

APPENDIX C
TRAFFIC ANALYSIS TECHNICAL REPORT
May 2020

U.S. Department of Transportation

Federal Highway Administration

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

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1

1 INTRODUCTION

1.1 Overview

The Federal Highway Administration (FHWA), as the Lead Federal Agency, and the Maryland Department of Transportation State Highway Administration (MDOT SHA), as the Local Project Sponsor, are preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for the I-495 & I-270 Managed Lanes Study (Study). The Study is evaluating potential transportation improvements to portions of the I-495 and I-270 corridors in Montgomery and Prince George's Counties, Maryland, and Fairfax County, Virginia.

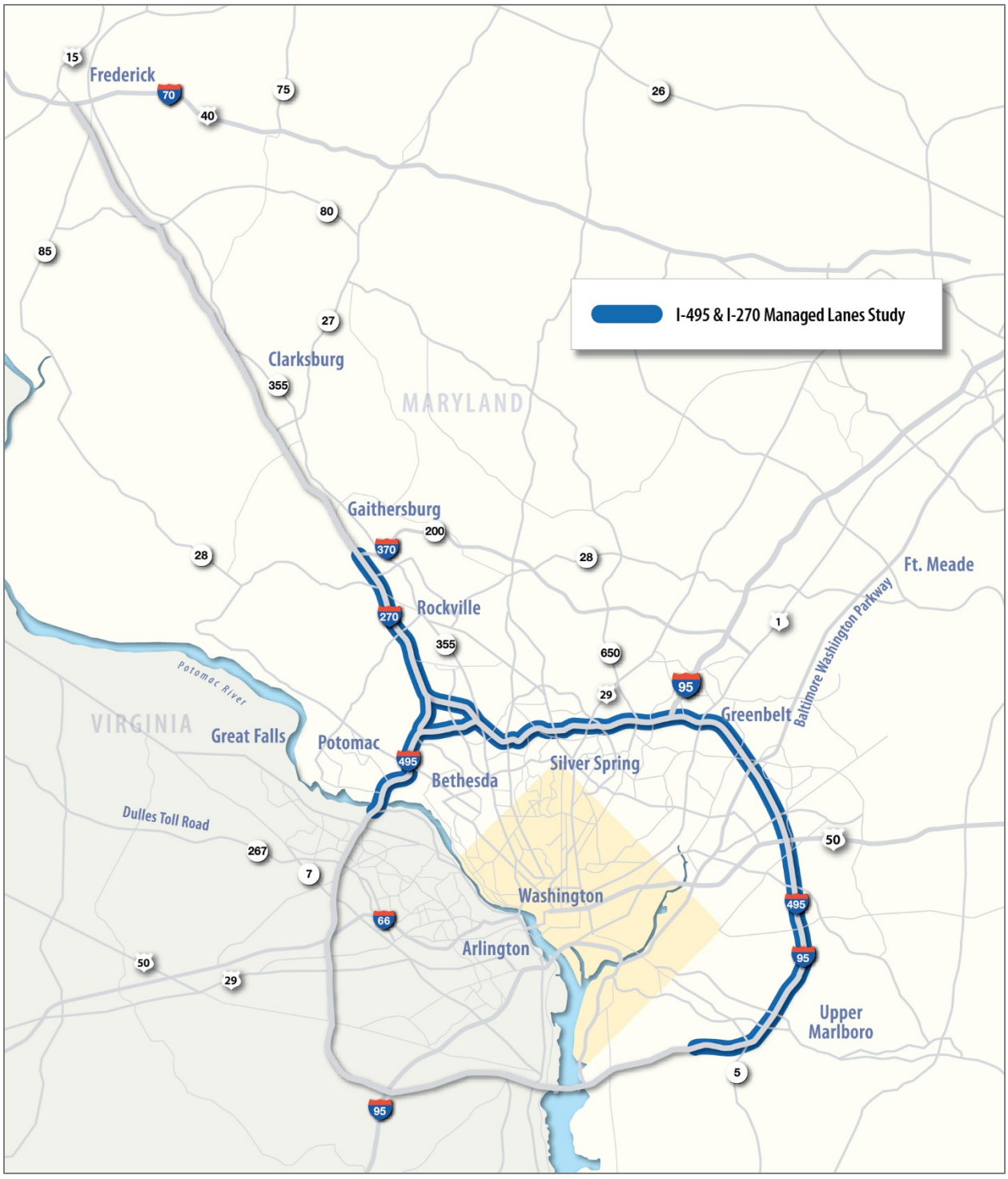
This EIS is being prepared in accordance with FHWA and Council on Environmental Quality (CEQ) regulations implementing NEPA and provisions of the Fixing America's Surface Transportation (FAST) Act. The content of the EIS also conforms to CEQ guidelines, which provide direction regarding implementation of the procedural provisions of NEPA, and the FHWA's Guidance for *Preparing and Processing Environmental and Section 4(f) Documents* (Technical Advisory T6640.8A, October 1987).

The purpose of the Traffic Analysis Technical Report is to present the existing conditions and an assessment of potential direct impacts of the Screened Alternatives and is being prepared to support and inform the EIS. The report begins with a description of the Study corridors, followed by a summary of the Purpose and Need, and a description of the alternatives evaluated.

1.2 Study Corridors

I-495 and I-270 in Maryland are the two most heavily traveled freeways in the National Capital Region, each with Average Annual Daily Traffic (AADT) volume up to 260,000 vehicles per day in 2018 (MDOT SHA, 2019). I-495 is the only circumferential route in the region that provides interregional connections to many radial routes in the region, such as I-270, US 29 (Colesville Road), I-95, the Baltimore-Washington Parkway, US 50 (John Hanson Highway), and MD 5 (Branch Avenue). I-270 is the only freeway link between I-495 and the fast-growing northwest suburbs in northern Montgomery County and the suburban areas in Frederick County. In addition to heavy commuter traffic demand, I-495 provides connectivity along the East Coast, as it merges with I-95 in Maryland for 25 miles around the east side of Washington DC. (**Figure 1-1**).

Figure 1-1: I-495 and I-270 Managed Lanes Study Corridors



1.3 Study Purpose and Need

The purpose of the Study is to develop a travel demand management solution(s) that addresses congestion and improves trip reliability on I-495 and I-270 within the Study limits and enhances existing and planned multimodal mobility and connectivity. The Study will address the following needs:

- **Accommodate Existing Traffic and Long-Term Traffic Growth** - High travel demand from commuter, business, and recreational trips results in severe congestion from 7 to 10 hours per day on the Study corridors, which is expected to deteriorate further by the planning horizon year of 2040. Additional roadway capacity is needed to address existing and future travel demand and congestion, reduce travel times, and allow travelers to use the facilities efficiently.

- **Enhance Trip Reliability** - Congestion on I-495 and I-270 results in unpredictable travel times. Travelers and freight commodities place a high value on reaching their destinations in a timely and safe manner, and in recent years, the Study corridors have become so unreliable that uncertain travel times are experienced daily. More dependable travel times are needed to ensure trip reliability.

- **Provide Additional Roadway Travel Choices** - Travelers on I-495 and I-270 do not have enough roadway options for efficient travel during extensive periods of congestion. Additional roadway management options are needed to improve travel choices, while retaining the general-purpose lanes.

- **Accommodate Homeland Security** - The National Capital Region is considered the main hub of government, military, and community installations related to homeland security. These agencies and installations rely on quick, unobstructed roadway access during a homeland security threat. Additional capacity would assist in accommodating a population evacuation and improving emergency response access should an event related to homeland security occur.

- **Improve Movement of Goods and Services** - I-495 and I-270 are major regional transportation networks that support the movement of passenger and freight travel within the National Capital Region. Existing congestion along both corridors increases the cost of doing business due to longer travel times and unreliable trips. The effects of this congestion on the movement of goods and services is a detriment to the health of the local, regional, and national economy. Efficient and reliable highway movement is necessary to accommodate passenger and freight travel, moving goods and services through the region.

Additional roadway capacity and improvements to enhance reliability must be financially viable. MDOT's traditional funding sources would be unable to effectively finance, construct, operate, and maintain improvements of this magnitude. Revenue sources that provide adequate funding, such as pricing options, are needed to achieve congestion relief and address existing high travel demand.

Given the highly constrained area surrounding the interstates in the Study corridors, MDOT SHA recognizes the need to plan and design this project in an environmentally responsible manner. MDOT SHA will strive to avoid and minimize community, natural, cultural, and other environmental impacts, and mitigate for any unavoidable impacts at an equal or greater value. MDOT SHA will work with our Federal, State, and Local resource agency partners in a streamlined, collaborative, and cooperative way to meet all regulatory requirements to ensure the protection of environmental resources to the greatest extent practicable. Any build alternatives will offset unavoidable impacts while prioritizing and coordinating comprehensive mitigation measures in or near the study area, which are meaningful to the environment and the community.

1.4 Alternatives Evaluated

Seven alternatives are being evaluated and compared in the technical reports supporting the EIS. These Screened Alternatives include Alternatives 1, 5, 8, 9, 10, 13B, and 13C and are illustrated in the typical sections shown in **Figure 1-2**. This report also references the "Build Screened Alternatives," which is a subset that includes all the Screened Alternatives except Alternative 1 (No Build).

The following terms are used in describing the Screened Alternatives.

- **General Purpose (GP) Lanes** are lanes on a freeway or expressway that are open to all motor vehicles.[1]
- **Managed Lanes** are highway facilities, or a set of lanes, where operational strategies are proactively implemented and managed in response to changing conditions.[2]
- **High-Occupancy Toll (HOT) Lanes** are High-Occupancy Vehicle (HOV) facilities that allow lower-occupancy vehicles, such as solo drivers, to use the facilities in return for toll payments, which could vary by time of day and level of congestion.[1]
- **Express Toll Lanes (ETL)** are dedicated managed lanes within highway rights-of-way that motorists may use by paying a variably priced toll.[3]
- **High-Occupancy Vehicle** (HOV) Lanes are any preferential lane designated for exclusive use by vehicles with two or more occupants for all or part of a day, including a designated lane on a freeway, other highway or a street, or independent roadway on a separate right-of-way.[4]
- **Reversible Lanes** are facilities in which the direction of traffic flow can be changed at different times of the day to match peak direction of travel, typically inbound in the morning and outbound in the afternoon.[1]

A. Alternative 1: No Build

The No Build Alternative, often called the base case, includes all projects in the 2040 financially Constrained Long-Range Plan (CLRP) for the National Capital Region adopted by the Metropolitan Washington Council of Governments (MWCOG) - Transportation Planning Board (TPB). This includes other projects impacting the facilities that are subject to this Study. Specifically, the CLRP reflects the Purple Line which is currently under construction (Spring 2019), and the extension of the I-495 Express Lanes in Virginia from north of the Dulles Toll Road interchange to the American Legion Bridge (Virginia's 495 Express Lanes Northern Extension [NEXT] Project). Alternative 1 also includes the I-270 Innovative Congestion Management (ICM) Contracts, which are providing a series of construction projects to improve mobility and safety at key points along I-270 targeted to reduce congestion at key bottlenecks along the corridor. All improvements are being implemented within the existing roadway right-of-way and are

[1] *National Cooperative Highway Research Program, Research Report 835, Guidelines for Implementing Managed Lanes*. Transportation Research Board. 2016

[2] https://ops.fhwa.dot.gov/publications/managelanes_primer/index.htm

[3] https://www.fhwa.dot.gov/ipd/tolling_and_pricing/defined/demand_mgmt_tool.aspx

[4] https://ops.fhwa.dot.gov/freewaymgmt/hovguidance/glossary.htm

anticipated to be completed by the end of 2021. While these improvements will improve mobility and safety, they will not address the long-term roadway capacity needs for the I-270 corridor. Routine maintenance and safety improvements along I-495 and I-270 are included in the No Build Alternative, but it does not include new capacity improvements to I-495 and I-270. Consistent with NEPA requirements, Alternative 1 will be carried forward for further evaluation to serve as a base case for comparing the other alternatives.

B. Alternative 5: 1-Lane, High-Occupancy Toll Managed Lanes Network

This alternative consists of adding one HOT managed lane in each direction on I-495 and converting the one existing HOV lane in each direction to a HOT managed lane on I-270. Buses would be permitted to use the managed lanes.

C. Alternative 8: 2-Lane, Express Toll Lane Managed Lanes Network on I-495 and 1-Lane Express Toll Lane and 1-Lane HOV Managed Lane Network on I-270

This alternative consists of adding two ETL managed lanes in each direction on I-495, retaining one existing HOV lane in each direction on I-270, and adding one ETL managed lane in each direction on I-270. Buses would be permitted to use the managed lanes.

D. Alternative 9: 2-Lane, High-Occupancy Toll Managed Lanes Network

This alternative consists of adding two HOT managed lanes in each direction on I-495, converting the one existing HOV lane in each direction on I-270 to a HOT managed lane, and adding one HOT managed lane in each direction on I-270, resulting in a two-lane, managed lane network on both highways. Buses would be permitted to use the managed lanes.

E. Alternative 10: 2-Lane, Express Toll Lane Managed Lanes Network and 1-Lane HOV Managed Lane Network on I-270 Only

This alternative consists of adding two ETL managed lanes in each direction on I-495, retaining one existing HOV lane per direction on I-270, and adding two ETL managed lanes in each direction on I-270. Buses would be permitted to use the managed lanes.

F. Alternative 13B: 2-Lane, High-Occupancy Toll Managed Lanes Network on I-495 and HOT Managed Reversible Lanes Network on I-270

This alternative consists of adding two HOT managed lanes in each direction on I-495 and converting the existing HOV lanes in both directions to two HOT managed, reversible lanes on I-270. Buses would be permitted to use the managed lanes.

G. Alternative 13C: 2-Lane, ETL Managed Lanes Network on I-495 and ETL Managed, Reversible Lanes Network and 1-Lane HOV Managed Lane Network on I-270

This alternative consists of adding two ETL managed lanes in each direction on I-495 and retaining the existing HOV lanes in both directions and adding two ETL managed, reversible lanes on I-270. Alternative 13C would maintain the existing roadway network on I-270 with HOV lanes to allow for HOV travel while adding two managed, reversible lanes. Buses would be permitted to use the managed lanes.

H. Consideration of Alternative 9M

The analysis for the Screened Alternatives summarized above was completed in Spring of 2019 and reflects information available to MDOT SHA at that time. As the Study progressed through the NEPA

process, the project team obtained comments as a result of cooperating agency coordination. As a result of this continued effort, MDOT SHA and FHWA have evaluated an additional alternative for the Study known as Alternative 9M. Alternative 9M is considered a blend of two Screened Alternatives, Alternative 5 (one-lane HOT) and Alternative 9 (two-lane HOT).

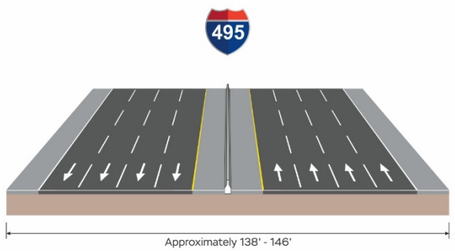
Alternative 9M has the same LOD as Alternative 9 along I-495 from south of the George Washington Memorial Parkway in Virginia to the I-270 West Spur and from the I-95 interchange to west of MD 5 as well as along I-270 from I-495 to I-370. Alternative 9M has the same LOD as Alternative 5 along I-495 from I-270 West Spur to the I-95 interchange. Alternative 9M includes the same build elements as the other Screened Alternatives including direct access locations and interchange improvements.

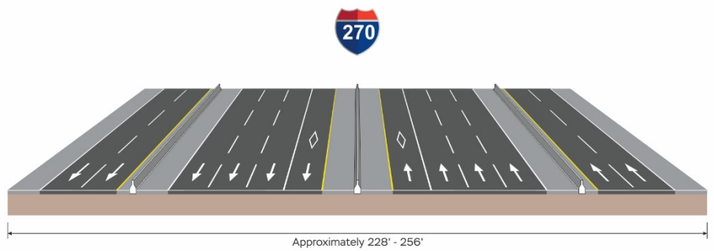
Details of the travel forecasting methodology and traffic operational analysis results for Alternative 9M are presented in the document titled "Alternative 9 Modified Preliminary Evaluation Memorandum" included with the DEIS in Appendix B of the Alternatives Technical Report. Alternative 9M was evaluated to the same level of detail as the Screened Alternatives, which are presented in this report.

Figure 1-2: Typical Sections of Alternatives Considered

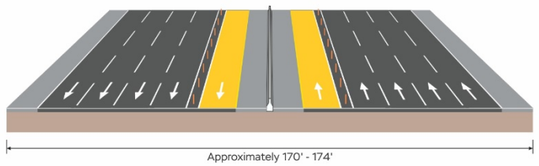
SCREENED ALTERNATIVES

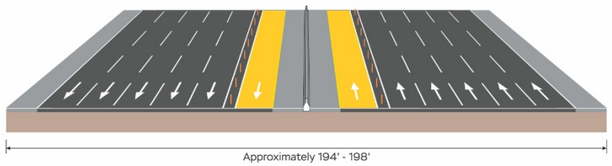
1 No Build (Existing):
All projects in Constrained Long-Range Plan (CLRP) (including I-270 Innovative Congestion Management (ICM) improvements)



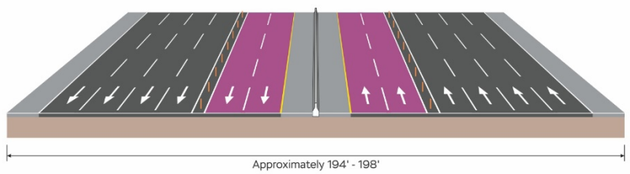


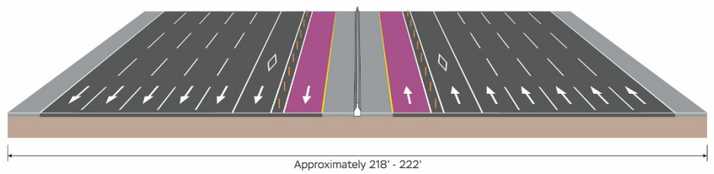
5 1-Lane, HOT Managed Lane Network:
Add one HOT managed lane in each direction **on I-495** and convert one existing HOV lane in each direction to a HOT managed lane **on I-270**



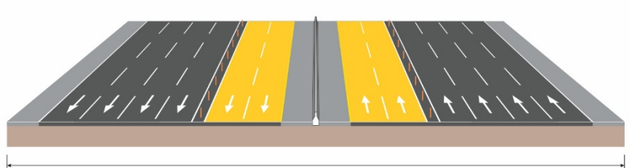


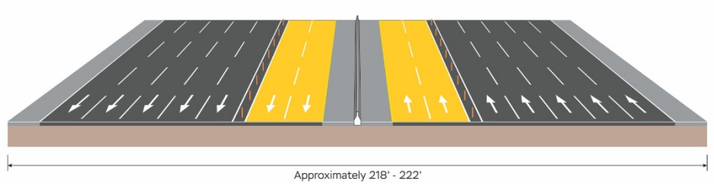
8 2-Lane, ETL Managed Lanes Network on I-495, 1-Lane ETL and 1-Lane HOV Managed Lane network on I-270 only
Add two ETL managed lanes in each direction **on I-495** and add one ETL managed lane and retain one HOV lane in each direction **on I-270**





9 2-Lane, HOT Managed Lane Network:
Add two HOT managed lanes in each direction **on I-495** and convert one existing HOV lane to a HOT managed lane and add one HOT managed lane in each direction **on I-270**





Legend
New HOT Managed Lanes
New ETL Managed Lanes

* **Note:** Managed Lanes Could Include Buses

NOT TO SCALE

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

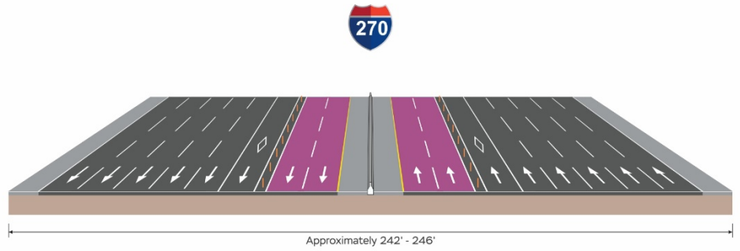
SCREENED ALTERNATIVES

10

2-Lane, ETL Managed Lane Network and 1-Lane HOV Managed Lane Network on I-270 only

Add two ETL managed lanes in each direction **on I-495 and on I-270** and retain one existing HOV lane in each direction **on I-270 only**

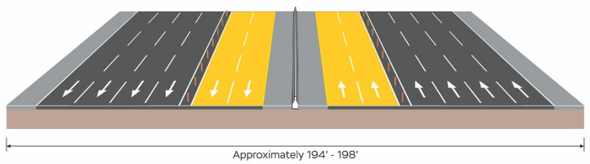


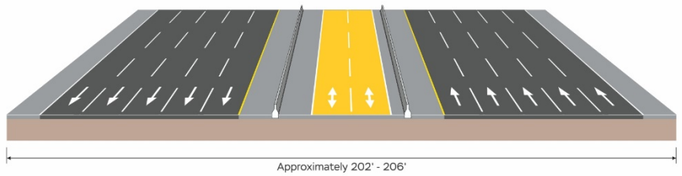


13B

2-Lane, HOT Managed Lane Network on I-495; HOT Managed, Reversible Lane Network on I-270:

Add two HOT managed lanes in each direction on I-495 and convert existing HOV lanes to two HOT managed reversible lanes **on I-270** while maintaining GP lanes

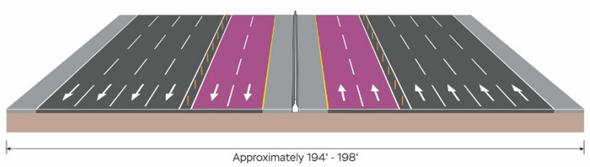


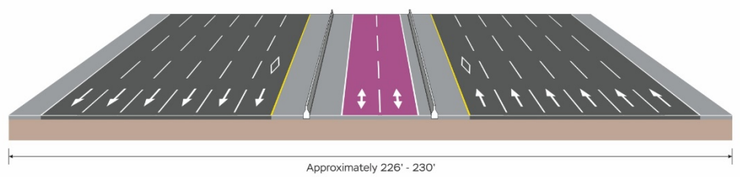


13C

2-Lane, ETL Managed Lane Network on I-495; ETL Managed, Reversible Lane Network and 1-Lane HOV Managed Lane Network on I-270

Add two ETL managed lanes in each direction on I-495, maintain existing HOV managed lanes on I-270 and add two reversible ETL managed lanes on I-270





Legend

- New HOT Managed Lanes
- New ETL Managed Lanes

* **Note:** Managed Lanes Could Include Buses

NOT TO SCALE

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

2

2 DEVELOPMENT AND CALIBRATION OF EXISTING TRAFFIC MODELS

The following sections detail the process of developing and then calibrating the models used in this Study. The development and calibration of any model is necessary to ensure that future models accurately reflect existing congestion patterns and vehicle behaviors. Model validation and calibration refers to the process that confirms the model can provide a reasonable approximation of real-world conditions (validation) and refines the model as necessary to bring it within desired validation targets (calibration). This process ensures that the model accurately represents existing traffic conditions prior to data being reported for analysis purposes.

Calibration thresholds can fluctuate depending on the nature of the project, precision of available inputs, and the needs and resources of the agency. However, MDOT SHA has well-established methods for calibration as documented in its VISSIM Modeling Document (MDOT SHA November 2016, Updated August 2017). This document is provided online[5] for anyone to use in their model calibration efforts, thus ensuring a level of consistency by all traffic modelers in the state. The guidance requires that calibration be focused on data-driven criteria to confirm that models reflect existing vehicle behaviors and congestion patterns experienced in the system being analyzed.

2.1 Model Area Limits

The first step in developing a model is defining its geographical limits and the roadways to be included in the model. As the Study is considering improvements along I-495, I-270, and its interchanges, the model development begins with determining the limits of these freeways to be included.

A. I-495 Description

I-495 is a 64-mile circular freeway that runs through Maryland and Virginia and around the District of Columbia and includes 42 miles in Maryland. I-495 provides access to several roadways in the Washington, DC area, including:

- I-95, which runs along the east coast of the United States from Maine to Florida,
- I-270, which connects the Washington, DC area to Frederick County and western Maryland,
- US 29 and MD 295 (Baltimore-Washington Parkway), which provide connections from the Washington, DC Maryland suburbs to the Baltimore region,
- US 50, which provides access to Annapolis and the Eastern Shore
- MD 5, which provides access to southern Maryland.

[5] https://www.roads.maryland.gov/OPPEN/VISSIM%20Modeling%20Guidance%209-12-2017.pdf

For a 25-mile section in Prince George's County from the I-495/I-95 interchange to the Woodrow Wilson Bridge, I-495 runs concurrent with I-95. Barrier-separated Collector-Distributor (CD) lanes are present along the Inner Loop from I-95 to US 1, and in both directions from north of MD 202 to Arena Drive and from MD 210 to the Woodrow Wilson Bridge. The posted speed limit along I-495 is 55 mph.

B. I-270 Description

I-270 is a 32-mile freeway that runs from I-495 to the southeast of I-70 in the northwest, near Frederick, Maryland. North of I-70, this roadway becomes US 15, which continues north into Pennsylvania. I-270 primarily serves as a commuter route to the Washington, DC area from Frederick County and the communities along the corridor. Two miles north of I-495, I-270 splits into an East Spur and a West Spur. Both directions of I-270 include High Occupancy Vehicle (HOV) and CD lanes. The I-270 Southbound HOV lane begins at I-370 and ends at MD 187 along the East Spur and at Democracy Boulevard along the West Spur. The I-270 Northbound HOV lane begins at MD 187 along the East Spur and Democracy Boulevard along the West Spur and ends at MD 117. The HOV lanes are in service weekdays from 6:00-9:00 AM in the southbound direction and 3:30-6:30 PM in the northbound direction. General traffic may use these lanes at other times. The HOV lanes are designated HOV 2+, meaning two or more people must occupy the vehicle. Motorcycles and emergency vehicles (during an emergency) are also permitted in these lanes. Additionally, plug-in electric and plug-in hybrid electric vehicles registered in Maryland are permitted to drive in the HOV lanes with only one occupant. The CD lanes run along I-270 Southbound from north of I-370 to south of Montrose Road, and along I-270 Northbound from south of Montrose Road to north of MD 124. The CD lanes are barrier separated, and the number of lanes vary along the corridor. The HOV lanes are not barrier-separated. The posted speed limit along I-270 is 55 mph from I-495 (both spurs) to MD 121, 65 mph from MD 121 to MD 85, and 55 mph from MD 85 to I-70.

C. Corridors Modeling Limits

While the NEPA limits of the Study extend along I-270 from I-370 to I-495 and along I-495 from the George Washington Memorial Parkway in Virginia to the Woodrow Wilson Bridge in Maryland, as previously shown in **Figure 1-1**, all modeling efforts for the Technical Analysis Traffic Report were extended to the following limits:

- I-495 from VA 193 in Virginia to the Woodrow Wilson Bridge on the Maryland side
- I-270 from the I-70 ramp merges to I-495, including the East and West Spurs

Extending the modeling to these limits ensures that the model accounts for effects of congestion originating outside the NEPA limits that impact the freeway segments within the NEPA limits, and that it captures the full extent of congestion both within the NEPA limits as well as outside of the NEPA limits that impact the Study area. Every existing interchange along I-495 and I-270 within these modeling limits was included in the modeling analysis. The interchange that is under construction at I-270 at Watkins Mill Road was included in all future models. The modeled network includes a total of 50 interchanges: 29 along I-495, 18 along I-270, 1 interchange between I-270 and the I-270 Spurs, and 2 interchanges between I-495 and the I-270 Spurs. The interchange locations are shown in **Figure 2-1**. Lane configurations for I-495 and I-270 are described in **Tables 2-1 and 2-2**, respectively. This list includes the locations of HOV lanes and CD lanes. The locations of the HOV lanes, as well as CD lanes, are shown in **Figure 2-2**.

Figure 2-1: Limits of Traffic Model Network and Interchange Locations Included along I-495 and I-270

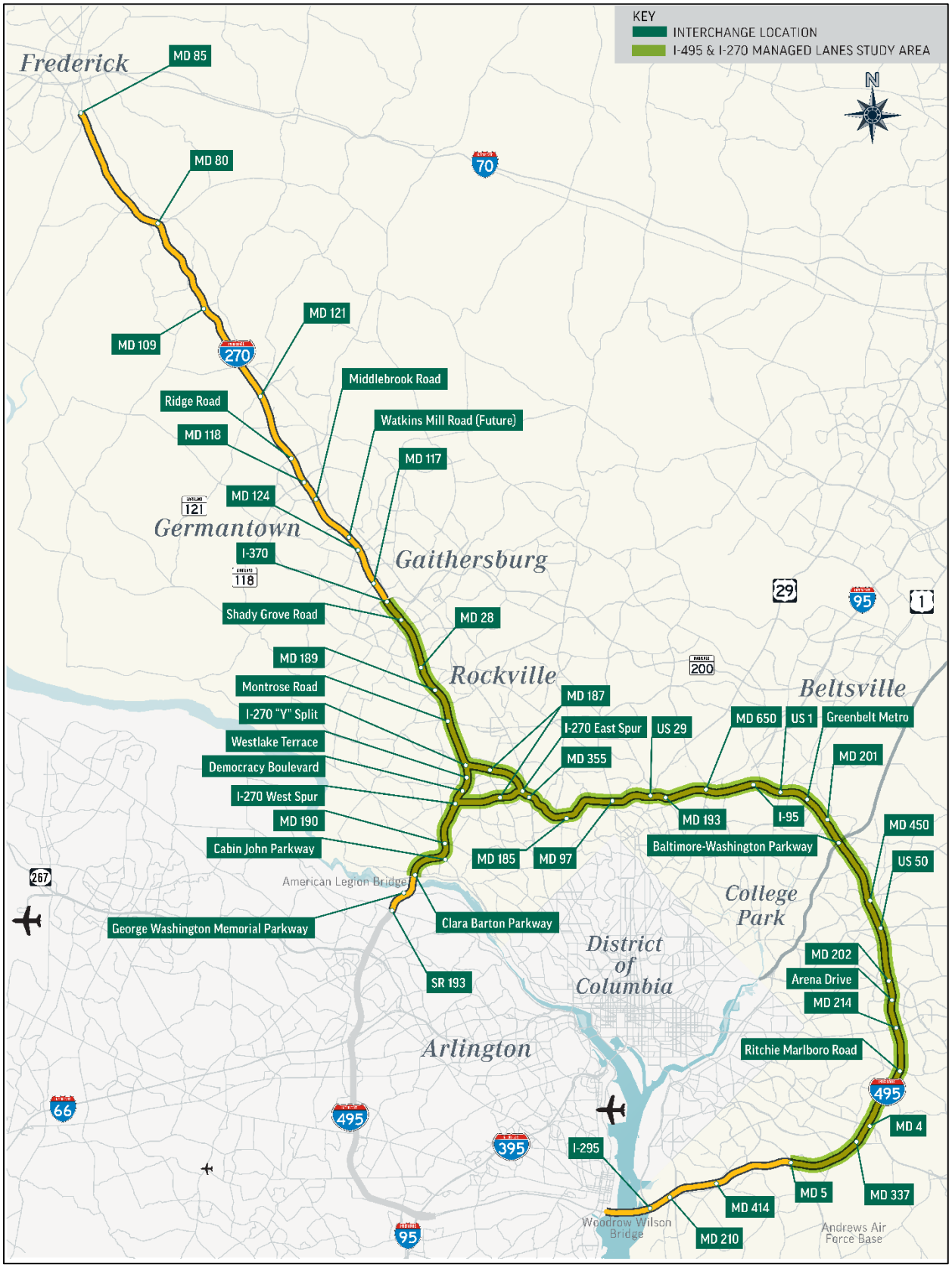


Table 2-1: I-495 Interchanges and Lane Configurations Included in Model

Segment		# Lanes	
From	**To**	**Inner Loop**	**Outer Loop**
VA 193	George Washington Memorial Pkwy	4 + 1 aux	4 + 3 CD
George Washington Memorial Pkwy	Clara Barton Pkwy	4 + 1 aux	4 + 1 aux
Clara Barton Pkwy	Cabin John Pkwy	4	4
Cabin John Pkwy	MD 190	4	4
MD 190	I-270 West Spur	5	5
I-270 West Spur	MD 187	3	3
MD 187	I-270 East Spur/MD 355	3	3
I-270 East Spur/MD 355	MD 185	4	4
MD 185	MD 97	4	4
MD 97	US 29	4	4
US 29	MD 193	4 + 1 aux	4
MD 193	MD 650	4	4 to 5
MD 650	I-95	4 + 1 aux	5 + 1 aux
I-95	US 1	4 + 2 CD	4 + 2 aux
US 1	Greenbelt Metro	4	4
Greenbelt Metro	MD 201	4	4
MD 201	Baltimore-Washington Pkwy	4	4 + 1 aux
Baltimore-Washington Pkwy	MD 450	4	4
MD 450	US 50	4	4 + 1 aux
US 50	MD 202	4 to 3 + 2 CD + 1 aux	4 to 3 + 2 CD + 1 aux
MD 202	Arena Drive	3 + 2 CD + 1 aux	3 + 2 CD + 1 aux
Arena Drive	MD 214	4 + 1 aux	4 + 1 aux
MD 214	Ritchie Marlboro Road	4	4
Ritchie Marlboro Road	MD 4	4	4
MD 4	MD 337	4	4
MD 337	MD 5	4	4
MD 5	MD 414	4	4
MD 414	MD 210	4	4
MD 210	I-295	2 + 3 CD	2 + 3 CD
I-295	Woodrow Wilson Bridge	2 + 3 CD	2 + 3 CD

Table 2-2: I-270 Interchanges and Lane Configurations Included in Model

Segment		# Lanes	
From	**To**	**Southbound**	**Northbound**
North of Split			
MD 85	MD 80	2	2
MD 80	MD 109	2	2
MD 109	MD 121	2	2
MD 121	Father Hurley Boulevard	3	2 + 1 HOV*
Father Hurley Boulevard	MD 118	3 + 1 aux	2 + 1 HOV* + 1 aux
MD 118	Middlebrook Road	3	3 + 1 HOV*
Middlebrook Road	Watkins Mill Road (Future)	4	3 + 1 HOV*
Watkins Mill Road (Future)	MD 124	4	3 + 1 HOV*
MD 124	MD 117	4	3 + 1 HOV* + 2 CD
MD 117	I-370	5 to 4 + 2 CD	3 + 1 HOV* + 3 CD
I-370	Shady Grove Road	3 + 1 HOV* + 3 CD	3 + 1 HOV* + 3 CD
Shady Grove Road	MD 28	3 + 1 HOV* + 2 CD	3 + 1 HOV* + 3 CD
MD 28	MD 189	3 + 1 HOV* + 2 CD	3 + 1 HOV* + 2 CD
MD 189	Montrose Road	3 + 1 HOV* + 2 CD	3 + 1 HOV* + 2 CD
Montrose Road	I-270 Split	5 + 1 HOV*	5 + 1 HOV*
East Spur			
I-270 Split	MD 187	3 to 2 + 1 HOV*	3 to 2 + 1 HOV*
MD 187	I-495	2 + 1 HOV*	2 + 1 HOV*
West Spur			
I-270 Split	Westlake Terrace	2 + 1 HOV*	2 + 1 HOV*
Westlake Terrace	Democracy Boulevard	2 + 1 HOV*	2 + 1 HOV*
Democracy Boulevard	I-495	3	3

**HOV lanes are in service from 6:00-9:00 AM Southbound and 3:30-6:30 PM Northbound on weekdays; lanes are for general purpose during other times*

Figure 2-2: Locations of High Occupancy Vehicle (HOV) and Collector-Distributor (CD) Lanes

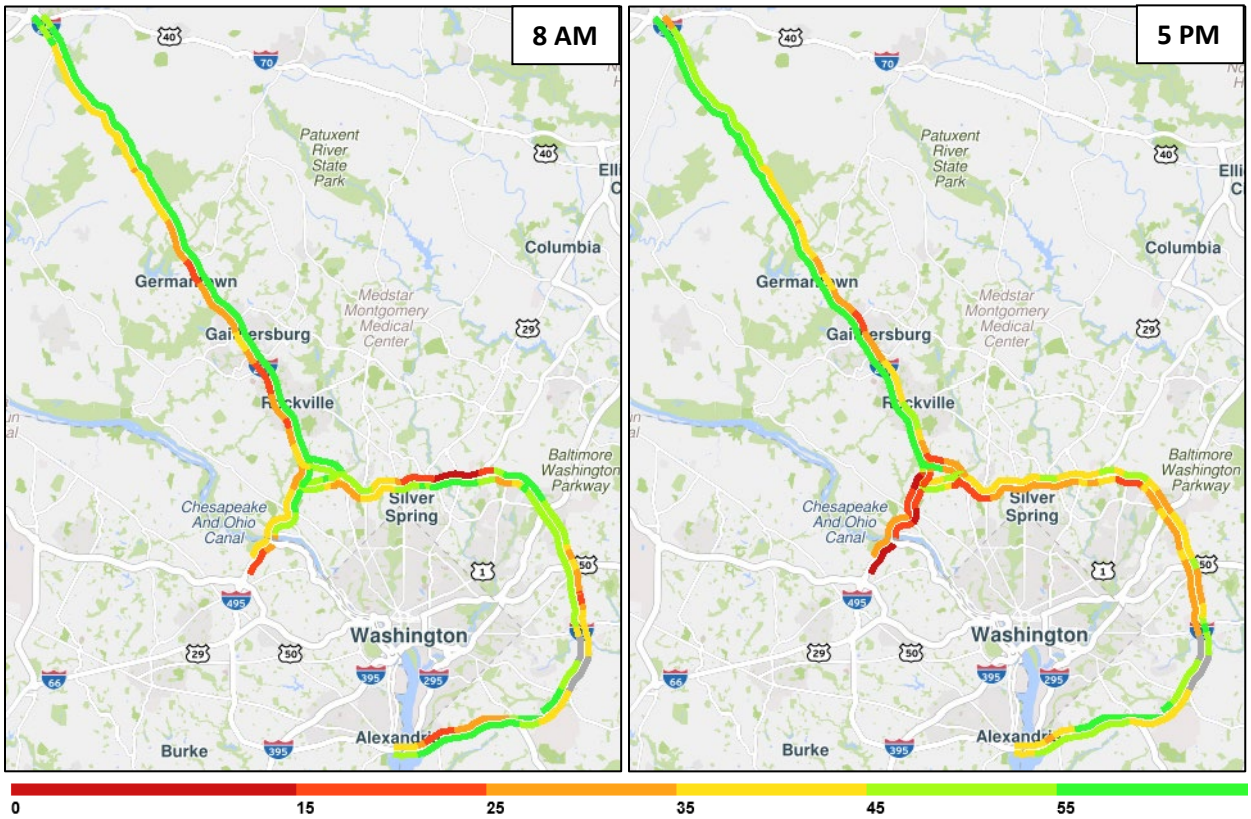


Average speeds in May 2017 along the I-495 and I-270 corridors during the peak morning and early evening hours are shown in **Figure 2-3**. The modeling limits of the I-495 corridor were determined based on congestion identified on the I-495 Outer Loop during the evening peak hour, which bottlenecks at the VA 193 interchange and then impacts the capacities at the American Legion Bridge (ALB), as shown in **Figure 2-3**. It was therefore required to include VA 193 to ensure any proposed managed lane solution did not result in further bottlenecks outside the NEPA limits that might affect the benefits to the driving public. A western terminus approximately 0.4 miles south of the I-495/George Washington Parkway interchange was identified as a logical model terminus as it allows any outer loop mainline improvements that are carried to the George Washington Memorial Parkway to be merged and transitioned into the existing mainline lanes without causing congestion due to lane drops and merges. The tie-in of the

proposed improvements with the existing I-495 configuration south of the George Washington Memorial Parkway interchange would not preclude any future improvements completed by Virginia Department of Transportation (VDOT) along I-495, including extending the I-495 HOT lane system to the George Washington Memorial Parkway interchange.

The modeling limits of the I-270 corridor were extended to I-70 to evaluate the traffic congestion impacts of any managed lanes occurring within the NEPA study limits (I-370 to I-495) and how they impact conditions farther north to Frederick. Extending the traffic analysis to I-70 also benefits future traffic analyses for NEPA within the section of I-270 from I-370 to I-70 by ensuring consistency between studies, as has already been proposed by the Managed Lanes Team for the 2019 year.

Figure 2-3: Average Speeds (mph) for Tuesdays, Wednesdays, and Thursdays in May 2017



Source: Regional Integrated Transportation Information System (RITIS); RITIS did not have speed data along I-495 Inner Loop from MD 214 to Ritchie Marlboro Road or along I-495 Outer Loop from MD 4 to Ritchie Marlboro Road (indicated in gray)

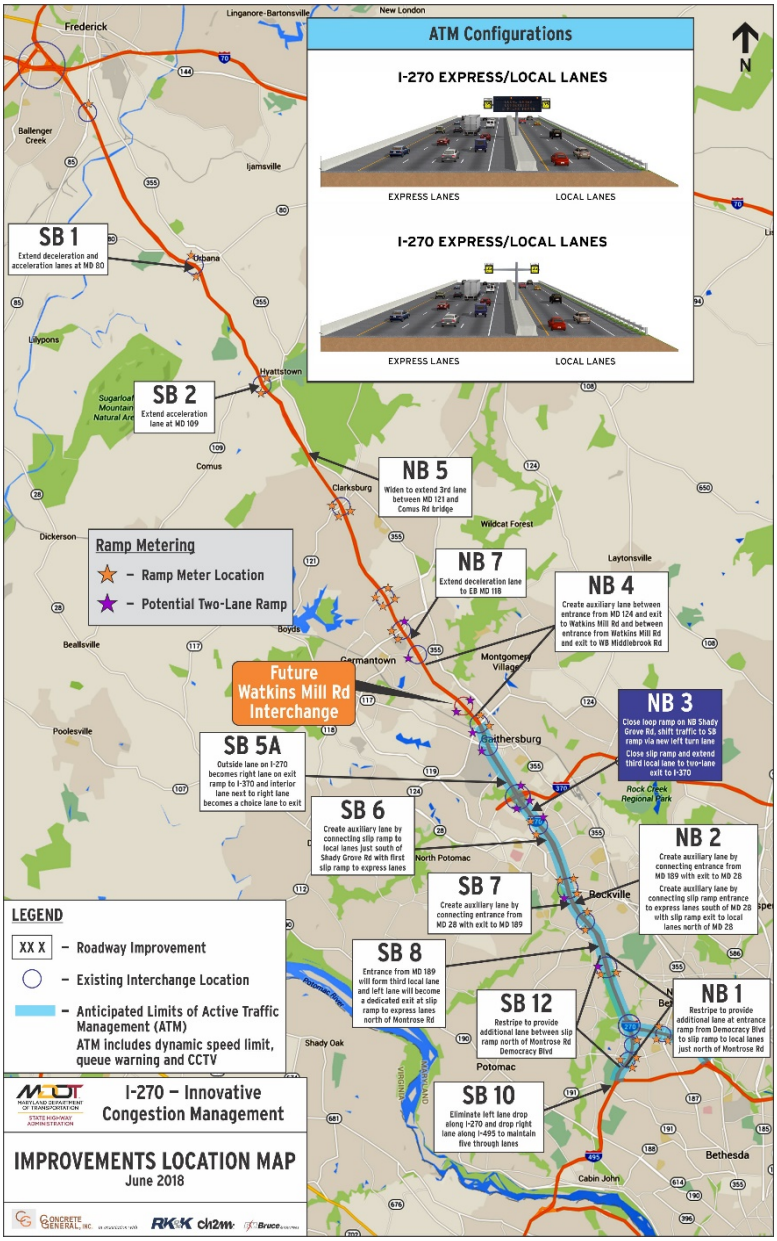
2.2 Analysis Years and Background Projects

For the purposes of this report, the baseline conditions for the Study was set to be the existing year (2017) conditions at the onset of the Study. This scenario is referred to as 2017 Existing within this report, and reflects traffic conditions along I-495 and I-270 prior to the completion of many projects that are proposed or under construction in the area.

A. I-270 Innovative Congestion Management (ICM) Improvements

The I-270 Innovative Congestion Management (ICM) initiative is a Progressive Design-Build project to construct improvements along I-270 between I-70 and I-495, including the East and West Spurs. This project was announced in April 2017 as a series of targeted improvements with the goal of reducing congestion at key locations, with a scheduled completion in 2021. The project includes fourteen roadway improvements that increase capacity and vehicle throughput and address safety concerns and bottlenecks. The project also includes innovative technologies and techniques, including adaptive ramp metering and active traffic management strategies, including dynamic message signs and dynamic speed limits. Traffic data with the I-270 ICM improvements could not be incorporated into the 2017 existing year because the project improvements were not fully implemented, so no reliable data is available to collect. **Figure 2-4** displays the proposed improvements of the I-270 ICM initiative.

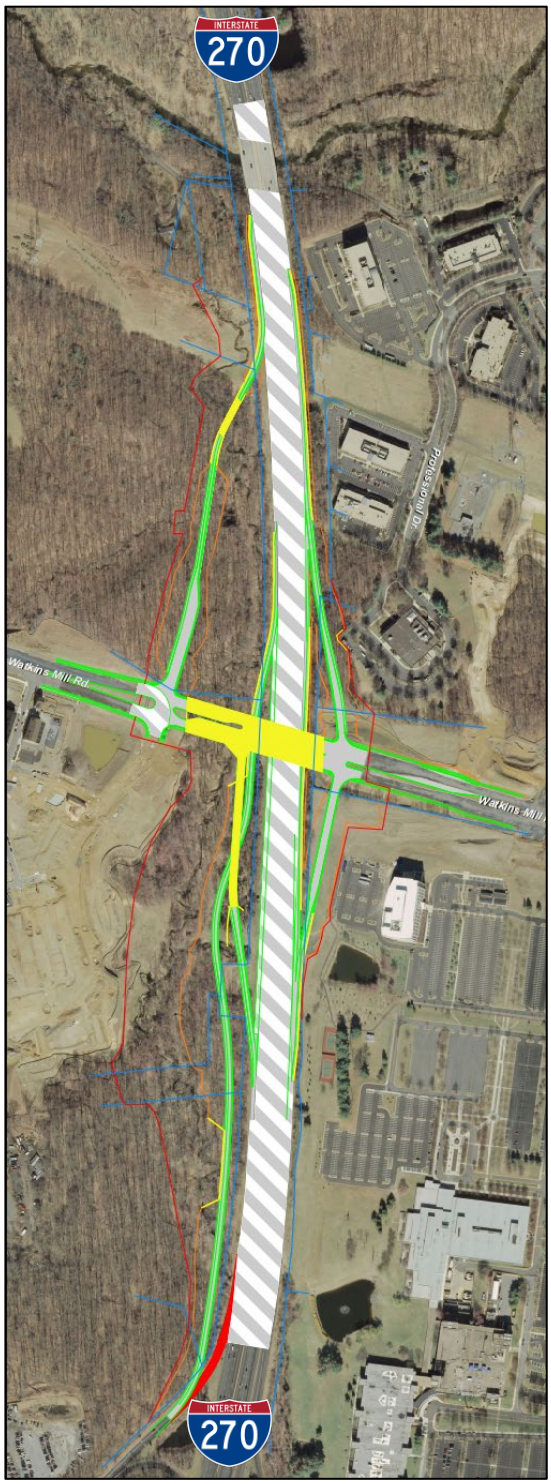
Figure 2-4: I-270 Innovative Congestion Management (ICM) Improvements



B. I-270 at Watkins Mill Road Interchange

A new interchange is currently under construction along I-270 at Watkins Mill Road, located north of the interchange at MD 124, with an anticipated completion date of July 2020. The plans for this interchange are shown in **Figure 2-5.**

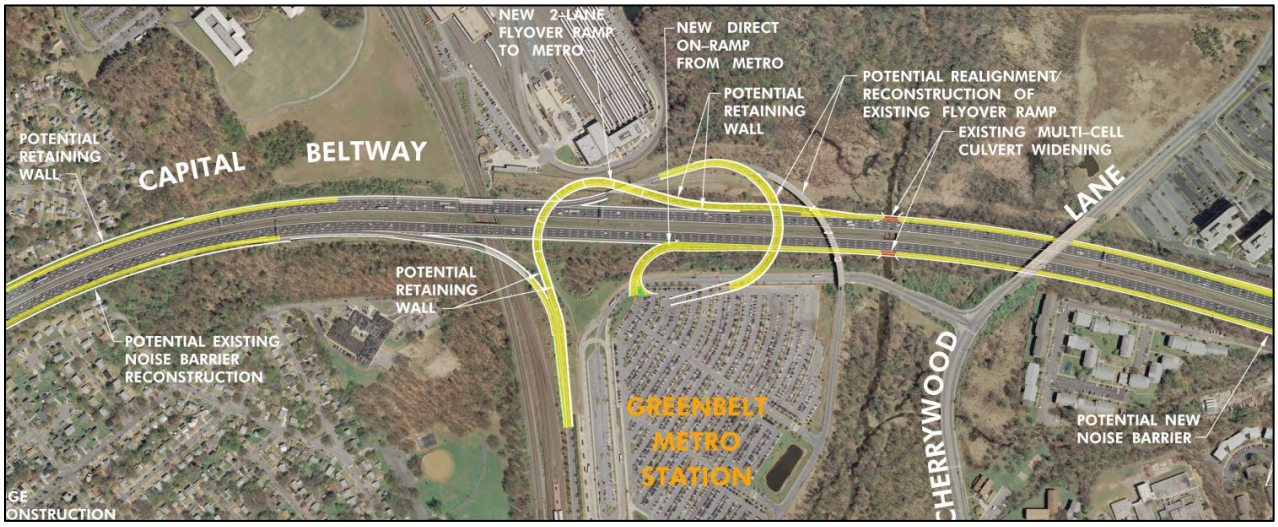
Figure 2-5: I-270 at Watkins Mill Road Interchange Project



C. Greenbelt Metro Station Access Improvements

There is an MDOT SHA-proposed access improvements project at the Greenbelt Metro Station along I-495. These improvements are shown in **Figure 2-6**.

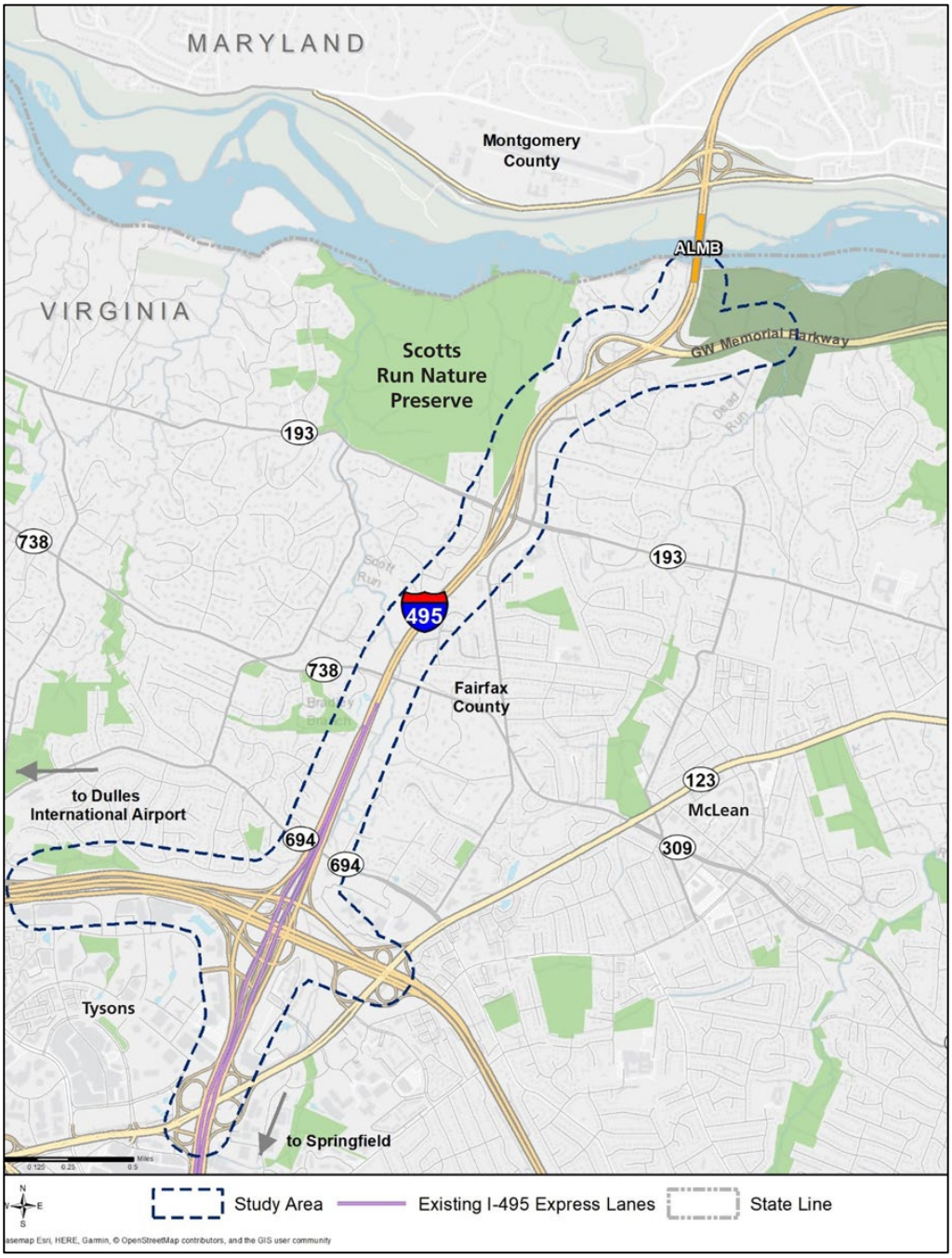
Figure 2-6: Greenbelt Metro Station Access Improvements



D. VDOT I-495 Express Lanes Northern Extension (NEXT) Study

The Virginia Department of Transportation (VDOT) is performing its I-495 Express Lanes Northern Extension (NEXT) study, on a proposed extension of the I-495 Express Lanes from the I-495 at Dulles Toll Road interchange to the American Legion Bridge. The study began in April 2018. Construction is scheduled to begin in 2021 and be completed in 2023. The study area for this project is shown in **Figure 2-7**.

Figure 2-7: VDOT NEXT Study Area



Source: VDOT

E. Analysis Years

Based on the previous discussion constraints at the time the planning effort was underway, the Study's baseline year was set to 2017 for the Existing Year without the I-270 ICM improvements, the I-270 at Watkins Mill Road interchange, the Greenbelt Metro Access improvements, and VDOT NEXT. These improvements are, however, implemented in all future year analyses, which includes the Alternative 1/No Build conditions. A 2025 Interim Year that includes these improvements was also evaluated, followed by

the traditional 20-year forecast, reflective of a 2040 Build Year. The 2025 Interim Year results were used for the Air Quality Analysis. The Air Quality Analysis is provided in a separate technical memorandum supporting the EIS.

2.3 Measures of Effectiveness

Measures of Effectiveness (MOEs) are the data outputs generated during simulation and analysis that assist in reaching data-driven decisions. For the purposes of the Study, the following MOEs are being reported for comparison between the Screened Alternatives, including Alternative 1/No Build:

- Travel speeds between sections, in miles per hour (mph)
- Vehicle throughput between sections, in vehicles per hour, and person throughput between sections, in person per hour
- Vehicles Miles Traveled (VMT) between sections
- Percent demand met, in vehicle throughput per hour of total hourly vehicle demand
- Ability to achieve an average speed of 45 mph within the managed lane, while maximizing throughput (all Build Screened Alternatives meet this speed threshold)
- Intersection Level of Service (LOS)
- Freeway Segment Level of Service (LOS)
- Latent Demand

Details of the outputs for 2017 Existing Year and 2040 Build Year are described in this report under their respective sections.

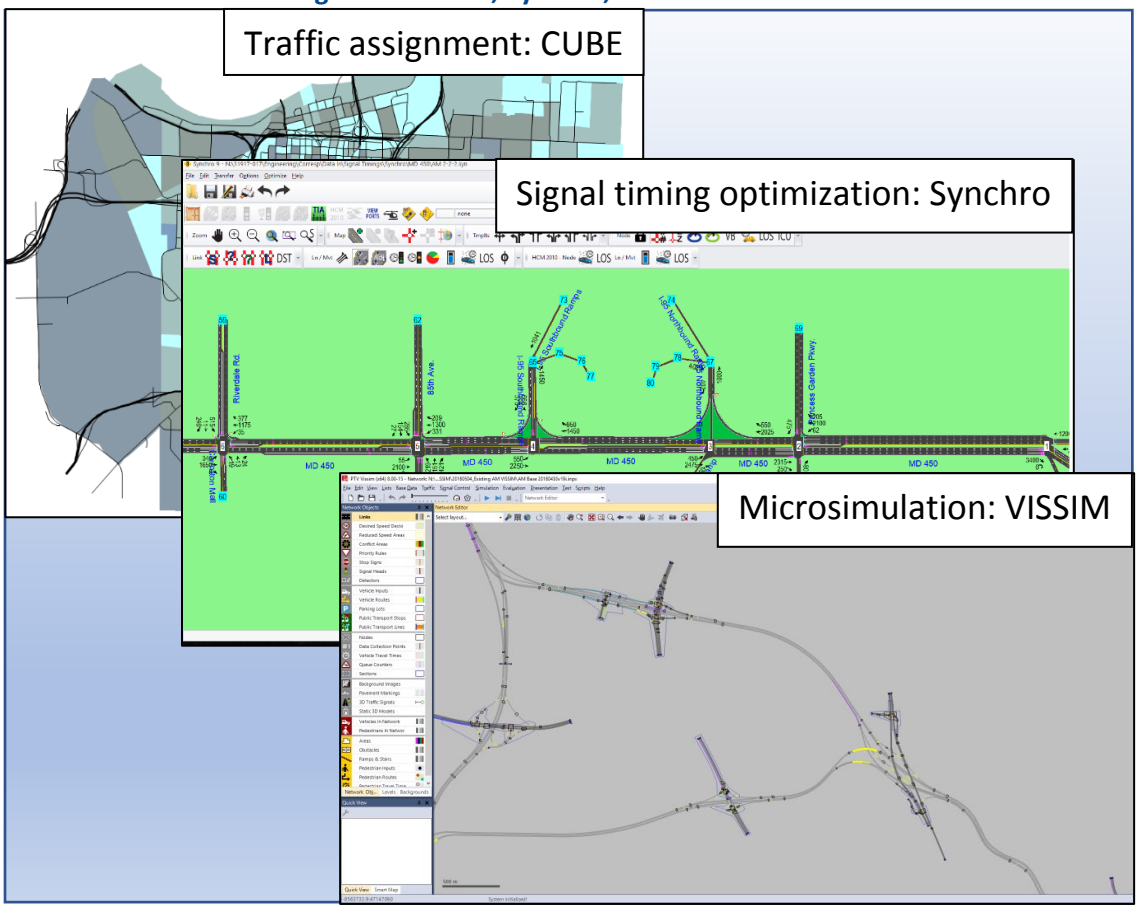
2.4 Traffic Analysis Tools

The traffic analysis tools used in this Study include macroscopic and microsimulation modeling software. Examples of these tools are shown in **Figure 2-8**. These tools use industry-standard methods for evaluating travel demand and traffic operations.

- ***CUBE, Version 6,*** by Citilabs, is a macroscopic modeling tool that is used to model regional travel demands based on changes to the transportation network, land use, and population. CUBE was used for this Study to run the travel demand model developed by MWCOG. The travel demand model results are then used to develop traffic volume forecasts.
- ***VISSIM, Version 10.00-09***, by PTV Group, is a traffic microsimulation model with primary applications being arterial and freeway operational analyses. VISSIM allows for flexibility to develop and analyze a wide range of complex vehicle movements and roadway geometry, including managed lanes and alternative interchange designs. VISSIM has the ability to shift unmet demand from one time period to subsequent time periods, which is useful for congested networks with latent demand. Results of VISSIM analyses are evaluated to assess the operations of No Build conditions versus build conditions, in addition to supporting alternatives analysis.
- ***Synchro, Version 10***, by Trafficware, is a deterministic tool primarily used for analyzing traffic flow, traffic signal progression, and traffic signal timing optimization. Synchro is often used to analyze signalized and unsignalized intersections, but not freeways, interchanges, or ramps. Synchro uses Highway Capacity Manual (HCM) and Intersection Capacity Utilization (ICU) methodology to

determine intersection capacity and LOS. For this Study, it was used as the basis of signal timing inputs for the VISSIM models.

Figure 2-8: Cube, Synchro, and VISSIM Models

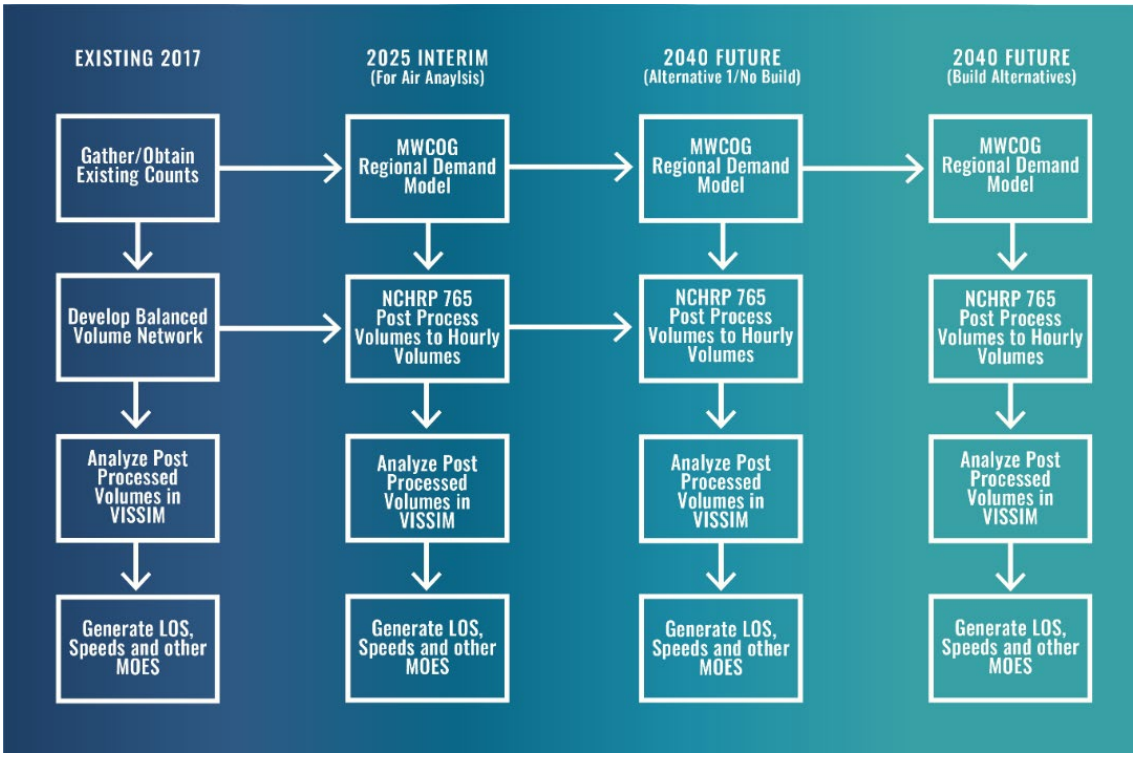


2.5 Overview of Modeling Methodology

The modeling methodology used in this analysis is described below and shown in **Figure 2-9**. Future daily and peak period demand volumes were developed using the Metropolitan Washington Council of Governments (MWCOG) Regional Travel Demand Model, described in Section 4.3 of this report. These volumes were then post-processed into hourly volumes using the methodology outlined in *NCHRP 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*.[6] The post-processed hourly volumes were then entered VISSIM models, with use of Synchro software to analyze and develop signal timings. Once the VISSIM models were run, VISSIM generated outputs, including Highway Capacity Manual (HCM) Level of Service (LOS) methodology, speeds, and other measures of effectiveness (MOEs). This process was followed for Existing 2017 conditions, 2025 Interim conditions (for Air Analysis only) and 2040 Alternative 1/No Build conditions. Once the 2040 Alternative 1/No Build model was completed, the other build alternatives could be developed. Each step of this process is explained in greater detail later in this report.

[6] National Cooperation Highway Research Program (NCHRP) 765 (2014) is the result of research sponsored by the American Association of State Highway and Transportation officials in cooperation with the Federal Highway Administration. The research was administered by the Transportation Research Board of the National Academies.

Figure 2-9: Modeling Methodology



2.6 Data Collection

In support of the Study, a data collection effort and subsequent data review was completed during the first few months of 2018. In addition to raw data collection, the project team conducted several field observations of the corridor during peak periods on weekdays and used innovative probe speed and origin-destination tools to better observe the corridor's congestion patterns. A summary of the data collection effort is discussed in the following sections.

2.7 Traffic Counts

Traffic count data was obtained from MDOT SHA's Internet Traffic Monitoring System (I-TMS), which is available to the public[7]. This data includes 59 counts from 2015, 97 counts from 2016, and 102 counts from 2017. Intersection turning movement counts (TMC) and average daily traffic (ADT) counts were collected at 101 locations along the I-495 and I-270 corridors in 2018 to supplement existing traffic data. TMC data was collected using 24-hour video counts and ADT count data was collected over 48-hour periods at mainline and ramp locations. All counts were conducted during typical weekday conditions (Tuesdays, Wednesdays, and Thursdays while schools are in session).

The use of multiple years of data was necessary to meet schedule requirements due to the vast quantity of data needed throughout the entire Study area (over 350 locations). Volume data along I-270 had previously been normalized as part of the I-270 ICM initiative; therefore, most of the new count data was used to supplement the information that had been collected previously.

[7] http://maps.roads.maryland.gov/itms_public/

Volumes were balanced through the study network, including the I-495 and I-270 along with the crossing roadways, so that no volume sinks were present along the access-controlled facilities. Along I-270, volumes were developed separately for the local, express, and HOV lanes where multiple facility types exist. For all roadways, ADT and peak period volumes were developed by direction.

Peak period hourly volumes were adjusted upward at some locations where drops in peak period traffic counts were due to upstream congestion and bottlenecks. This produces a set of peak period traffic volumes that reflect the actual traveler demand and not the resulting network throughput, which was needed to ensure that VISSIM model volume inputs for existing (and future) conditions were adequate to represent actual congestion.

Figures 2-10 through 2-15 show the balanced ADTs and peak period volumes along I-495 and I-270. Balanced traffic volumes are included in **Appendix A**.

Figure 2-10: I-495 Existing (2017) ADTs

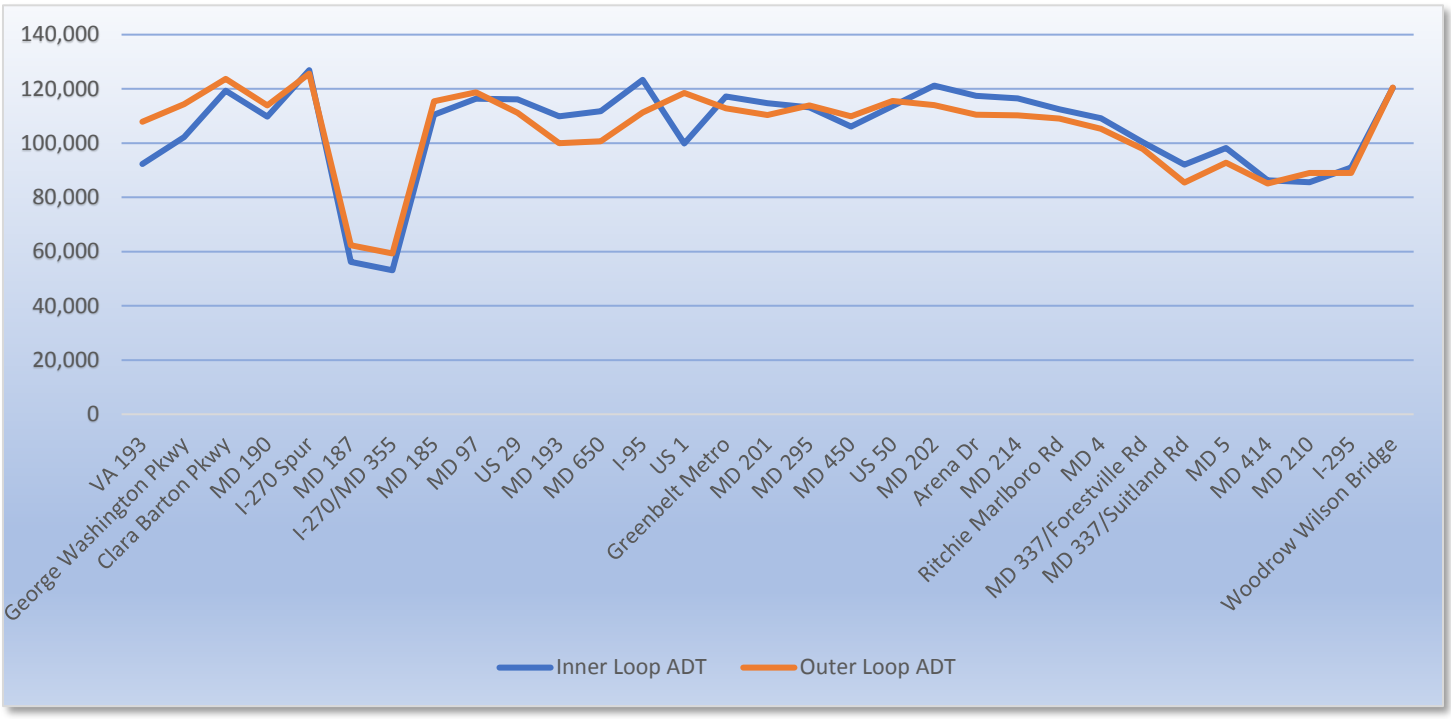


Figure 2-11: I-270 Existing (2017) ADTs

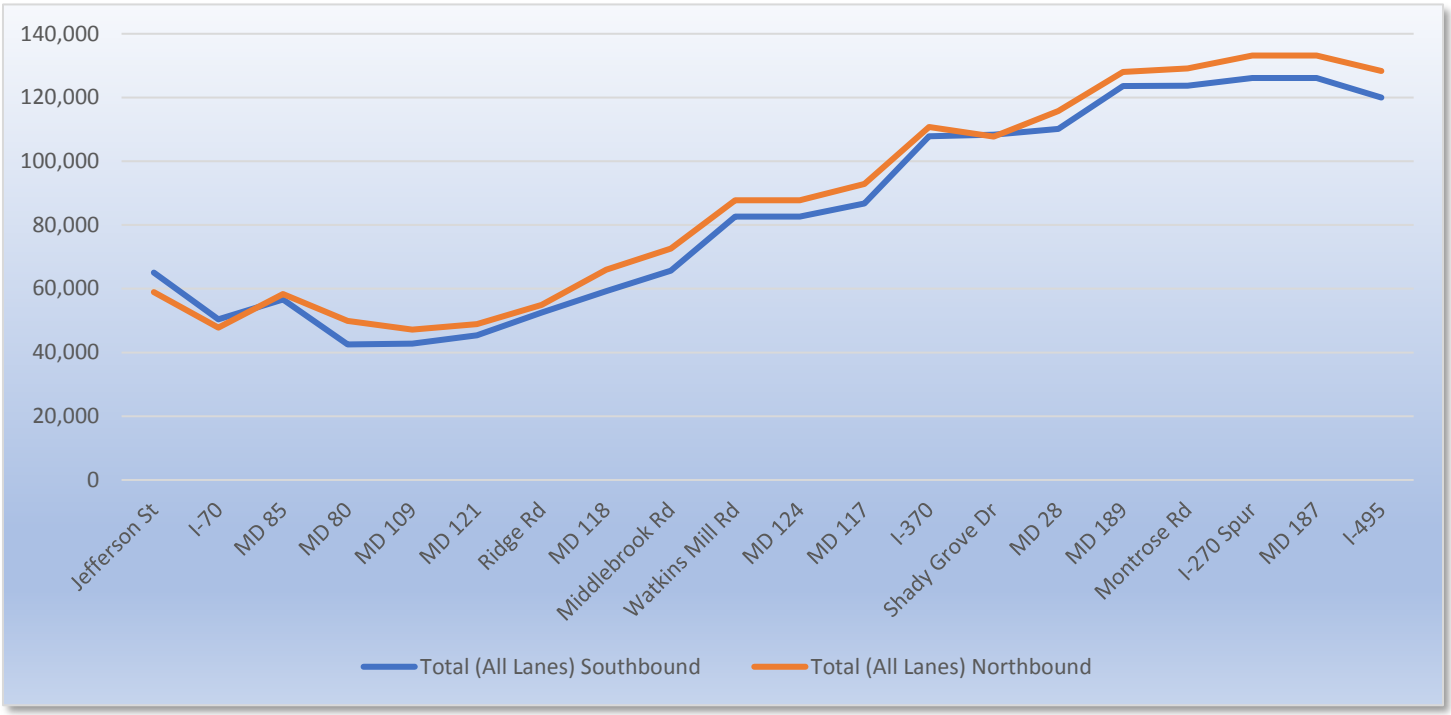


Figure 2-12: I-495 Existing (2017) Inner Loop Peak Period Hourly Volumes

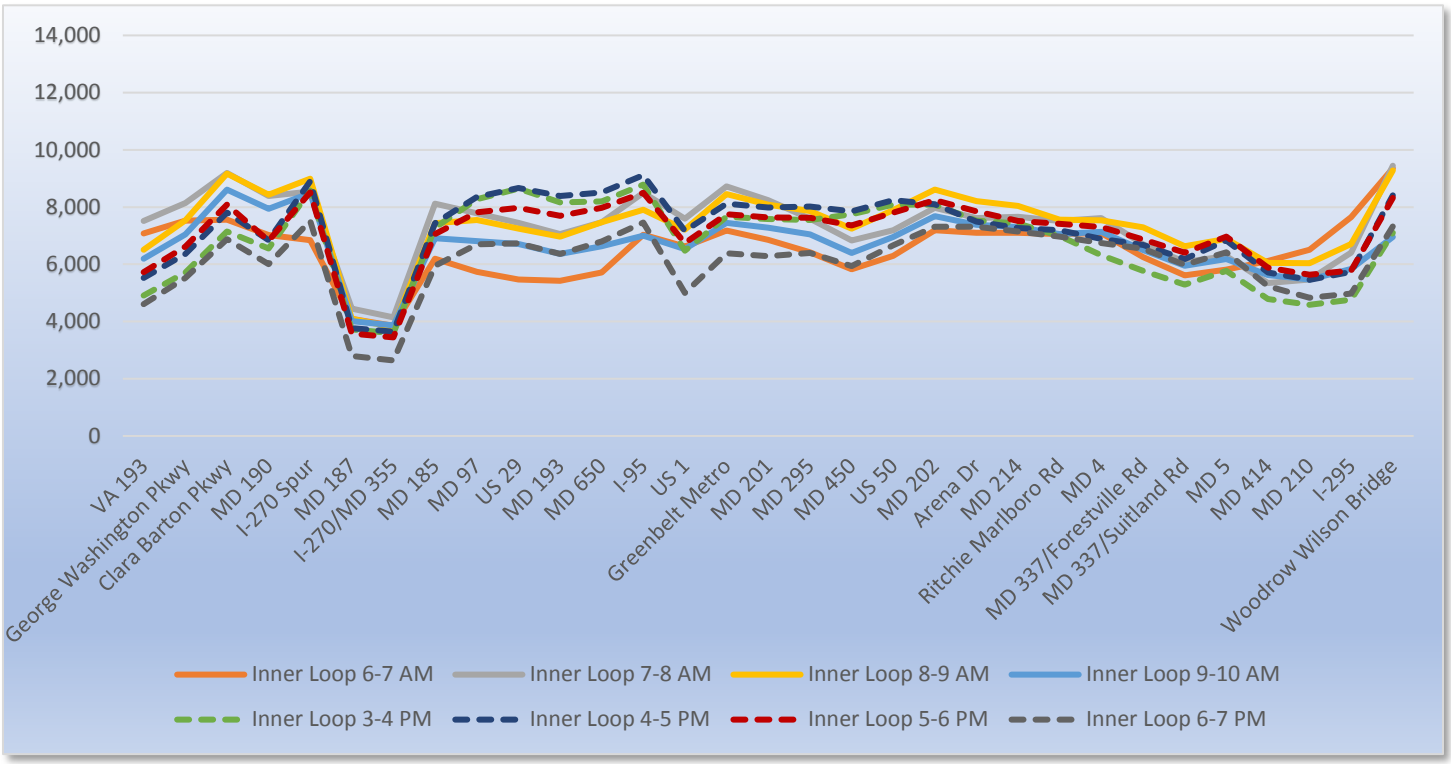


Figure 2-13: I-495 Existing (2017) Outer Loop Peak Period Hourly Volumes

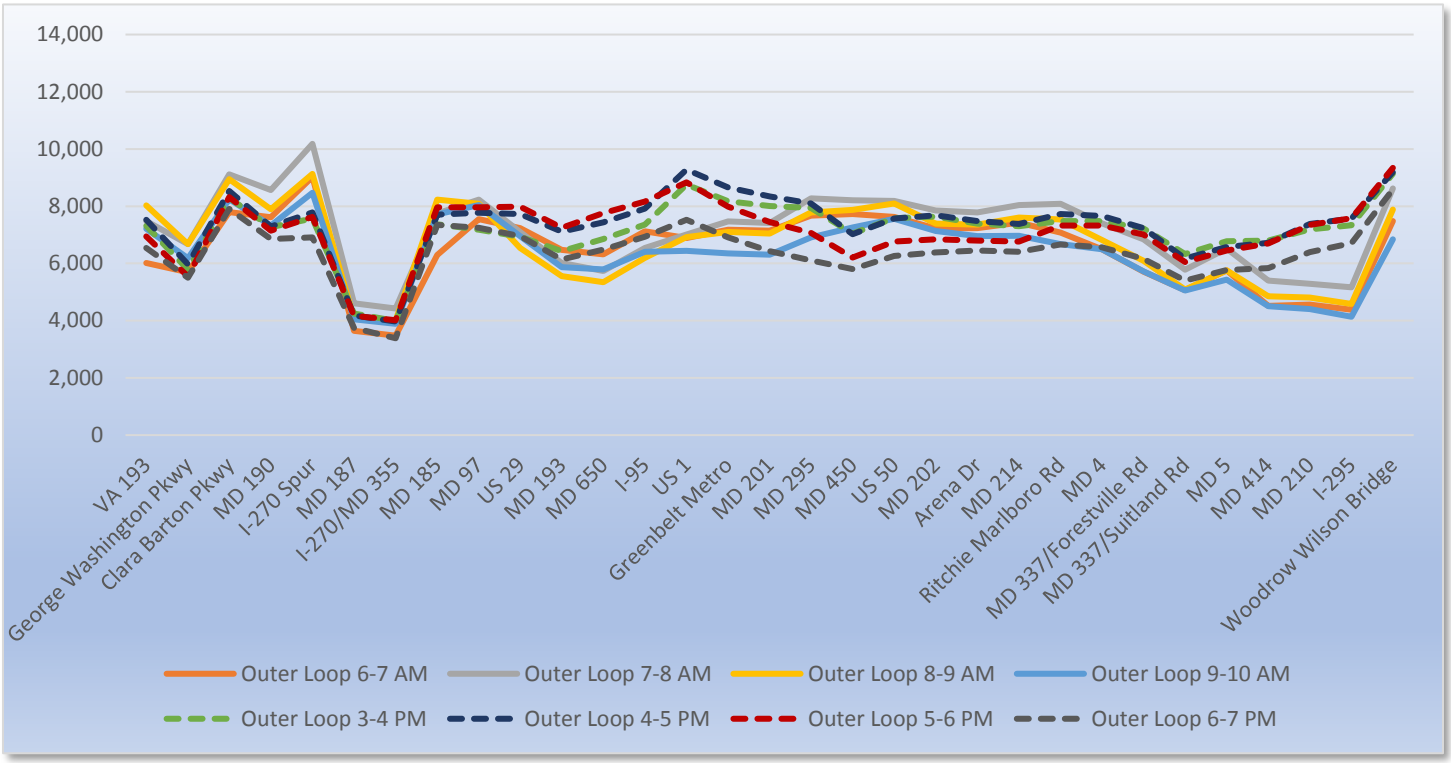
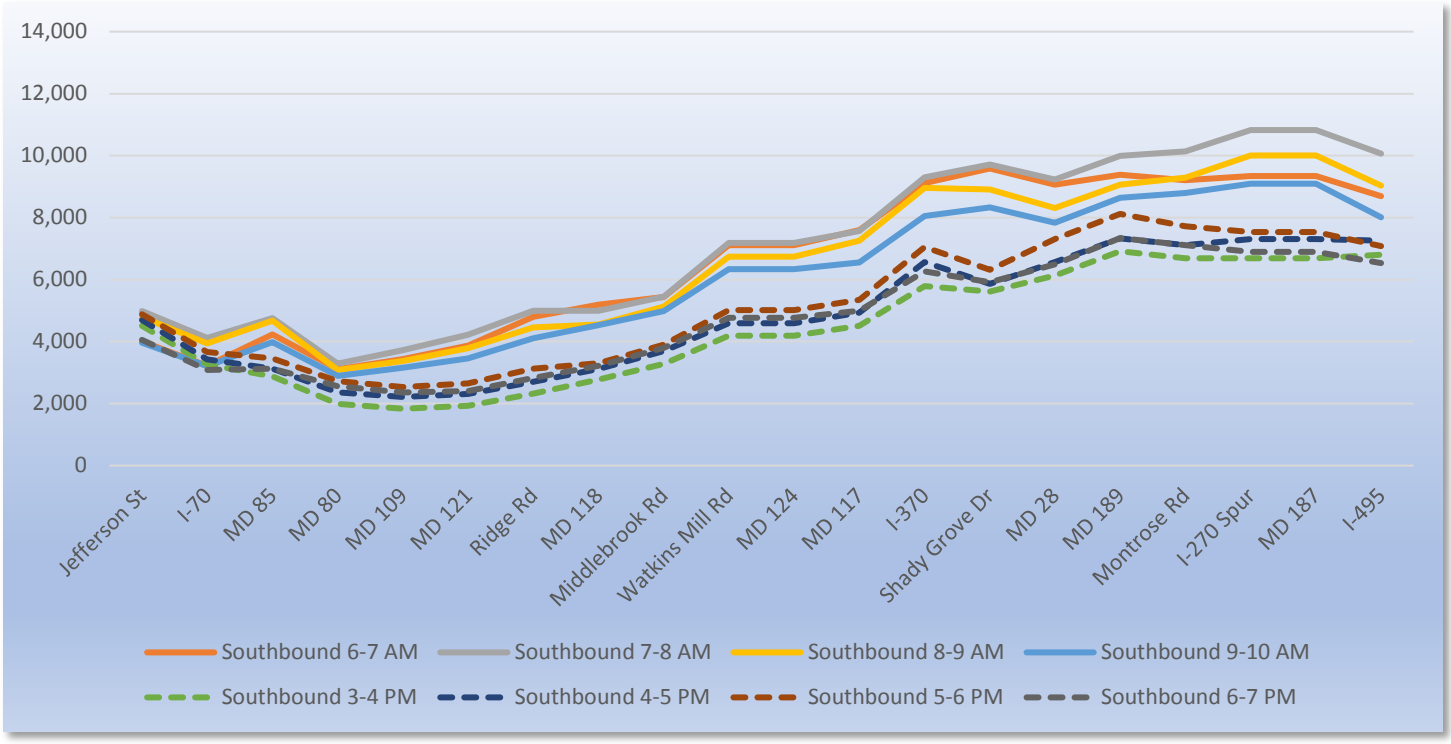
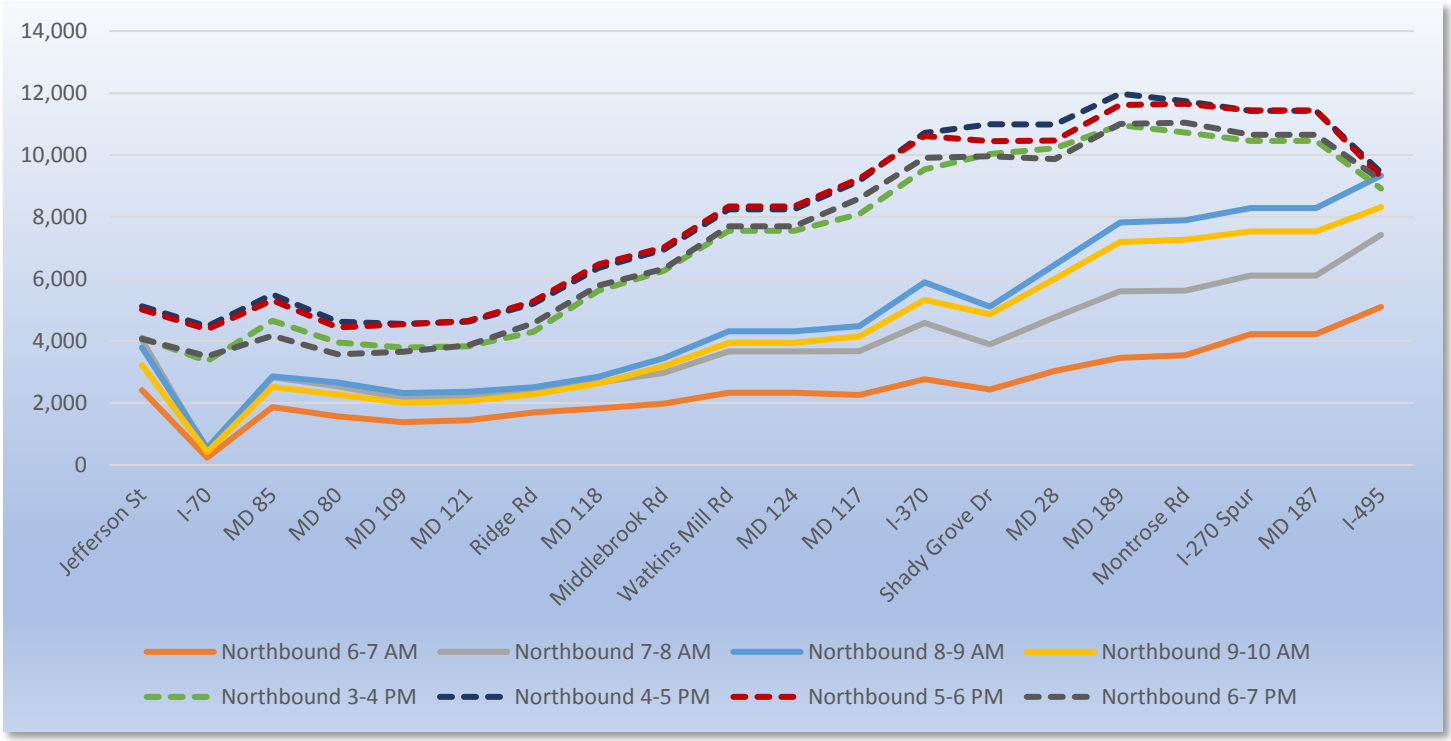


Figure 2-14: I-270 Existing (2017) Southbound Peak Period Hourly Volumes



Note: West Spur and East Spur volumes are combined in this chart

Figure 2-15: I-270 Existing (2017) Northbound Peak Period Hourly Volumes



Note: West Spur and East Spur volumes are combined in this chart

2.8 Speed Data

Hourly speed data along the I-495 and I-270 corridors consists of probe data from the Regional Integrated Transportation Information System (RITIS) platform developed by the University of Maryland's Center for Advanced Transportation Technology (CATT) lab. The RITIS platform provides probe data from INRIX, HERE, TomTom, and NPMRDS for any state-owned facility in Maryland in support of the I-95 Corridor Coalition. The segment-level data is available for any day of the year and any time of the day and provides insight into corridor speeds and bottlenecks. The data for this Study was pulled for all months in 2015 (the oldest count used in this Study) through all months in 2017. **Figures 2-16 through 2-19** show the average and 5th/95th percentile speeds along the I-495 and I-270 corridors throughout the day to demonstrate the variability of the corridor's average speeds.

Figures 2-20 through 2-25 describe the speed breakdown along the corridors for each month of the year, including the average for all months during the two worst hours of the day, found to be 8:00 to 9:00 AM and 5:00 to 6:00 PM along I-495, and 7:30 to 8:30 AM and 5:15 to 6:15 PM along I-270. Also highlighted is the month of May 2017, which as previously discussed was used for calibration purposes. The month of May 2017 was chosen as a month that reflects conditions worse than the average speeds experienced along the corridor during any given day. The average speeds from May 2017 along both the I-270 and I-495 corridors fall at or below the annual average speeds for 2015, 2016, and 2017. Thus, this dataset, and therefore the model used in analysis, reflects at least half of the year's speeds along these corridors, as shown in the following figures. The purpose of selecting this month is to use higher-than-average congestion to ensure that solutions proposed along these corridors can mitigate over half of the conditions experienced on this corridor. It is also important to note that annual average speeds across 2015, 2016, and 2017 do not vary significantly from each other, supporting the use of traffic counts from these years. While the use of count and speed data collected during the same month, week, or even day would be the most ideal situation for modeling purposes, the project schedule, budget, and the availability of technical resources such as traffic counting equipment and technicians needed for a large Study area would not make this option feasible at this time. Note that RITIS did not have speed data along the I-495 Inner Loop from MD 214 to Ritchie Marlboro Road or along the I-495 Outer Loop from MD 4 to Ritchie Marlboro Road. These gaps are noted in the figures.

Figure 2-16: Annual and May 2017 Average and 5th/95th Percentile Speeds for I-495 Inner Loop

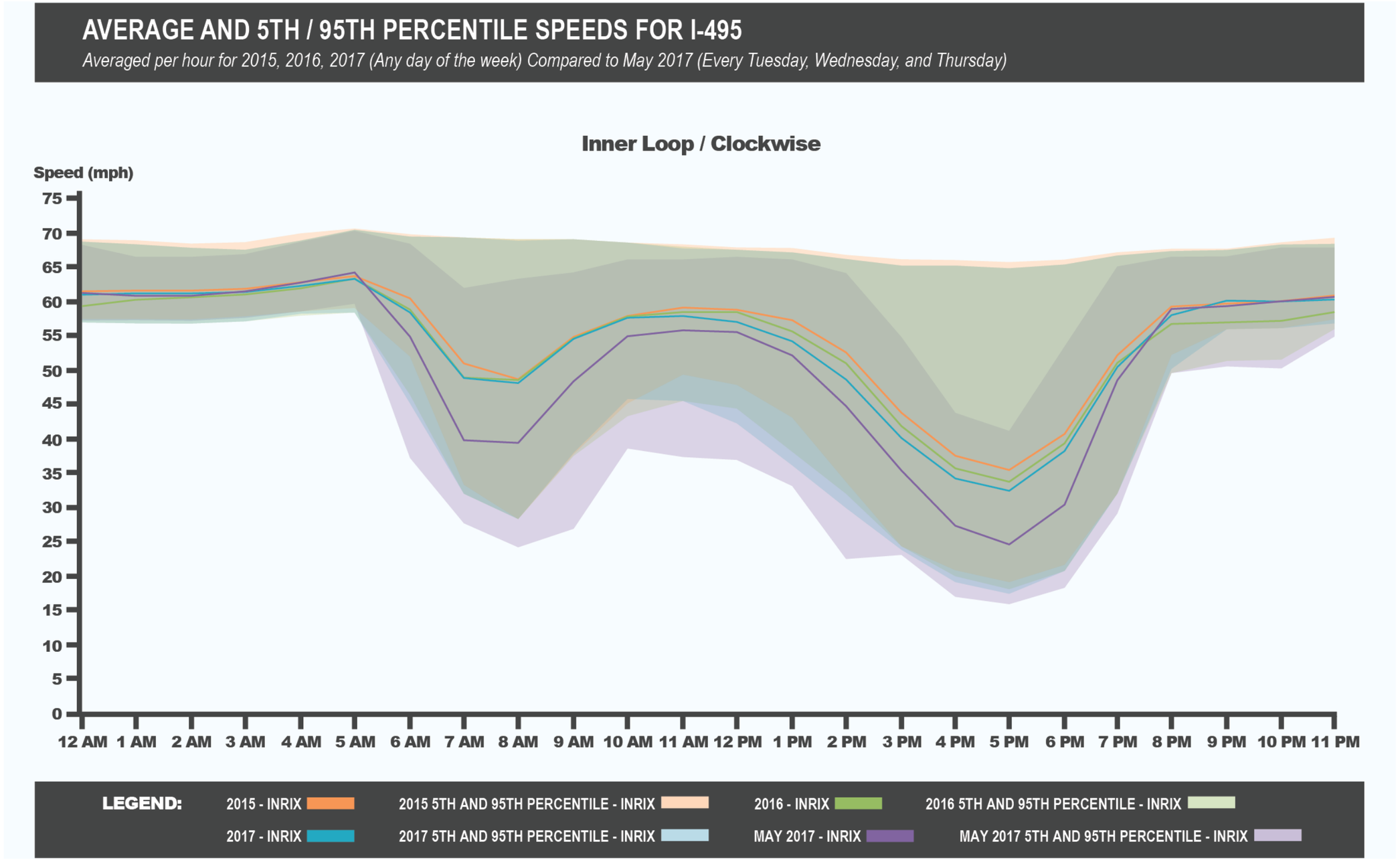


Figure 2-17: Annual and May 2017 Average and 5th/95th Percentile Speeds for I-495 Outer Loop

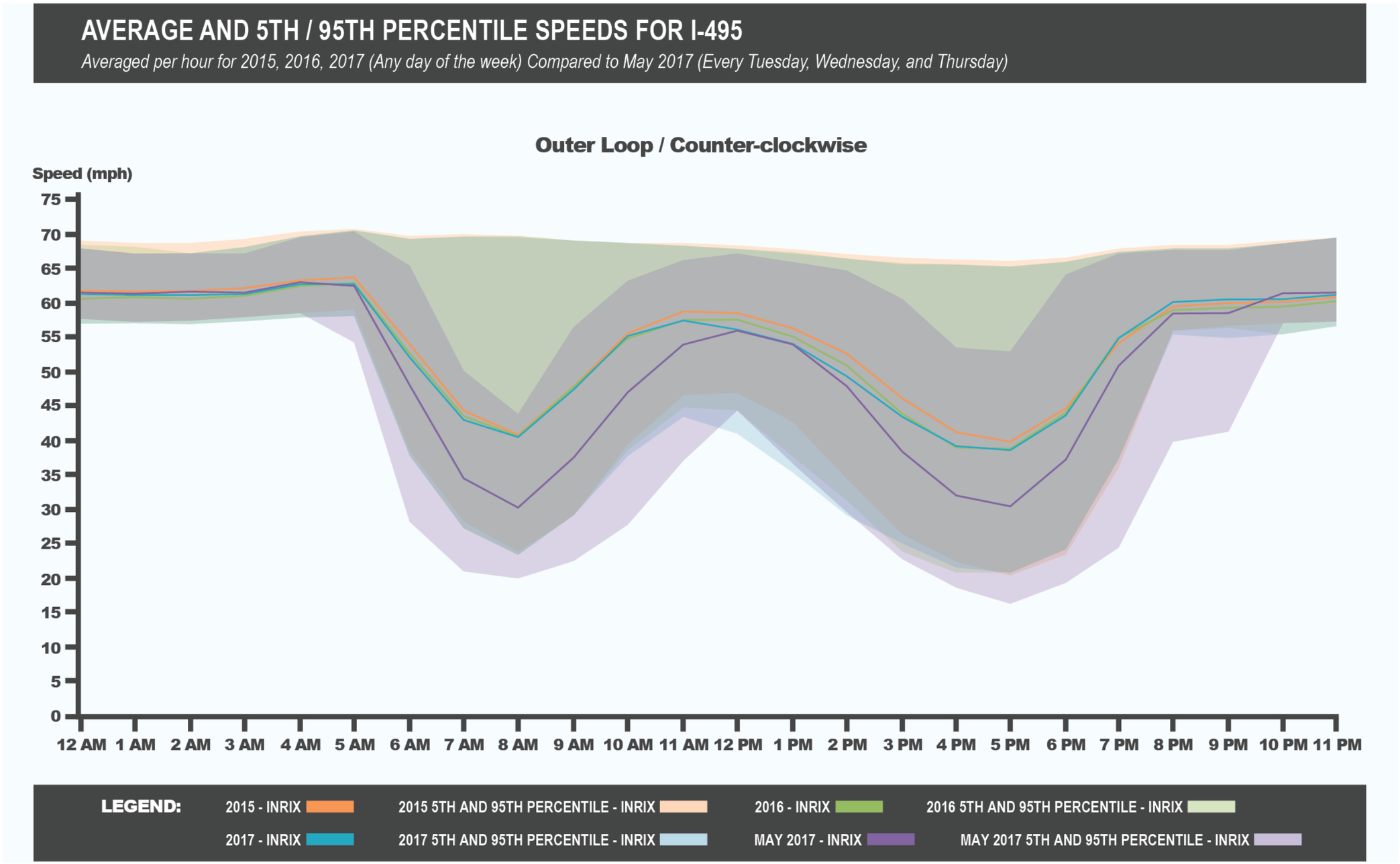


Figure 2-18: Annual and May 2017 Average and 5th/95th Percentile Speeds for I-270 Southbound

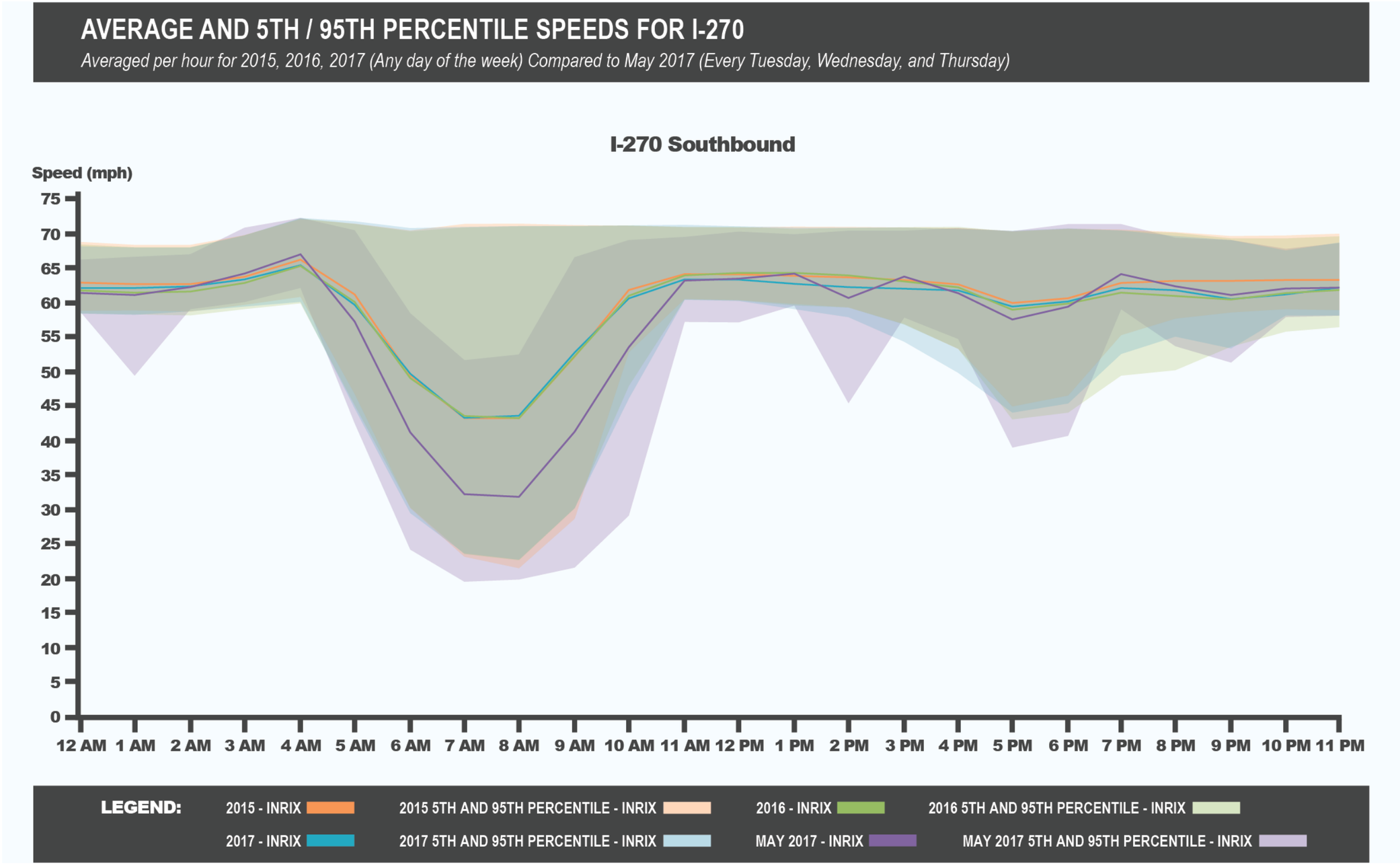


Figure 2-19: Annual and May 2017 Average and 5th/95th Percentile Speeds for I-270 Northbound

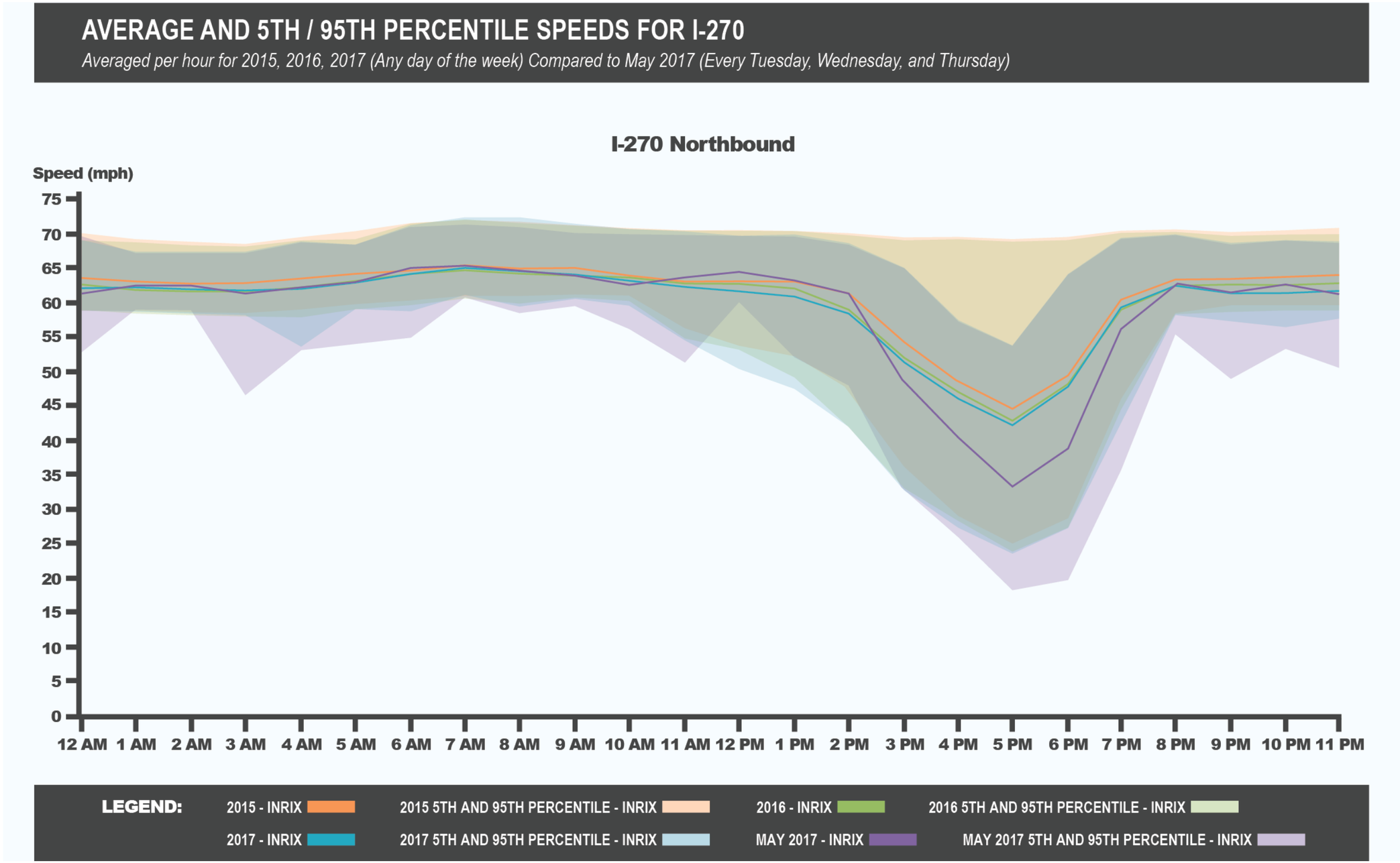


Figure 2-20: 8-9 AM Peak Hour Monthly Average Speeds along I-495 Corridor in 2017 – Inner Loop

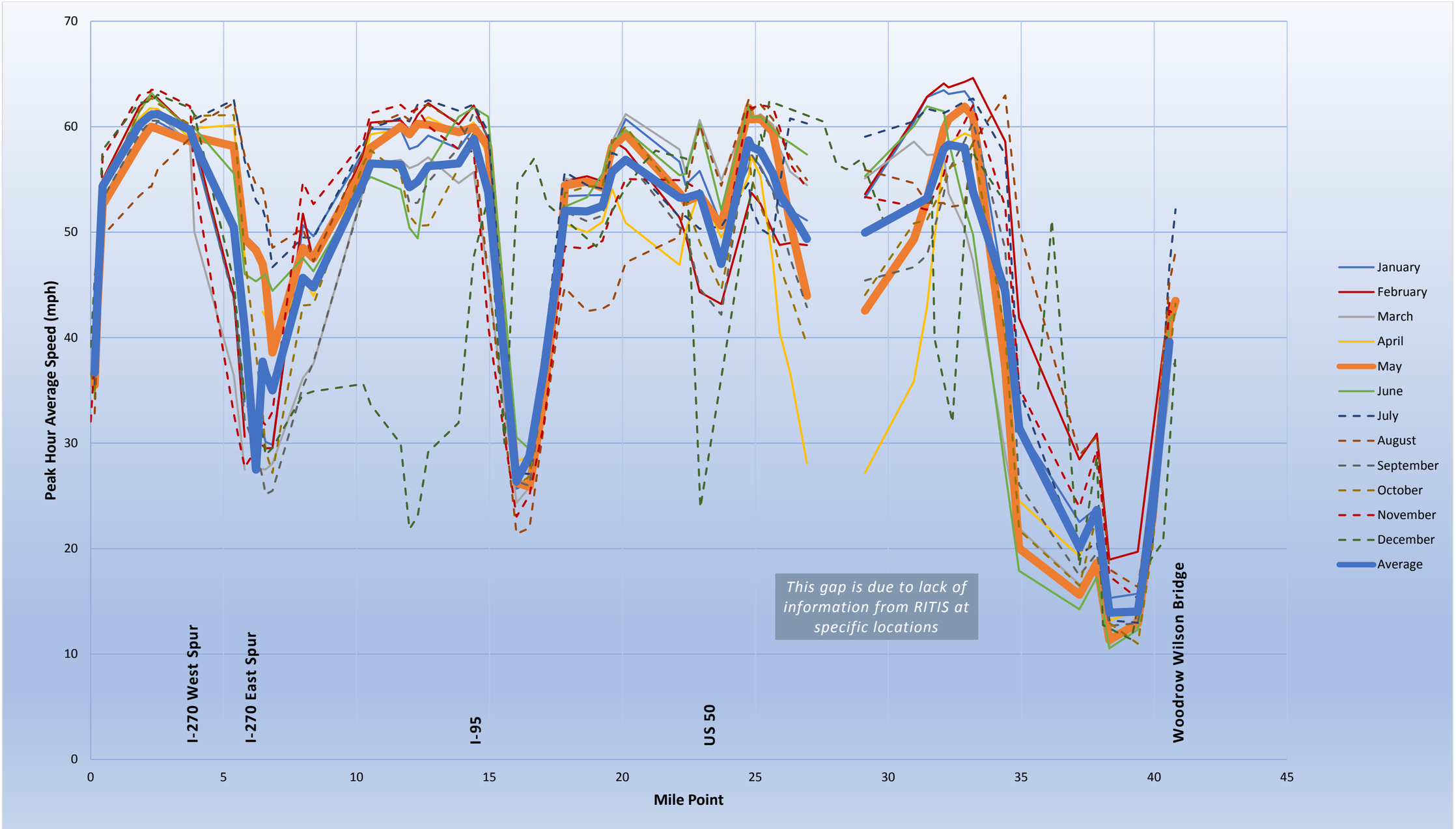


Figure 2-21: 8-9 AM Peak Hour Monthly Average Speeds along I-495 Corridor in 2017 – Outer Loop

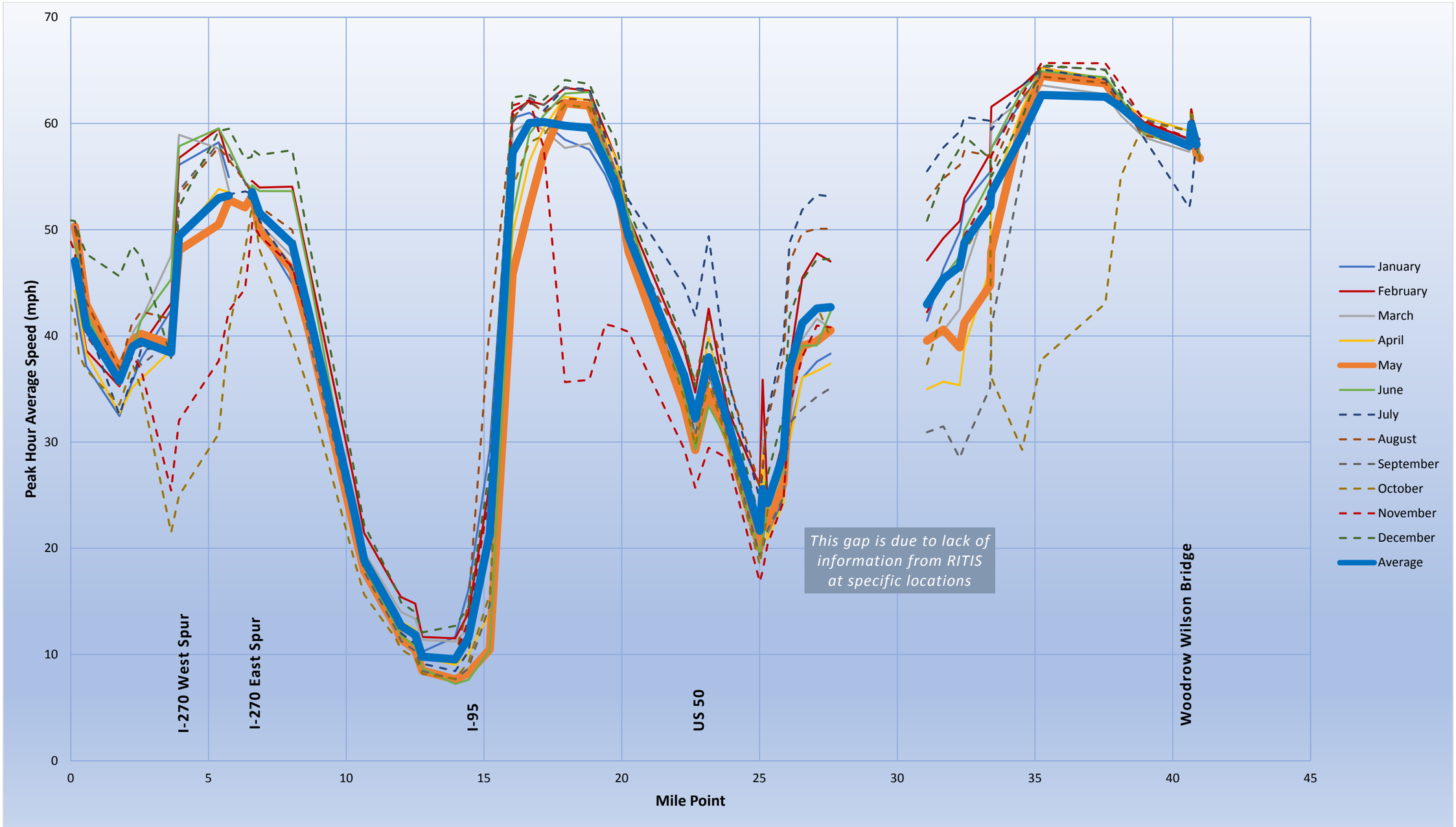


Figure 2-22: 5-6 PM Peak Hour Monthly Average Speeds along I-495 Corridor in 2017 – Inner Loop

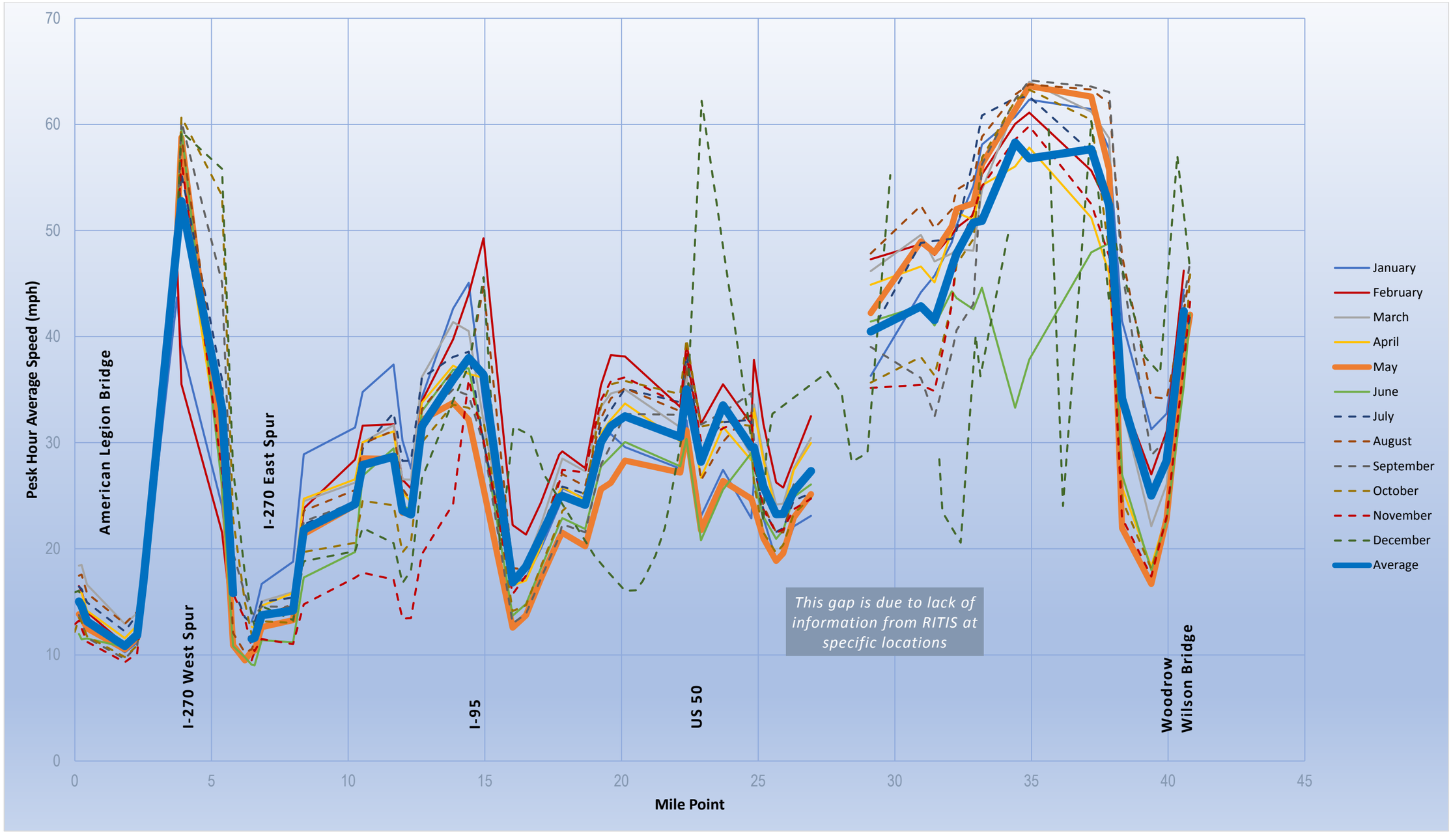


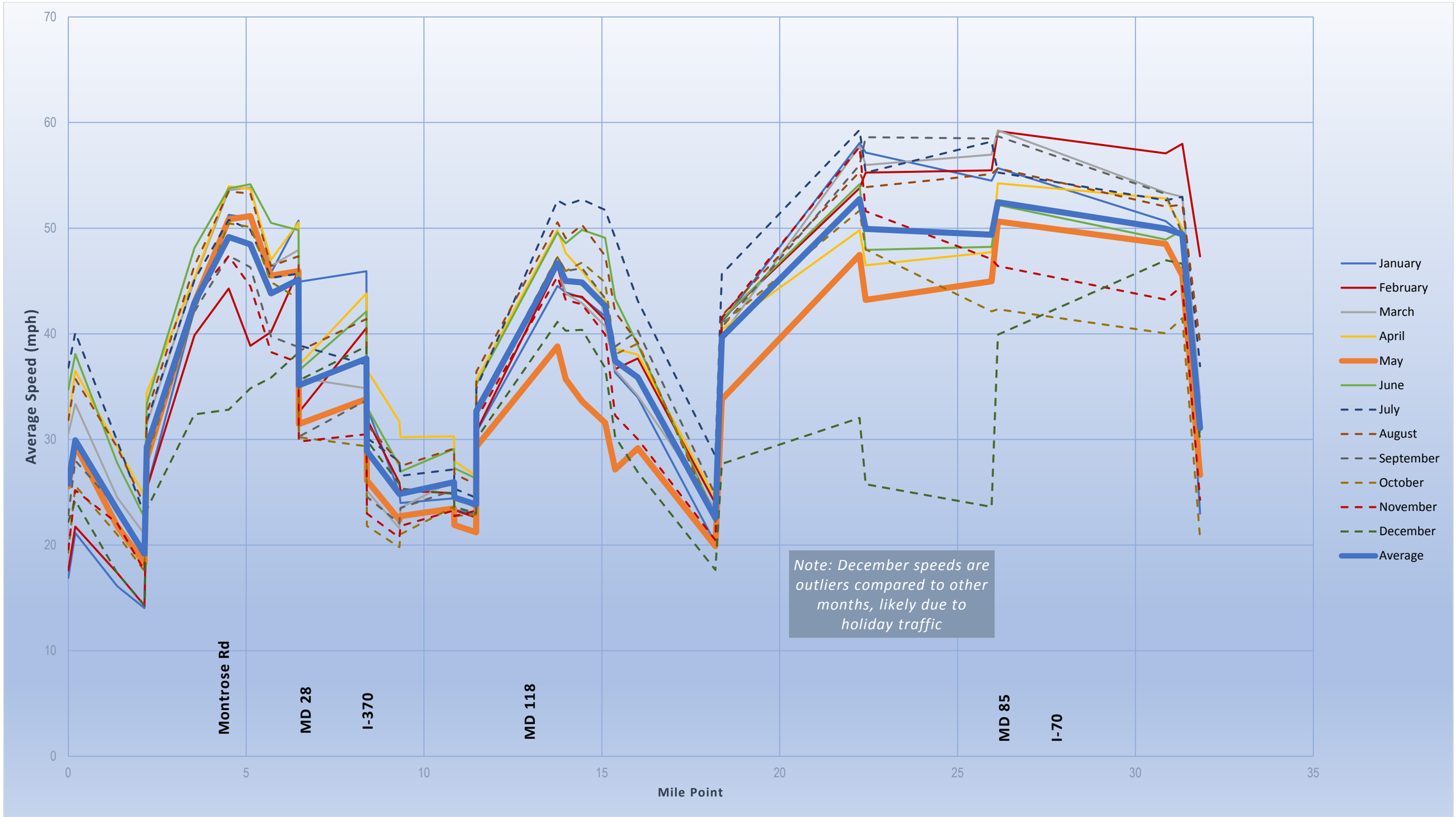
Figure 2-23: 5-6 PM Peak Hour Monthly Average Speeds along I-495 Corridor in 2017 – Outer Loop



Figure 2-24: 7:30-8:30 AM Peak Hour Monthly Average Speeds along I-270 Corridor in 2017 – Southbound



Figure 2-25: 5:30-6:30 PM Peak Hour Monthly Average Speeds along I-270 Corridor in 2017 – Northbound



2.9 Reliability

Key Points

- MDOT SHA uses TTI and PTI to measure the reliability of facilities
- Multiple segments along I-495 and I-270 rank among the top congested segments in Maryland
- The most congested segments during the AM peak include I-495 Outer Loop from the Montgomery/Prince George's County Line to MD 97 and I-495 Inner Loop from MD 210 to I-295
- The most congested segments during the PM peak include I-495 Inner Loop from Clara Barton Parkway to I-270 West Spur and MD 355 to MD 185, I-495 Outer Loop from MD 190 to Cabin John Parkway, I-270 West Spur Southbound from the I-270 Split to Democracy Boulevard, and I-270 Northbound from MD 124 to north of the MD 124 CD Lane

As demand from commuter, commercial, and recreational trips increase, operations along these roadway systems degrade, negatively impacting the movement of people and goods throughout the region. MDOT SHA summarizes the congestion trends in its annual *Maryland State Highway Mobility Report*. This report describes performance and mobility trends for the most recent year, compares the results to past years, and identifies accomplishments. Key elements of the *Mobility Report* include Transportation Systems Management and Operations, freight, multi-modalism, and major capital projects. It includes a review of congestion trends. The primary measures of congestion on freeway/expressways are the Travel Time Index (TTI) and the Planning Time Index (PTI). Past trends indicate that the region's rapid growth, combined with its high traffic volume, commuting patterns, and limited capacity, has caused congestion to increase considerably, thus increasing travel and planning times, as indicated in the increased TTI and PTI in recent years. These trends are shown on the following pages.

The TTI, which is also used in the MDOT *Excellerator*[8] program as a performance measure metric, compares the 50th percentile travel time of a trip on a segment of freeway/expressway for a particular hour to the travel time of a trip during off-peak conditions when vehicles travel at free-flow or uncongested conditions. The higher the TTI for a given hour of the day, the longer the travel time for that hour compared to free-flow travel time. A TTI of 1.0 indicates free-flow conditions, a TTI of 2.0 indicates a trip takes twice as long as free-flow conditions, and a TTI of greater than 2.0 indicates severe congestion. The TTI for each highway segment is calculated to provide an understanding of the statewide freeway/expressway system for average weekday peak hour conditions.

However, longer travel times only demonstrate part of the congestion issue along the Study corridors. A user can plan accordingly if they know their expected travel time, but when travel times vary greatly, such as within these Study corridors, trip reliability is uncertain. MDOT SHA measures trip reliability using the PTI, which represents the total time travelers should allow to ensure they arrive at their destination on time while considering potential delays due to non-recurring congestion. MDOT SHA uses the ratio of the 95th percentile travel time to the free-flow travel time to derive the PTI. For example, if a section of roadway that takes 5 minutes to traverse in free-flow conditions has a PTI of 3.0, motorists should allow

[8] MDOT *Excellerator* is a performance management system comprised of ten tangible results. These results are used by MDOT to drive its daily business decisions. It is updated quarterly.

15 minutes to ensure arriving on time. The lower the PTI, the more reliable the trip. The higher the PTI, the less reliable and longer a trip might take.

Additionally, users traveling along roadways that experience high levels of congestion are more likely to be impacted by minor incidents. These incidents can produce severe back-ups and system-level unreliable conditions for hours. Recent trends indicate that congestion continues to negatively impact the region. The 2018 *Mobility Report* lists the top 15 most congested freeway/expressway segments statewide for the AM and PM peaks, and their reliability values, for the years 2016 and 2017. The 2016 *Mobility Report* lists the top 30 most congested freeway/expressway segments statewide for the AM and PM peaks, and their reliability values, for the years 2014 and 2015. Those segments that ranked in the top 15 for 2017 and occurred within the Study corridors are provided below in **Tables 2-3 and 2-4**.

All roadway segments listed and ranked in these tables experienced severe congestion (TTI greater than 2.0) during the peak travel times for 2014 through 2017. All roadway segments listed, and ranked, also experienced high to extreme unreliability (PTI greater than 2.5) during these three years. Segments listed as "Not Ranked" did not experience a TTI or PTI severe enough to be in the rankings for that year. The peak hours in these tables are 8-9 AM and 5-6 PM, as defined by the *Mobility Report*.

Table 2-3: Top Congested Segments in the Study Area and Reliability Values (AM Peak Hour)

Road	Location	Direction	2017 Rank (TTI)	2016 Rank (TTI)	2015 Rank (TTI)	2014 Rank (TTI)	2017 Rank (PTI)	2016 Rank (PTI)	2015 Rank (PTI)	2014 Rank (PTI)
I-495	MD 650 to MD 193	Outer Loop	1 (5.1)	1 (4.8)	1 (4.4)	2 (3.9)	2 (8.3)	2 (8.0)	6 (8.5)	6 (7.5)
I-495	At MD 650	Outer Loop	2 (4.6)	2 (4.5)	2 (4.4)	1 (4.0)	1 (8.9)	1 (8.7)	1 (9.2)	1 (9.0)
I-495	MD 193 to US 29	Outer Loop	3 (4.1)	3 (3.9)	4 (3.6)	4 (3.2)	11 (6.2)	12 (6.2)	15 (6.3)	15 (5.8)
I-495	I-95 to Prince George's County Line	Outer Loop	5 (3.6)	6 (3.5)	15 (2.4)	15 (2.5)	3 (8.2)	3 (8.0)	4 (9.0)	3 (8.6)
I-495	US 29 to MD 97	Outer Loop	9 (2.9)	9 (3.0)	8 (2.8)	7 (2.5)	38 (4.0)	33 (4.2)	48 (4.4)	47 (4.0)
I-495	MD 210 to I-295	Inner Loop	10 (2.9)	14 (2.7)	27 (2.2)	19 (2.1)	8 (6.3)	14 (5.5)	28 (5.2)	28 (4.6)

Source: Maryland State Highway Mobility Report, 2016 and 2018

MDOT SHA defines the various levels of congestion in four categories based on TTI. These are:

- *Uncongested (TTI < 1.15)*
- *Moderate Congestion (1.15 < TTI < 1.3)*
- *Heavy Congestion (1.3 < TTI < 2.0)*
- *Severe Congestion (TTI > 2.0)*

For reporting purposes, MDOT SHA categorizes PTI for freeways/expressways as:

- *Reliable (PTI < 1.5)*
- *Moderately Unreliable (1.5 < PTI < 2.5)*
- *Highly to Extremely Unreliable (PTI > 2.5)*

Top-ranked statewide segment in red

Table 2-4: Top Congested Segments in the Study Area and Reliability Values (PM Peak Hour)

Road	Location	Direction	2017 Rank (TTI)	2016 Rank (TTI)	2015 Rank (TTI)	2014 Rank (TTI)	2017 Rank (PTI)	2016 Rank (PTI)	2015 Rank (PTI)	2014 Rank (PTI)
I-495	At Cabin John Pkwy	Inner Loop	1 (4.5)	3 (4.2)	4 (3.7)	3 (3.6)	5 (7.5)	7 (6.9)	9 (7.4)	9 (7.1)
I-495	Clara Barton Pkwy to Cabin John Pkwy	Inner Loop	6 (3.8)	9 (3.5)	8 (3.2)	7 (3.1)	14 (6.0)	16 (5.8)	17 (6.3)	20 (5.6)
I-270 Spur	I-270 Split to Democracy Blvd	South-bound	7 (3.5)	1 (4.7)	12 (3.0)	74 (1.8)	1 (10.4)	2 (11.6)	1 (15.0)	1 (11.7)
I-495	MD 355 to MD 185	Inner Loop	9 (3.4)	14 (3.0)	25 (2.5)	38 (2.1)	19 (5.7)	25 (5.1)	32 (5.2)	16 (6.0)
I-495	At MD 185	Inner Loop	10 (3.4)	19 (2.9)	26 (2.5)	35 (2.2)	20 (5.6)	28 (5.0)	36 (5.1)	15 (6.0)
I-495	At MD 355	Inner Loop	11 (3.3)	24 (2.7)	Not Ranked	Not Ranked	6 (7.2)	6 (7.1)	Not Ranked	Not Ranked
I-495	MD 190 to I-270 West Spur	Inner Loop	12 (3.3)	13 (3.2)	9 (3.1)	8 (3.1)	43 (4.4)	38 (4.4)	38 (5.1)	26 (5.3)
I-270	MD 124 to North of MD 124 CD Lane	North-bound	13 (3.3)	12 (3.3)	17 (2.8)	21 (2.4)	30 (5.0)	24 (5.1)	39 (5.0)	36 (5.0)
I-495	At MD 190	Outer Loop	14 (3.2)	11 (3.4)	13 (2.9)	62 (1.9)	33 (4.8)	30 (4.9)	19 (6.2)	40 (4.7)
I-495	MD 190 to Clara Barton Pkwy	Outer Loop	15 (3.1)	8 (3.5)	Not ranked	Not ranked	23 (5.4)	17 (5.7)	Not ranked	Not ranked

Source: Maryland State Highway Mobility Report, 2016 and 2018
MDOT SHA defines the various levels of congestion in four categories based on TTI. These are:

- *Uncongested (TTI < 1.15)*
- *Moderate Congestion (1.15 < TTI < 1.3)*
- *Heavy Congestion (1.3 < TTI < 2.0)*
- *Severe Congestion (TTI > 2.0)*

For reporting purposes, MDOT SHA categorizes PTI for freeways/expressways as:

- *Reliable (PTI < 1.5)*
- *Moderately Unreliable (1.5 < PTI < 2.5)*
- *Highly to Extremely Unreliable (PTI > 2.5)*

Top-ranked statewide segment in red

The 2040 TTI projections show even greater impacts, with an increase in travel times of over 25 percent at all locations along I-495 during the AM peak period, and even greater travel time increases of up to 80 percent during the 2040 PM peak period, as shown in **Tables 2-5 and 2-6**. 2040 TTIs were projected for the top congested segments along I-495, I-270, and I-270 Spur.

As travel times along the Study corridors increase, users will need to increase their planned travel time to reach their intended destinations. Additionally, increased amounts of congestion will decrease vehicle spacing along the roadways, thereby increasing the potential for congestion-related crashes, particularly rear end and sideswipe collisions. When these occur, traffic incidents and non-recurring congestion will

further degrade the performance and reliability of I-495 and I-270, causing additional delay for the projected 300,000+ commuters each weekday by 2040. All these issues will also contribute to higher travel costs.

Table 2-5: 2017 and 2040 No Build Study Corridors TTI (AM Peak Hour)

Road	Location	Direction	2017 TTI	2040 TTI	Forecasted % Increase
I-495	MD 650 to MD 193	Outer Loop	5.1	6.2	21%
I-495	At MD 650	Outer Loop	4.6	5.3	16%
I-495	MD 193 to US 29	Outer Loop	4.1	4.7	15%
I-495	I-95 to Prince George's County Line	Outer Loop	3.6	5.9	63%
I-495	US 29 to MD 97	Outer Loop	2.9	3.4	16%
I-495	MD 210 to I-295	Inner Loop	2.9	4.0	37%

Table 2-6: 2017 and 2040 No Build Study Corridors TTI (PM Peak Hour)

Road	Location	Direction	2017 TTI	2040 TTI	Forecasted % Increase
I-495	At Cabin John Pkwy	Inner Loop	4.5	6.5	45%
I-495	Clara Barton Pkwy to Cabin John Pkwy	Inner Loop	3.8	5.9	55%
I-270 Spur	I-270 Split to Democracy Blvd	Southbound	3.5	3.5	0%
I-495	MD 355 to MD 185	Inner Loop	3.4	4.9	44%
I-495	At MD 185	Inner Loop	3.4	4.4	29%
I-495	At MD 355	Inner Loop	3.3	6.8	106%
I-495	MD 190 to I-270 West Spur	Inner Loop	3.3	4.5	36%
I-270	MD 124 to North of MD 124 CD Lane	Northbound	3.3	3.3	0%
I-495	At MD 190	Outer Loop	3.2	3.4	6%
I-495	MD 190 to Clara Barton Pkwy	Outer Loop	3.1	3.2	5%

Source: MDOT SHA Mobility Report, 2018

MDOT SHA defines the various levels of congestion in four categories based on TTI. These are:

- *Uncongested (TTI < 1.15)*
- *Moderate Congestion (1.15 < TTI < 1.3)*
- *Heavy Congestion (1.3 < TTI < 2.0)*
- *Severe Congestion (TTI > 2.0)*

Overall, the TTI and PTI data show that users in the corridor need an option for a reliable trip when the general-purpose lanes experience recurring or non-recurring congestion. Users would benefit from having an option with a more reliable travel time for their trips, one that would reliably operate at an acceptable level of service even when the general-purpose lanes are congested. Such an option would provide users with a way to reach their destinations with a predictable travel time.

2.10 Signal Timing

Signal controller timing data for all signalized ramp terminals along the I-495 and I-270 interchanges were provided by the relevant agencies. Signals along state routes are owned by MDOT SHA for traffic signals in Prince George's County and Frederick County and by Montgomery County Department of Transportation (MCDOT), for traffic signals in Montgomery County. Signal timings for County-owned

signals were provided by the relevant county. The latest timings were requested to ensure the timings in the model were reflective of the latest timing updates.

2.11 Regional Travel Demand Model Calibration: MWCOG

A. Definition of the MWCOG Model

The National Capital Region Transportation Planning Board (TPB) is the federally-designated metropolitan planning organization (MPO) serving the metropolitan Washington, DC area. The TPB is located at the Metropolitan Washington Council of Governments (MWCOG) and develops the regional travel demand model for the Washington, DC region. The regional travel demand model for the Washington, DC region is the MWCOG Travel Demand Forecasting Model. Version 2.3.70 (November 2017) of this model was used as it was the most recently adopted model at the time the modeling for the MLS was initiated. This model extends across 22 jurisdictions in the District of Columbia, Maryland, Virginia, and West Virginia, including the study area for the I-495 and I-270 Managed Lane Study. The model includes all major roadways and public transportation services (including bus, Metrorail, and commuter rail), local land use data, and population, household, and employment data. Land uses in the area are shown in **Figure 2-26**.

B. MWCOG Modeling Methodology

To provide consistency with regional planning efforts, the MWCOG Travel Demand Forecasting Model, Version 2.3.70 was used as the basis for the development of daily and peak period traffic forecasts. The MWCOG model is a mathematical representation of the supply and demand for travel in an urban area. The travel supply is generally represented by a highway network and a transit network. The highway network represents all major roads in the region, including managed lane facilities, and the transit network represents all public transportation service in the region, including bus, Metrorail, and commuter rail. In addition to transportation networks, the other major input to the travel model is the land activity data for each transportation analysis zone (TAZ). The demand for travel is developed using a series of mathematical models. Models exist for the following years: 2015, 2017, 2020, 2025, 2030, 2040, and 2045. The forecasting methodology was consistent with FHWA's *Interim Guidance on the Application of Travel and Land Use Forecasting in NEPA publication* (USDOT FHWA, 2010).

The MWCOG Model utilizes a four-step trip-based model framework with feedback between traffic assignment and distribution, as shown in **Figure 2-27**. Calibration of the MWCOG model for the Study focused on screenlines and validation of land use. The MWCOG user guide is included as **Appendix B** and the MWCOG validation memo is included as **Appendix C**.

Prior to utilizing the model for analysis, the existing network was reviewed for consistency with field conditions, including links and number of lanes. The model was then validated to ensure reasonable volumes across a set of cutlines (locations) and the corridors and study area were defined to capture the movements in the region. The next several sections describe the models and calibration generated for the I-495 and I-270 corridors using data-driven criteria.

Figure 2-26: Regional Land Use

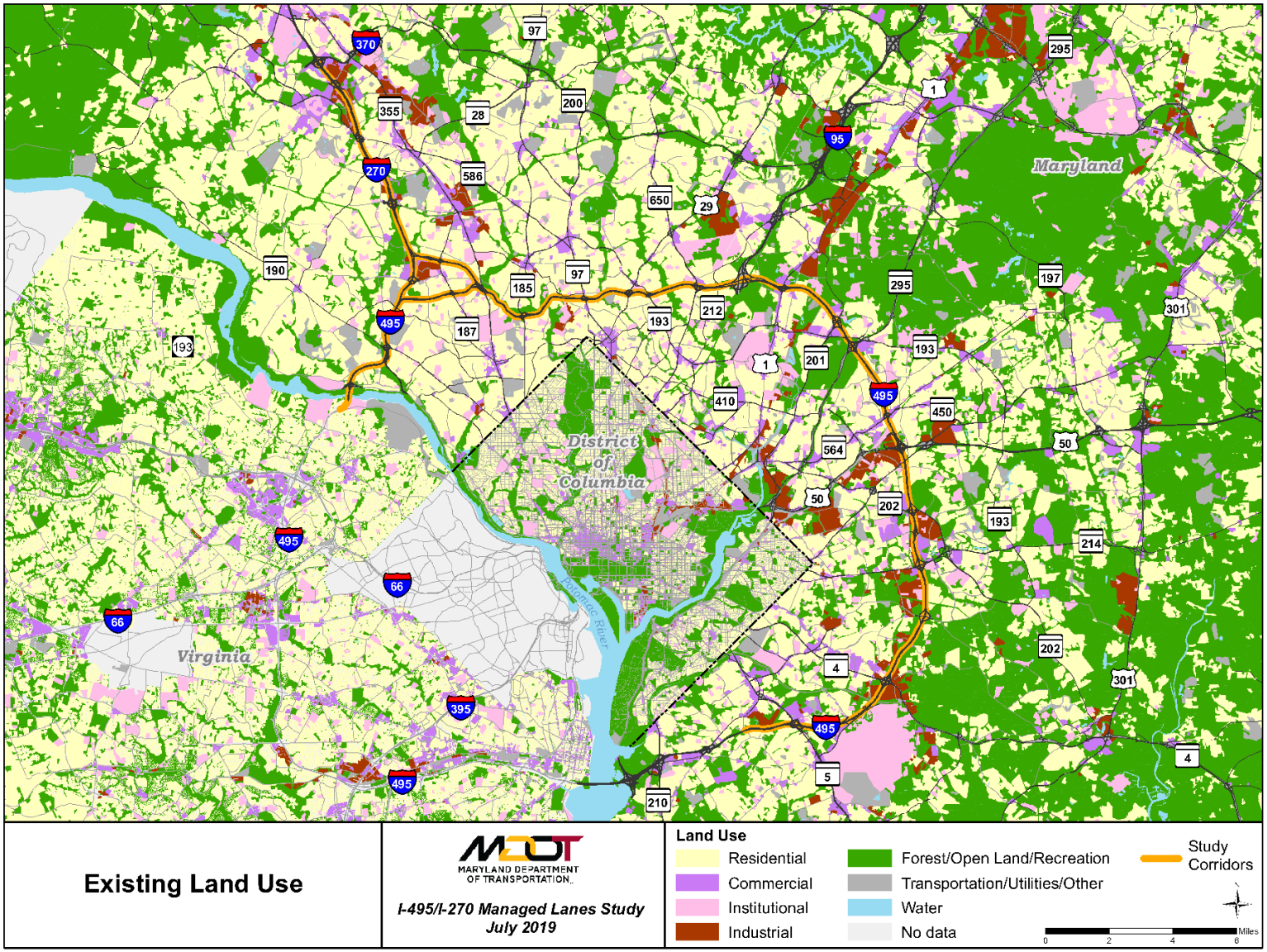
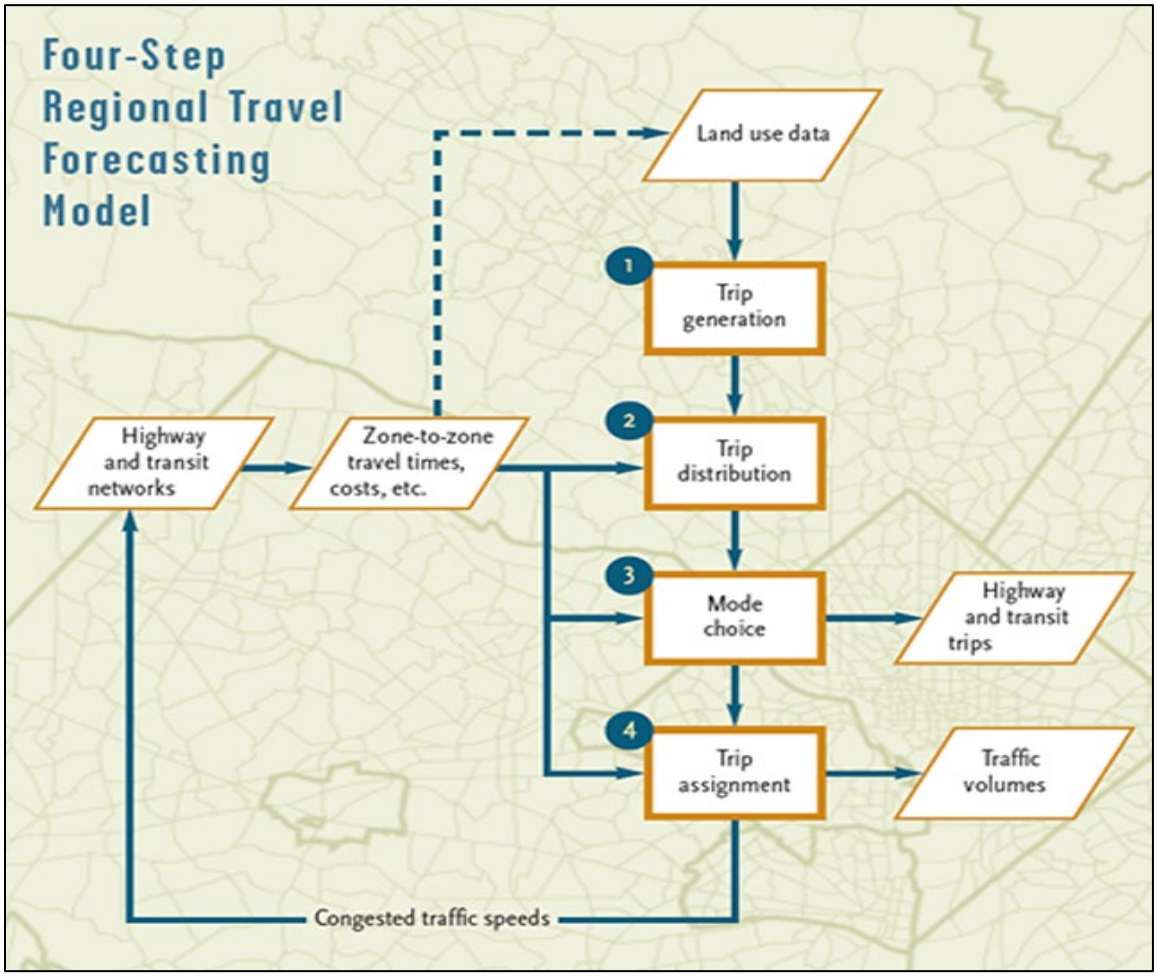


Figure 2-27: Four-Step Regional Travel Forecasting Model



Source: Metropolitan Washington Council of Governments

C. Analysis Hours

Regional travel demand models analyze large portions of a day, including peak and off-peak hours. For these purposes, the MWCOG regional travel demand model considers 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM as the peak periods and the rest of the model time is considered "off-peak". Except where otherwise noted, analysis results are based on the peak periods. For this Study, where results for the peak hours (i.e., the highest hour of each peak period) are shown, the peak hours were established as 7:00 AM to 8:00 AM and 4:00 PM to 5:00 PM.

D. Background Developments, Capital Projects, and Network Refinements

Calibration is based upon existing conditions. The I-270 ICM improvements, the I-270 at Watkins Mill Road interchange, the Greenbelt Metro Access Improvements, and VDOT NEXT were not included in the baseline model since these improvements were not completed at the time the Study began. Those developments and capital projects are included in the future-year scenarios.

Travel demand forecasts were prepared by the National Capital Region Transportation Planning Board (TPB). Per standard TPB staff modeling practices, prior to executing models for future year alternatives,

travel demand model output is validated to existing conditions in the study area. Therefore, TPB executed an existing model validation run and prepared summaries that compare 2016 model estimates to the 2015 observed data they had available. At the time the Study commenced, the 2015 counts were readily available in a format that could easily be used, and more recent counts were not. However, recent history shows that individual facility counts tend to be stable from year to year.

Study inputs were based on Round 9.0 Cooperative Forecasts and the 2016 "Off-Cycle" Constrained Long Range Plan (CLRP), which was adopted in October 2017. MWCOG then refined the official highway networks to more accurately reflect the study area. These refinements include:

- Review and revisions of the number of lanes on I-495, I-270, and Baltimore-Washington Parkway
- Review and revisions of interchanges with access to/from the above freeways
- Additional refinements in the Fort Meade area, including the addition of the existing National Security Agency (NSA) interchange
- Decrease in highway capacity on Baltimore-Washington Parkway, which is degraded from a freeway to an expressway

The Version 2.3.70 travel demand model is the official TPB "production model" and the approved version for analysis associated with this project. Although it was used as the starting point (or "base" model), MWCOG subsequently modified the model to be able to better represent Build alternatives that include dynamically-priced lanes that do not provide preferential treatment to high occupancy vehicles (which are assumed in all Build alternatives in this Study). Essentially, to reflect this policy assumption, TPB removed what is known as the "HOV Skim Replacement" procedure from the modeling process, so that the revised model is no longer required to perform the "base-run" modeling step for each analysis year. At the same time, the revised model still provides preferential treatment to the HOV carpools using existing HOT lane facilities in Virginia, as HOV users of Virginia HOT lanes can access these dynamically priced lanes free of charge. The resulting regional model used in preparation of the model estimates by TPB for base-year validation and 2040 alternatives analysis is referred to as the Version 2.3.71 travel demand model.

The Version 2.3.71 travel demand model is therefore not an official model used in air quality conformity analysis, but is a model specifically developed for modeling of this Study's alternatives. The new methods and features introduced in Version 2.3.71 were incorporated into the following version of the official TPB model with an updated user's guide, which can be found in **Appendix B**.

E. Volume Validation

Model validation results, which compare 2016 model estimates to 2015 observed data, are included in **Figures 2-28 and 2-29**. The official MWCOG model was used, which MWCOG validates based on the user guide found in **Appendix B**. The MWCOG validation memo is included in **Appendix C**. Validation is based upon the percent difference between estimated and observed volumes at the screenline level, and between link-level model estimates and observed counts.

All the estimated screenline volumes are within +/- 20% of the observed counts, except for Screenline I-270-2 at 33%. Some of the estimated volumes for the Capital beltway screenlines are close to the 20%

margin (e.g., Screenline I-495-2), but these regional model findings are in line with the model validation for the Capital Beltway PEL Study conducted in 2016 and 2017.

As shown, most link-level model estimates for I-270 and I-495 are within 25% of the observed counts, with the following exceptions:

- I-270 – 0.20 mi S of Baker Valley Rd (30%)
- I-270 – 50 ft S of Frederick County Line (45%)
- I-270 – 0.50 mi N of MD 121 (52%)
- I-270 – S of MD 121 (34%)
- I-270 West Spur – 0.30 mi N of Westlake Terrace (27%)
- I-270 West Spur – 0.40 mi S of Democracy Blvd (34%)

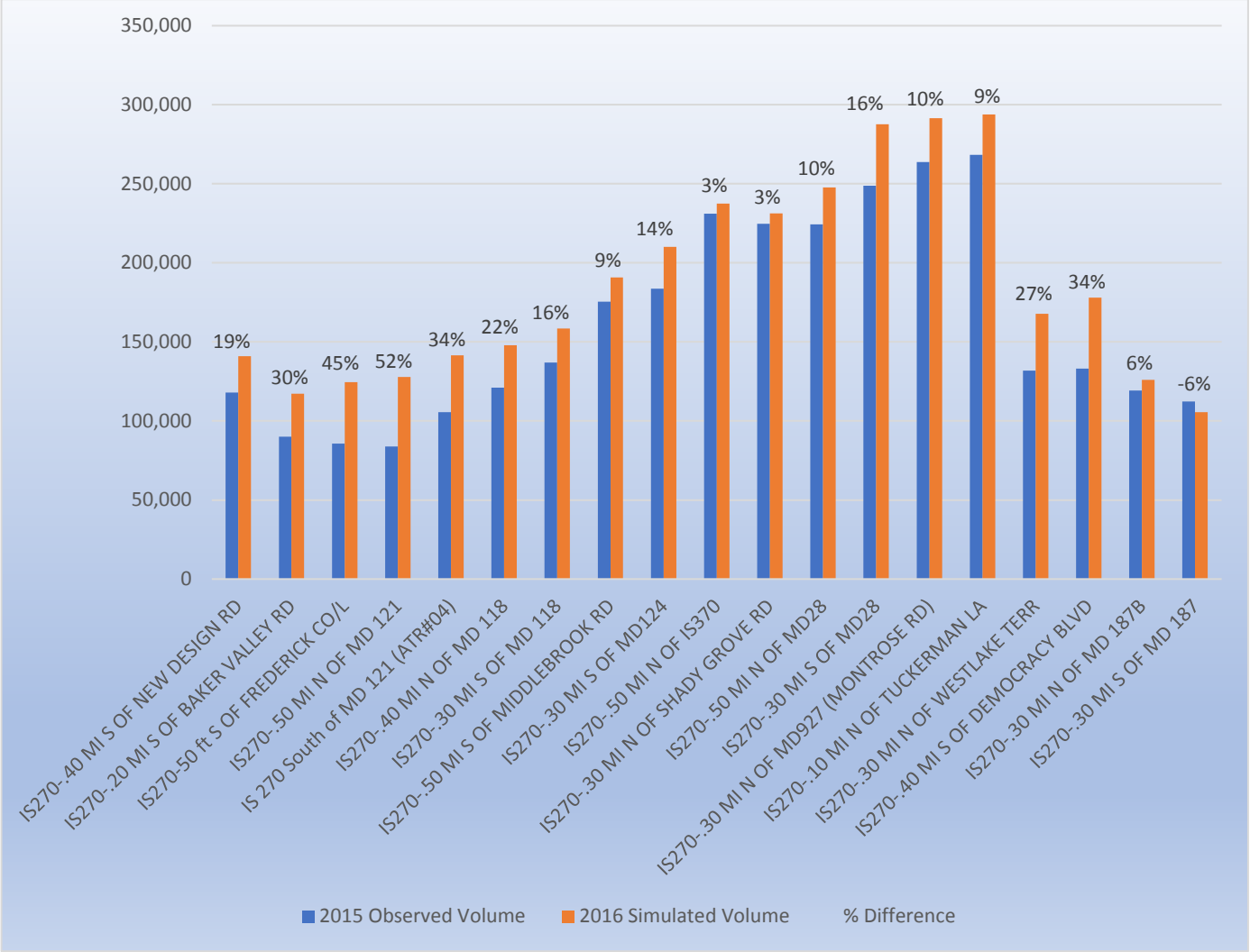
It is important to realize that the model results for this study were used to establish growths (or expected changes) for future conditions, which could be applied to known existing volumes (observed counts). The methodology considers both the percent and absolute differences between base year ADT volumes and base year model forecasts for facilities along defined screenlines and applies those same corrections to future year forecasted model volumes.

Figure 2-28: I-495 Observed (2015) vs. Simulated (2016) Average Annual Weekday Daily Traffic Volumes



Note: Links with no count are excluded from screenline totals

Figure 2-29: I-270 Observed (2015) vs. Simulated (2016) AAWDT Volumes



Note: Links with no count are excluded from screenline totals

F. HOV Validation Metrics

HOV lanes are present along I-270 Southbound from I-370 to the I-270 between the East Spur and the West Spur. The HOV lanes continue to MD 187 along the East Spur and to Democracy Boulevard along the West Spur. HOV lanes are present along I-270 Northbound from MD 187 along the East Spur and from Democracy Boulevard along the West Spur, continuing past the merge between the two spurs to MD 117. Existing (2017) modeled volumes in the HOV lanes and general-purpose lanes are shown in **Figures 2-30 through 2-33**, along with the percentage of vehicles using the HOV lanes.

Figure 2-30: Existing (2017) ADTs in HOV and General-Purpose Lanes – I-270 Southbound

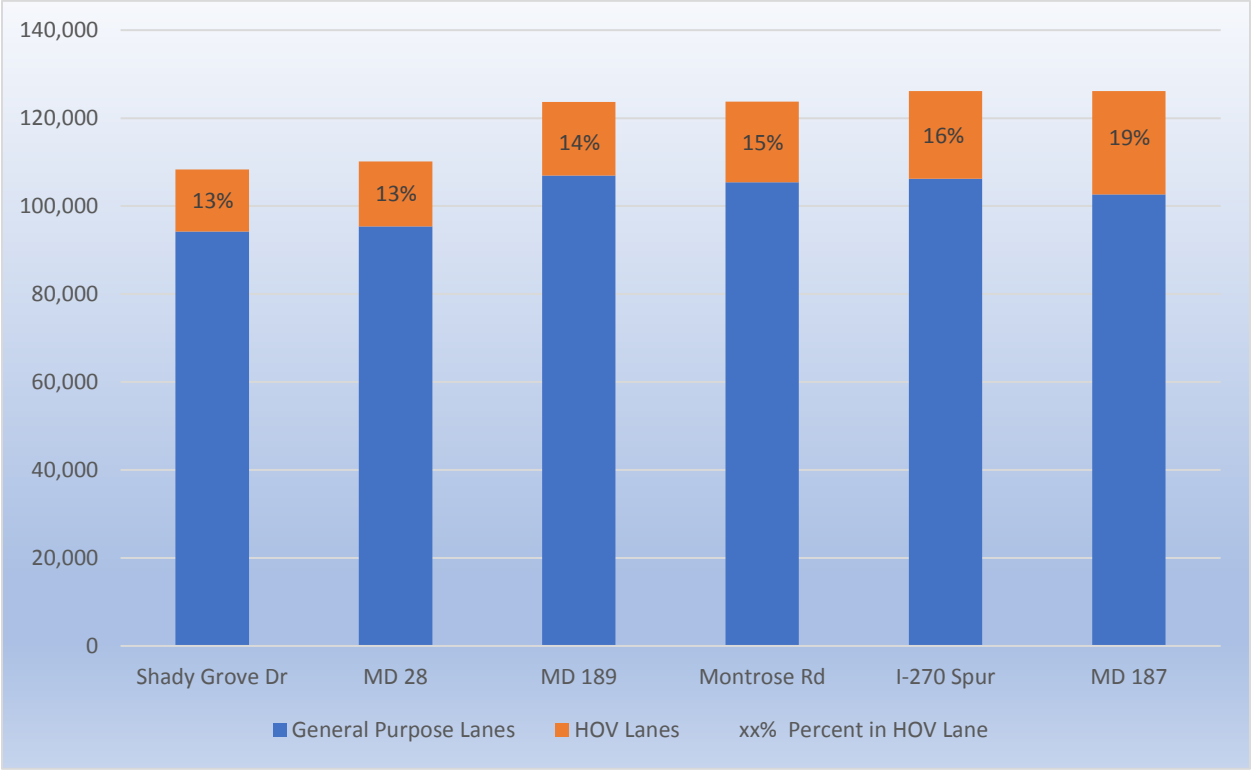
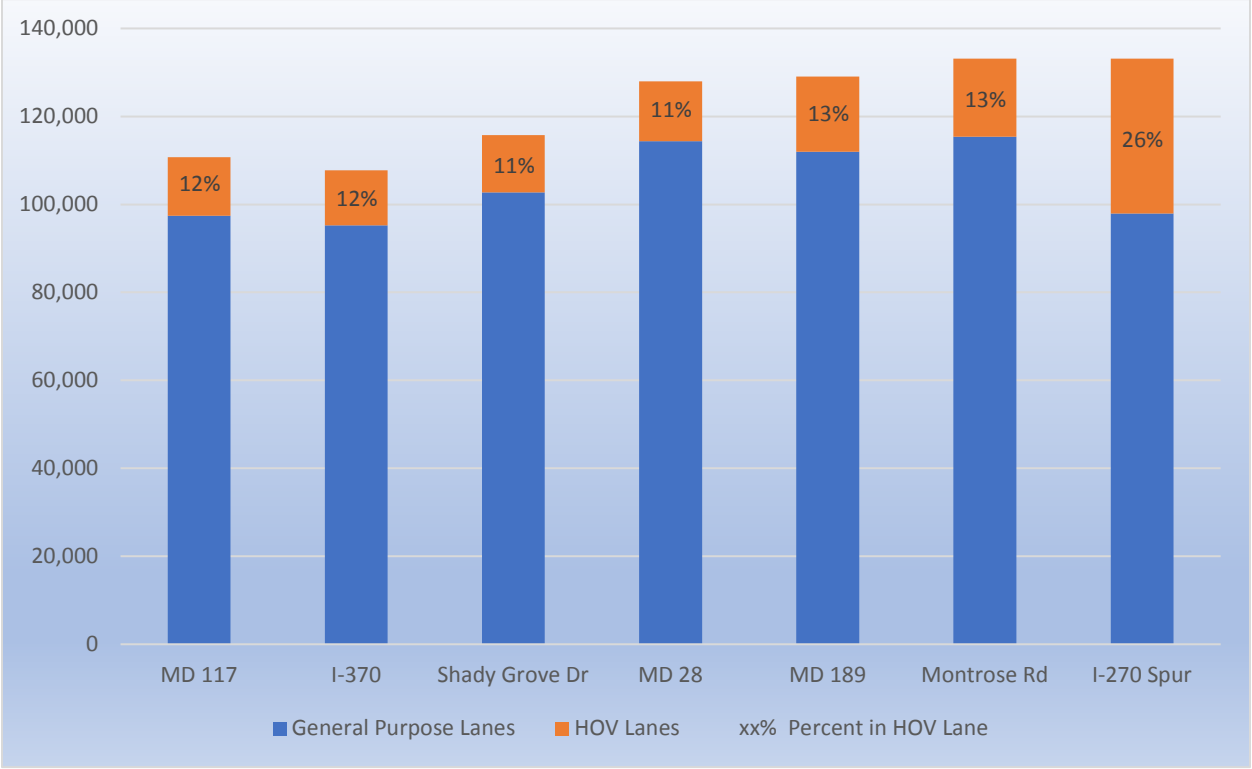


Figure 2-31: Existing (2017) ADTs in HOV and General-Purpose Lanes – I-270 Northbound



Note: HOV lanes are present at MD 117 and I-370 northbound but not southbound

Figure 2-32: Existing (2017) 7-8 AM Peak Hour Volumes in HOV and General-Purpose Lanes – I-270 Southbound

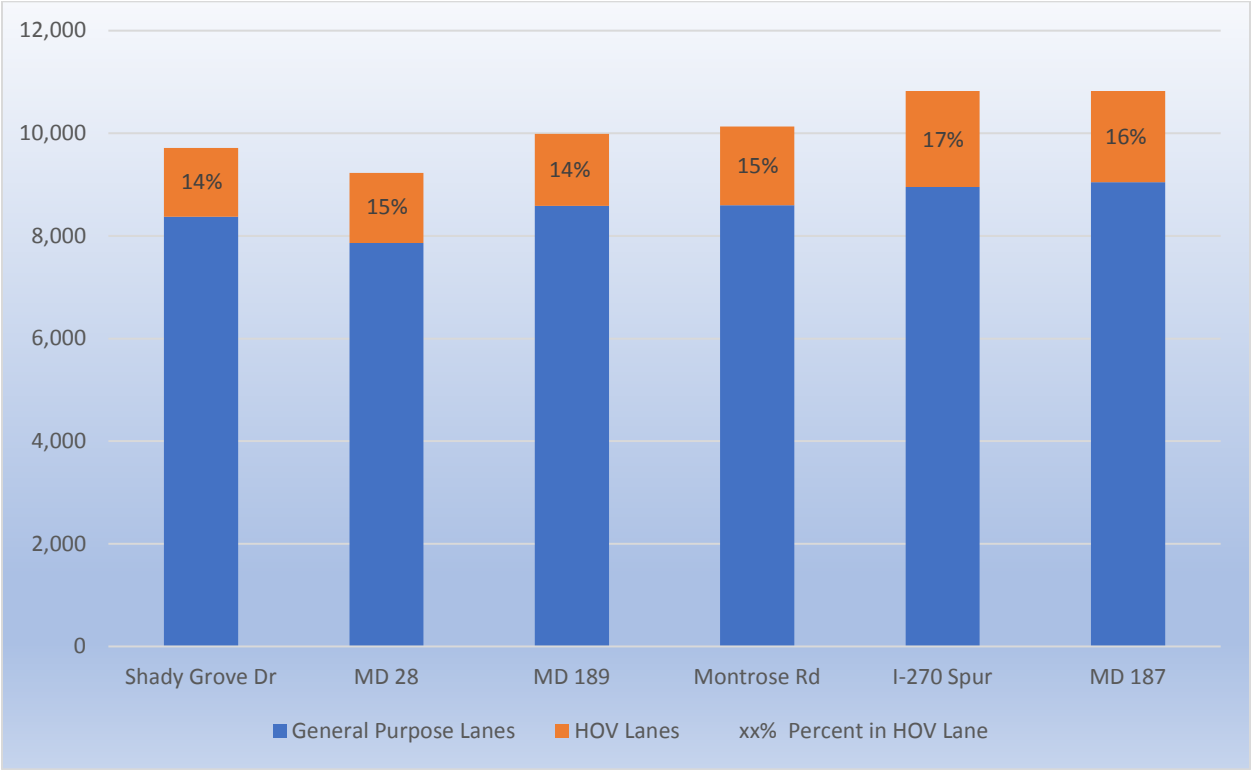
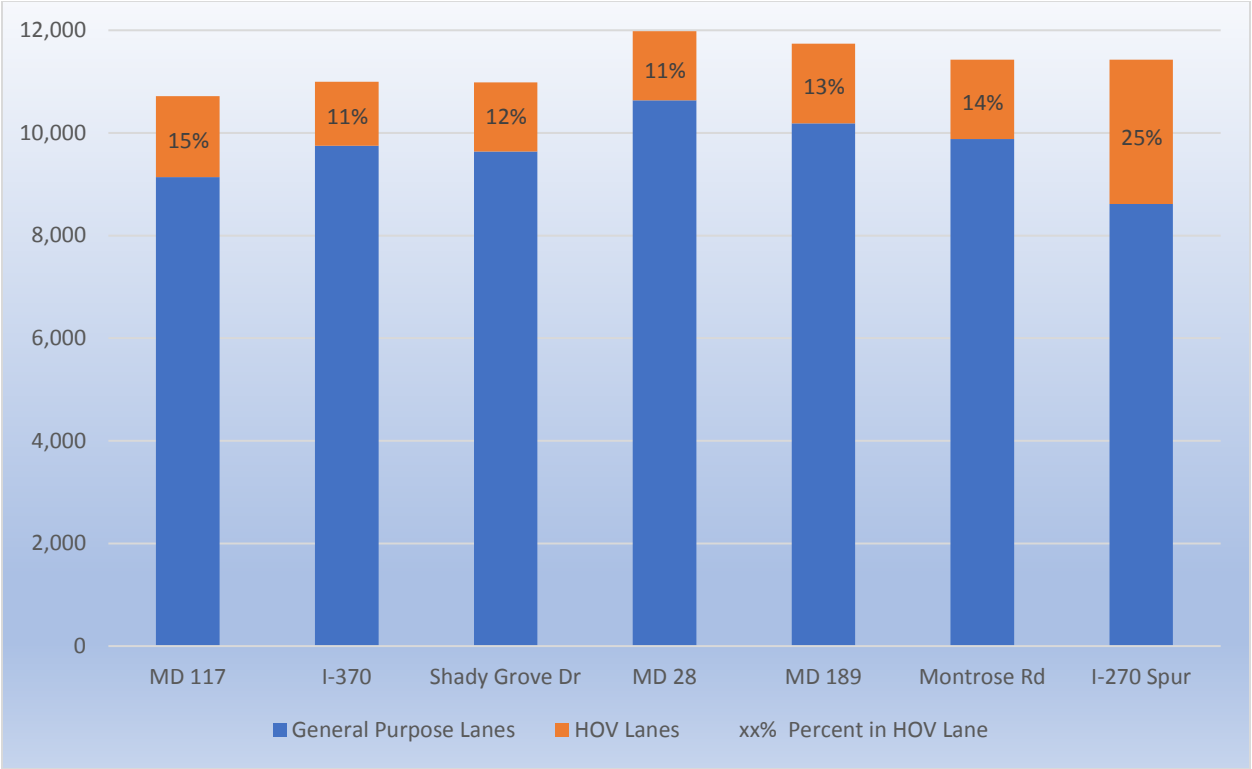


Figure 2-33: Existing (2017) 4-5 PM Peak Hour Volumes in HOV and General-Purpose Lanes – I-270 Northbound



Note: HOV lanes are present along I-270 northbound at MD 117 and I-370 but not southbound

G. MWCOG Screenline Volume Outputs

Average Annual Weekday Daily Traffic (AAWDT) volume outputs at selected screenline locations from the 2016 simulated model are shown in **Figure 2-34**. These screenline locations reflect various locations along the study corridors. Nine locations were included along I-495, including at the Potomac River, east of MD 650, and south of US 50. Six locations were included along I-270, including south of I-70, south of I-370, and north of the I-270 Spurs. Six locations were also included along the Baltimore-Washington Parkway, which was not considered beyond the MWCOG analysis. Note that the selected AAWDT counts/observed data represent the 2015 conditions, while model output represents the 2016 conditions. At the time the Study commenced, the 2015 counts were readily available in a format that could easily be used, and more recent counts were not. However, recent history shows that individual facility counts tend to be stable from year to year. All the estimated screenline volumes (see **Table 2-7**) are within +/- 20% of the observed counts, except for Screenline I-270-2 (at 33%). In addition, some of the estimated volumes for the I-495 screenlines are close to the 20% margin (e.g., Screenline I-495-2); however, these regional model findings are in line with the model validation for the Capital Beltway PEL Study conducted in 2016 and 2017 (Dusan Vukan and Yu Gao, *Model Validation for Capital Beltway Planning Study*, TPB Technical Memorandum, August 23, 2016). The MWCOG validation memo is included in **Appendix C**. The simulated volumes exclude links with no count. A separate memo, also included in **Appendix C**, includes all links on the screenline. These volumes are included in **Table 2-7** as well as in **Figure 2-34.**

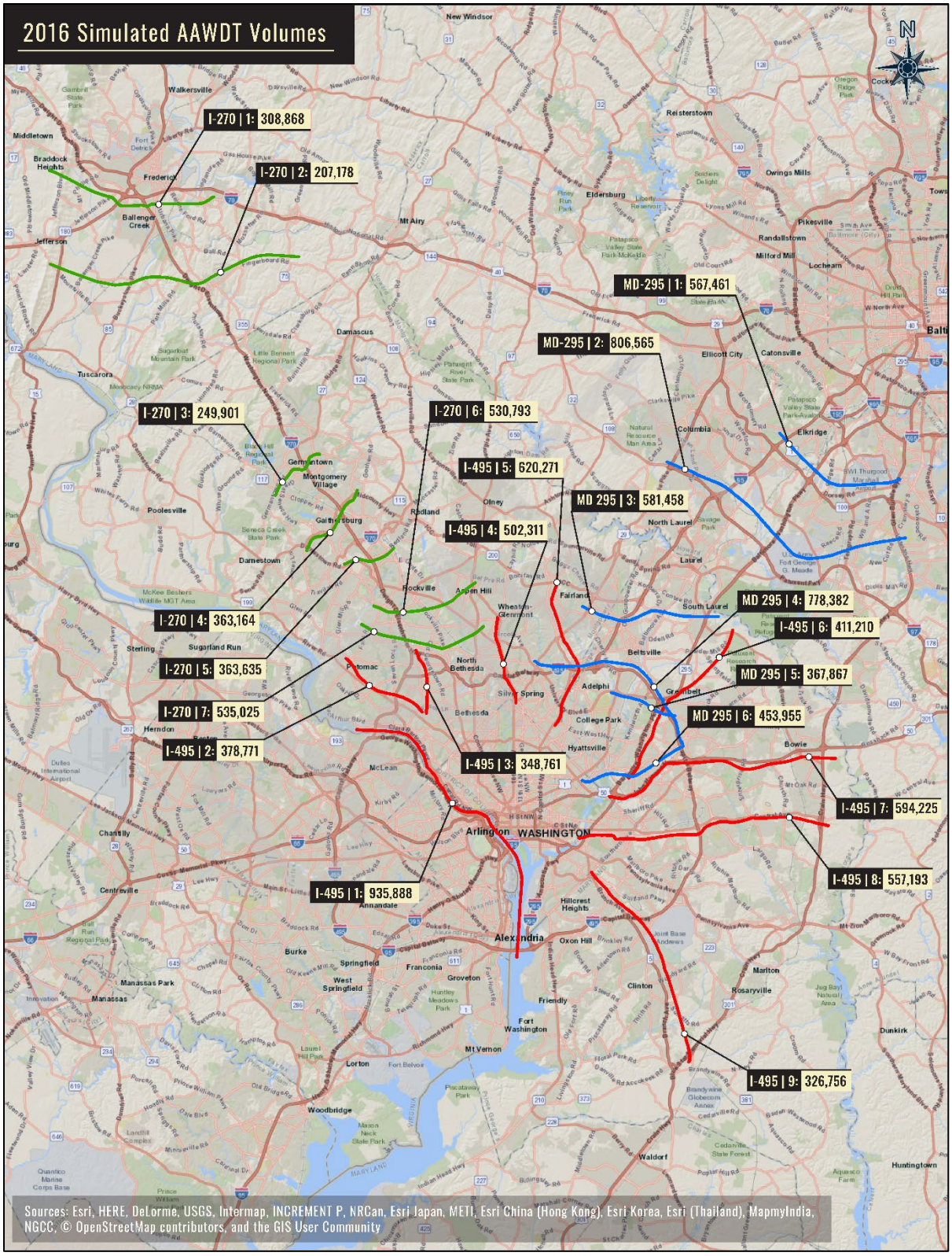
Table 2-7: Observed versus Simulated AAWDT Volumes by Screenline

Screenline	Location	2015 Observed Volume	2016 Simulated Volume (Excluding Links with No Count)*	Percent Difference	2016 Simulated Volume (Including All Links on Screenline)**
I-270-1	South of I-70	288,116	307,940	7%	308,868
I-270-2	North of Fingerboard Rd	138,134	184,326	33%	207,178
I-270-3	South of Germantown Rd	231,104	249,901	8%	249,901
I-270-4	South of Quince Orchard Rd	363,634	359,373	-1%	363,164
I-270-5	South of I-370	338,752	342,027	1%	363,635
I-270-6	North of Montrose Rd	436,266	473,757	9%	530,793
I-270-7	North of the Spurs	425,466	475,267	12%	535,025
I-495-1	Potomac River	916,448	935,888	2%	935,888
I-495-2	North of River Rd	302,322	357,450	18%	378,771
I-495-3	Between the Spurs	294,286	319,958	9%	348,761
I-495-4	West of Georgia Ave	421,760	473,152	12%	502,311
I-495-5	East of New Hampshire Ave	485,514	550,779	13%	620,271
I-495-6	East of Baltimore-Washington Pkwy	393,800	358,883	-9%	411,210
I-495-7	South of US 50	612,422	546,973	-11%	594,225
I-495-8	South of Central Ave	496,968	436,251	-12%	557,193
I-495-9	East of Branch Ave	362,926	298,519	-18%	326,756

* From February 2018 validation memo

**From March 2018 validation memo

Figure 2-34: 2016 Simulated AAWDT Screenline Volumes for I-270 and I-495



Note: includes all links on screenline, as detailed in the March 2018 memo in Appendix C

2.12 Microsimulation Model Calibration: VISSIM

A. Definition of the VISSIM Model/Microsimulation

VISSIM, a microsimulation modeling software, was used to develop the network-based operational analysis for the I-495 and I-270 corridors. Version 10.00-09, the most recent version available at the beginning of the modeling process, was used. VISSIM's operational analysis capabilities include, but are not limited to: car, truck, and pedestrian volumes, transit routes and stops, to-scale lane geometry, and complex signal timings. The microsimulation model covers the entire Study corridor, with additional intersections on cross roads to ensure traffic approach and departure patterns were replicated on both I-495 and I-270. All items are input based on field-collected or field-verified data. These input data and their data sources are described below.

B. VISSIM Model Calibration Methodology

Model calibration and validation refers to the process that confirms the model provides a reasonable approximation of existing field conditions, and incorporates model refinements to bring it within an accepted range of validation targets. It is important to calibrate your existing year models to reflect actual conditions and then carry that calibration forward to future year conditions, as appropriate. For this Study, the model was run five times per peak period. Calibration of the model followed the guidelines in MDOT SHA's *VISSIM Modeling Guidance* (August 2017) and focused on the following criteria. Detailed calibration thresholds are described in the following sections.

- Vehicle throughput
- Speeds
- Travel times
- Visual confirmation of congestion patterns (queue buildup and dissipation)

During the VISSIM model calibration, attention was given to the following parameters:

- Modifying lane change distances to ensure smooth yet realistic traffic flow in both the peak and off-peak directions
- Modifying driver behavior parameters and link behavior types; driver and link behavior types

C. Hours of Analysis and Inputs

Vehicle inputs and VISSIM static routes were developed based on the existing balanced traffic volumes for the AM peak hours from 5 AM to 6 AM for seeding, and 6 AM to 10 AM for data collection. The evening peak hours developed in VISSIM were based on volumes from 2 PM to 3 PM for seeding, and 3 PM to 7 PM for data collection. The "exact volume" input was set for the arrival distribution for all the vehicle inputs, wherein the volume coded in is used in every simulation (as opposed to the "stochastic" input in which volumes vary slightly with each simulation). A series of vehicle compositions were set up for peak hour vehicle inputs throughout the network, based on the vehicle classification counts at various locations.

D. Background Developments or Capital Projects

No background developments were included as this calibration applies to existing 2017 conditions. The I-270 ICM improvements were not included in the baseline because these mitigation strategies were not completed at the time the Study was undertaken. Similarly, the I-270 at Watkins Mill Road interchange, the Greenbelt Metro access improvements, and VDOT NEXT, which were not completed at the time of this Study, were also not included.

E. Speed Data Fluctuation Threshold

Unreliability is important not only to better understand the need for new modes of transport along the corridors, but also for determining the detailed simulation model thresholds for calibration. Based on the unreliability of the I-270 and I-495 corridors, and on the guidance in MDOT SHA's *VISSIM Modeling Guidance* that mainline speeds should be modeled as a distribution of existing speeds along the corridor, calibration thresholds were set according to the results of the RITIS platform probe data. The calibration thresholds for the AM peak period, based on probe data from RITIS were:

- ±15 mph for I-495 Inner Loop in the AM peak hour
- ±14 mph for I-495 Outer Loop in the AM peak hour
- ±17 mph for I-270 Southbound in the AM peak hour
- ±6 mph for I-270 Northbound in the AM peak hour

The calibration thresholds for the PM peak period based on probe data from RITIS were:

- ±16 mph for I-495 Inner Loop in the PM peak hour
- ±19 mph for I-495 Outer Loop in the PM peak hour
- ±12 mph for I-270 Southbound in the PM peak hour
- ±16 mph for I-270 Northbound in the PM peak hour

The volume calibration threshold was 10% for throughput volumes, in concurrence with MDOT SHA's *VISSIM Modeling Guidance*.

These targets were chosen based on the complexity and size of the network and the variability of travel time runs along certain travel time segments. Priority was given to corridor travel speeds since it is an important measure of effectiveness for evaluation.

F. VISSIM Calibration Outputs and Summary

The outputs of the VISSIM calibration are provided in **Appendix D** and summarized below in **Tables 2-8 to 2-10.** Average speeds along I-495 and I-270, as collected in May 2017 and as simulated in the VISSIM models can be found in **Figures 2-35 through 2-40**. Detailed speed and travel time data can be found in **Appendix E**.

Calibration was based on speeds and as a result, travel times. These tables show the travel time along the I-495 and I-270 corridors, the length and percentage of each corridor meeting the calibration thresholds, and the length and percentage of each segment over 0.5 miles long meeting the calibration thresholds

during the 8-9 AM and 5-6 PM peak hours. Most evaluation periods show close correlation in terms of speed and travel time with some exceptions:

- I-270 Southbound from 6 AM to 8 AM
- I-270 Northbound from 3 PM to 7 PM

For the longer segment evaluation of the 8-9 AM and 5-6 PM peak hours, 80% to 83% of I-495 Inner Loop segments met the calibration thresholds, and 75% to 79% of I-495 Outer Loop segments met the calibration thresholds. Along I-270 Southbound, 73% of segments met the calibration thresholds during the 8-9 AM peak hour and 89% of segments met the calibration thresholds during the PM peak hour. Along I-270 Northbound, 94% of segments met the calibration thresholds during the 8-9 AM peak hour, but only 36% of segments met the calibration thresholds during the PM peak hour. Except for I-270 during the PM peak hour, most of the longer evaluated segments met the speed thresholds.

It should be noted that the speeds are reflective of May 2017 data, but the volumes were collected over multiple days, months, and years. Due to the size of the study area, there was not a cost-effective method to collect all volume data on the same day. Additionally, due to oversaturated conditions along both corridors, the traffic conditions are very volatile and can change dramatically from day to day. The goal of calibrating the existing model is to develop a model that is reasonably representative of a typical day along the corridor, while also considering the volatility of the corridor and reliability of each data set. Graphs showing the average speeds and 95% confidence intervals for I-270 and I-495 during each of the peak hours are included in **Appendix D**.

The VISSIM study area network for the I-270 and I-495 Managed Lane Study is larger and more complex than most traffic simulation models, due to the duration of daily congestion and variability of the day-to-day traffic speeds and volumes along the corridors. When evaluating the combination of model speeds and traffic volumes compared to the field-collected data, while also considering the variability along the corridor, the model were considered to be reasonably calibrated, thereby providing the sensitivity necessary to evaluate the future year conditions for alternative analysis.

Table 2-8: VISSIM Outputs of Existing Calibration: Travel Times

Segment	Length (miles)	Time Period	Field Travel Time (min)	Simulated Travel Time (min)	Difference (min)	Difference (%)
I-495 Inner Loop	43.3	6-7 AM	43.4	46.0	-2.6	-6%
		7-8 AM	65.8	54.6	11.2	17%
		8-9 AM	66.2	53.1	13.0	20%
		9-10 AM	53.2	50.3	3.0	6%
		3-4 PM	72.9	64.0	8.9	12%
		4-5 PM	97.4	84.8	12.7	13%
		5-6 PM	109.2	104.6	4.5	4%
		6-7 PM	86.7	94.9	-8.2	-9%
I-495 Outer Loop	43.6	6-7 AM	49.3	54.1	-4.9	-10%
		7-8 AM	69.6	66.8	2.8	4%
		8-9 AM	79.9	69.1	10.8	13%
		9-10 AM	64.7	61.8	2.9	5%
		3-4 PM	63.7	62.6	1.1	2%
		4-5 PM	77.3	71.4	5.9	8%
		5-6 PM	81.5	83.6	-2.2	-3%
		6-7 PM	65.8	84.8	-19.0	-29%
I-270 Southbound	31.3	6-7 AM	48.3	51.5	-3.2	-7%
		7-8 AM	61.7	59.9	1.8	3%
		8-9 AM	56.9	48.8	8.1	14%
		9-10 AM	42.8	41.6	1.3	3%
		3-4 PM	29.4	30.9	-1.5	-5%
		4-5 PM	31.4	31.3	0.0	0%
		5-6 PM	32.9	31.7	1.2	4%
		6-7 PM	30.1	31.3	-1.1	-4%
I-270 Northbound	33.1	6-7 AM	28.5	29.5	-1.0	-4%
		7-8 AM	28.5	29.7	-1.1	-4%
		8-9 AM	28.7	29.8	-1.1	-4%
		9-10 AM	29.3	29.8	-0.5	-2%
		3-4 PM	44.5	41.0	3.5	8%
		4-5 PM	53.9	44.4	9.5	18%
		5-6 PM	65.5	50.3	15.1	23%
		6-7 PM	46.6	49.1	-2.4	-5%

Note: MDOT SHA's VISSIM Modeling Guidance requires that travel times along the entire corridor be calibrated to within 5%; however, due to the complexity of the network, some segments are outside this range

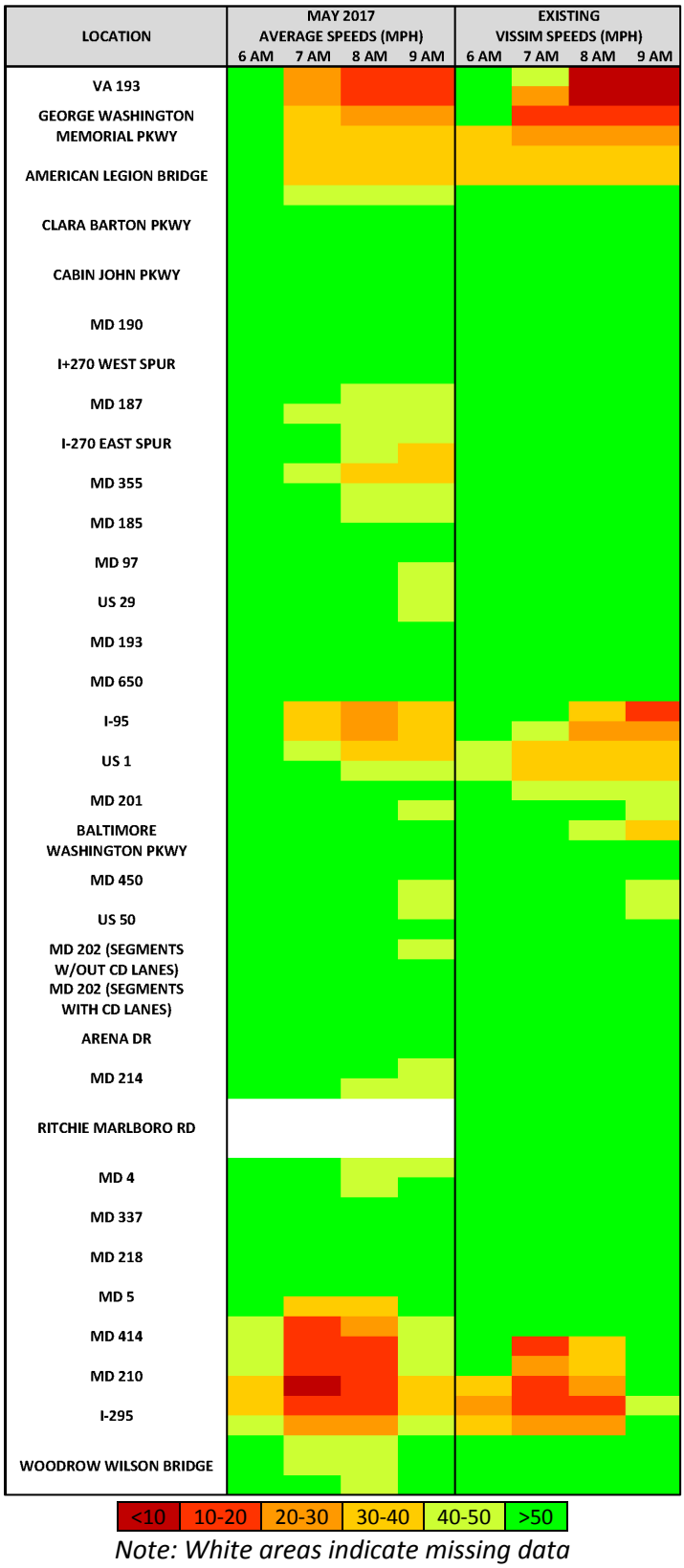
Table 2-9: VISSIM Outputs of Calibration: Segment Compliance Summary

Segment	Length (miles)	Time Period	Total Length of Segments Meeting Volume Criteria		Total Length of Segments Meeting Speed Criteria		Total Length of Segments Meeting Both Volume and Speed Criteria	
			Miles	%	Miles	%	Miles	%
I-495 Inner Loop	43.3	6-7 AM	11.6	26.7%	41.4	95.7%	11.6	26.7%
		7-8 AM	11.7	27.0%	37.0	85.5%	13.0	30.1%
		8-9 AM	5.8	13.4%	36.8	85.1%	4.6	10.6%
		9-10 AM	5.5	12.7%	37.4	86.5%	5.5	12.7%
		3-4 PM	16.3	37.7%	33.6	77.5%	12.5	28.8%
		4-5 PM	5.8	13.5%	37.0	85.5%	5.8	13.5%
		5-6 PM	11.4	26.4%	35.3	81.5%	10.3	23.8%
		6-7 PM	12.0	27.7%	38.0	87.7%	11.4	26.4%
I-495 Outer Loop	43.6	6-7 AM	14.0	32.2%	40.1	92.0%	11.4	26.2%
		7-8 AM	13.9	31.8%	34.5	79.2%	13.6	31.1%
		8-9 AM	10.9	25.1%	34.6	79.3%	8.0	18.5%
		9-10 AM	7.8	17.8%	34.7	79.6%	40.8	93.5%
		3-4 PM	29.5	67.8%	31.5	72.2%	20.7	47.4%
		4-5 PM	23.1	52.9%	29.8	68.4%	15.3	35.1%
		5-6 PM	18.4	42.3%	31.9	73.3%	10.9	25.1%
		6-7 PM	16.4	37.7%	37.1	85.2%	13.3	30.5%
I-270 Southbound	33.3	6-7 AM	3.2	9.6%	25.1	75.3%	3.0	8.9%
		7-8 AM	1.3	3.9%	29.3	87.9%	1.3	3.9%
		8-9 AM	3.5	10.5%	24.8	74.4%	3.5	10.5%
		9-10 AM	12.3	36.9%	28.5	85.5%	11.3	33.8%
		3-4 PM	18.1	54.2%	31.1	93.2%	18.1	54.2%
		4-5 PM	17.3	52.0%	31.1	93.2%	17.3	52.0%
		5-6 PM	23.2	69.4%	29.9	89.7%	23.2	69.4%
		6-7 PM	8.1	24.2%	30.6	91.8%	8.1	24.2%
I-270 Northbound	33.1	6-7 AM	6.0	18.3%	31.1	94.0%	6.0	18.3%
		7-8 AM	20.2	61.1%	31.1	94.0%	19.2	58.1%
		8-9 AM	20.8	62.9%	31.1	93.9%	19.9	60.0%
		9-10 AM	8.3	24.9%	30.9	93.4%	7.3	22.0%
		3-4 PM	1.0	3.0%	23.1	69.8%	0.0	0.0%
		4-5 PM	0.7	2.1%	20.4	61.5%	0.7	2.1%
		5-6 PM	1.0	3.1%	12.5	37.6%	0.1	0.2%
		6-7 PM	2.0	6.0%	25.7	77.7%	0.0	0.0%

Table 2-10: VISSIM Outputs of Calibration: Long Segments Compliance Summary

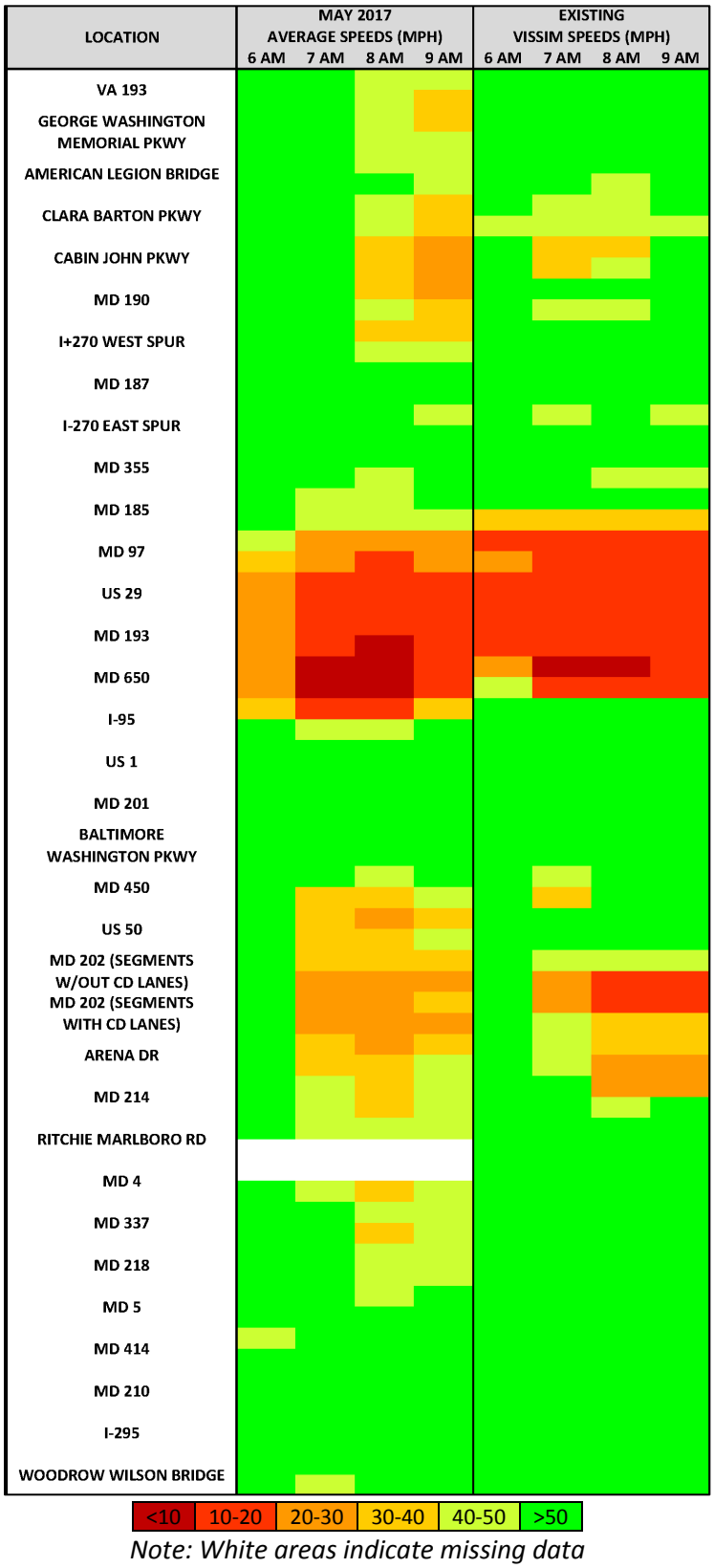
Segment	Total Length of Segments (Length ≥ 0.5 Miles) (Miles)	Time Period	Total Length of Segments (Length ≥ 0.5 Miles) Meeting Volume Criteria		Total Length of Segments (Length ≥ 0.5 Miles) Meeting Speed Criteria		Total Length of Segments (Length ≥ 0.5 Miles) Meeting Both Volume and Speed Criteria	
			Miles	%	Miles	%	Miles	%
I-495 Inner Loop	33.1	8-9 AM	5.8	17.5%	27.3	82.6%	4.6	13.8%
		5-6 PM	8.3	25.2%	26.5	80.0%	7.2	21.8%
I-495 Outer Loop	34.9	8-9 AM	9.5	27.3%	27.4	78.5%	7.1	20.3%
		5-6 PM	14.7	42.0%	26.2	75.1%	8.4	24.0%
I-270 Southbound	29.9	8-9 AM	3.3	11.0%	21.9	73.2%	3.3	11.0%
		5-6 PM	20.2	67.6%	26.7	89.4%	20.2	67.6%
I-270 Northbound	31.0	8-9 AM	18.9	60.8%	29.0	93.6%	17.9	57.7%
		5-6 PM	1.0	3.2%	11.2	36.2%	0.0	0.0%

Figure 2-35: I-495 Inner Loop Existing (2017) AM Peak Period Average Speeds – RITIS and VISSIM



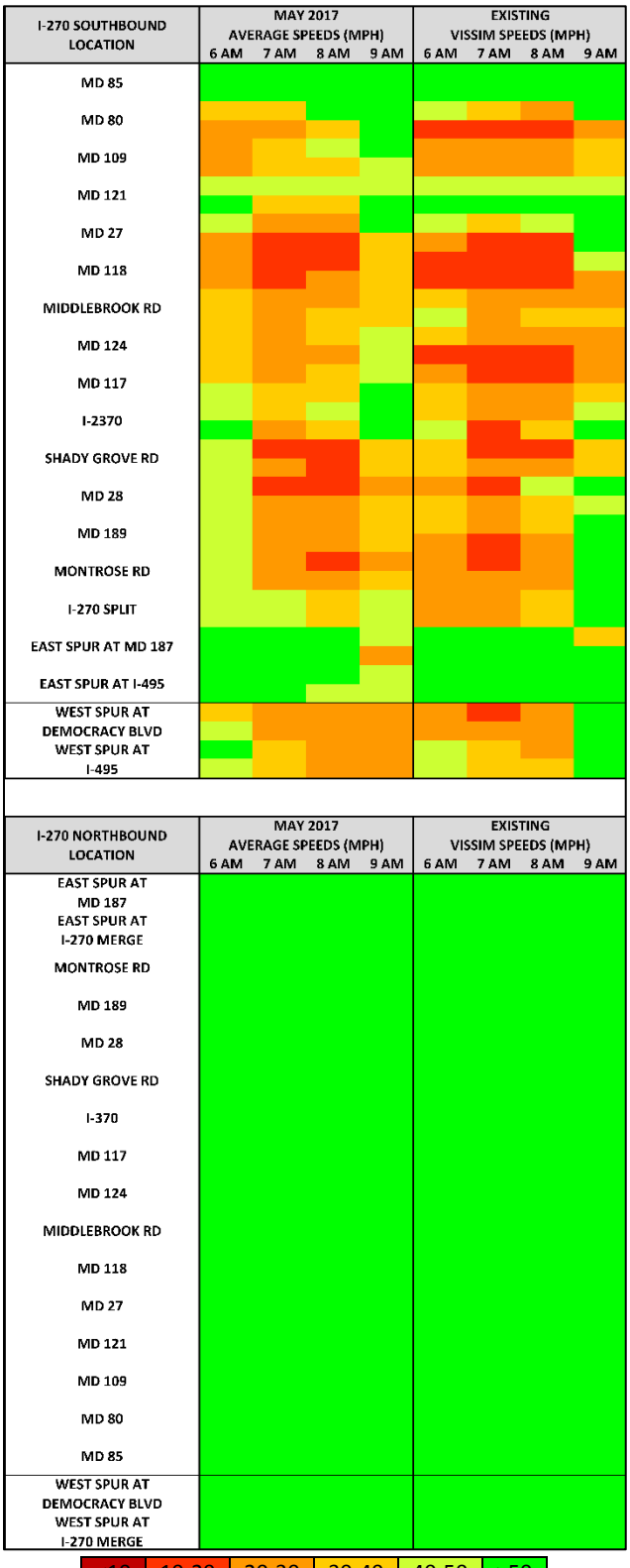
Note: White areas indicate missing data

Figure 2-36: I-495 Outer Loop Existing (2017) AM Peak Period Average Speeds – RITIS and VISSIM



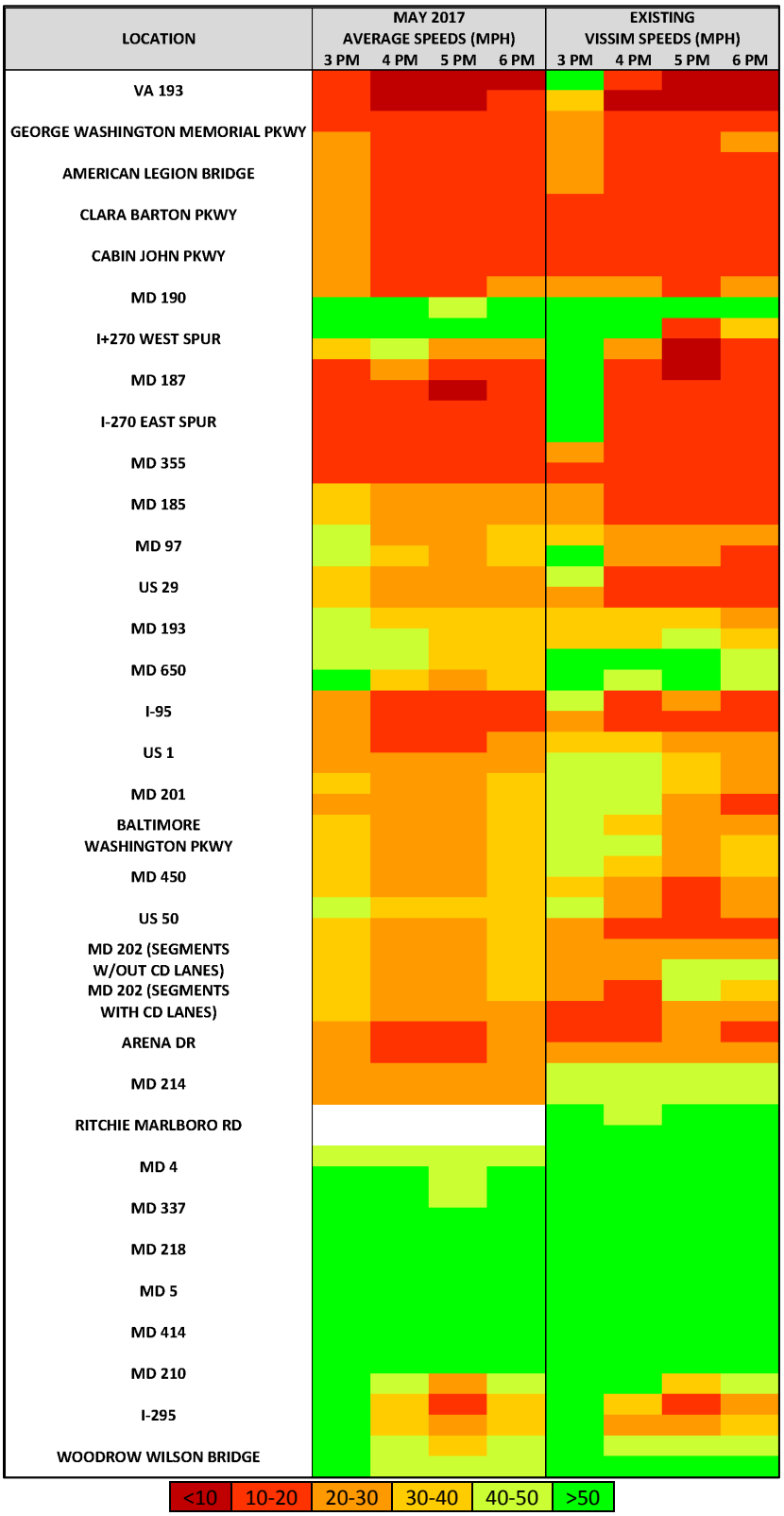
Note: White areas indicate missing data

Figure 2-37: I-270 Existing (2017) AM Peak Period Average Speeds – RITIS and VISSIM



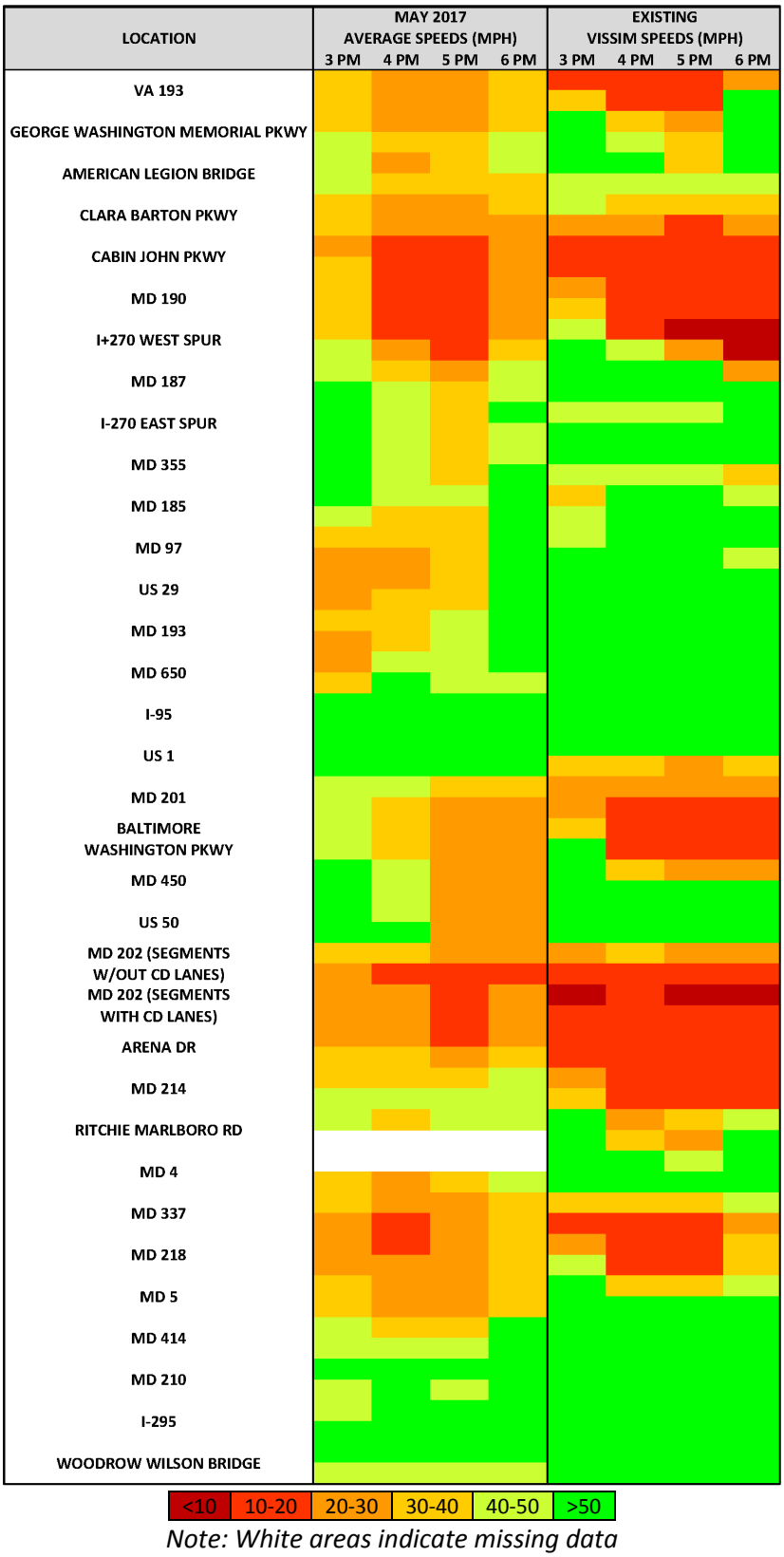
Note: White areas indicate missing data

Figure 2-38: I-495 Inner Loop Existing (2017) PM Peak Period Average Speeds – RITIS and VISSIM



Note: White areas indicate missing data

Figure 2-39: I-495 Outer Loop Existing (2017) PM Peak Period Average Speeds – RITIS and VISSIM



Note: White areas indicate missing data

Figure 2-40: I-270 Existing (2017) PM Peak Period Average Speeds – RITIS and VISSIM



3

3 SUMMARY OF EXISTING CONDITIONS

Building upon the previous discussion about the gathered data and how it can help to calibrate models, those models are then used for the development of the MOEs that have been previously discussed. Summarized below are the MOEs that were evaluated for this Study.

Key Points

- The average travel time for vehicles in the VISSIM model is 32.3 minutes.
- Of that, 13 minutes (40% of the commute) is delay.
- This equates to 2.25 hours of delay per week, and 117 hours of delay per year, per commuter.

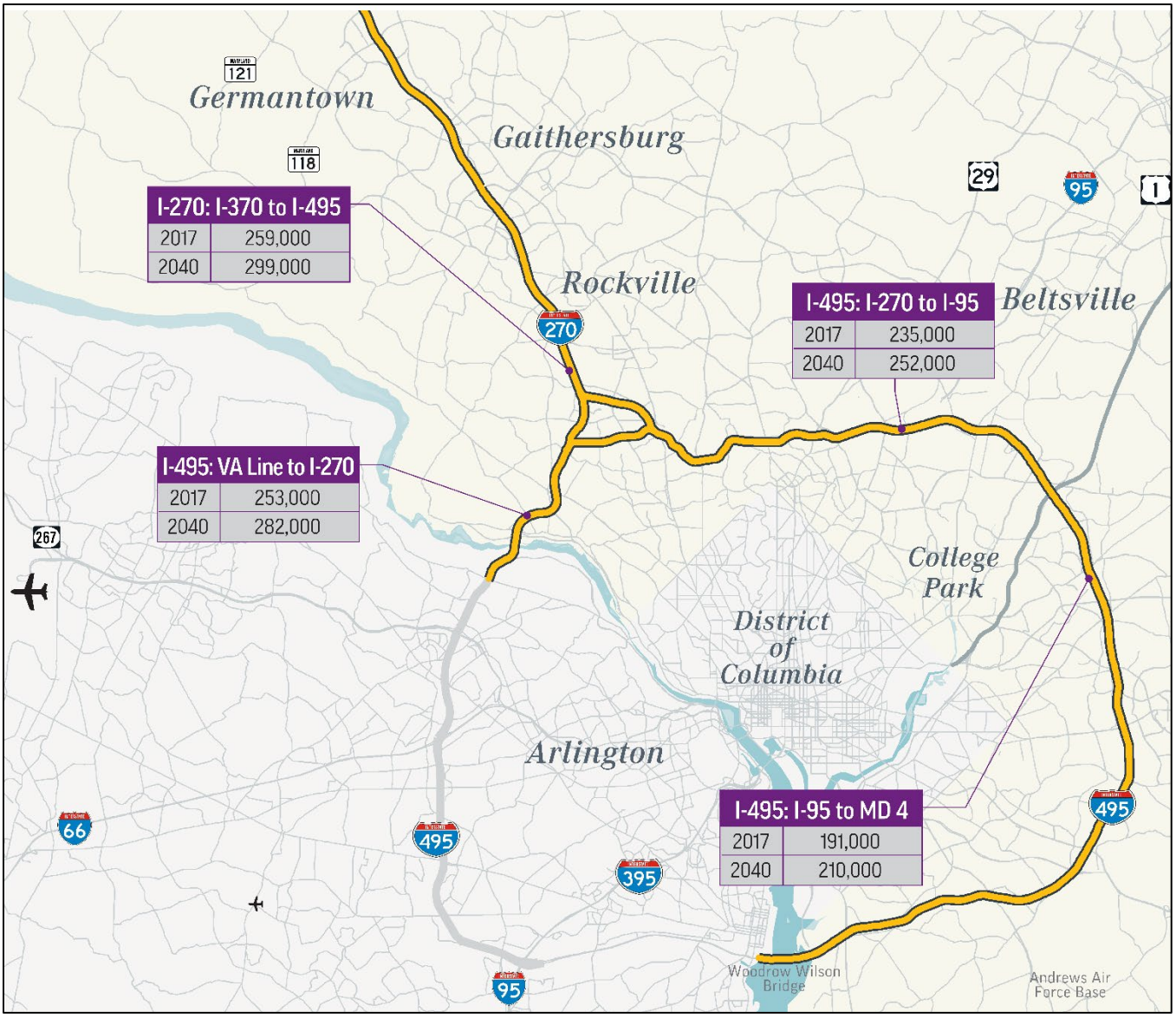
3.1 Annual Average Daily Traffic

Figure 3-1 provides a summary of existing (2017) and future (2040) annual average daily traffic (AADT) along the Study roadways. The development of future volumes will be detailed in section 5 of this report.

3.2 Travel Times and Speeds

Figures 2-35 through 2-40, as previously discussed, show the average speeds along I-495 and I-270 as collected in May 2017, and in the VISSIM models. Detailed speed and travel time data can be found in **Appendix E**.

Figure 3-1: Annual Average Daily Traffic (AADT) along Study Roadways



3.3 Vehicle Demand, Throughput, and Percent Demand Met

Throughput represents the number of vehicles and/or people that pass by a given point in the roadway network in a set amount of time. Throughput quantifies the efficiency of the roadway network in getting people, goods, and services to their destinations. Benefits of increased throughput on the highway include reduced peak spreading (i.e., less congestion in the off-peak hours) and reduced burden on the surrounding roadway network.

Existing travel demand and throughput at four key locations along the Study corridors are summarized in the following tables and figures. These locations cover the four main segments of the study area, separated by major freeway junctions (I-495 at I-95 and I-495 at I-270), and are therefore representative of the study area as a whole. For a complete set of demand and throughput results for all segments, refer to **Appendix F** and **Appendix G**. Person throughputs are based upon vehicle classification outputs, including classifications for HOV 2 and HOV 3+, in the MWCOG model. Percent vehicle demand (**Table 3-4**) met refers to the vehicle throughputs (**Table 3-2**) as a percentage of travel demand (**Table 3-1**).

Table 3-1: I-495 and I-270 Existing (2017) Travel Demand

Location	Travel Demand (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,100	9,500	9,200	8,600	8,600	8,500	8,700	7,500
I-495 West of I-95	7,000	8,500	7,900	7,000	8,800	9,100	8,500	7,500
I-495 at MD 5	6,300	6,300	6,900	6,200	5,800	6,800	7,000	6,400
I-270 at Montrose Rd	9,300	10,800	10,000	9,100	6,700	7,300	7,500	6,900
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	7,800	9,100	9,000	8,200	8,300	8,600	8,400	7,900
I-495 West of I-95	8,400	7,400	6,400	6,600	7,400	7,900	8,200	6,900
I-495 at MD 5	5,900	6,700	5,900	5,500	6,800	6,700	6,700	5,800
I-270 at Montrose Rd	4,200	6,100	8,300	7,500	10,500	11,400	11,400	10,700

Table 3-2: I-495 and I-270 Existing (2017) Vehicle Throughputs

Location	Throughput (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,000	8,300	8,200	8,000	8,300	8,000	7,300	8,800
I-495 West of I-95	7,200	8,100	7,800	7,100	8,100	8,300	8,000	7,300
I-495 at MD 5	6,500	6,000	6,500	6,500	6,000	6,900	7,300	7,100
I-270 at Montrose Rd	9,600	10,100	9,800	9,600	6,700	7,400	7,500	6,900
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,100	8,800	9,200	8,600	8,100	8,300	7,700	7,700
I-495 West of I-95	8,200	6,500	6,400	6,700	6,900	7,300	7,900	7,300
I-495 at MD 5	5,700	6,300	5,700	5,400	6,700	6,700	6,500	5,700
I-270 at Montrose Rd	5,000	6,200	8,400	8,000	10,500	11,400	11,400	10,700

Table 3-3: I-495 and I-270 Existing (2017) Person Throughputs

Location	Throughput (persons per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	9,500	9,900	9,700	9,500	10,800	10,400	9,500	11,400
I-495 West of I-95	8,400	9,400	9,100	8,200	10,200	10,500	10,100	9,200
I-495 at MD 5	7,700	7,100	7,700	7,700	7,800	8,900	9,500	9,200
I-270 at Montrose Rd	11,700	12,300	11,900	11,700	8,900	9,800	9,900	8,400
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	9,600	10,400	10,900	10,200	10,500	10,800	10,000	10,000
I-495 West of I-95	9,500	7,600	7,400	7,800	8,700	9,200	10,000	9,200
I-495 at MD 5	6,700	7,500	6,700	6,400	8,700	8,700	8,400	7,400
I-270 at Montrose Rd	6,100	7,600	10,200	9,800	12,800	13,900	13,900	13,100

Table 3-4: I-495 and I-270 Existing (2017) Percent Vehicle Demand Met

Location	Percent Vehicle Demand Met							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	99%	87%	89%	93%	97%	95%	84%	100%
I-495 West of I-95	100%	96%	98%	100%	93%	91%	94%	98%
I-495 at MD 5	100%	96%	94%	100%	100%	100%	100%	100%
I-270 at Montrose Rd	100%	93%	98%	100%	100%	100%	100%	100%
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	100%	97%	100%	100%	98%	96%	92%	98%
I-495 West of I-95	97%	87%	100%	100%	94%	92%	96%	100%
I-495 at MD 5	97%	94%	96%	98%	99%	99%	97%	99%
I-270 at Montrose Rd	100%	100%	100%	100%	100%	96%	98%	100%

<90% ≥90% 100%

Figure 3-2: I-495 Existing (2017) 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

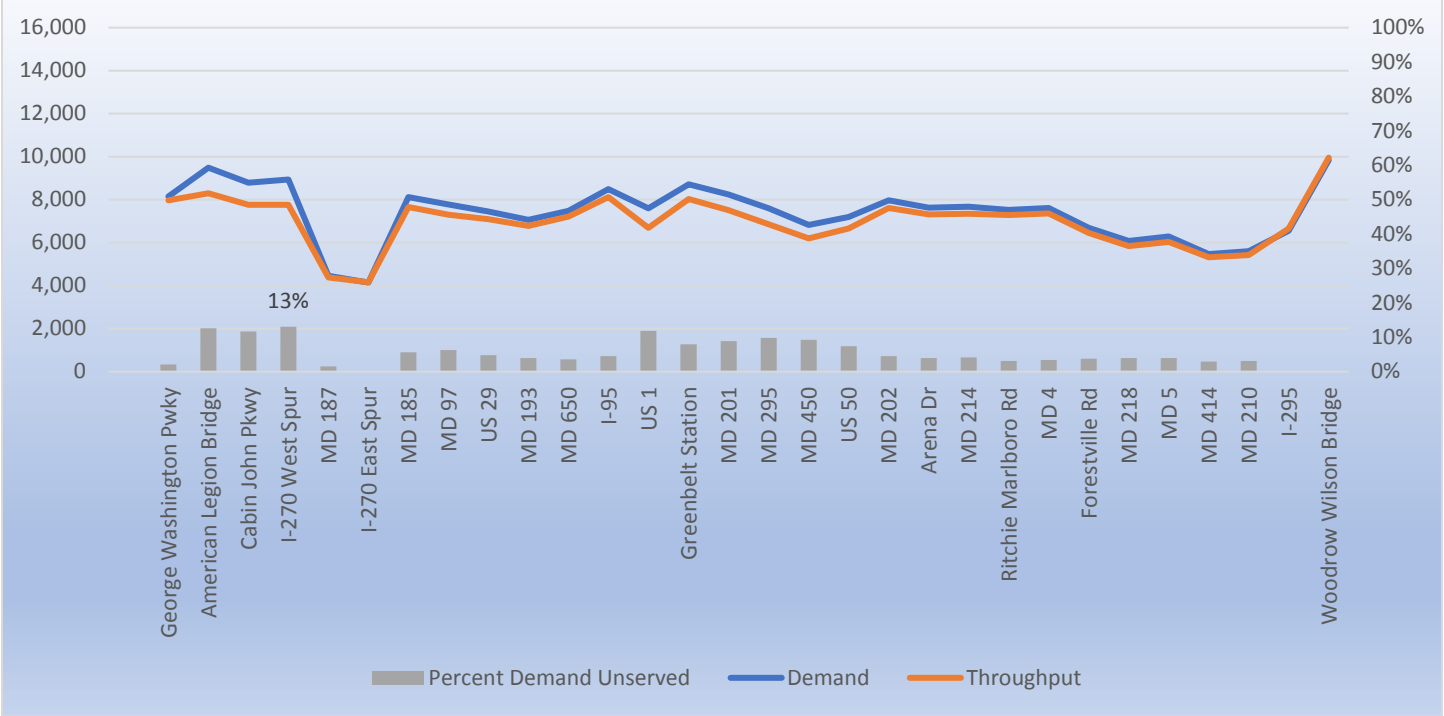
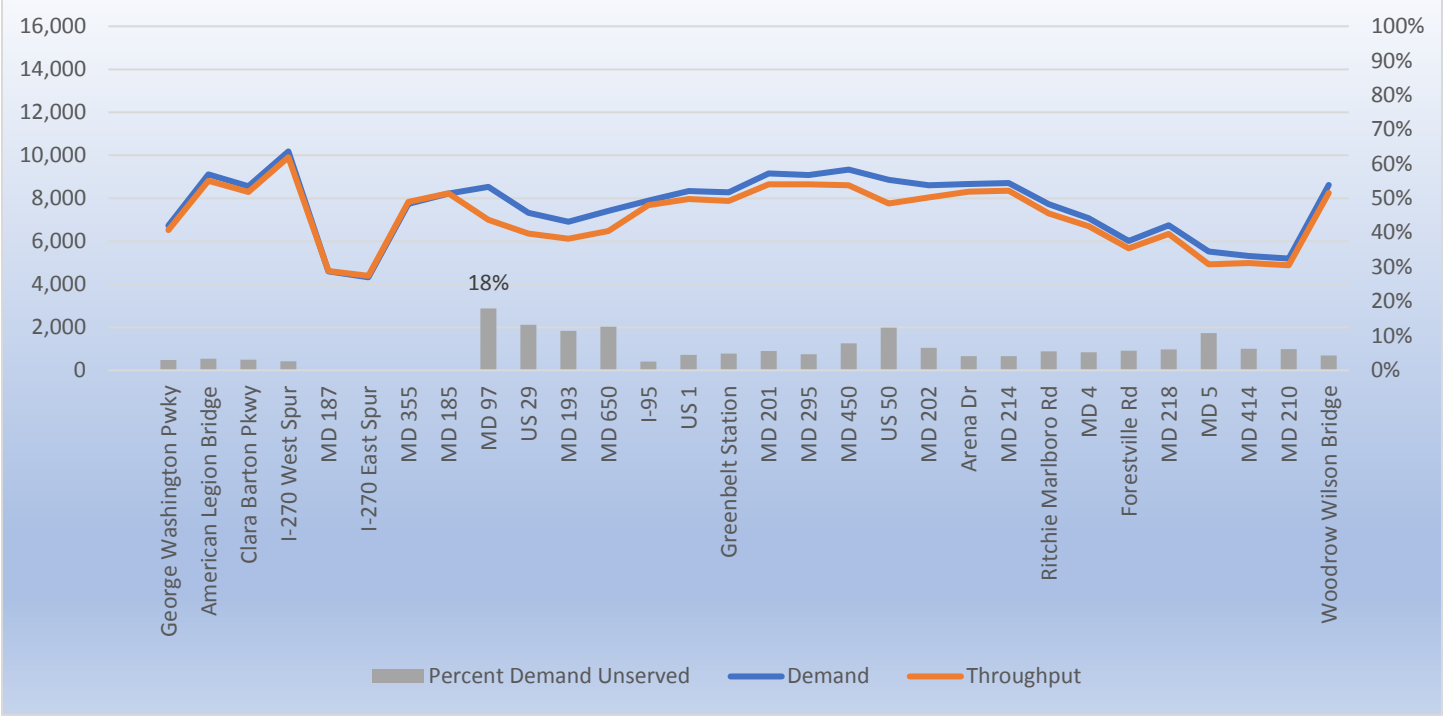


Figure 3-3: I-495 Existing (2017) 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 3-4: I-495 Existing (2017) 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

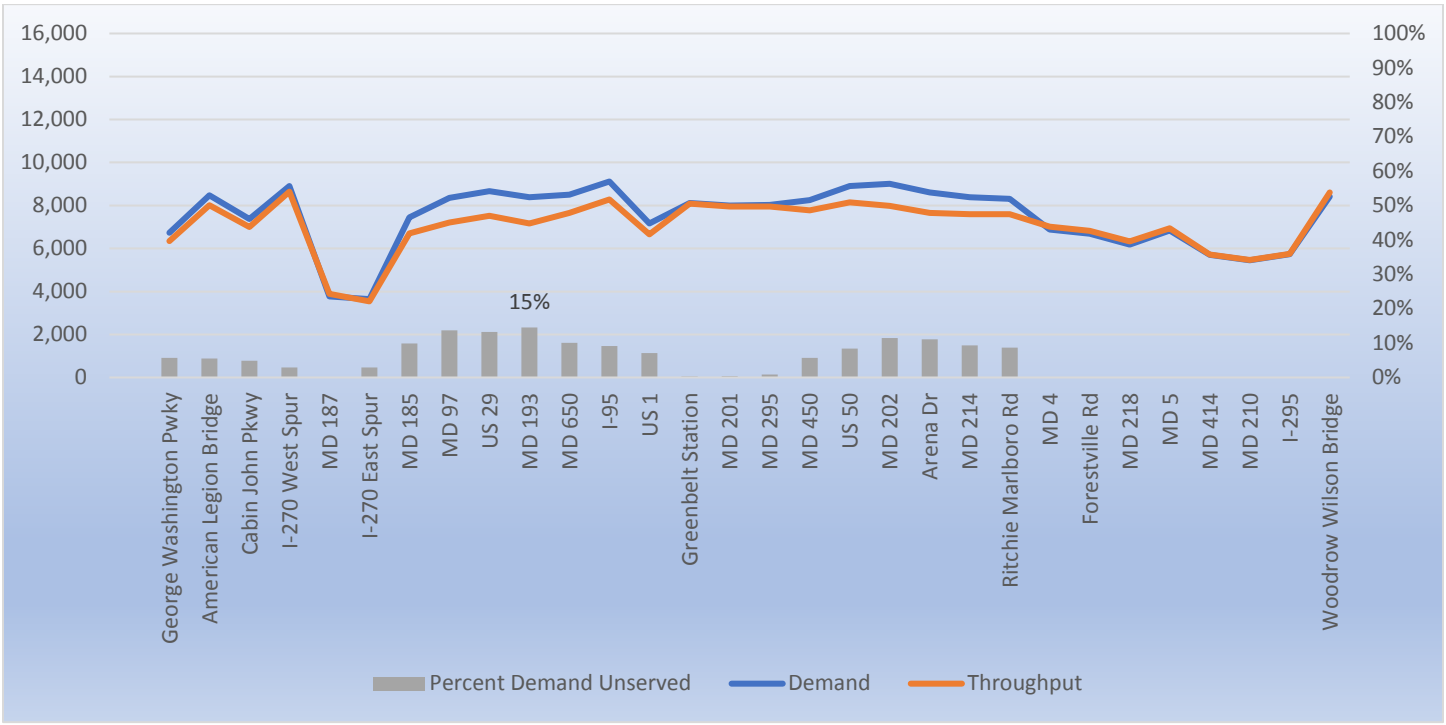
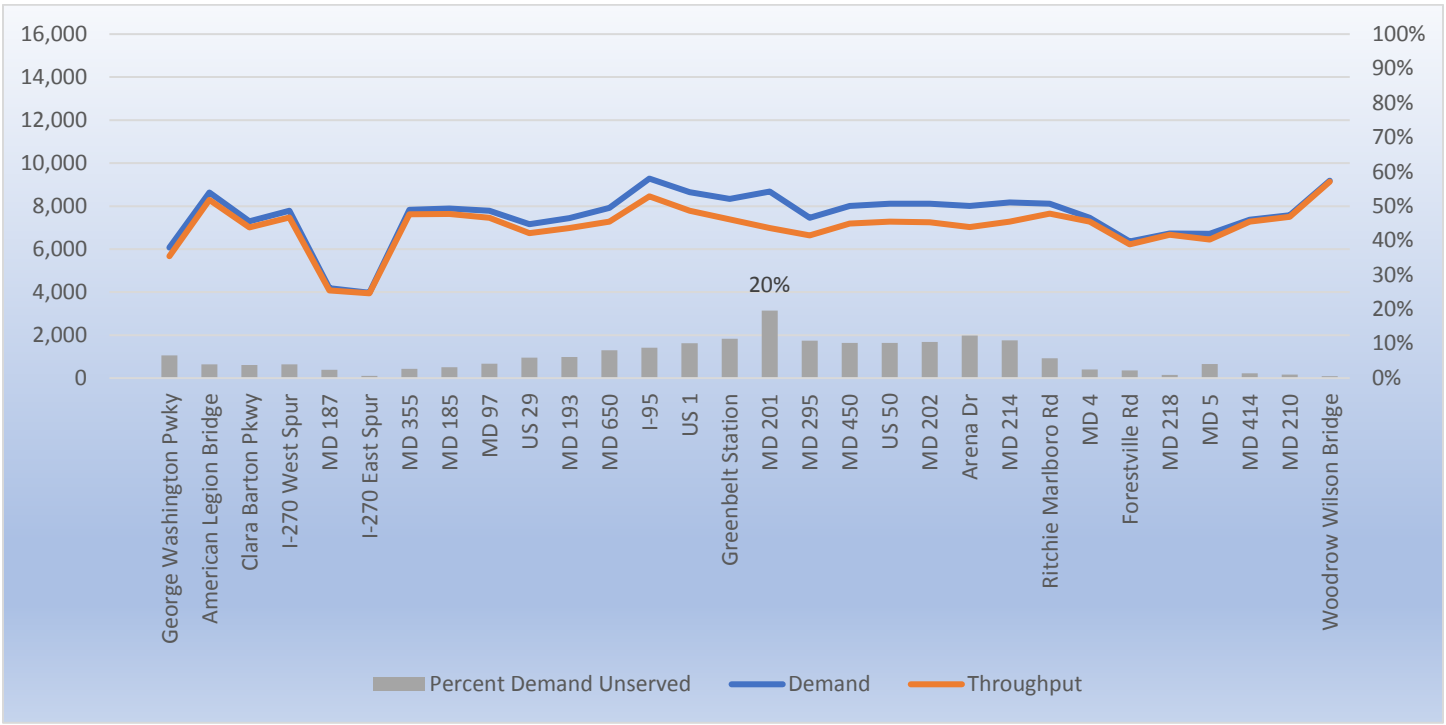


Figure 3-5: I-495 Existing (2017) 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 3-6: I-270 Existing (2017) 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

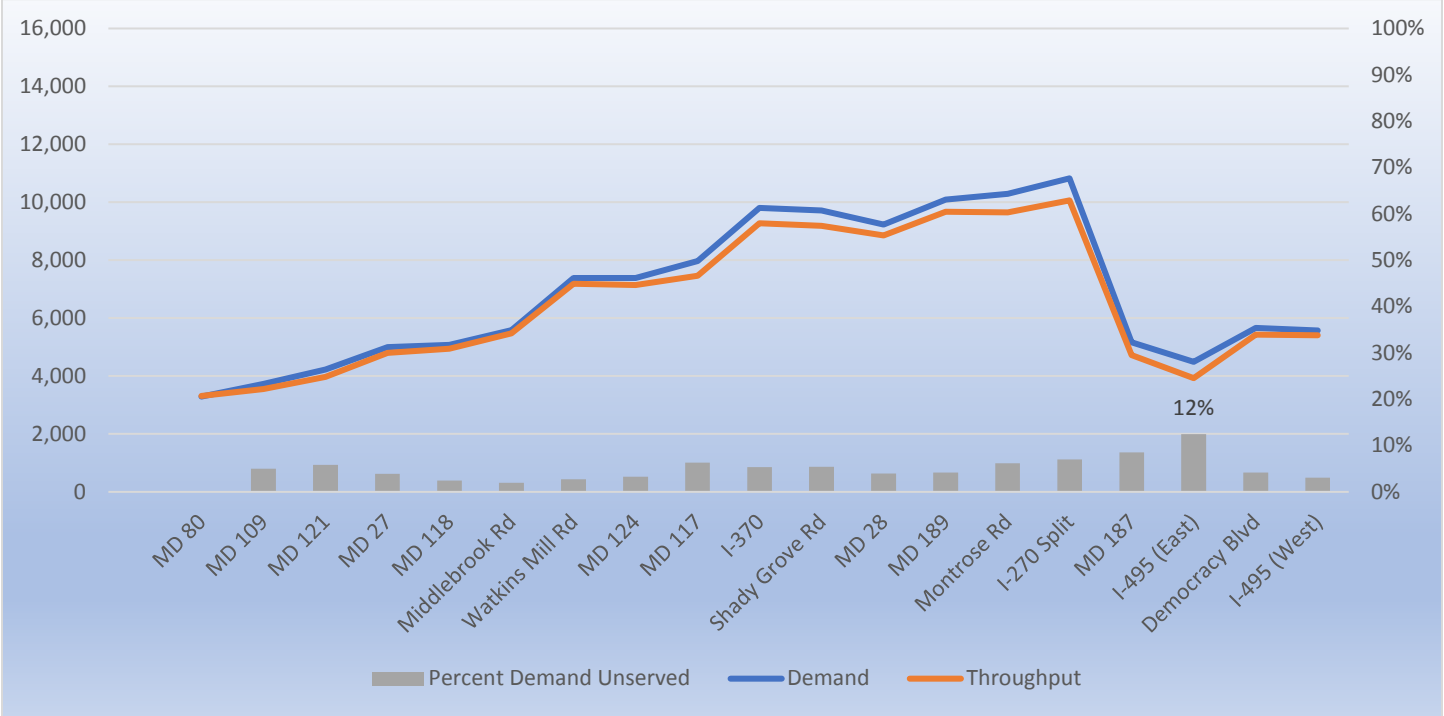
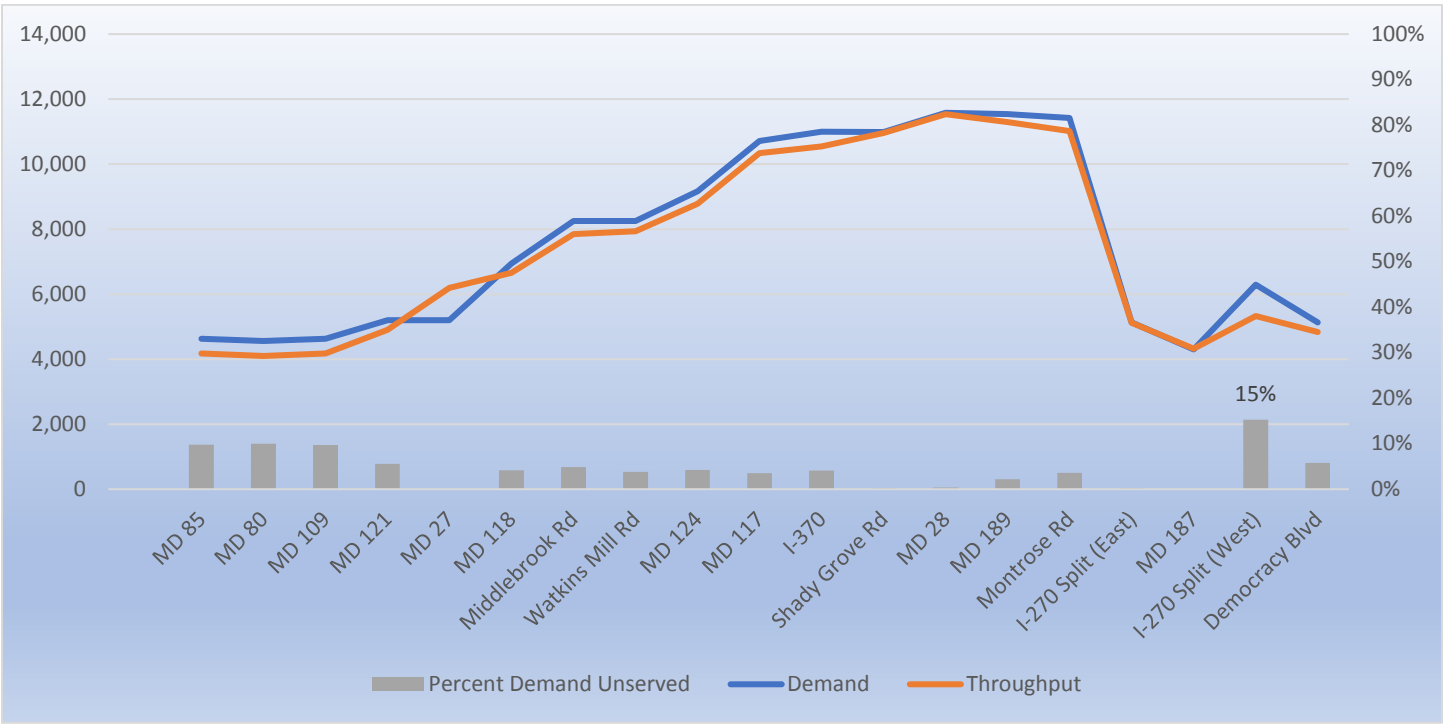


Figure 3-7: I-270 Existing (2017) 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

3.4 Freeway Segment and Arterial Intersection Level of Service (LOS)

For intersections, level of service (LOS) is defined in terms of the average total vehicle delay of all movements traveling through an intersection. LOS quantifies several qualitative factors including driver discomfort, frustration, and lost travel time. For segments, LOS criteria are predicted in terms of density or in terms of travel speed as a percentage of free-flow speed. Density refers to the number of vehicles occupying a given length of a roadway. Density is averaged over time and is expressed in passenger cars per mile per lane (pc/mi/ln). Higher density values are indicative of more friction in the system and more congestion. For freeway and arterial segments, the *Highway Capacity Manual (HCM)* assigns LOS grades based on density. Urban freeway segments reach failing (LOS F) conditions when the density exceeds 45 pc/mi/ln.

For intersections, LOS criteria are depicted in terms of average delay per vehicle during a specific time interval. Average vehicle delay is measured based on several variables including signal phasing, signal timing, signal cycle length, and traffic volumes with respect to intersection capacity. Operational conditions for arterial intersections were color-coded to reflect various congestion levels based on delay thresholds established in the *HCM, 6th Edition*. **Figure 3-8** summarizes the thresholds for freeway segments and signalized intersections. Existing LOS along the Study corridors are summarized in the **Figures 3-9 and 3-10**. Speed, density, and LOS for each segment are included in **Appendix H**.

Figure 3-8: *HCM* Freeway Segment Level of Service (LOS) Thresholds

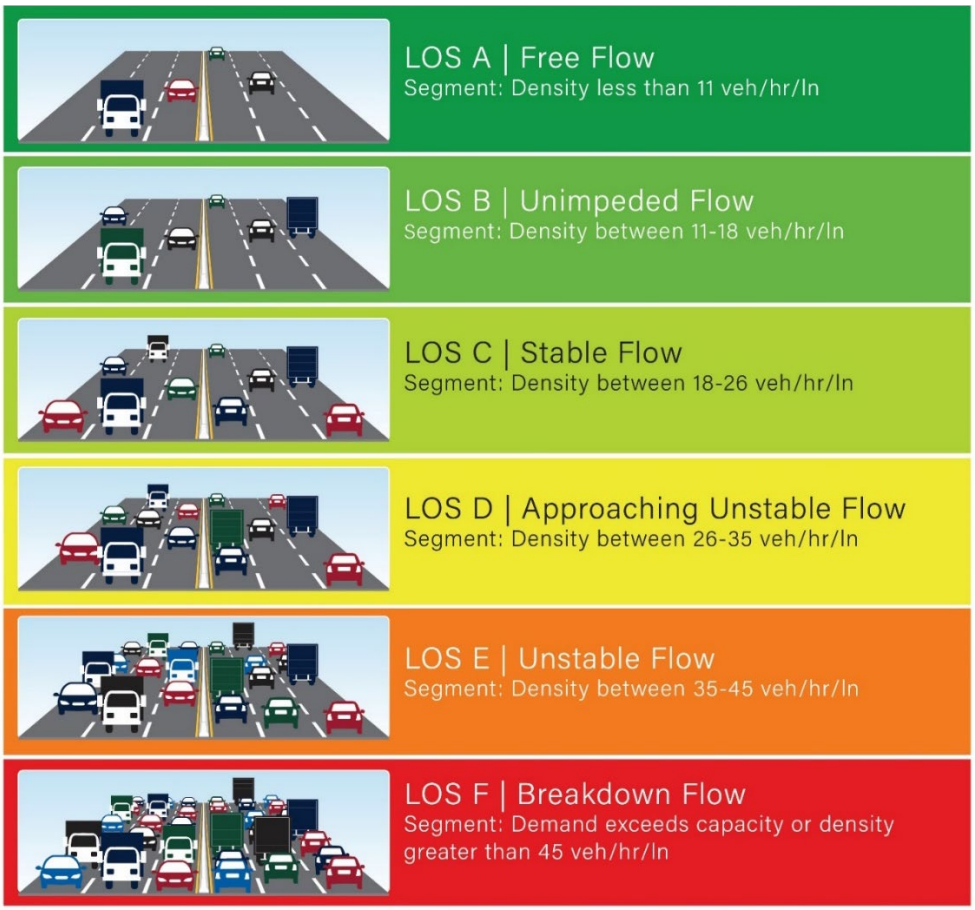


Figure 3-9: Existing AM Segment Level of Service (LOS)

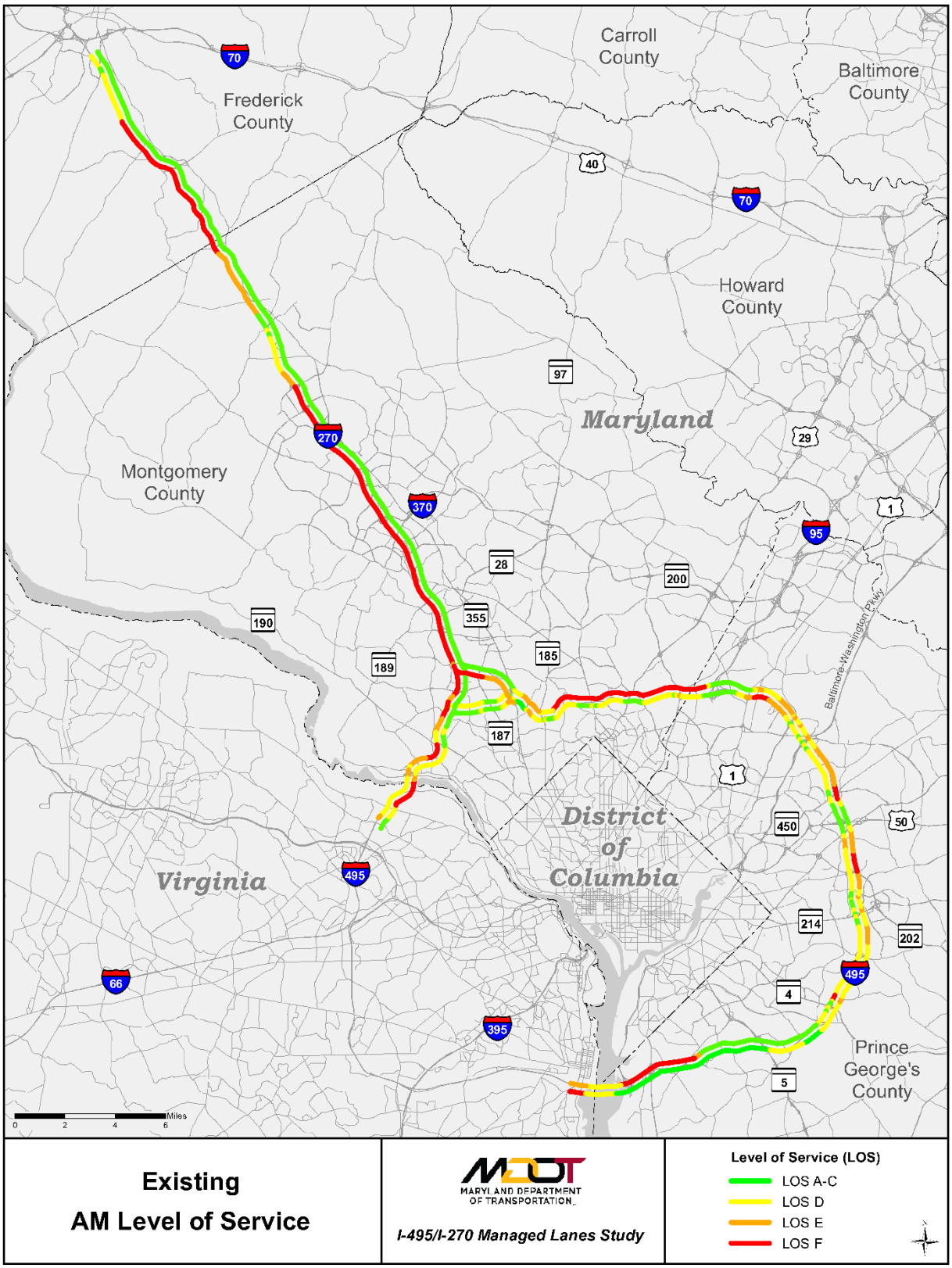
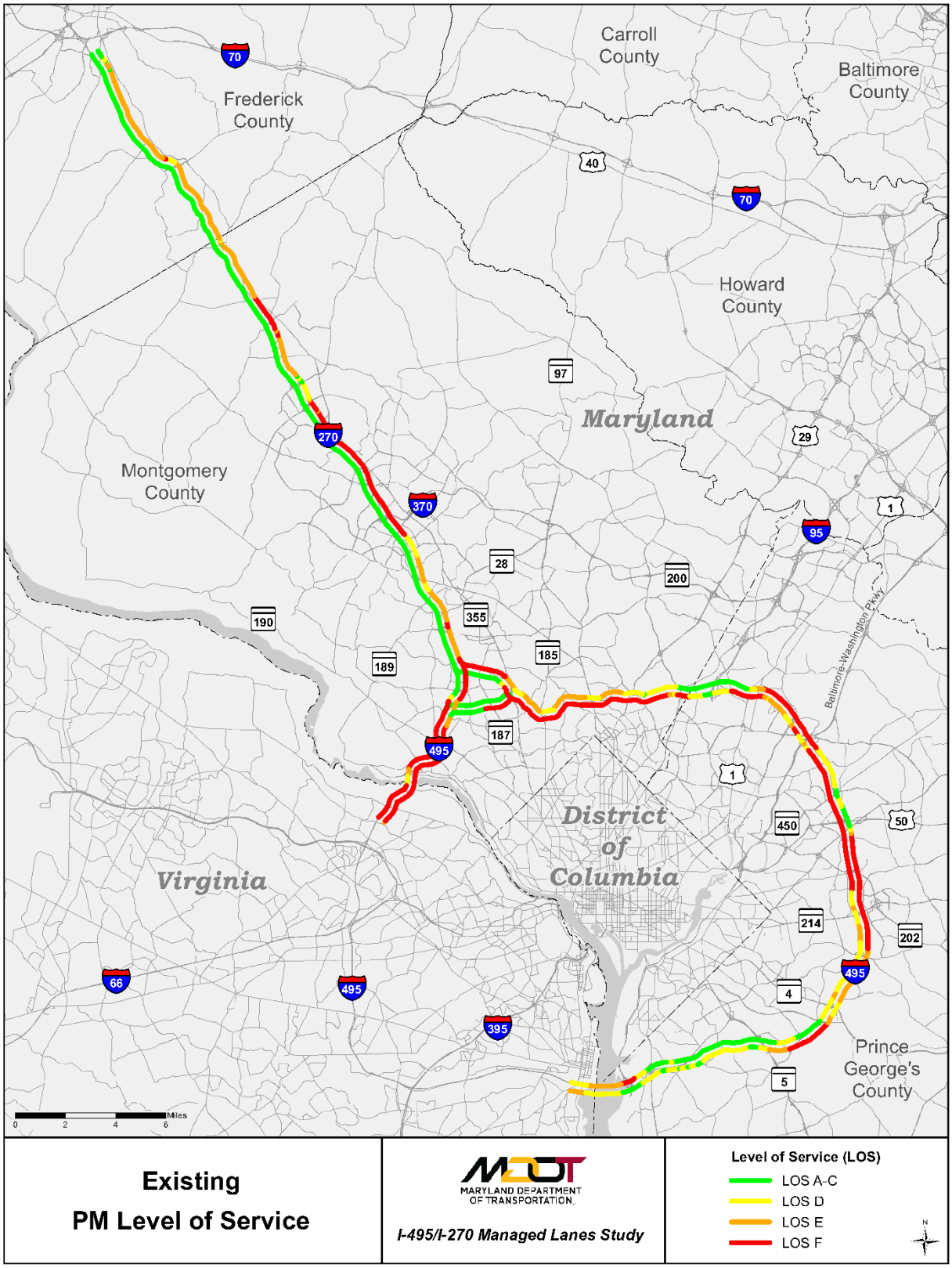


Figure 3-10: Existing PM Segment Level of Service (LOS)



4

4 DEVELOPMENT OF FUTURE ALTERNATIVE MODELS

The following sections detail the development of the future alternative models. As these models are used to compare the alternatives, accurate development of the models, including roadway geometry, volumes, speeds, etc., is a critical step in the modeling process.

4.1 Key Assumptions

A. Forecast Development

Two sets of travel demand forecasts were carried out in 2018. The initial round of analyses and high-level evaluations took place prior to July 2018 using the Maryland Statewide Transportation Model (MSTM V 1.092) networks. These evaluations provided high-level demand forecasts and screening of alternatives based upon the facility average daily traffic in each of the potential managed lane corridors (I-270, I-495, and the Baltimore-Washington Parkway). This first round of screening included the modeling of access points at all interchanges with the goal of identifying the locations with the most impactful demand sources and sinks (i.e., locations where vehicles enter and exit the network). This led to the determination that access points could be provided at interchanges, and that slip ramps would not be needed except at termination points. These termination points are:

- The northern end of I-270
- The southern end of I-495 east of the Woodrow Wilson Memorial Bridge
- Near the American Legion Bridge in Maryland and the Dulles Toll Road in Virginia

This round of screening was also used to evaluate the network with and without the HOV lane on I-270.

In late June 2018, the travel forecasting process was changed to the MWCOG Version 2.3.71 Travel Demand Model. The MWCOG Travel Demand Model Region covers 6,800 square miles including 22 counties/jurisdictions in the District of Columbia, Maryland, and Virginia with 3,722 Traffic Analysis Zones. The change was made to be consistent with the parallel travel forecasting carried out by MWCOG in support of the Study's incorporation into the Washington region's *Visualize 2045* – Financially Constrained Long-Range Plan (CLRP), adopted by the MWCOG – Transportation Planning Board (TPB) in 2018, along with additional screening, as well as air quality efforts and traffic and revenue efforts. The V.2.3.71 Travel Demand Model was revised[9] from the V.2.3.70 Model to "better represent dynamically-priced lanes that

[9] Refer to the June 1, 2018 *Transmittal Information for the COG/TPB Version 2.3.71 Travel Demand Model in Support of Maryland's Traffic Relief Plan (TRP) Study* memorandum from Feng Xie et al. of MWCOG to Carole Delion et al. of MDOT SHA, as well as the December 5, 2018 *User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.75* in Appendix C for additional information.

do not provide preferential treatment to high occupancy vehicles (which are assumed in all of the build alternatives for Maryland's TRP Study)". It also was modified to no longer use the "HOV Skim Replacement" process that required two complete executions of the regional model ("Base" and "Final") to capture variable price tolling. Instead, it only requires a "Final" execution and runs in substantially less time.

The baseline model networks and data provided are the same as the V.2.3.70 Travel Demand Model adopted for the region's Air Quality Conformity Analysis on October 18, 2017 and incorporate Round 9.0 Cooperative Forecasts for the MWCOG Region and the off-cycle amendment to the 2016 Constrained Long Range Plan. All other assumptions including trip rates, tolls, transit fares, and others are consistent with the adopted V.2.3.70 Travel Demand Model.

B. Land Use

Land use information used for the travel demand modeling was based on the local jurisdiction/MWCOG long-range plan (i.e., this is not developed or modified by MDOT SHA, which is standard practice). The Study area is highly congested and mostly built out today and will be even more so by 2040. Therefore, the MWCOG model assumes the same land uses in the 2040 Alternative 1/No Build model and the Build Screened Alternatives, with no further zoning changes that would result in induced travel.

The Study began using the 2040 MWCOG model. A preliminary analysis was performed utilizing the updated 2045 MWCOG model to determine the impacts of this project on the 2045 model and compare them to the impacts in previous year models. A memorandum summarizing this analysis is included in **Appendix C**. In addition, a sensitivity analysis was performed to validate that any land use assumption changes between the 2040 model and the 2045 model would not have a significant impact on the analysis results and conclusions. Documentation of this analysis is included in **Appendix J**. Full runs with the 2045 model will be included in the FEIS.

C. Latent Demand and Induced Demand

The Build forecasts account for latent demand and induced demand that would be expected as a result of the additional capacity provided. Latent demand (or unserved demand) refers to users that are not currently served by the system but would like to use the system. In this Study, latent demand refers to people who want to use I-495 or I-270 during the peak hours, but do not because of the congestion. Instead, they travel via local roadways or at other times of the day. Induced demand refers to newly generated trips that would not exist without capacity improvements to the transportation network. The MWCOG model was used to model latent and induced demand. The MWCOG model considers route changes, destination changes, and mode changes. As stated in the Land Use section above, the MWCOG model assumes the same land uses in the 2040 Alternative 1/No Build model and the Build Screened Alternatives. Because the Build Screened Alternatives would decrease travel times along I-495 and I-270, people may be willing to drive a longer distance for their trips as that distance is now within an acceptable travel time. Once a preferred alternative is selected, the potential for land use changes that could result in greater induced demand can be investigated further. At that time, the approach to this type of analysis will need to be discussed further with MWCOG, as it is currently not included in their adopted models.

D. Background Projects

All future alternatives include all projects in *Visualize 2045*. Background projects along the Study corridors include the I-270 ICM initiative, I-270 at Watkins Mill Road Interchange, the Greenbelt Metro Access improvements along I-495, and VDOT Next, as described in Section 2.2 in this report.

E. Managed Lanes Criteria

This Study includes the evaluation of managed lanes, which are restricted based on certain criteria, such as express toll lanes (ETL), HOV lanes, and high-occupancy toll (HOT) lanes. Descriptions of the types of managed lanes are provided in Section 1.4 of this report.

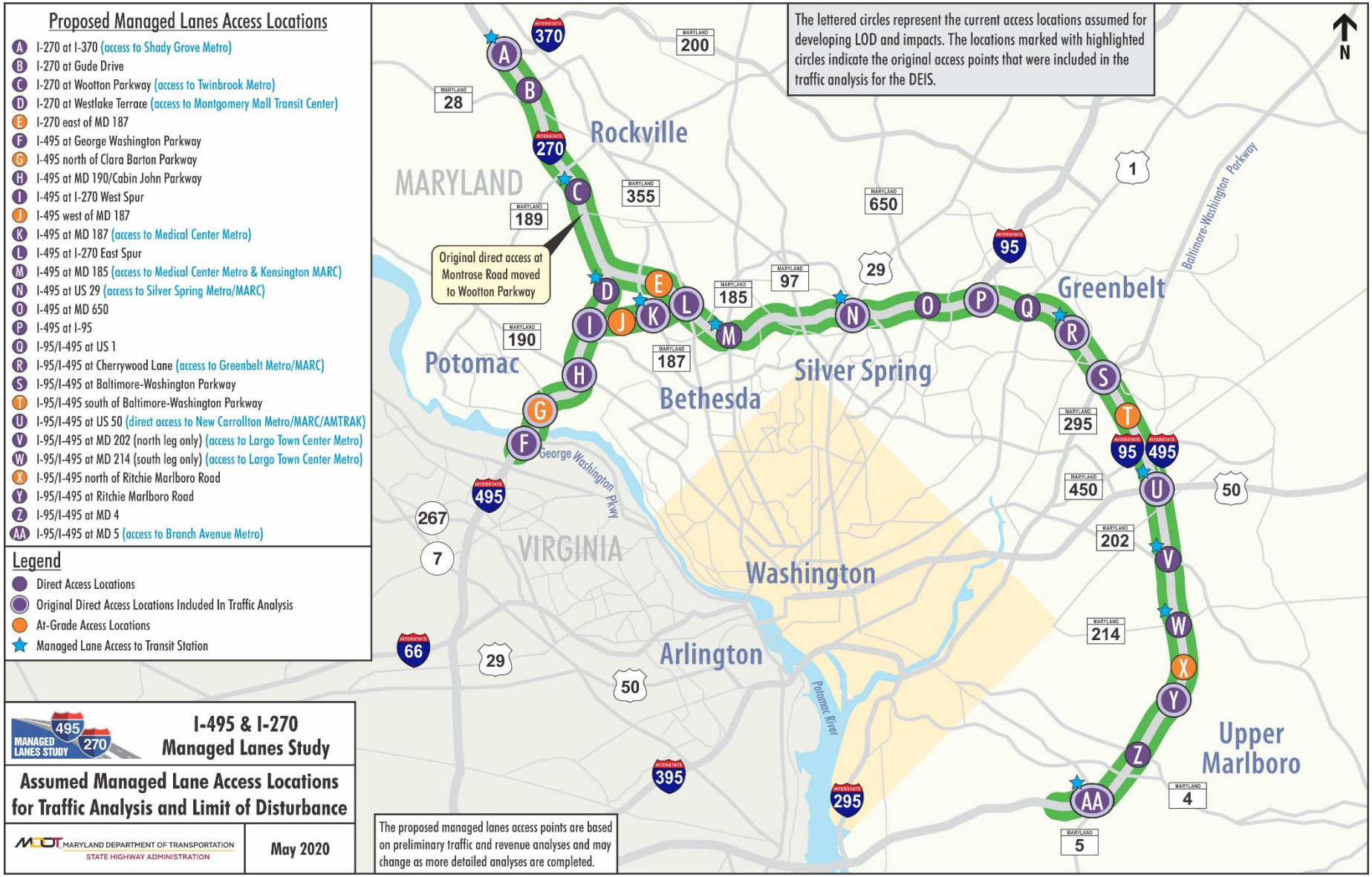
It should be noted that toll rates are unknown at this point, but they will be dynamic to manage traffic demand in the ETL/HOT lanes. For the purposes of this analysis, volumes in the managed lanes were assigned to provide the maximum throughput while maintaining speeds of at least 45 mph in the managed lanes (the federal requirement). This threshold occurs at 1,600 to 1,700 vehicles per hour per lane in the highest demand segment, which equates to a maximum of 3,200 to 3,400 vehicles per hour in the two-lane managed lane alternatives. Based on this assumption, the projected volume using the managed lanes is approximately the same for ETL and HOT alternatives – the toll rate would be higher for single-occupant vehicles in the HOT alternatives to offset the high-occupancy vehicles that could use the HOT lanes at a reduced rate.

F. Managed Lanes Access

As part of the Build Screened Alternatives, access to and from the managed lanes is proposed via at-grade auxiliary lanes or direct access ramps. The proposed locations of these direct access points are shown in **Figure 4-1**. The direct access locations assumed in the traffic modeling for all Screened Alternatives are listed below:

- Twelve (12) Interchanges along I-495
  - George Washington Memorial Parkway
  - Cabin John Parkway / MD 190
  - I-270 West Spur
  - MD 187
  - I-270 East Spur
  - US 29
  - I-95
  - Cherrywood Lane
  - Baltimore-Washington Parkway
  - US 50
  - Ritchie Marlboro Road
  - MD 5
- Four (4) Interchanges along I-270
  - Westlake Terrace (to and from the north only)
  - Montrose Road
  - Gude Drive (to and from the south only)
  - I-370
- One (1) Set of At-Grade Slip Ramps: North of Clara Barton Parkway

Figure 4-1: Assumed Managed Lanes Access Locations



The proposed managed lane access points are based on preliminary traffic and revenue analyses and may change as more detailed analyses are completed. These changes to the access point locations may impact future traffic volumes and operations, requiring additional simulation and analysis. This analysis will be completed once a preferred alternative is selected. It should be noted that the direct access locations included in the traffic models for this report are the same for all Build Screened Alternatives, providing a fair comparison among the alternatives. As noted in Figure 4-1, additional direct access locations were assumed when developing the limit of disturbance and impacts for this Study.

G. Removal of Collector-Distributor Lanes

The existing Collector-Distributor lane system was removed from all I-270 Build Screened Alternatives to minimize the footprint and associated impacts. The removal of the Collector-Distributor lanes eliminates conflict points at the slip ramps and helps to balance volumes evenly across the general-purpose lanes, which improves traffic flow. However, there is some tradeoff as this change causes additional merging and weaving in the general-purpose lanes, which can negatively impact operations. Removal of the Collector-Distributor lanes were evaluated as part of each Build Screened Alternative and was not identified as a separate alternative meeting the Purpose and Need. The net result of removing the Collector-Distributor lane system is included in the VISSIM results for all Build Screened Alternatives, which are presented in Section 5 of this report.

H. Consideration of Automated Vehicles

The expected influx of connected and autonomous vehicles (CAVs) will impact future traffic operations on all roads in Maryland, including I-495 and I-270. MDOT SHA participates in a statewide CAV working group (http://www.mva.maryland.gov/safety/MarylandCAV/) to stay up to date on the latest research and industry projections. At this time, there are too many unknowns regarding how CAVs could affect demand and capacity to include CAVs directly in the traffic forecasts. Therefore, the traffic projections for this Study apply traditional forecasting techniques, while being cognizant of the potential CAV impacts. However, it is anticipated that this project will be adaptable to accommodate CAVs because the proposed managed lanes will create a controlled environment with physical separation, new pavement, and clear delineations, features that are conducive to CAV use.

4.2 Initial Screening of Alternatives

The alternatives development process typically involves developing conceptual alternatives that address the Purpose and Need of the project. Public and agency coordination is then conducted to receive input on the conceptual alternatives.

MWCOG Model V.2.3.71 was used to analyze the following scenarios. These alternatives were used in the initial screening. Each alternative was either modified or removed while more alternatives were added after the screening step was completed. The scenarios that were screened are as follows:

- 2016 validation
- 2040 Alternative 1/No Build
- Original 2040 Alternative 2 (similar to Screened Alternative 9)
- Original 2040 Alternative 3 (similar to Screened Alternative 5)

- Original 2040 Alternative 4: Maintain the existing number of general-purpose lanes, plus two ETLS per direction along I-495, I-270, and Baltimore-Washington Parkway/I-695 *(not considered for further analysis beyond the MWCOG evaluation)*

The vehicle miles traveled (VMT) by time of day between the MWCOG networks and the loaded networks produced for this project for the 2016 validation and 2040 Alternative 3 scenarios were compared. The networks matched exactly for the 2016 validation and 2040 Alternative 3 scenarios, establishing that the model and processes were working properly.

The V.2.3.71 model was used for building Alternatives 5, 8, 9, 10, 13A and 13B for use in the post processing of volume data. The Base Validation Year and 2040 Alternative 1/No Build models prepared by MWCOG were also used for the post processing effort.

Additional information on alternative screening is discussed in Section 1.4 of this report.

4.3 Regional Travel Demand Model Alternatives Analysis: MWCOG

As discussed above, the second round of analyses using the MWCOG V.2.3.71 Travel Demand Model and networks/data refined the alternatives and explored additional options. The most significant revision was to no longer include the Baltimore-Washington Parkway, I-695, or I-270 north of I-370, based on the established logical termini for this Study.

For the alternatives that have both managed lanes and HOV lanes, the HOV maintains the same access to/from the general-purpose lanes as assumed in Alternative 1/No Build. The number of general-purpose lanes were adjusted as needed based on repurposing of lanes for managed lanes and HOV lanes. No changes were made to the network to include the removal of local lane barriers on I-270 as the MWCOG model is not sensitive to those changes as currently constructed.

For planning purposes only, dynamically set toll rates ($/Mile), which were part of the initial MWCOG Alternative 2, were retained in this Study. The dynamic toll rates used by MWCOG for travel demand modeling were developed as “per mile” rates based on an iterative process for each alternative and ranged from $0.20 to $1.36 per mile (in 2016 dollars). The iterative process was designed to estimate appropriate toll values to control the volume of traffic using the managed lanes through a combination of volume to capacity ratios and maintaining a minimum operating speed at or near free-flow conditions. As documented by TPB (see **Appendix C**), the toll rates produced as part of this MWCOG modeling process were developed by TPB staff. MDOT SHA did not perform this step for traffic forecasting and traffic analysis purposes, because the estimated toll values for future-year networks were provided as part of the model transmittal package. The toll rates set by MWCOG were determined by evaluating the resulting congestion on the facility and iteratively adjusting toll rates as needed to maintain a reasonable LOS on the facility. It should be noted that no further congestion refinements to rates were made in the MDOT SHA modeling effort. The tolls were used solely for the purposes of the MWCOG analyses to maintain a minimum average operating speed of 45 mph in the managed lanes and not exceed 1,600 to 1,700 vehicles per hour per lane in the highest demand section in the managed lanes.

4.4 MWCOG Model Post Processing

A. Overall Assumptions and Inputs

The forecasted year 2040 average daily traffic (ADT) and peak period volumes prepared for the Study were based upon the travel demand model volume outputs from the 2.3.70 and 2.3.71 versions of the MWCOG regional travel demand model. The volumes assigned by the model via loaded network files were inputted into the NCHRP 765 screenline spreadsheets. The outputs from the spreadsheets were then refined into ADT volumes and into hourly volumes during the peak periods for the roadway and interchange links on the project's roadway network.

B. NCHRP 765 Screenline Spreadsheet Methodology

The screenline spreadsheets as described in the NCHRP 765 publication *Analytical Travel Forecasting Approaches for Project-Level Planning and Design* were the primary tools used to develop post-processed ADT volumes for the Study network. This methodology uses the percent and absolute differences between existing year (2017) ADT volumes and existing year model forecasts for facilities along defined screenlines and applies the same corrections to future year forecasted model volumes. This results in refined volumes for these roadways, which account for under or overloading of the network elements that remain after travel demand model calibration and validation. Screenlines were prepared for the project to cover freeway links along I-270 and I-495 as well as the roadways which cross those freeways. The screenline process compares the model estimates to the observed volumes.

2040 Alternative 1/No Build volumes for the I-270 and I-495 corridors were developed using the Alternative 1/No Build screenline results for links located at the screenlines to determine the growth in volume to the year 2040. Traffic volumes for roadway links located between screenline locations were determined by observing the growth in raw model volumes between the existing year and 2040 and comparing that growth to the growth on adjacent screens. Initial link volumes, including those for freeways, ramps, and local roadways were first determined using the following methodology. For the Build Screened Alternatives (Alternatives 5, 8, 9, 10, 13B and 13C), ADT volumes for 2040 were developed by comparing the screenline and raw model volume growth between the existing year and 2040 in the Build Screened Alternative compared to the same growth for Alternative 1/No Build (i.e., Alternative 1/No Build was used as a base for developing the Build volumes). The volumes for the Build Screened Alternatives were then adjusted from Alternative 1/No Build based on that comparison. With this process, the resulting volume set will have minor traffic sinks where volumes do not match along a facility, due to rounding or minor differences in growth rates between adjacent links. Minor adjustments were then made in turning or ramp volumes using an incremental/iterative process, so that there were no traffic sinks and to ensure volumes added through interchanges and intersections were completely balanced as would be expected on an access-controlled facility. Vehicle miles traveled were not estimated as part of this forecasting.

Excel spreadsheets were used to manage this data and the process of applying growth rates that originated from the NCHRP 765 spreadsheets to the link traffic volumes.

C. Development of Forecasted General Purpose Lane, Managed Lane, and HOV ADT volumes

The process of ADT volume development resulted in the establishment of total volumes along the roadways in each direction. However, additional work was needed to develop the volumes among the

three principal facility types present in the 2040 Alternative scenarios, including general purpose lane, managed lane, and HOV lane volumes. This was done by observing the changes in the splits among these trip types in the raw model volume outputs. The following process was used:

- Alternative 1/No Build
    - Along I-495, all lanes are for general purpose traffic in most locations, so this additional step was not necessary.
    - Along I-270, the NCHRP process was used to determine the total growth. As the MWCOG model does not differentiate between express and local lanes, it was then assumed that the growth rates along the express, local and HOV lanes were approximately equal to the overall ADT growth rate, with the local lanes also impacted by the growth of the adjacent on- and off-ramps at interchanges. As the three streams interact with each other though out the corridor (no barrier separation for HOV and frequent slip ramps between the express and local lanes), it was decided that the overall demand growth would impact each relatively equally. The slip ramps between the local and express lanes were generally grown in accordance with the overall ADT growth and adjusted to balance traffic volumes through the network.
- Build Screened Alternatives
    - The portion of traffic assigned to the managed lanes was determined by averaging the percent of total raw ADT traffic assigned in the travel demand model to the managed lanes between toll access points. This is an added step beyond the NCHRP 765 process. The raw model managed lane volumes were used to determine the percentage of managed lane traffic getting off or on at each ramp location, and that percentage was applied to the refined managed lane link volumes to get refined managed lane ramp volumes.
    - The resulting percentage of traffic was assigned to the managed lanes, with the remainder of total volumes assigned to the general purpose and HOV lanes.
        - Though it is anticipated that the volumes in the managed lanes will be controlled through congestion-based toll prices, no cap was used for the ADT volumes in those lanes as was done for the peak hours.
        - In the Build Screened Alternatives, it is expected that the barriers between the local and express lanes on I-270 will be removed, so growth of those individual components was not done separately.
        - For the Build Screened Alternatives that included HOV lanes along I-270, the percent change in raw HOV volumes in the model from Alternative 1/No Build conditions was used to determine the resulting change in the post-processed ADT volumes.
    - ADT volumes along the managed lane ramps were determined by observing the percentage of raw model volumes from the toll lanes entering/existing at these locations and applying that percentage to the refined link managed lane volumes. The raw model managed lane volumes were used to determine the percentage of managed lane traffic entering or exiting along each ramp location; that percentage was applied to the refined managed lane link volumes.

- Toll volumes were then distributed by direction to the cross-street roadways based on the percentage of general traffic turns present in Alternative 1/No Build, similar to the process used to determine the managed lane volumes as described above.

D. Development of Peak Period Volumes

For all Screened Alternatives, hourly volumes were developed for the peak periods of 6 AM to 10 AM and 3 PM to 7 PM to assure coverage of the peak hours and conditions leading to those hours for input into the VISSIM models. The following process was used to develop peak period volumes:

- Alternative 1/No Build
  - The ADT growth percentages from the existing year (2017) to 2040 were applied to the peak hours.
  - The differences between the growth in ADT traffic and peak hour traffic in the MWCOG model outputs were reviewed. The differences ranged between 38 and 97% across the study area:
    - Along I-270, AM growth was 97 percent of the ADT growth rate, and PM growth was 84 percent of the ADT growth rate.
    - Along I-495 west of I-270, AM and PM growth were both 83 percent of the ADT growth rate.
    - Along I-495 east of I-270, AM and PM growth were both 38 percent of the ADT growth rate.
    - Values ranged between 38 percent and 97 percent of the ADT growth rate over the study area, with an average of 71 percent.
  - A reduction in the peak period growth rate to 75 percent of the ADT growth rate, which was based on engineering planning-level knowledge of the area and the use of similar reductions for area roadway projects by MDOT SHA in recent years, was found to be in line with the differences between the ADT and the peak hour volumes in the MWCOG model. Additionally, a universal rate was used for the entire system as the various sections within the system interact with one another.
  - This reduction was taken to account for the lack of available capacity on I-270, I-495, and the surrounding roadway network to accommodate that much growth and the likely spread of the peak period.
- Build Screened Alternatives
  - The growth in raw travel demand model volume outputs for the peak periods was compared to the raw growth in ADT volumes in those models.
  - Peak period “Mainline Multipliers” were then developed and applied to the ADT growth rates to determine the overall growth of volumes on the subject roadway facilities by direction.
    - For each Build Screened Alternative, multipliers were developed for I-270, I-495 west of I-270, and I-495 east of I-270 each of those major roadway sections has similar growth rates within the sections but differ between the three sections.
    - For example, in Alternative 10, the ADTs on I-270 were found to grow by an average of 8 percent between Alternative 1/No Build and Alternative 10, while the peak period volumes grew by an average of 16 percent. Therefore, the

multiplier developed for Alternative 10 on I-270 was 16 percent divided by 8 percent, or 2.0, and peak period volumes were grown by twice the growth percentage as the ADT growth between Alternative 1/No Build and Alternative 10.

- This methodology accounts for any peak shortening (i.e., drivers shifting their trips from off-peak hours to the peak hours) that would likely occur with the addition of more network capacity. This was done independent of the NCHRP process as an additional set of processes developed by the project team in response to the limitations of the regional model used.

- Peak period "Cross Street Multipliers" were developed for the streets that have interchanges with I-270 and I-495.
  - These were assumed to be halfway between the Mainline Multiplier for the adjoining freeways and 1.0, based on the assumption that growth stays the same as the ADT growth for area roadways that do not have planned improvements. This methodology was based on engineering judgement of the forecasters to establish growth rates for the adjacent facilities, that were closely-tied into the improvement options being evaluated on the interstate, which was the only change occurring to the system compared to Alternative 1/No Build.
  - For the Alternative 10 example above with the Mainline Multiplier of 2.0 for I-270, the Cross-Street Multiplier would be the average of 2.0 and 1.0, or 1.5. This methodology considers that while I-270 and I-495 will have added capacity in the peak periods in the Build Screened Alternatives, the supplying roadway network will not, and the peak period traffic will not be able to grow at quite as high a rate.
- Peak period "Managed Lane Multipliers" were developed to determine the percentage of managed lane traffic during the peak periods compared to the daily total.
  - This was done by comparing raw model volumes for the peak periods to the ADT volumes for the same three sections (I-495 west of I-270, I-495 east of I-270, and I-270).
  - For I-270 in Alternative 10, the model showed an average of 8 percent managed lane traffic for the daily traffic volumes, while the peak periods ranged from 16 percent to 18 percent. Therefore, the percentage of peak period traffic in the managed lanes was assumed to be approximately double the percentage used for the ADT traffic, as it is likely that drivers will be more inclined to pay for the convenience of the managed lanes when congestion is highest and the value of time for commuting and day care is highest.
  - As a result of this process, many locations in the Build Screened Alternatives had 75 percent or more of the daily managed lane volumes occurring over the eight peak period hours. Volumes in the toll lanes were capped at approximately 1,600 to 1,700 vehicles per hour per lane to account for the impact of variable congestion-based pricing to control congestion in the managed lanes.

As with the ADT volumes, the volumes for each of the peak periods were balanced through the network by adjusting volumes on access points to assure that approaching links met desired growth rates. For the Build Screened Alternatives that included HOV lanes on I-270, the percent change in raw HOV volumes in

the model from Alternative 1/No Build conditions was used to determine the resulting change in the post processed peak period volumes.

E. Model Validation Outputs

Screenline Average Annual Weekday Daily Traffic (AAWDT) volume outputs from the 2040 Alternative 1/No Build simulated model are shown in **Figure 4-2**. Model validation results comparing the 2040 Alternative 1/No Build volumes to the 2016 model volumes (described earlier in this report) are included in **Figures 4-3 and 4-4**. The MWCOG validation memo is included in **Appendix C**. The Build Screened Alternatives carry up to 15% more vehicles than Alternative 1/No Build.

Figure 4-2: 2040 Alternative 1/No Build Simulated AAWDT Screenline Volumes for I-270 and I-495

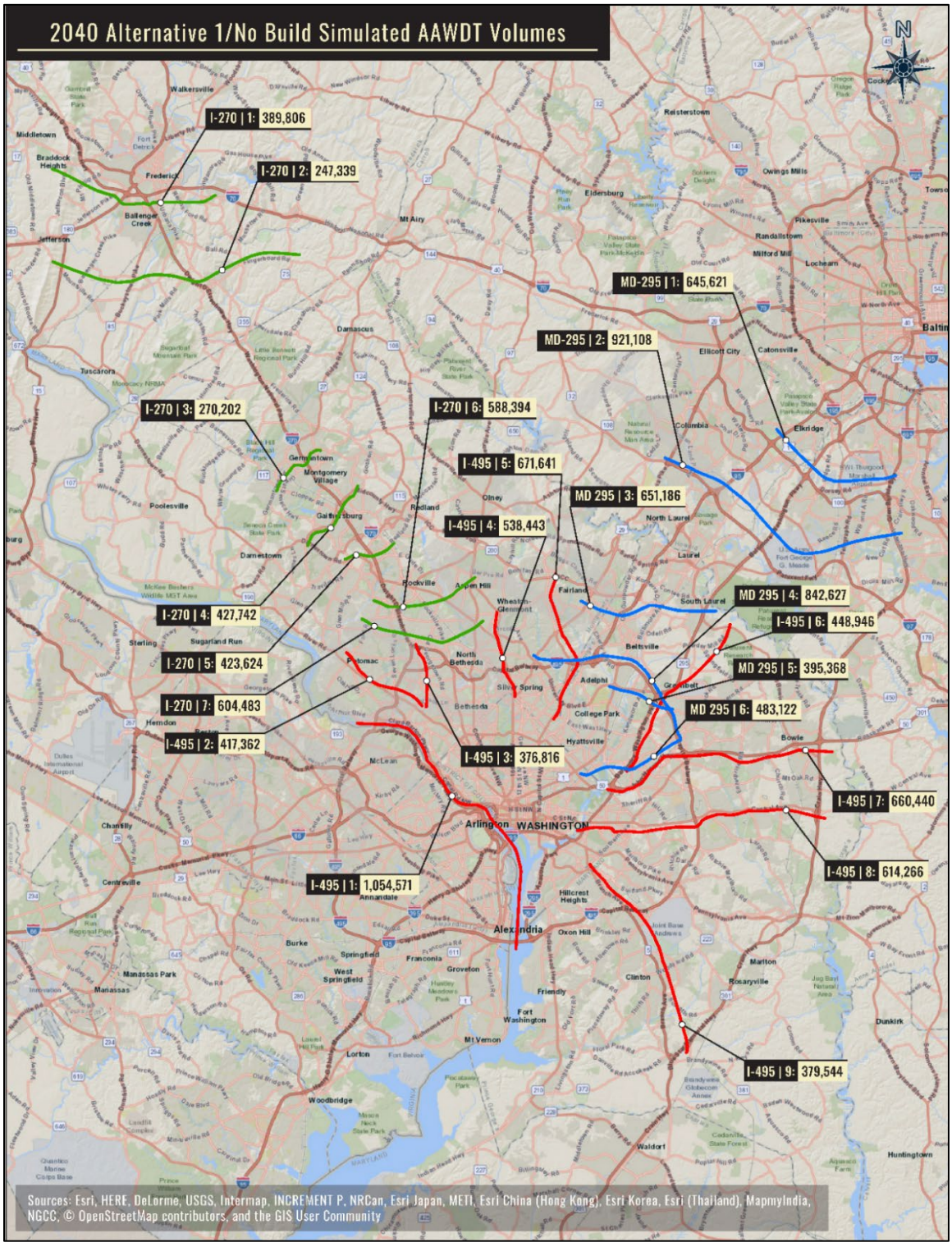


Figure 4-3: Simulated Average Annual Weekday Daily Traffic Volumes on I-495; 2016 vs. 2040 Alternative 1/No Build

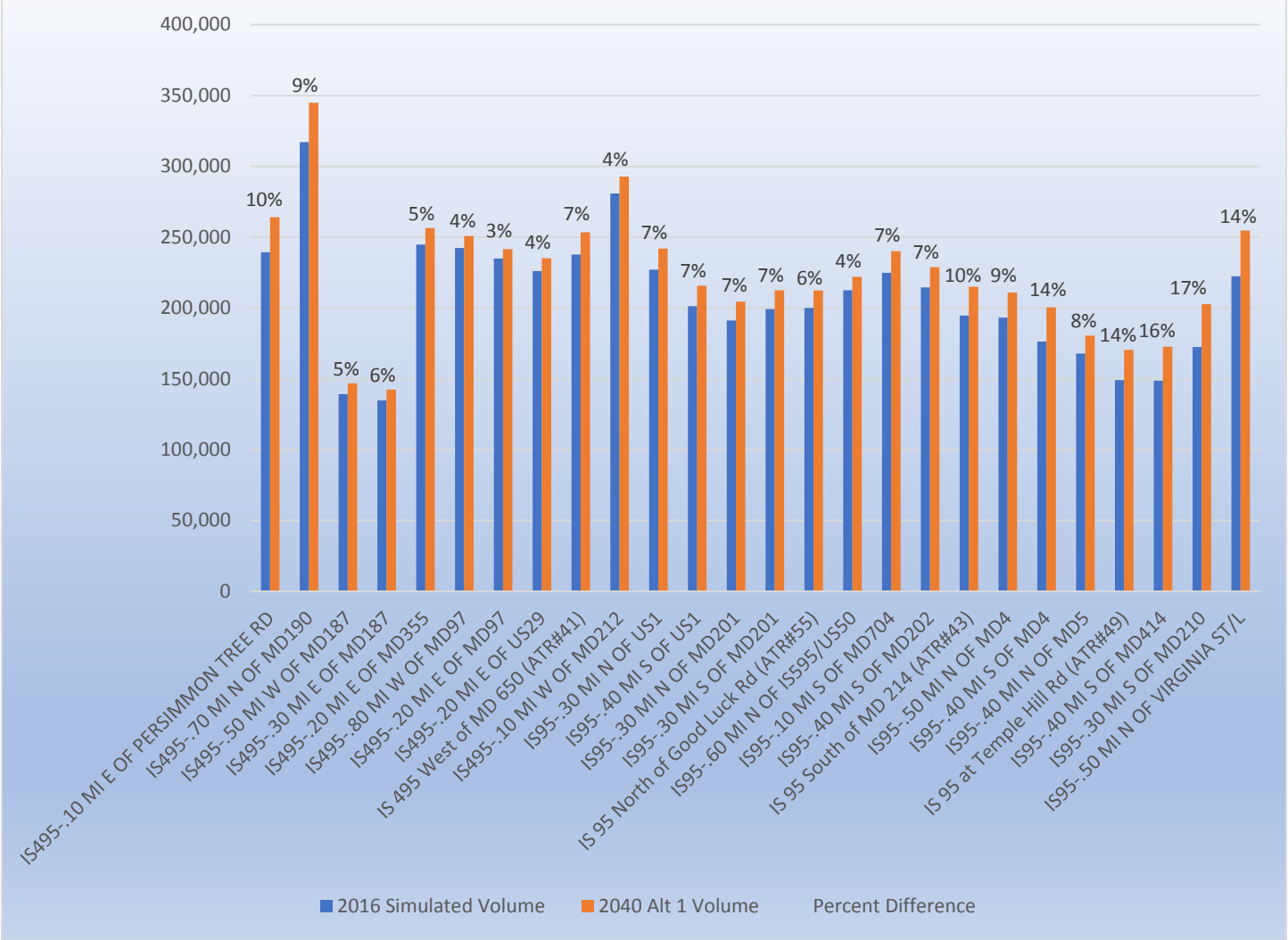
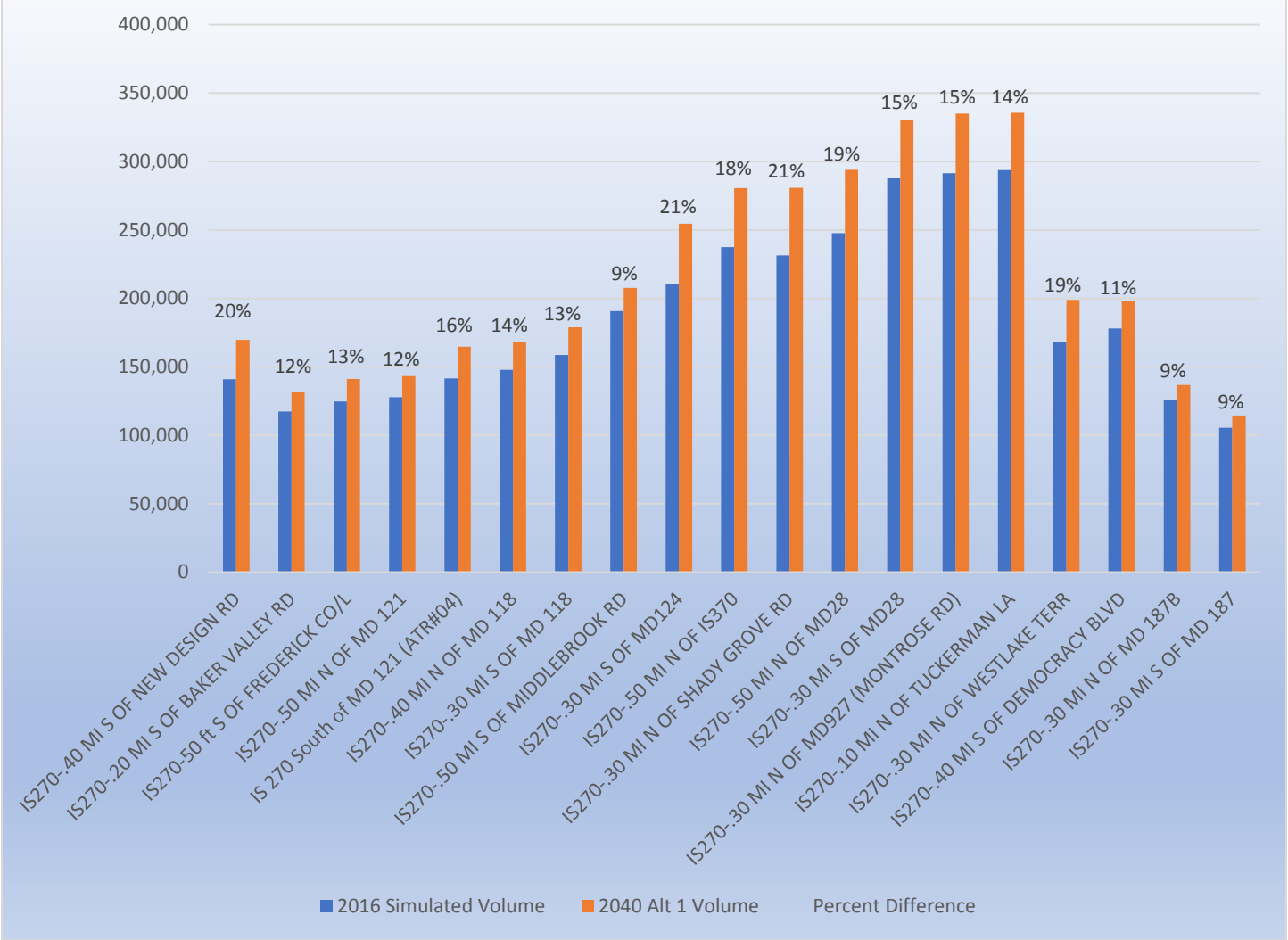


Figure 4-4: Simulated Average Annual Weekday Daily Traffic Volumes on I-270; 2016 vs. 2040 Alternative 1/No Build



5

5 SUMMARY OF FUTURE CONDITIONS

VISSIM models were developed for Alternative 1/No Build and the Build Screened Alternatives using the Existing VISSIM model and applying the future volumes (Alternative 1/No Build and the Build models) and proposed geometry (Build models). Future (2040) conditions for Alternative 1/No Build and the Build Screened Alternatives are summarized in the following sections, beginning with a summary of Alternative 1/No Build conditions. The results of the modeling of the Build Screened Alternatives are summarized for the following key metrics:

- System-Wide Delay
- Corridor Travel Time and Speed
- Density and Level of Service (LOS)
- Travel Time Index (TTI)
- Vehicle Throughput
- Effect on Local Roadway Network

The metric of achieving an average speed of 45 mph within the managed lanes is met for all Build Screened Alternatives.

5.1 Average Daily Traffic and Peak Period Demand Volumes

Future (2040) Alternative 1/No Build ADT and peak period traffic demand along the study roadways are summarized in **Figures 5-1 through 5-6**. AADTs at key locations were previously shown in **Figure 3-1**. **Appendix F** shows future travel demand for all Screened Alternatives, and **Appendix G** shows future throughputs for all Screened Alternatives. Balanced traffic volumes for all future-year conditions are included in **Appendix A.**

With the Build Screened Alternatives, some volumes will shift to the managed lanes. **Figures 5-7 to 5-42** show volumes in the managed lanes compared to the volumes in the general-purpose lanes for each of the Build Screened Alternatives. As shown, the percent of the total volume in the managed lanes during the peak periods ranges from 6% to 46% along I-495 and from 11% to 27% along I-270, compared to 12% to 17% in the HOV lanes along I-270 with existing conditions.

Figure 5-1: I-495 2040 Alternative 1/No Build Average Daily Traffic (ADT)

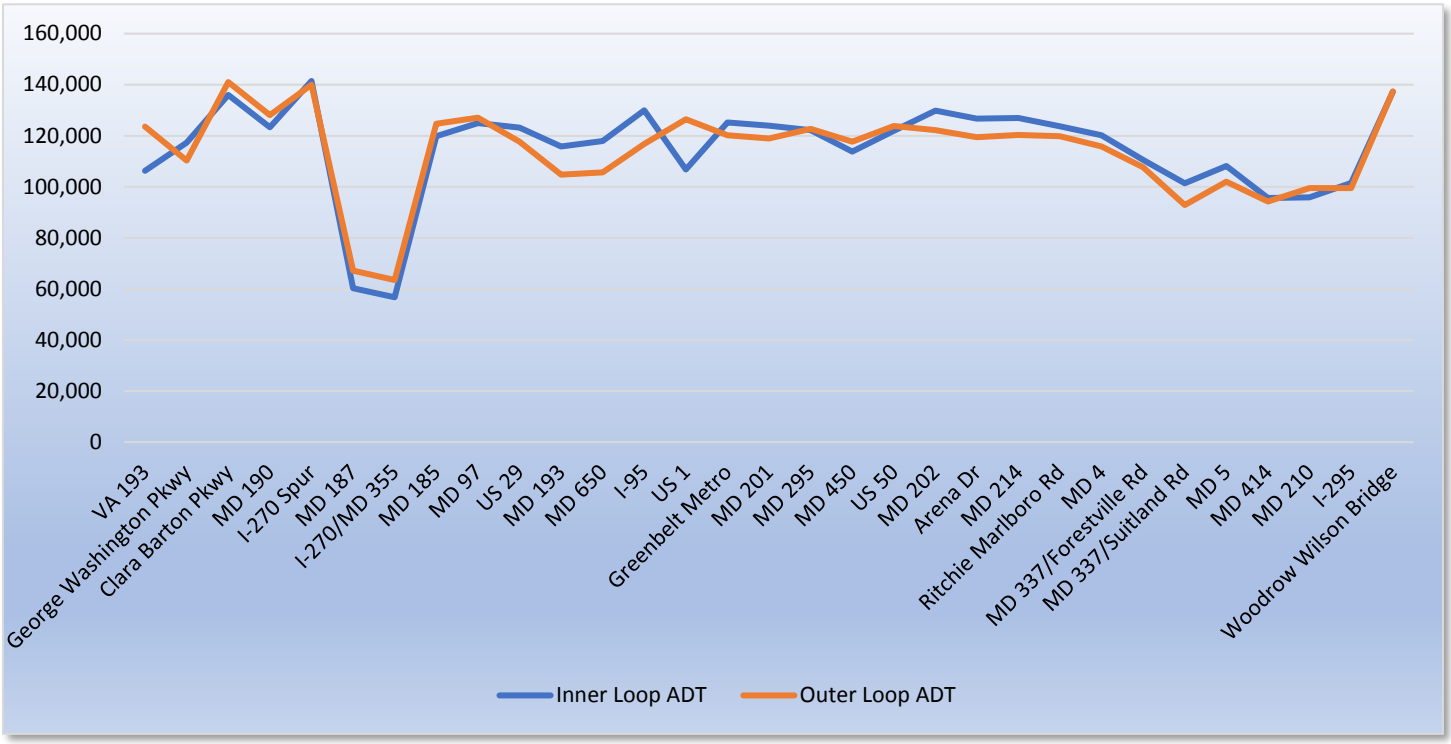


Figure 5-2: I-270 2040 Alternative 1/No Build Average Daily Traffic (ADT)

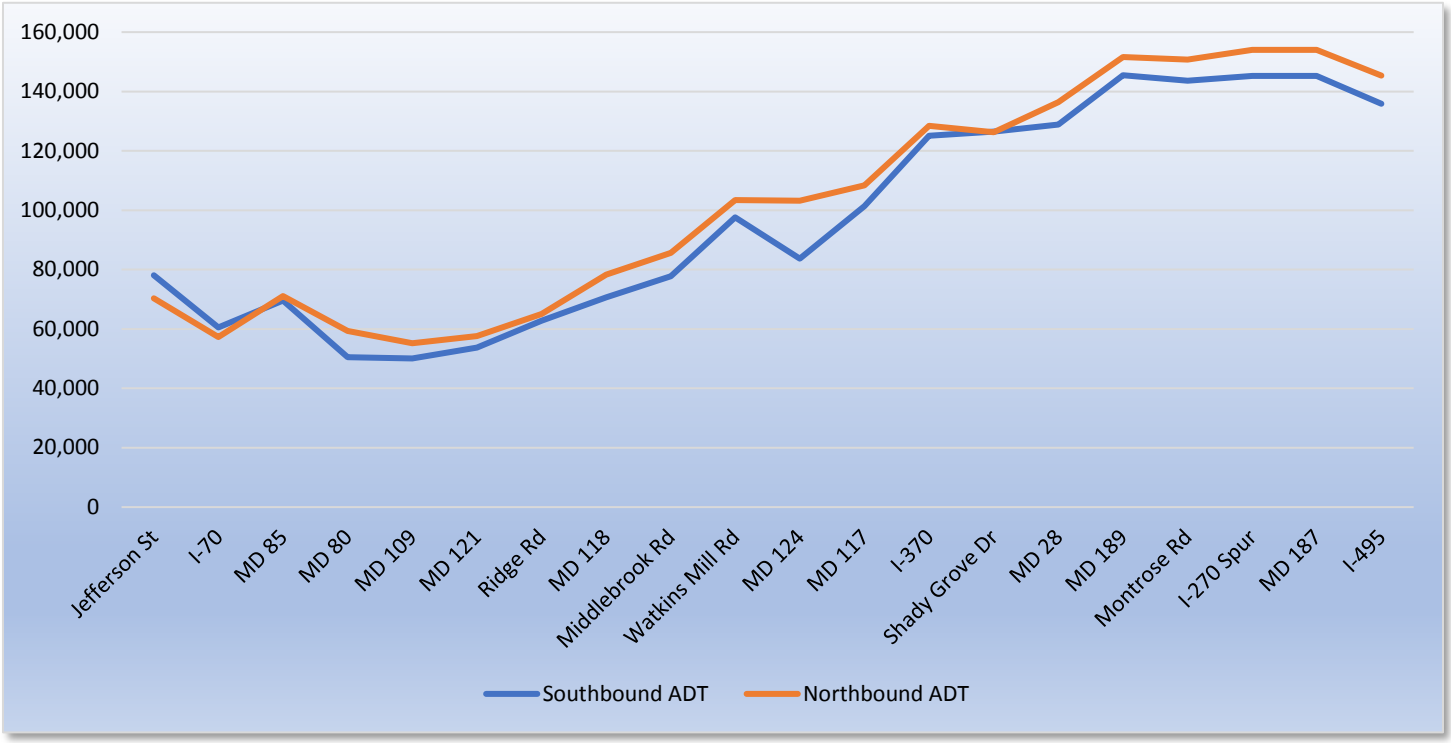


Figure 5-3: I-495 2040 Alternative 1/No Build Inner Loop Peak Period Hourly Volumes

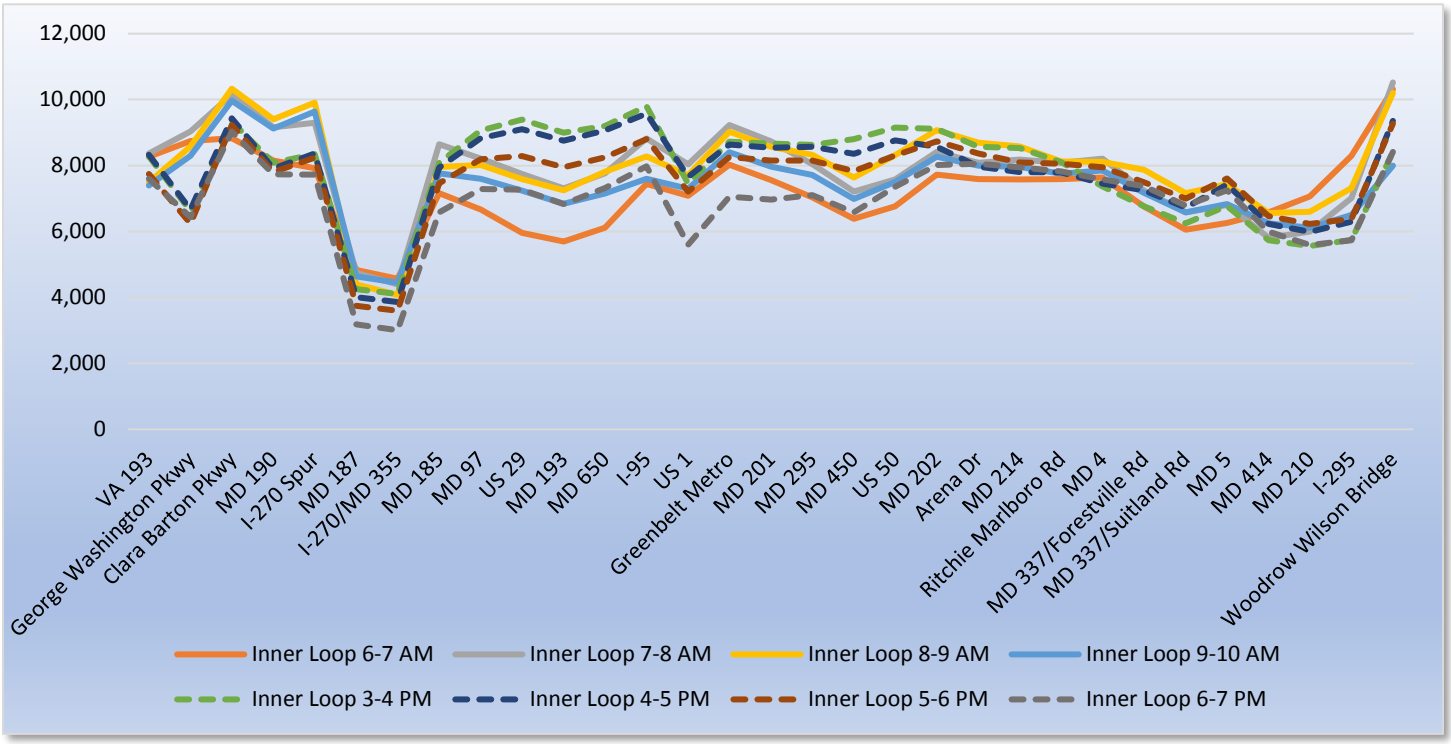


Figure 5-4: I-495 2040 Alternative 1/No Build Outer Loop Peak Period Hourly Volumes

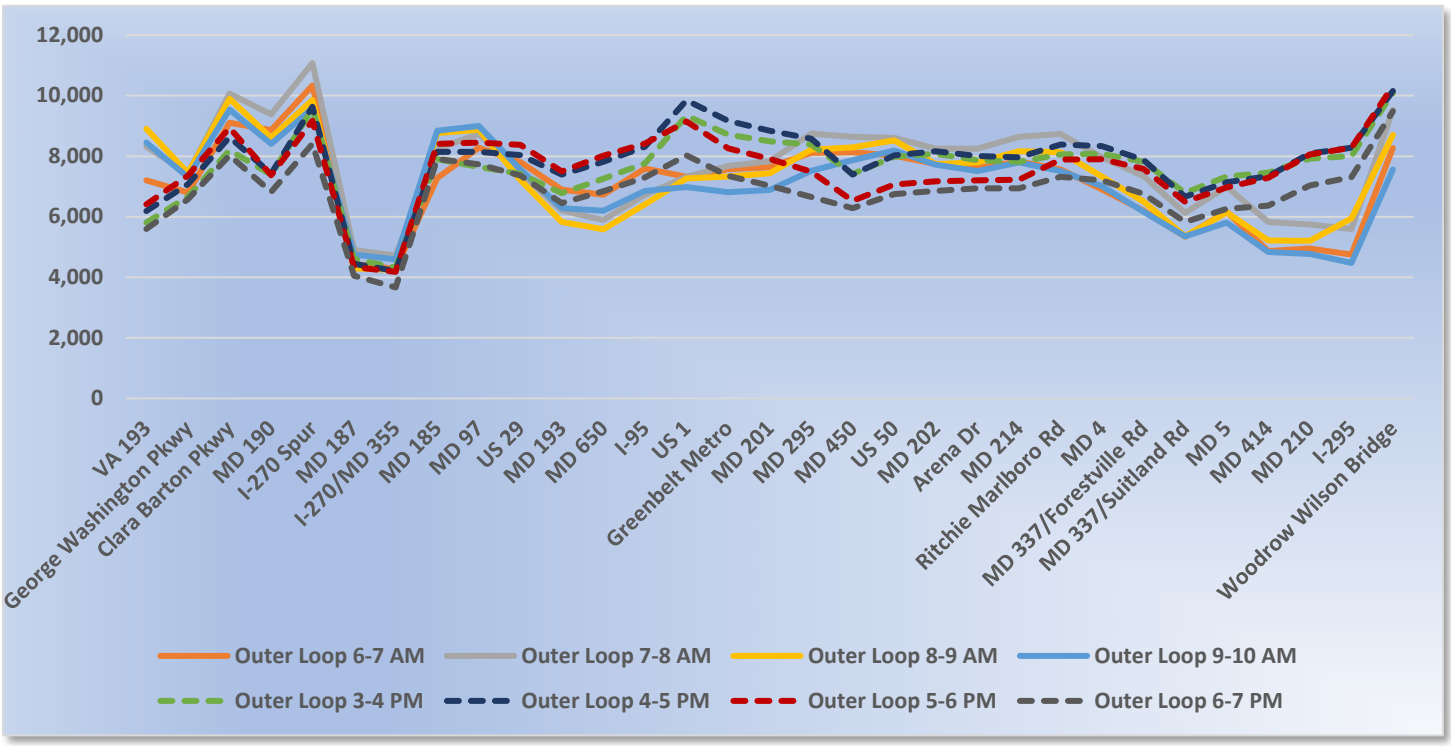
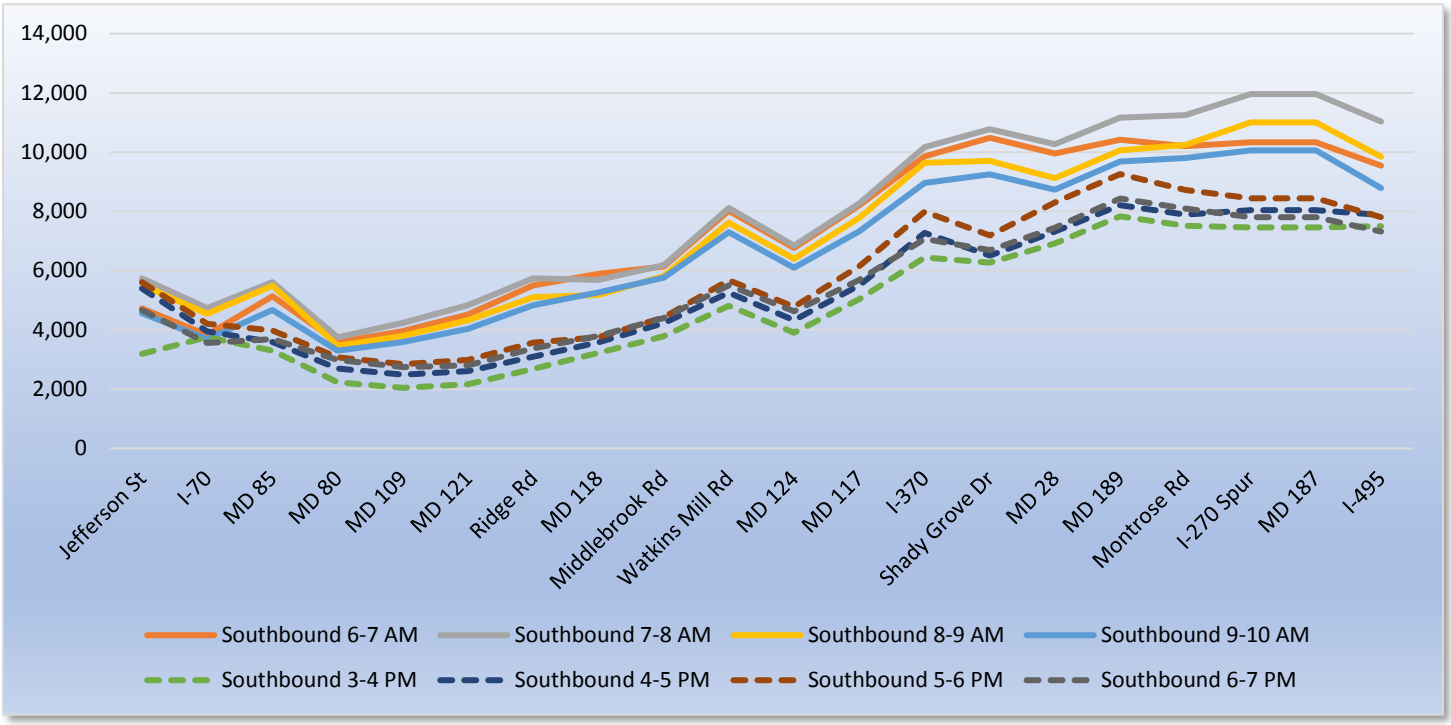
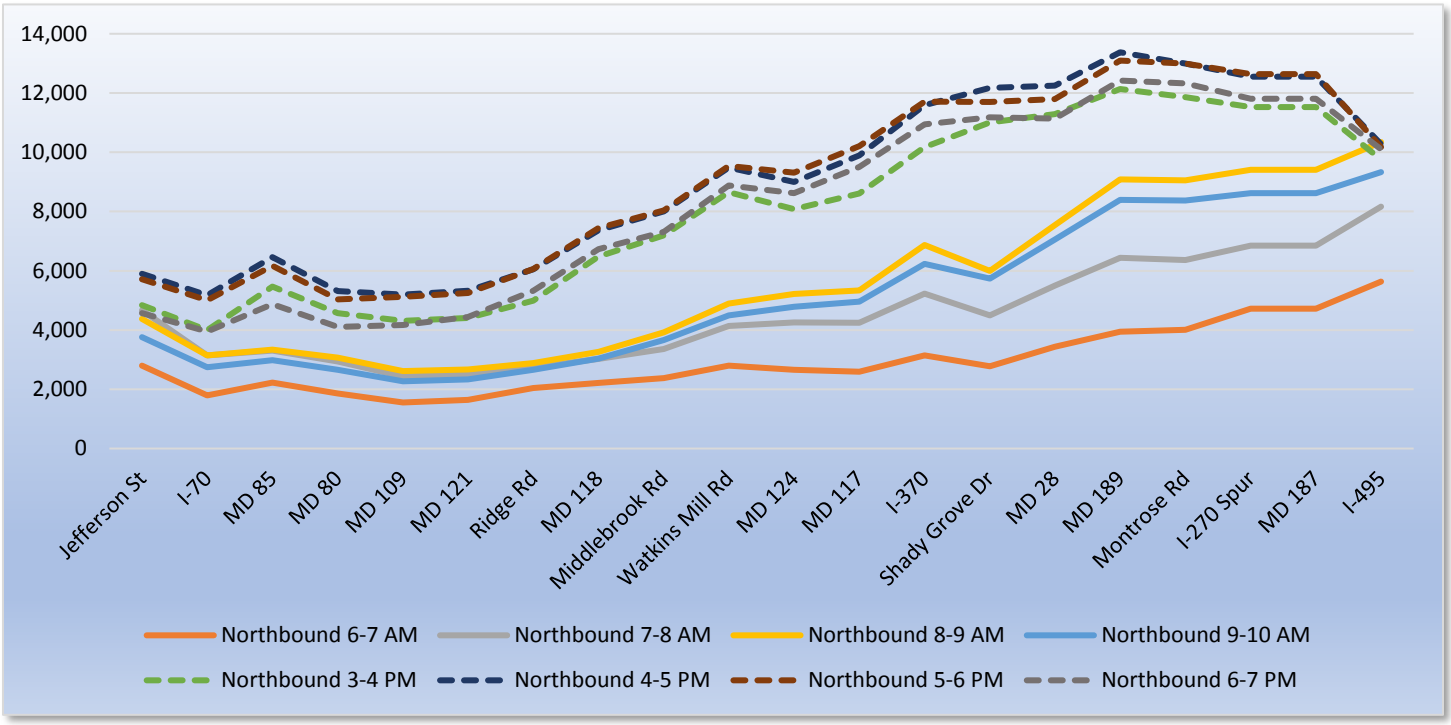


Figure 5-5: I-270 2040 Alternative 1/No Build Southbound Peak Period Hourly Volumes



Note: West Spur and East Spur volumes are combined in this chart

Figure 5-6: I-270 2040 Alternative 1/No Build Northbound Peak Period Hourly Volumes



Note: West Spur and East Spur volumes are combined in this chart

Figure 5-7: 2040 Alternative 5
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop



Figure 5-8: 2040 Alternative 5
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

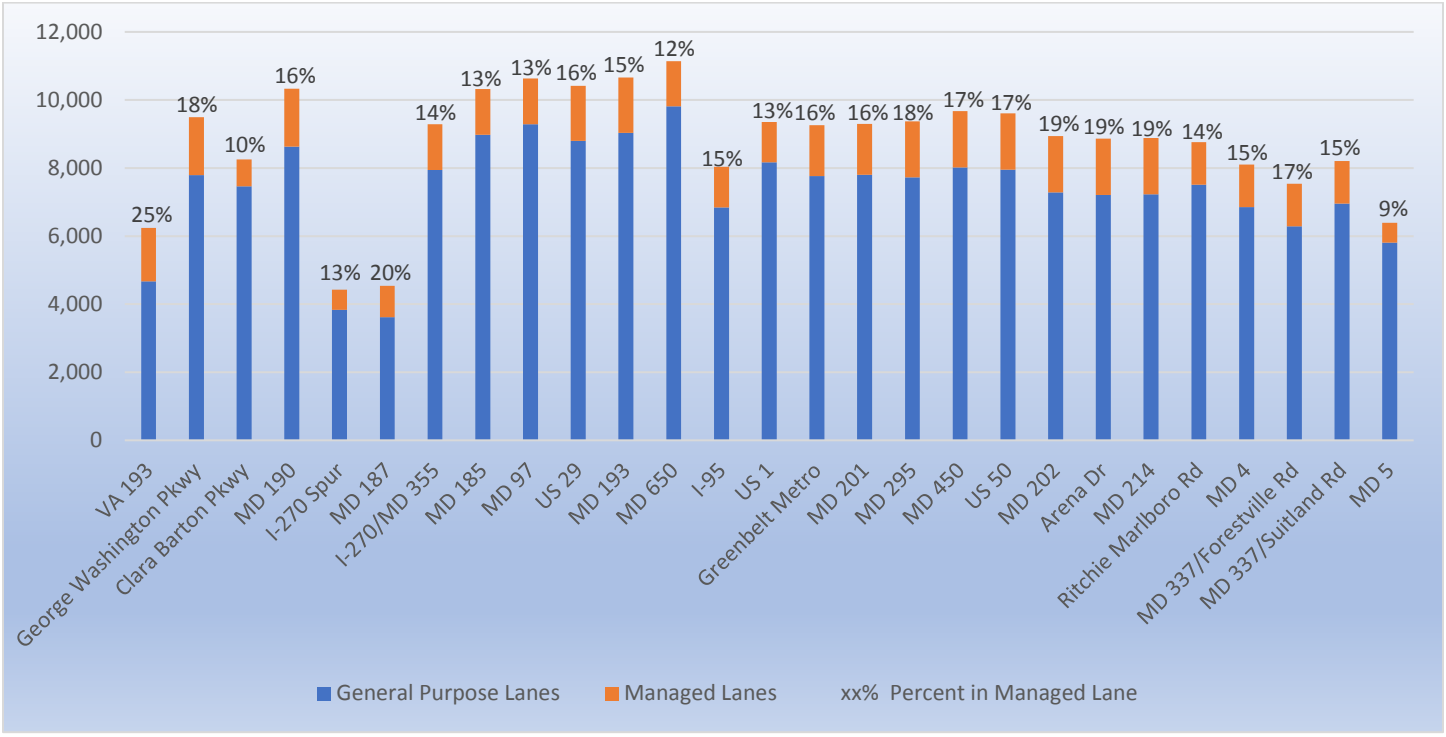


Figure 5-9: 2040 Alternative 5
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

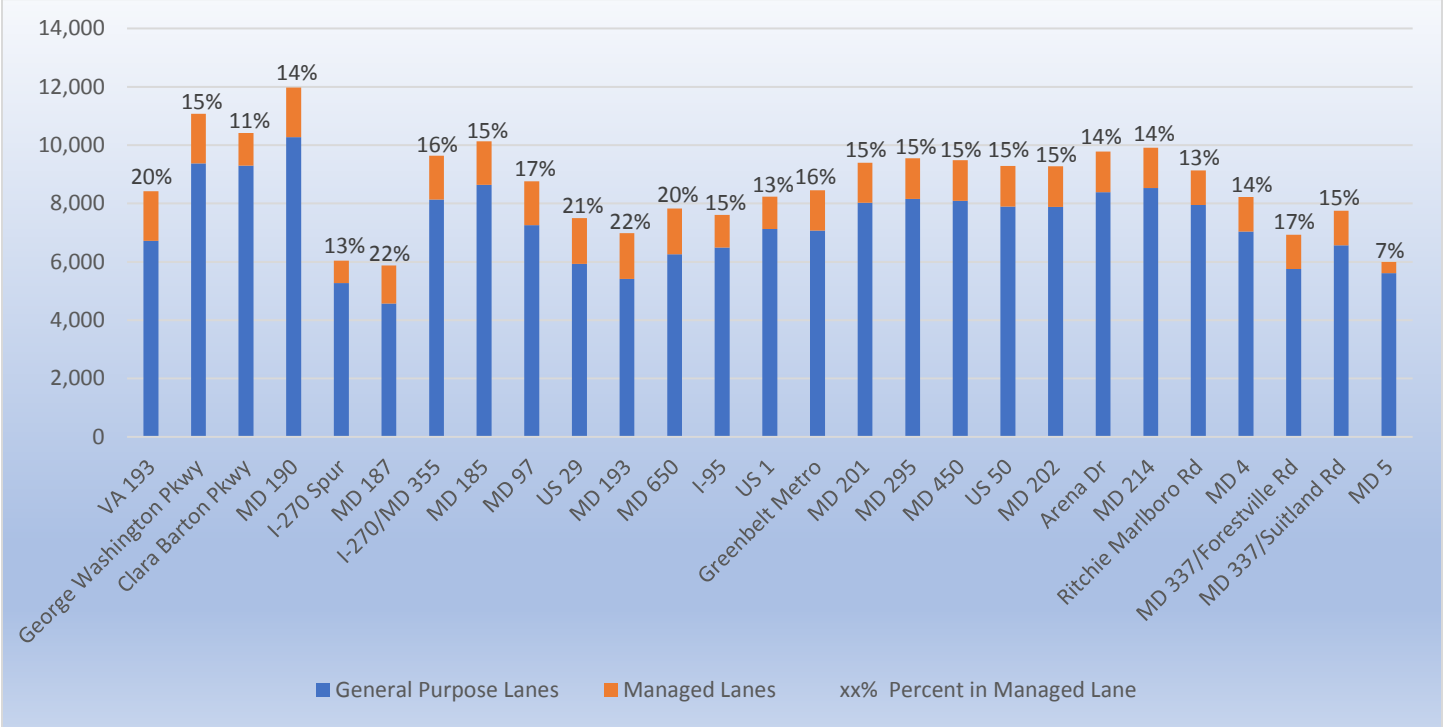
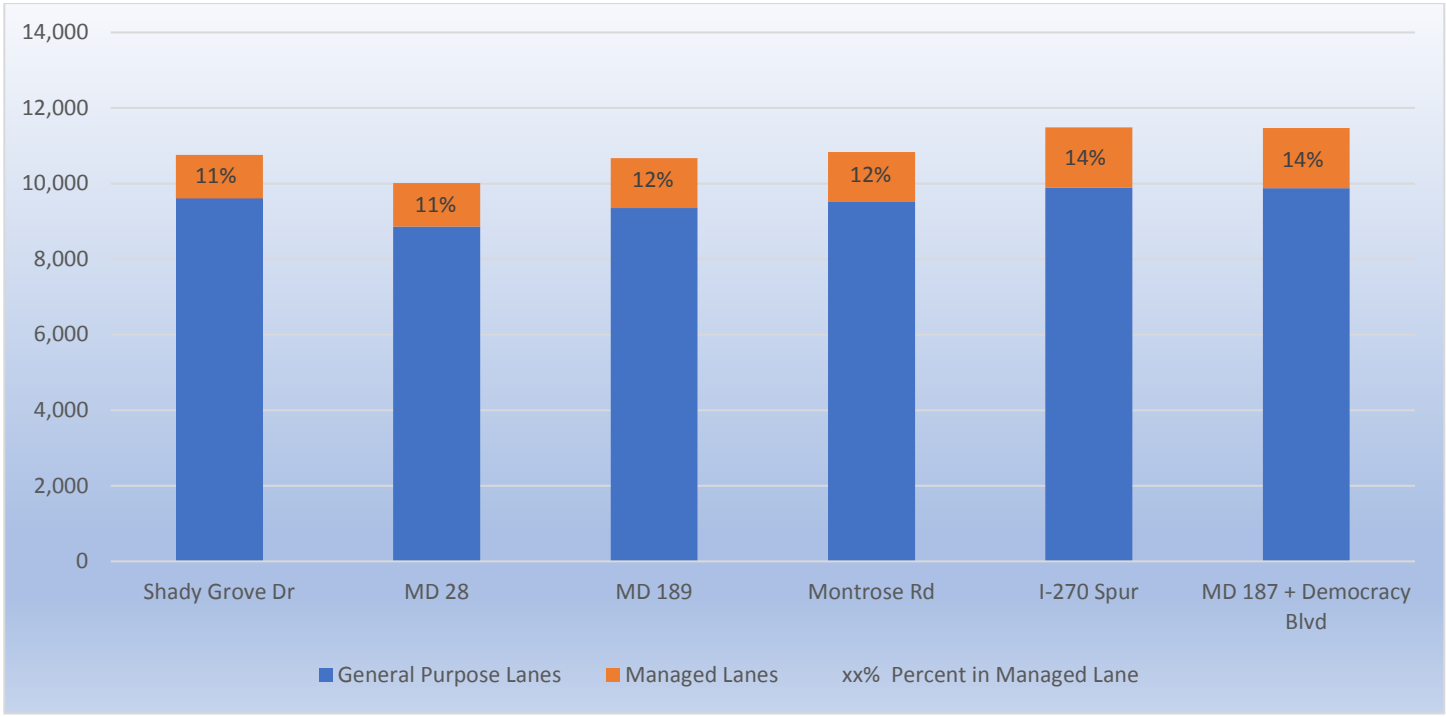


Figure 5-10: 2040 Alternative 5
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

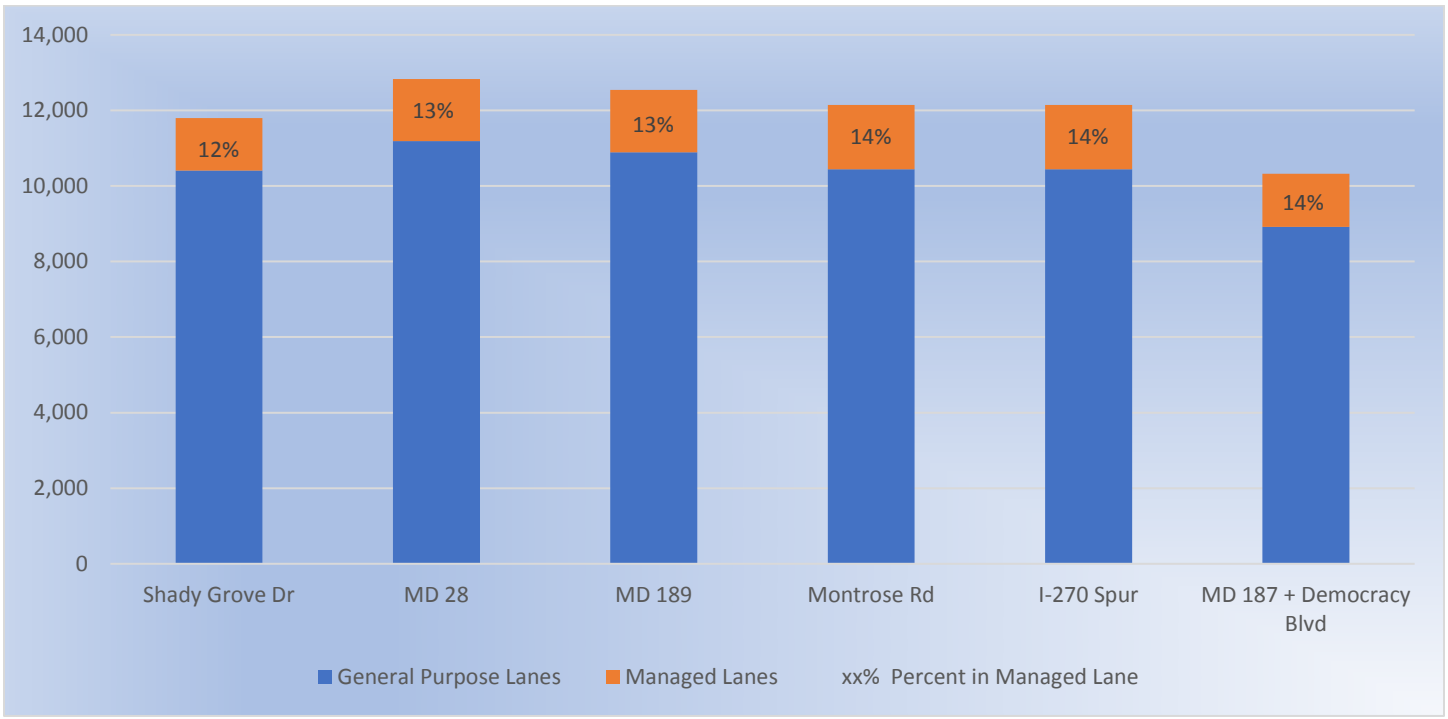


Figure 5-11: 2040 Alternative 5
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-12: 2040 Alternative 5
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-13: 2040 Alternative 8
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

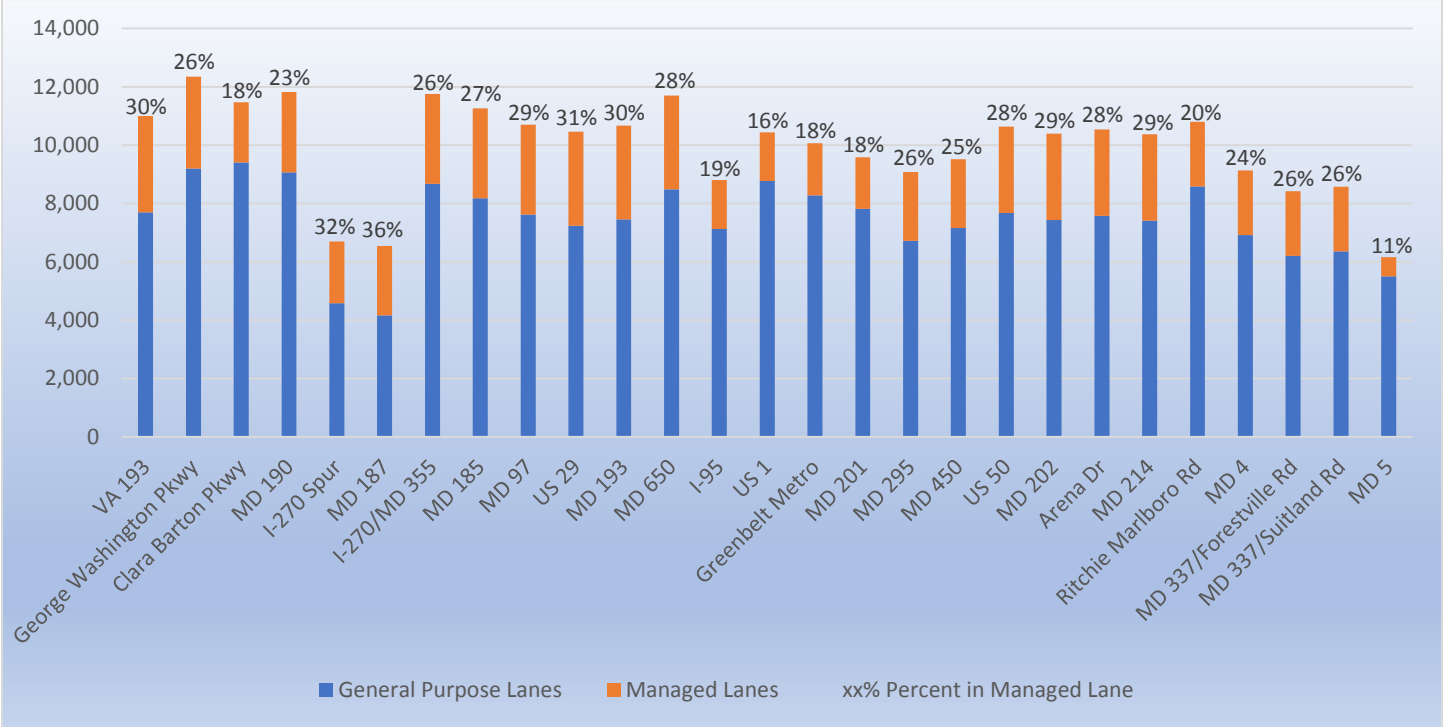


Figure 5-14: 2040 Alternative 8
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

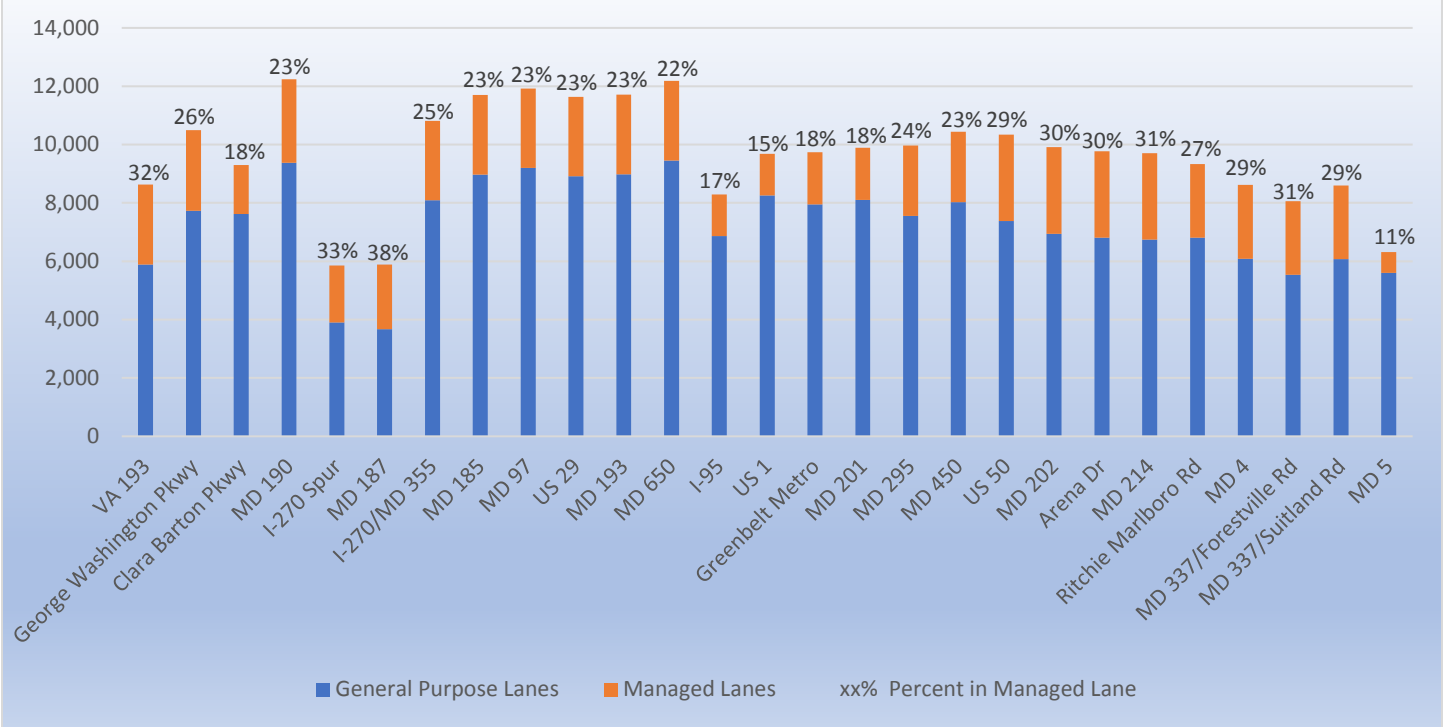


Figure 5-15: 2040 Alternative 8
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

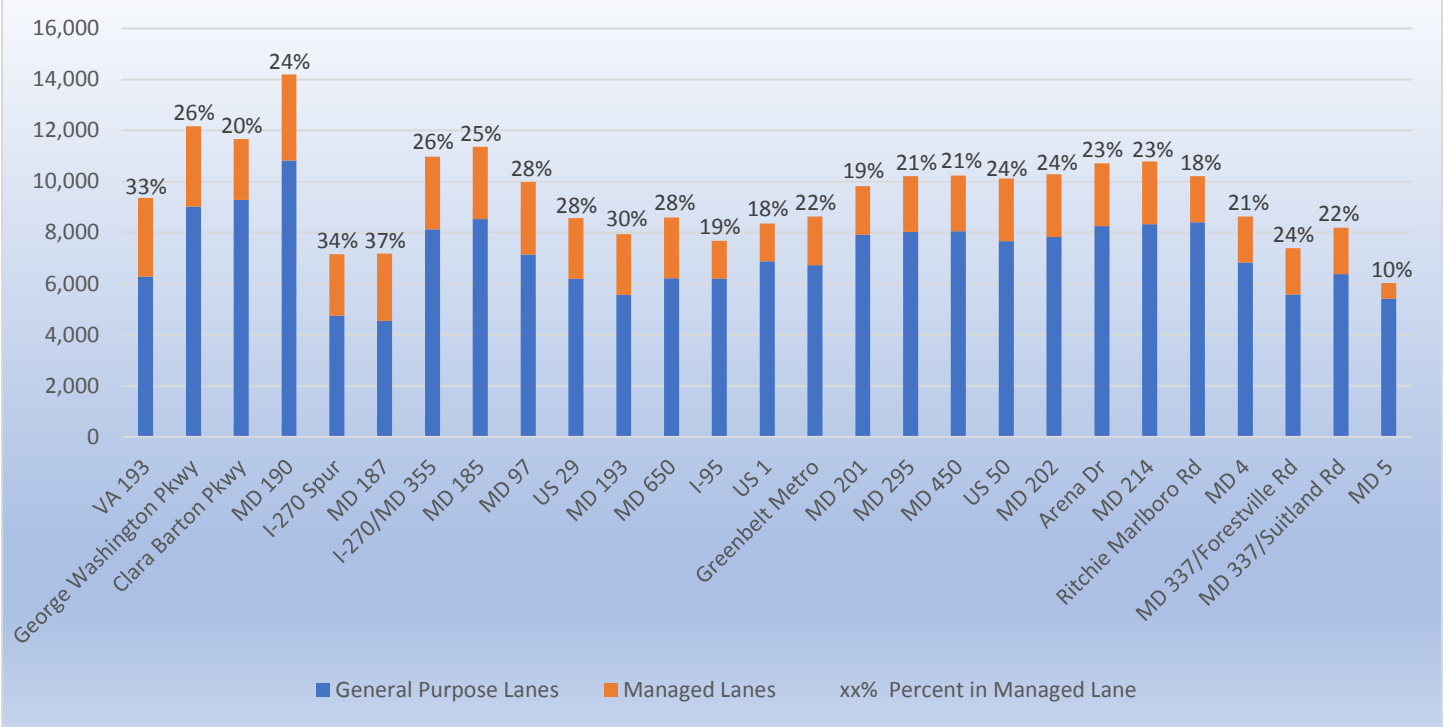


Figure 5-16: 2040 Alternative 8
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

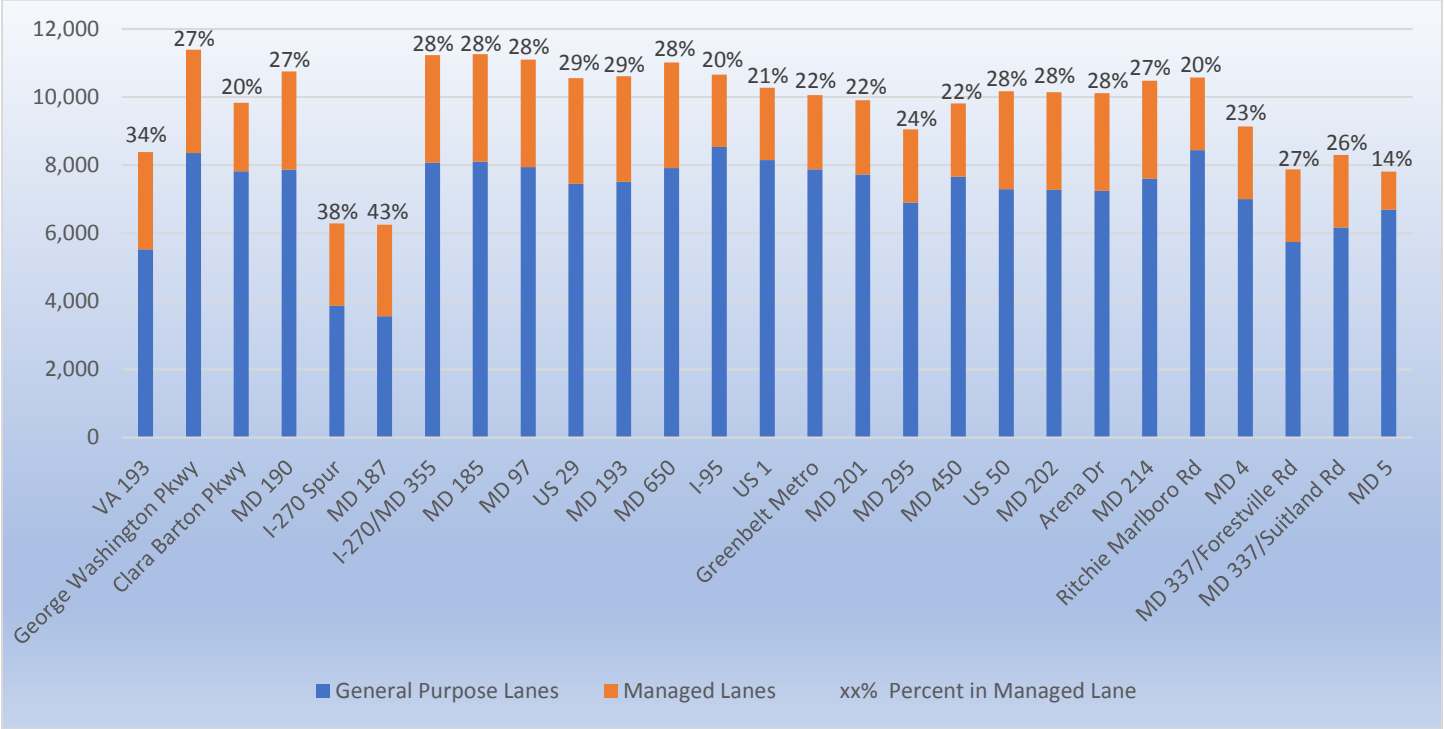
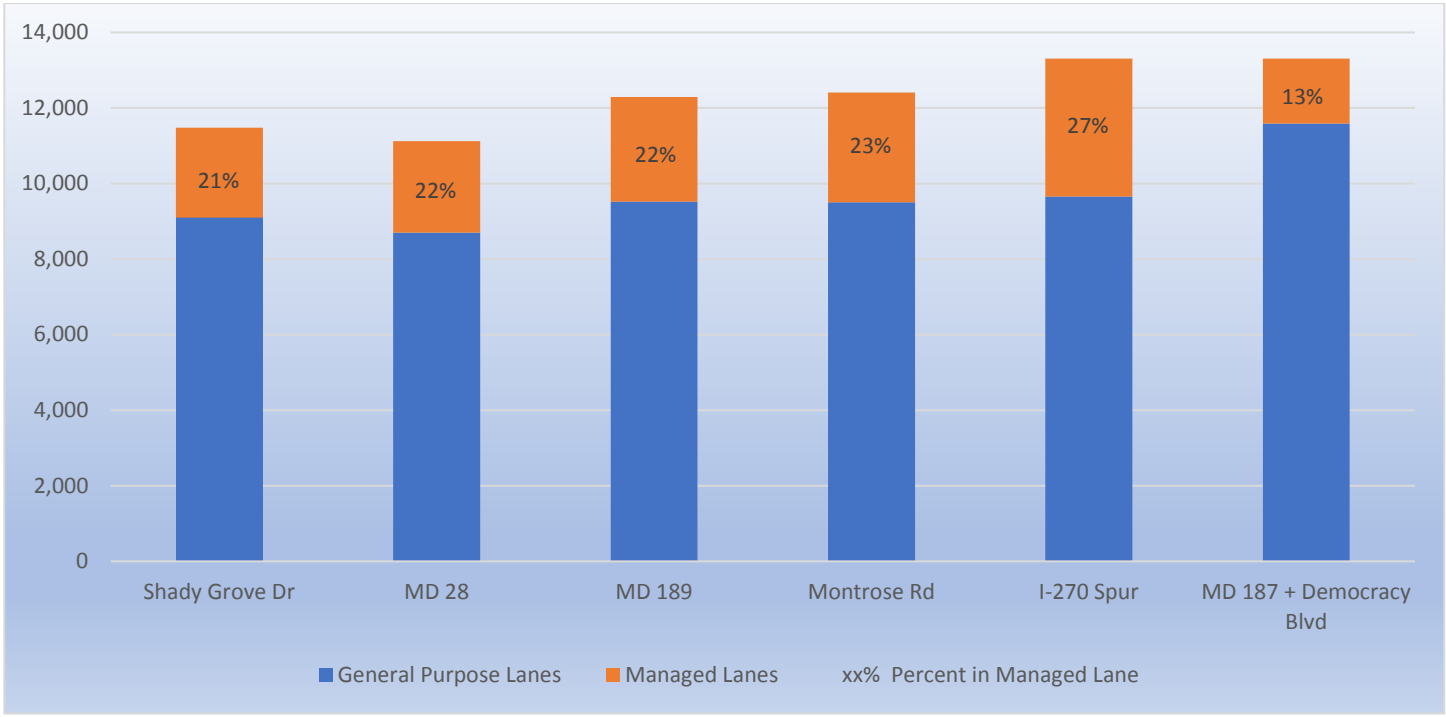
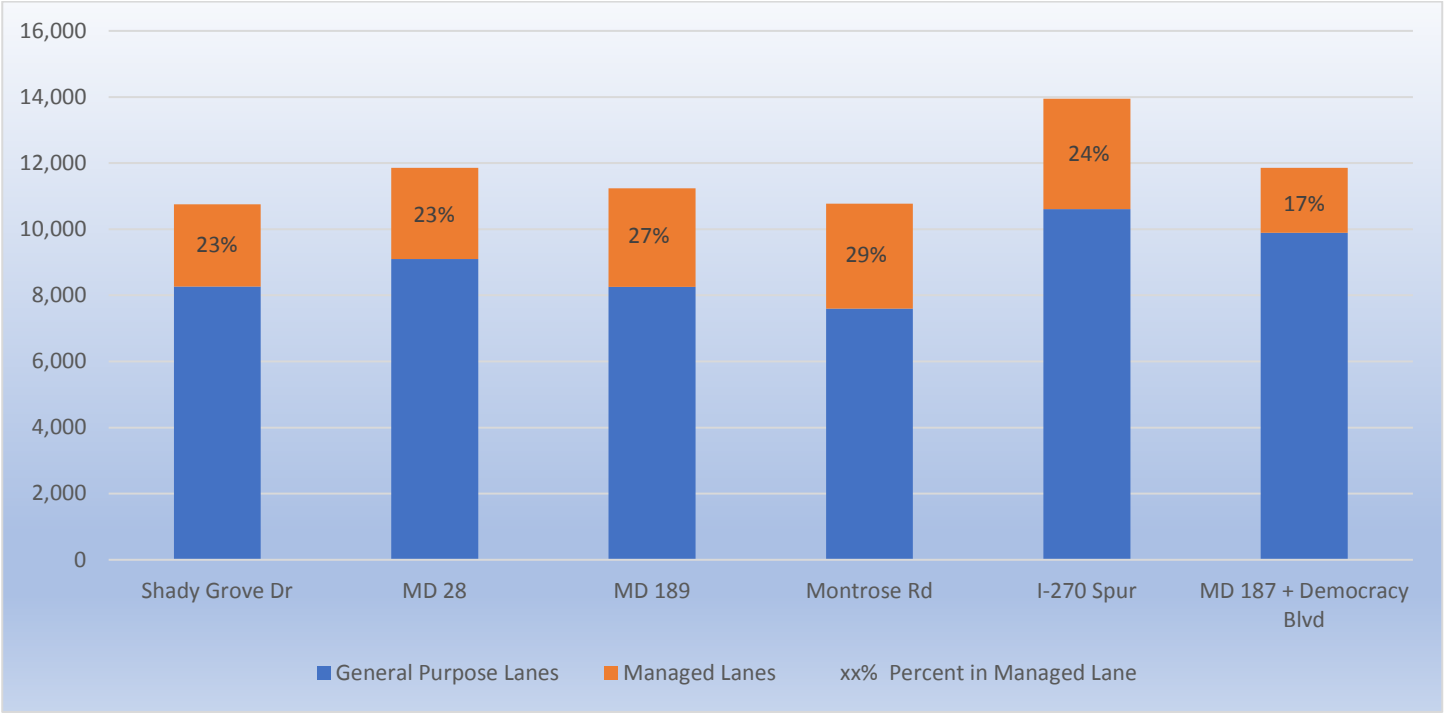


Figure 5-17: 2040 Alternative 8
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-18: 2040 Alternative 8
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-19: 2040 Alternative 9
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

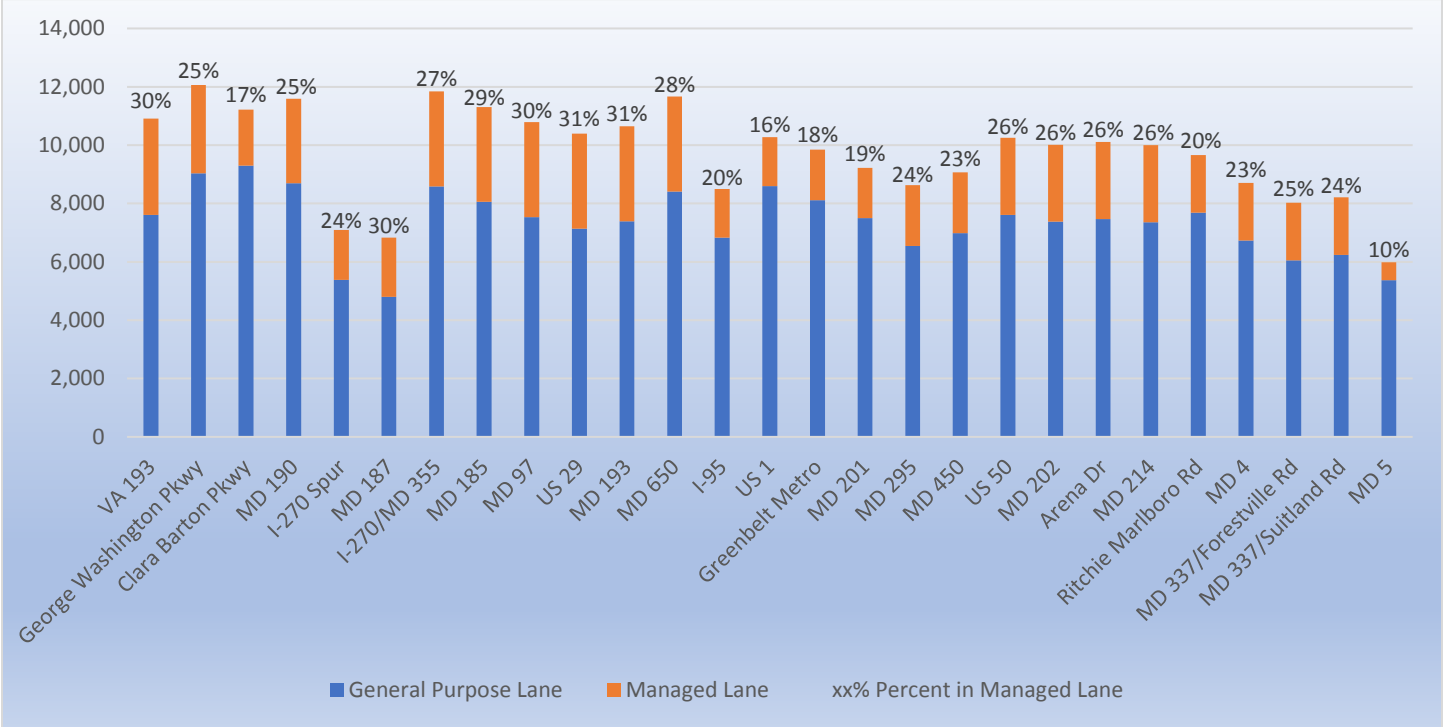


Figure 5-20: 2040 Alternative 9
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

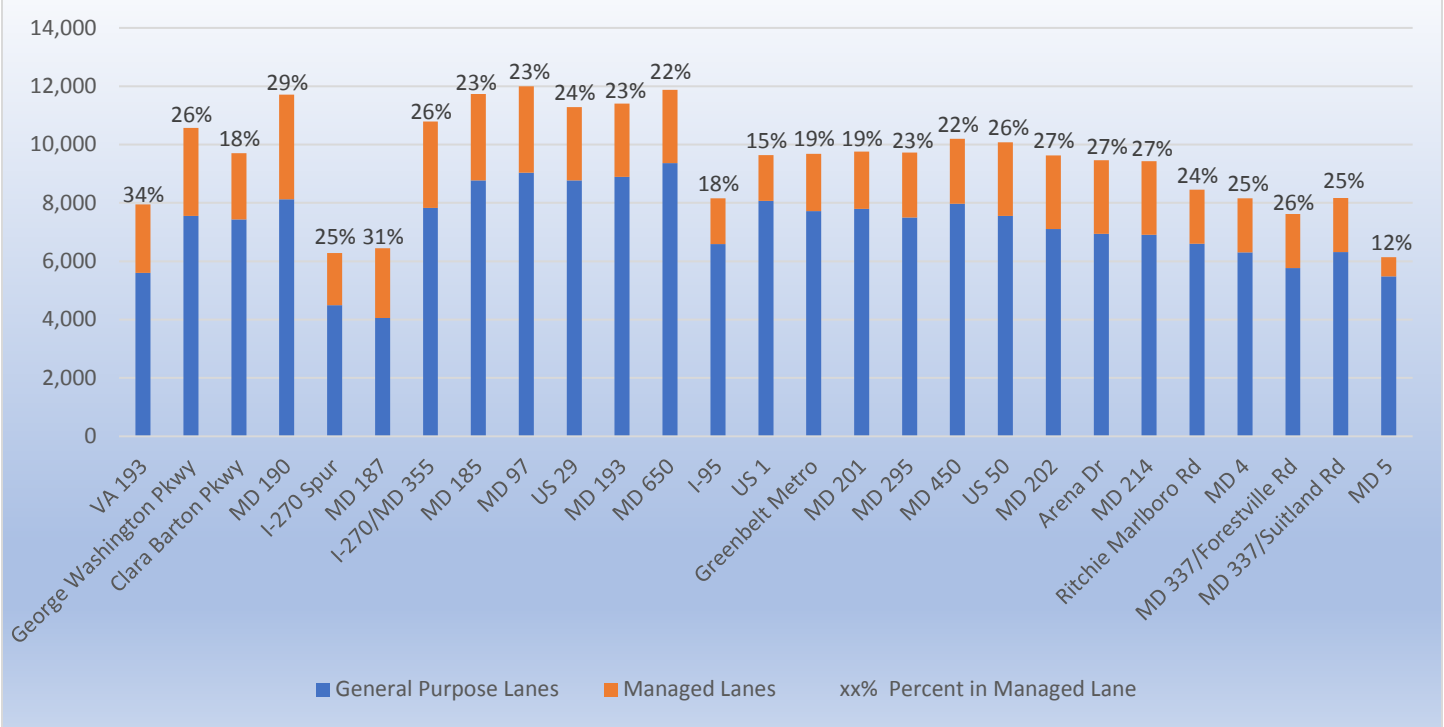


Figure 5-21: 2040 Alternative 9
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

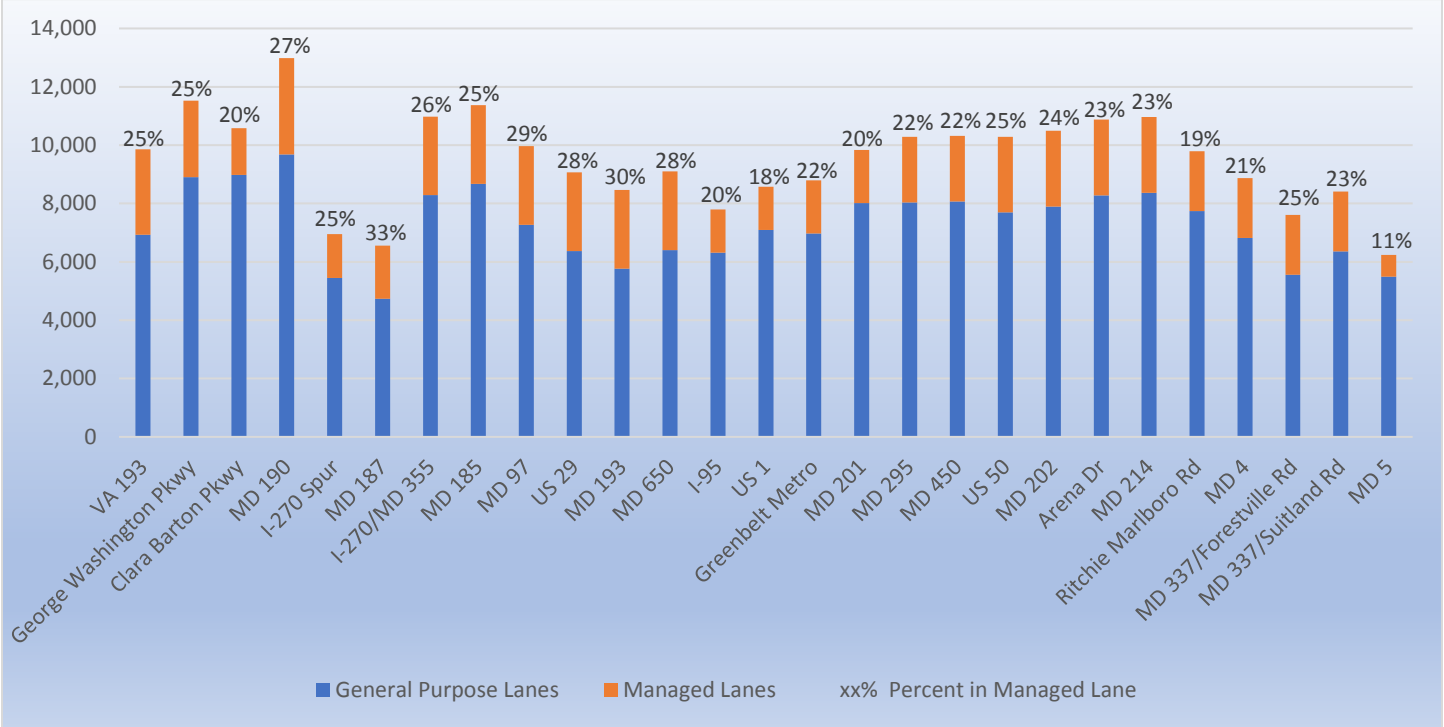


Figure 5-22: 2040 Alternative 9
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

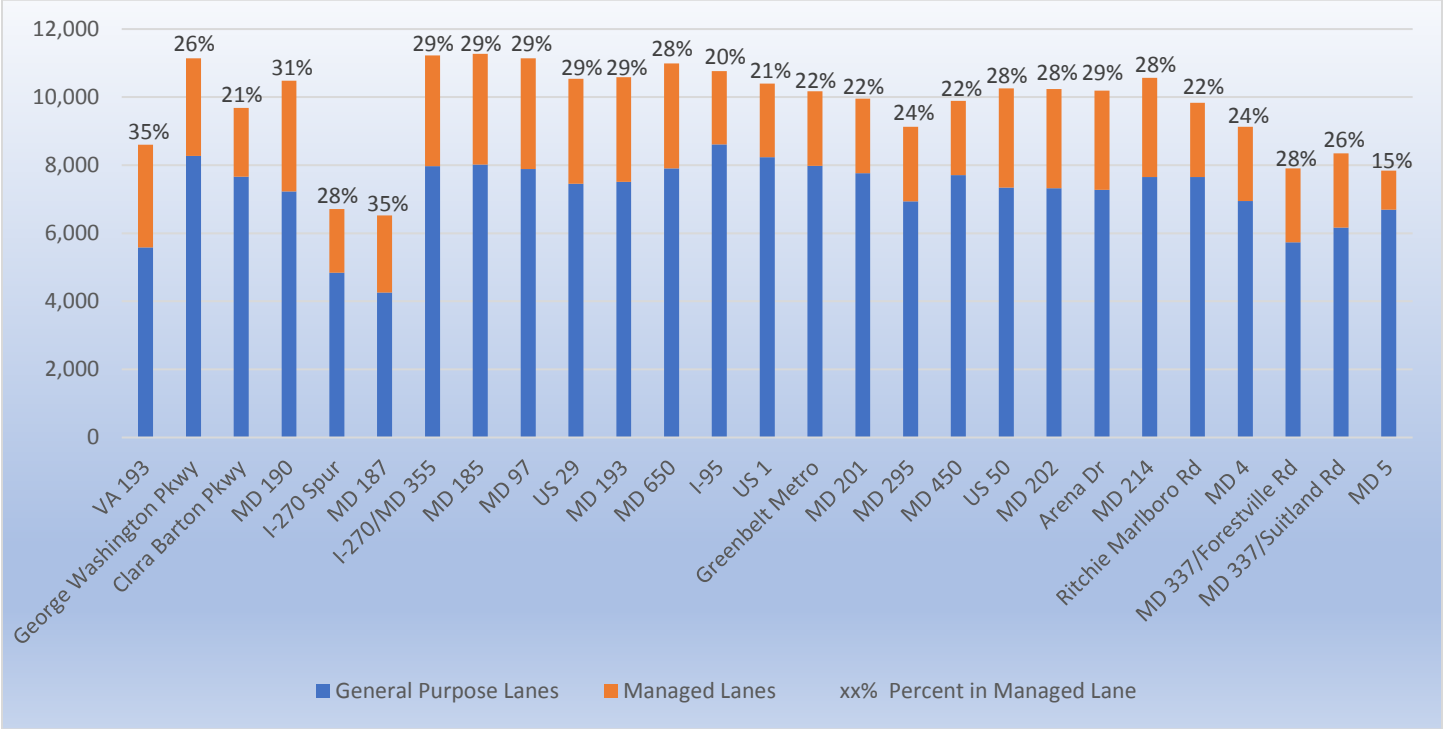
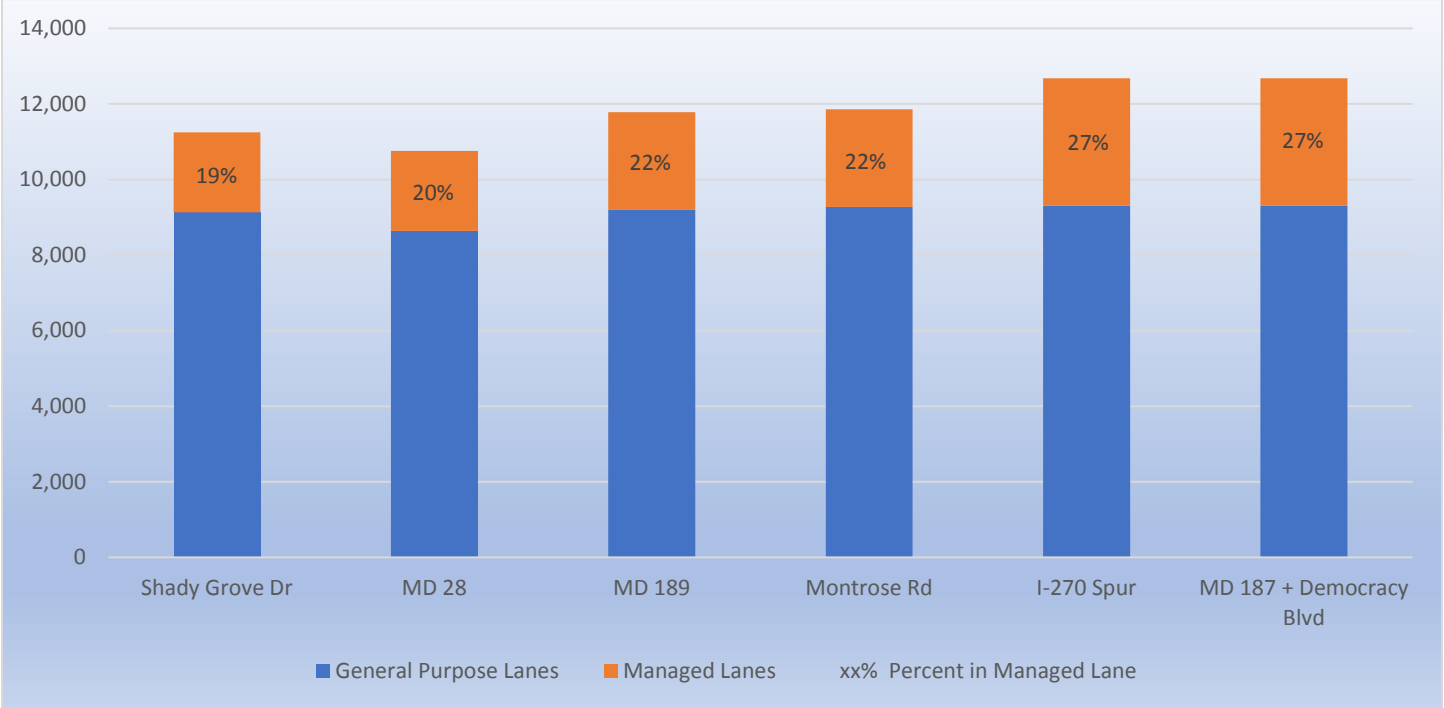
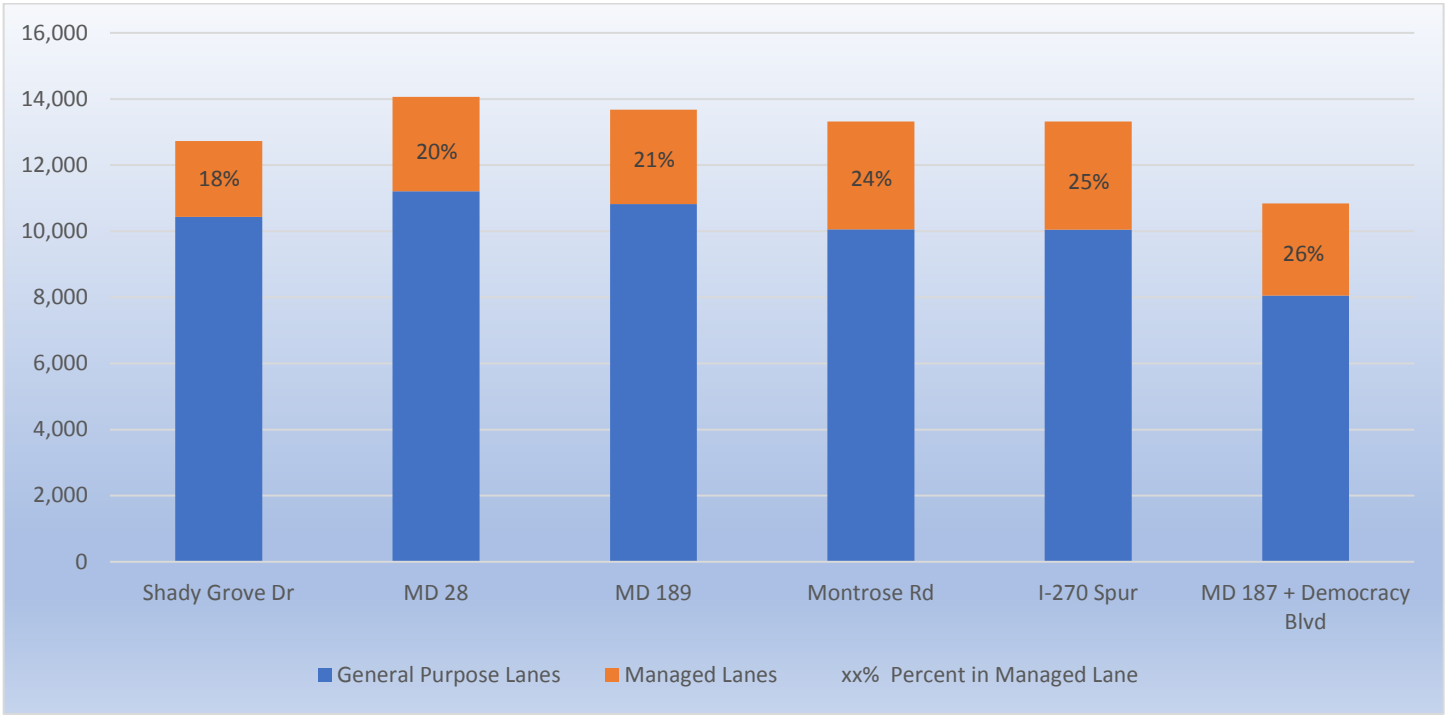


Figure 5-23: 2040 Alternative 9
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-24: 2040 Alternative 9
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-25: 2040 Alternative 10
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

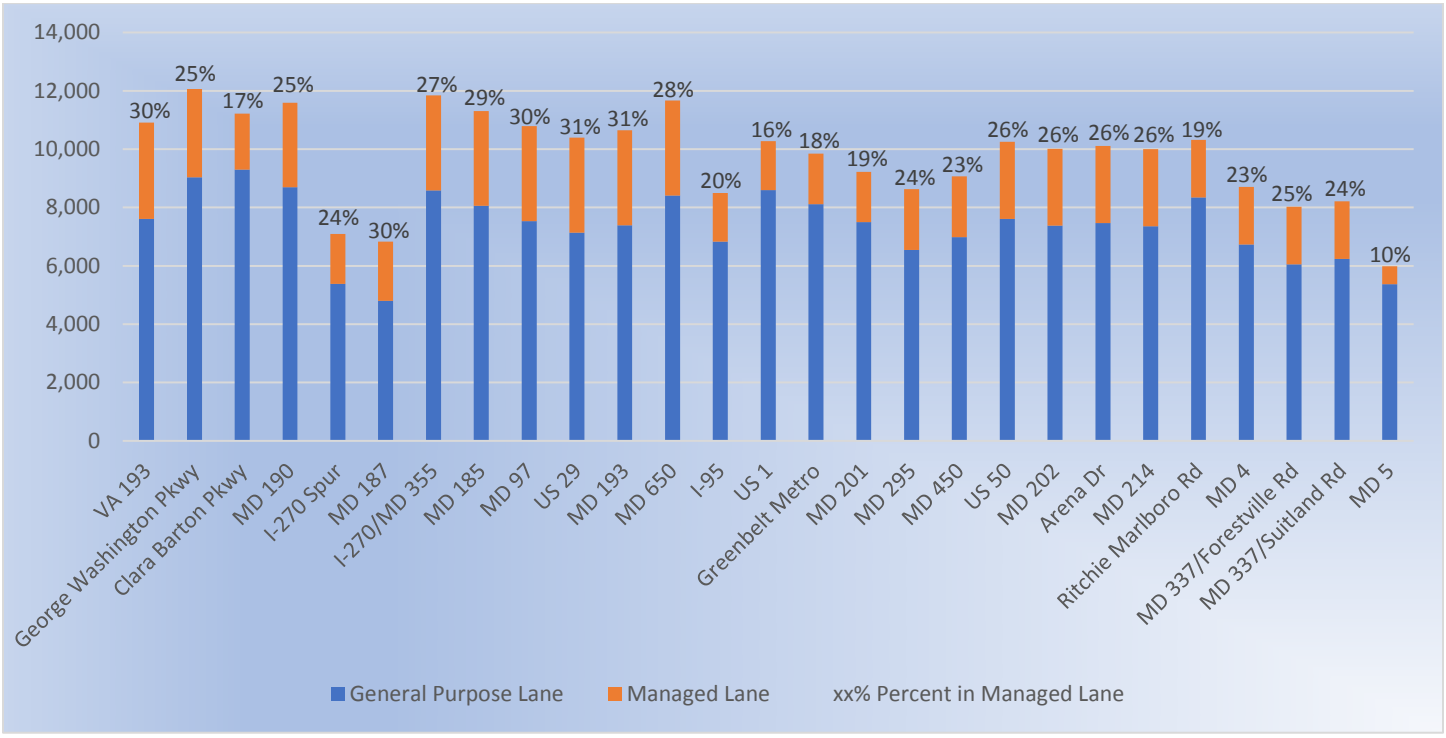


Figure 5-26: 2040 Alternative 10
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

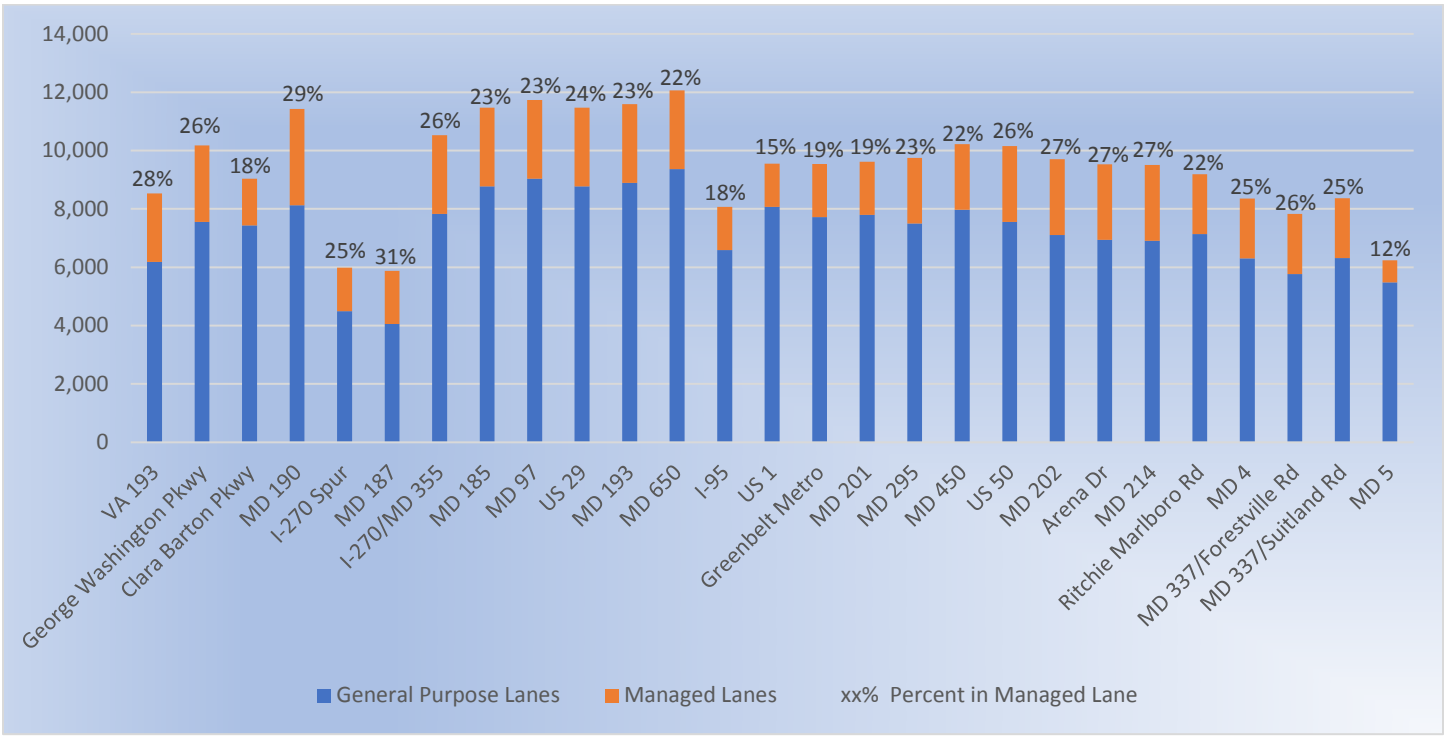


Figure 5-27: 2040 Alternative 10
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

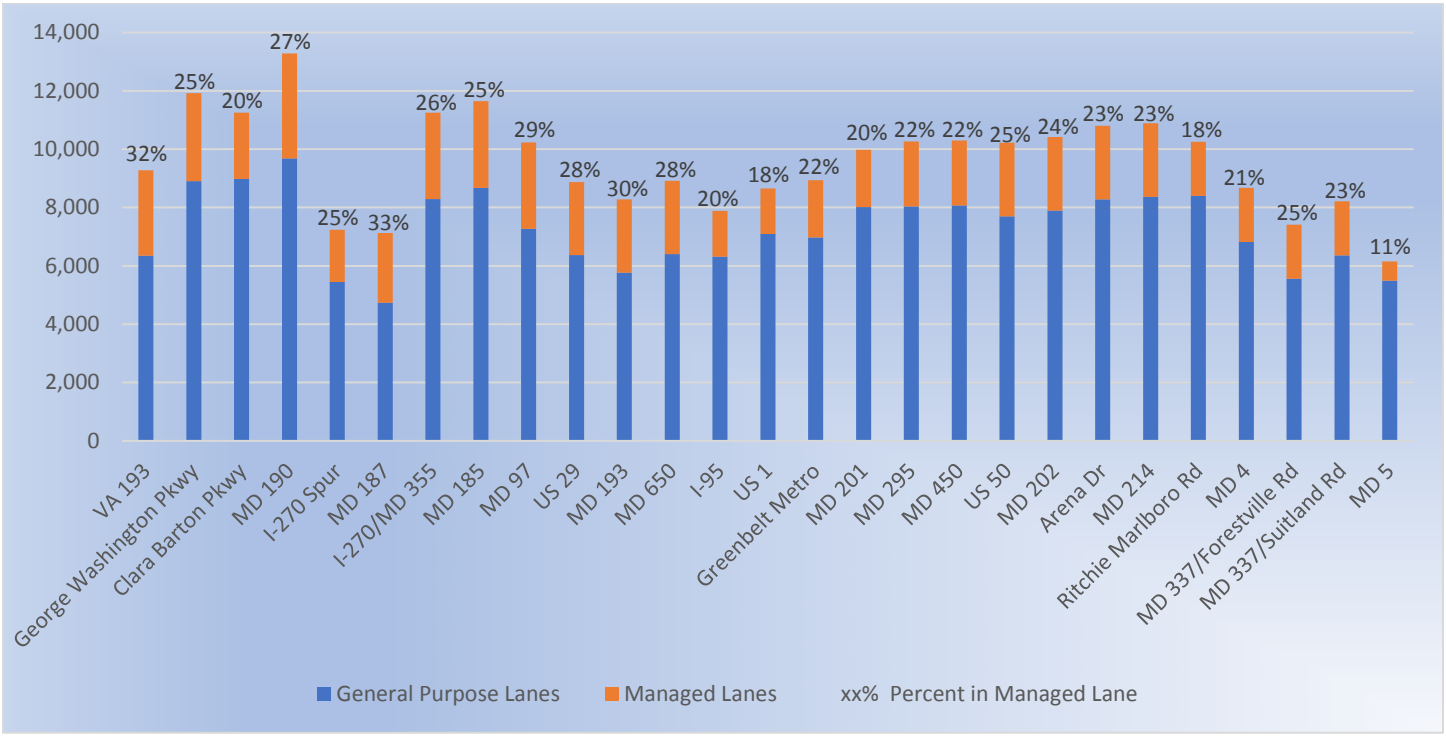
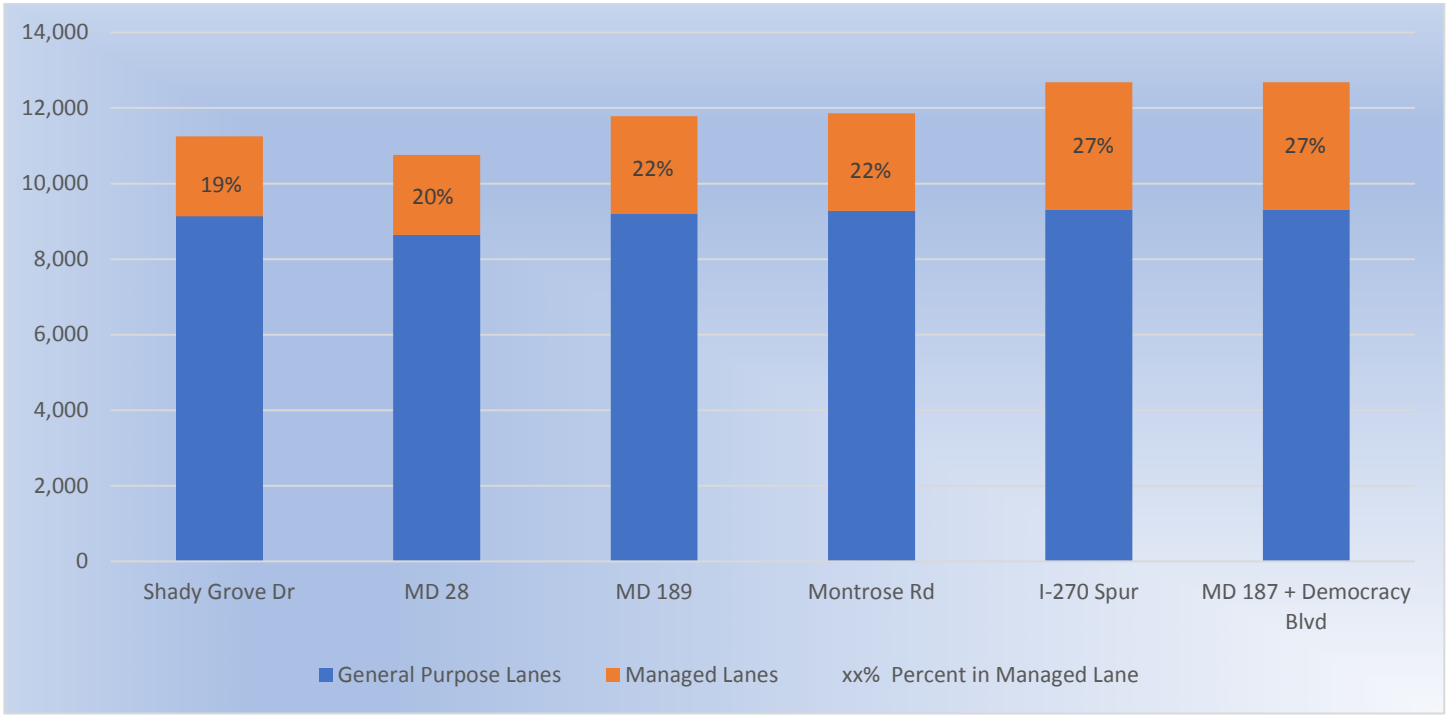


Figure 5-28: 2040 Alternative 10
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

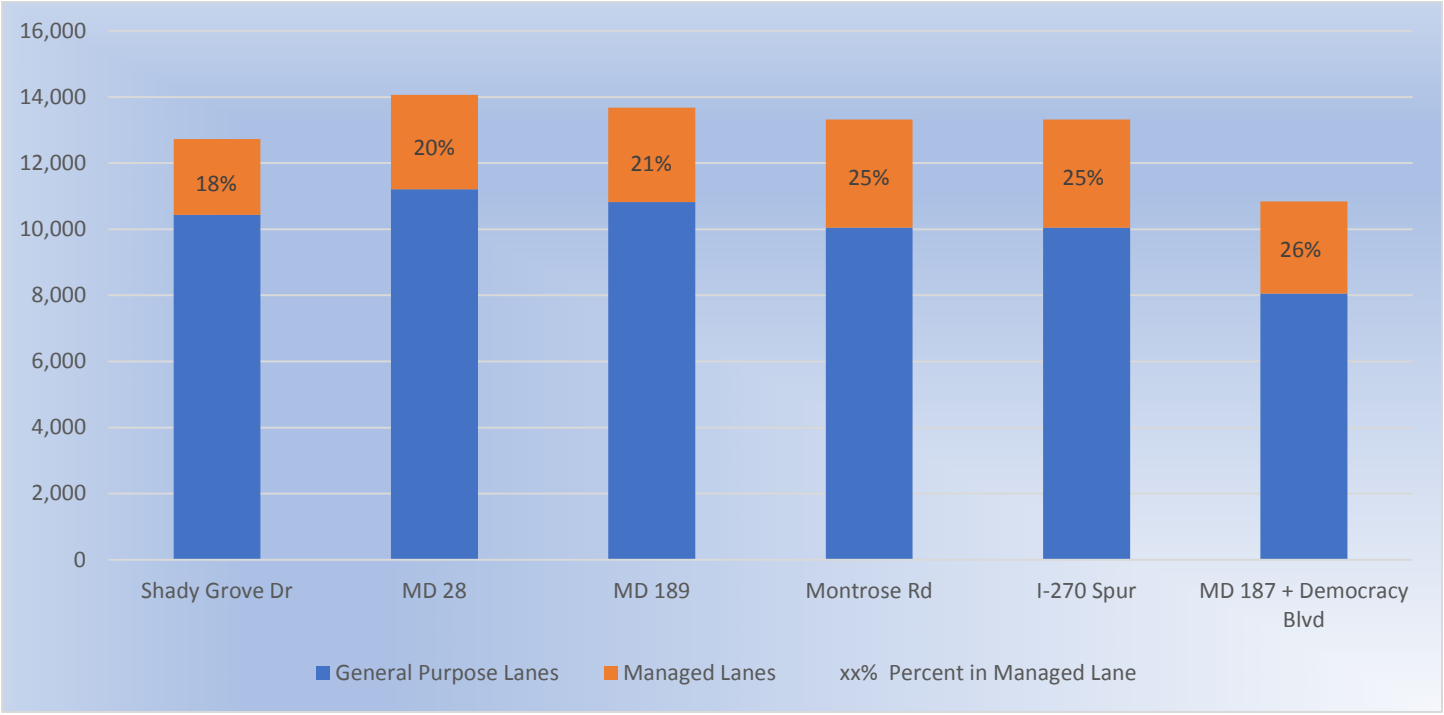


Figure 5-29: 2040 Alternative 10
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-30: 2040 Alternative 10
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-31: 2040 Alternative 13B
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

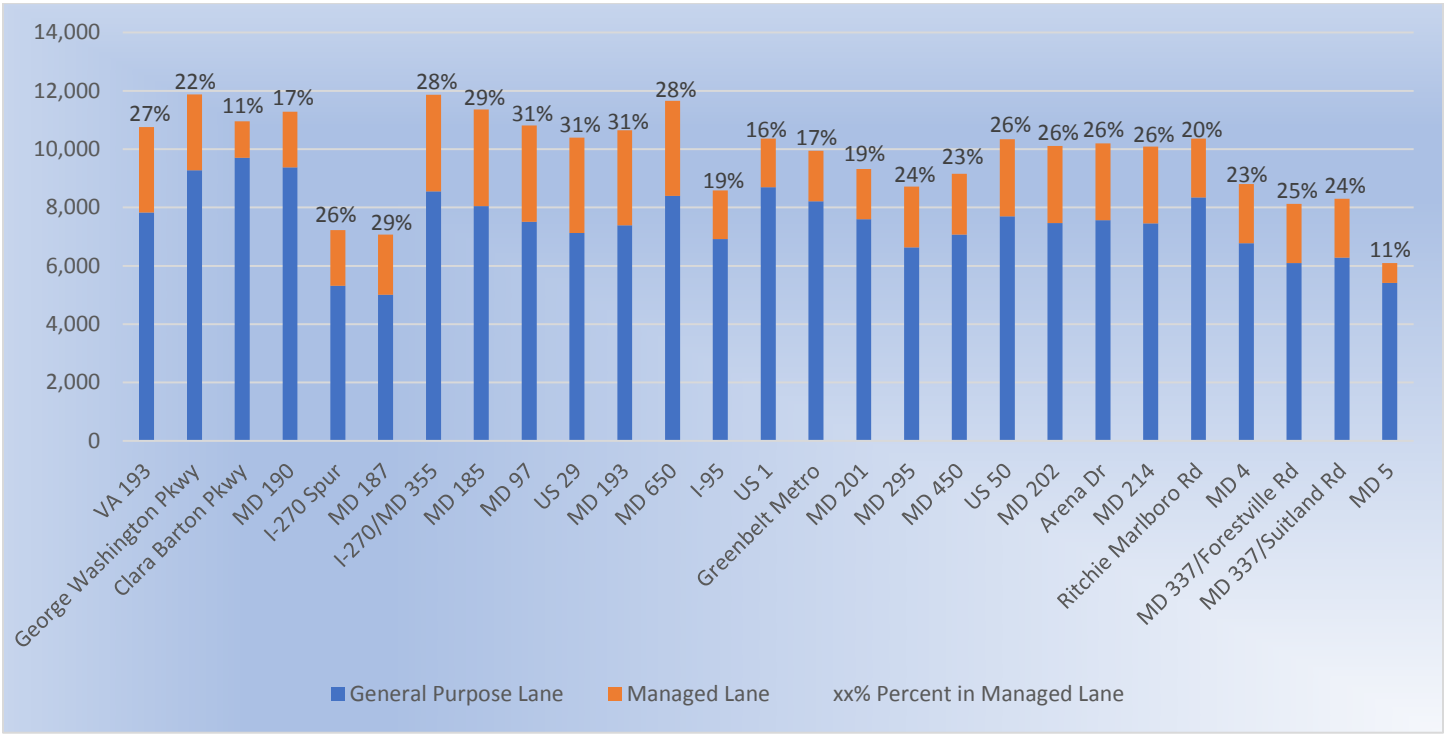


Figure 5-32: 2040 Alternative 13B
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

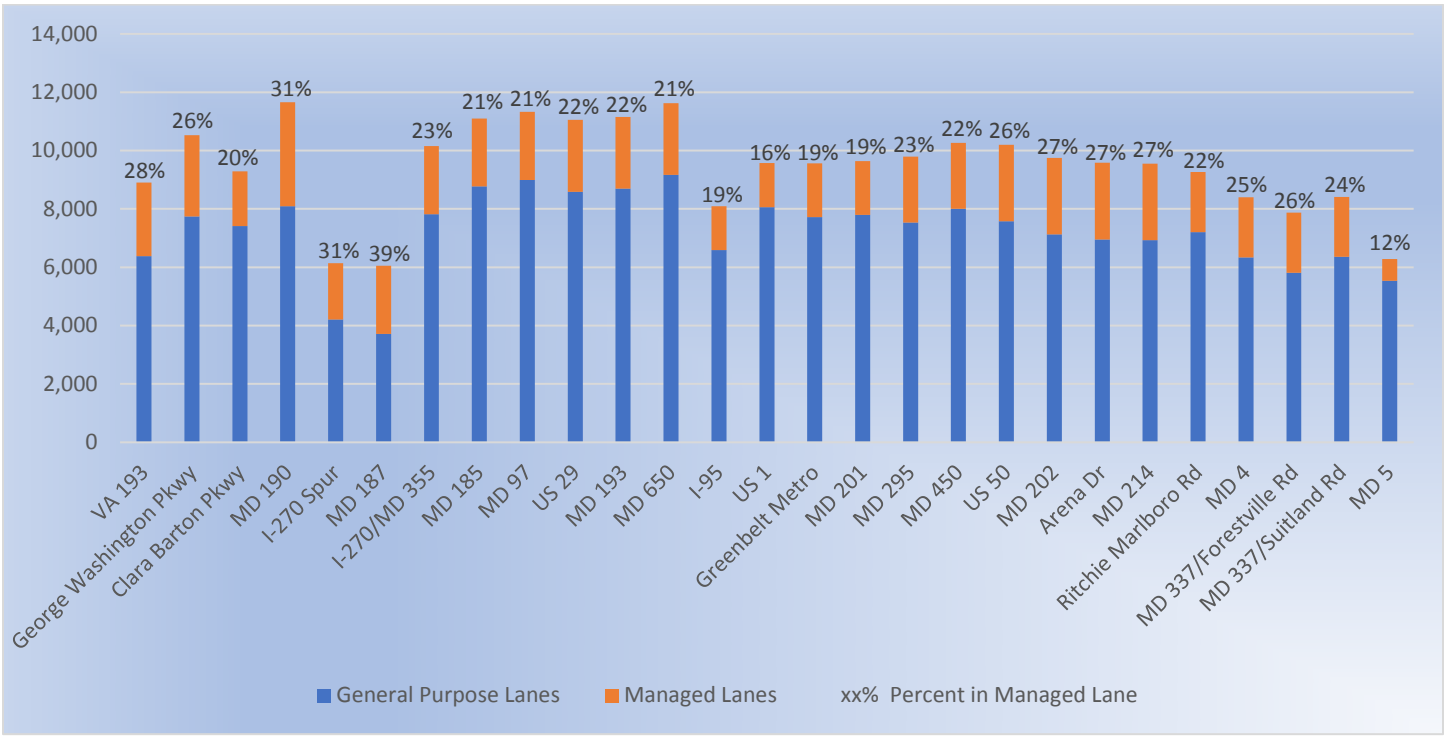


Figure 5-33: 2040 Alternative 13B
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop



Figure 5-34: 2040 Alternative 13B
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

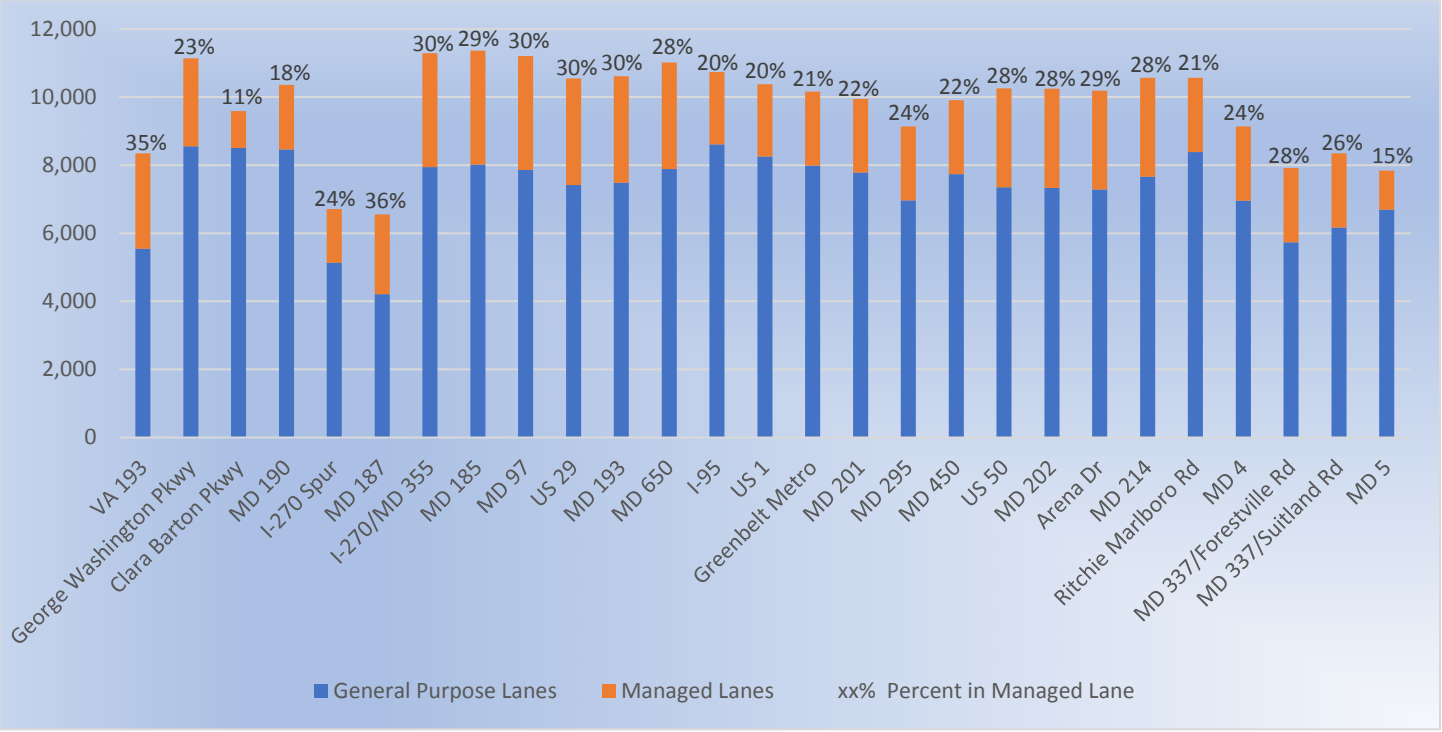
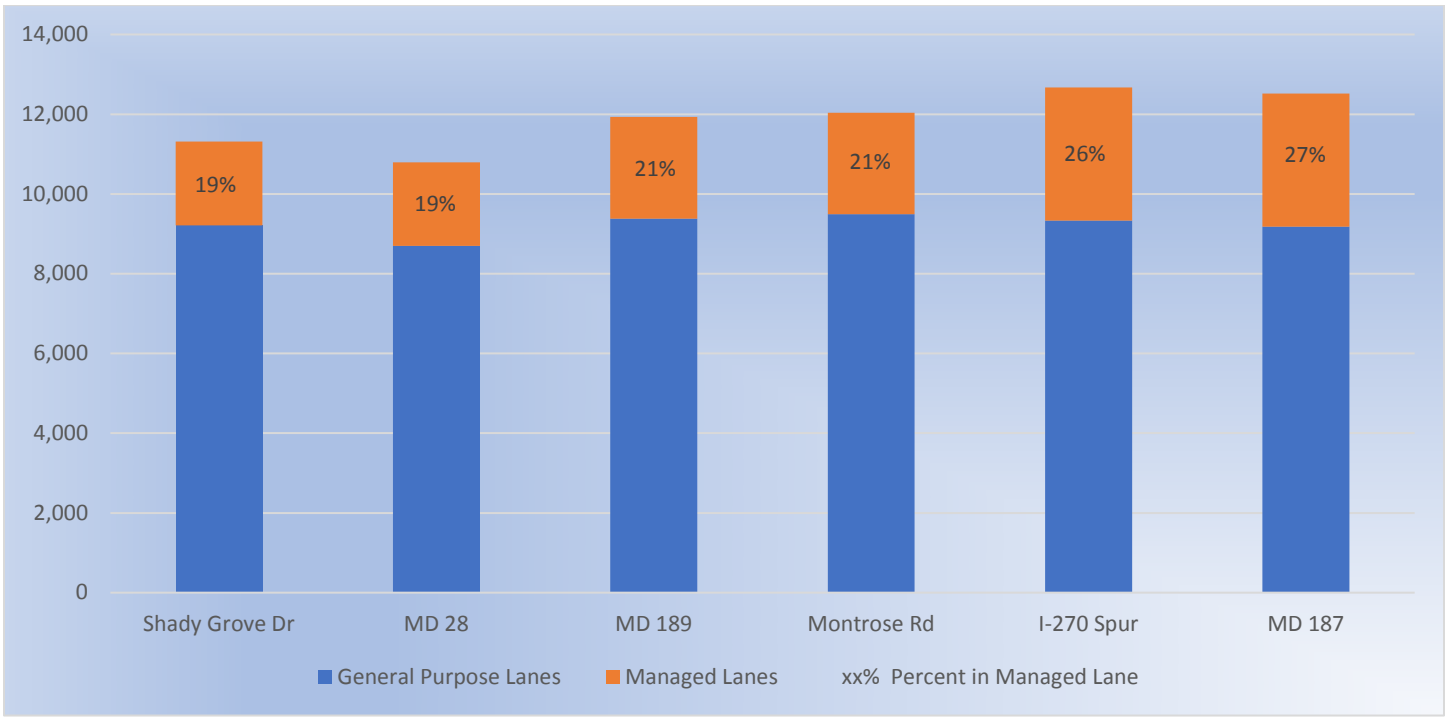
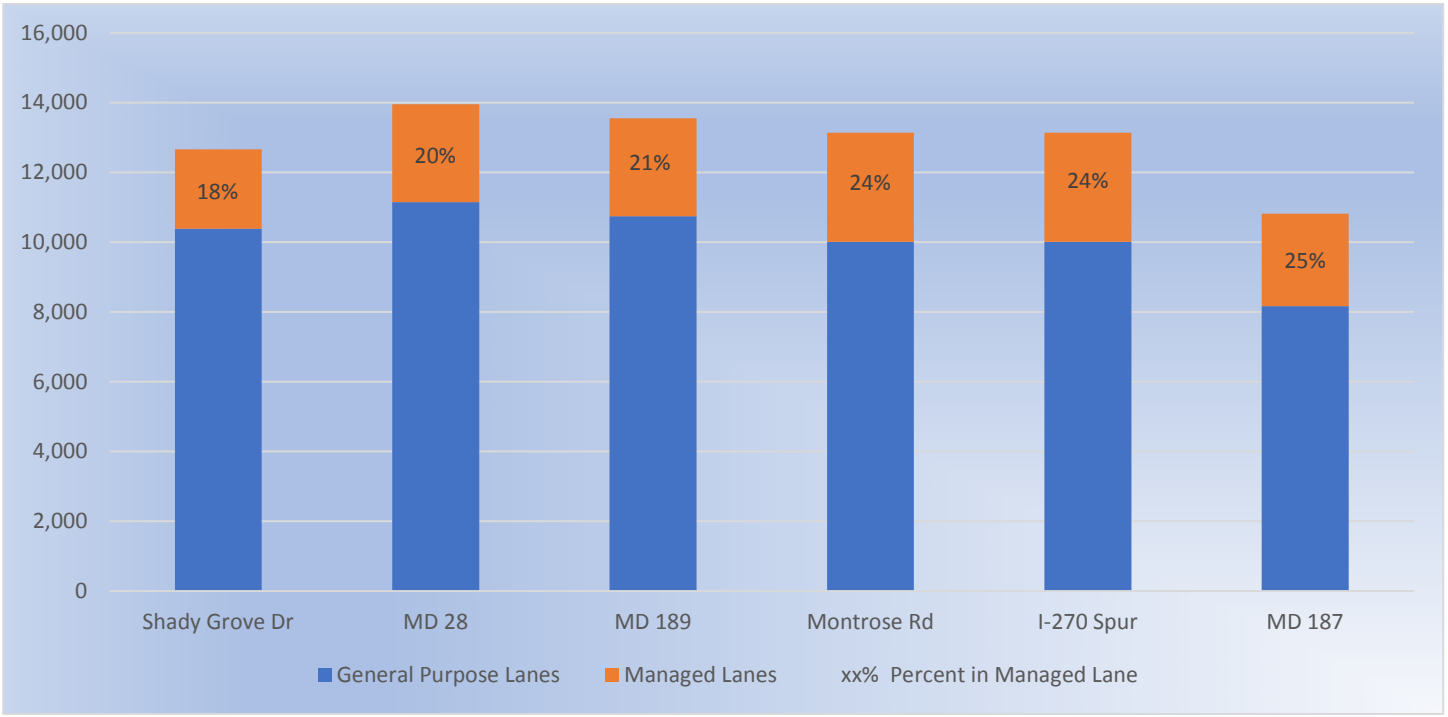


Figure 5-35: 2040 Alternative 13B
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-36: 2040 Alternative 13B
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-37: 2040 Alternative 13C
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

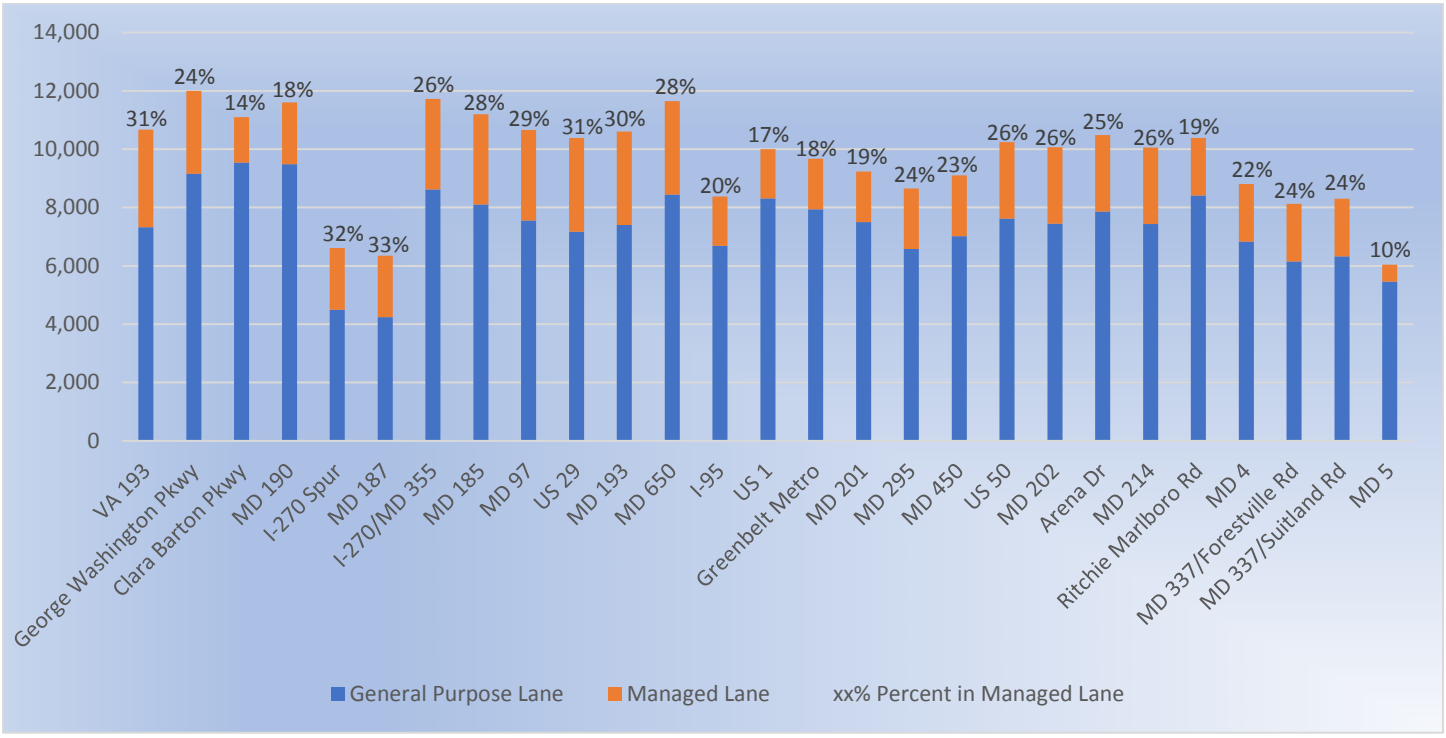


Figure 5-38: 2040 Alternative 13C
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Inner Loop

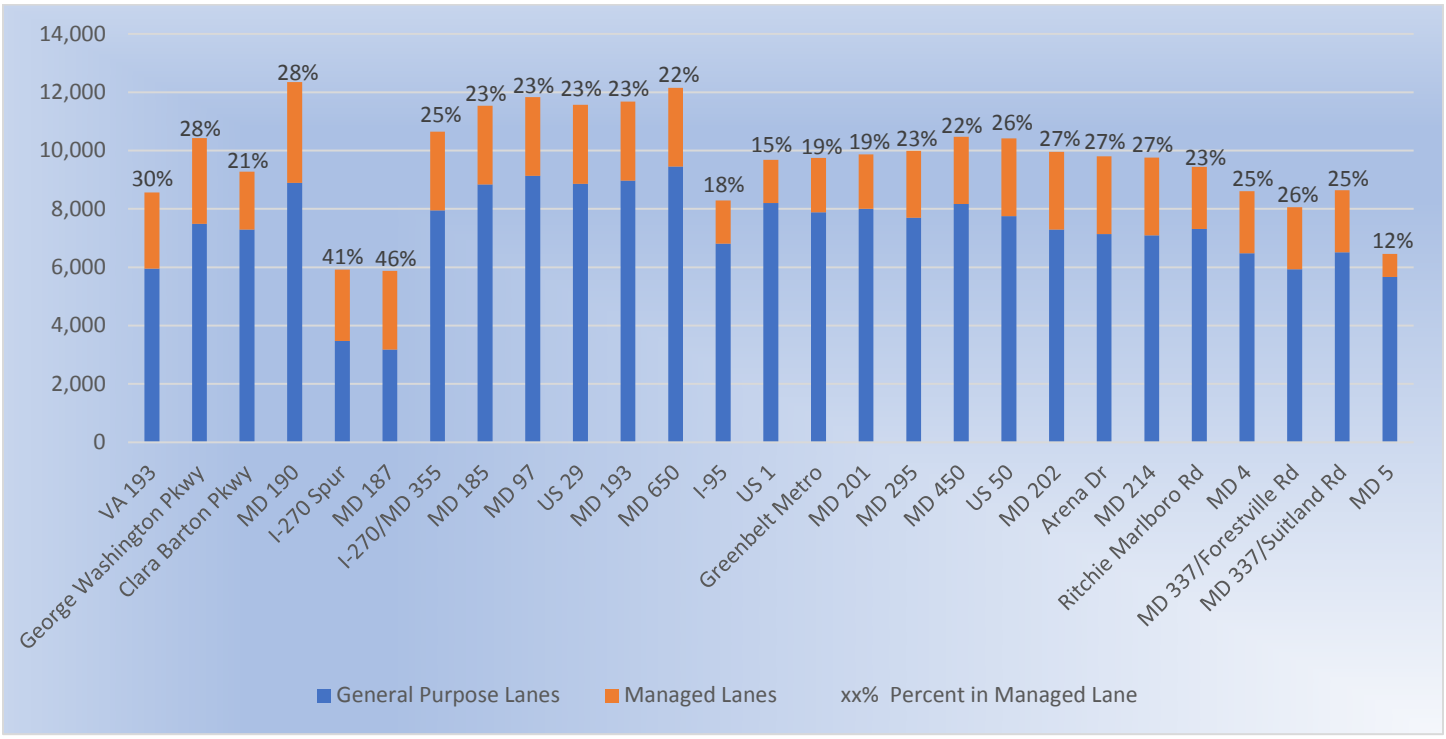


Figure 5-39: 2040 Alternative 13C
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop



Figure 5-40: 2040 Alternative 13C
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-495 Outer Loop

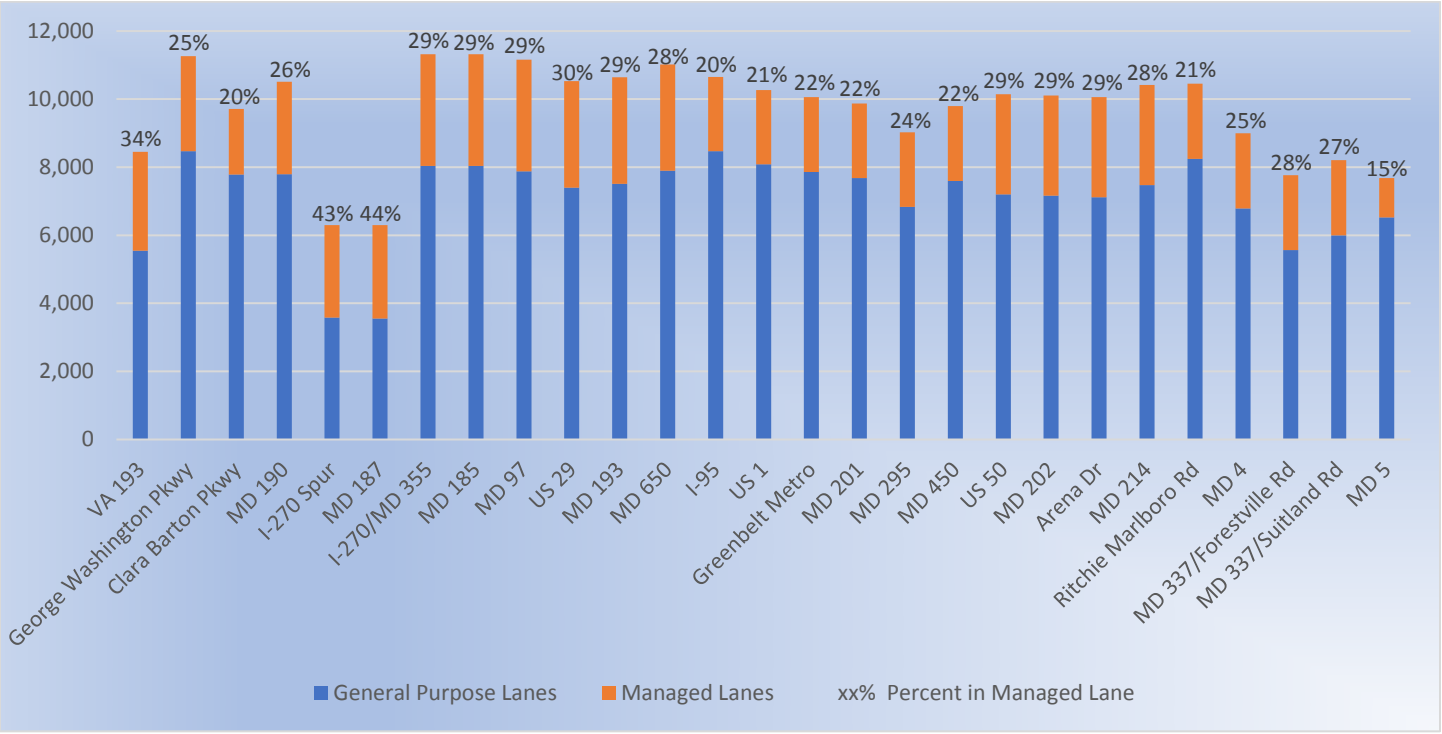
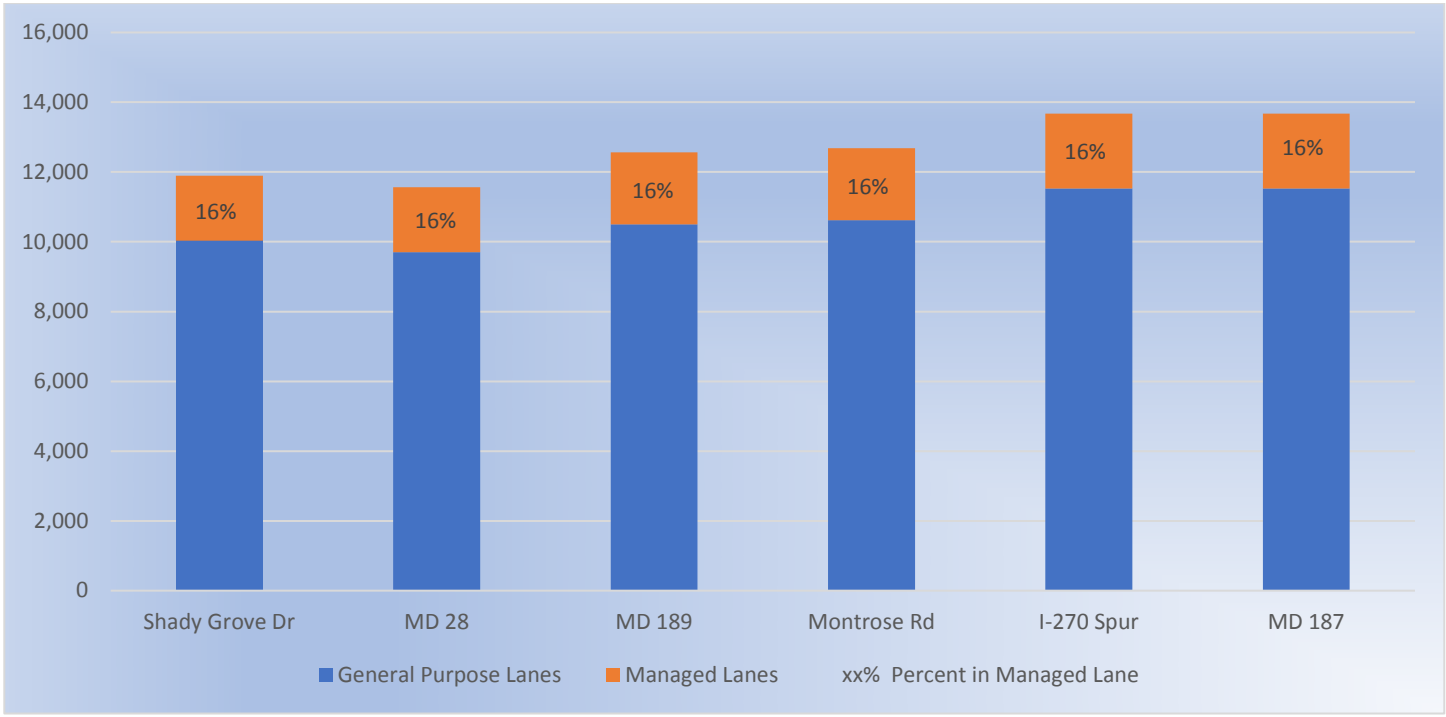
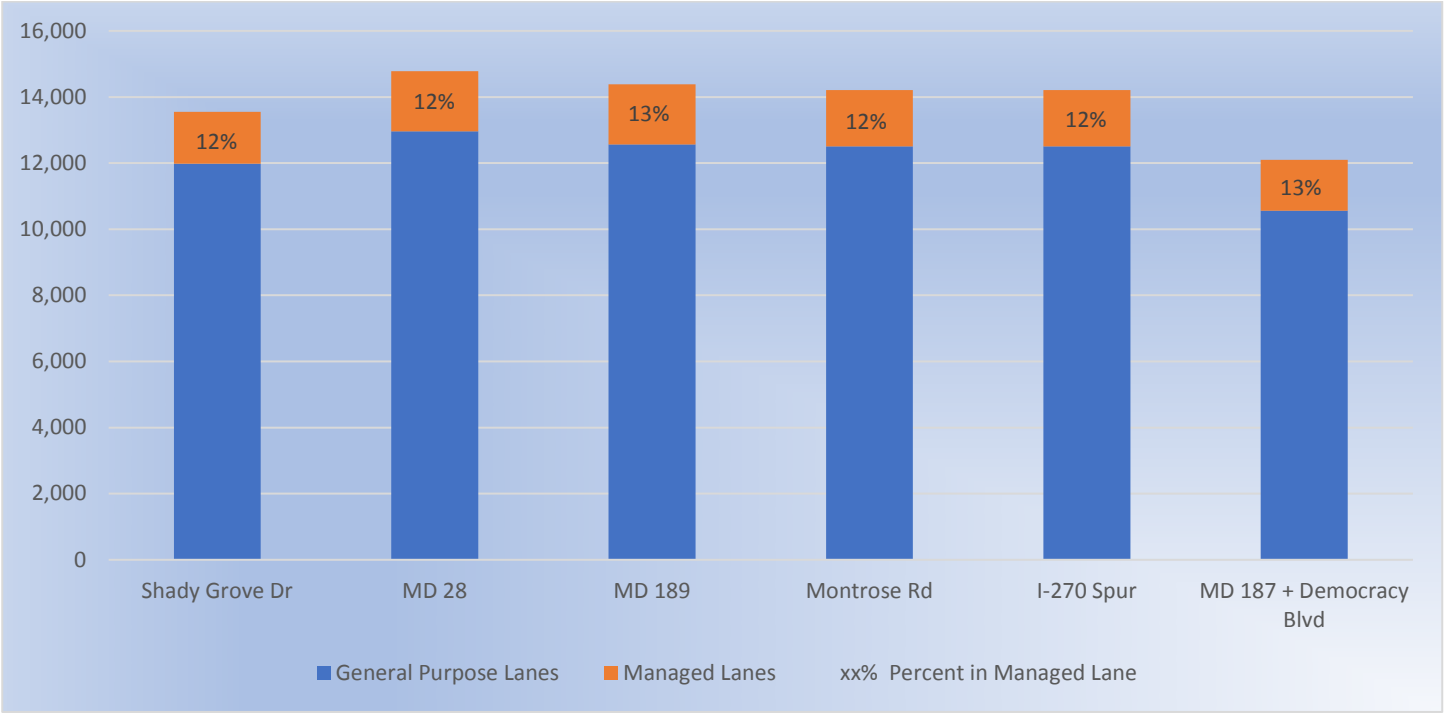


Figure 5-41: 2040 Alternative 13C
7-8 AM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Southbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

Figure 5-42: 2040 Alternative 13C
4-5 PM Peak Hour Volumes in Managed Lanes and General-Purpose Lanes – I-270 Northbound



West Spur and East Spur volumes are combined in this chart; total volumes both spurs shown at MD 187/Democracy Blvd

5.2 Speeds and Travel Times

Figures 5-43 through 5-48 describe the speed breakdown along the corridors for each hour where data was being reported (6:00 to 10:00 AM and 3:00 to 7:00 PM) for Existing and Alternative 1/No Build. Detailed speed data can be found in **Appendix E**. As shown, speeds along several segments will degrade in the future years of 2025 and 2040 as volumes increase if no capacity improvements are provided. This outcome is reflected in Alternative 1/No Build. However, end to end travel times on I-270 are projected to improve under the Alternative 1/No Build prior to 2025 as a result of the ICM improvements. Regardless, congestion may return by the design year, 2040.

Key Points

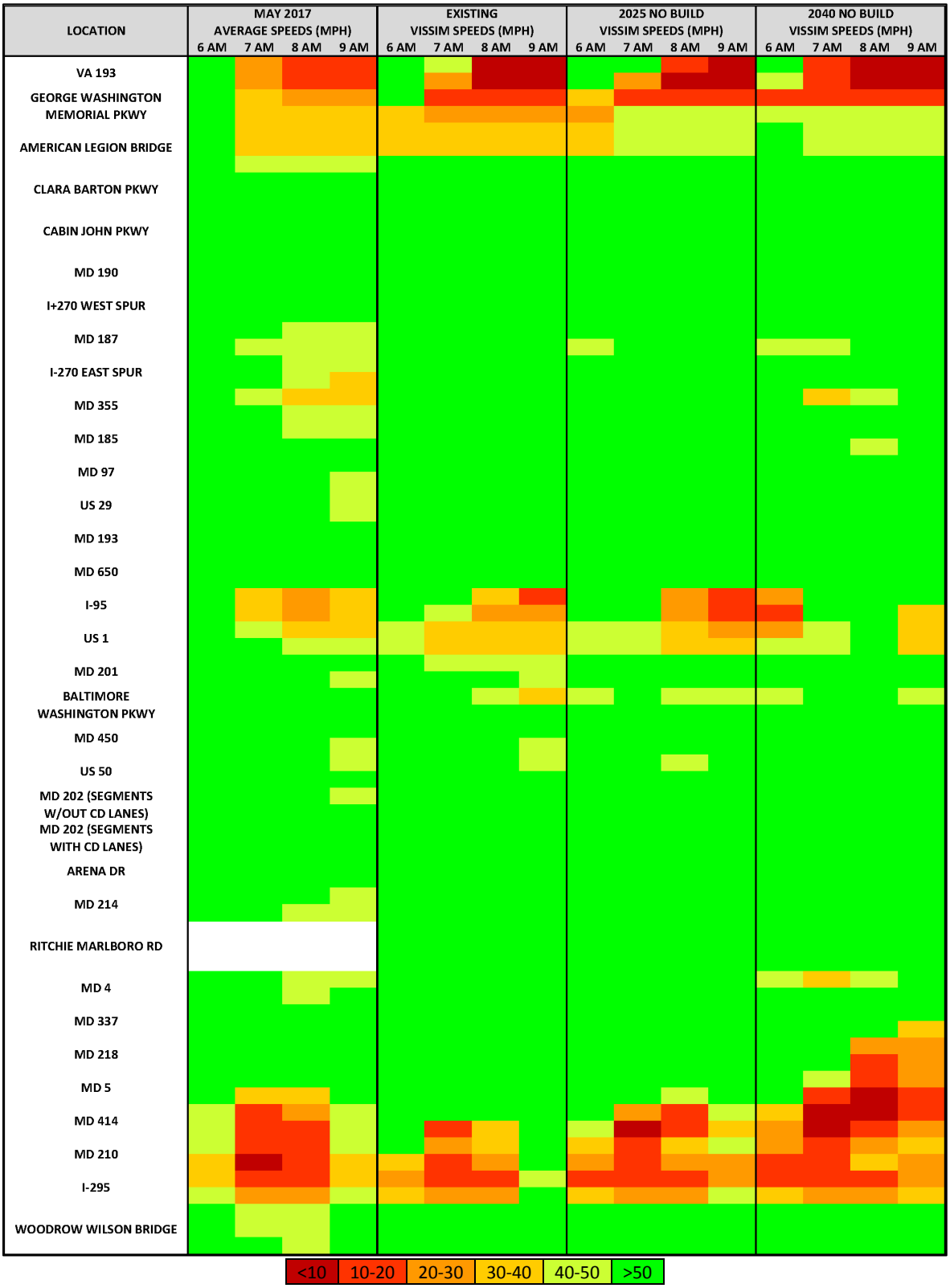
- In Virginia, the general-purpose lanes along I-495 and I-95 have experienced a 7 to 15% reduction in travel times over the last 5 years as the toll lanes have been extended.
- Along I-95 north of Baltimore, the general-purpose lanes have experienced a 12% reduction in delays since the opening of the managed lanes.

During the AM peak period, speeds will degrade along I-495 Outer Loop between I-270 and the existing low-speed segments starting at MD 97. Along I-270 Southbound, speeds will degrade beginning at MD 85. While speeds further to the south may increase, this may be due to decreased throughput caused by the lower speeds to the north.

During the PM peak period, speeds along I-495 Inner Loop will degrade between the American Legion Bridge and MD 202, with the greatest degradations occurring between MD 185 and MD 202. Along I-495 Outer Loop, speeds will degrade between I-270 and MD 5, with the greatest degradation occurring between I-270 and I-95. Along I-270 Northbound, speeds will degrade between MD 28 and MD 85.

Figures 5-49 through 5-56 and **Tables 5-1 through 5-4** summarize the travel times along the corridors during the peak periods for Existing and Alternative 1/No Build. Detailed travel time data can be found in **Appendix E**. Between 2017 and 2040, travel times along the Inner Loop of I-495 are projected to increase by 28 minutes (43%) during the AM peak period and 67 minutes (71%) during the PM peak period. Travel times along the Outer Loop of I-495 are projected to increase by 36 minutes (51%) during the AM peak period and 47 minutes (58%) during the PM peak period. Travel times along I-270 Southbound are projected to remain relatively unchanged during both peak periods due to the I-270 Innovative Congestion Management project, while travel times along I-270 Northbound are projected to increase by 10 minutes (20%) during the PM peak period. Travel times along I-270 Northbound will remain unchanged during the AM peak period as this is not the peak period of travel.

Figure 5-43. I-495 Inner Loop Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period Average Speeds (mph)



Note: White areas indicate missing data

Figure 5-44: I-495 Outer Loop Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period Average Speeds (mph)



Note: White areas indicate missing data

Figure 5-45. I-270 Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period Average Speeds (mph)

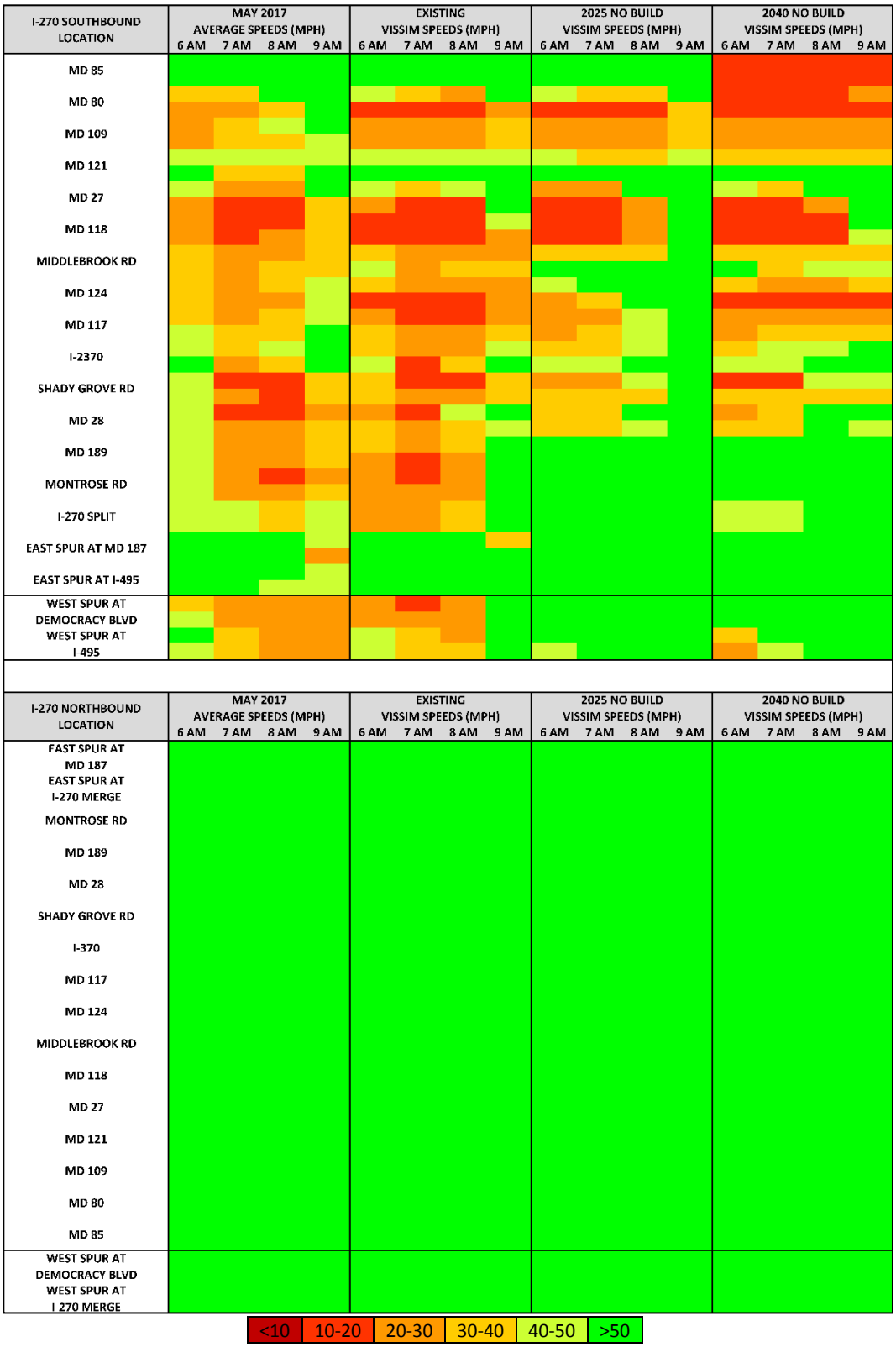
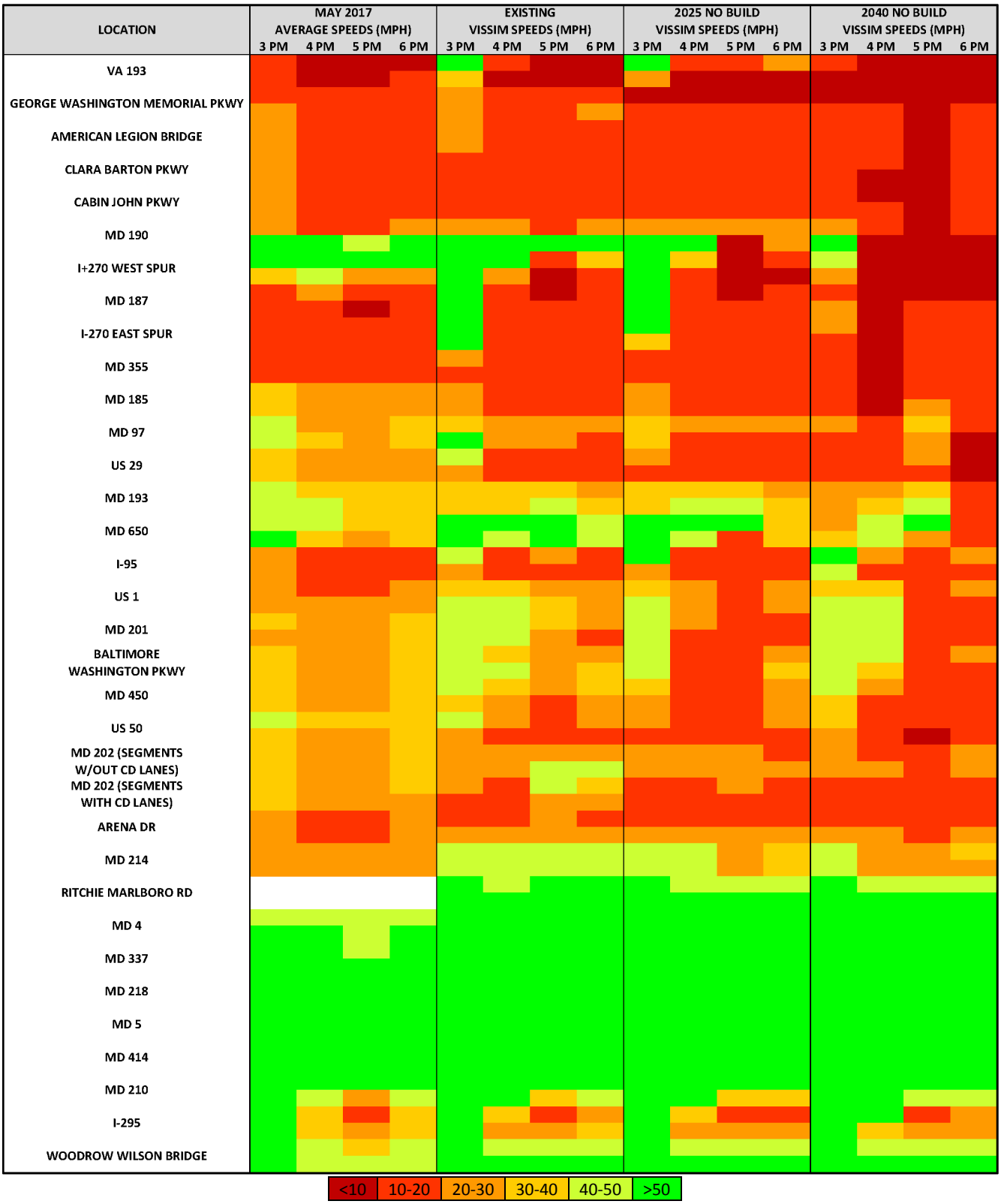


Figure 5-46: I-495 Inner Loop Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period Average Speeds (mph)



Note: White areas indicate missing data

Figure 5-47: I-495 Outer Loop Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period Average Speeds (mph)



Note: White areas indicate missing data

Figure 5-48: I-270 PM Existing (2017) and 2025/2040 Alternative 1/No Build Peak Period Average Speeds (mph)

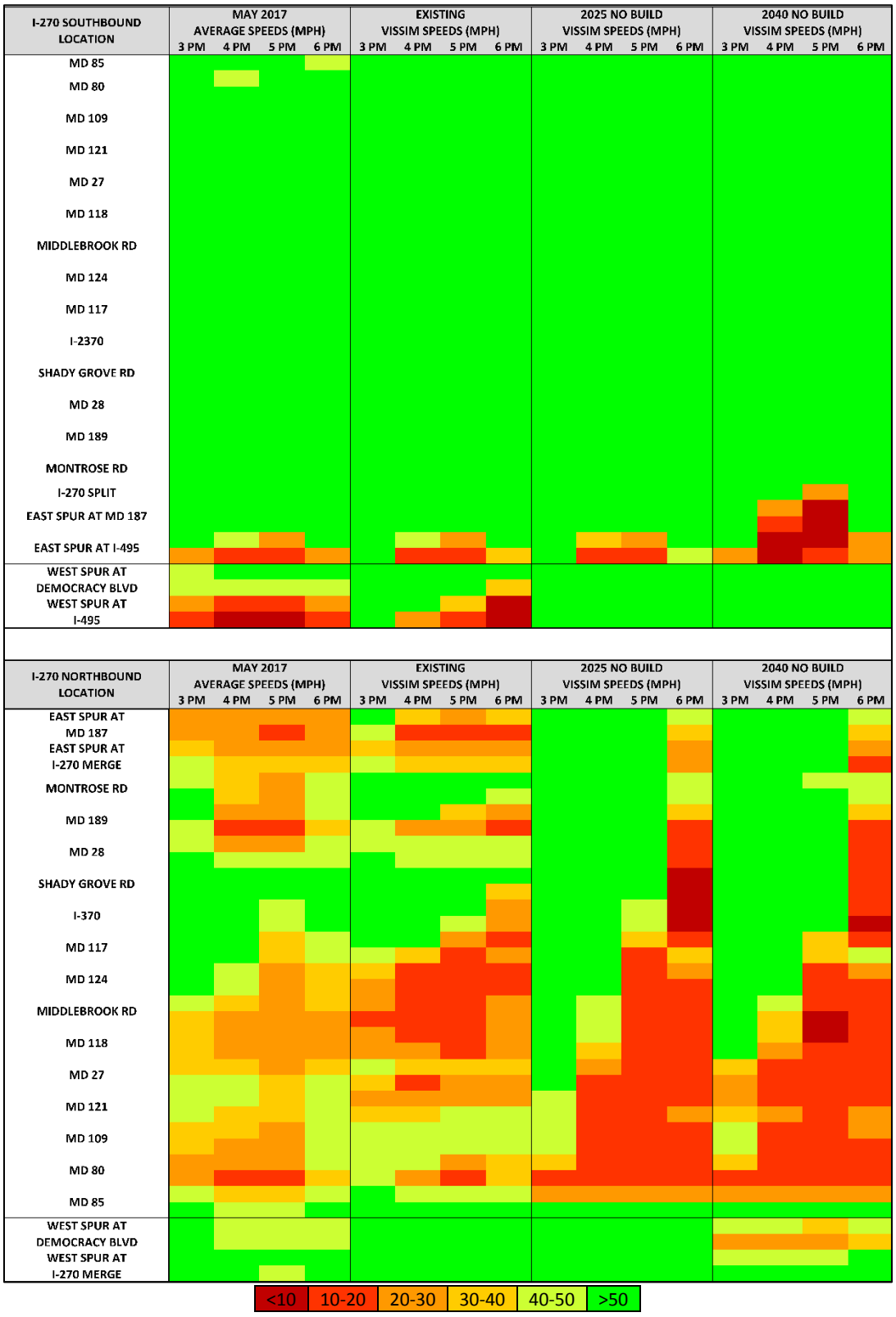


Figure 5-49: I-495 Inner Loop Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period

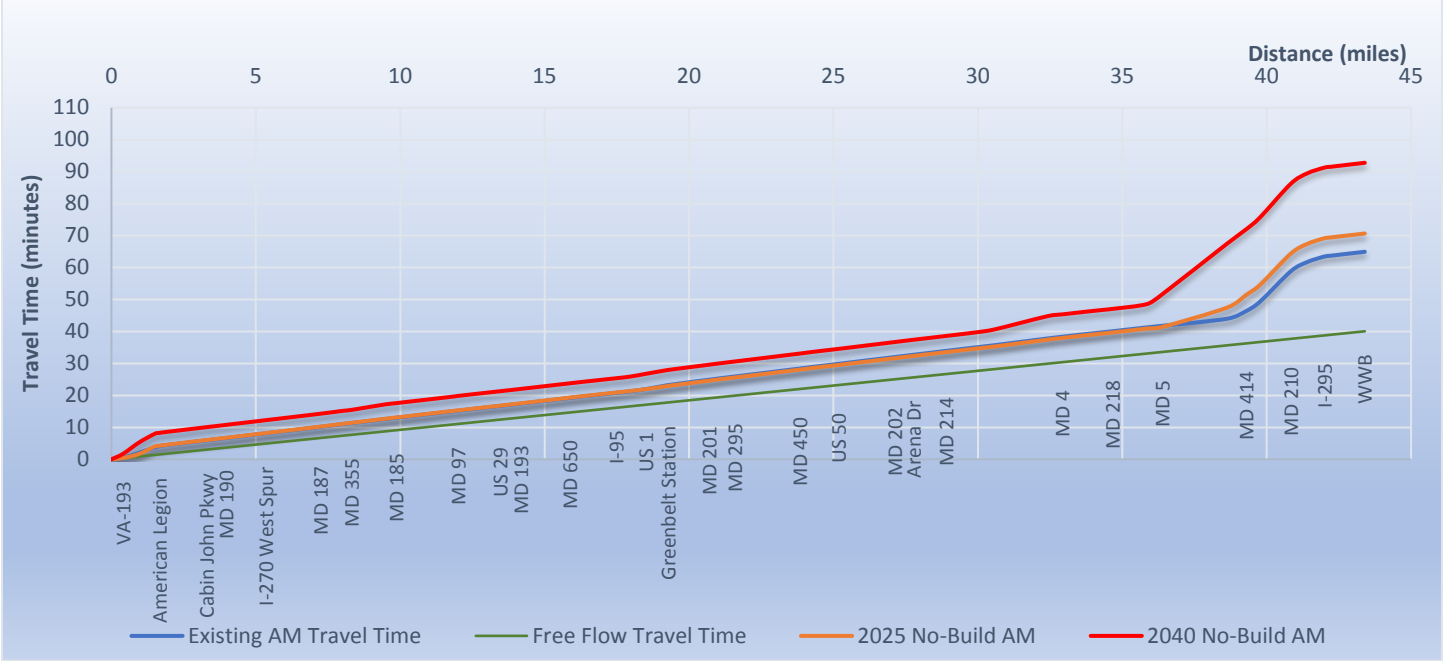


Figure 5-50: I-495 Inner Loop Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period

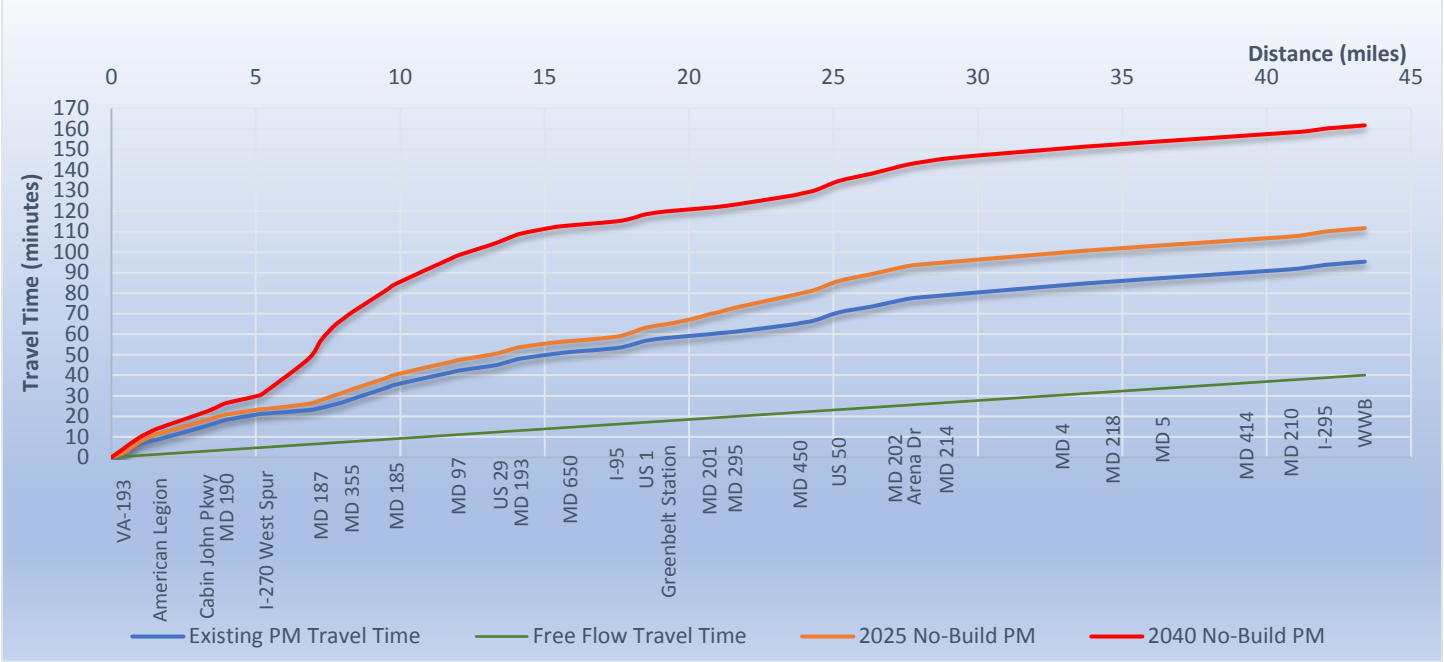


Table 5-1: I-495 Inner Loop Peak Period Existing (2017) and 2025/2040 Alternative 1/No Build Travel Times (minutes)

Peak Period	2017 Existing	2025 No Build	2040 No Build
AM Peak	65	71	93
PM Peak	95	112	162

Figure 5-51: I-495 Outer Loop Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period

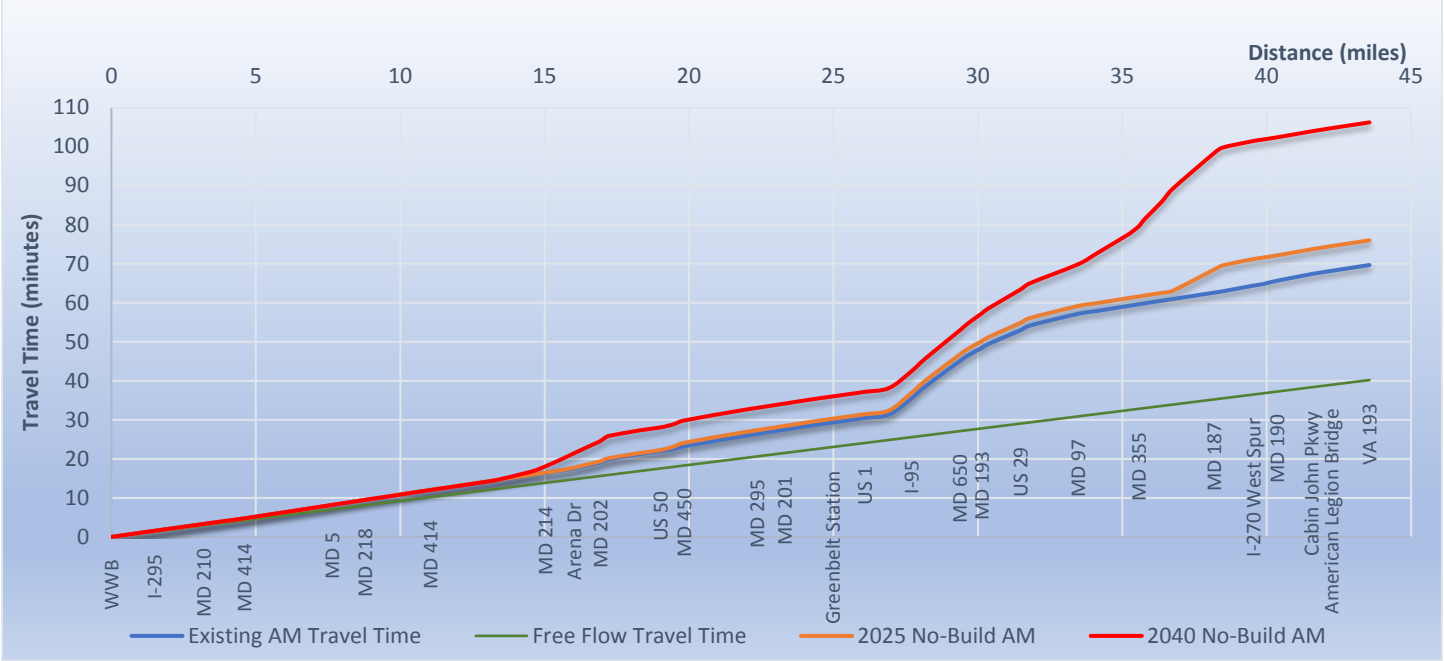


Figure 5-52: I-495 Outer Loop Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period

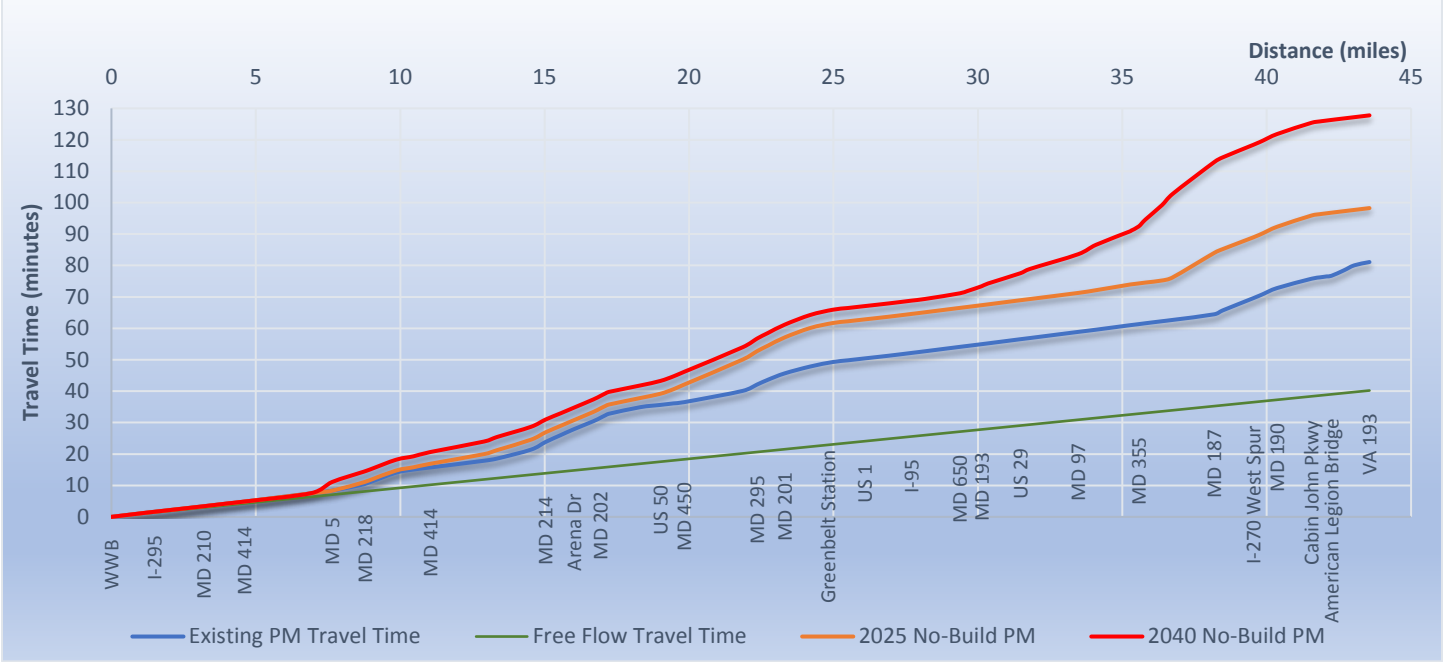


Table 5-2: I-495 Outer Loop Peak Period Existing (2017) and 2025/2040 Alternative 1/No Build Travel Times (minutes)

Peak Period	2017 Existing	2025 No Build	2040 No Build
AM Peak	70	76	106
PM Peak	81	98	128

Figure 5-53: I-270 Southbound Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period

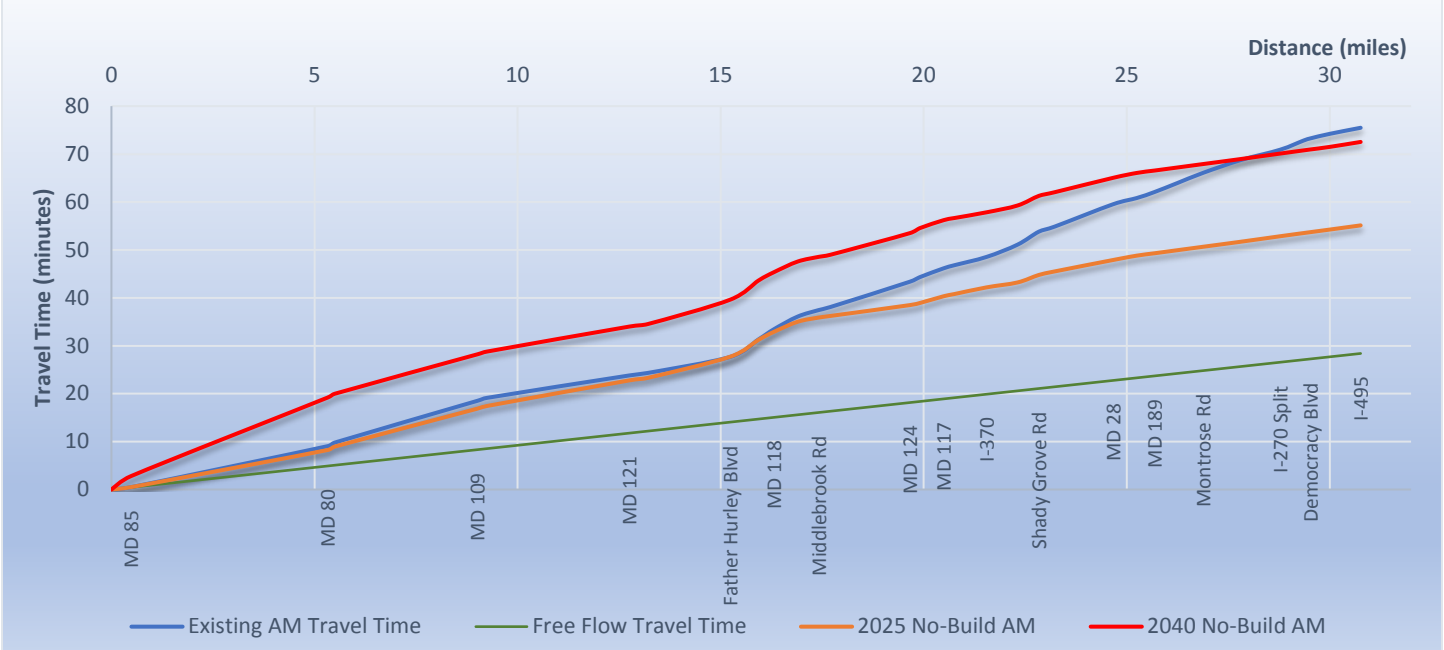


Figure 5-54: I-270 Southbound Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period

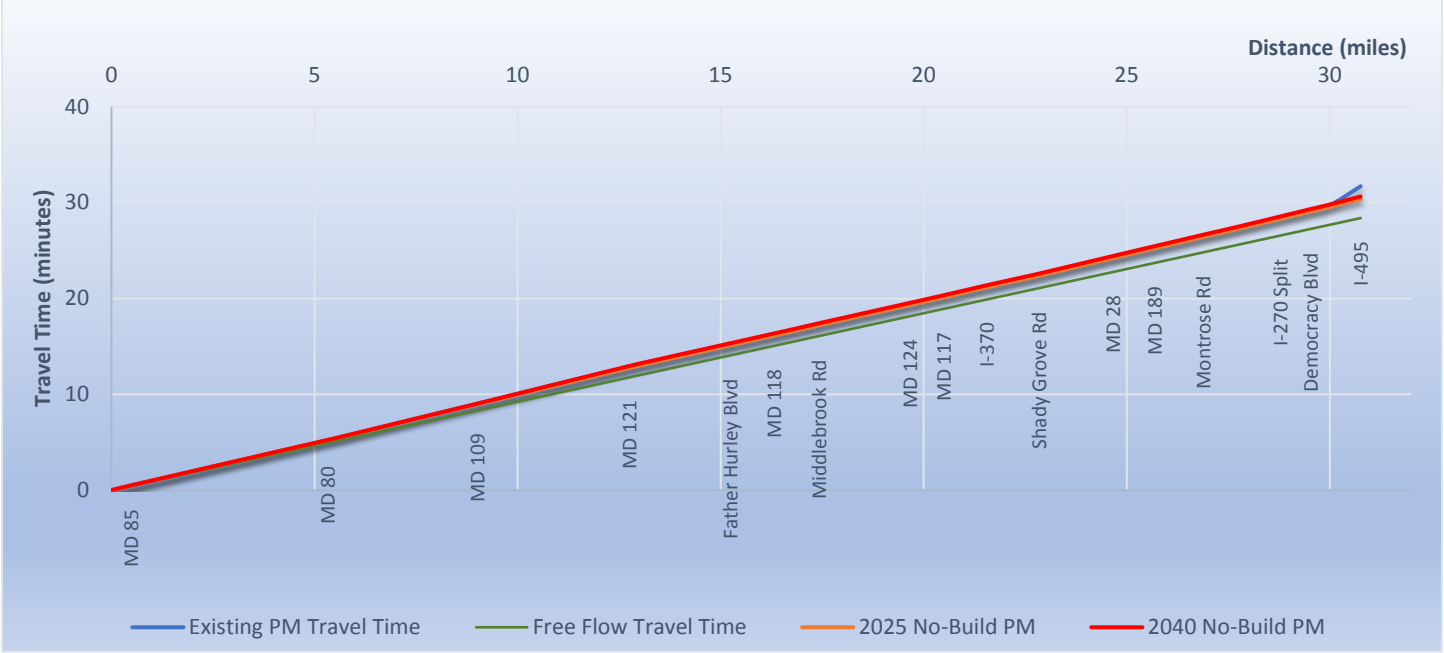


Table 5-3: I-270 Southbound Peak Period Existing (2017) and 2025/2040 Alternative 1/No Build Travel Times (minutes)

Peak Period	2017 Existing	2025 No Build*	2040 No Build*
AM Peak	76	55	73
PM Peak	32	30	31

*Reduction in travel time due to I-270 ICM improvements

Figure 5-55: I-270 Northbound Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build AM Peak Period

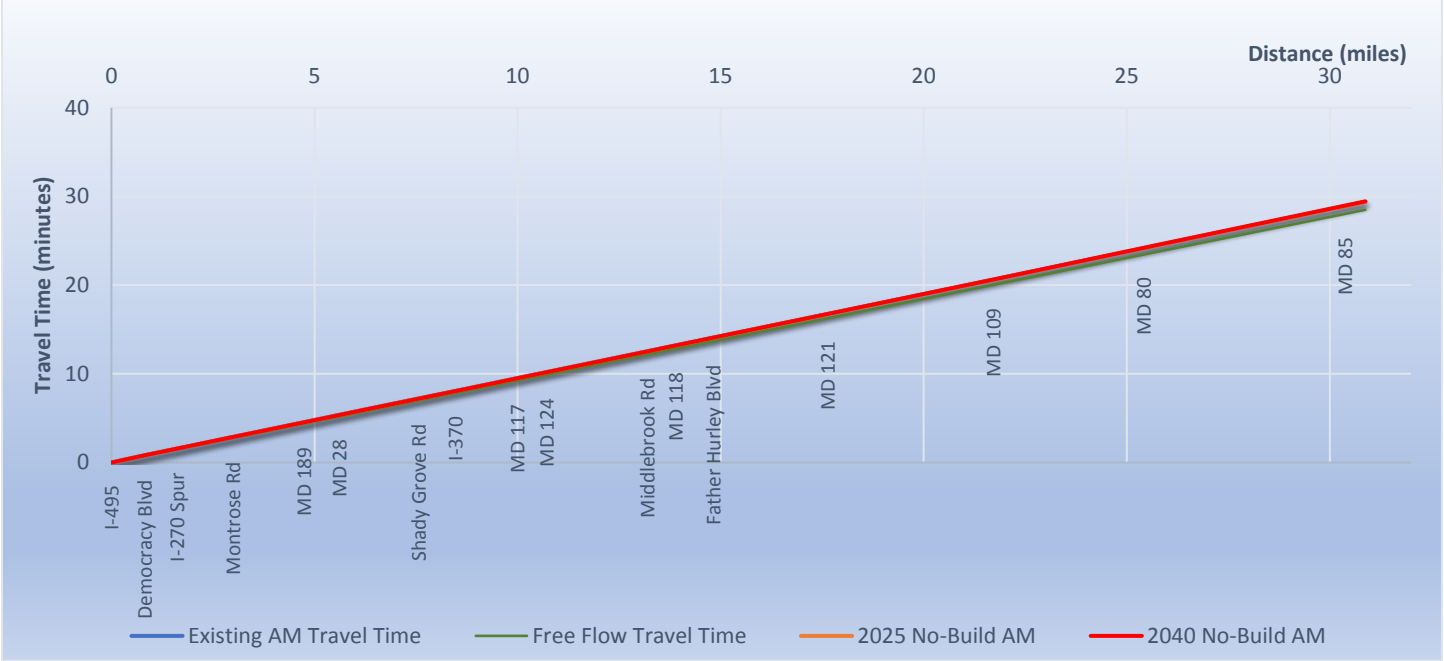


Figure 5-56: I-270 Northbound Travel Times – Existing (2017) and 2025/2040 Alternative 1/No Build PM Peak Period

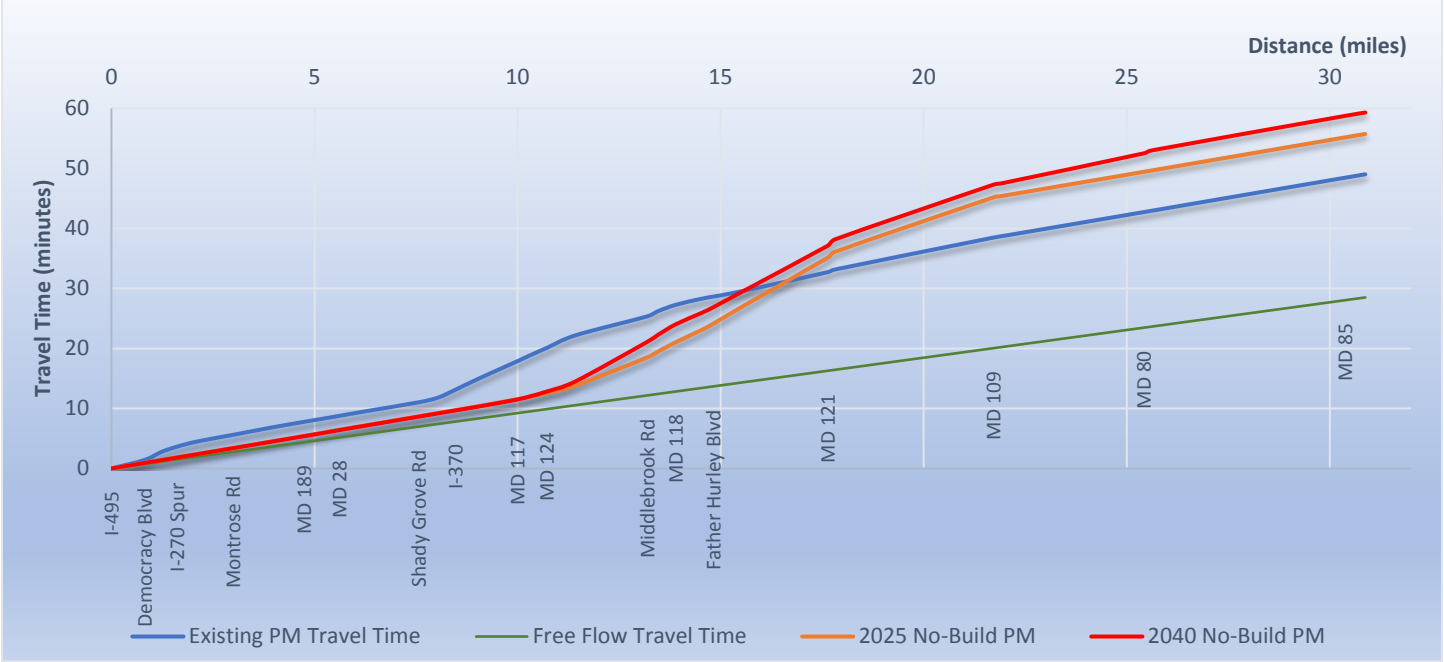


Table 5-4: I-270 Northbound Peak Period Existing (2017) and 2025/2040 Alternative 1/No Build Travel Times (minutes)

Peak Period	2017 Existing	2025 No Build	2040 No Build
AM Peak	29	29	29
PM Peak	49	56	59

With the Alternative 1/No Build results summarized, the Build Screened Alternative results can be developed, and these results can be compared to the Alternative 1/No Build results. The following tables show the modeled corridor-wide travel times for each of the Screened Alternatives. Corridor travel time represents the amount of time it would take a vehicle to travel from one end of the Study limits to the other along either I-495 or I-270 during the peak hour in the design year of 2040. Similarly, corridor speed represents the average speed along the corridor during the peak hour in the design year of 2040. For travel times, lower numbers are better, reflecting more efficient travel. For speeds, higher numbers are better.

Travel time is based on the VISSIM model results. The existing VISSIM models were calibrated to match the INRIX travel time, as described previously. The calibrated models are then used as base to develop 2025 and 2040 No Build VISSIM models. Because the existing model is calibrated to MDOT SHA standards, no adjustments are necessary to the future results when comparing results.

Key Points

- Along the Inner Loop, the Build Screened Alternatives will result in up to 12 minutes (18%) in travel time savings during the AM peak period and 96 minutes (62%) in travel time savings during the PM peak period.
- Along the Outer Loop, the Build Screened Alternatives will result in up to 38 minutes (38%) in travel time savings during the AM peak period and 78 minutes (63%) in travel time savings during the PM peak period.
- Along I-270 Southbound, the Build Screened Alternatives will result in up to five minutes (29%) in travel time savings during the AM peak period.
- Along I-270 Northbound, the Build Screened Alternatives do not have a significant travel time savings as compared to the No Build condition.

Results were generated for the I-495 Outer Loop from MD 5 to the George Washington Memorial Parkway, the I-495 Inner Loop from the George Washington Memorial Parkway to MD 5, I-270 Northbound from I-495 to I-370, and I-270 Southbound from I-370 to I-495. Results were also generated separately for travel in the general-purpose lanes and the managed lanes. For alternatives that maintained the existing HOV lanes on I-270 in addition to buffer-separated, limited access managed lanes, the corridor travel time and speed results for the general-purpose lanes included the non-tolled HOV lanes. These results are summarized in **Tables 5-5 and 5-6**.

In general, the Build Screened Alternatives will provide significant travel time savings as compared to Alternative 1/No Build. Further travel time savings will be experienced in the managed lanes. While there are some locations where travel times are slower than with Alternative 1/No Build, that is attributed to the clearing of bottlenecks at other locations, increasing throughput to downstream segments. Overall, travel times are improved with each Build Screened Alternative.

Table 5-5: Corridor Travel Time Summary (minutes) – AM Peak Period

Corridor		2017 Existing	2040 Alt 1	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
I-495 Inner Loop from George Washington Memorial Parkway to MD 5	General Purpose Lane	44	68	61	58	56	58	57	57
	Managed Lane	N/A	N/A	43	43	43	44	43	46
I-495 Outer Loop from MD 5 to George Washington Memorial Parkway	General Purpose Lane	65	101	74	64	64	63	71	73
	Managed Lane	N/A	N/A	38	37	38	38	38	38
I-270 Southbound from I-370 to I-495	General Purpose Lane	29	16*	16	15	12	19	12	24
	Managed Lane**	13	12*	10	10	10	10	10	10
I-270 Northbound from I-495 to I-370	General Purpose Lane	9	9	9	9	9	9	9	9
	Managed Lane	N/A	N/A	9	9	9	9	N/A	N/A

**Improved travel times along I-270 in Alternative 1/No Build are a result of the I-270 ICM initiative*

*** Managed Lane refers to existing HOV lane for 2017 Existing and 2040 Alt 1*

Table 5-6: Corridor Travel Time Summary (minutes) – PM Peak Period

Corridor		2017 Existing	2040 Alt 1	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
I-495 Inner Loop from George Washington Memorial Parkway to MD 5	General Purpose Lane	89	156	89	93	80	60	75	62
	Managed Lane	N/A	N/A	38	45	42	49	42	42
I-495 Outer Loop from MD 5 to George Washington Memorial Parkway	General Purpose Lane	76	123	50	45	45	48	45	47
	Managed Lane	N/A	N/A	38	38	38	38	38	38
I-270 Southbound from I-370 to I-495	General Purpose Lane	11	12	40	22	15	14	28	15
	Managed Lane**	N/A	N/A	10	10	10	9	N/A	N/A
I-270 Northbound from I-495 to I-370	General Purpose Lane	15	10*	14	11	12	16	13	12
	Managed Lane	11	10*	10	10	12	9	14	9

**Improved travel times along I-270 in Alternative 1/No Build are a result of the I-270 ICM initiative*

*** Managed Lane refers to existing HOV lane for 2017 Existing and 2040 Alt 1*

The following is a summary of the travel time results:

- I-495
  - AM Peak Period
    - Travel times in the Inner Loop general-purpose lanes would improve from 68 minutes in Alternative 1/No Build to between 56 minutes (for Alternative 9, best among the Screened Alternatives) and 61 minutes (for Alternative 5)
    - Travel times in the Outer Loop general-purpose lanes would improve from over 100 minutes in Alternative 1/No Build to between 63 minutes (for Alternative 10, best among the Screened Alternatives) and 74 minutes (for Alternative 5)
    - In the managed lanes, the Outer Loop would have travel times of 37 to 38 minutes in each Build Screened Alternative and the Inner Loop would have travel times of 43 to 46 minutes in each Build Screened Alternative
  - PM Peak Period
    - Travel times in the Inner Loop general-purpose lanes would improve from 156 minutes in Alternative 1/No Build to between 60 minutes (for Alternative 10, best among the Screened Alternatives) and 93 minutes (for Alternative 8)
    - Travel times in the Outer Loop general-purpose lanes would improve from over two hours (123 minutes) in Alternative 1/No Build to between 45 minutes (for Alternatives 8, 9, and 13B, tied for best among the Screened Alternatives) to 50 minutes (for Alternative 5)
    - In the managed lanes, the Outer Loop would have travel times of 38 minutes in each Build Screened Alternative and the Inner Loop would have travel times between 38 minutes (for Alternative 5, best among the Screened Alternatives) and 49 minutes (for Alternative 10)
- I-270
  - AM Peak Period
    - Travel times in the southbound lanes would improve from 17 minutes in Alternative 1/No Build to 12 minutes in Alternatives 9 and 13B and to 15 minutes in Alternative 8; the other alternatives would not provide an improvement
    - The southbound managed lanes would have travel times of 10 minutes with each Build Screened Alternative
    - The northbound lanes would have a travel time of 9 minutes in Alternative 1/No Build, and would remain unchanged in the Build Screened Alternatives in both the general purpose and the managed lanes
  - PM Peak Period
    - Conditions are generally projected to be acceptable under Alternative 1/No Build in the northbound and southbound directions due to the Financially Constrained Long-Range Transportation Plan (CLRP) programmed improvements, including the Innovative Congestion Management (ICM) initiative, except for congestion along the I-270 Southbound East Spur due to spillback from I-495
    - In some cases, the Build Screened Alternatives are projected to operate worse than Alternative 1/No Build along I-270 due to increased volumes in the system

and/or reduced capacity in the off-peak direction from the removal of the HOV lanes.

The speed and travel time results were also used to calculate anticipated average annual travel time savings for commuters living and working within the Study area (hours saved per commuter per year). This value summarizes the travel time and speed data into a single number for each Alternative for ease of comparison. It also provides a tangible number that could be understood more easily by the public.

For calculating average annual savings per commuter, the average time spent commuting to work in Maryland under existing conditions (32.3 minutes) was compared to the average speed during the peak periods in the existing VISSIM model (34.9 mph) to estimate average trip length per commute. Under Alternative 1/No Build, the average speed during the peak periods in the VISSIM model is projected to decrease to 27.1 mph. This decrease in average speed would be projected to increase the average commute time within the Study area to 41.6 minutes under Alternative 1/No Build in the design year 2040. Using that travel time as base, the peak period average speed outputs from the VISSIM model were used to determine the average commute time in 2040 and the savings per trip for each Build Screened Alternative compared to Alternative 1/No Build. With two commute trips per day and approximately 260 commute days per year, the value per commute was converted into a yearly savings in hours.

The results indicate that the Build Screened Alternatives would be expected to save commuters between 45 and 73 hours per year compared to Alternative 1/No Build, on average, as shown below:

- Alternative 5: 45 hours per year
- Alternative 8: 59 hours per year
- Alternative 9: 73 hours per year
- Alternative 10: 72 hours per year
- Alternative 13B: 65 hours per year
- Alternative 13C: 64 hours per year

5.3 Vehicle Demand, Throughput, and Percent Demand Met

Future 2025 and 2040 No Build travel demand, throughput, and percent demand served along the study corridors are summarized in **Tables 5-7 to 5-14** and **Figures 5-57 to 5-68**. While the model can calculate outputs at any single location in the model, this evaluation focused on throughput at four key points located throughout the study network: I-495 at the American Legion Bridge, I-495 west of I-95, I-495 at MD 5, and I-270 at Montrose Road. These locations were selected as they include each corridor and are representative of each of the areas that have similar character and volumes. This allows for the evaluation of the needs through each part of the network. Person throughputs are based on the MWCOG travel demand model vehicle classification outputs, including classifications for HOV 2 and HOV 3+; however, it does not account for trips using bus service. Although transit buses will be permitted to use the managed lanes, specific transit routes are currently undetermined and therefore, appropriate bus throughput cannot be assessed at this time. However, any inclusion of buses in the Screened Alternatives would increase the person throughput compared to the values shown here. Tables showing the travel demand for each segment and time period are included in **Appendix F**. Tables showing the throughputs and percent demand met for each segment and time period are included in **Appendix G**.

Table 5-7: I-495 and I-270 2025 Alternative 1/No Build Travel Demand

Location	Travel Demand (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,100	9,500	9,200	8,600	8,900	8,800	9,000	7,900
I-495 West of I-95	7,200	8,600	8,000	7,200	9,100	9,300	8,600	7,600
I-495 at MD 5	6,400	6,500	7,100	6,400	5,800	6,900	7,100	6,600
I-270 at Montrose Rd	9,700	11,200	10,400	9,400	7,000	7,600	7,900	7,200
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	7,800	9,100	9,000	8,200	8,700	8,900	8,700	8,300
I-495 West of I-95	8,600	7,500	6,400	6,800	7,500	8,100	8,300	7,100
I-495 at MD 5	6,100	6,900	6,000	5,700	7,000	6,900	6,900	5,900
I-270 at Montrose Rd	4,400	6,400	8,700	7,900	10,800	11,800	11,900	11,100

Table 5-8: I-495 and I-270 2040 Alternative 1/No Build Travel Demand

Location	Travel Demand (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,100	9,500	9,200	8,600	9,600	9,300	9,500	8,600
I-495 West of I-95	7,400	8,800	8,300	7,600	9,800	9,600	8,800	8,000
I-495 at MD 5	6,700	6,800	7,400	6,800	5,700	7,000	7,400	7,000
I-270 at Montrose Rd	10,300	12,000	11,000	10,100	7,500	8,000	8,400	7,800
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	7,800	9,100	9,000	8,200	9,300	9,500	9,300	9,000
I-495 West of I-95	8,900	7,600	6,600	7,100	7,800	8,300	8,400	7,300
I-495 at MD 5	6,300	7,200	6,300	5,900	7,300	7,300	7,200	6,300
I-270 at Montrose Rd	4,700	6,900	9,400	8,600	11,500	12,600	12,600	11,800

Table 5-9: I-495 and I-270 2025 Alternative 1/No Build Vehicle Throughputs

Location	Throughput (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,400	8,500	8,500	8,600	8,000	7,900	8,500	8,200
I-495 West of I-95	7,300	8,300	7,800	7,200	8,400	8,200	8,000	7,700
I-495 at MD 5	6,600	6,100	6,500	6,500	6,100	6,800	7,300	6,900
I-270 at Montrose Rd	10,500	10,900	9,900	8,800	6,700	7,300	7,300	6,600
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,500	8,800	9,300	8,400	8,200	8,500	8,100	8,100
I-495 West of I-95	8,000	6,300	6,600	6,700	7,000	7,000	6,700	7,300
I-495 at MD 5	5,900	6,400	5,700	5,600	6,800	6,600	6,500	6,000
I-270 at Montrose Rd	5,100	6,400	8,800	8,500	11,100	11,600	11,400	8,400

Table 5-10: I-495 and I-270 2040 Alternative 1/No Build Vehicle Throughputs

Location	Throughput (vehicles per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,500	8,400	8,600	8,600	7,600	6,700	3,400	7,000
I-495 West of I-95	7,300	7,900	7,700	7,300	7,300	8,100	7,800	5,300
I-495 at MD 5	6,600	6,300	6,000	7,500	6,000	6,800	7,100	7,000
I-270 at Montrose Rd	10,900	11,000	9,500	9,600	7,100	7,700	7,300	7,000
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	8,600	9,000	9,400	9,300	8,200	8,700	8,300	8,400
I-495 West of I-95	7,800	6,100	5,400	6,600	7,200	7,300	5,700	5,800
I-495 at MD 5	6,100	6,300	4,300	5,600	6,600	6,600	6,300	6,300
I-270 at Montrose Rd	5,100	6,100	8,800	8,800	11,400	10,300	9,500	8,400

Table 5-11: I-495 and I-270 2025 Alternative 1/No Build Person Throughputs

Location	Throughput (persons per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	10,000	10,100	10,100	10,200	10,500	10,300	11,100	10,700
I-495 West of I-95	8,500	9,600	9,100	8,400	10,600	10,400	10,100	9,800
I-495 at MD 5	7,900	7,300	7,800	7,800	8,000	9,000	9,600	9,100
I-270 at Montrose Rd	12,800	13,300	12,100	10,700	8,900	9,700	9,700	8,800
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	10,100	10,500	11,100	10,000	10,700	11,100	10,600	10,600
I-495 West of I-95	9,300	7,300	7,700	7,800	8,900	8,900	8,500	9,200
I-495 at MD 5	7,000	7,600	6,800	6,700	9,000	8,700	8,600	7,900
I-270 at Montrose Rd	6,200	7,800	10,700	10,400	14,800	15,500	15,200	11,200

Table 5-12: I-495 and I-270 2040 Alternative 1/No Build Person Throughputs

Location	Throughput (persons per hour)							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	10,100	10,000	10,300	10,300	10,000	8,800	4,500	9,200
I-495 West of I-95	8,500	9,200	8,900	8,500	9,200	10,300	9,900	6,700
I-495 at MD 5	7,900	7,500	7,200	8,900	7,900	9,000	9,300	9,200
I-270 at Montrose Rd	13,300	13,400	11,600	11,700	9,500	10,300	9,700	9,300
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	10,300	10,700	11,200	11,100	10,700	11,400	10,900	11,000
I-495 West of I-95	9,100	7,100	6,300	7,700	9,100	9,200	7,200	7,300
I-495 at MD 5	7,300	7,500	5,100	6,700	8,700	8,700	8,300	8,300
I-270 at Montrose Rd	6,200	7,500	10,700	10,700	15,200	13,700	12,700	11,200

Table 5-13: I-495 and I-270 2025 Alternative 1/No Build Percent Vehicle Demand Met

Location	Percent Vehicle Demand Met							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	100%	89%	93%	100%	89%	90%	95%	100%
I-495 West of I-95	100%	96%	97%	100%	91%	89%	91%	100%
I-495 at MD 5	100%	95%	93%	100%	100%	99%	100%	100%
I-270 at Montrose Rd	100%	97%	96%	94%	97%	96%	93%	91%
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	100%	96%	100%	100%	95%	95%	92%	97%
I-495 West of I-95	93%	84%	100%	98%	94%	91%	84%	100%
I-495 at MD 5	97%	93%	94%	99%	98%	95%	94%	100%
I-270 at Montrose Rd	100%	100%	100%	100%	100%	98%	96%	76%

<90% ≥90% 100%

Table 5-14: I-495 and I-270 2040 Alternative 1/No Build Percent Vehicle Demand Met

Location	Percent Vehicle Demand Met							
I-495 Inner Loop/ I-270 Southbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	100%	89%	93%	100%	79%	73%	35%	81%
I-495 West of I-95	98%	89%	93%	96%	75%	84%	89%	67%
I-495 at MD 5	98%	93%	81%	100%	100%	96%	96%	100%
I-270 at Montrose Rd	97%	93%	89%	100%	95%	95%	87%	89%
I-495 Outer Loop/ I-270 Northbound	**6-7 AM**	**7-8 AM**	**8-9 AM**	**9-10 AM**	**3-4 PM**	**4-5 PM**	**5-6 PM**	**6-7 PM**
American Legion Bridge	100%	99%	100%	100%	88%	91%	88%	93%
I-495 West of I-95	88%	80%	82%	93%	93%	88%	68%	80%
I-495 at MD 5	96%	87%	68%	94%	90%	90%	88%	100%
I-270 at Montrose Rd	100%	88%	92%	100%	99%	82%	75%	71%

<90% ≥90% 100%

Figure 5-57: I-495 2025 Alternative 1/No Build 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

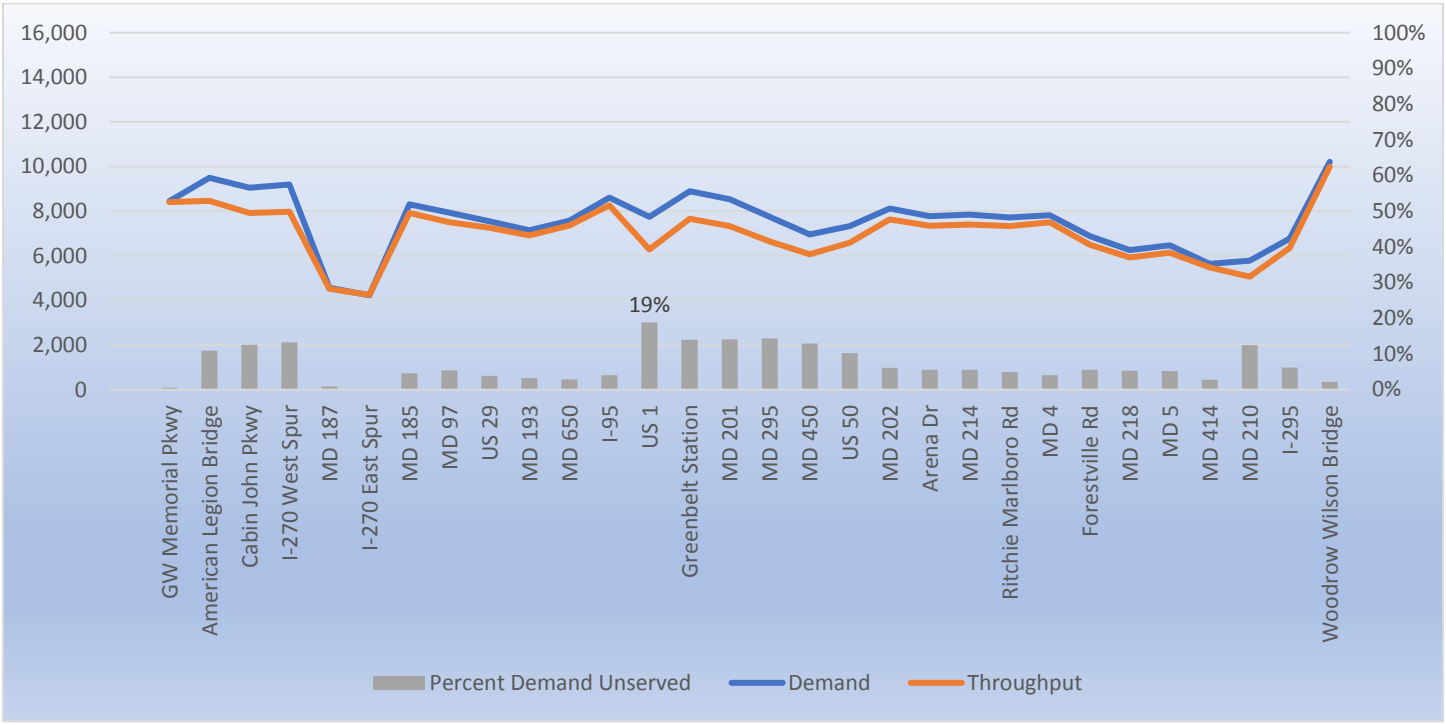
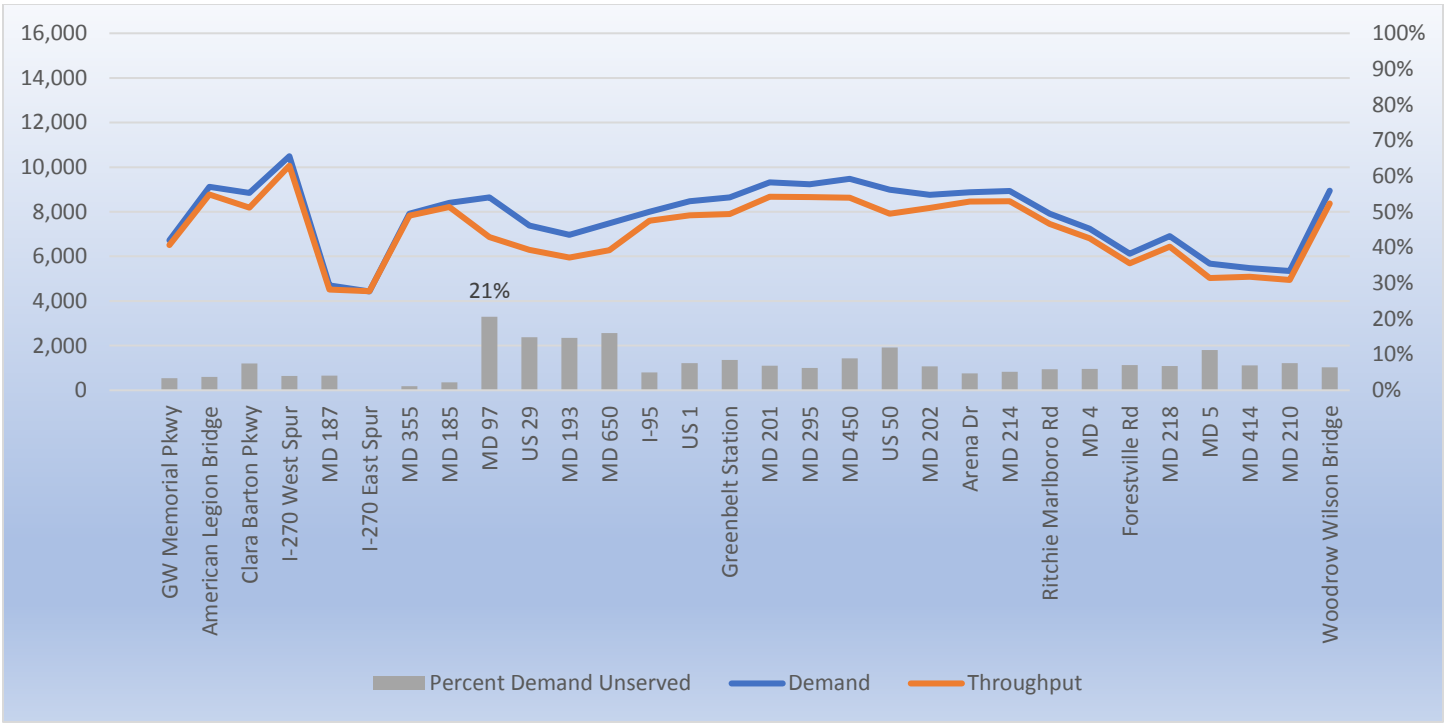


Figure 5-58: I-495 2025 Alternative 1/No Build 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 5-59: I-495 2025 Alternative 1/No Build 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

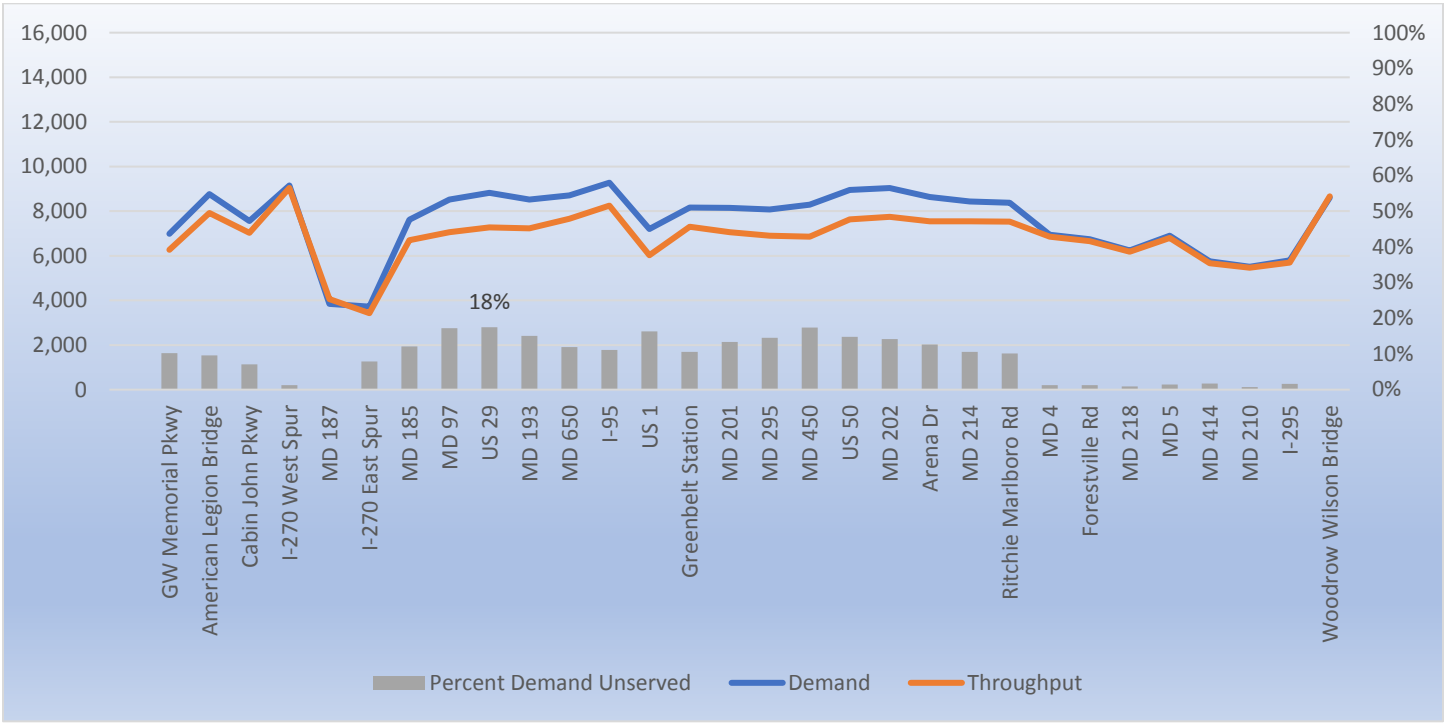
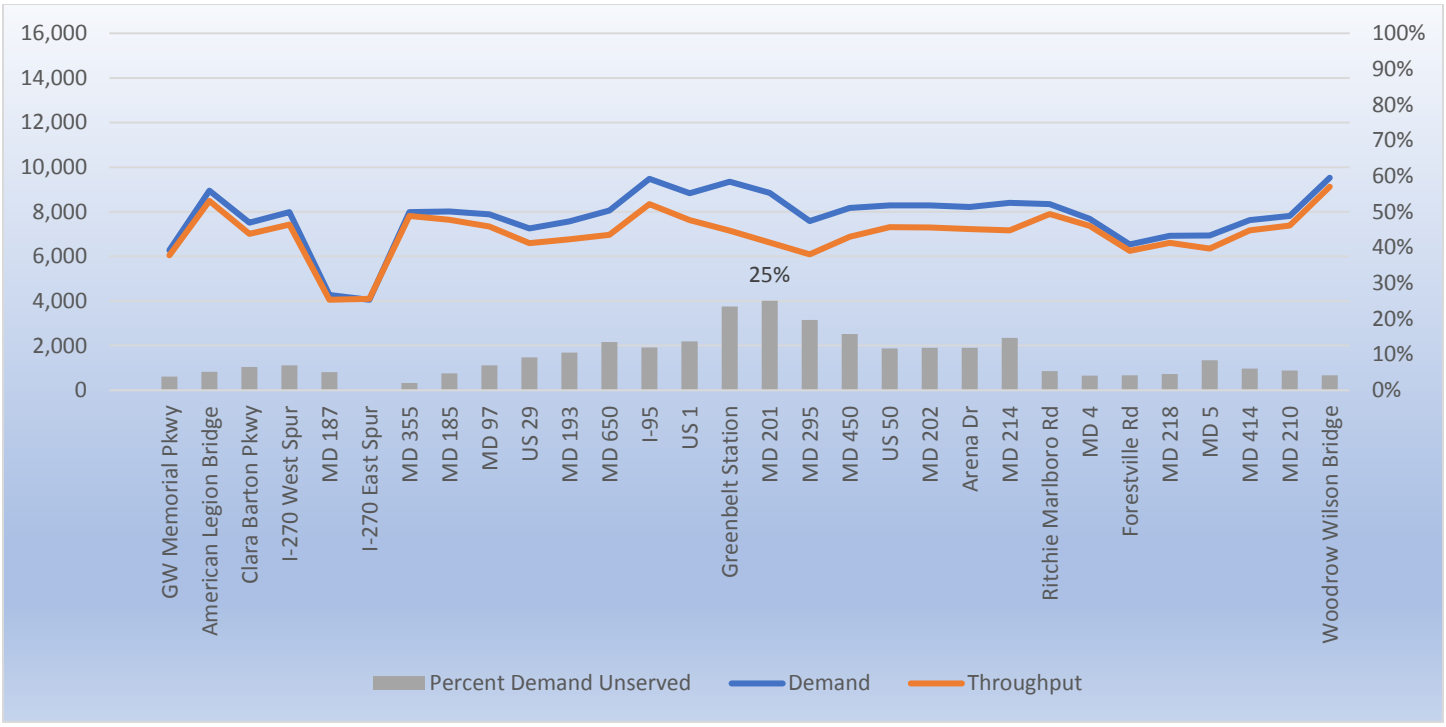


Figure 5-60: I-495 2025 Alternative 1/No Build 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 5-61: I-270 2025 Alternative 1/No Build 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

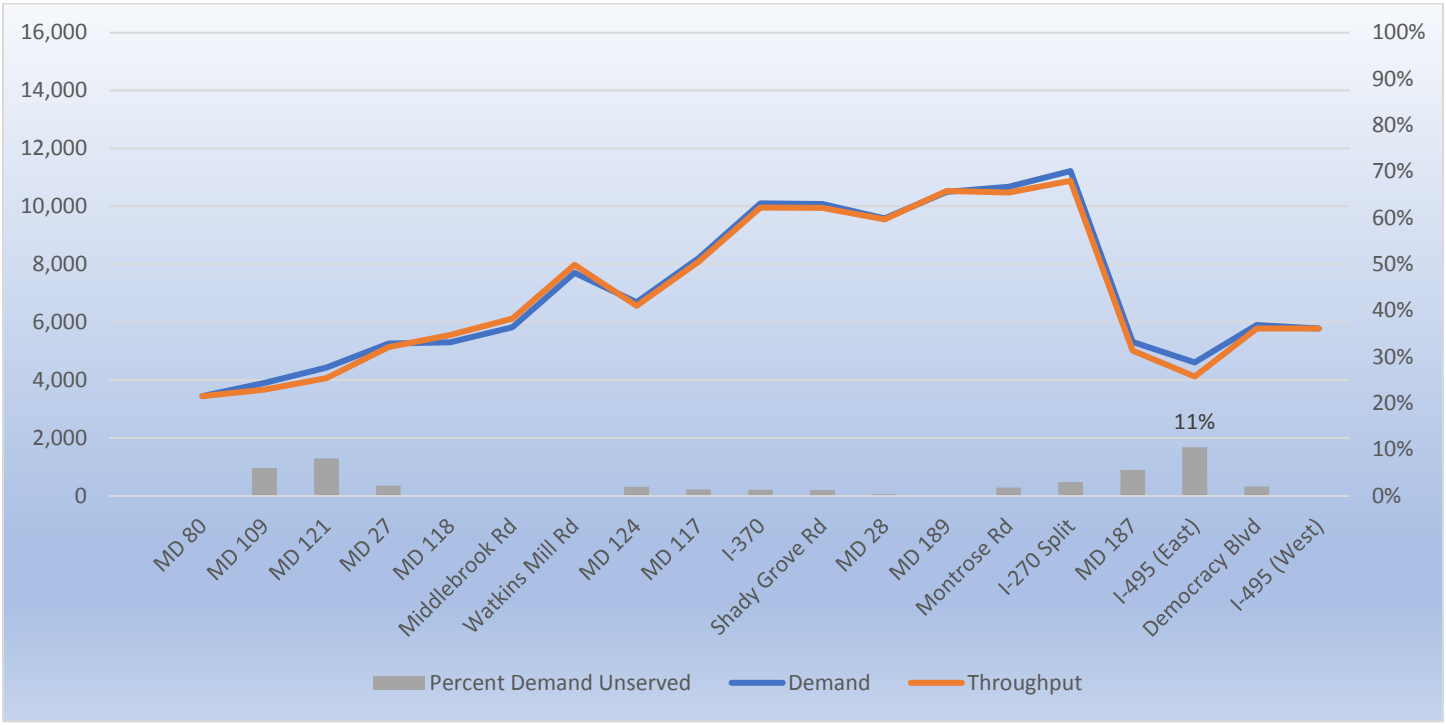
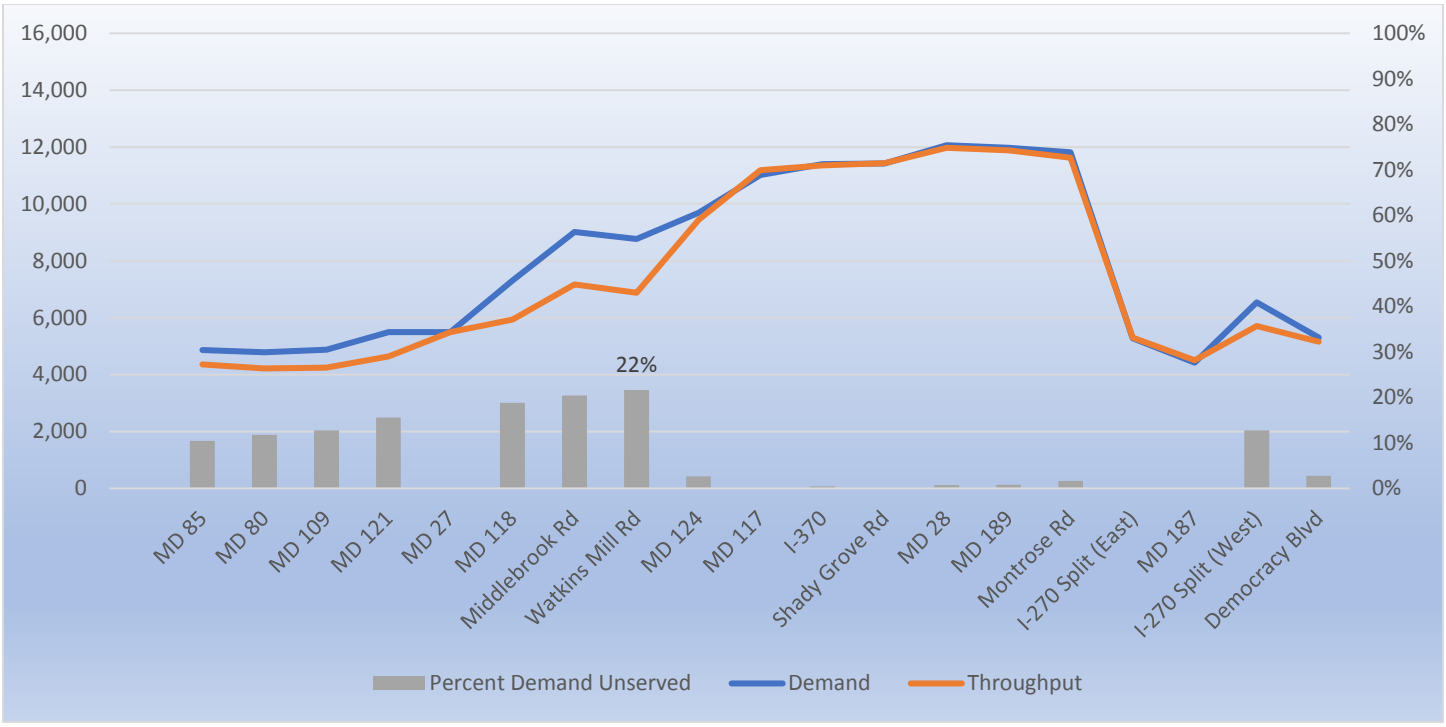


Figure 5-62: I-270 2025 Alternative 1/No Build 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 5-63: I-495 2040 Alternative 1/No Build 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

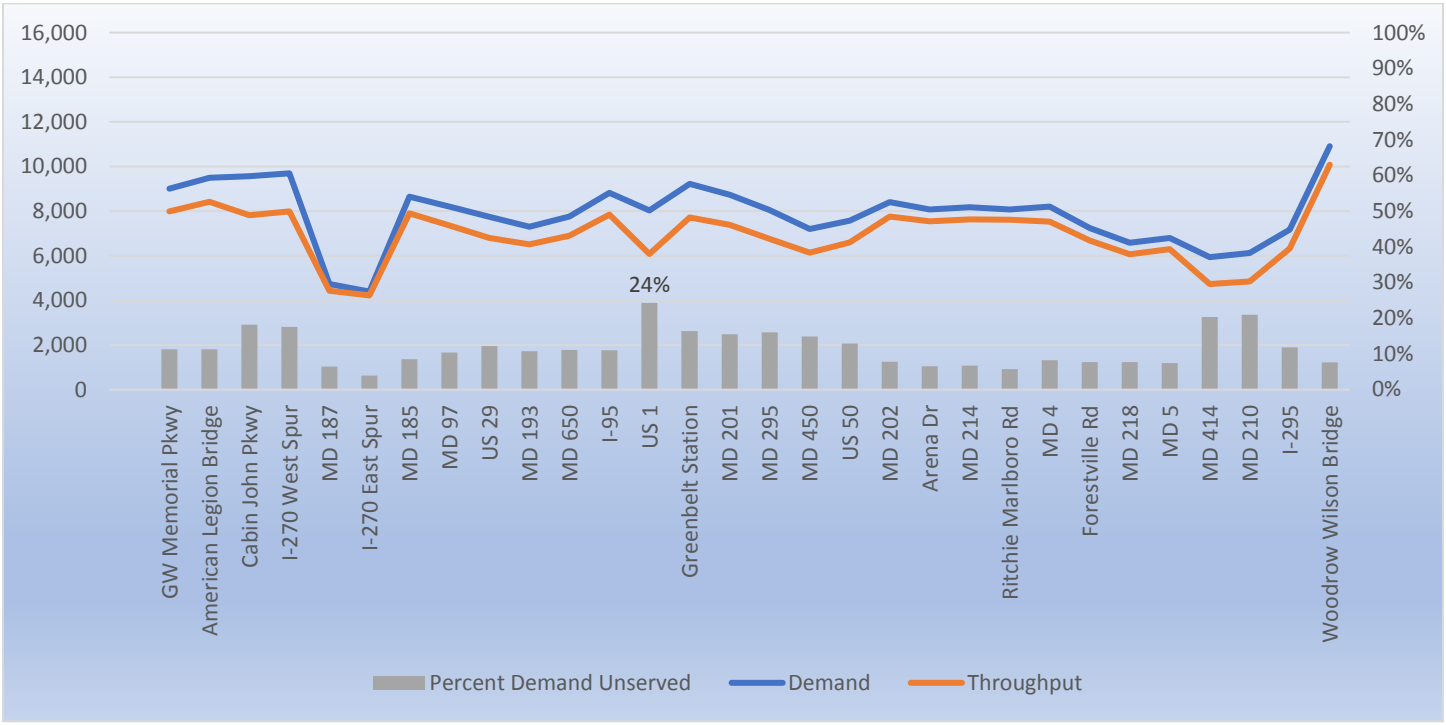
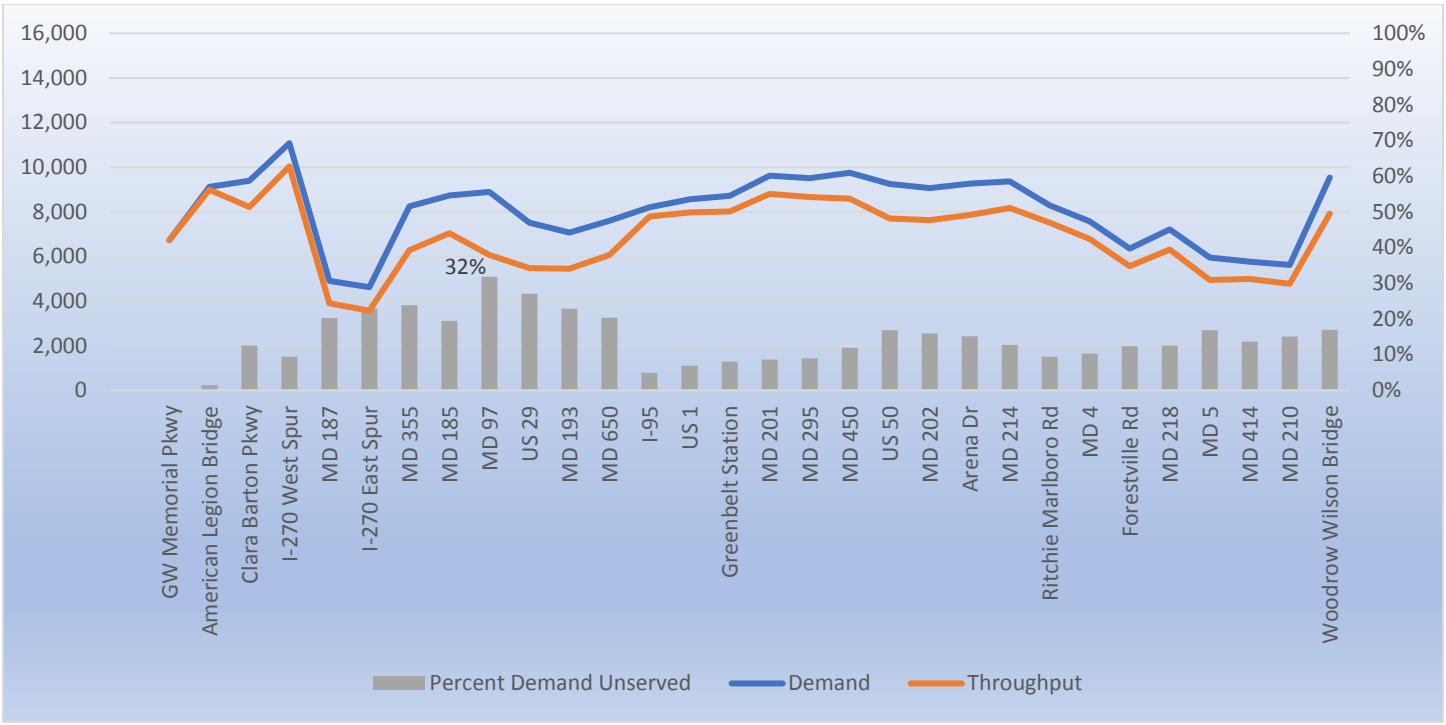


Figure 5-64: I-495 2040 Alternative 1/No Build 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 5-65: I-495 2040 Alternative 1/No Build 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

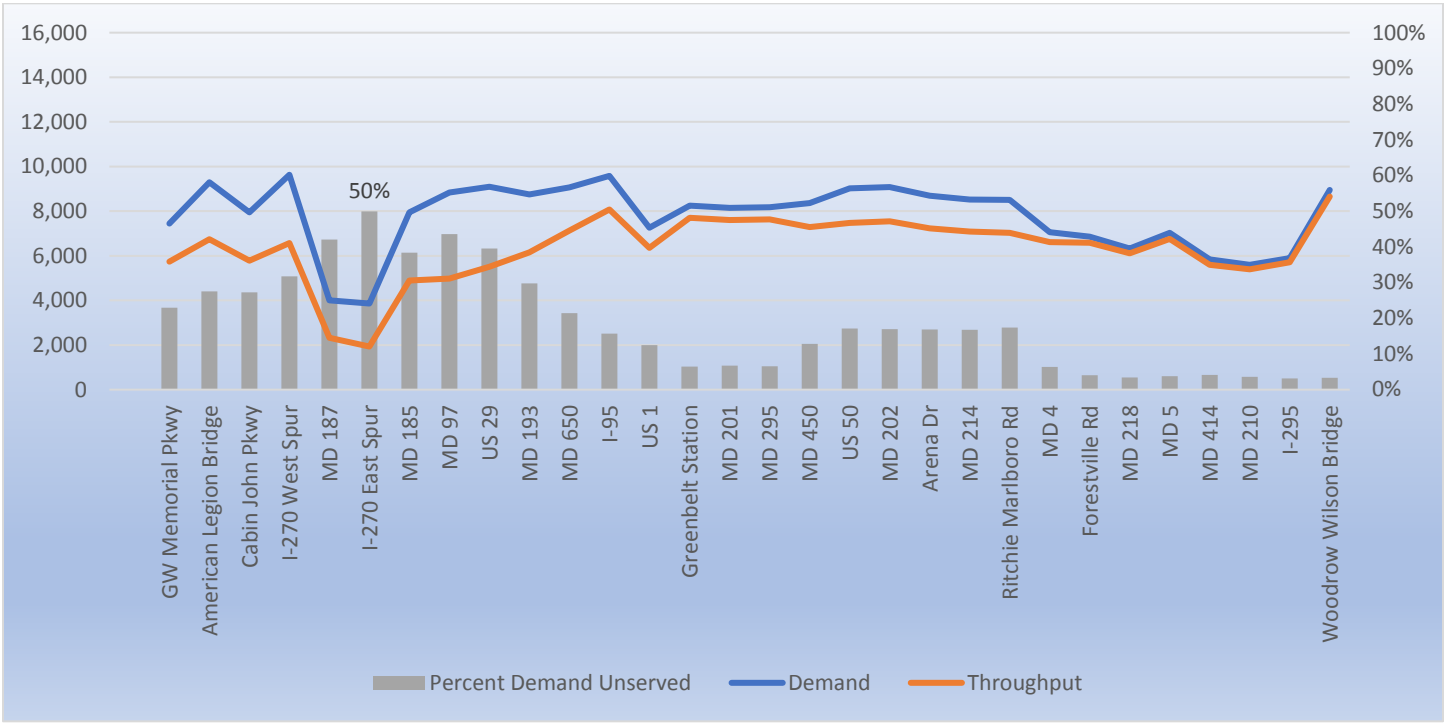
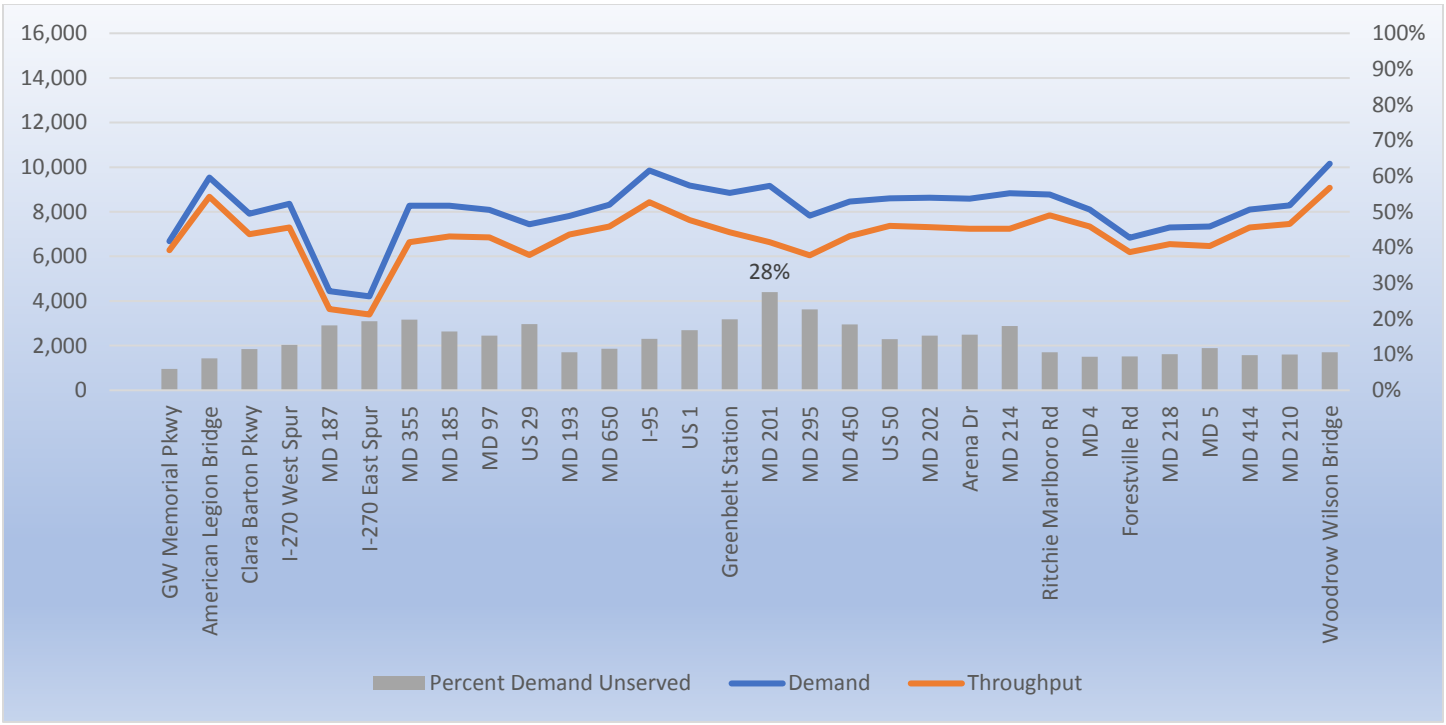


Figure 5-66: I-495 2040 Alternative 1/No Build 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Figure 5-67: I-270 2040 Alternative 1/No Build 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

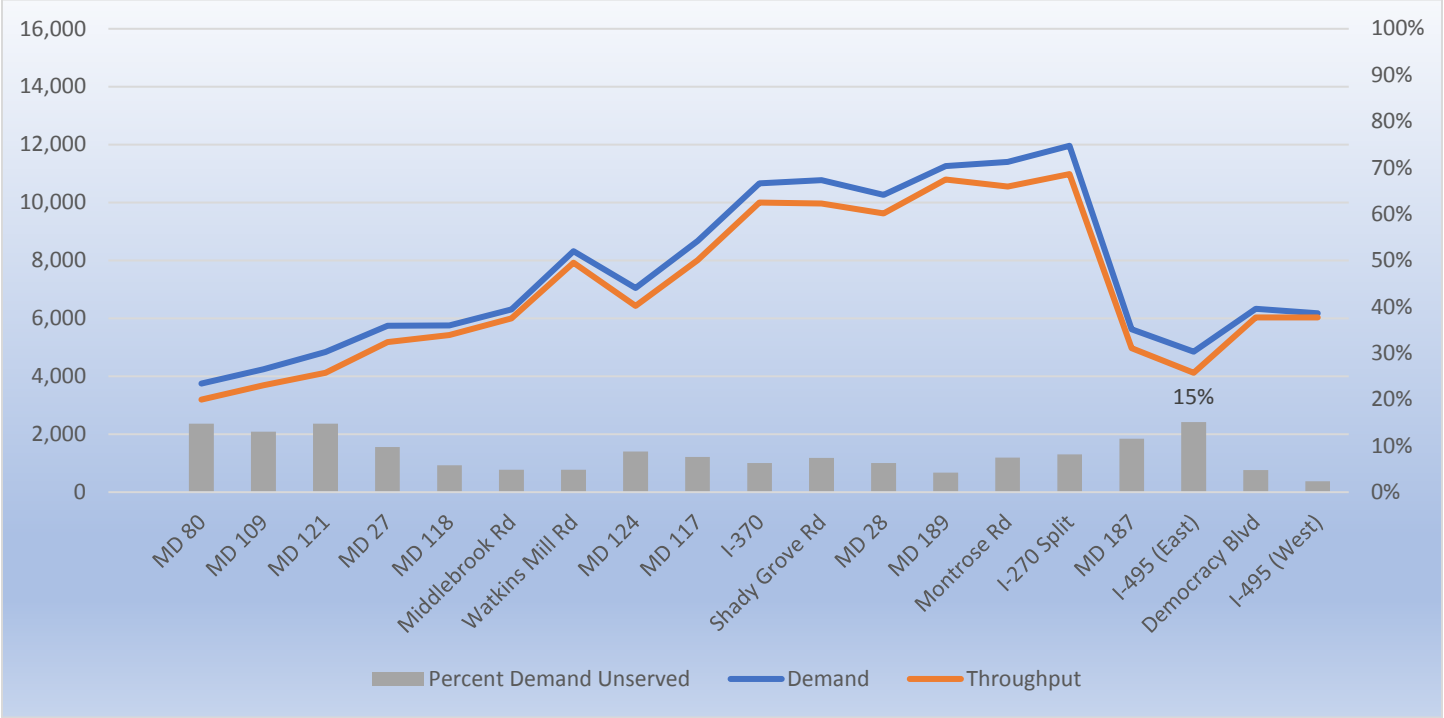
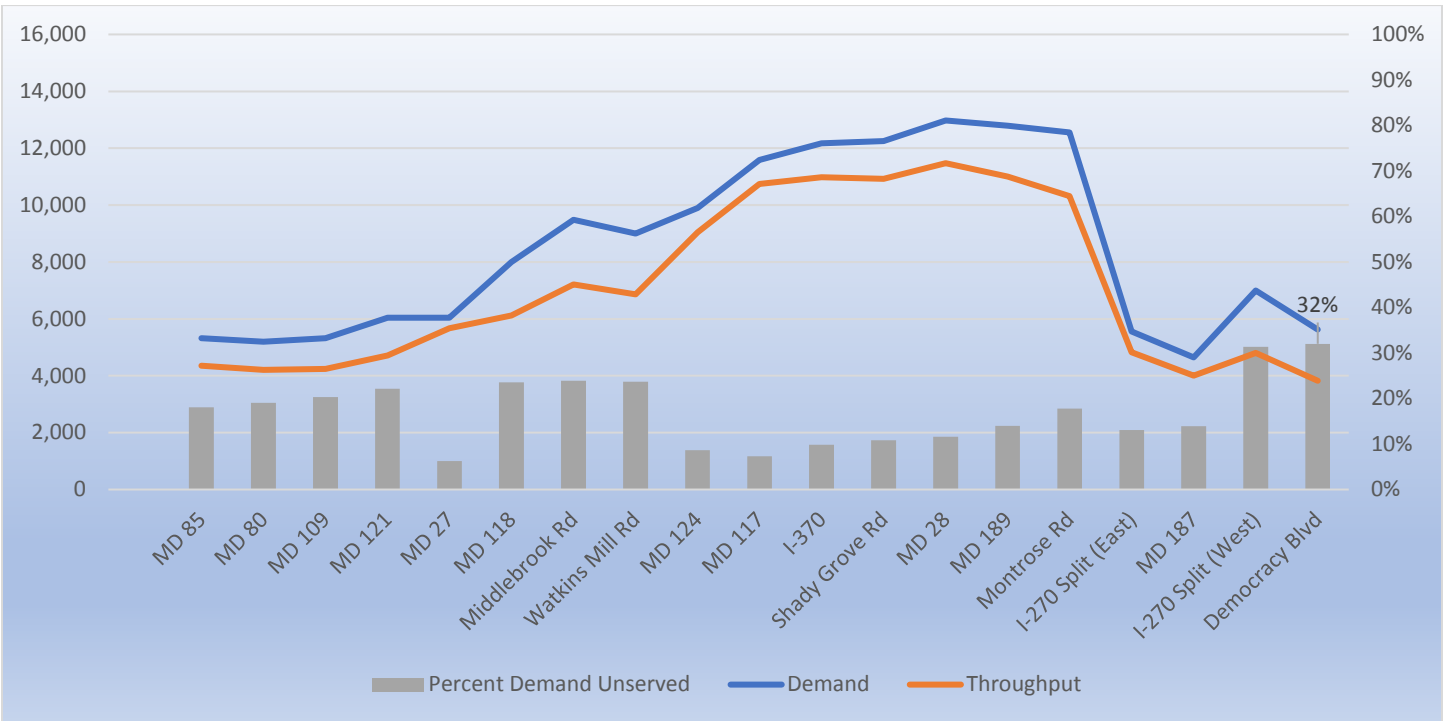


Figure 5-68: I-270 2040 Alternative 1/No Build 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved



Demand Unserved is the demand that is not met; it is shown as the percent difference between demand and throughput.

Throughput results at key locations from VISSIM for each of the Screened Alternatives are shown in **Tables 5-15 through 5-18**. Results are reported in terms of percent increase in vehicle-throughput and person-throughput for each Screened Alternative compared to Alternative 1/No Build, to the nearest 5 percent.

Table 5-15: Summary of 2040 Screened Alternatives Vehicle Throughput Results (veh/hr)

Location	2017 Existing	2040 Alt 1/ No Build	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
AM Peak Hour (7-8 AM) – Both Directions								
I-495 at American Legion Bridge	17,100	17,400	20,100	22,200	22,300	22,800	21,800	22,400
I-495 West of I-95	14,600	13,900	16,000	19,000	19,200	19,100	19,000	19,700
I-495 at MD 5	12,400	12,600	12,800	15,600	14,000	14,100	14,500	15,300
I-270 at Montrose Rd	16,200	17,100	18,000	21,000	19,000	21,400	18,300	19,700
PM Peak Hour (4-5 PM) – Both Directions								
I-495 at American Legion Bridge	16,300	15,400	18,800	18,800	20,900	20,800	20,000	20,300
I-495 West of I-95	15,600	15,400	19,100	21,500	21,300	21,500	20,200	21,500
I-495 at MD 5	13,600	13,900	15,100	13,900	15,700	15,700	15,700	15,900
I-270 at Montrose Rd	18,400	18,000	16,100	18,500	20,200	22,300	16,900	20,000

Table 5-16: Summary of 2040 Screened Alternatives Person Throughput Results (persons/hr)

Location	2017 Existing	2040 Alt 1/ No Build	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
AM Peak Hour (7-8 AM) – Both Directions								
I-495 at American Legion Bridge	20,300	20,800	24,600	27,900	27,900	28,700	27,300	28,200
I-495 West of I-95	17,000	16,100	19,600	23,800	23,900	23,800	23,600	24,500
I-495 at MD 5	14,700	15,000	15,900	19,200	17,300	17,300	17,800	18,800
I-270 at Montrose Rd	19,900	20,900	22,400	25,500	24,400	26,900	23,200	24,500
PM Peak Hour (4-5 PM) – Both Directions								
I-495 at American Legion Bridge	21,200	20,200	25,400	25,900	28,600	28,700	27,400	28,000
I-495 West of I-95	19,700	19,500	25,700	29,700	29,200	29,500	27,800	29,600
I-495 at MD 5	17,600	18,300	20,800	19,200	21,800	21,700	21,700	21,900
I-270 at Montrose Rd	24,400	24,000	22,500	24,700	28,500	30,800	23,300	26,800

Table 5-17: 2040 Screened Alternatives Percent Change in Vehicle Throughput vs. 2040 Alternative 1/No Build

Location	2017 Existing	2040 Alt 1/ No Build	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
AM Peak Hour (7-8 AM) – Both Directions								
I-495 at American Legion Bridge	N/A	0%	15%	30%	30%	30%	25%	30%
I-495 West of I-95	N/A	0%	15%	35%	40%	35%	35%	40%
I-495 at MD 5	N/A	0%	0%	25%	10%	10%	15%	20%
I-270 at Montrose Rd	N/A	0%	5%	25%	10%	25%	5%	15%
PM Peak Hour (4-5 PM) – Both Directions								
I-495 at American Legion Bridge	N/A	0%	20%	20%	35%	35%	30%	30%
I-495 West of I-95	N/A	0%	25%	40%	40%	40%	30%	40%
I-495 at MD 5	N/A	0%	10%	< 0%	15%	15%	10%	15%
I-270 at Montrose Rd	N/A	0%	< 0%	5%	10%	25%	< 0%	10%

≤0%	>0% to <10%	≥10% to <20%	≥20% to <30%	≥30%

Table 5-18: 2040 Screened Alternatives Percent Change in Person Throughput vs. 2040 Alternative 1/No Build

Location	2017 Existing	2040 Alt 1/ No Build	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
AM Peak Hour (7-8 AM) – Both Directions								
I-495 at American Legion Bridge	N/A	0%	20%	35%	35%	40%	30%	35%
I-495 West of I-95	N/A	0%	20%	50%	50%	50%	45%	50%
I-495 at MD 5	N/A	0%	5%	30%	15%	15%	20%	25%
I-270 at Montrose Rd	N/A	0%	5%	20%	15%	30%	10%	15%
PM Peak Hour (4-5 PM) – Both Directions								
I-495 at American Legion Bridge	N/A	0%	25%	30%	40%	40%	35%	40%
I-495 West of I-95	N/A	0%	30%	50%	50%	50%	45%	50%
I-495 at MD 5	N/A	0%	15%	5%	20%	20%	20%	20%
I-270 at Montrose Rd	N/A	0%	< 0%	5%	20%	30%	< 0%	10%

≤0%	>0% to <10%	≥10% to <20%	≥20% to <30%	≥30%

Most of the Build Screened Alternatives provide significant throughput benefits during the AM peak period compared to Alternative 1/No Build. The exception is Alternative 5, which provides no additional vehicle throughput on I-495 at MD 5 during the AM peak period or on I-270 at Montrose Road during the PM peak period compared to the No Build, and provides the smallest throughput benefit at the other three key locations studied. Alternative 13B also provides no vehicle throughput benefit on I-270 at Montrose Road during the PM peak period compared to the No Build. Alternative 10 performed the best during the PM peak period. Of the Screened Alternatives, Alternative 10 provides the highest amount of throughput during the PM peak period at all four key locations studied. Conversely, some Build Screened Alternatives provide no benefit in throughput compared to Alternative 1/No Build at certain locations during the PM peak. Alternatives 5 and 13B did not provide any vehicle throughput or person throughput benefits on I-270 at Montrose Road. Benefits of increased throughput on the highway include reduced peak spreading (i.e., less congestion in the off-peak hours) and reduced burden on the surrounding roadway network.

5.4 System-Wide Delay

System-wide delay reflects the average amount of time each vehicle in the VISSIM simulation model is delayed while trying to reach their destination. Delay can be caused by slow travel due to congestion or when vehicles must yield right-of-way at an intersection. System-wide delay is reported in the units of minutes per vehicle. The results were generated from the simulation model outputs and are shown in **Table 5-19**. For the raw delay values, lower numbers are better, reflecting a reduction in congestion. For the percent improvement compared to Alternative 1/No Build, higher numbers are better, reflecting a greater benefit.

With Alternative 1/No Build, system-wide delay during the AM peak period is projected to increase from 4.45 minutes per vehicle in 2017 to 8.77 minutes per vehicle in 2040, a 97% increase. During the PM peak period, system-wide delay is projected to increase from 4.00 minutes per vehicle in 2017 to 11.78 minutes per vehicle in 2040, a 195% increase.

Alternative 9 and Alternative 10 have the best results. Both alternatives result in a delay savings of greater than 30 percent during the AM and PM peak periods compared to Alternative 1/No Build, which is the baseline. Alternative 8 and Alternative 13C also perform well during the PM peak period but provide less benefit during the AM peak period than Alternative 9 and Alternative 10. While both alternatives are better than Alternative 1/No Build, they lag the other alternatives in terms of delay savings, particularly during the PM peak, although Alternative 13B does outperform Alternative 8 and Alternative 13C during the AM peak period. Alternative 5 has the least delay savings in both the AM and PM.

Table 5-19: Summary of 2040 Screened Alternatives System-Wide Delay Results

Alternative	AM Peak Period		PM Peak Period	
	Average Delay (min/veh)	Percent Improvement vs. No Build	Average Delay (min/veh)	Percent Improvement vs. No Build
Existing	4.45	N/A	4.00	N/A
2040 Alternative 1/No Build	8.77	0%	11.78	0%
2040 Alternative 5	7.02	20%	9.15	22%
2040 Alternative 8	6.73	23%	7.90	33%
2040 Alternative 9	5.77	34%	7.87	33%
2040 Alternative 10	5.68	35%	7.73	34%
2040 Alternative 13B	6.40	27%	9.17	22%
2040 Alternative 13C	6.48	26%	7.73	34%

<20%	≥20% to <25%	≥25% to <30%	≥30%

5.5 Density and Level of Service (LOS)

Alternative 1/No Build speed, density, and LOS along the study corridors are summarized in the **Figures 5-69 and 5-70**. Speed (miles per hour), density (passenger cars per hour per lane), and LOS for each segment and for each Screened Alternative are included in **Appendix H**. In evaluating density, the percentage of lane-miles operating at LOS F was calculated within the Study limits during the AM peak period and the PM peak period. The results are shown in **Table 5-20** and were generated from the VISSIM outputs. Lower percentages are better, reflecting fewer failing roadway segments. With Alternative 1/No Build, the percentage of lane miles operating at LOS F along the study corridors will increase from 21% in 2017 to 28% in 2040 during the AM peak period and from 38% in 2017 to 53% in 2040 during the PM peak period.

Alternative 9 had the lowest percentage of failing segments during both the AM and PM peak periods, with only 12 percent of the lane-miles projected to operate at LOS F during both peak period in 2040. Alternative 5 had the highest percentage of failing segments of the Build Screened Alternatives. However, all Build Screened Alternatives performed significantly better than Alternative 1/No Build, in which 28 percent of the system is projected to fail during the AM peak hour and 53 percent is projected to fail during the PM peak hour.

Table 5-20: Summary of 2040 Screened Alternatives Percent of Lane Miles Operating at LOS F

Alternative	AM Peak	PM Peak
Existing	22%	38%
2040 Alternative 1/No Build	28%	53%
2040 Alternative 5	21%	20%
2040 Alternative 8	14%	14%
2040 Alternative 9	12%	12%
2040 Alternative 10	15%	14%
2040 Alternative 13B	14%	12%
2040 Alternative 13C	18%	12%

≥0% to <15%	≥15% to <20%	≥20% to <25%	≥25%

Based on density; LOS F is reached at a density of 45 passenger cars per mile per lane (pc/mi/ln).

Figure 5-69: 2040 Alternative 1/No Build AM Segment Level of Service (LOS)

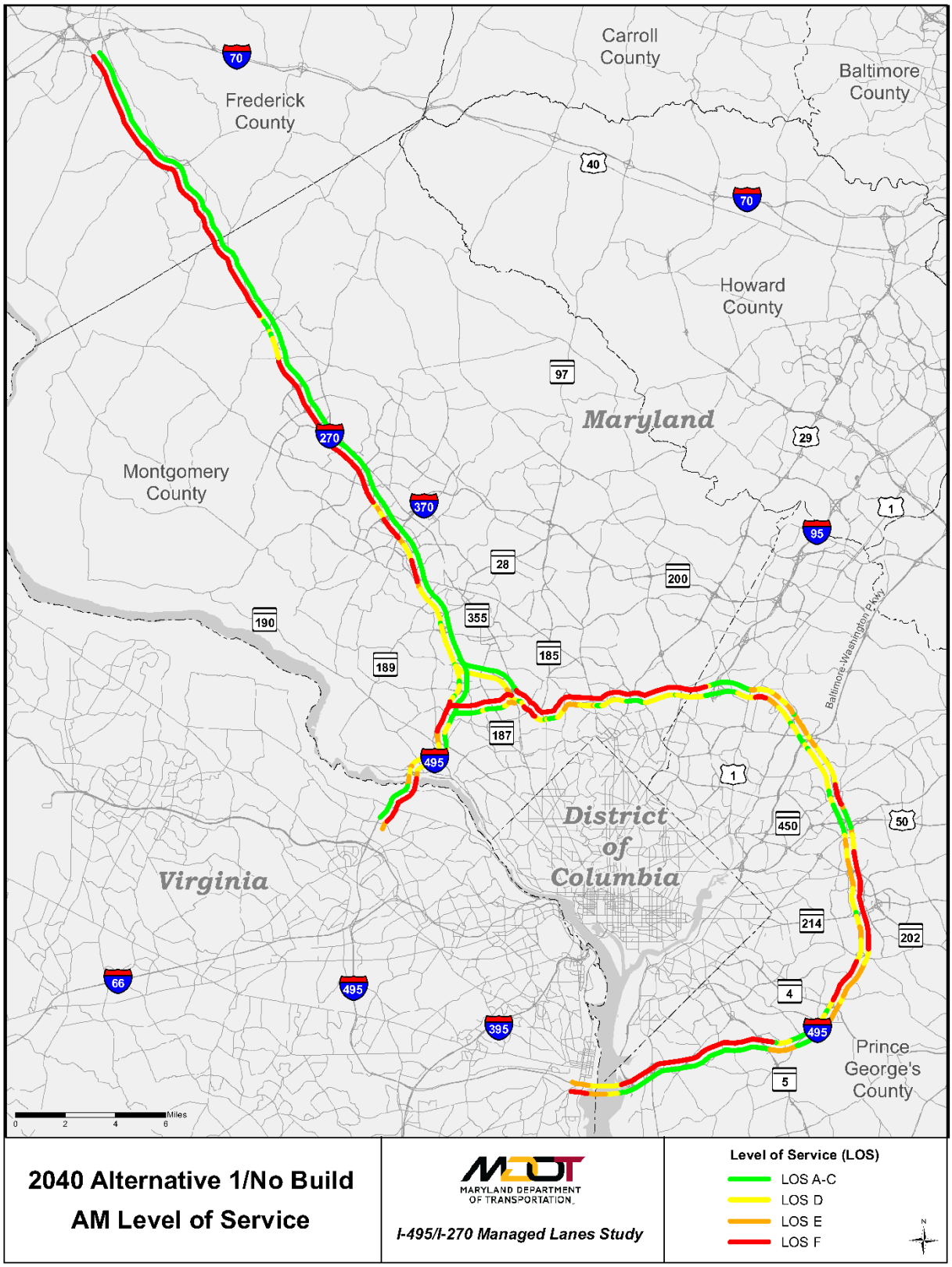
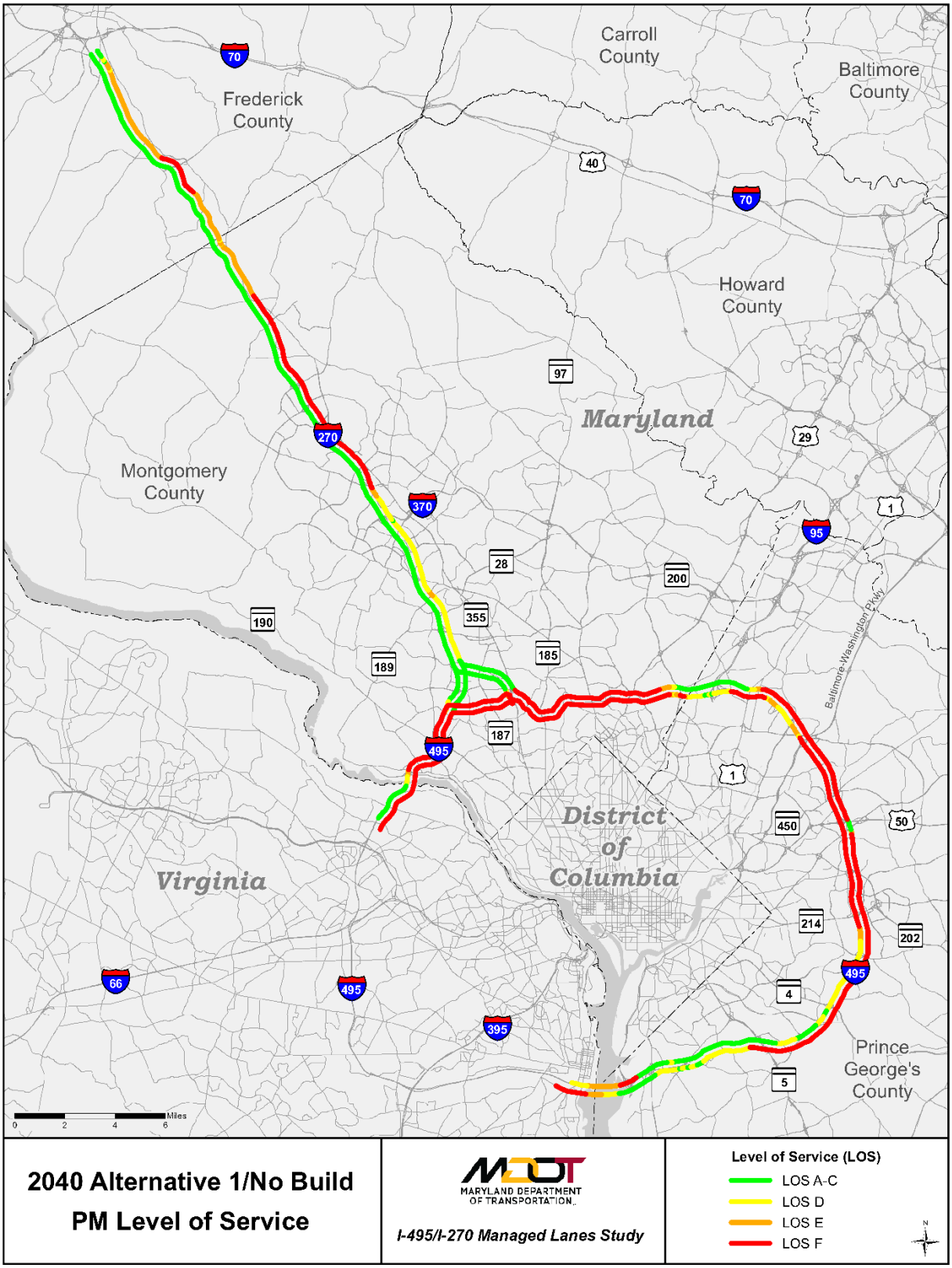


Figure 5-70: 2040 Alternative 1/No Build PM Segment Level of Service (LOS)



5.6 Travel Time Index

Key Points

- Alternative 9 had the best TTI values during the AM peak, with no segments ranked as "severe"
- Alternative 13C had the poorest TTI values during the AM peak, with I-270 Southbound ranked as "severe"
- Alternatives 10 and 13C had the best TTI values during the PM peak, although one segment of Alternative 10 was ranked as "severe"
- Alternative 5 had the poorest TTI values during the PM peak, with three segments ranked as "severe"

While corridor travel time and speed provide a good way to compare alternatives, few vehicles will travel from one end to the other during their trip, particularly along I-495. Therefore, the Travel Time Index (TTI) metric, defined earlier in this report, was evaluated for shorter trip segments. The TTI also serves as a proxy for assessing reliability. While the Planning Time Index (PTI) is traditionally used as a measure for reliability, the PTI cannot be directly calculated for future travel times. However, there is a strong correlation between TTI and PTI values. The TTI represents the 50th percentile travel time, while the PTI represents the 95th percentile travel time. TTI values were calculated for the general-purpose lanes of eight total highway segments, including four segments in each direction: I-495 from the George Washington Memorial Parkway to I-270, I-495 from I-270 to I-95, I-495 from I-95 to MD 5, and I-270 from I-495 to I-370. The results are shown in **Table 5-21** and were generated from the VISSIM outputs.

For this metric, Alternative 9 performs the best during the AM peak. Three of the eight segments had a TTI value in the "uncongested" category for Alternative 9, with two others in the "moderate" category, and the remaining three in the "heavy" category. Alternative 13C performs the poorest during the AM peak, with the segment of I-270 southbound experiencing a TTI value of 2.2 (in the "severe" category). None of the segments operated in the "severe" category for Alternatives 5, 8, 9, or 10 during the AM peak period.

Alternative 10 and 13C performs the best in terms of TTI during the PM peak. Although the segment of the I-495 Inner Loop from I-270 to I-95 was in the "severe" category, Alternative 10 experienced the lowest TTI of the Screened Alternatives for this segment. Additionally, the other seven segments had TTI values of 1.6 or less for Alternative 10 and Alternative 13C. Alternative 5 performs the poorest during the PM peak, with three segments in the "severe" category. For the majority of the segments, Alternative 1/No Build has the worst TTI value.

Some segments show degradations in the TTI in the Build Screened Alternatives as compared to Alternative 1/No Build. The TTI in Alternative 1/No Build is low in these segments due to upstream bottlenecks. The main bottleneck along the I-495 Inner Loop is at the American Legion Bridge, where congestion occurs outside of the study area. After widening the American Legion Bridge in the Build Screened Alternatives, there is increased throughput across the bridge, increasing the downstream travel time from the American Legion Bridge to I-95 relative to Alternative 1/No Build, in which traffic is metered by the bridge. As stated above, for the majority of segments, Alternative 1/No Build has the worst TTI value.

It should be noted that all managed lane segments were projected to operate at uncongested levels of less than 1.15, and therefore the results above only compared operations in the general-purpose lanes. However, according to the National Cooperative Highway Research Program (NCHRP) Report 03-96,

Analysis of Managed Lanes on Freeway Facilities, "For a single managed lane facility, a slow-moving vehicle drags down the speed of vehicles following it, much like it would on a two-lane highway or a single-lane tunnel. On the contrary, multi-lane managed lane facilities allow opportunities for passing, and the impact of slow-moving vehicles is expected to be lower, at least until higher flow levels are reached." This report documented a Case Study (I-880 in San Francisco) where the operating speed at capacity was lower than the expected speed because the speed on the HOV lane was governed by the slowest moving vehicle. Since the studied facility was a single HOV lane facility, "the HOV speed reduction was contributed to a 'snail' effect, meaning that the speed on the HOV lane was governed by the slowest moving vehicle. Since passing was constrained on the single HOV lane, vehicles were trapped behind the 'snail' when general-purpose lanes are heavily congested. As the traffic flow increased, so did the number of slow drivers." Based on this research, a separate metric was applied to differentiate the TTI in the managed lanes for each Screened Alternative.

5.7 Freight

The ability to move freight, services, and commuting employees efficiently through the Study corridors is heavily influenced by the performance of I-495 and I-270. It is closely tied to TTI, vehicle throughput, and effects on the local roadway network.

- According to the Federal Highway Administration's "Freight Analysis Framework Inter-Regional Commodity Flow Forecast Study" (May 2016), freight in the United States is expected to grow by 40% over the forecast period of 2012 to 2045. As the Maryland Port and BWI Airport grow and expand, MDOT and the modal TBU's have and will continue to coordinate to maintain and mitigate the freight network by ensuring the safety, reliability and mobility of goods and people in and out of Maryland.
- Since the managed lanes will provide improvements to the travel times, speeds, reliability, and vehicle throughputs on I-495 and I-270 in both the managed lanes and general-purpose lanes, those benefits will also positively effect freight and truck travel. Additionally, FHWA's Office of Freight Management and Operations monitors interstate as part of the Freight Performance Measures Initiative. Through this, the nation's worst bottlenecks for freight movements are identified. Four of the top 100 locations are in Maryland and two are included in the Study area: I-495 at I-95 and I-495 at I-270.
- The managed lanes will improve the movement of cars, which would reduce peak period length, and separate truck travel (typically off peak) from the cars that can better be served during the peaks. With reduced congestion and reduced spread of peak periods by the managed lanes corridors, more cars will be served during the peaks, which provides the potential for safety benefits associated with truck/car conflicts.

Table 5-21: Summary of 2040 Screened Alternatives Travel Time Index (TTI) Results for General-Purpose Lanes

Corridor	2017 Existing	2040 Alt 1/ No Build	2040 Alt 5	2040 Alt 8	2040 Alt 9	2040 Alt 10	2040 Alt 13B	2040 Alt 13C
AM Peak Period								
I-495 Inner Loop from George Washington Memorial Pkwy to I-270	1.4	2.1	1.6	1.6	1.3	1.3	1.8	1.6
I-495 Outer Loop from I-270 to George Washington Memorial Pkwy	1.2	1.2	1.7	1.3	1.7	1.7	1.7	1.6
I-495 Inner Loop from I-270 to I-95	1.0	1.0	1.5	1.2	1.3	1.2	1.2	1.2
I-495 Outer Loop from I-95 to I-270	2.8	4.3	1.6	1.5	1.6	1.3	2.1	1.8
I-495 Inner Loop from I-95 to MD 5	1.0	1.8	1.5	1.5	1.4	1.5	1.3	1.4
I-495 Outer Loop from MD 5 to I-95	1.2	1.5	1.2	1.0	1.0	1.0	1.0	1.0
I-270 Southbound from I-370 to I-495	2.6	1.5	1.5	1.4	1.1	1.7	1.1	2.2
I-270 Northbound from I-495 to I-370	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM Peak Period								
I-495 Inner Loop from George Washington Memorial Pkwy to I-270	3.7	5.5	2.7	4.5	2.6	1.2	1.6	1.6
I-495 Outer Loop from I-270 to George Washington Memorial Pkwy	2.8	2.4	1.4	1.0	1.0	1.0	1.0	1.0
I-495 Inner Loop from I-270 to I-95	2.7	5.0	3.2	2.5	2.6	2.4	2.4	2.6
I-495 Outer Loop from I-95 to I-270	1.1	2.7	1.2	1.1	1.1	1.4	1.1	1.3
I-495 Inner Loop from I-95 to MD 5	1.5	1.8	1.0	1.0	1.0	1.0	1.0	1.0
I-495 Outer Loop from MD 5 to I-95	1.9	2.5	1.2	1.0	1.0	1.0	1.0	1.0
I-270 Southbound from I-370 to I-495	1.0	1.1	3.7	2.0	1.3	1.3	2.6	1.4
I-270 Northbound from I-495 to I-370	1.5	1.0	1.4	1.1	1.3	1.6	1.3	1.2

Uncongested (TTI < 1.15)
Moderate Congestion (1.15 < TTI < 1.3)
Heavy Congestion (1.3 < TTI < 2.0)
Severe Congestion (TTI > 2.0)

5.8 Latent and Induced Demand

Latent demand (or unserved demand) refers to users that are not currently served by the system but would like to use the system. For this Study, this includes trips using local roads and arterials instead of I-270 and I-495 as well as users who may adjust the time of their trip to avoid congested periods. With the additional capacity on the freeways provided by completion of the project, these users can complete their trips using their preferred route on the freeways instead of the local roads. This represents the latent demand served by the project.

Key Points

- Latent demand represents diverted trips. The project will improve the system by serving more latent demand on the freeways instead of on arterials.
- Induced demand represents new trips. While the project may generate some new trips, MWCOG modeling shows that the amount of induced demand caused directly by the project would be less than 1% of the total VMT in the region.
- Induced demand is related in part to increase in job accessibly. The project will increase job accessibility in the region by 10% to 15%.
- The addition of one to two managed lanes along I-495 and I-270 will result in a decrease in vehicle miles traveled of 0.8% to 1.5% along arterials within the network.

The MWCOG travel demand model determines the demand for the transportation system based on land use assumptions, number and type of trips generated by each of those land uses, and the capacity of the existing roadway network. The ability of the project to serve the latent demand can be shown in part by the expected reduction in vehicle miles traveled (VMT) on the arterial routes. Reduction in vehicular through traffic on the local system is important in promoting safer mobility in developed urban/suburban areas. With respect to consideration of induced demand, or the potential for the project to create additional traffic on the arterials because more people will use the arterials to get to the I-270 and I-495 corridors, while some sections of arterials will likely experience this increase, the overall VMT on those routes is expected to be reduced. The overall reduction in VMT along arterials within the network will be between 0.8% and 1.5%.

Induced demand for this project can be described as newly-generated users of the system. These are new trips that would not exist without capacity improvements to transportation. As the land use assumptions do not vary between Alternative 1/No Build and the Build Screened Alternatives, all the trip generators are equal among scenarios: there will not be new housing developments or new places of employment. There is little room for increased land use along I-270 and I-495 as the areas is already built out, and the model already accounts for changes in land use in areas further from these facilities. However, because the project is projected to increase the speeds and reduce travel times along I-270 and I-495, people may make more trips or longer trips. While the model does not show that people will relocate simply to move farther away, people may be willing to drive a longer distance for their trip because that distance is now within their acceptable travel time.

A. Job Accessibility

The creation of induced demand can be seen in part in job accessibility:

- With two Express Toll Lanes, over 160,000 additional commuters within the region will be able to access jobs within 60 minutes, equivalent to nearly 15% increase in job accessibility over 2040 No Build conditions.

- With one Express Toll Lane, over 110,000 additional commuters within the region will be able to access jobs within 60 minutes, equivalent to nearly 10% increase in job accessibility over 2040 No Build conditions.

B. Vehicle Miles Traveled (Total Modeling Area)

Due to the improvements, the total VMT within the modeling area (shown in **Figure 5-71**) does increase slightly, as shown in **Figure 5-72**. The change is based on runs of the approved 2040 MWCOG model, comparing Alternative 1/No Build to the Build scenarios. The only change to the MWCOG model between Alternative 1/No Build and the Build scenarios is the addition of the managed lanes.

- With the addition of two managed lanes using congestion pricing, the entire modeling area in 2040 would be expected to see a small increase of 0.8% in VMT when compared to the 2040 Alternative 1/No Build condition
- With the addition of one managed lane using congestion pricing, the entire modeling area in 2040 would be expected to see a small increase of 0.6% of VMT when compared to the 2040 Alternative 1/No Build condition

Overall, VMT is only expected to increase by less than 1% with Build conditions in comparison to No Build conditions, which indicates that induced demand is not exceedingly high for this project. This is due to the new lanes (i.e., new capacity) being managed. Managing the new lanes will be able to put a limit on how much induced demand can be created by the project.

C. Vehicle Miles Traveled (Arterials)

VMT projections that include only the arterial roadways in Montgomery and Prince George's Counties (i.e., the projections do not include I-495, I-270, or other freeways) decrease between 2040 No Build and Build conditions. These values reflect what would be experienced on the local roads.

- With the addition of two managed lanes using congestion pricing, arterial roadways within Montgomery and Prince George's Counties are expected to experience a decrease of 1.5% in VMT compared to 2040 No Build conditions in the MWCOG model.
- With the addition of one managed lane using congestion pricing, arterial roadways within Montgomery and Prince George's Counties are expected to experience a decrease of 0.8% in vehicular miles of travel compared to 2040 No Build conditions in the MWCOG model.

D. Modeling of Latent Demand

Table 5-22 summarizes the VISSIM simulation network-wide latent demand for the each of the Screened Alternatives, including Alternative 1/No Build. In VISSIM, latent demand refers to the number of vehicles that are unable to enter the network (I-495 and I-270) due to queues that extend outside the network, as measures in vehicles per hour (vph). As shown, with Alternative 1/No Build, latent demand during the AM and PM peak periods is projected to increase from 4,500 vehicles per hour in 2017 to 27,100 vehicles per hour in 2040, an increase of over 500%. Each of the Build Screened Alternatives reduces latent demand by 26% to 44%. **Figures 5-57 to 5-68** include charts that compare throughput and demand volumes and include the percent demand that is unmet. These charts are shown for all analysis hours in **Appendix G**.

Figure 5-71: Modeling Area for Vehicle Miles Traveled

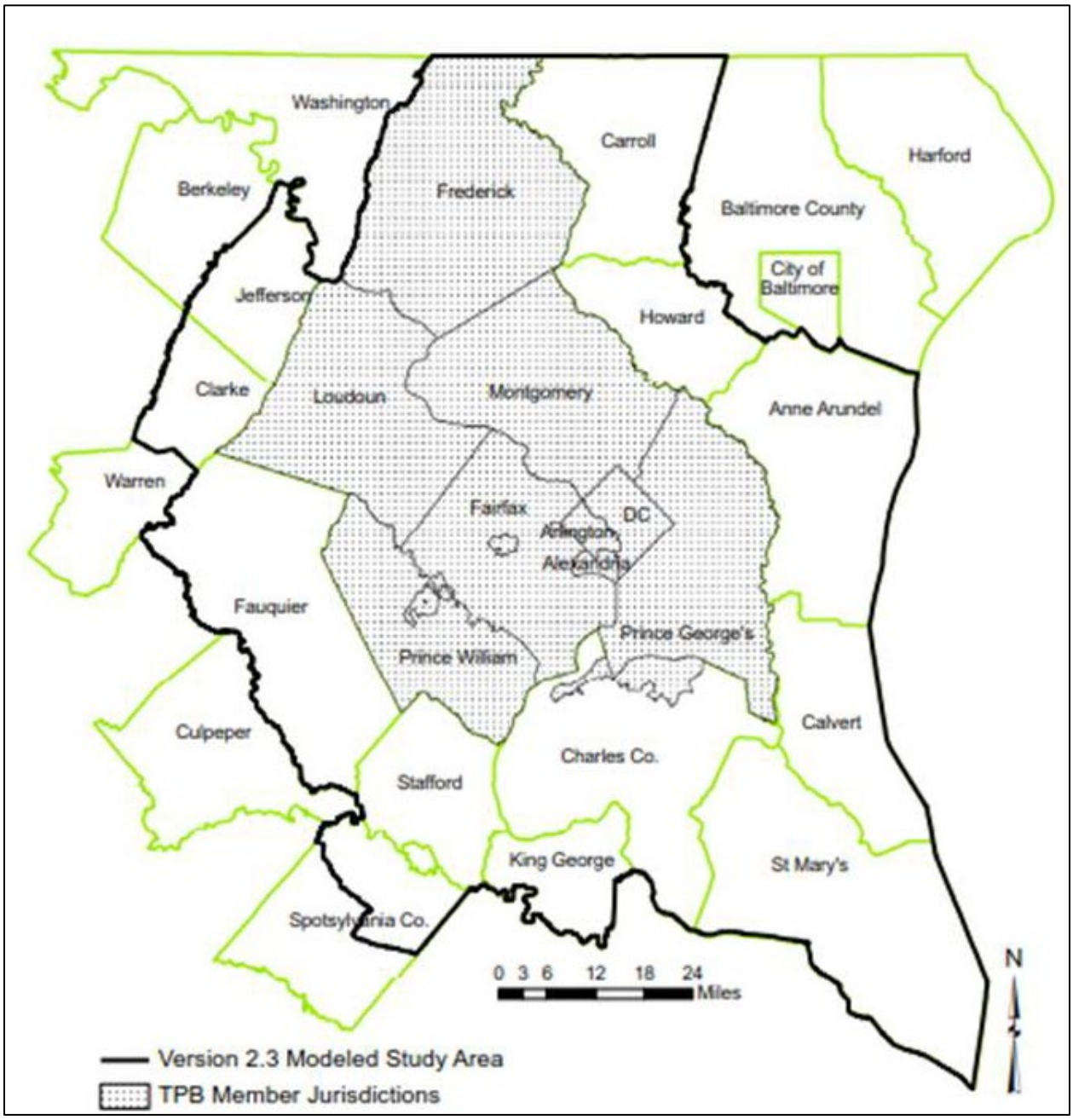


Figure 5-72: Projected 2040 VMT Change, Alternative 1/No Build vs. Two Managed Lanes

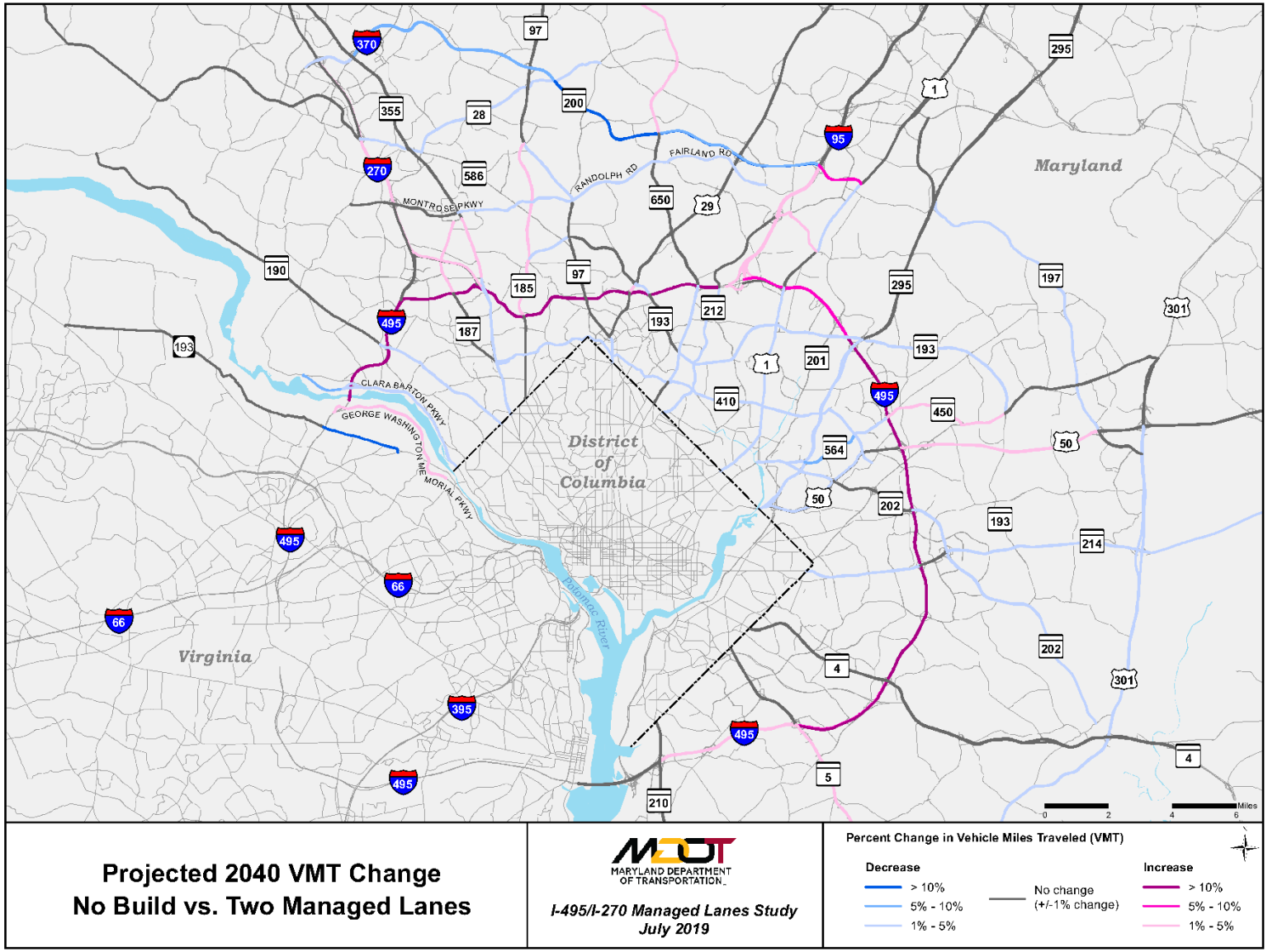


Table 5-22: Summary of 2040 Screened Alternatives Network-wide Latent Demand from VISSIM

Alternative	Latent Demand (vehicles per hour)			Change Compared to Alternative 1/No Build	
	AM Peak	PM Peak	Average	Vehicles per Hour	Percent
2017 Existing	6,900	2,000	4,500	N/A	N/A
2040 Alternative 1/No Build	24,100	30,100	27,100	N/A	N/A
2040 Alternative 5	16,600	22,700	19,700	-7,400	-27%
2040 Alternative 8	15,700	16,800	16,300	-10,800	-40%
2040 Alternative 9	12,100	19,600	15,900	-11,200	-41%
2040 Alternative 10	11,500	19,000	15,300	-11,800	-44%
2040 Alternative 13B	15,000	25,300	20,200	-6,900	-25%
2040 Alternative 13C	13,900	18,200	16,100	-11,000	-41%

≥0% to <10% | ≥10% to <20% | ≥20% to <30% | ≥30%

5.9 Effect on Local Roadway Network

While the focus of the project is to provide benefits to travelers using I-495 and I-270, the project will also have impacts on the surrounding roadway network. This impact was quantified to assist in the evaluation of the Screened Alternatives by calculating the projected reduction in delay on the local road network. The results are shown in **Table 5-23** and **Figure 5-73** and were generated from the MWCOG regional model outputs. Values are presented in terms of total vehicle hours of delay each day on all arterials in Montgomery County, Maryland, Prince George's County, Maryland, and the District of Columbia. With two managed lanes, delay along all arterials in Montgomery County would be reduced by up to 6.4%, and delay along all arterials in Prince George's County would be reduced by up to 7.4%, averaging to a 6.8% reduction along all arterials in both counties. Delay along all arterials in the District of Columbia would be reduced by up to 7.6%. Lower values are better, representing less delay for local travelers. The percent reduction in delay versus Alternative 1/No Build is shown to help compare the relative merit of each of the Screened Alternatives for this metric. Higher values are better, reflecting greater benefit.

The 2040 MWCOG results specific to the MD 185, MD 97, US 29, MD 193 and MD 650 corridors (between MD 410 and the ICC) indicate that additional daily volumes would be expected on MD 185 and US 29, but less daily volume would be expected on MD 97, MD 193, and MD 650, compared to the 2040 Alternative 1/No Build scenario. The segments that are expected to increase are in the vicinity of the I-495 interchanges, with the largest increase along US 29 just north of I-495. Farther from the I-495 interchanges, the volumes on these roadways are expected to decrease compared to the Alternative 1/No Build scenario. For example, US 29 in the vicinity of MD 410 is expected to experience approximately a 3% reduction in daily traffic volumes.

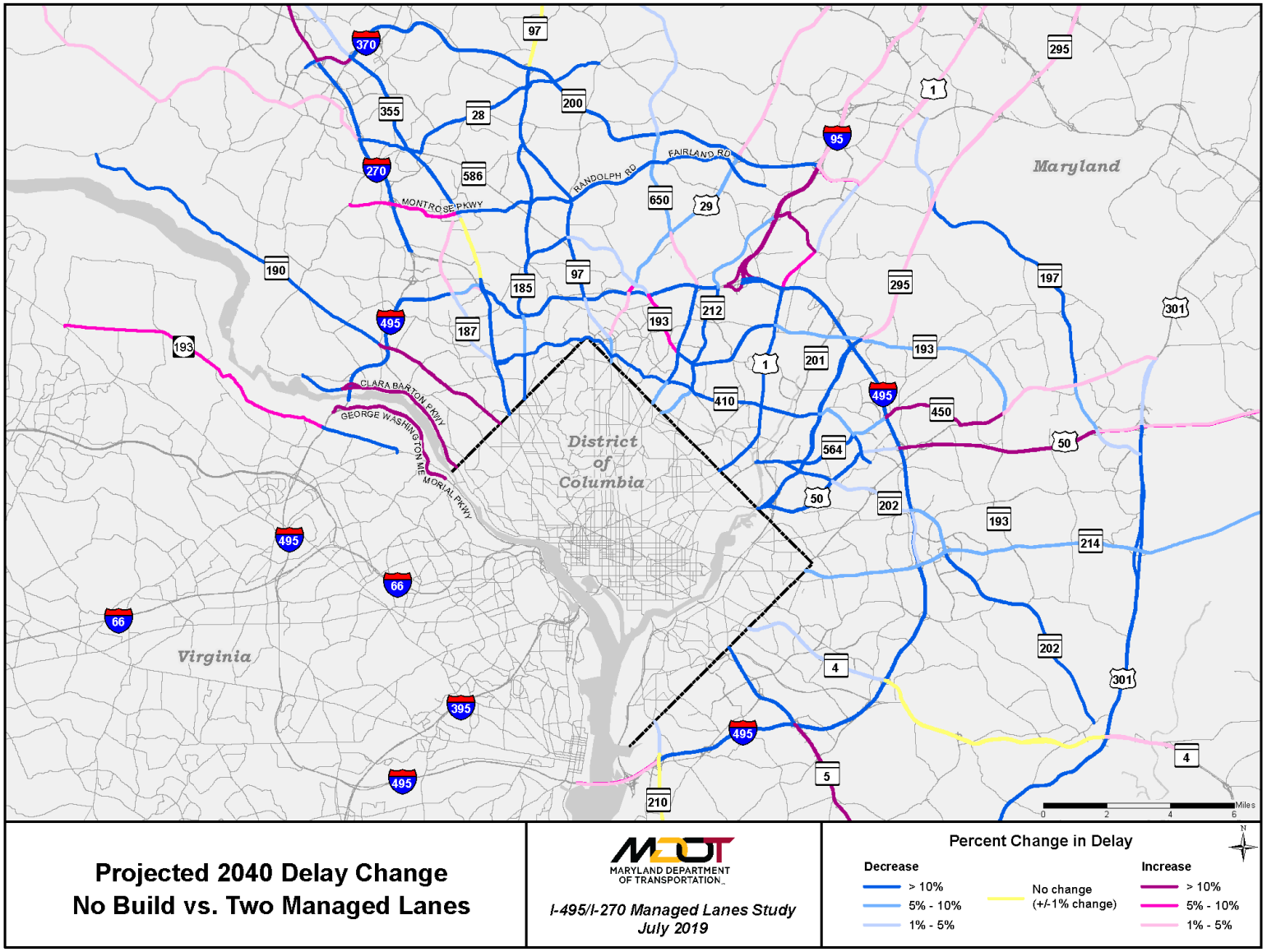
Table 5-23: Summary of 2040 Screened Alternatives Effect on the Local Roadway Network

Metric	Existing	Alternative 1/No Build	Alternative 5	Alternative 8	Alternative 9	Alternative 10	Alternative 13B	Alternative 13C
Montgomery County								
Daily Delay (vehicle-hours) for All Arterials	144,000	247,500	241,600	233,700	231,600	233,100	233,400	234,400
Percent Reduction vs. No Build	N/A	0%	2.4%	5.6%	6.4%	5.8%	5.7%	5.3%
Prince George's County								
Daily Delay (vehicle-hours) for All Arterials	98,400	171,300	163,700	158,700	158,600	158,800	158,800	158,500
Percent Reduction vs. No Build	N/A	0%	4.4%	7.3%	7.4%	7.3%	7.3%	7.5%
Montgomery and Prince George's Counties								
Daily Delay (vehicle-hours) for All Arterials	242,400	418,700	405,300	392,500	390,200	392,000	392,200	392,900
Percent Reduction vs. No Build	N/A	0%	3.2%	6.3%	6.8%	6.4%	6.3%	6.2%
District of Columbia								
Daily Delay (vehicle-hours) for All Arterials	105,300	178,100	169,600	165,200	164,600	165,900	164,000	165,900
Percent Reduction vs. No Build	N/A	0%	4.7%	7.2%	7.6%	6.8%	7.9%	6.9%

≥0% to <5% ≥5%

Other Maryland and Virginia counties in the region are expected to experience less than a 3% change

Figure 5-73: Projected 2040 Delay Change, Alternative 1/No Build vs. Two Managed Lanes



6

6 SAFETY ANALYSIS

This section provides a summary of crash data. Crash data was obtained from MDOT SHA's Office of Traffic & Safety (OOTS) and Traffic Development & Support Division (TDSD). The data covers a six-year period from 2012 to 2017 and consists of multiple segments which include some overlaps with adjacent segments.

During the study period 4,017 crashes occurred along I-270, nine of which were fatal crashes, and 11,773 crashes occurred along I-495, 55 of which were fatal crashes.

Key Points

- In the six-year study period from 2012 to 2017, 4,017 crashes occurred along I-270 and 11,773 crashes occurred along I-495.
- Nine of the crashes along I-270 and 55 of the crashes along I-495 were fatal crashes.
- Crash rates are higher than the statewide average rate per 100 million vehicle miles for 15 of the 20 segments along I-270 and 27 of the 28 segments along I-495.

The I-270 crash data encompasses approximately 35 miles, divided over 20 segments, stretching across Montgomery and Frederick Counties. The crash rate, measured by per 100 million vehicle miles (MVM), for 15 of the 20 segments are higher than the latest available 2017 statewide average crash rate of 44.3 crashes per 100 MVM for similar facilities.

Crash data for I-495 encompasses 42 miles, divided over 28 segments, across Montgomery and Prince George's Counties. The crash rates for 27 of the 28 segments are higher than the latest available 2017 statewide average crash rate of 44.3 crashes per 100 MVM for similar facilities.

Although improving safety is not explicitly included in the project purpose and need, it is worth noting that congestion alleviation resulting from this project would reduce the frequency of congested related crashes (e.g., commonly rear-end and sideswipe crashes).

Tables 6-1 and 6-2 summarize the crash data along the I-495 and I-270 corridors, respectively. **Figures 6-1 and 6-2** summarize the crash rates along the I-495 and I-270 corridors, respectively with a comparison of these rates to the statewide average crash rate of 44.3 crashes per 100 MVM for similar facilities. 2017 crash rates are listed separately from 2012-2016 crash rates, in **Appendix I**, as this data was pulled separately from the 2012-2016 crash data. Summaries of crash data for individual segments along each corridor are included in **Appendix I**.

Table 6-1: Summary of Crashes along I-495 (2012-2017)

Time of Day	# of Crashes	Surface Condition	# of Crashes
6:00 AM to 9:00 AM	1,728	Wet	2,420
9:00 AM to 11:00 AM	1,007	Dry	8,816
11:00 AM to 1:00 PM	854	Snow/Ice	194
1:00 PM to 4:00 PM	1,827	Unknown	343
4:00 PM to 7:00 PM	2,375	**Total**	**11,773**
7:00 PM to 6:00 AM	3,982	**Reported Year**	**# of Crashes**
Total	**11,773**	2012	1,379
Severity	**# of Crashes**	2013	1,606
Fatal	55	2014	1,811
Injury	3,809	2015	1,892
Property Damage Only	7,909	2016	2,283
Total	**11,773**	2017	2,802
		Total	**11,773**

Table 6-2: Summary of Crashes along I-270 (2012-2017)

Time of Day	# of Crashes	Surface Condition	# of Crashes
6:00 AM to 9:00 AM	619	Wet	809
9:00 AM to 11:00 AM	397	Dry	3,070
11:00 AM to 1:00 PM	318	Snow/Ice	66
1:00 PM to 4:00 PM	581	Unknown	72
4:00 PM to 7:00 PM	990	**Total**	**4,017**
7:00 PM to 6:00 AM	1,112	**Reported Year**	**# of Crashes**
Total	**4,017**	2012	438
Severity	**# of Crashes**	2013	498
Fatal	9	2014	587
Injury	1,341	2015	633
Property Damage Only	2,667	2016	762
Total	**4,017**	2017	1,099
		Total	**4,017**

Figure 6-1: Crash Rates along I-270 (2012-2017)

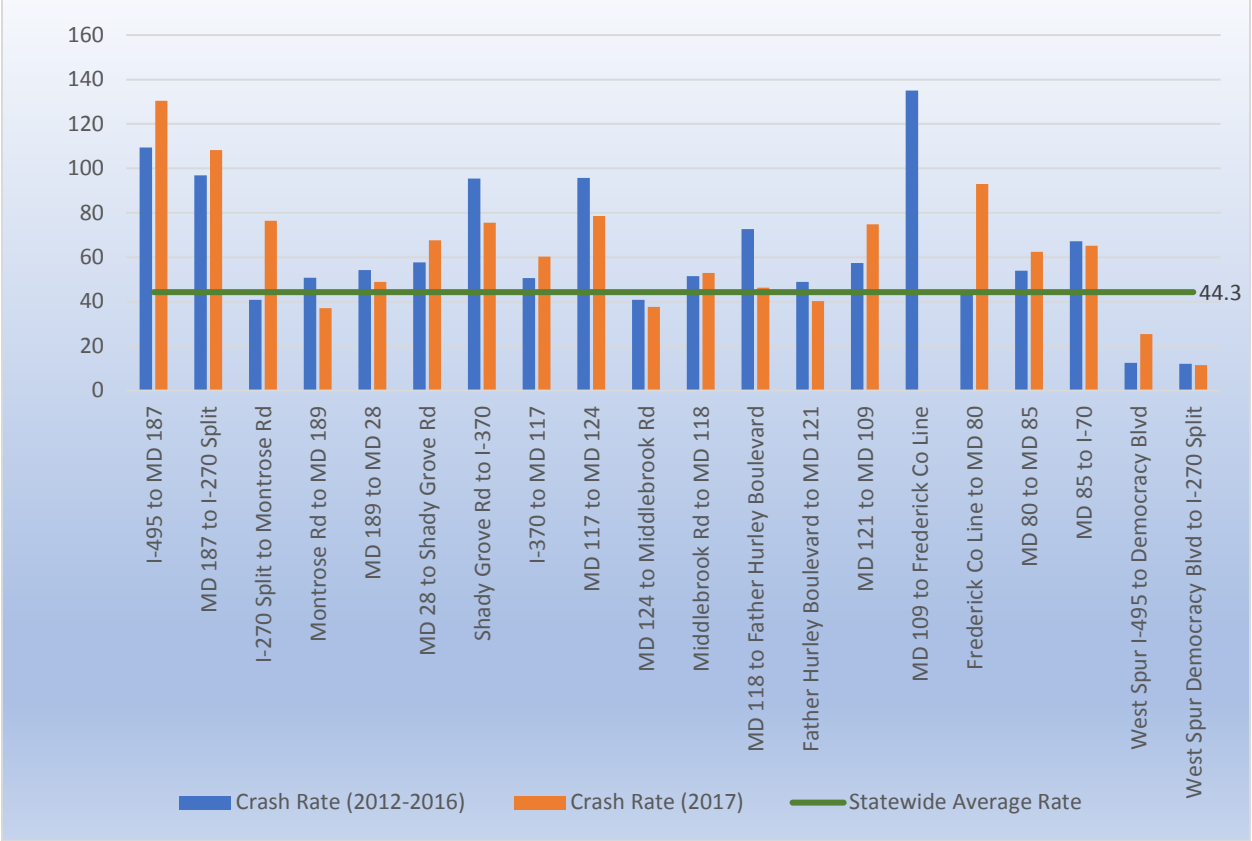
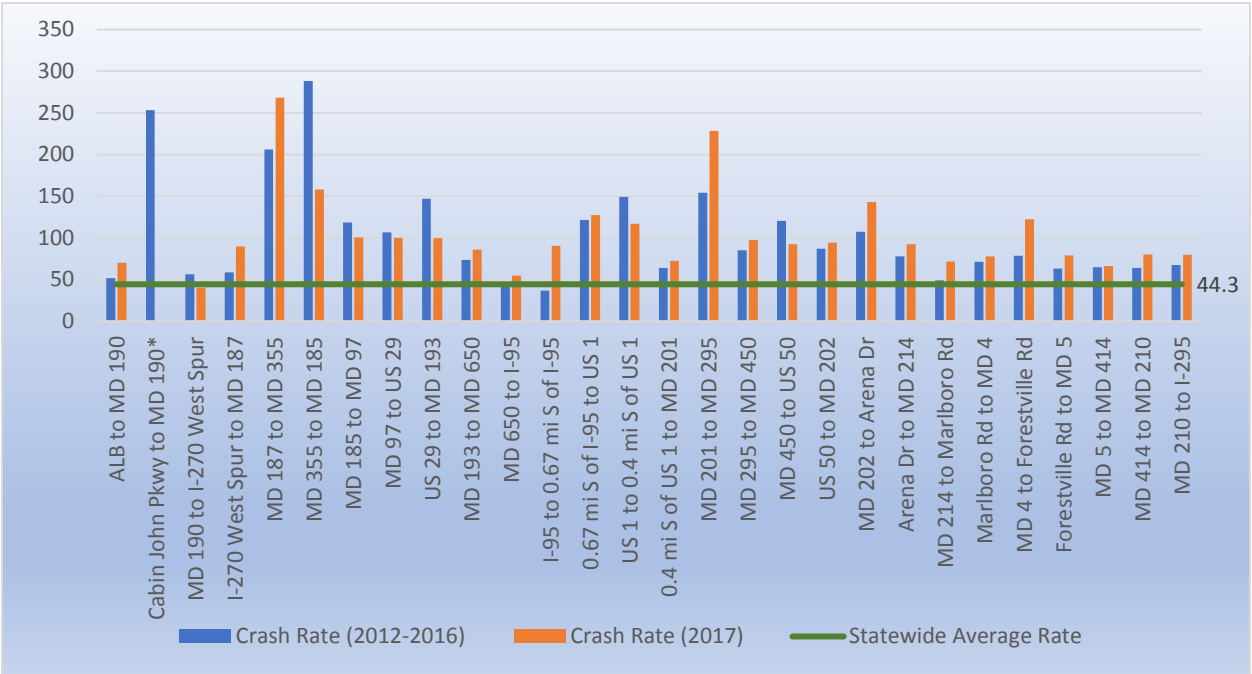


Figure 6-2: Crash Rates along I-495 (2012-2017)



*2017 crash data is not available for this segment

7

7 NEXT STEPS

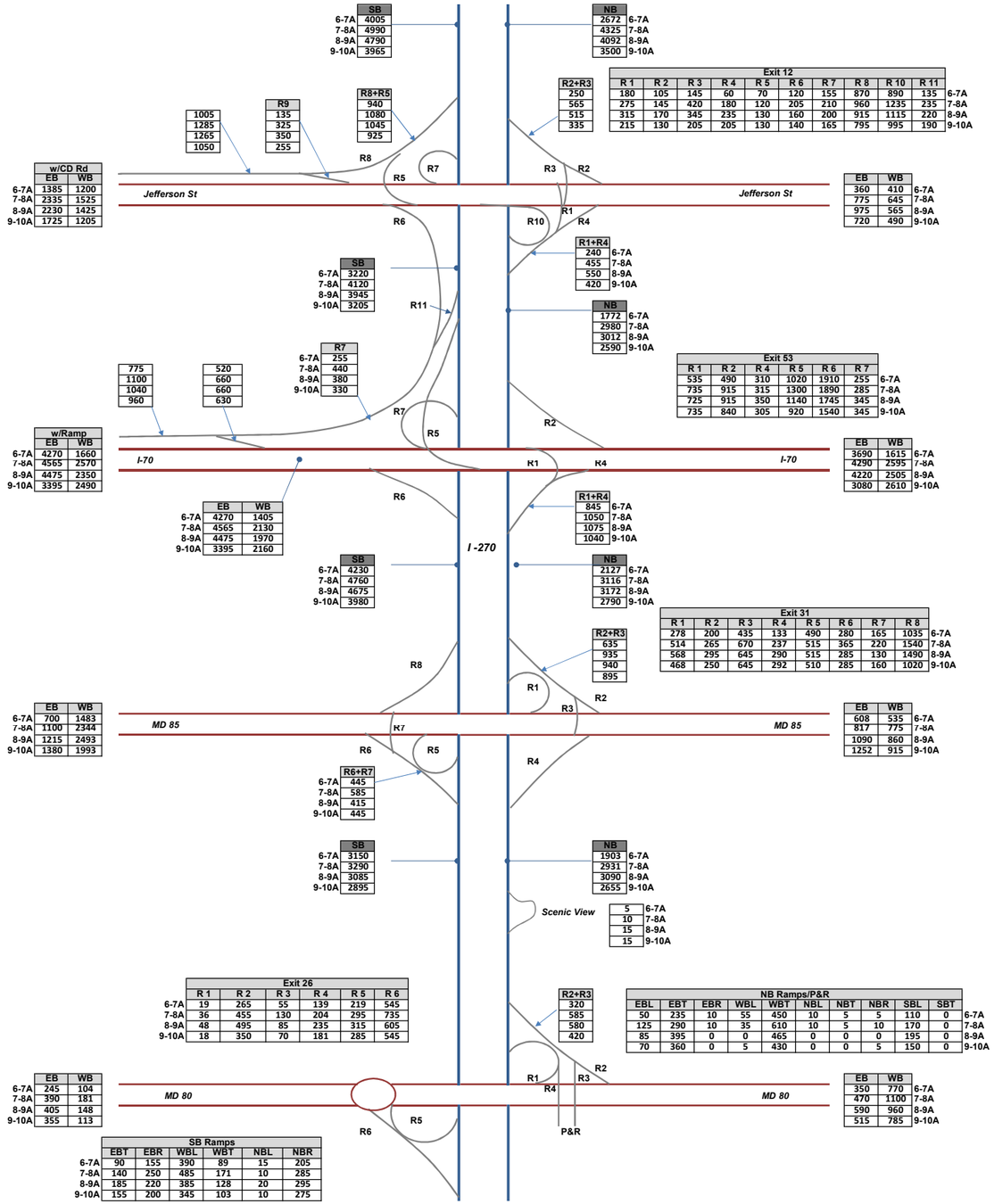
As the Study continues, the following steps will be taken:

- Additional/modified direct access locations beyond the ones stated previously will be considered. Analysis of these additional locations will be performed using the modeling software, and the results will be used to determine whether to add these direct access locations to the network and potentially eliminate others.
- The model will continue to be refined as the alternatives develop. Factors such as tolling assumptions and policy decisions may result in these refinements. Model results will be updated as the refinement process continues.
- The 2045 MWCOG travel demand model will be finalized. This model will be compared to the 2040 model. If there are significant differences between the models, these differences will be noted and considered in future analysis. A preliminary comparison of 2040 vs. 2045 forecasts was conducted, and the results are included in **Appendix J**.
- The Interstate Access Point Approval (IAPA), which is required to gain approval by FHWA for any changes to interstate access, will be also be initiated.
- As this project has multiple phases of construction, each phase will be analyzed separately and operations at the tie-ins will be closely investigated.

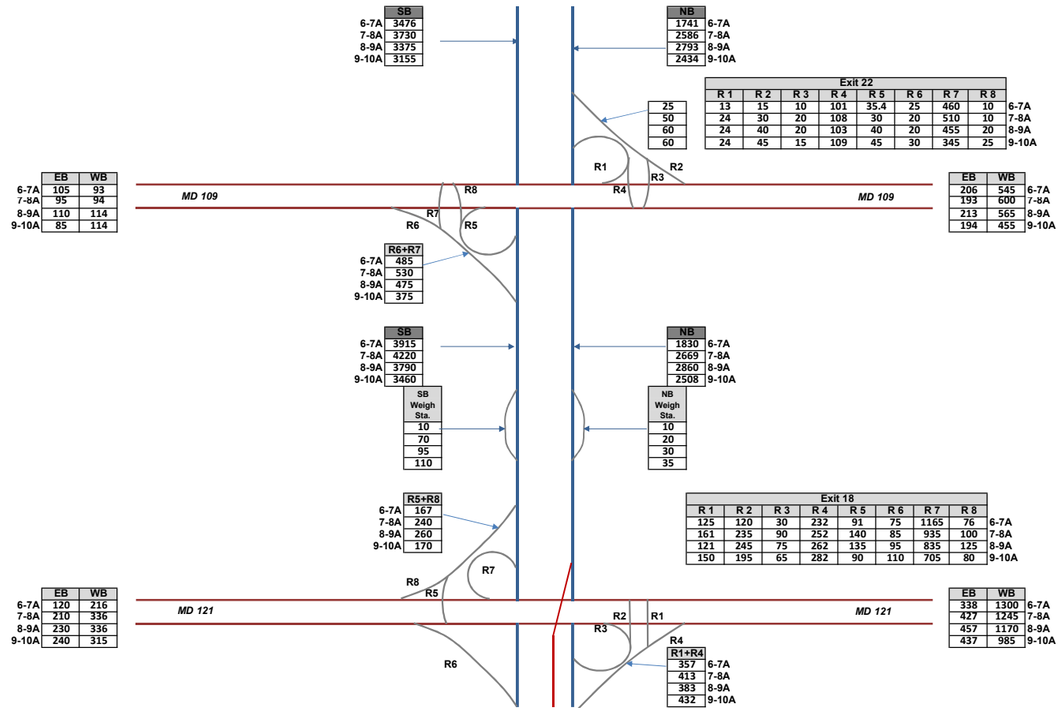
Appendix A:

Existing and Future Traffic Volumes

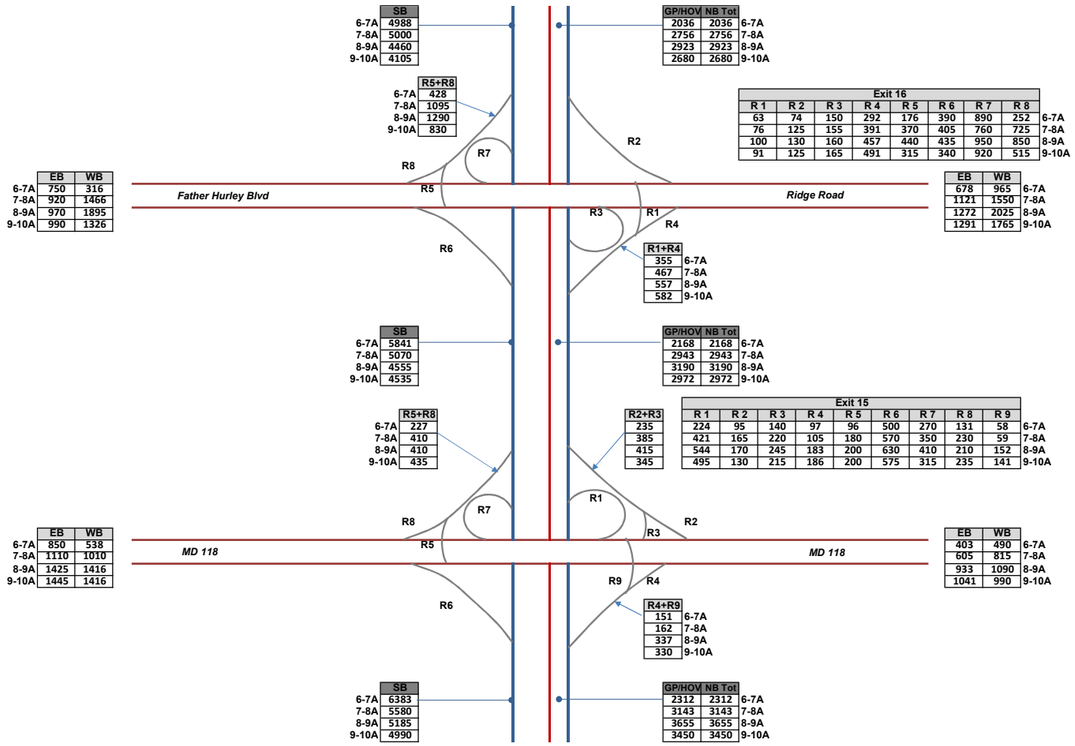
I-270 & I-495 West Side AM
Existing Peak Period Volumes



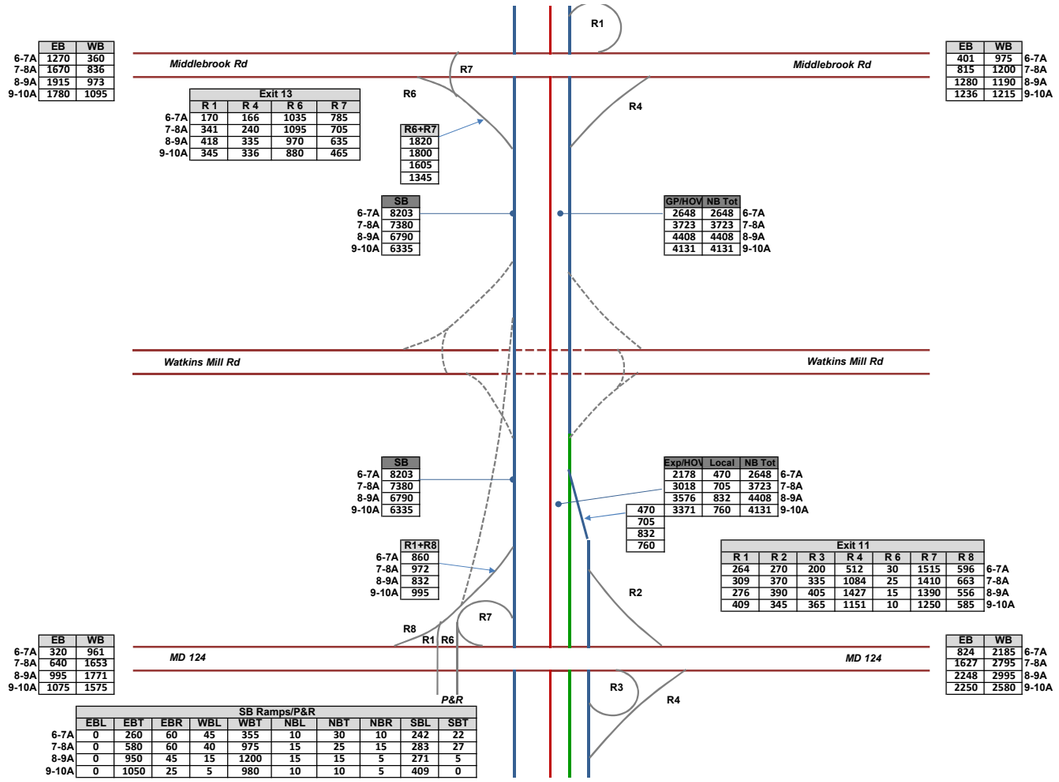
I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



	EB	WB
6-7A	1270	360
7-8A	1670	836
8-9A	1915	973
9-10A	1780	1095

Exit 13			
R 1	R 4	R 6	R 7
170	166	1035	785
341	240	1095	705
418	335	970	635
345	336	880	465

R6+R7
1820
1800
1605
1345

SB	
6-7A	8203
7-8A	7380
8-9A	6790
9-10A	6335

GP/HOV	NB Tot	
2648	2648	6-7A
3723	3723	7-8A
4408	4408	8-9A
4131	4131	9-10A

EB	WB	
401	975	6-7A
815	1200	7-8A
1280	1190	8-9A
1236	1215	9-10A

SB	
6-7A	8203
7-8A	7380
8-9A	6790
9-10A	6335

Exp/HOV	Local	NB Tot	
2178	470	2648	6-7A
3018	705	3723	7-8A
3576	832	4408	8-9A
3371	760	4131	9-10A

470
705
832
760

R1+R8	
6-7A	860
7-8A	972
8-9A	832
9-10A	995

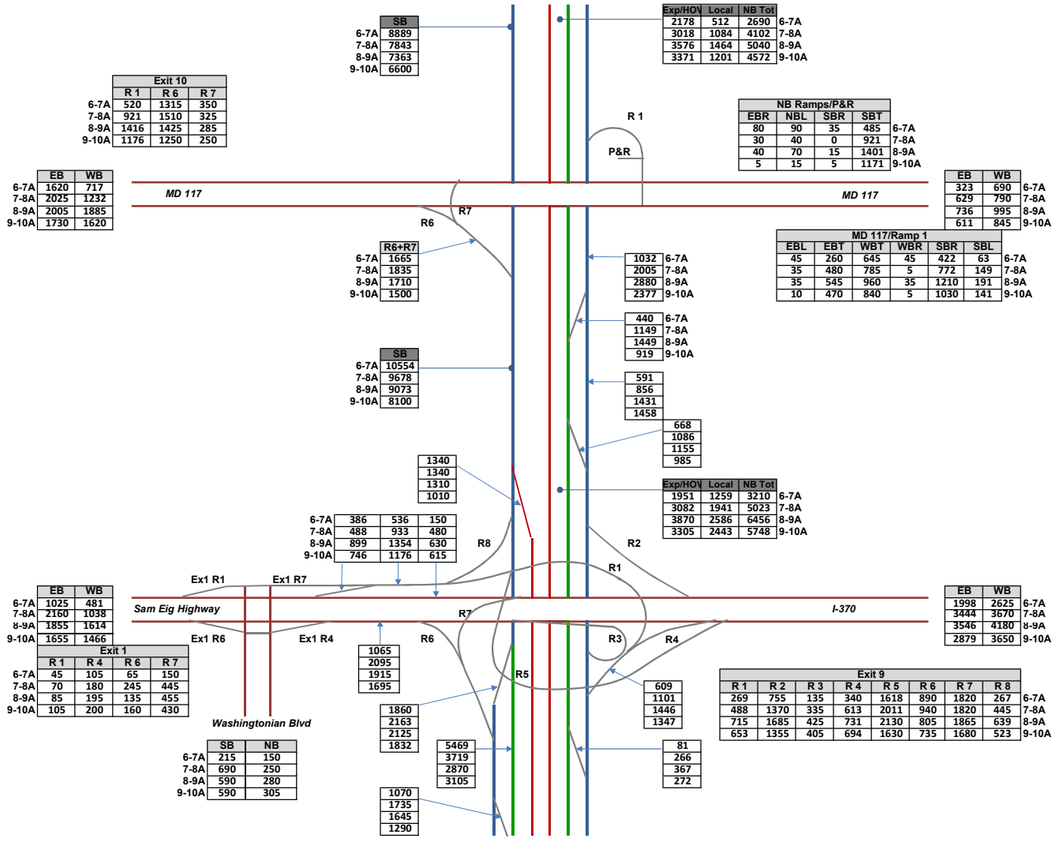
Exit 11							
R 1	R 2	R 3	R 4	R 6	R 7	R 8	
264	270	200	512	30	1515	596	6-7A
309	370	335	1084	25	1410	663	7-8A
276	390	405	1427	15	1390	556	8-9A
409	345	365	1151	10	1250	585	9-10A

EB	WB
6-7A	320	961
7-8A	640	1653
8-9A	995	1771
9-10A	1075	1575

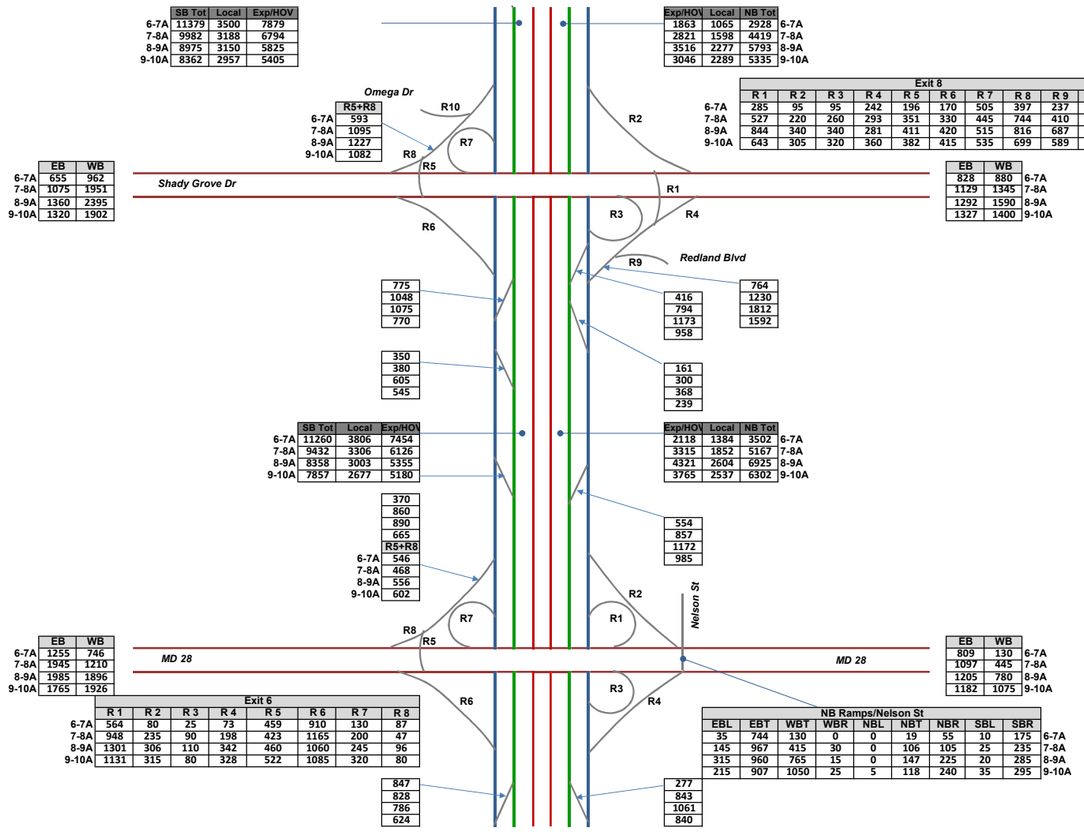
EB	WB	
824	2185	6-7A
1627	2795	7-8A
2248	2995	8-9A
2250	2580	9-10A

SB Ramps/P&R									
EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
6-7A	0	260	60	45	355	10	30	10	242	22
7-8A	0	580	60	40	975	15	25	15	283	27
8-9A	0	950	45	15	1200	15	15	5	271	5
9-10A	0	1050	25	5	980	10	10	5	409	0

I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



	SB Tot	Local	Exp/HOV
6-7A	11379	3500	7879
7-8A	9982	3188	6794
8-9A	8975	3150	5825
9-10A	8362	2957	5405

	Exp/HOV	Local	NB Tot	
6-7A	1863	1065	2928	6-7A
7-8A	2821	1598	4419	7-8A
8-9A	3516	2277	5793	8-9A
9-10A	3046	2289	5335	9-10A

	Exit 8									
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
6-7A	285	95	95	242	196	170	505	397	237	201
7-8A	527	220	260	293	351	330	445	744	410	230
8-9A	844	340	340	281	411	420	515	816	687	325
9-10A	643	305	320	360	382	415	535	699	589	372

	R5+R8
6-7A	593
7-8A	1095
8-9A	1227
9-10A	1082

	EB	WB
6-7A	655	962
7-8A	1075	1951
8-9A	1360	2395
9-10A	1320	1902

	EB	WB	
	828	880	6-7A
	1129	1345	7-8A
	1292	1590	8-9A
	1327	1400	9-10A

775
1048
1075
770

350
380
605
545

764
1230
1812
1592

416
794
1173
958

161
300
368
239

	SB Tot	Local	Exp/HOV
6-7A	11260	3806	7454
7-8A	9432	3306	6126
8-9A	8358	3003	5355
9-10A	7857	2677	5180

	Exp/HOV	Local	NB Tot	
6-7A	2118	1384	3502	6-7A
7-8A	3315	1852	5167	7-8A
8-9A	4321	2604	6925	8-9A
9-10A	3765	2537	6302	9-10A

370
860
890
665

	R5+R8
6-7A	546
7-8A	468
8-9A	556
9-10A	602

554
857
1172
985

	EB	WB
6-7A	1255	746
7-8A	1945	1210
8-9A	1985	1896
9-10A	1765	1926

	EB	WB	
	809	130	6-7A
	1097	445	7-8A
	1205	780	8-9A
	1182	1075	9-10A

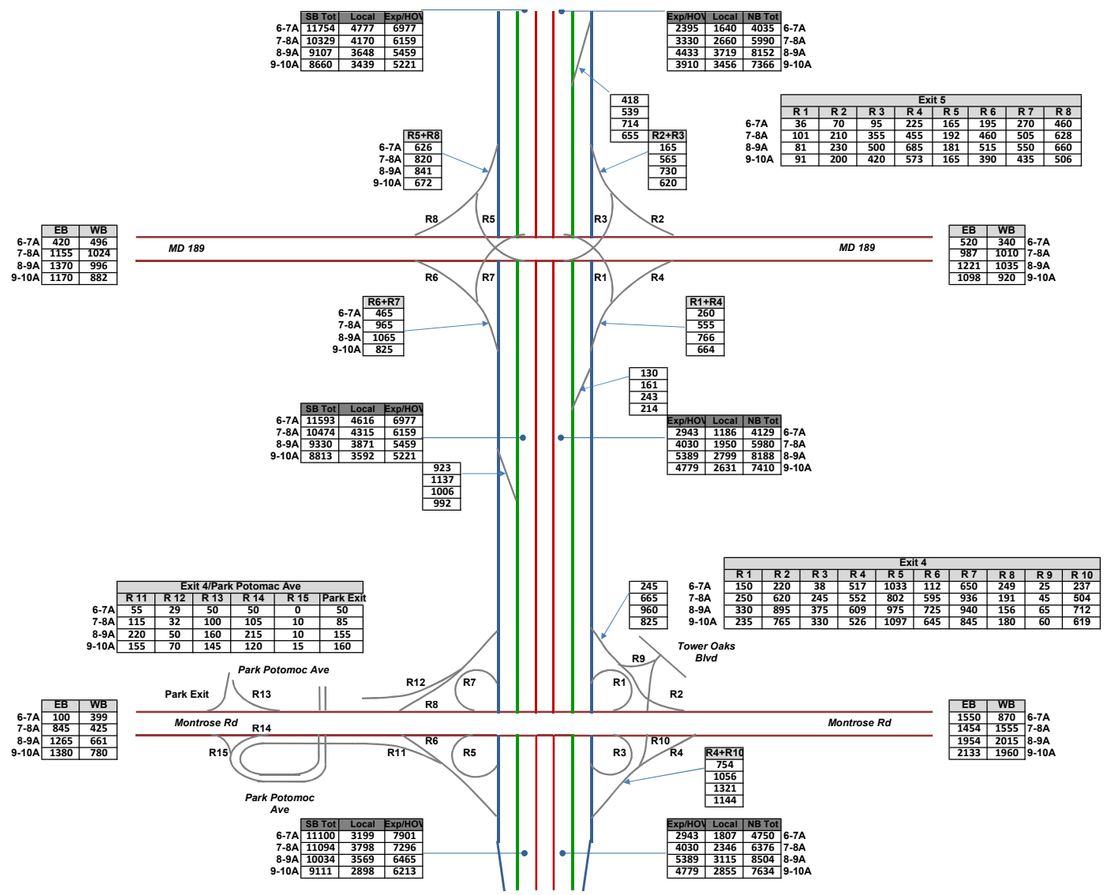
	Exit 6							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
6-7A	564	80	25	73	459	910	130	87
7-8A	948	235	90	198	423	1165	200	47
8-9A	1301	306	110	342	460	1060	245	96
9-10A	1131	315	80	328	522	1085	320	80

847
828
786
624

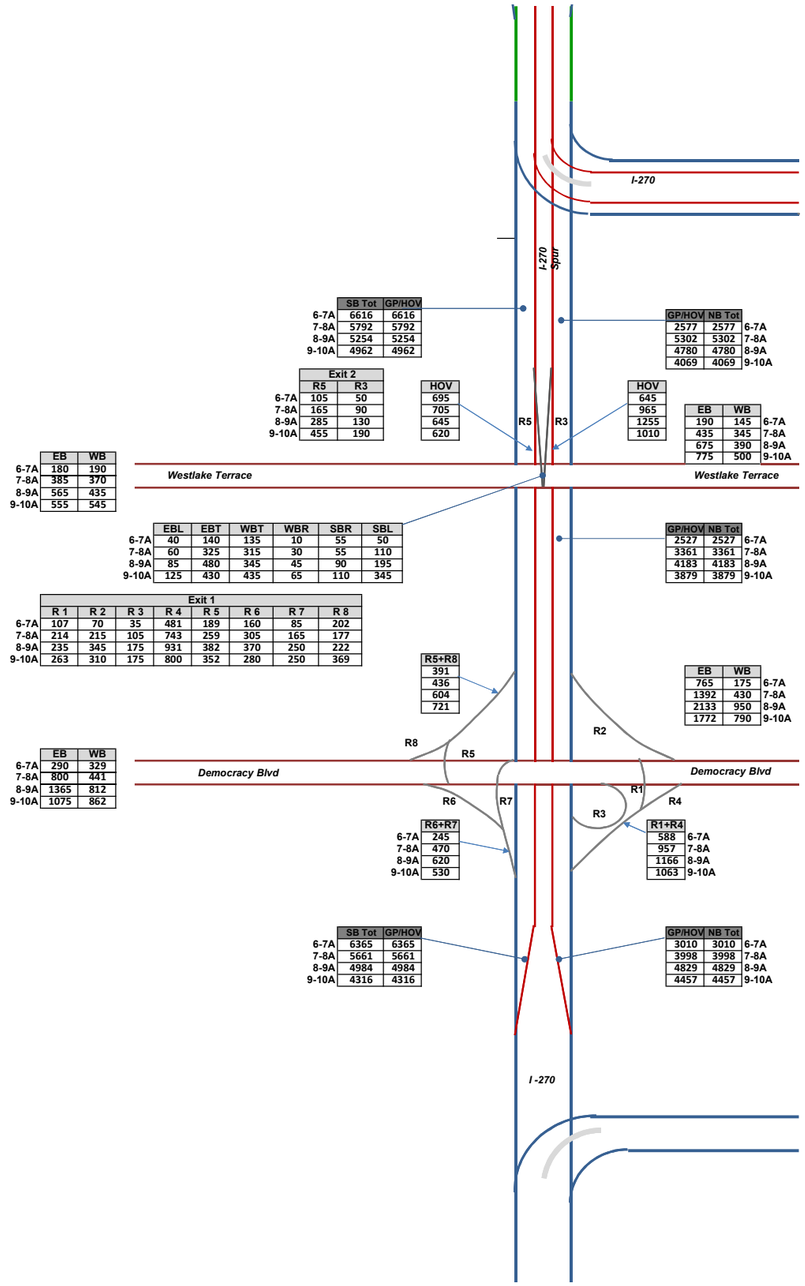
277
843
1061
840

	NB Ramps/Nelson St								
	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
6-7A	35	744	130	0	0	19	55	10	175
7-8A	145	967	415	30	0	106	105	25	235
8-9A	315	960	765	15	0	147	225	20	285
9-10A	215	907	1050	25	5	118	240	35	295

I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



	SB Tot	GP/HOV
6-7A	6616	6616
7-8A	5792	5792
8-9A	5254	5254
9-10A	4962	4962

	GP/HOV	NB Tot	
	2577	2577	6-7A
	5302	5302	7-8A
	4780	4780	8-9A
	4069	4069	9-10A

	Exit 2	
	R5	R3
6-7A	105	50
7-8A	165	90
8-9A	285	130
9-10A	455	190

HOV
695
705
645
620

HOV
645
965
1255
1010

EB	WB	
190	145	6-7A
435	345	7-8A
675	390	8-9A
775	500	9-10A

	EB	WB
6-7A	180	190
7-8A	385	370
8-9A	565	435
9-10A	555	545

	EBL	EBT	WBT	WBR	SBR	SBL
6-7A	40	140	135	10	55	50
7-8A	60	325	315	30	55	110
8-9A	85	480	345	45	90	195
9-10A	125	430	435	65	110	345

	GP/HOV	NB Tot	
	2527	2527	6-7A
	3361	3361	7-8A
	4183	4183	8-9A
	3879	3879	9-10A

	Exit 1							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
6-7A	107	70	35	481	189	160	85	202
7-8A	214	215	105	743	259	305	165	177
8-9A	235	345	175	931	382	370	250	222
9-10A	263	310	175	800	352	280	250	369

R5+R8
391
436
604
721

	EB	WB	
	765	175	6-7A
	1392	430	7-8A
	2133	950	8-9A
	1772	790	9-10A

	EB	WB
6-7A	290	329
7-8A	800	441
8-9A	1365	812
9-10A	1075	862

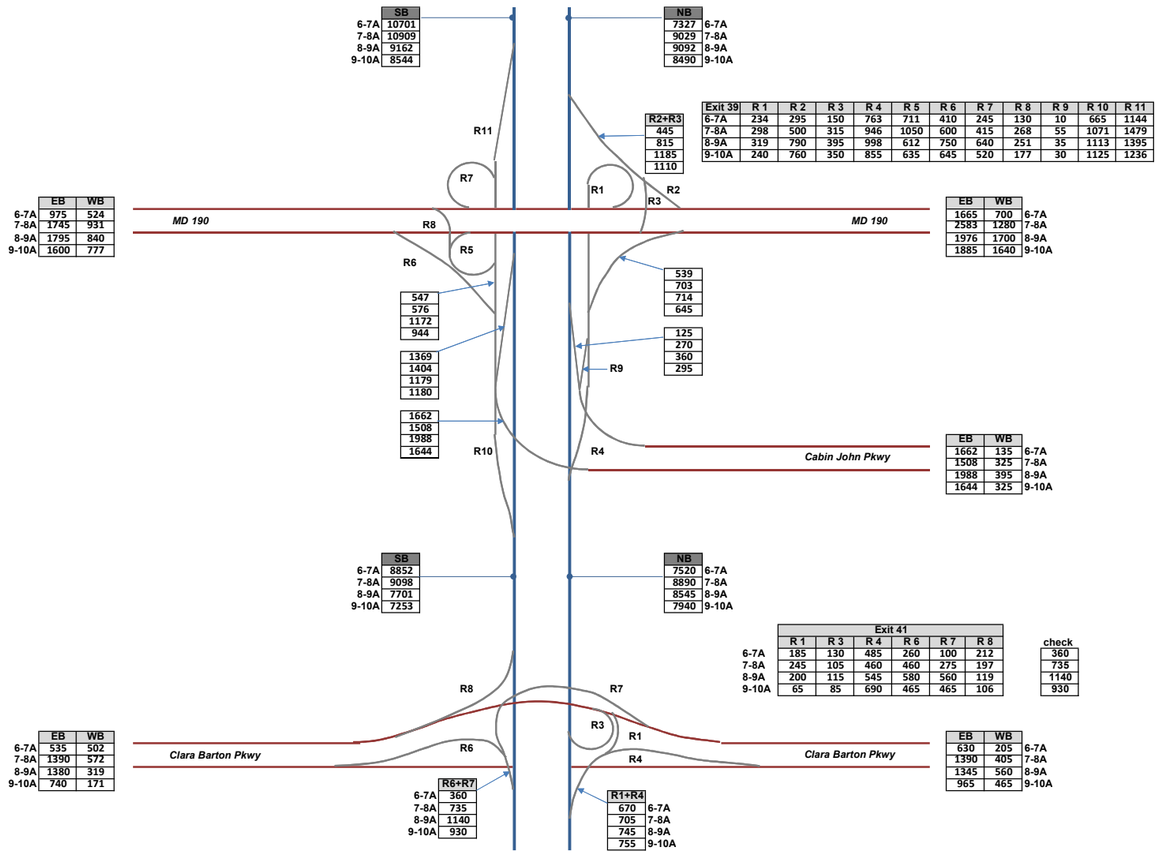
R6+R7
245
470
620
530

R1+R4	
588	6-7A
957	7-8A
1166	8-9A
1063	9-10A

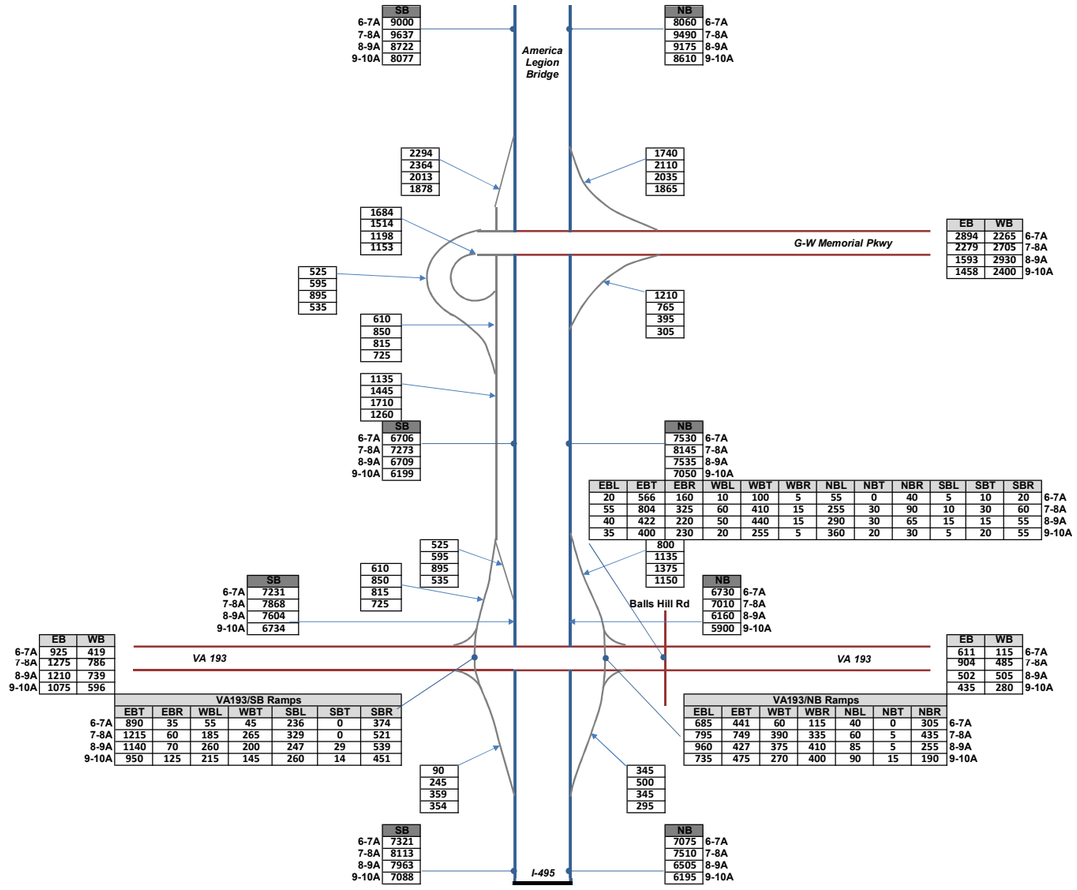
	SB Tot	GP/HOV
6-7A	6365	6365
7-8A	5661	5661
8-9A	4984	4984
9-10A	4316	4316

	GP/HOV	NB Tot	
	3010	3010	6-7A
	3998	3998	7-8A
	4829	4829	8-9A
	4457	4457	9-10A

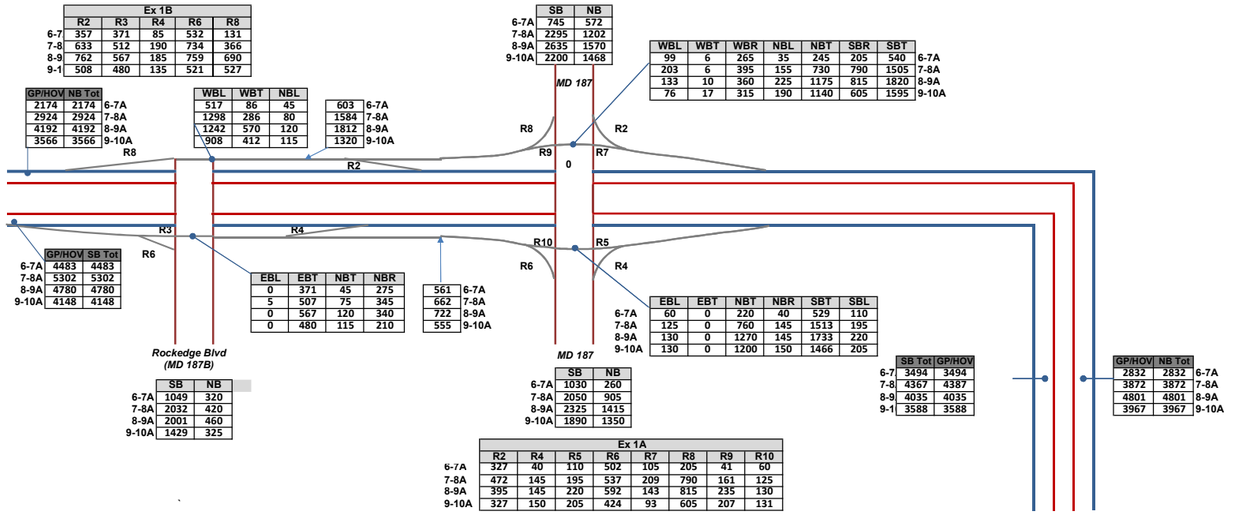
I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



I-270 & I-495 West Side AM
Existing Peak Period Volumes



	Ex 1B				
	R2	R3	R4	R6	R8
6-7	357	371	85	532	131
7-8	633	512	190	734	366
8-9	762	567	185	759	690
9-1	508	480	135	521	527

GP/HOV	NB Tot	
2174	2174	6-7A
2924	2924	7-8A
4192	4192	8-9A
3566	3566	9-10A

WBL	WBT	NBL	
517	86	45	6-7A
1298	286	80	7-8A
1242	570	120	8-9A
908	412	115	9-10A

603	6-7A
1584	7-8A
1812	8-9A
1320	9-10A

	SB	NB
6-7A	745	572
7-8A	2295	1202
8-9A	2635	1570
9-10A	2200	1468

WBL	WBT	WBR	NBL	NBT	SBR	SBT	
99	6	265	35	245	205	540	6-7A
203	6	395	155	730	790	1505	7-8A
133	10	360	225	1175	815	1820	8-9A
76	17	315	190	1140	605	1595	9-10A

	GP/HOV	SB Tot
6-7A	4483	4483
7-8A	5302	5302
8-9A	4780	4780
9-10A	4148	4148

EBL	EBT	NBT	NBR
0	371	45	275
5	507	75	345
0	567	120	340
0	480	115	210

561	6-7A
662	7-8A
722	8-9A
555	9-10A

EBL	EBT	NBT	NBR	SBT	SBL	
60	0	220	40	529	110	6-7A
125	0	760	145	1513	195	7-8A
130	0	1270	145	1733	220	8-9A
130	0	1200	150	1466	205	9-10A

	SB	NB
6-7A	1049	320
7-8A	2032	420
8-9A	2001	460
9-10A	1429	325

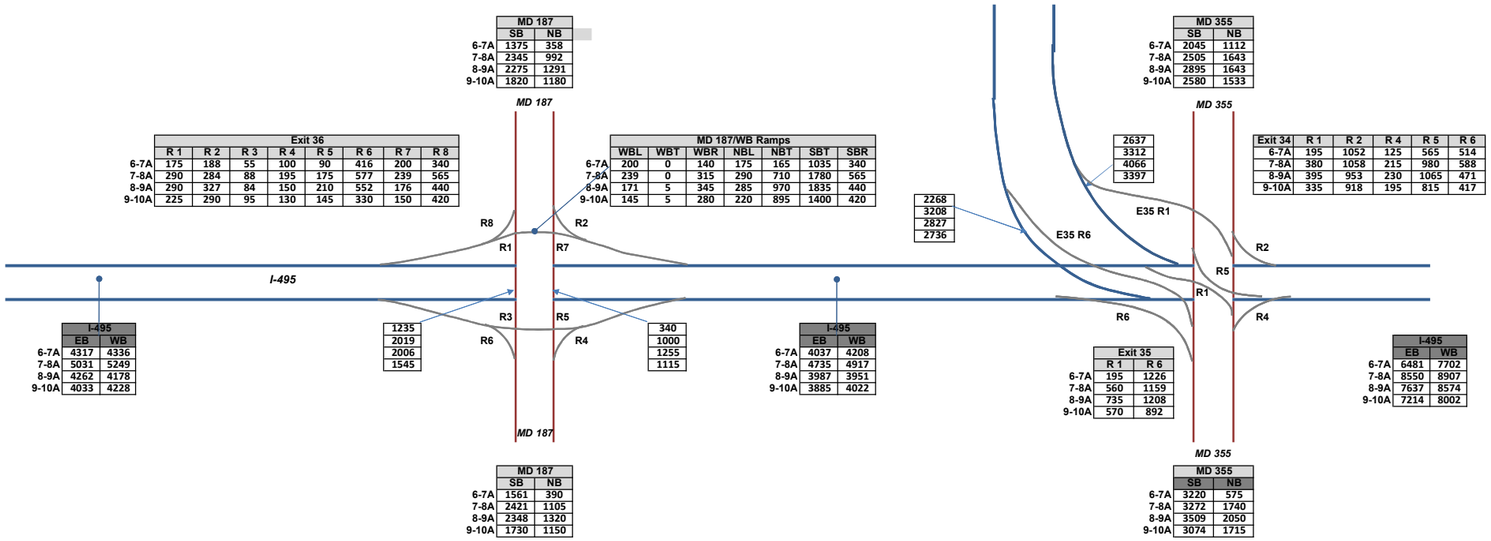
	SB	NB
6-7A	1030	260
7-8A	2050	905
8-9A	2325	1415
9-10A	1890	1350

	SB Tot	GP/HOV	
6-7	3494	3494	
7-8	4367	4387	
8-9	4035	4035	
9-1	3588	3588	

GP/HOV	NB Tot	
2832	2832	6-7A
3872	3872	7-8A
4801	4801	8-9A
3967	3967	9-10A

	Ex 1A							
	R2	R4	R5	R6	R7	R8	R9	R10
6-7A	327	40	110	502	105	205	41	60
7-8A	472	145	195	537	209	790	161	125
8-9A	395	145	220	592	143	815	235	130
9-10A	327	150	205	424	93	605	207	131

I-270 & I-495 West Side AM
Existing Peak Period Volumes



MD 187	SB	NB
6-7A	1375	358
7-8A	2345	992
8-9A	2275	1291
9-10A	1820	1180

MD 355	SB	NB
6-7A	2045	1112
7-8A	2505	1643
8-9A	2895	1643
9-10A	2580	1533

Exit 36	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
6-7A	175	188	55	100	90	416	200	340
7-8A	290	284	88	195	175	577	239	565
8-9A	290	327	84	150	210	552	176	440
9-10A	225	290	95	130	145	330	150	420

MD 187/WB Ramps	WBL	WBT	WBR	NBL	NBT	SBT	SBR
6-7A	200	0	140	175	165	1035	340
7-8A	239	0	315	290	710	1780	565
8-9A	171	5	345	285	970	1835	440
9-10A	145	5	280	220	895	1400	420

Exit 34	R 1	R 2	R 4	R 5	R 6
6-7A	195	1052	125	565	514
7-8A	380	1058	215	980	588
8-9A	395	953	230	1065	471
9-10A	335	918	195	815	417

I-495	EB	WB
6-7A	4317	4336
7-8A	5031	5249
8-9A	4262	4178
9-10A	4033	4228

I-495	EB	WB
6-7A	4037	4208
7-8A	4735	4917
8-9A	3987	3951
9-10A	3885	4022

I-495	EB	WB
6-7A	6481	7702
7-8A	8550	8907
8-9A	7637	8574
9-10A	7214	8002

Exit 35	R 1	R 6
6-7A	195	1226
7-8A	560	1159
8-9A	735	1208
9-10A	570	892

MD 187	SB	NB
6-7A	1561	390
7-8A	2421	1105
8-9A	2348	1320
9-10A	1730	1150

MD 355	SB	NB
6-7A	3220	575
7-8A	3272	1740
8-9A	3509	2050
9-10A	3074	1715

1235
2019
2006
1545

340
1000
1255
1115

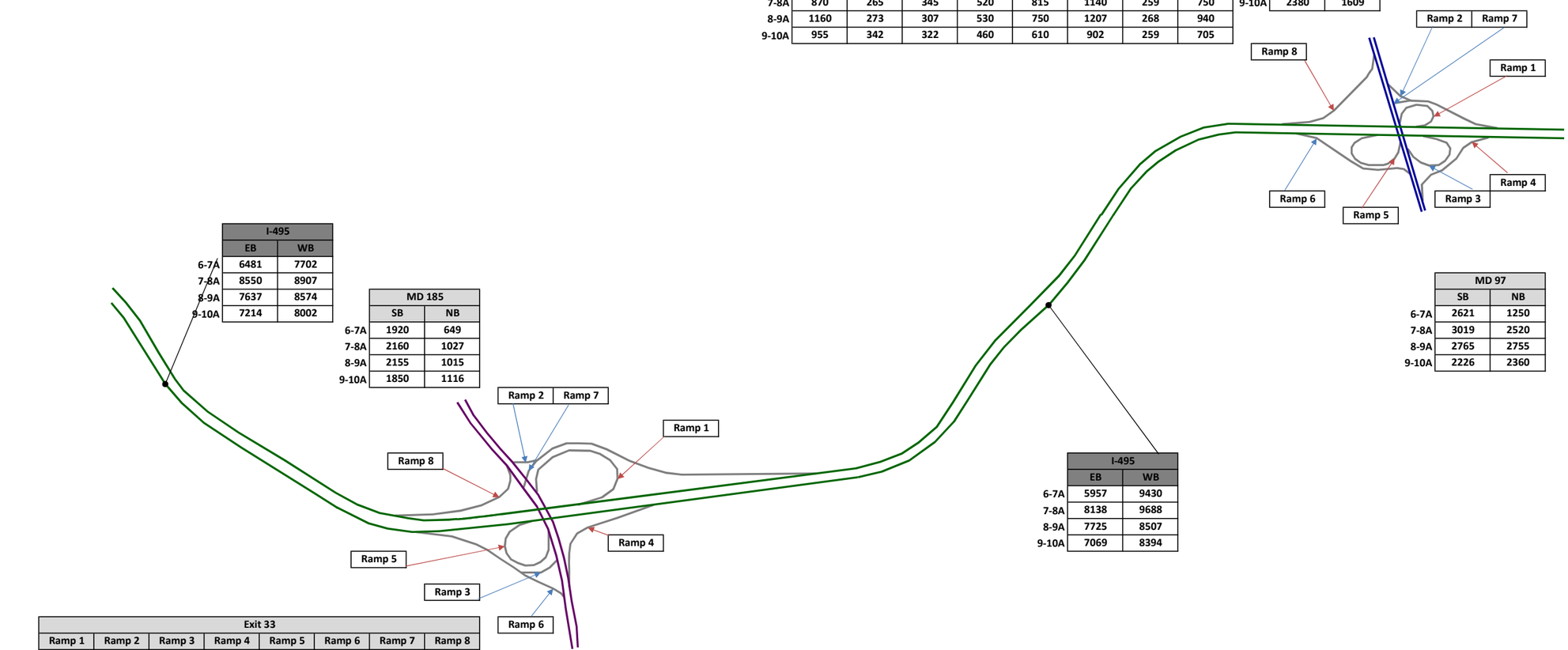
2637
3312
4066
3397

2268
3208
2827
2736

I-495 North Side AM
Existing Peak Period Volumes

	Exit 31							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	410	296	266	305	650	959	352	485
7-8A	870	265	345	520	815	1140	259	750
8-9A	1160	273	307	530	750	1207	268	940
9-10A	955	342	322	460	610	902	259	705

	MD 97	
	SB	NB
6-7A	2445	1097
7-8A	3185	1740
8-9A	2980	1645
9-10A	2380	1609



	I-495	
	EB	WB
6-7A	6481	7702
7-8A	8550	8907
8-9A	7637	8574
9-10A	7214	8002

	MD 185	
	SB	NB
6-7A	1920	649
7-8A	2160	1027
8-9A	2155	1015
9-10A	1850	1116

	MD 97	
	SB	NB
6-7A	2621	1250
7-8A	3019	2520
8-9A	2765	2755
9-10A	2226	2360

	I-495	
	EB	WB
6-7A	5957	9430
7-8A	8138	9688
8-9A	7725	8507
9-10A	7069	8394

	Exit 33							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	185	356	288	395	135	748	2051	490
7-8A	555	401	411	830	180	1011	1614	675
8-9A	980	226	344	900	235	704	1420	730
9-10A	685	261	360	715	225	725	1410	590

	MD 185	
	SB	NB
6-7A	4094	585
7-8A	3930	1600
8-9A	3314	2325
9-10A	3170	1895

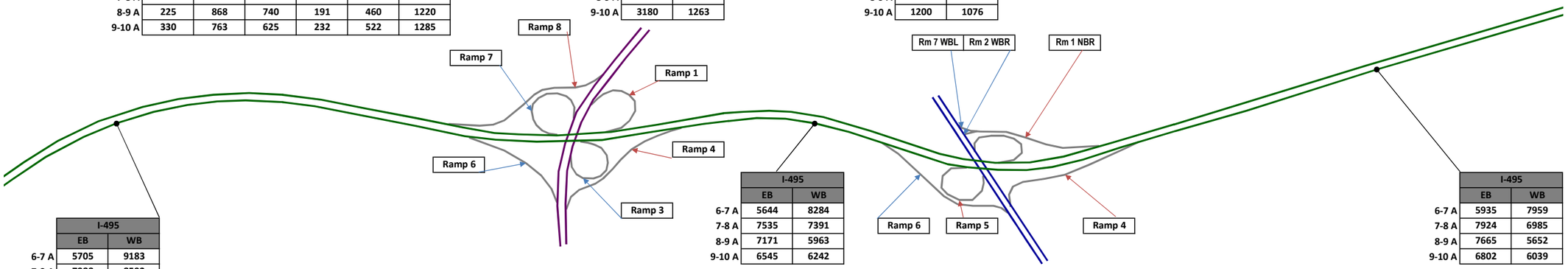
I-495 North Side AM
Existing Peak Period Volumes

	Exit 29					
	Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
6-7 A	690	284	285	420	414	81
7-8 A	760	268	415	580	606	86
8-9 A	705	278	440	590	537	116
9-10 A	610	291	340	465	549	116

	Exit 30					
	Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
6-7 A	40	318	320	63	411	1270
7-8 A	105	837	545	161	384	1480
8-9 A	225	868	740	191	460	1220
9-10 A	330	763	625	232	522	1285

	US 29	
	SB	NB
6-7 A	2655	558
7-8 A	3660	1592
8-9 A	4135	1658
9-10 A	3180	1263

	MD 193	
	SB	NB
6-7 A	1160	799
7-8 A	1650	1213
8-9 A	1520	1188
9-10 A	1200	1076



	I-495	
	EB	WB
6-7 A	5705	9183
7-8 A	7988	8592
8-9 A	7491	6948
9-10 A	6915	7335

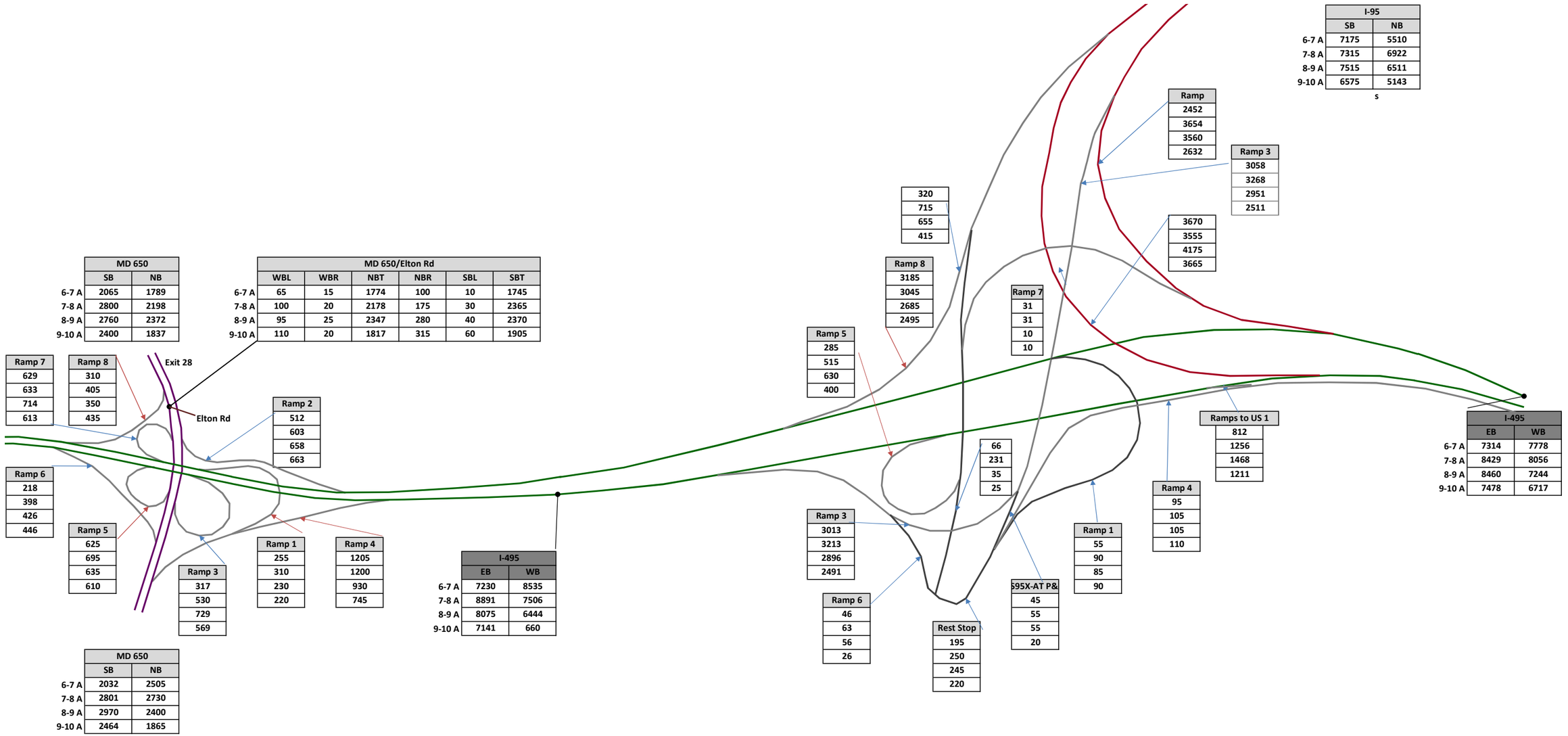
	I-495	
	EB	WB
6-7 A	5644	8284
7-8 A	7535	7391
8-9 A	7171	5963
9-10 A	6545	6242

	I-495	
	EB	WB
6-7 A	5935	7959
7-8 A	7924	6985
8-9 A	7665	5652
9-10 A	6802	6039

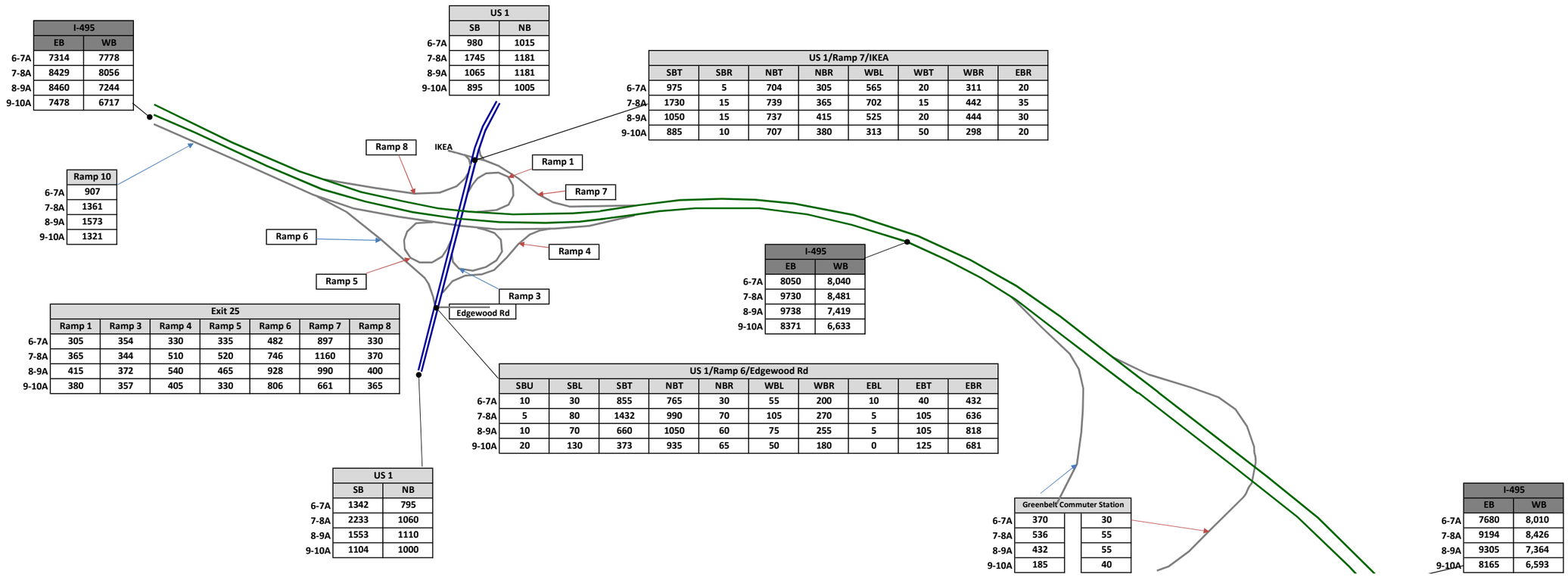
	US 29	
	SB	NB
6-7 A	1859	600
7-8 A	2725	1405
8-9 A	3566	1755
9-10 A	2649	1455

	MD 193	
	SB	NB
6-7 A	1235	1490
7-8 A	1762	2120
8-9 A	1583	2055
9-10 A	1400	1735

I-495 North Side AM
Existing Peak Period Volumes



I-495 Northeast Side AM
Existing Peak Period Volumes



I-495		
	EB	WB
6-7A	7314	7778
7-8A	8429	8056
8-9A	8460	7244
9-10A	7478	6717

US 1		
	SB	NB
6-7A	980	1015
7-8A	1745	1181
8-9A	1065	1181
9-10A	895	1005

US 1/Ramp 7/IKEA								
	SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
6-7A	975	5	704	305	565	20	311	20
7-8A	1730	15	739	365	702	15	442	35
8-9A	1050	15	737	415	525	20	444	30
9-10A	885	10	707	380	313	50	298	20

Ramp 10	
6-7A	907
7-8A	1361
8-9A	1573
9-10A	1321

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	305	354	330	335	482	897	330
7-8A	365	344	510	520	746	1160	370
8-9A	415	372	540	465	928	990	400
9-10A	380	357	405	330	806	661	365

US 1		
	SB	NB
6-7A	1342	795
7-8A	2233	1060
8-9A	1553	1110
9-10A	1104	1000

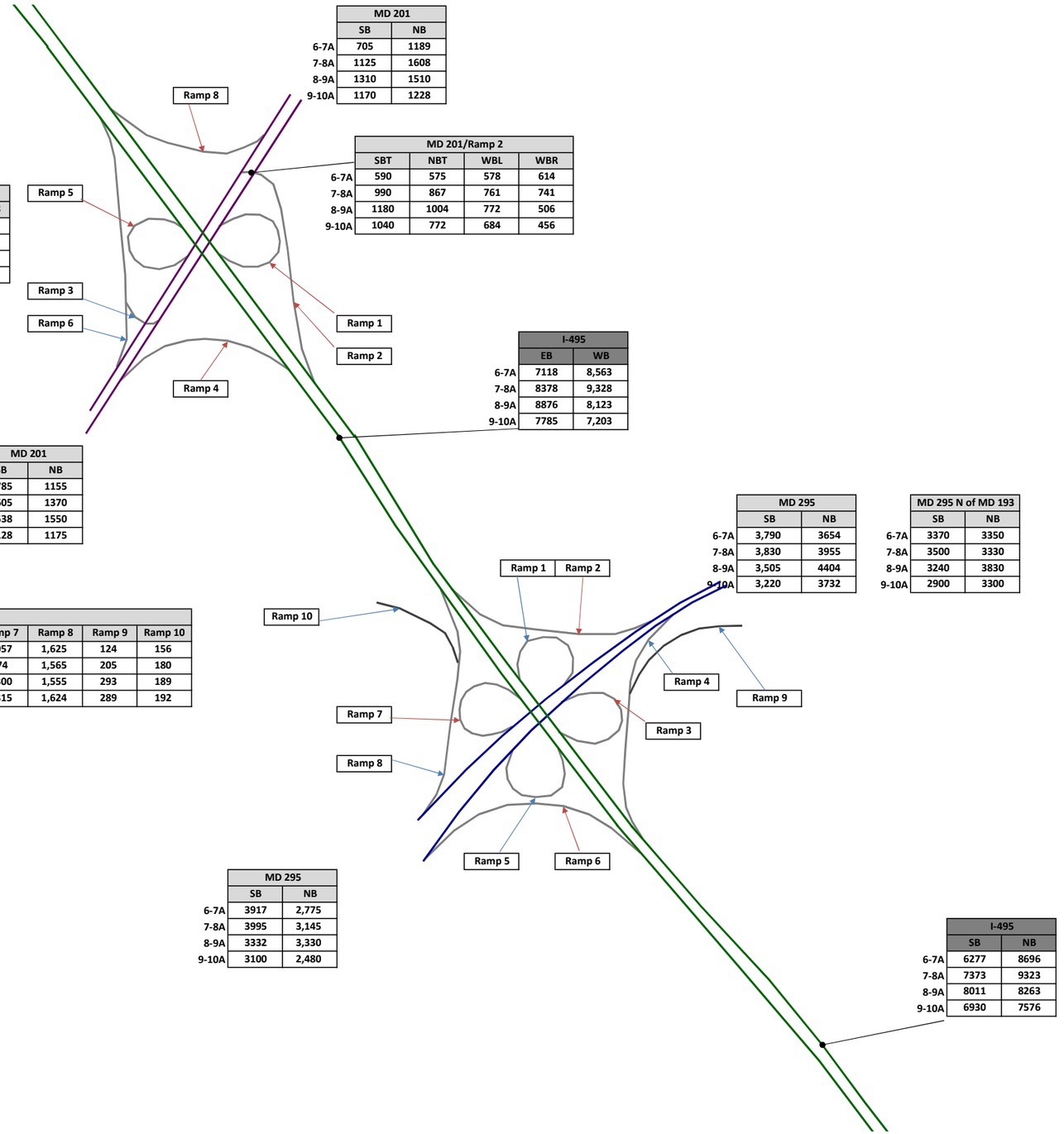
US 1/Ramp 6/Edgewood Rd									
	SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
6-7A	10	30	855	765	30	55	200	10	40	432
7-8A	5	80	1432	990	70	105	270	5	105	636
8-9A	10	70	660	1050	60	75	255	5	105	818
9-10A	20	130	373	935	65	50	180	0	125	681

I-495		
	EB	WB
6-7A	8050	8,040
7-8A	9730	8,481
8-9A	9738	7,419
9-10A	8371	6,633

Greenbelt Commuter Station		
6-7A	370	30
7-8A	536	55
8-9A	432	55
9-10A	185	40

I-495		
	EB	WB
6-7A	7680	8,010
7-8A	9194	8,426
8-9A	9305	7,364
9-10A	8165	6,593

I-495 Northeast Side AM
Existing Peak Period Volumes



	MD 201	
	SB	NB
6-7A	705	1189
7-8A	1125	1608
8-9A	1310	1510
9-10A	1170	1228

	MD 201/Ramp 2			
	SBT	NBT	WBL	WBR
6-7A	590	575	578	614
7-8A	990	867	761	741
8-9A	1180	1004	772	506
9-10A	1040	772	684	456

	Exit 23						
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
6-7A	525	1193	280	335	325	942	115
7-8A	465	1502	357	395	390	1244	135
8-9A	390	1279	409	565	565	1151	130
9-10A	400	1140	472	475	540	944	130

	I-495	
	EB	WB
6-7A	7118	8,563
7-8A	8378	9,328
8-9A	8876	8,123
9-10A	7785	7,203

	MD 201	
	SB	NB
6-7A	1785	1155
7-8A	2605	1370
8-9A	2538	1550
9-10A	2128	1175

	MD 295	
	SB	NB
6-7A	3,790	3654
7-8A	3,830	3955
8-9A	3,505	4404
9-10A	3,220	3732

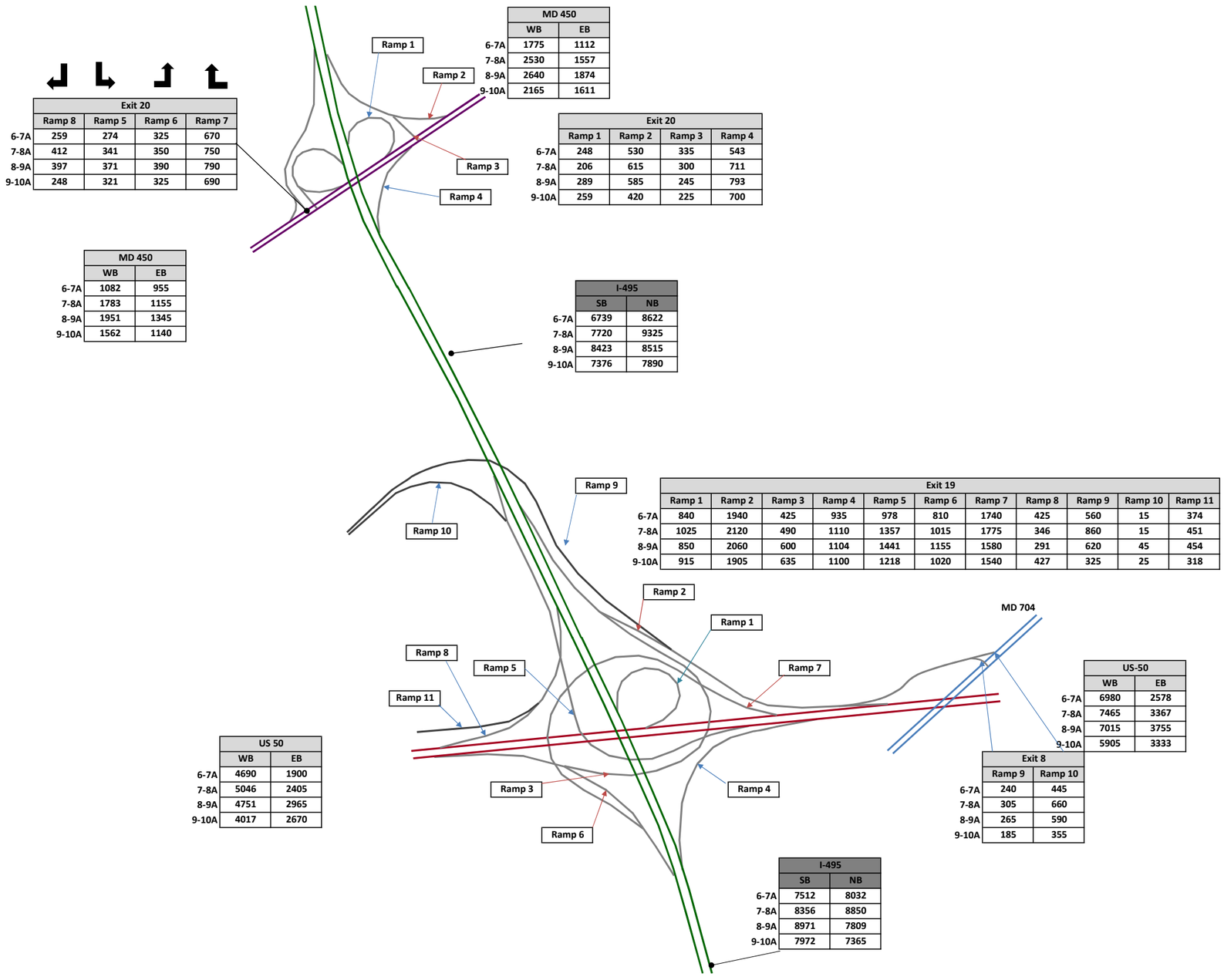
	MD 295 N of MD 193	
	SB	NB
6-7A	3370	3350
7-8A	3500	3330
8-9A	3240	3830
9-10A	2900	3300

	Exit 22									
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
6-7A	26	467	1,100	1,550	449	20	1,057	1,625	124	156
7-8A	56	482	1,145	1,361	624	30	974	1,565	205	180
8-9A	62	490	1,030	1,305	824	25	1,300	1,555	293	189
9-10A	51	480	850	1,363	769	30	1,315	1,624	289	192

	MD 295	
	SB	NB
6-7A	3917	2,775
7-8A	3995	3,145
8-9A	3332	3,330
9-10A	3100	2,480

	I-495	
	SB	NB
6-7A	6277	8696
7-8A	7373	9323
8-9A	8011	8263
9-10A	6930	7576

I-495 Northeast Side AM
Existing Peak Period Volumes



	Exit 20			
	Ramp 8	Ramp 5	Ramp 6	Ramp 7
6-7A	259	274	325	670
7-8A	412	341	350	750
8-9A	397	371	390	790
9-10A	248	321	325	690

	MD 450	
	WB	EB
6-7A	1775	1112
7-8A	2530	1557
8-9A	2640	1874
9-10A	2165	1611

	Exit 20			
	Ramp 1	Ramp 2	Ramp 3	Ramp 4
6-7A	248	530	335	543
7-8A	206	615	300	711
8-9A	289	585	245	793
9-10A	259	420	225	700

	MD 450	
	WB	EB
6-7A	1082	955
7-8A	1783	1155
8-9A	1951	1345
9-10A	1562	1140

	I-495	
	SB	NB
6-7A	6739	8622
7-8A	7720	9325
8-9A	8423	8515
9-10A	7376	7890

	Exit 19										
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
6-7A	840	1940	425	935	978	810	1740	425	560	15	374
7-8A	1025	2120	490	1110	1357	1015	1775	346	860	15	451
8-9A	850	2060	600	1104	1441	1155	1580	291	620	45	454
9-10A	915	1905	635	1100	1218	1020	1540	427	325	25	318

	US-50	
	WB	EB
6-7A	6980	2578
7-8A	7465	3367
8-9A	7015	3755
9-10A	5905	3333

	US 50	
	WB	EB
6-7A	4690	1900
7-8A	5046	2405
8-9A	4751	2965
9-10A	4017	2670

	Exit 8	
	Ramp 9	Ramp 10
6-7A	240	445
7-8A	305	660
8-9A	265	590
9-10A	185	355

	I-495	
	SB	NB
6-7A	7512	8032
7-8A	8356	8850
8-9A	8971	7809
9-10A	7972	7365

I-495 East Side AM
Existing Peak Period Volumes

	I-495	
	SB	NB
6-7A	7512	8032
7-8A	8356	8850
8-9A	8917	7809
9-10A	7972	7365

	MD 202/NB Ramps					
	NBL	NBR	WBT	WBR	EBL	EBT
6-7A	595	40	640	730	10	670
7-8A	750	120	1250	1060	15	1368
8-9A	834	105	1665	1015	5	1524
9-10A	475	115	1315	840	15	1318

	Exit 17			
	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	350	340	145	256
7-8A	733	455	240	367
8-9A	979	595	320	396
9-10A	773	530	255	353

	Exit 17				
	Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
6-7A	730	170	40	10	635
7-8A	1060	170	120	15	870
8-9A	1015	215	105	5	939
9-10A	840	135	115	15	590

	MD 202	
	EB	WB
6-7A	840	1346
7-8A	1275	2127
8-9A	1360	2575
9-10A	1225	1888

	MD 202	
	EB	WB
6-7A	710	1370
7-8A	1488	2310
8-9A	1629	2680
9-10A	1433	2155

	I-495	
	SB	NB
6-7A	7391	7797
7-8A	7951	8595
8-9A	8511	7618
9-10A	7631	7080

	Exit 16				
	Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
6-7A	120	315	275	170	176
7-8A	150	425	340	275	239
8-9A	200	385	360	245	419
9-10A	145	365	195	240	330

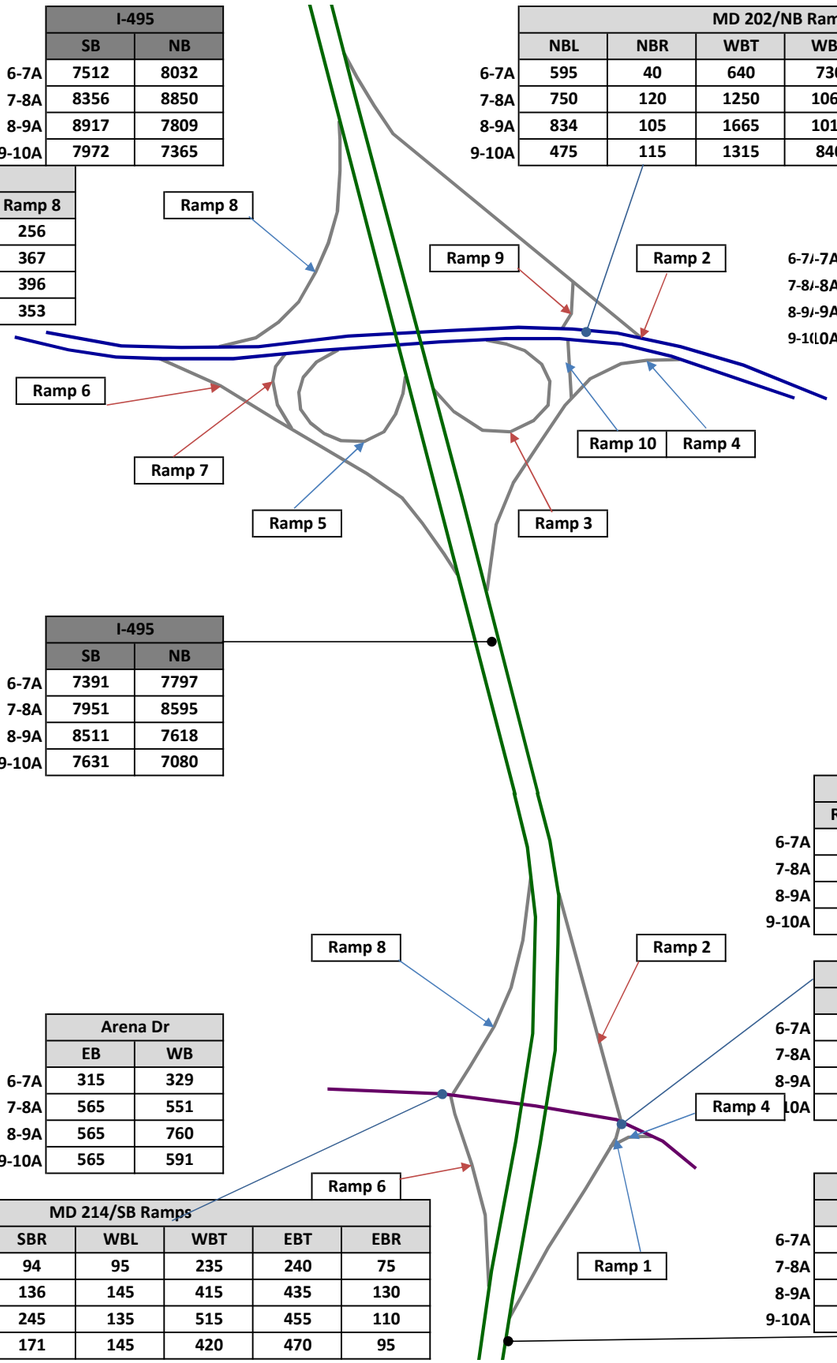
	Arena Dr	
	EB	WB
6-7A	315	329
7-8A	565	551
8-9A	565	760
9-10A	565	591

	MD 214/NB Ramps						
	NBL	NBT	NBR	WBT	WBR	EBL	EBT
6-7A	120	0	275	210	160	155	169
7-8A	150	0	340	410	225	200	340
8-9A	195	5	360	455	210	170	462
9-10A	145	0	195	420	180	185	446

	MD 214/SB Ramps						
	SBL	SBT	SBR	WBL	WBT	EBT	EBR
6-7A	83	0	94	95	235	240	75
7-8A	105	0	136	145	415	435	130
8-9A	177	0	245	135	515	455	110
9-10A	161	0	171	145	420	470	95

	Arena Dr	
	EB	WB
6-7A	444	370
7-8A	680	635
8-9A	822	665
9-10A	641	600

I-495		
SB	NB	
7383	7877	6-7A
7685	8660	7-8A
8334	7793	8-9A
7539	7055	9-10A



I-495 East Side AM
Existing Peak Period Volumes

	Exit 15								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
6-7A	690	545	480	500	463	255	322	239	175
7-8A	890	600	615	945	609	300	443	344	310
8-9A	790	525	630	779	689	350	544	451	305
9-10A	615	520	610	575	681	375	402	196	265

	MD 214/SB Ramps				
	SBR	WBL	WBT	EBT	EBR
6-7A	239	690	2235	615	255
7-8A	344	890	1920	980	300
8-9A	451	790	1295	1145	350
9-10A	196	615	930	1120	375

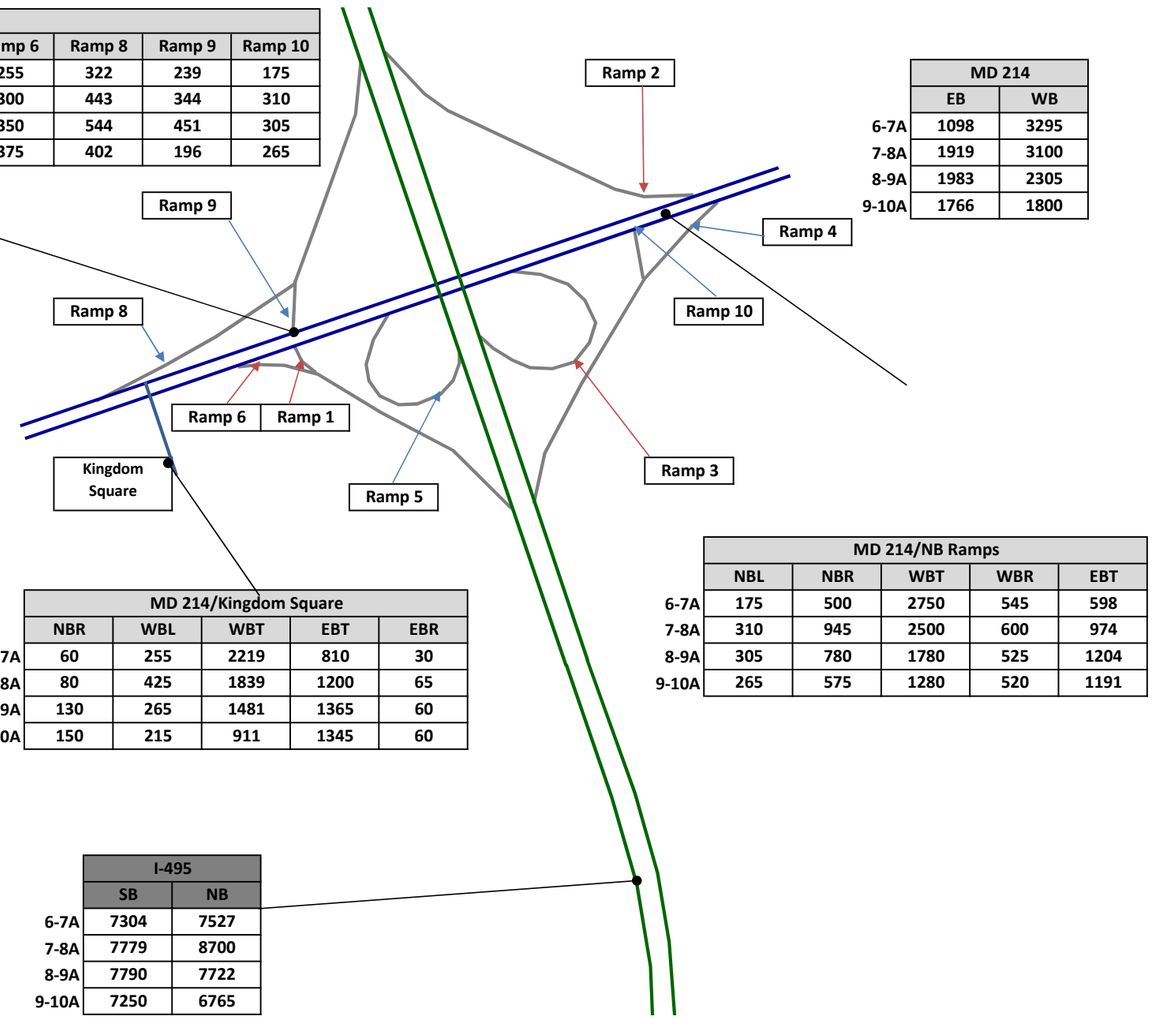
	MD 214	
	EB	WB
6-7A	1098	3295
7-8A	1919	3100
8-9A	1983	2305
9-10A	1766	1800

	MD 214	
	EB	WB
6-7A	840	2541
7-8A	1265	2282
8-9A	1425	2025
9-10A	1405	1313

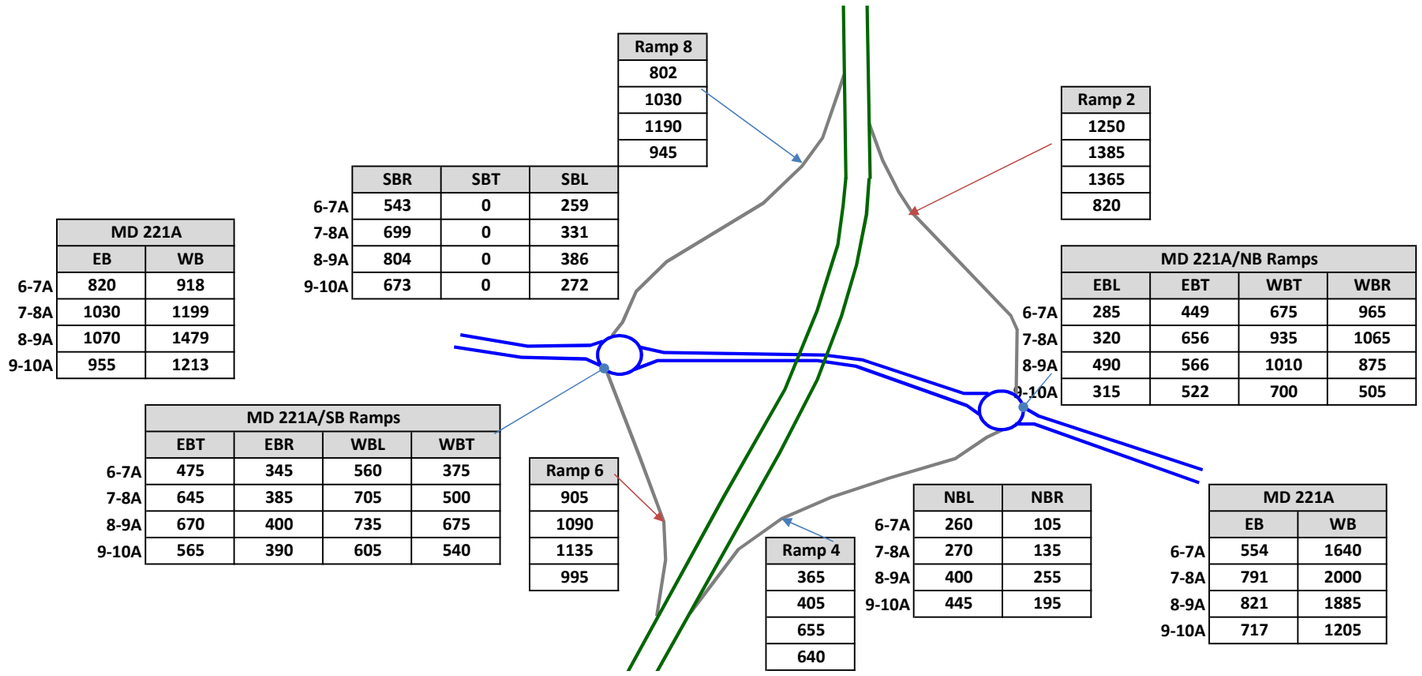
	MD 214/Kingdom Square				
	NBR	WBL	WBT	EBT	EBR
6-7A	60	255	2219	810	30
7-8A	80	425	1839	1200	65
8-9A	130	265	1481	1365	60
9-10A	150	215	911	1345	60

	I-495	
	SB	NB
6-7A	7304	7527
7-8A	7779	8700
8-9A	7790	7722
9-10A	7250	6765

	MD 214/NB Ramps				
	NBL	NBR	WBT	WBR	EBT
6-7A	175	500	2750	545	598
7-8A	310	945	2500	600	974
8-9A	305	780	1780	525	1204
9-10A	265	575	1280	520	1191



I-495 East Side AM
Existing Peak Period Volumes



	MD 221A	
	EB	WB
6-7A	820	918
7-8A	1030	1199
8-9A	1070	1479
9-10A	955	1213

	SBR	SBT	SBL
6-7A	543	0	259
7-8A	699	0	331
8-9A	804	0	386
9-10A	673	0	272

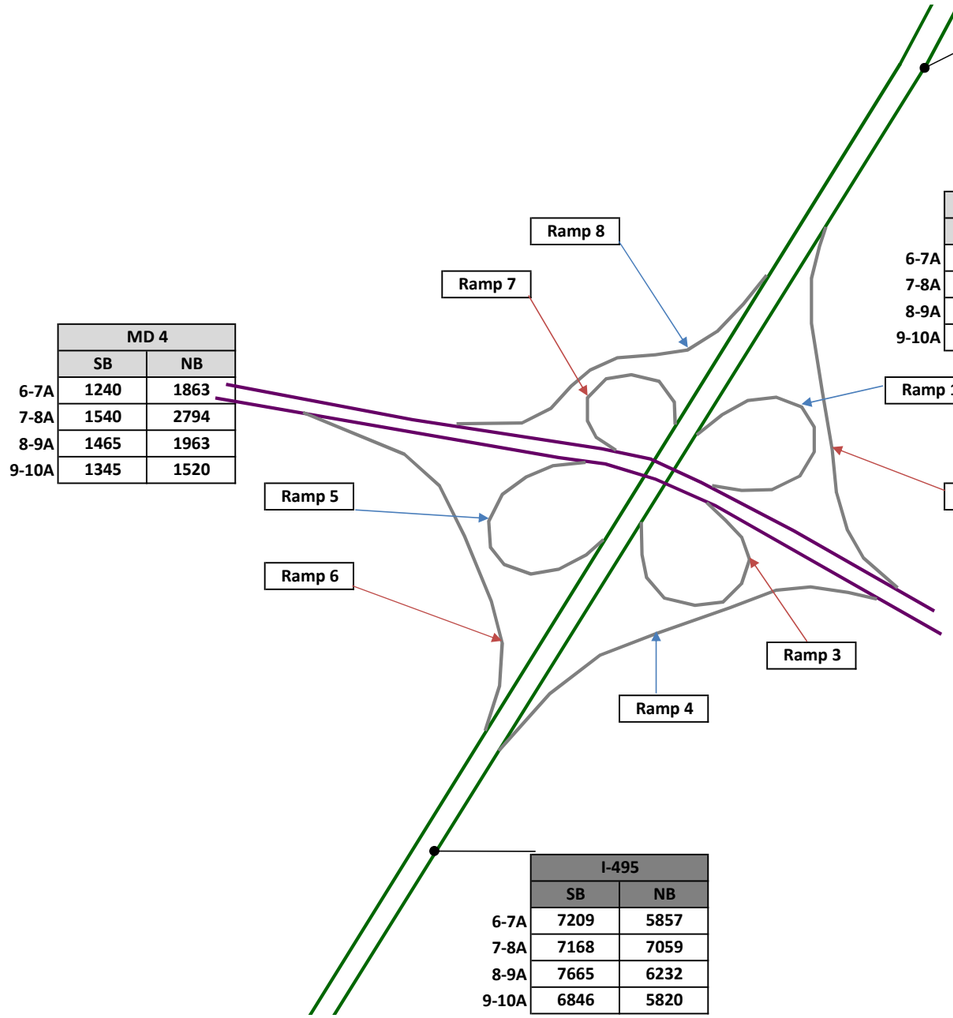
	MD 221A/NB Ramps			
	EBL	EBT	WBT	WBR
6-7A	285	449	675	965
7-8A	320	656	935	1065
8-9A	490	566	1010	875
9-10A	315	522	700	505

	MD 221A/SB Ramps			
	EBT	EBR	WBL	WBT
6-7A	475	345	560	375
7-8A	645	385	705	500
8-9A	670	400	735	675
9-10A	565	390	605	540

	NBL	NBR
6-7A	260	105
7-8A	270	135
8-9A	400	255
9-10A	445	195

	MD 221A	
	EB	WB
6-7A	554	1640
7-8A	791	2000
8-9A	821	1885
9-10A	717	1205

I-495 East Side AM
Existing Peak Period Volumes



	I-495	
	SB	NB
6-7A	7407	6642
7-8A	7838	7720
8-9A	7735	7012
9-10A	7300	6585

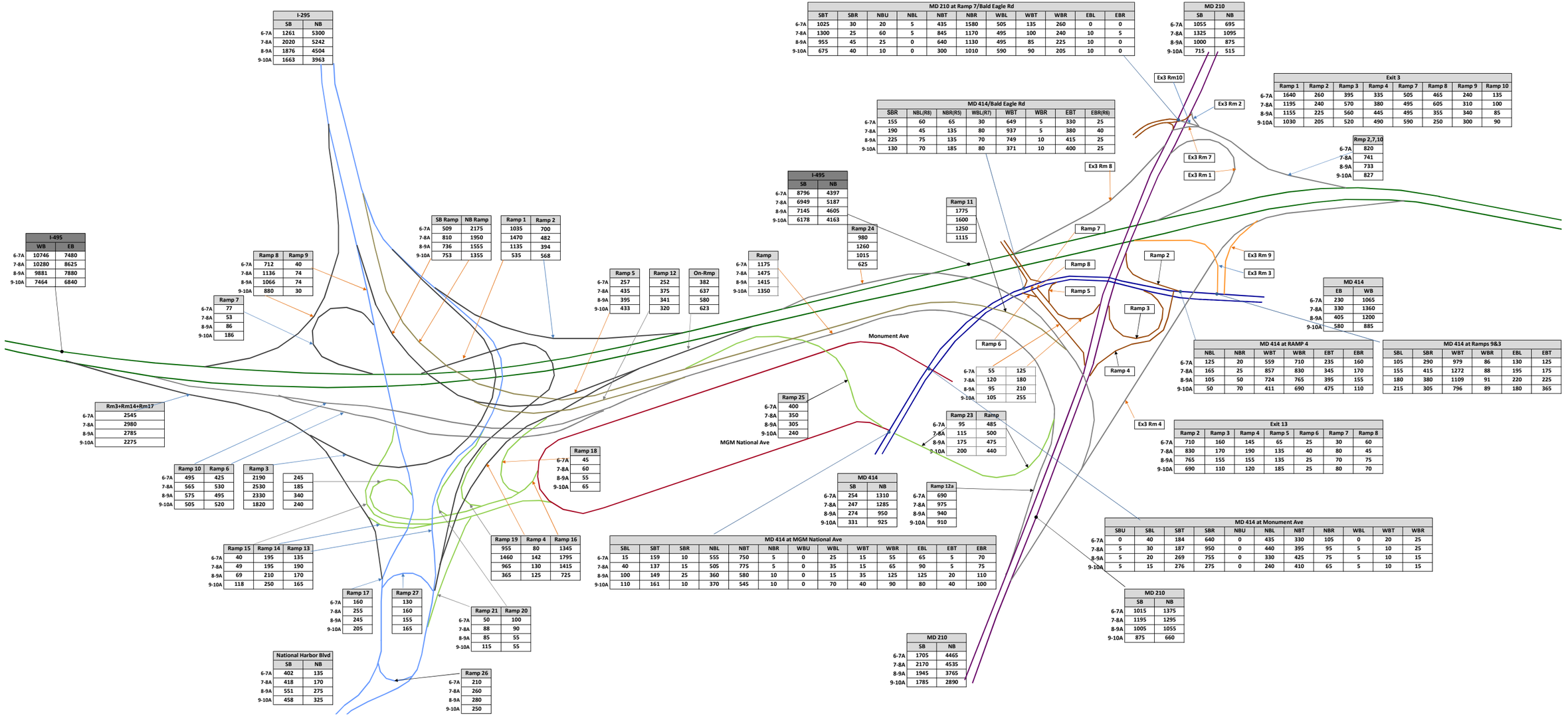
	Exit 11							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	500	1260	515	490	760	455	1115	1008
7-8A	699	1205	605	450	661	425	815	1250
8-9A	640	1290	600	470	512	450	740	748
9-10A	540	1160	560	415	579	360	565	800

	MD 4	
	SB	NB
6-7A	1240	1863
7-8A	1540	2794
8-9A	1465	1963
9-10A	1345	1520

	MD 4	
	SB	NB
6-7A	1520	2730
7-8A	1621	2865
8-9A	1397	2605
9-10A	1419	1905

	I-495	
	SB	NB
6-7A	7209	5857
7-8A	7168	7059
8-9A	7665	6232
9-10A	6846	5820

I-495 South Side AM
Existing Peak Period Volumes



I-295		
	SB	NB
6-7A	1261	5300
7-8A	2020	5242
8-9A	1876	4504
9-10A	1663	3963

MD 210 at Ramp 7/Bald Eagle Rd											
	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR	EBL	EBR
6-7A	1025	30	20	5	435	1580	505	135	260	0	0
7-8A	1300	25	60	5	845	1170	495	100	240	10	5
8-9A	955	45	25	0	640	1130	495	85	225	10	0
9-10A	675	40	10	0	300	1010	590	90	205	10	0

MD 210		
	SB	NB
6-7A	1055	695
7-8A	1325	1095
8-9A	1000	875
9-10A	715	515

MD 414/Bald Eagle Rd							
	SBR	NBL(R8)	NBR(R5)	WBL(R7)	WBT	WBR	EBT	EBR(R6)
6-7A	155	60	65	30	649	5	330	25
7-8A	190	45	135	80	937	5	380	40
8-9A	225	75	135	70	749	10	415	25
9-10A	130	70	185	80	371	10	400	25

Exit 3								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 7	Ramp 8	Ramp 9	Ramp 10
6-7A	1640	260	395	335	505	465	240	135
7-8A	1195	240	570	380	495	605	310	100
8-9A	1155	225	560	445	495	355	340	85
9-10A	1030	205	520	490	590	250	300	90

Rmp 2,7,10
6-7A 820
7-8A 741
8-9A 733
9-10A 827

I-495		
	SB	NB
6-7A	8796	4397
7-8A	6949	5187
8-9A	7145	4605
9-10A	6178	4163

Ramp 24
6-7A 980
7-8A 1260
8-9A 1015
9-10A 625

Ramp 11
6-7A 1775
7-8A 1600
8-9A 1250
9-10A 1115

I-495		
	WB	EB
6-7A	10746	7480
7-8A	10280	8625
8-9A	9881	7880
9-10A	7464	6840

SB Ramp	NB Ramp	Ramp 1	Ramp 2
6-7A 509	2175	1035	700
7-8A 810	1950	1470	482
8-9A 736	1555	1135	394
9-10A 753	1355	535	568

Ramp 8	Ramp 9
6-7A 712	40
7-8A 1136	74
8-9A 1066	74
9-10A 880	30

Ramp 7
6-7A 77
7-8A 53
8-9A 86
9-10A 186

Ramp 5	Ramp 12	On-Rmp
6-7A 257	252	382
7-8A 435	375	637
8-9A 395	341	580
9-10A 433	320	623

Ramp
6-7A 1175
7-8A 1475
8-9A 1415
9-10A 1350

Ramp 6	
6-7A	55 125
7-8A	120 180
8-9A	95 210
9-10A	105 255

Ramp 25
6-7A 400
7-8A 350
8-9A 305
9-10A 240

Ramp 23	Ramp
6-7A	95 485
7-8A	115 500
8-9A	175 475
9-10A	200 440

Rm3+Rm14+Rm17
6-7A 2545
7-8A 2980
8-9A 2785
9-10A 2275

Ramp 10	Ramp 6	Ramp 3	
6-7A	495 425	2190	245
7-8A	565 530	2530	185
8-9A	575 495	2330	340
9-10A	505 520	1820	240

Ramp 18
6-7A 45
7-8A 60
8-9A 55
9-10A 65

Ramp 19	Ramp 4	Ramp 16
955	80	1345
1460	142	1795
965	130	1415
365	125	725

Ramp 15	Ramp 14	Ramp 13
6-7A 40	195	135
7-8A 49	195	190
8-9A 69	210	170
9-10A 118	250	165

Ramp 17	Ramp 27
6-7A 160	130
7-8A 255	160
8-9A 245	155
9-10A 205	165

Ramp 21	Ramp 20
6-7A 50	100
7-8A 88	90
8-9A 85	55
9-10A 115	55

National Harbor Blvd		
	SB	NB
6-7A	402	135
7-8A	418	170
8-9A	551	275
9-10A	458	325

Ramp 26
6-7A 210
7-8A 260
8-9A 280
9-10A 250

MD 414		
	SB	NB
6-7A	254	1310
7-8A	247	1285
8-9A	274	950
9-10A	331	925

Ramp 12a
6-7A 690
7-8A 975
8-9A 940
9-10A 910

MD 414 at MGM National Ave												
	SBL	SBT	SBR	NBL	NBT	NBR	WBU	WBL	WBT	WBR	EBL	EBT	EBR
6-7A	15	159	10	555	750	5	0	25	15	55	65	5	70
7-8A	40	137	15	505	775	5	0	35	15	65	90	5	75
8-9A	100	149	25	360	580	10	0	15	35	125	125	20	110
9-10A	110	161	10	370	545	10	0	70	40	90	80	40	100

MD 210		
	SB	NB
6-7A	1705	4465
7-8A	2170	4535
8-9A	1945	3765
9-10A	1785	2890

MD 414		
	EB	WB
6-7A	230	1065
7-8A	330	1360
8-9A	405	1200
9-10A	580	885

MD 414 at RAMP 4					
	NBL	NBR	WBT	WBR	EBT	EBR
6-7A	125	20	559	710	235	160
7-8A	165	25	857	830	345	170
8-9A	105	50	724	765	395	155
9-10A	50	70	411	690	475	110

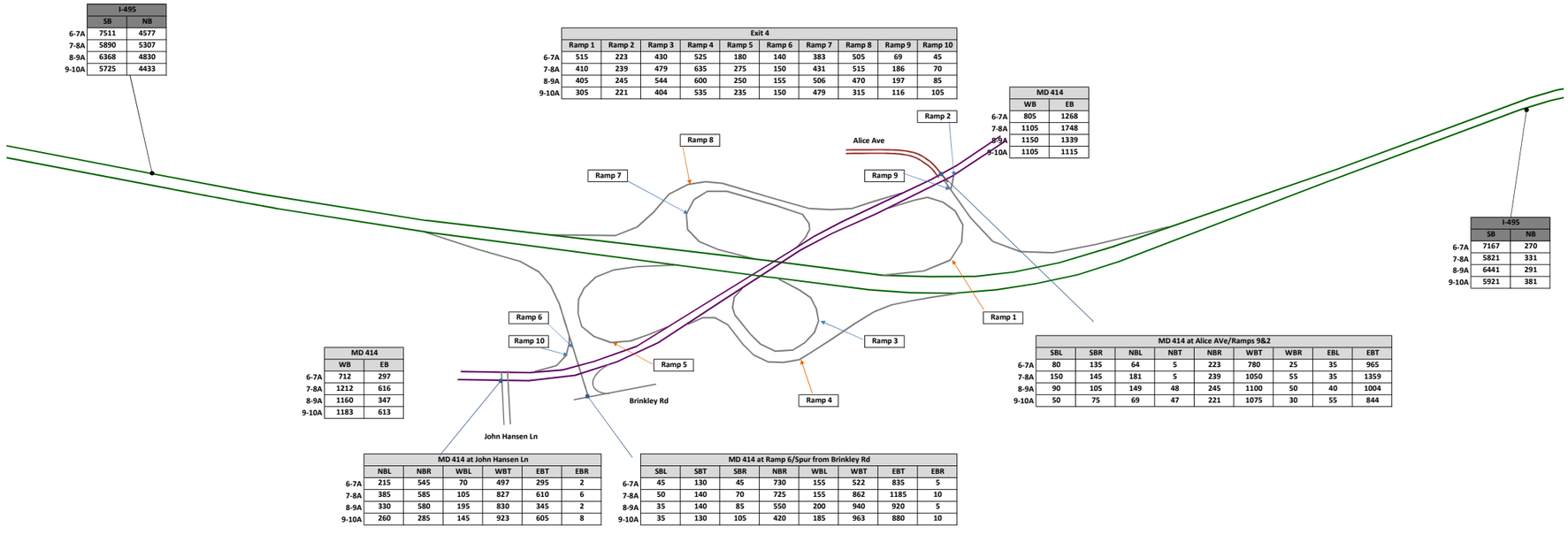
MD 414 at Ramps 9&3					
	SBL	SBR	WBT	WBR	EBL	EBT
6-7A	105	290	979	86	130	125
7-8A	155	415	1272	88	195	175
8-9A	180	380	1109	91	220	225
9-10A	215	305	796	89	180	365

Exit 13							
	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	710	160	145	65	25	30	60
7-8A	830	170	190	135	40	80	45
8-9A	765	155	155	135	25	70	75
9-10A	690	110	120	185	25	80	70

MD 414 at Monument Ave										
	SBU	SBL	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR
6-7A	0	40	184	640	0	435	330	105	0	20	25
7-8A	5	30	187	950	0	440	395	95	5	10	25
8-9A	5	20	269	755	0	330	425	75	5	10	15
9-10A	5	15	276	275	0	240	410	65	5	10	15

MD 210		
	SB	NB
6-7A	1015	1375
7-8A	1195	1295
8-9A	1005	1055
9-10A	875	660

I-495 South Side AM
Existing Peak Period Volumes



I-495		
	SB	NB
6-7A	7511	4577
7-8A	5890	5307
8-9A	6368	4830
9-10A	5725	4433

Exit 4										
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
6-7A	515	223	430	525	180	140	383	505	69	45
7-8A	410	239	479	635	275	150	431	515	186	70
8-9A	405	245	544	600	250	155	506	470	197	85
9-10A	305	221	404	535	235	150	479	315	116	105

MD 414		
	WB	EB
6-7A	805	1268
7-8A	1105	1748
8-9A	1150	1339
9-10A	1105	1115

I-495		
	SB	NB
6-7A	7167	270
7-8A	5821	331
8-9A	6441	291
9-10A	5921	381

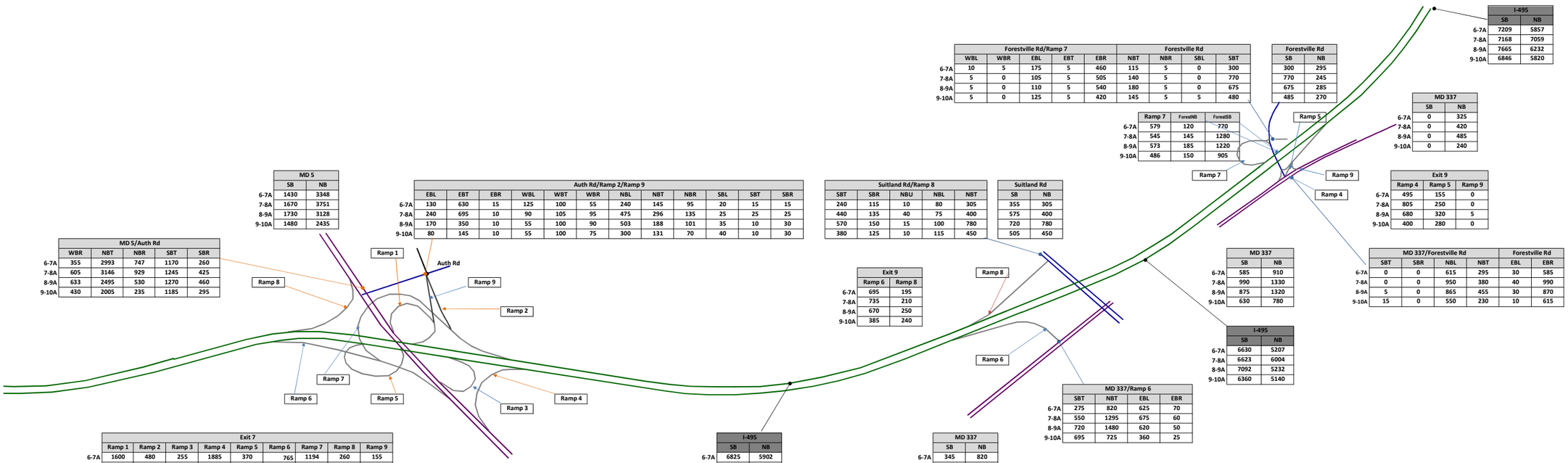
MD 414		
	WB	EB
6-7A	712	297
7-8A	1212	616
8-9A	1160	347
9-10A	1183	613

MD 414 at Alice AVe/Ramps 9&2								
	SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
6-7A	80	135	64	5	223	780	25	35	965
7-8A	150	145	181	5	239	1050	55	35	1359
8-9A	90	105	149	48	245	1100	50	40	1004
9-10A	50	75	69	47	221	1075	30	55	844

MD 414 at John Hansen Ln						
	NBL	NBR	WBL	WBT	EBT	EBR
6-7A	215	545	70	497	295	2
7-8A	385	585	105	827	610	6
8-9A	330	580	195	830	345	2
9-10A	260	285	145	923	605	8

MD 414 at Ramp 6/Spur from Brinkley Rd								
	SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
6-7A	45	130	45	730	155	522	835	5
7-8A	50	140	70	725	155	862	1185	10
8-9A	35	140	85	550	200	940	920	5
9-10A	35	130	105	420	185	963	880	10

I-495 South Side AM
Existing Peak Period Volumes



	Forestville Rd/Ramp 7					Forestville Rd			
	WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
6-7A	10	5	175	5	460	115	5	0	300
7-8A	5	0	105	5	505	140	5	0	770
8-9A	5	0	110	5	540	180	5	0	675
9-10A	5	0	125	5	420	145	5	5	480

	Forestville Rd	
	SB	NB
6-7A	300	295
7-8A	770	245
8-9A	675	285
9-10A	485	270

	I-495	
	SB	NB
6-7A	7209	5857
7-8A	7168	7059
8-9A	7665	6232
9-10A	6846	5820

	Ramp 7	ForestNB	ForestSB
6-7A	579	120	770
7-8A	545	145	1280
8-9A	573	185	1220
9-10A	486	150	905

	MD 337	
	SB	NB
6-7A	0	325
7-8A	0	420
8-9A	0	485
9-10A	0	240

	Exit 9		
	Ramp 4	Ramp 5	Ramp 9
6-7A	495	155	0
7-8A	805	250	0
8-9A	680	320	5
9-10A	400	280	0

	MD 5	
	SB	NB
6-7A	1430	3348
7-8A	1670	3751
8-9A	1730	3128
9-10A	1480	2435

	Auth Rd/Ramp 2/Ramp 9											
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
6-7A	130	630	15	125	100	55	240	145	95	20	15	15
7-8A	240	695	10	90	105	95	475	296	135	25	25	25
8-9A	170	350	10	55	100	90	503	188	101	35	10	30
9-10A	80	145	10	55	100	75	300	131	70	40	10	30

	Suitland Rd/Ramp 8				
	SBT	SBR	NBU	NBL	NBT
6-7A	240	115	10	80	305
7-8A	440	135	40	75	400
8-9A	570	150	15	100	780
9-10A	380	125	10	115	450

	Suitland Rd	
	SB	NB
6-7A	355	305
7-8A	575	400
8-9A	720	780
9-10A	505	450

	MD 5/Auth Rd				
	WBR	NBT	NBR	SBT	SBR
6-7A	355	2993	747	1170	260
7-8A	605	3146	929	1245	425
8-9A	633	2495	530	1270	460
9-10A	430	2005	235	1185	295

	Exit 9	
	Ramp 6	Ramp 8
6-7A	695	195
7-8A	735	210
8-9A	670	250
9-10A	385	240

	MD 337	
	SB	NB
6-7A	585	910
7-8A	990	1330
8-9A	875	1320
9-10A	630	780

	MD 337/Forestville Rd				Forestville Rd	
	SBT	SBR	NBL	NBT	EBL	EBR
6-7A	0	0	615	295	30	585
7-8A	0	0	950	380	40	990
8-9A	5	0	865	455	30	870
9-10A	15	0	550	230	10	615

	I-495	
	SB	NB
6-7A	6630	5207
7-8A	6623	6004
8-9A	7092	5232
9-10A	6360	5140

	MD 337/Ramp 6			
	SBT	NBT	EBL	EBR
6-7A	275	820	625	70
7-8A	550	1295	675	60
8-9A	720	1480	620	50
9-10A	695	725	360	25

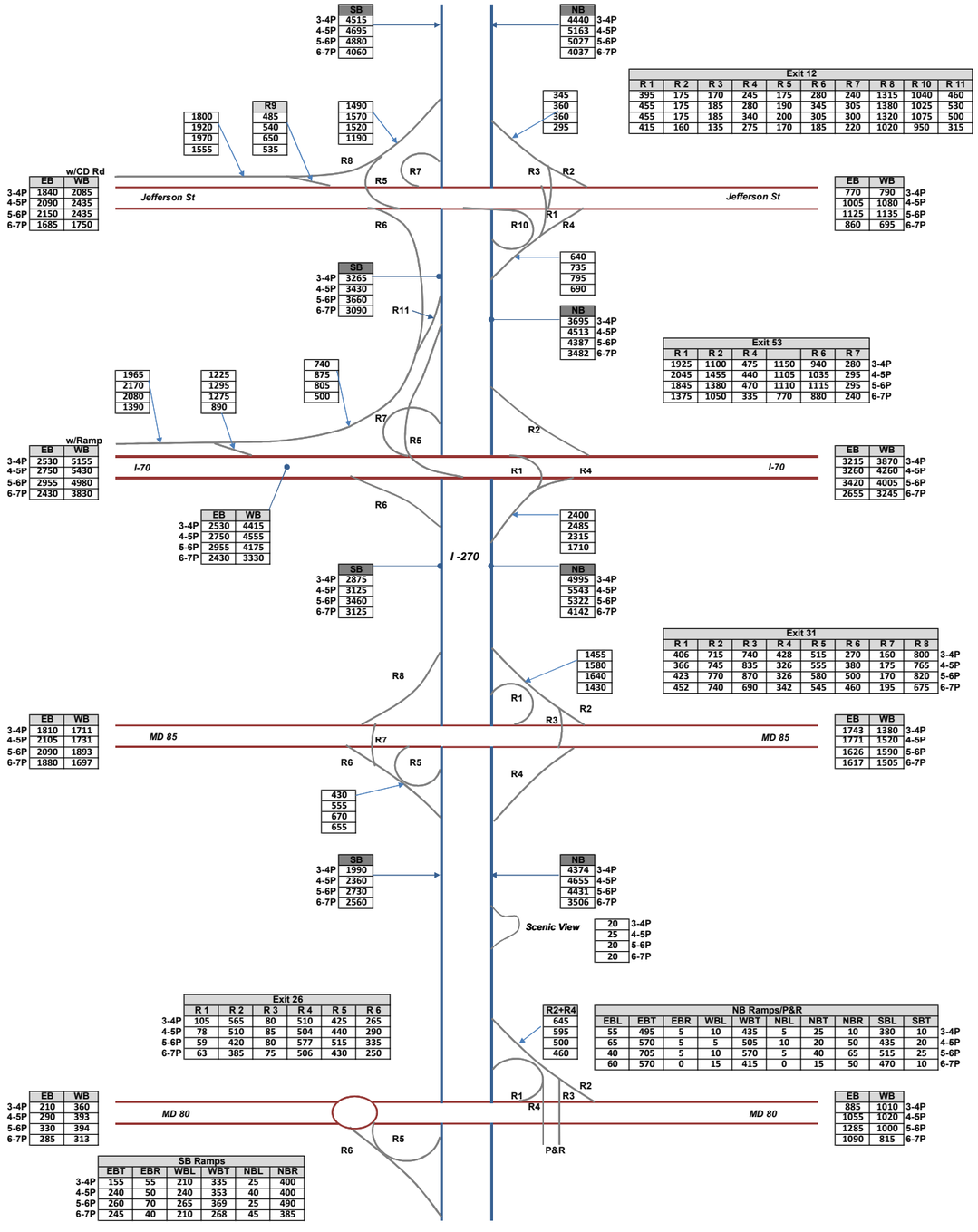
	Exit 7								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
6-7A	1600	480	255	1885	370	765	1194	260	155
7-8A	950	906	365	2050	435	899	1606	425	125
8-9A	845	792	360	1840	400	874	1489	460	75
9-10A	785	501	295	1755	395	874	1333	295	75

	I-495	
	SB	NB
6-7A	6825	5902
7-8A	6833	6739
8-9A	7342	5902
9-10A	6600	5525

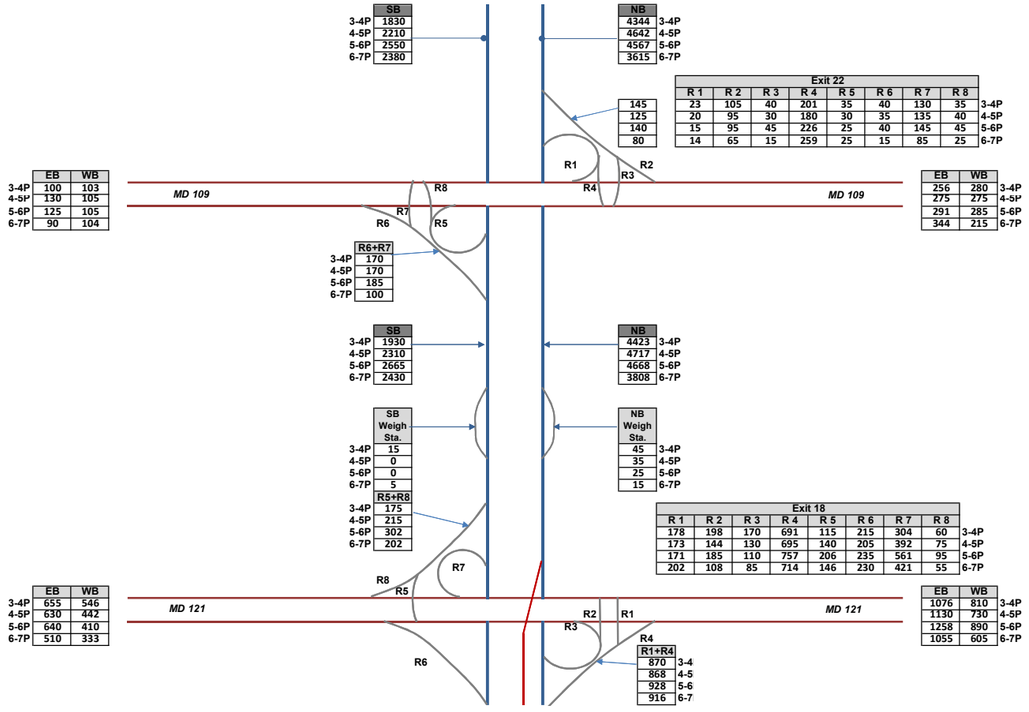
	MD 337	
	SB	NB
6-7A	345	820
7-8A	610	1295
8-9A	770	1480
9-10A	720	725

	MD 5	
	SB	NB
6-7A	2759	6970
7-8A	3315	6710
8-9A	3233	5350
9-10A	2997	4485

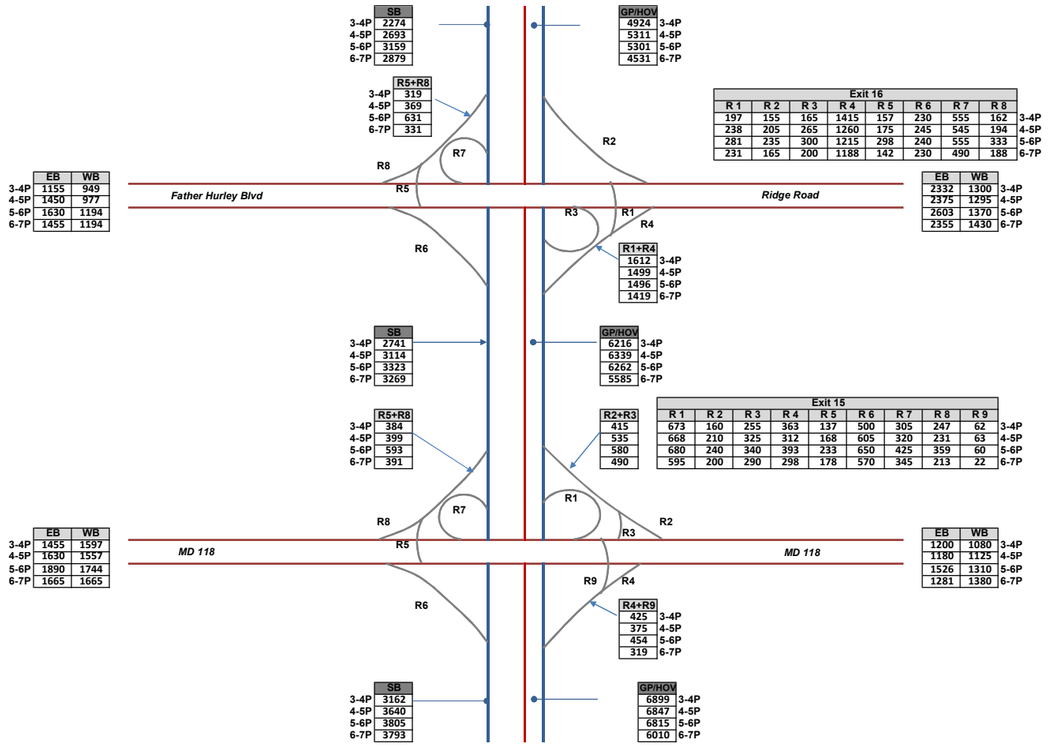
I-270 & I-495 West Side PM
Existing Peak Period Volumes



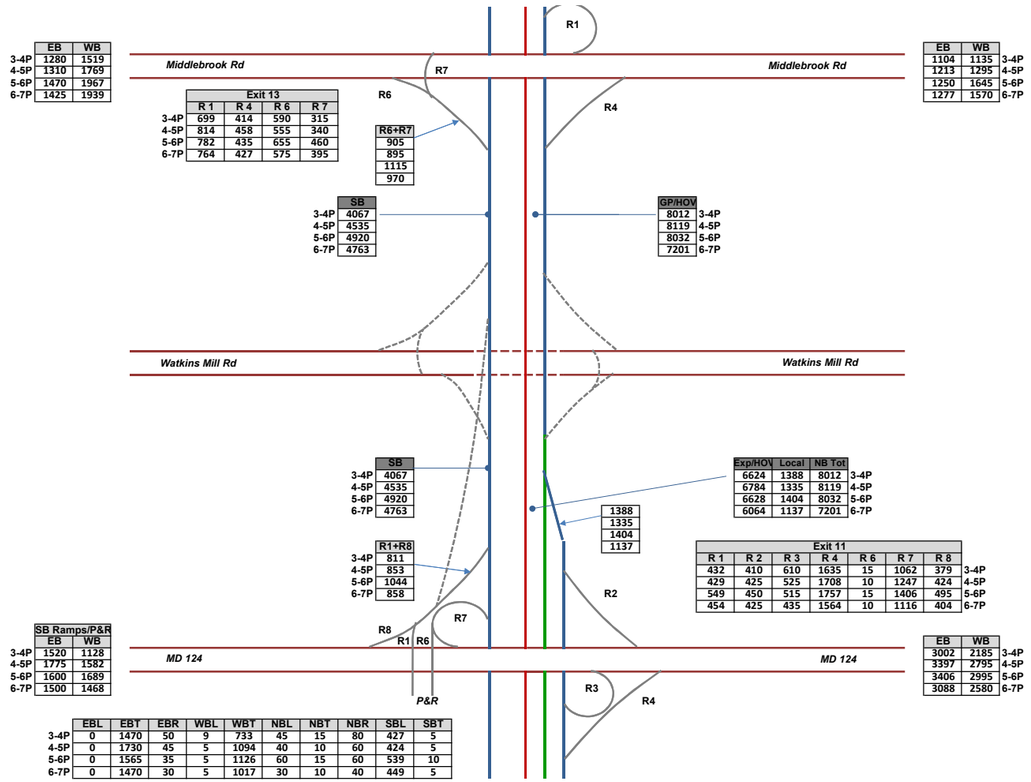
I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-270 & I-495 West Side PM
Existing Peak Period Volumes



Exit 13

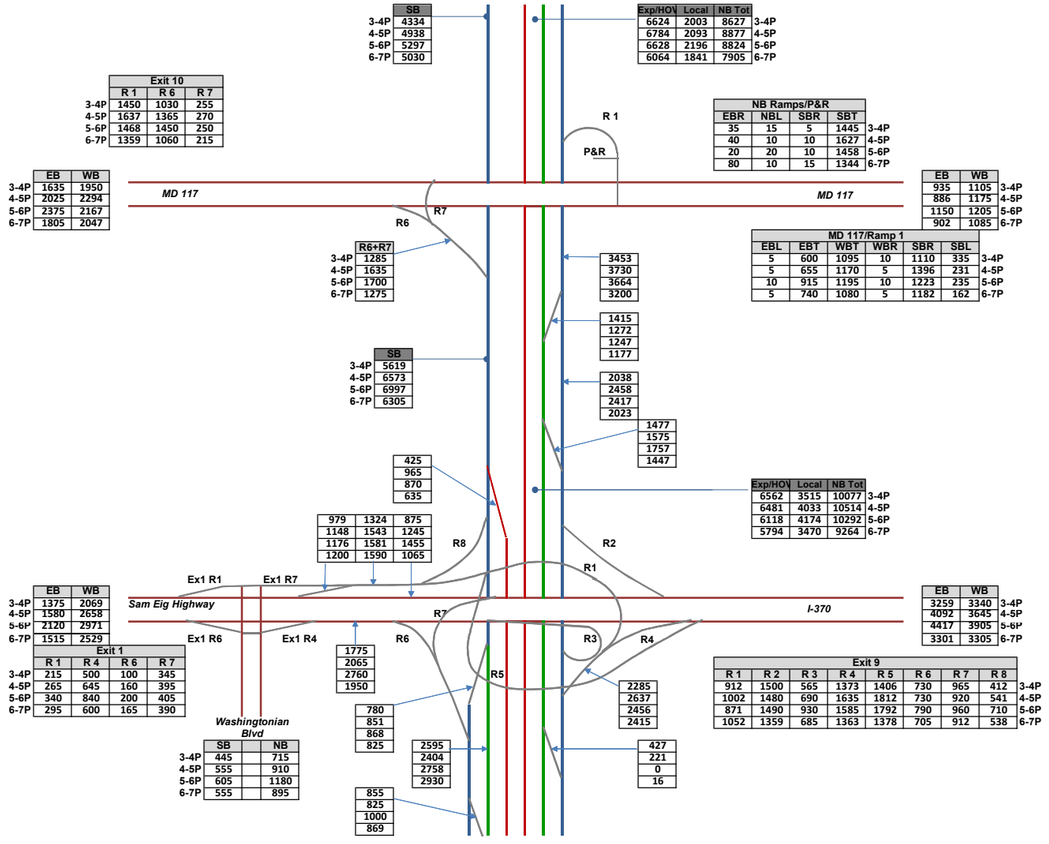
	R 1	R 4	R 6	R 7
3-4P	699	414	590	315
4-5P	814	458	555	340
5-6P	782	435	655	460
6-7P	764	427	575	395

Exit 11

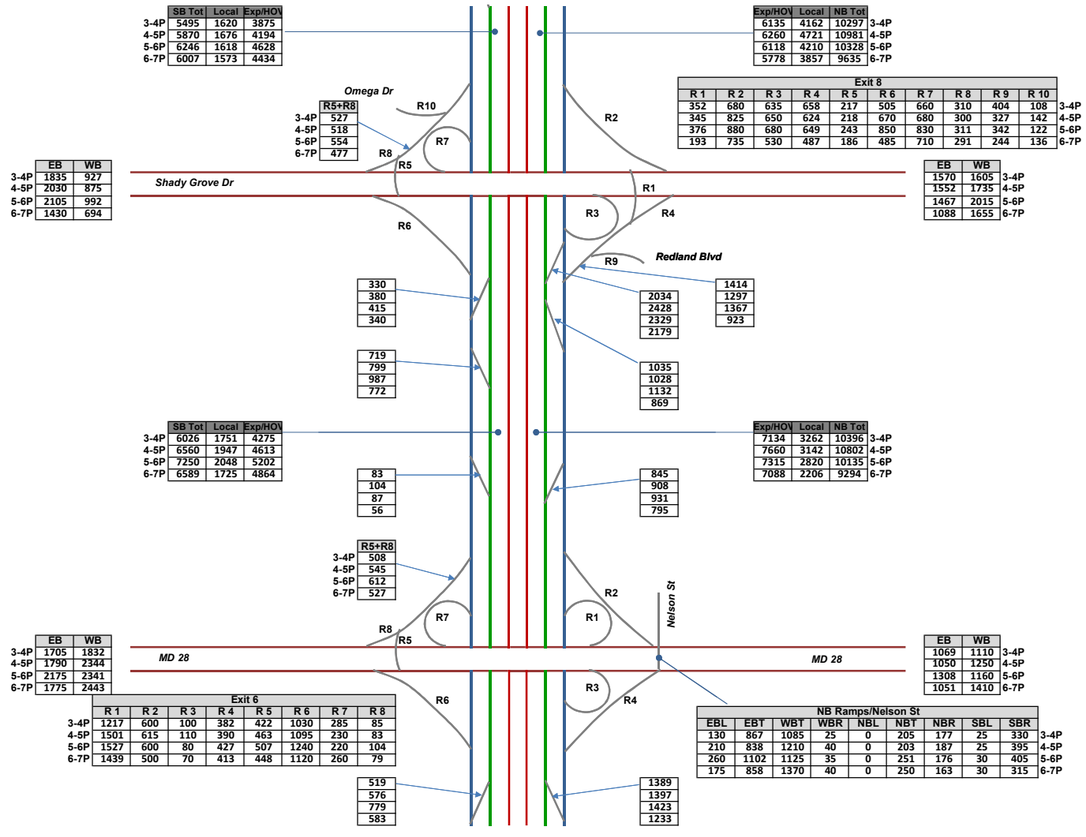
	R 1	R 2	R 3	R 4	R 6	R 7	R 8
3-4P	432	410	610	1635	15	1062	379
4-5P	429	425	525	1708	10	1247	424
5-6P	549	450	515	1757	15	1406	495
6-7P	454	425	435	1564	10	1116	404

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
3-4P	0	1470	50	9	733	45	15	80	427	5
4-5P	0	1730	45	5	1094	40	10	60	424	5
5-6P	0	1565	35	5	1126	60	15	60	539	10
6-7P	0	1470	30	5	1017	30	10	40	449	5

I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-270 & I-495 West Side PM
Existing Peak Period Volumes



	SB Tot	Local	Exp/HOV
3-4P	5495	1620	3875
4-5P	5870	1676	4194
5-6P	6246	1618	4628
6-7P	6007	1573	4434

	Exp/HOV	Local	NB Tot
3-4P	6135	4162	10297
4-5P	6260	4721	10981
5-6P	6118	4210	10328
6-7P	5778	3857	9635

	R5+R8
3-4P	527
4-5P	518
5-6P	554
6-7P	477

	Exit 8										
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	
3-4P	352	680	635	658	217	505	660	310	404	108	3-4P
4-5P	345	825	650	624	218	670	680	300	327	142	4-5P
5-6P	376	880	680	649	243	850	830	311	342	122	5-6P
6-7P	193	735	530	487	186	485	710	291	244	136	6-7P

	EB	WB
3-4P	1835	927
4-5P	2030	875
5-6P	2105	992
6-7P	1430	694

	EB	WB
3-4P	1570	1605
4-5P	1552	1735
5-6P	1467	2015
6-7P	1088	1655

330
380
415
340

719
799
987
772

1414
1297
1367
923

2034
2428
2329
2179

1035
1028
1132
869

83
104
87
56

845
908
931
795

	SB Tot	Local	Exp/HOV
3-4P	6026	1751	4275
4-5P	6560	1947	4613
5-6P	7250	2048	5202
6-7P	6589	1725	4864

	Exp/HOV	Local	NB Tot
3-4P	7134	3262	10396
4-5P	7660	3142	10802
5-6P	7315	2820	10135
6-7P	7088	2206	9294

	R5+R8
3-4P	508
4-5P	545
5-6P	612
6-7P	527

	EB	WB
3-4P	1705	1832
4-5P	1790	2344
5-6P	2175	2341
6-7P	1775	2443

	Exit 6							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
3-4P	1217	600	100	382	422	1030	285	85
4-5P	1501	615	110	390	463	1095	230	83
5-6P	1527	600	80	427	507	1240	220	104
6-7P	1439	500	70	413	448	1120	260	79

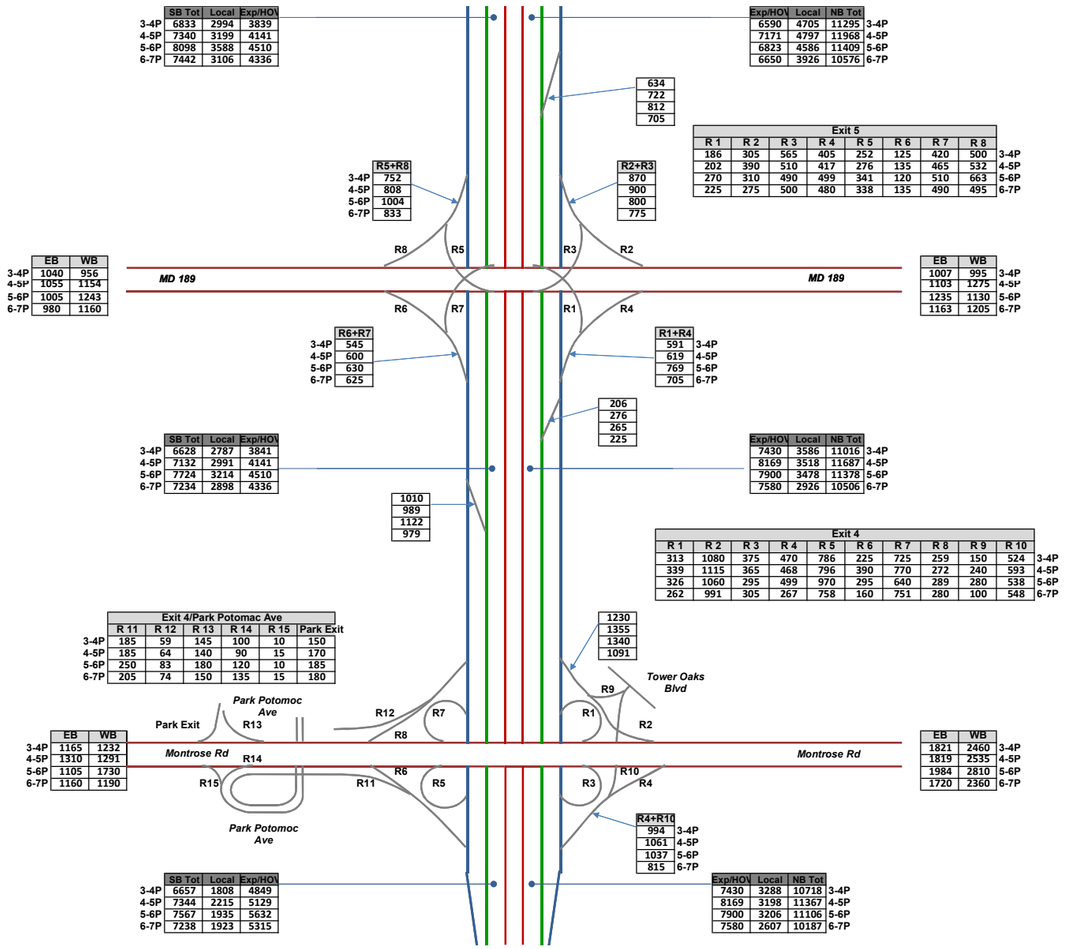
	EB	WB
3-4P	1069	1110
4-5P	1050	1250
5-6P	1308	1160
6-7P	1051	1410

519
576
779
583

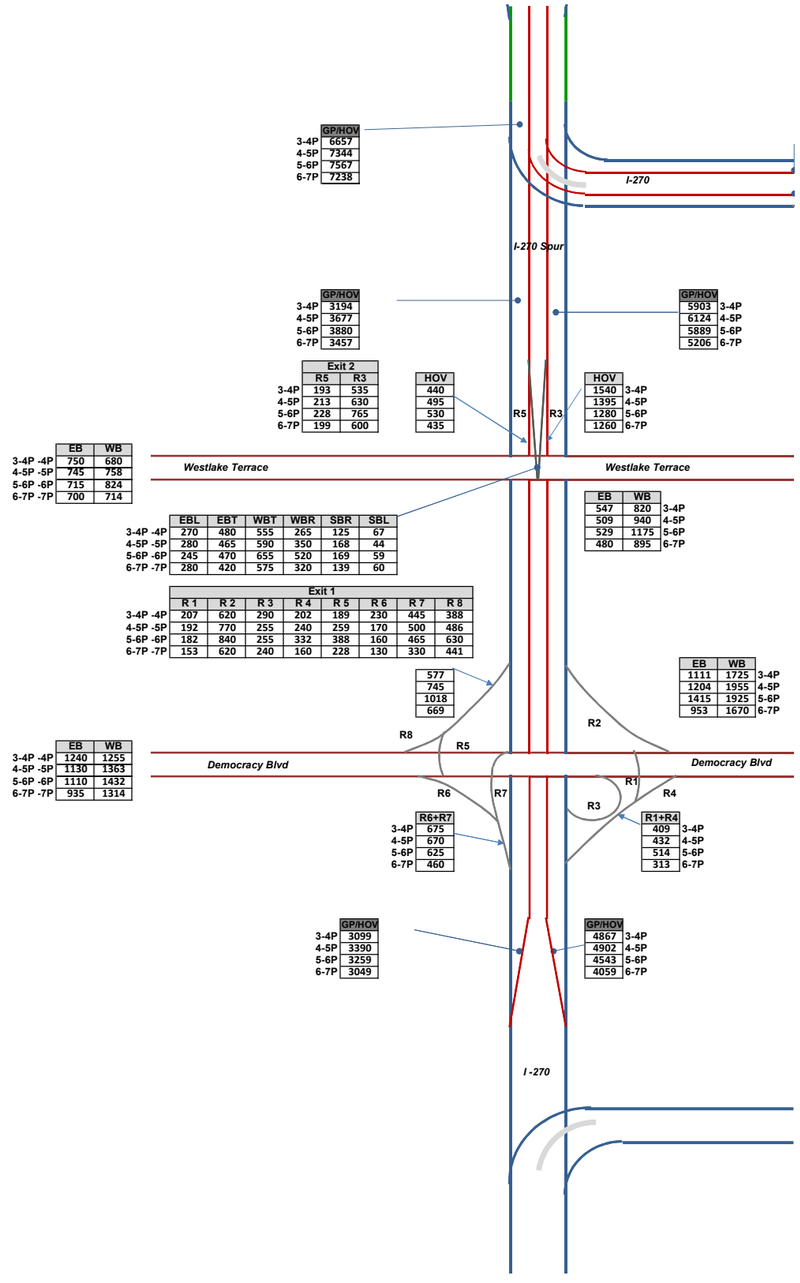
1389
1397
1423
1233

	NB Ramps/Nelson St								
	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
3-4P	130	867	1085	25	0	205	177	25	330
4-5P	210	838	1210	40	0	203	187	25	395
5-6P	260	1102	1125	35	0	251	176	30	405
6-7P	175	858	1370	40	0	250	163	30	315

I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-270 & I-495 West Side PM
Existing Peak Period Volumes



	GP/HOV
3-4P	6657
4-5P	7344
5-6P	7567
6-7P	7238

	GP/HOV
3-4P	3194
4-5P	3677
5-6P	3880
6-7P	3457

	GP/HOV	
	5903	3-4P
	6124	4-5P
	5889	5-6P
	5206	6-7P

	Exit 2	
	R5	R3
3-4P	193	535
4-5P	213	630
5-6P	228	765
6-7P	199	600

HOV
440
495
530
435

HOV	
1540	3-4P
1395	4-5P
1280	5-6P
1260	6-7P

	EB	WB
3-4P -4P	750	680
4-5P -5P	745	758
5-6P -6P	715	824
6-7P -7P	700	714

	EBL	EBT	WBT	WBR	SBR	SBL
3-4P -4P	270	480	555	265	125	67
4-5P -5P	280	465	590	350	168	44
5-6P -6P	245	470	655	520	169	59
6-7P -7P	280	420	575	320	139	60

	EB	WB	
	547	820	3-4P
	509	940	4-5P
	529	1175	5-6P
	480	895	6-7P

	Exit 1							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
3-4P -4P	207	620	290	202	189	230	445	388
4-5P -5P	192	770	255	240	259	170	500	486
5-6P -6P	182	840	255	332	388	160	465	630
6-7P -7P	153	620	240	160	228	130	330	441

577
745
1018
669

	EB	WB	
	1111	1725	3-4P
	1204	1955	4-5P
	1415	1925	5-6P
	953	1670	6-7P

	EB	WB
3-4P -4P	1240	1255
4-5P -5P	1130	1363
5-6P -6P	1110	1432
6-7P -7P	935	1314

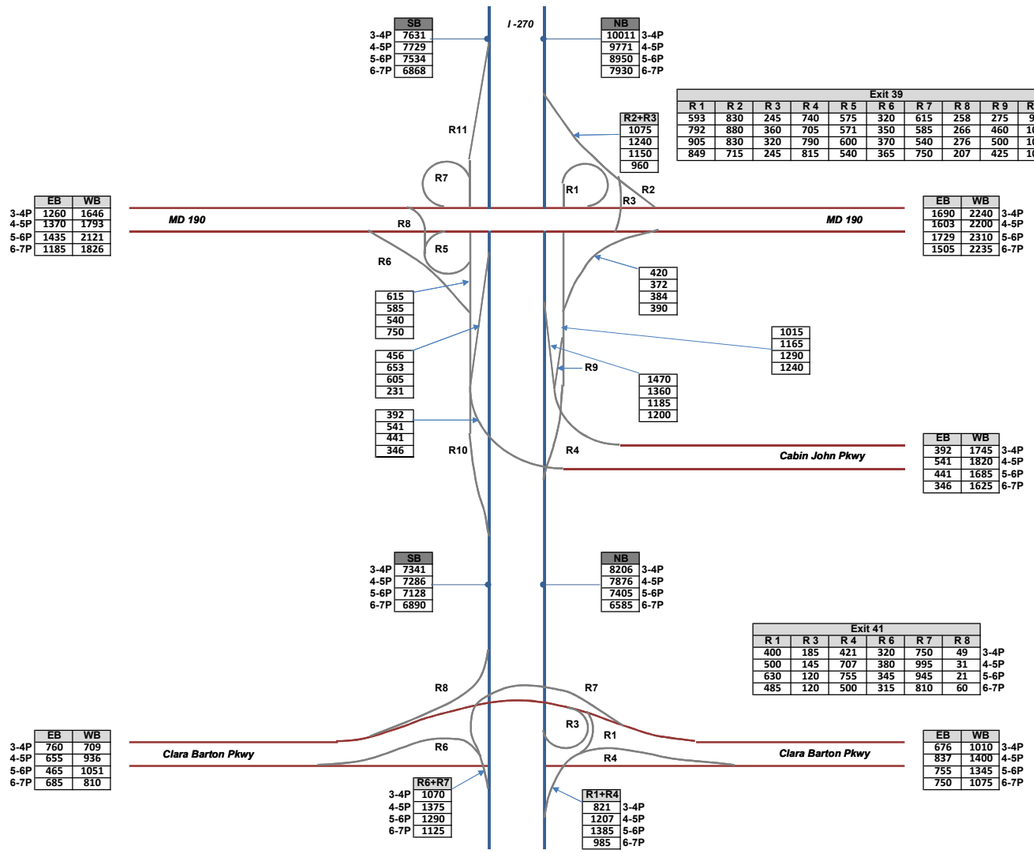
	R6+R7
3-4P	675
4-5P	670
5-6P	625
6-7P	460

	R1+R4	
	409	3-4P
	432	4-5P
	514	5-6P
	313	6-7P

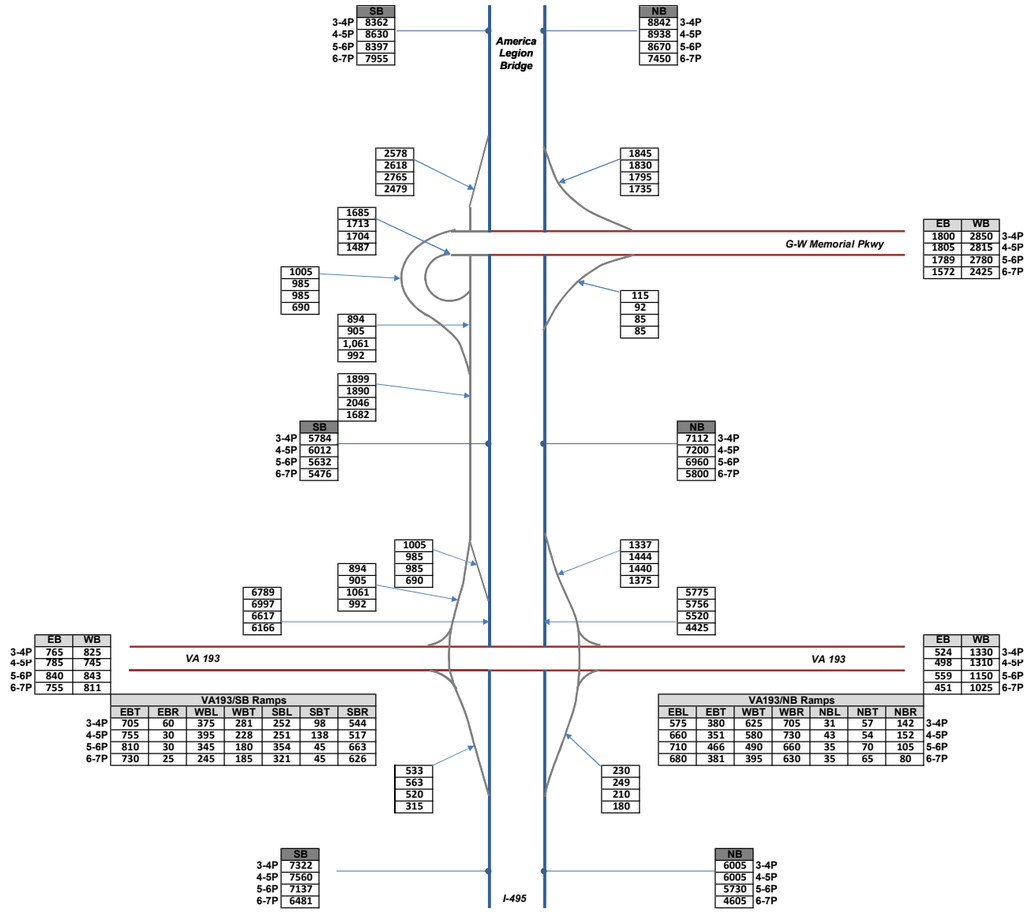
	GP/HOV
3-4P	3099
4-5P	3390
5-6P	3259
6-7P	3049

	GP/HOV	
	4867	3-4P
	4902	4-5P
	4543	5-6P
	4059	6-7P

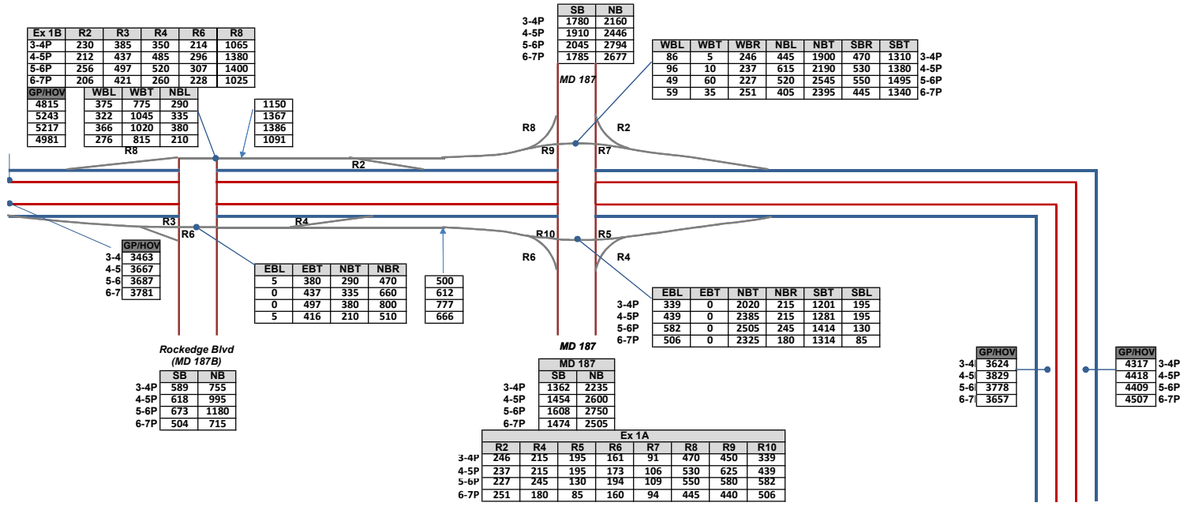
I-270 & I-495 West Side PM
Existing Peak Period Volumes



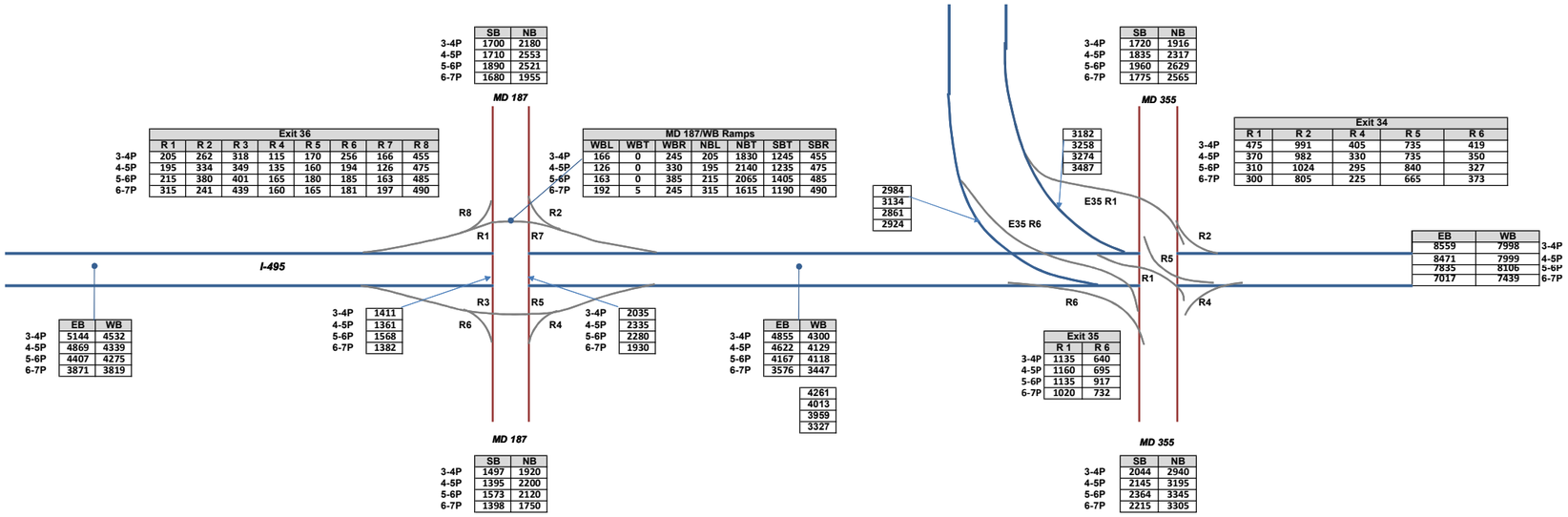
I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-270 & I-495 West Side PM
Existing Peak Period Volumes



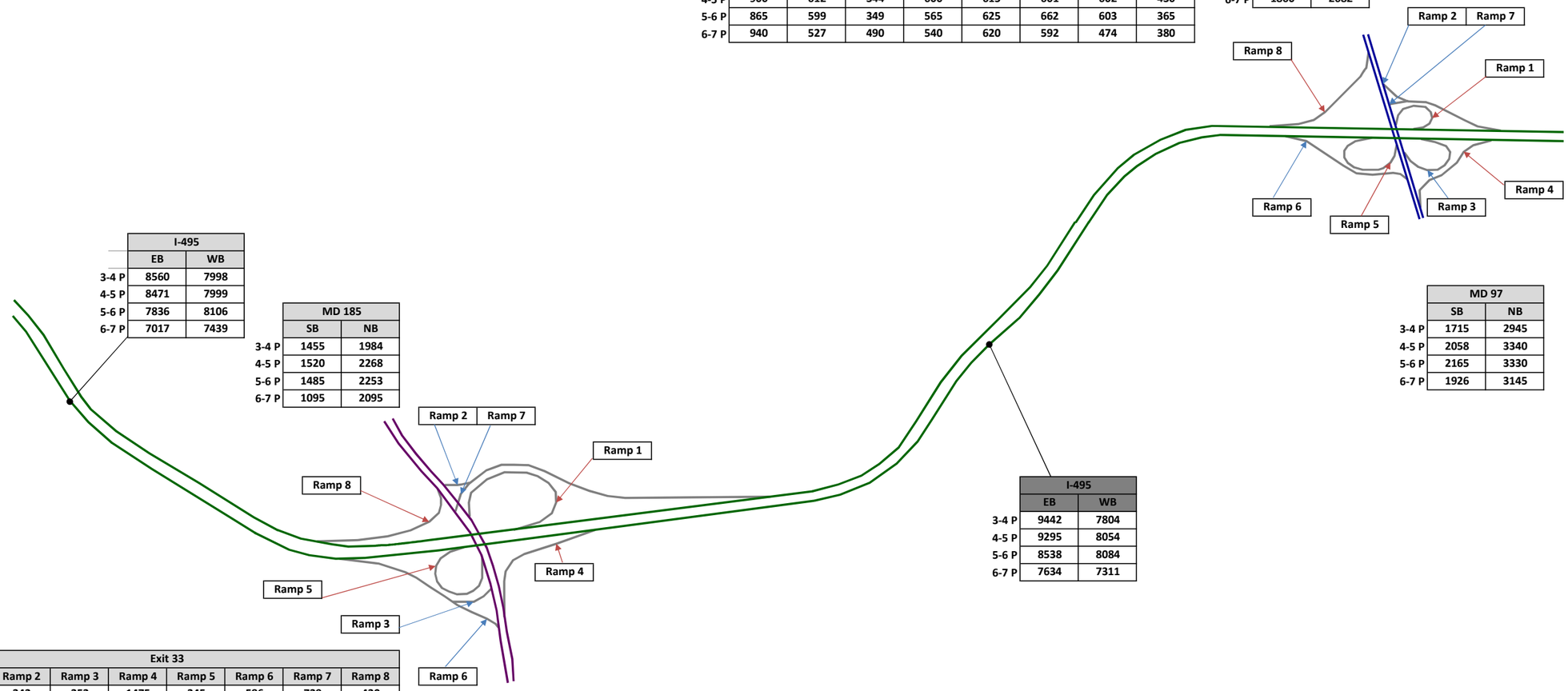
I-270 & I-495 West Side PM
Existing Peak Period Volumes



I-495 North Side PM
Existing Peak Period Volumes

	Exit 31							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4 P	925	529	330	585	610	615	430	410
4-5 P	900	612	344	600	615	601	602	430
5-6 P	865	599	349	565	625	662	603	365
6-7 P	940	527	490	540	620	592	474	380

	MD 97	
	SB	NB
3-4 P	1690	2294
4-5 P	1900	2796
5-6 P	1890	2848
6-7 P	1860	2682



	I-495	
	EB	WB
3-4 P	8560	7998
4-5 P	8471	7999
5-6 P	7836	8106
6-7 P	7017	7439

	MD 185	
	SB	NB
3-4 P	1455	1984
4-5 P	1520	2268
5-6 P	1485	2253
6-7 P	1095	2095

	MD 97	
	SB	NB
3-4 P	1715	2945
4-5 P	2058	3340
5-6 P	2165	3330
6-7 P	1926	3145

	I-495	
	EB	WB
3-4 P	9442	7804
4-5 P	9295	8054
5-6 P	8538	8084
6-7 P	7634	7311

	Exit 33							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4 P	845	342	352	1475	345	586	739	430
4-5 P	775	403	375	1495	305	601	812	385
5-6 P	795	377	476	1570	270	662	716	320
6-7 P	770	264	541	1545	205	592	738	360

	MD 185	
	SB	NB
3-4 P	2005	3610
4-5 P	2243	3760
5-6 P	2273	3765
6-7 P	1860	3605

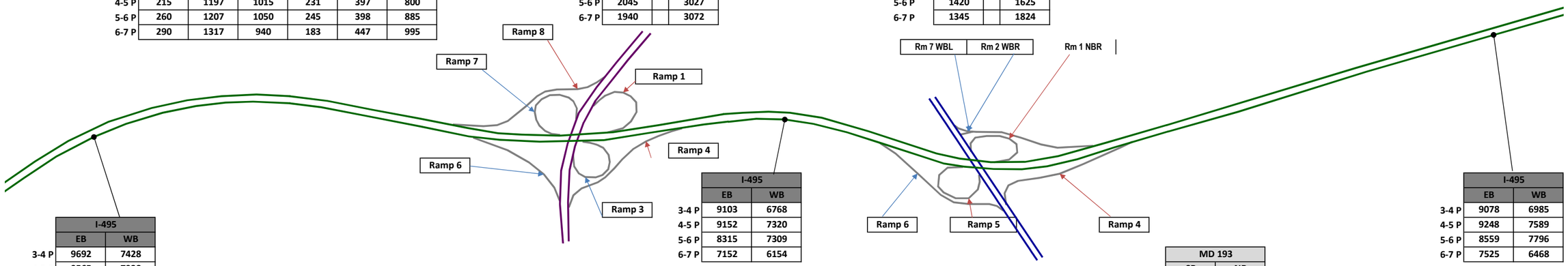
I-495 North Side PM
Existing Peak Period Volumes

	Exit 29					
	Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
3-4 P	415	400	395	415	835	232
4-5 P	585	556	450	435	789	298
5-6 P	565	635	545	425	726	417
6-7 P	590	539	455	450	532	365

	Exit 30					
	Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
3-4 P	185	1149	840	280	410	885
4-5 P	215	1197	1015	231	397	800
5-6 P	260	1207	1050	245	398	885
6-7 P	290	1317	940	183	447	995

	US 29		
	SB		NB
3-4 P	1865		2564
4-5 P	1930		2872
5-6 P	2045		3027
6-7 P	1940		3072

	MD 193		
	SB		NB
3-4 P	1285		1675
4-5 P	1395		1856
5-6 P	1420		1625
6-7 P	1345		1824



	I-495	
	EB	WB
3-4 P	9692	7428
4-5 P	9565	7938
5-6 P	8717	8056
6-7 P	7712	6992

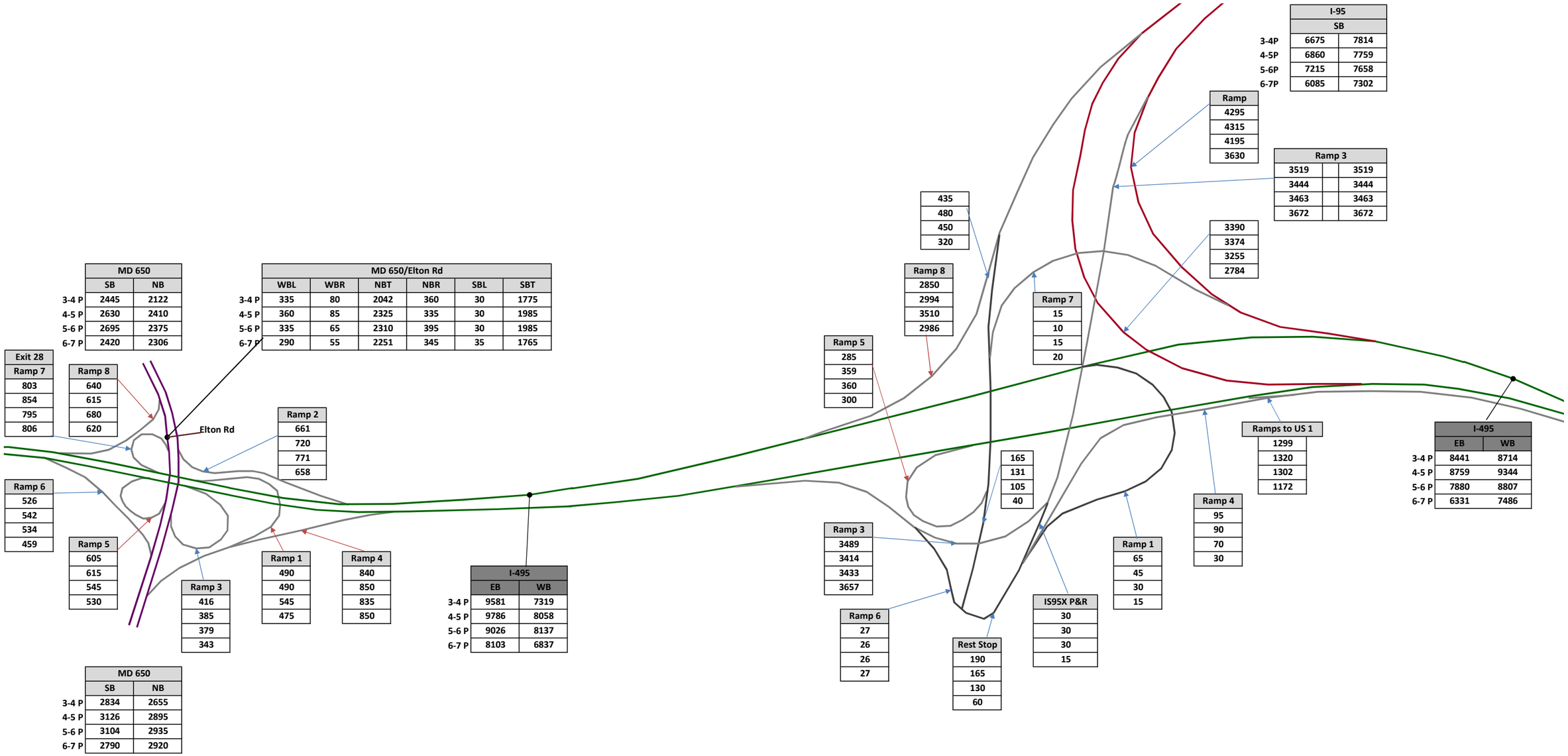
	I-495	
	EB	WB
3-4 P	9103	6768
4-5 P	9152	7320
5-6 P	8315	7309
6-7 P	7152	6154

	I-495	
	EB	WB
3-4 P	9078	6985
4-5 P	9248	7589
5-6 P	8559	7796
6-7 P	7525	6468

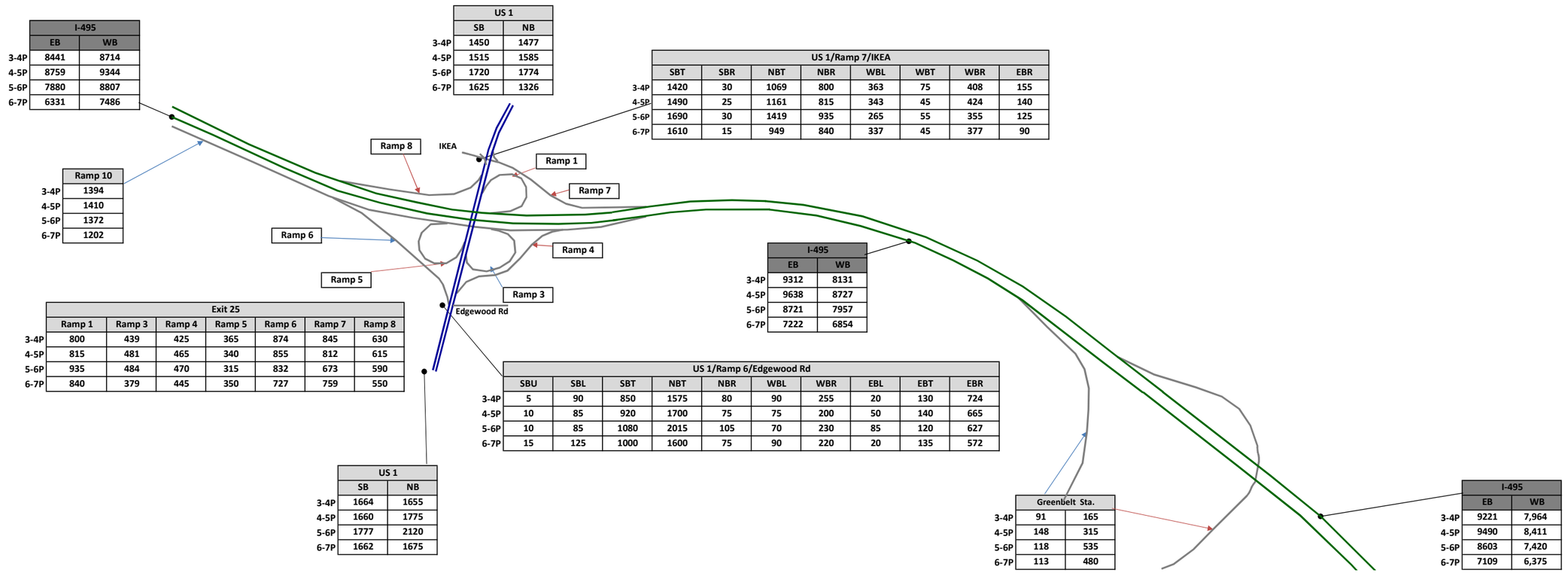
	US 29	
	SB	NB
3-4 P	1670	2440
4-5 P	1758	2905
5-6 P	1803	3130
6-7 P	1575	2985

	MD 193	
	SB	NB
3-4 P	1937	2085
4-5 P	2047	2335
5-6 P	2138	2100
6-7 P	1792	2330

I-495 North Side PM
Existing Peak Period Volumes



I-495 Northeast Side PM
Existing Peak Period Volumes



I-495		
	EB	WB
3-4P	8441	8714
4-5P	8759	9344
5-6P	7880	8807
6-7P	6331	7486

US 1		
	SB	NB
3-4P	1450	1477
4-5P	1515	1585
5-6P	1720	1774
6-7P	1625	1326

US 1/Ramp 7/IKEA								
	SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
3-4P	1420	30	1069	800	363	75	408	155
4-5P	1490	25	1161	815	343	45	424	140
5-6P	1690	30	1419	935	265	55	355	125
6-7P	1610	15	949	840	337	45	377	90

Ramp 10	
3-4P	1394
4-5P	1410
5-6P	1372
6-7P	1202

Exit 25							
	Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	800	439	425	365	874	845	630
4-5P	815	481	465	340	855	812	615
5-6P	935	484	470	315	832	673	590
6-7P	840	379	445	350	727	759	550

US 1/Ramp 6/Edgewood Rd									
	SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
3-4P	5	90	850	1575	80	90	255	20	130	724
4-5P	10	85	920	1700	75	75	200	50	140	665
5-6P	10	85	1080	2015	105	70	230	85	120	627
6-7P	15	125	1000	1600	75	90	220	20	135	572

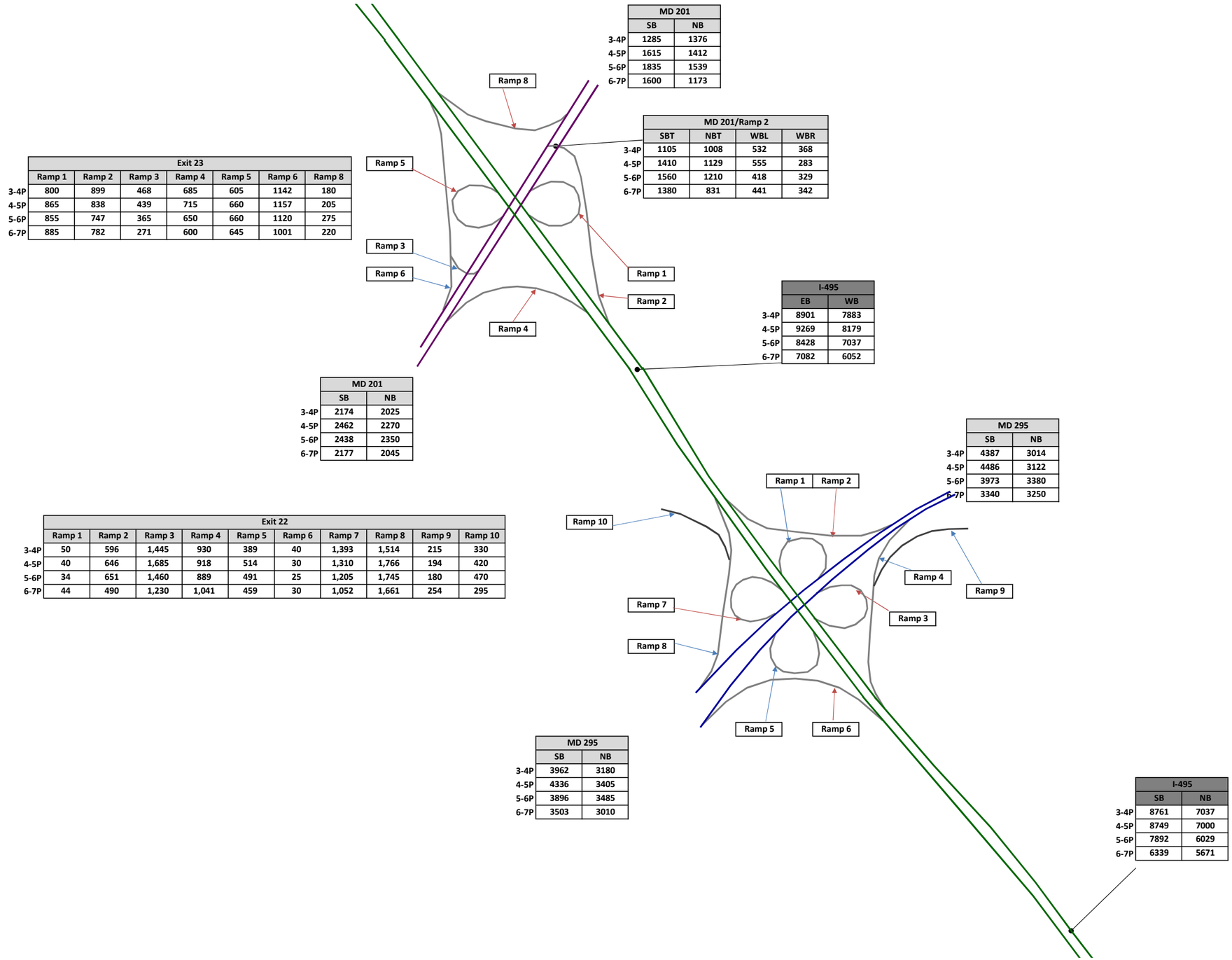
US 1		
	SB	NB
3-4P	1664	1655
4-5P	1660	1775
5-6P	1777	2120
6-7P	1662	1675

I-495		
	EB	WB
3-4P	9312	8131
4-5P	9638	8727
5-6P	8721	7957
6-7P	7222	6854

Greenbelt Sta.		
3-4P	91	165
4-5P	148	315
5-6P	118	535
6-7P	113	480

I-495		
	EB	WB
3-4P	9221	7,964
4-5P	9490	8,411
5-6P	8603	7,420
6-7P	7109	6,375

I-495 Northeast Side PM
Existing Peak Period Volumes



	Exit 23						
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
3-4P	800	899	468	685	605	1142	180
4-5P	865	838	439	715	660	1157	205
5-6P	855	747	365	650	660	1120	275
6-7P	885	782	271	600	645	1001	220

	MD 201	
	SB	NB
3-4P	1285	1376
4-5P	1615	1412
5-6P	1835	1539
6-7P	1600	1173

	MD 201/Ramp 2			
	SBT	NBT	WBL	WBR
3-4P	1105	1008	532	368
4-5P	1410	1129	555	283
5-6P	1560	1210	418	329
6-7P	1380	831	441	342

	I-495	
	EB	WB
3-4P	8901	7883
4-5P	9269	8179
5-6P	8428	7037
6-7P	7082	6052

	MD 201	
	SB	NB
3-4P	2174	2025
4-5P	2462	2270
5-6P	2438	2350
6-7P	2177	2045

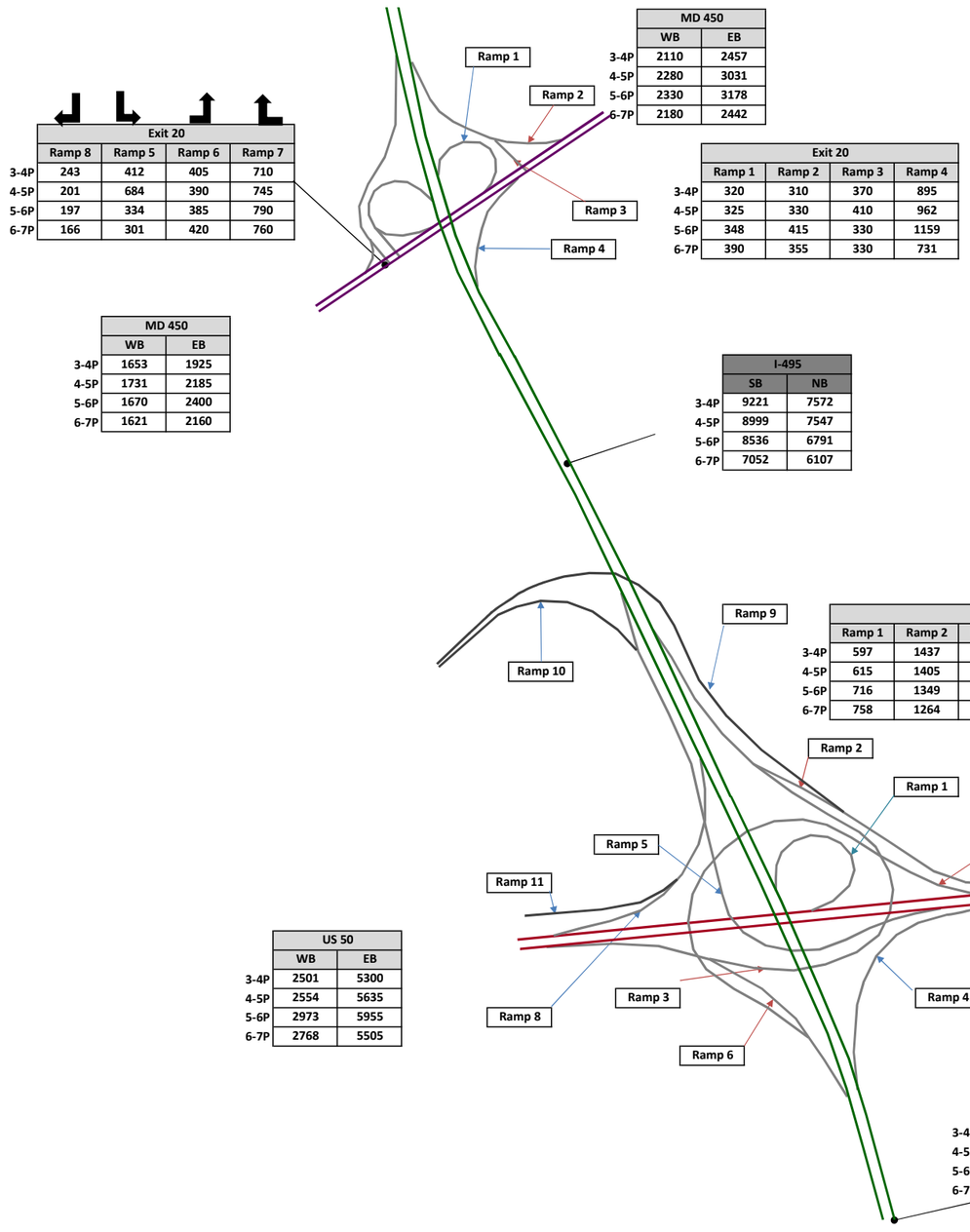
	MD 295	
	SB	NB
3-4P	4387	3014
4-5P	4486	3122
5-6P	3973	3380
6-7P	3340	3250

	Exit 22									
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
3-4P	50	596	1,445	930	389	40	1,393	1,514	215	330
4-5P	40	646	1,685	918	514	30	1,310	1,766	194	420
5-6P	34	651	1,460	889	491	25	1,205	1,745	180	470
6-7P	44	490	1,230	1,041	459	30	1,052	1,661	254	295

	MD 295	
	SB	NB
3-4P	3962	3180
4-5P	4336	3405
5-6P	3896	3485
6-7P	3503	3010

	I-495	
	SB	NB
3-4P	8761	7037
4-5P	8749	7000
5-6P	7892	6029
6-7P	6339	5671

I-495 Northeast Side PM
Existing Peak Period Volumes



	Exit 20			
	Ramp 8	Ramp 5	Ramp 6	Ramp 7
3-4P	243	412	405	710
4-5P	201	684	390	745
5-6P	197	334	385	790
6-7P	166	301	420	760

	MD 450	
	WB	EB
3-4P	2110	2457
4-5P	2280	3031
5-6P	2330	3178
6-7P	2180	2442

	Exit 20			
	Ramp 1	Ramp 2	Ramp 3	Ramp 4
3-4P	320	310	370	895
4-5P	325	330	410	962
5-6P	348	415	330	1159
6-7P	390	355	330	731

	MD 450	
	WB	EB
3-4P	1653	1925
4-5P	1731	2185
5-6P	1670	2400
6-7P	1621	2160

	I-495	
	SB	NB
3-4P	9221	7572
4-5P	8999	7547
5-6P	8536	6791
6-7P	7052	6107

	Exit 19										
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
3-4P	597	1437	945	1882	2030	1145	1175	309	88	90	221
4-5P	615	1405	830	1874	2110	1090	1285	309	195	210	167
5-6P	716	1349	740	1680	1986	1220	1365	237	291	320	192
6-7P	758	1264	720	1491	1731	1230	1295	250	251	280	142

	US 50	
	WB	EB
3-4P	2501	5300
4-5P	2554	5635
5-6P	2973	5955
6-7P	2768	5505

	US-50	
	WB	EB
3-4P	3745	7122
4-5P	3960	7699
5-6P	4415	7661
6-7P	4090	6777

	Exit 8	
	Ramp 9	Ramp 10
3-4P	175	375
4-5P	165	390
5-6P	170	440
6-7P	175	305

	I-495	
	SB	NB
3-4P	8981	7669
4-5P	8788	7801
5-6P	8706	7098
6-7P	7454	6372

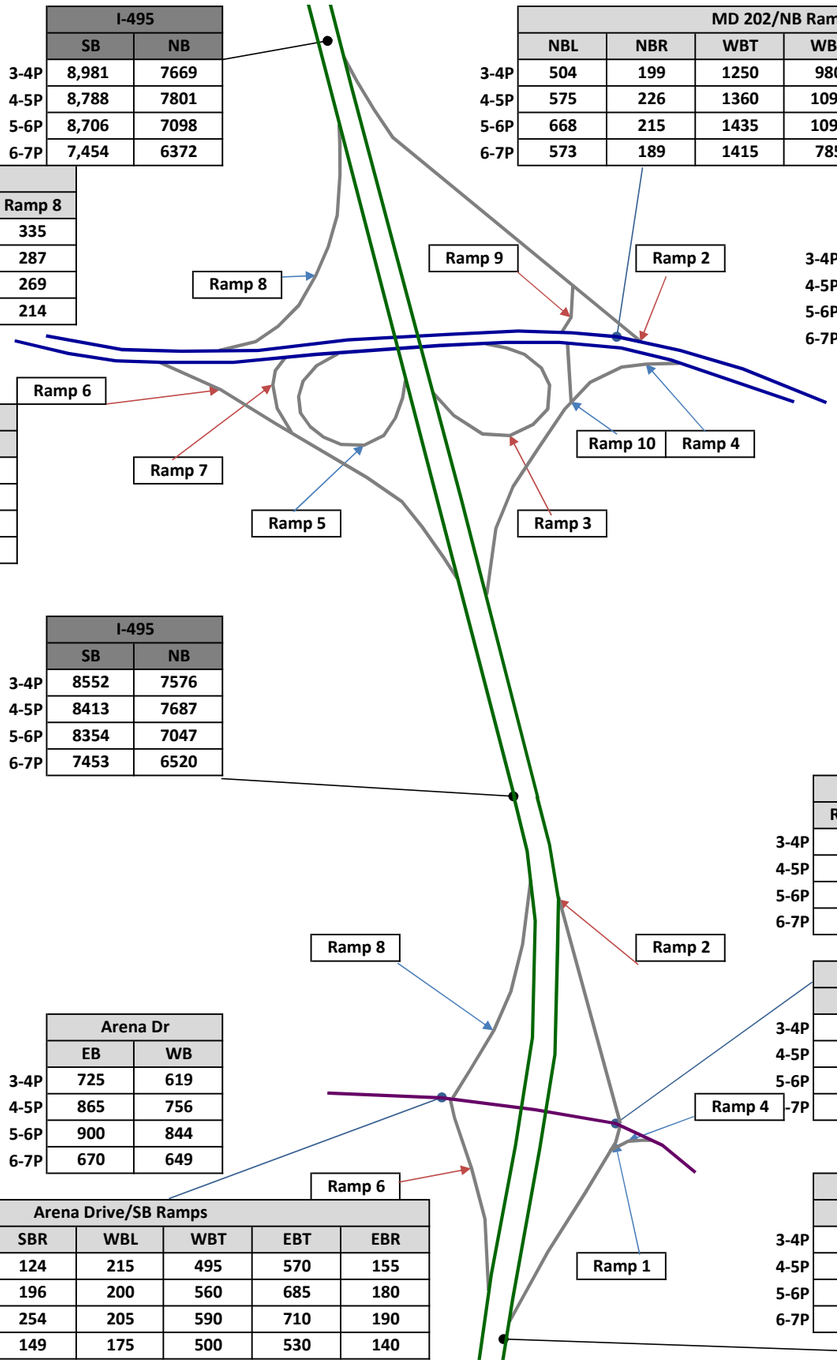
I-495 East Side PM
Existing Peak Period Volumes

	I-495	
	SB	NB
3-4P	8,981	7669
4-5P	8,788	7801
5-6P	8,706	7098
6-7P	7,454	6372

	MD 202/NB Ramps					
	NBL	NBR	WBT	WBR	EBL	EBT
3-4P	504	199	1250	980	15	2014
4-5P	575	226	1360	1095	10	2268
5-6P	668	215	1435	1095	20	2443
6-7P	573	189	1415	785	15	2187

	Exit 17				
	Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
3-4P	980	225	199	15	703
4-5P	1095	190	190	10	801
5-6P	1095	145	180	20	884
6-7P	785	140	185	15	763

	Exit 17			
	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	839	505	240	335
4-5P	838	535	215	287
5-6P	938	570	285	269
6-7P	707	565	355	214



	MD 202	
	EB	WB
3-4P	1920	1849
4-5P	2165	2007
5-6P	2240	2087
6-7P	2200	1847

	MD 202	
	SB	NB
3-4P	2213	2230
4-5P	2494	2455
5-6P	2658	2530
6-7P	2376	2200

	I-495	
	SB	NB
3-4P	8552	7576
4-5P	8413	7687
5-6P	8354	7047
6-7P	7453	6520

	Exit 16				
	Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
3-4P	106	420	199	375	374
4-5P	113	440	199	487	672
5-6P	114	410	220	528	808
6-7P	123	370	189	339	503

	Arena Drive/SB Ramps						
	NBL	NBT	NBR	WBT	WBR	EBL	EBT
3-4P	115	0	215	595	220	200	614
4-5P	125	0	220	635	215	225	828
5-6P	120	9	250	675	195	205	925
6-7P	125	5	200	550	155	210	648

	Arena Dr	
	EB	WB
3-4P	725	619
4-5P	865	756
5-6P	900	844
6-7P	670	649

	Arena Drive/SB Ramps						
	SBL	SBT	SBR	WBL	WBT	EBT	EBR
3-4P	244	5	124	215	495	570	155
4-5P	368	107	196	200	560	685	180
5-6P	420	133	254	205	590	710	190
6-7P	328	24	149	175	500	530	140

	Arena Dr	
	EB	WB
3-4P	829	815
4-5P	1048	850
5-6P	1175	870
6-7P	848	705

	I-495		
	SB	NB	
3-4P	8553	7461	3-4P
4-5P	8228	7559	4-5P
5-6P	8074	6971	5-6P
6-7P	7289	6462	6-7P

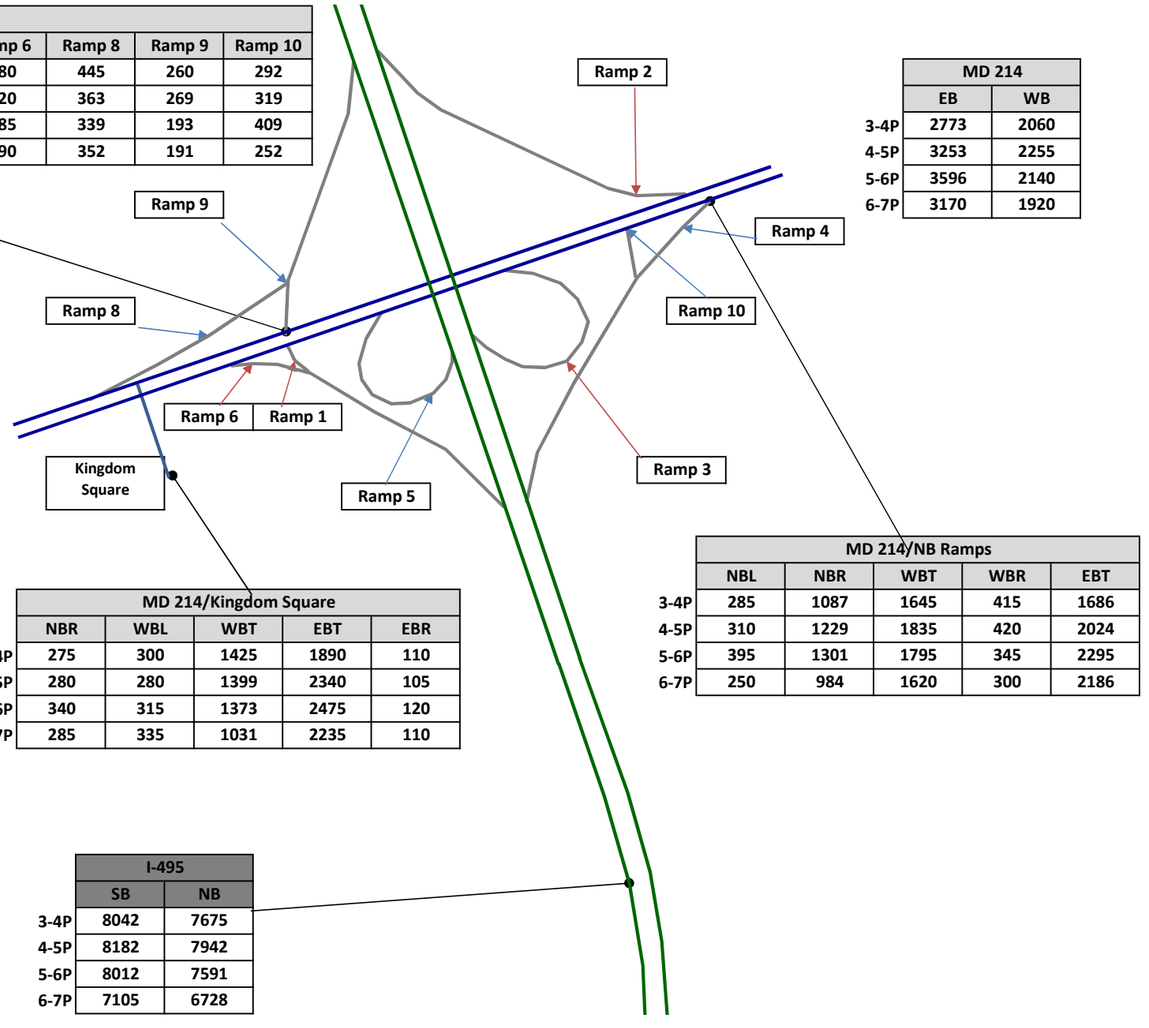
I-495 East Side PM
Existing Peak Period Volumes

Exit 15									
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
3-4P	465	415	750	1087	551	280	445	260	292
4-5P	735	420	745	1229	569	420	363	269	319
5-6P	695	345	745	1301	610	385	339	193	409
6-7P	695	300	670	984	726	390	352	191	252

MD 214/SB Ramps					
	SBR	WBL	WBT	EBT	EBR
3-4P	260	465	1465	1885	280
4-5P	269	735	1410	2200	420
5-6P	193	695	1495	2430	385
6-7P	191	695	1175	2130	390

MD 214		
	EB	WB
3-4P	2773	2060
4-5P	3253	2255
5-6P	3596	2140
6-7P	3170	1920

MD 214		
	EB	WB
3-4P	2000	1870
4-5P	2445	1762
5-6P	2595	1712
6-7P	2345	1383

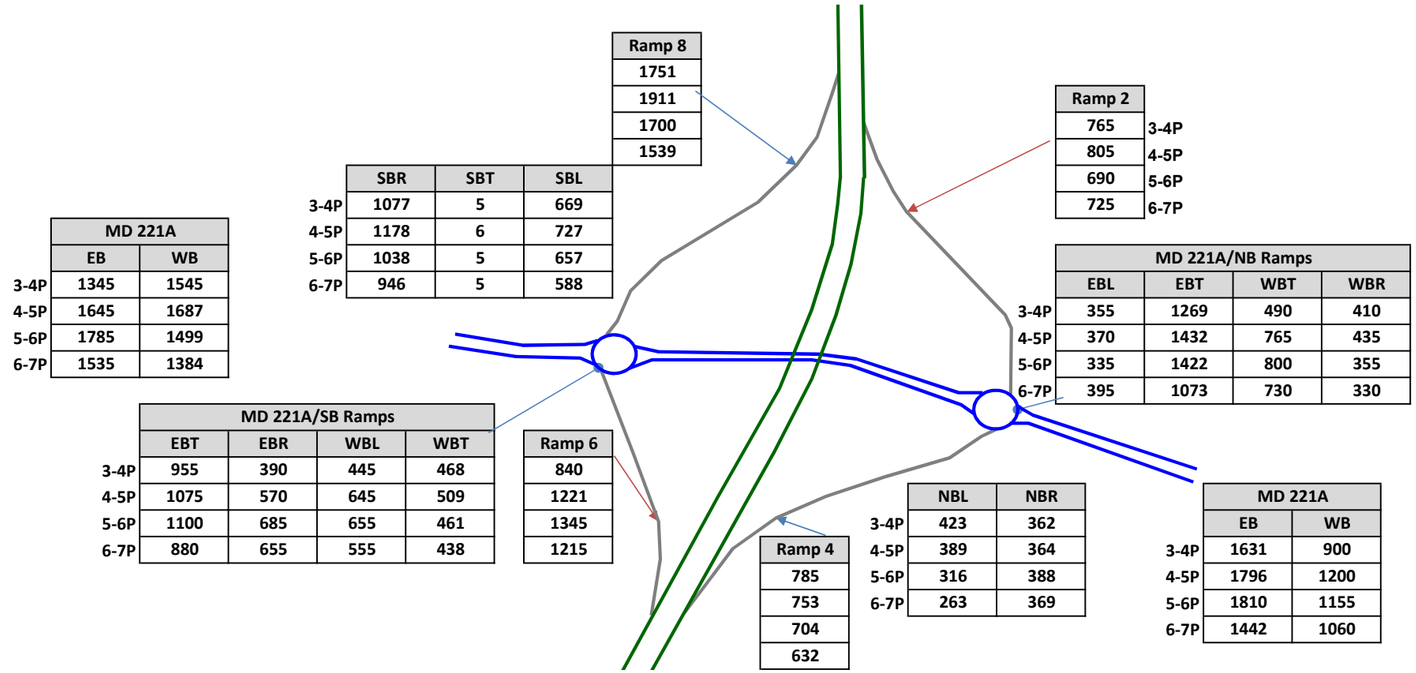


MD 214/Kingdom Square					
	NBR	WBL	WBT	EBT	EBR
3-4P	275	300	1425	1890	110
4-5P	280	280	1399	2340	105
5-6P	340	315	1373	2475	120
6-7P	285	335	1031	2235	110

MD 214/NB Ramps					
	NBL	NBR	WBT	WBR	EBT
3-4P	285	1087	1645	415	1686
4-5P	310	1229	1835	420	2024
5-6P	395	1301	1795	345	2295
6-7P	250	984	1620	300	2186

I-495		
	SB	NB
3-4P	8042	7675
4-5P	8182	7942
5-6P	8012	7591
6-7P	7105	6728

I-495 East Side PM
Existing Peak Period Volumes



	MD 221A	
	EB	WB
3-4P	1345	1545
4-5P	1645	1687
5-6P	1785	1499
6-7P	1535	1384

	SBR	SBT	SBL
3-4P	1077	5	669
4-5P	1178	6	727
5-6P	1038	5	657
6-7P	946	5	588

Ramp 8
1751
1911
1700
1539

Ramp 2	
765	3-4P
805	4-5P
690	5-6P
725	6-7P

	MD 221A/NB Ramps			
	EBL	EBT	WBT	WBR
3-4P	355	1269	490	410
4-5P	370	1432	765	435
5-6P	335	1422	800	355
6-7P	395	1073	730	330

	MD 221A/SB Ramps			
	EBT	EBR	WBL	WBT
3-4P	955	390	445	468
4-5P	1075	570	645	509
5-6P	1100	685	655	461
6-7P	880	655	555	438

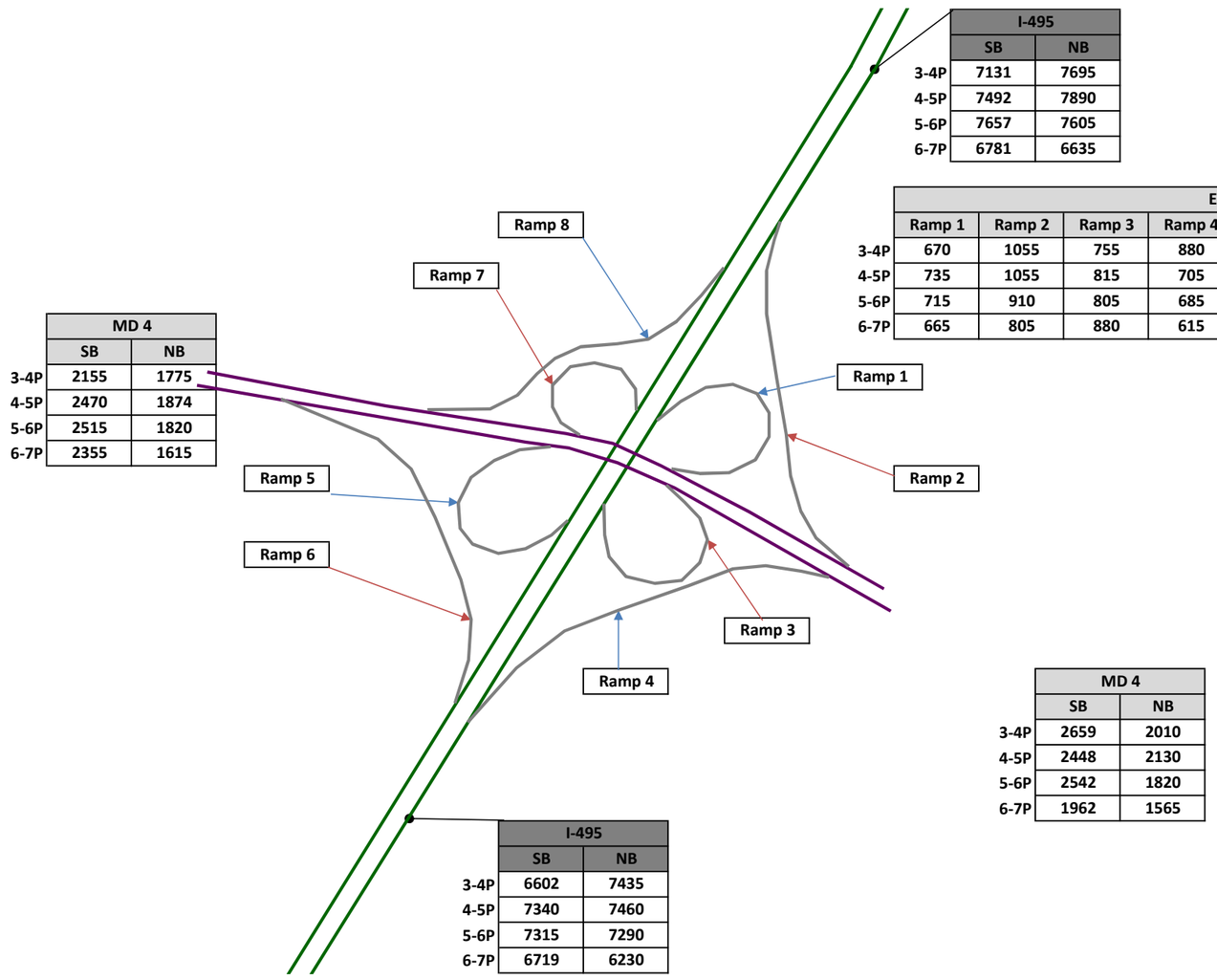
Ramp 6
840
1221
1345
1215

Ramp 4
785
753
704
632

	NBL	NBR
3-4P	423	362
4-5P	389	364
5-6P	316	388
6-7P	263	369

	MD 221A	
	EB	WB
3-4P	1631	900
4-5P	1796	1200
5-6P	1810	1155
6-7P	1442	1060

I-495 East Side PM
Existing Peak Period Volumes



	I-495	
	SB	NB
3-4P	7131	7695
4-5P	7492	7890
5-6P	7657	7605
6-7P	6781	6635

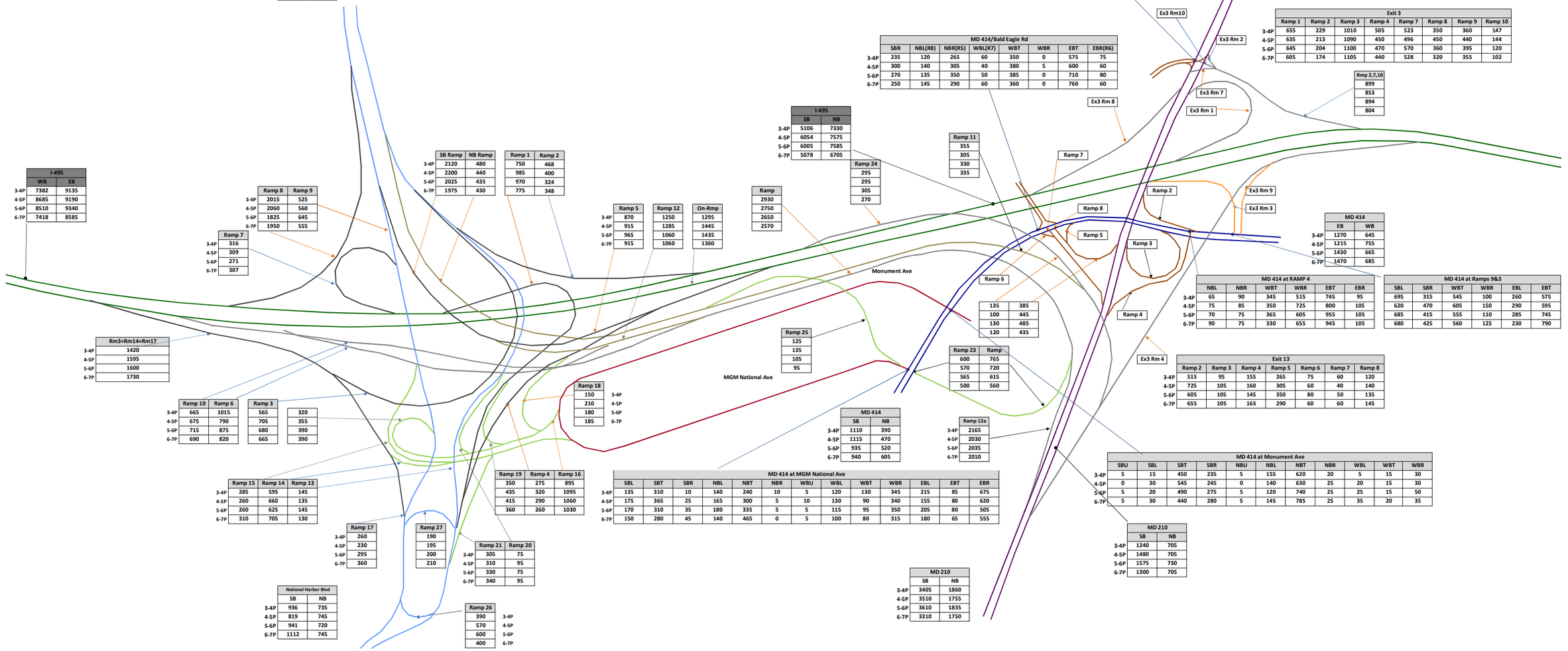
	Exit 11							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	670	1055	755	880	884	505	625	775
4-5P	735	1055	815	705	823	735	715	779
5-6P	715	910	805	685	747	600	600	795
6-7P	665	805	880	615	642	770	575	765

	MD 4	
	SB	NB
3-4P	2155	1775
4-5P	2470	1874
5-6P	2515	1820
6-7P	2355	1615

	MD 4	
	SB	NB
3-4P	2659	2010
4-5P	2448	2130
5-6P	2542	1820
6-7P	1962	1565

	I-495	
	SB	NB
3-4P	6602	7435
4-5P	7340	7460
5-6P	7315	7290
6-7P	6719	6230

I-495 South Side PM
Existing Peak Period Volumes



I-295	SB	NB
3-4P	4660	1733
4-5P	4820	1775
5-6P	4495	1659
6-7P	4480	1668

I-495	WB	EB
3-4P	7382	9135
4-5P	8685	9190
5-6P	8510	9340
6-7P	7418	8585

MD 210 at Ramp 7/Bald Eagle Rd	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR	EBL	EBR
3-4P	1345	95	5	0	500	655	480	135	229	0	10
4-5P	1795	115	5	0	735	635	465	135	213	0	10
5-6P	1730	110	5	0	645	645	545	115	204	0	10
6-7P	1415	95	0	0	695	605	515	100	174	5	5

MD 210	SB	NB
3-4P	1440	729
4-5P	1910	948
5-6P	1840	849
6-7P	1510	874

MD 414/Bald Eagle Rd	SBR	NBL(R8)	NBR(R5)	WBL(R7)	WBT	WBR	EBT	EBR(R6)
3-4P	235	120	265	60	350	0	575	75
4-5P	300	140	305	40	380	5	600	60
5-6P	270	135	350	50	385	0	710	80
6-7P	250	145	290	60	360	0	760	60

Exit 3	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 7	Ramp 8	Ramp 9	Ramp 10
3-4P	655	229	1010	505	523	350	360	147
4-5P	635	213	1090	450	496	450	440	144
5-6P	645	204	1100	470	570	360	395	120
6-7P	605	174	1105	440	528	320	355	102

Rmp 2,7,10
899
853
894
804

I-495	SB	NB
3-4P	5106	7330
4-5P	6054	7575
5-6P	6005	7585
6-7P	5078	6705

Ramp 11
355
305
330
335

Ramp 24
295
295
305
270

SB Ramp	NB Ramp
2120	480
2200	440
2025	435
1975	430

Ramp 1	Ramp 2
750	468
985	400
970	324
775	348

Ramp 8	Ramp 9
3-4P 2015	525
4-5P 2060	560
5-6P 1825	645
6-7P 1950	555

Ramp 7
3-4P 316
4-5P 309
5-6P 271
6-7P 307

Ramp 5	Ramp 12	On-Rmp
3-4P 870	1250	1295
4-5P 915	1285	1445
5-6P 965	1060	1435
6-7P 915	1060	1360

Ramp
2930
2750
2650
2570

MD 414	EB	WB
3-4P	1270	645
4-5P	1215	755
5-6P	1430	665
6-7P	1470	685

MD 414 at RAMP 4	NBL	NBR	WBT	WBR	EBT	EBR
3-4P	65	90	345	515	745	95
4-5P	75	85	350	725	800	105
5-6P	70	75	365	605	955	105
6-7P	90	75	330	655	945	105

MD 414 at Ramps 9&3	SBL	SBR	WBT	WBR	EBL	EBT
3-4P	695	315	545	100	260	575
4-5P	620	470	605	150	290	595
5-6P	685	415	555	110	285	745
6-7P	680	425	560	125	230	790

Ramp 6
135 385
100 445
130 485
120 435

Ramp 25
125
135
105
95

Ramp 23	Ramp
600	765
570	720
565	615
500	560

Exit 13	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	515	95	155	265	75	60	120
4-5P	725	105	160	305	60	40	140
5-6P	605	105	145	350	80	50	135
6-7P	655	105	165	290	60	60	145

Rm3+Rm14+Rm17
3-4P 1420
4-5P 1595
5-6P 1600
6-7P 1730

Ramp 10	Ramp 6	Ramp 3	
3-4P	665	1015	565 320
4-5P	675	790	705 355
5-6P	715	875	680 390
6-7P	690	820	665 390

Ramp 18	
150	3-4P
210	4-5P
180	5-6P
185	6-7P

MD 414	SB	NB
3-4P	1110	390
4-5P	1115	470
5-6P	935	520
6-7P	940	605

Ramp 12a
3-4P 2165
4-5P 2030
5-6P 2035
6-7P 2010

Ramp 15	Ramp 14	Ramp 13
3-4P 285	595	145
4-5P 260	660	135
5-6P 260	625	145
6-7P 310	705	130

Ramp 19	Ramp 4	Ramp 16
350	275	895
435	320	1095
415	290	1060
360	260	1030

MD 414 at MGM National Ave	SBL	SBT	SBR	NBL	NBT	NBR	WBU	WBL	WBT	WBR	EBL	EBT	EBR
3-4P	135	310	10	140	240	10	5	120	130	345	215	85	675
4-5P	175	365	25	165	300	5	10	130	90	340	155	80	620
5-6P	170	310	35	180	335	5	5	115	95	350	205	80	505
6-7P	150	280	45	140	465	0	5	100	80	315	180	65	555

MD 414 at Monument Ave	SBU	SBL	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR
3-4P	5	15	450	235	5	155	620	20	5	15	30
4-5P	0	30	545	245	0	140	630	25	20	15	30
5-6P	5	20	490	275	5	120	740	25	25	15	50
6-7P	5	30	440	280	5	145	785	25	35	20	35

Ramp 17
3-4P 260
4-5P 230
5-6P 295
6-7P 360

Ramp 27
190
195
200
210

Ramp 21	Ramp 20
3-4P 305	75
4-5P 310	95
5-6P 330	75
6-7P 340	95

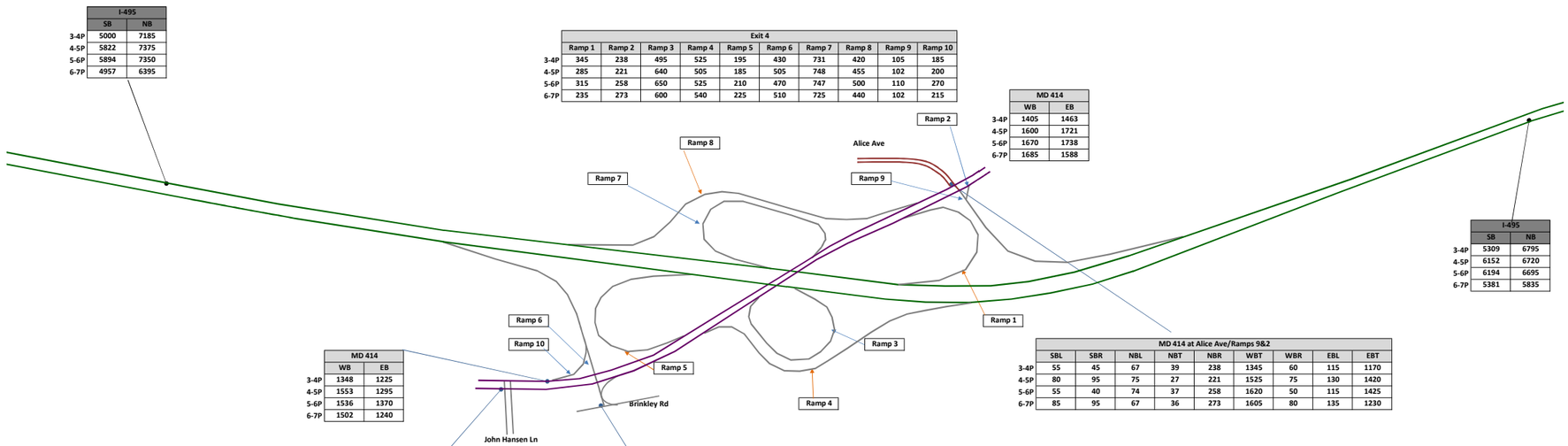
National Harbor Blvd	SB	NB
3-4P	936	735
4-5P	819	745
5-6P	941	720
6-7P	1112	745

Ramp 26	
390	3-4P
570	4-5P
600	5-6P
400	6-7P

MD 210	SB	NB
3-4P	3405	1860
4-5P	3510	1755
5-6P	3610	1835
6-7P	3310	1750

MD 210	SB	NB
3-4P	1240	705
4-5P	1480	705
5-6P	1575	730
6-7P	1300	705

I-495 South Side PM
Existing Peak Period Volumes



I-495		
	SB	NB
3-4P	5000	7185
4-5P	5822	7375
5-6P	5894	7350
6-7P	4957	6395

Exit 4										
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
3-4P	345	238	495	525	195	430	731	420	105	185
4-5P	285	221	640	505	185	505	748	455	102	200
5-6P	315	258	650	525	210	470	747	500	110	270
6-7P	235	273	600	540	225	510	725	440	102	215

MD 414		
	WB	EB
3-4P	1405	1463
4-5P	1600	1721
5-6P	1670	1738
6-7P	1685	1588

I-495		
	SB	NB
3-4P	5309	6795
4-5P	6152	6720
5-6P	6194	6695
6-7P	5381	5835

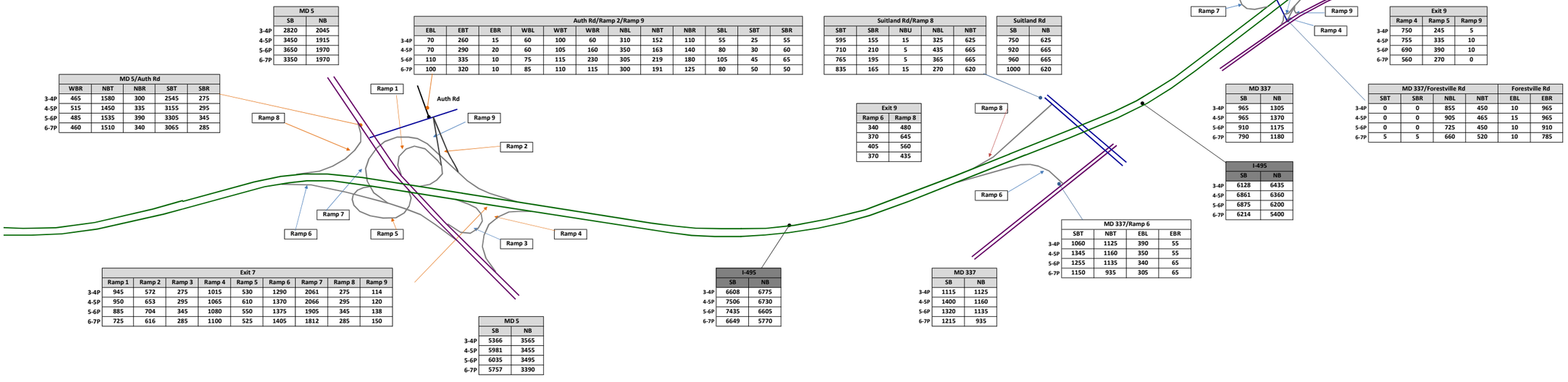
MD 414		
	WB	EB
3-4P	1348	1225
4-5P	1553	1295
5-6P	1536	1370
6-7P	1502	1240

MD 414 at Alice Ave/Ramps 9&2								
	SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
3-4P	55	45	67	39	238	1345	60	115	1170
4-5P	80	95	75	27	221	1525	75	130	1420
5-6P	55	40	74	37	258	1620	50	115	1425
6-7P	85	95	67	36	273	1605	80	135	1230

MD 414 at John Hansen Ln						
	NBL	NBR	WBL	WBT	EBT	EBR
3-4P	265	220	400	1083	930	295
4-5P	260	255	460	1293	905	390
5-6P	240	265	455	1296	960	410
6-7P	260	280	495	1242	870	370

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
35	395	185	495	275	1298	1130	20
50	455	200	515	250	1553	1135	25
35	435	270	485	290	1481	1210	15
35	475	215	385	305	1522	1120	30

I-495 South Side PM
Existing Peak Period Volumes



MD 5		
	SB	NB
3-4P	2820	2045
4-5P	3450	1915
5-6P	3650	1970
6-7P	3350	1970

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
3-4P	465	1580	300	2545	275
4-5P	515	1450	335	3155	295
5-6P	485	1535	390	3305	345
6-7P	460	1510	340	3065	285

Auth Rd/Ramp 2/Ramp 9												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3-4P	70	260	15	60	100	60	310	152	110	55	25	55
4-5P	70	290	20	60	105	160	350	163	140	80	30	60
5-6P	110	335	10	75	115	230	305	219	180	105	45	65
6-7P	100	320	10	85	110	115	300	191	125	80	50	50

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
595	155	15	325	625
710	210	5	435	665
765	195	5	365	665
835	165	15	270	620

Suitland Rd		
	SB	NB
750	625
920	665
960	665
1000	620

Exit 9	
Ramp 6	Ramp 8
340	480
370	645
405	560
370	435

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
3-4P	945	572	275	1015	530	1290	2061	275	114
4-5P	950	653	295	1065	610	1370	2066	295	120
5-6P	885	704	345	1080	550	1375	1905	345	138
6-7P	725	616	285	1100	525	1405	1812	285	150

MD 5		
	SB	NB
3-4P	5366	3565
4-5P	5981	3455
5-6P	6035	3495
6-7P	5757	3390

I-495		
	SB	NB
3-4P	6608	6775
4-5P	7506	6730
5-6P	7435	6605
6-7P	6649	5770

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
3-4P	5	5	70	5	405	205	10	5	810
4-5P	5	5	75	5	415	190	0	10	895
5-6P	5	5	40	5	420	160	5	0	885
6-7P	15	0	105	5	445	165	10	5	605

Forestville Rd		
	SB	NB
3-4P	815	165
4-5P	905	220
5-6P	885	65
6-7P	610	200

Ramp 7	ForestNB	ForestSB
3-4P	474	215	1220
4-5P	479	190	1315
5-6P	440	165	1310
6-7P	505	175	1065

I-495		
	SB	NB
3-4P	6,602	7435
4-5P	7,340	7460
5-6P	7,315	7290
6-7P	6,719	6230

MD 337		
	SB	NB
3-4P	0	460
4-5P	5	480
5-6P	0	460
6-7P	0	530

Exit 9		
Ramp 4	Ramp 5	Ramp 9
3-4P	750	245	5
4-5P	755	335	10
5-6P	690	390	10
6-7P	560	270	0

MD 337		
	SB	NB
3-4P	965	1305
4-5P	965	1370
5-6P	910	1175
6-7P	790	1180

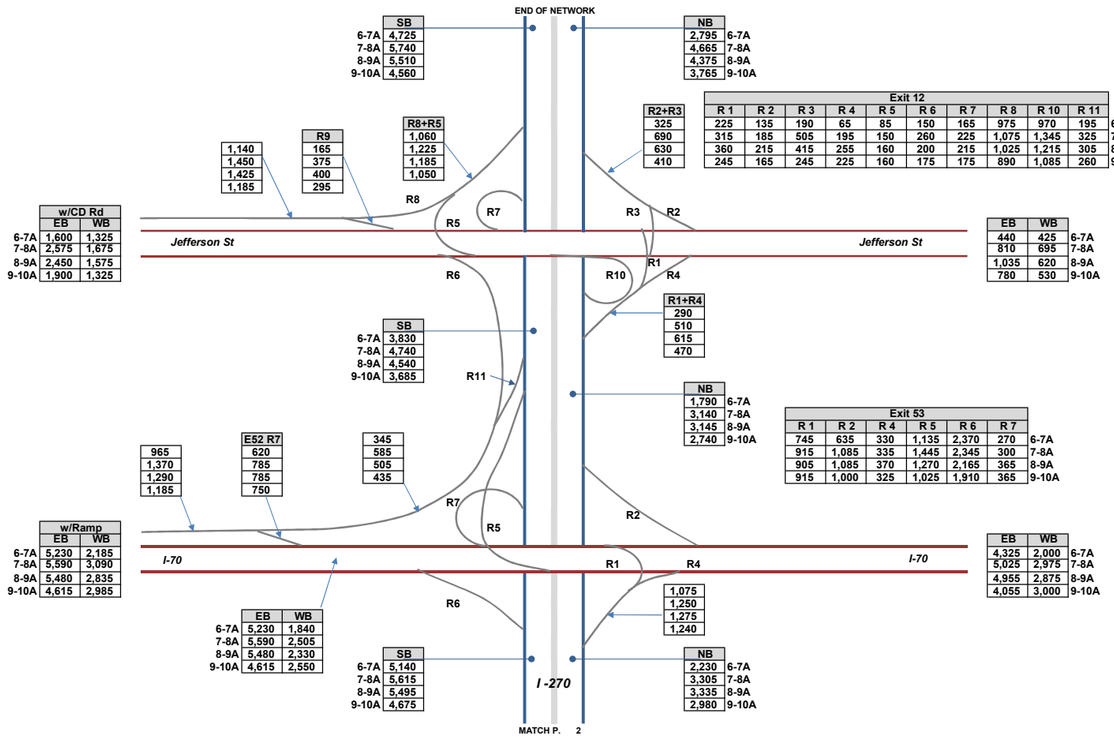
MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
3-4P	0	0	855	450	10	965
4-5P	0	0	905	465	15	965
5-6P	0	0	725	450	10	910
6-7P	5	5	660	520	10	785

I-495		
	SB	NB
3-4P	6128	6435
4-5P	6861	6360
5-6P	6875	6200
6-7P	6214	5400

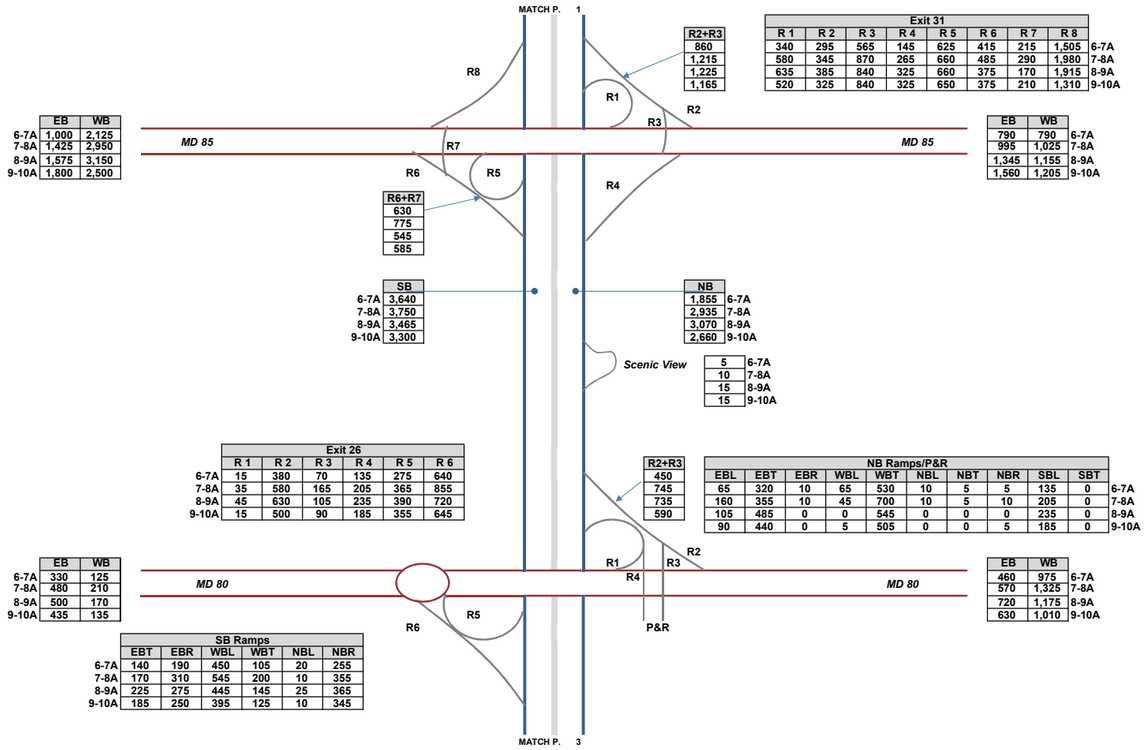
MD 337/Ramp 6			
SBT	NBT	EBL	EBR
3-4P	1060	1125	390	55
4-5P	1345	1160	350	55
5-6P	1255	1135	340	65
6-7P	1150	935	305	65

MD 337		
	SB	NB
3-4P	1115	1125
4-5P	1400	1160
5-6P	1320	1135
6-7P	1215	935

I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	EB	WB
6-7A	1,000	2,125
7-8A	1,425	2,950
8-9A	1,575	3,150
9-10A	1,800	2,500

R2+R3
860
1,215
1,225
1,165

Exit 31								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	
340	295	565	145	625	415	215	1,505	6-7A
580	345	870	265	660	495	290	1,980	7-8A
635	385	840	325	660	375	170	1,915	8-9A
520	325	840	325	650	375	210	1,310	9-10A

	EB	WB
	790	790
	995	1,025
	1,345	1,155
	1,560	1,205

6-7A
7-8A
8-9A
9-10A

R6+R7
630
775
545
585

	SB
6-7A	3,640
7-8A	3,750
8-9A	3,465
9-10A	3,300

	NB
	1,855
	2,935
	3,070
	2,660

6-7A
7-8A
8-9A
9-10A

	5
	10
	15
	15

6-7A
7-8A
8-9A
9-10A

Exit 26						
	R 1	R 2	R 3	R 4	R 5	R 6
6-7A	15	380	70	135	275	640
7-8A	35	580	165	205	365	855
8-9A	45	630	105	235	390	720
9-10A	15	500	90	185	355	645

R2+R3
450
745
735
590

NB Ramps/P&R										
EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	
65	320	10	65	530	10	5	5	135	0	6-7A
160	355	10	45	700	10	5	10	205	0	7-8A
105	485	0	0	545	0	0	0	235	0	8-9A
90	440	0	5	505	0	0	5	185	0	9-10A

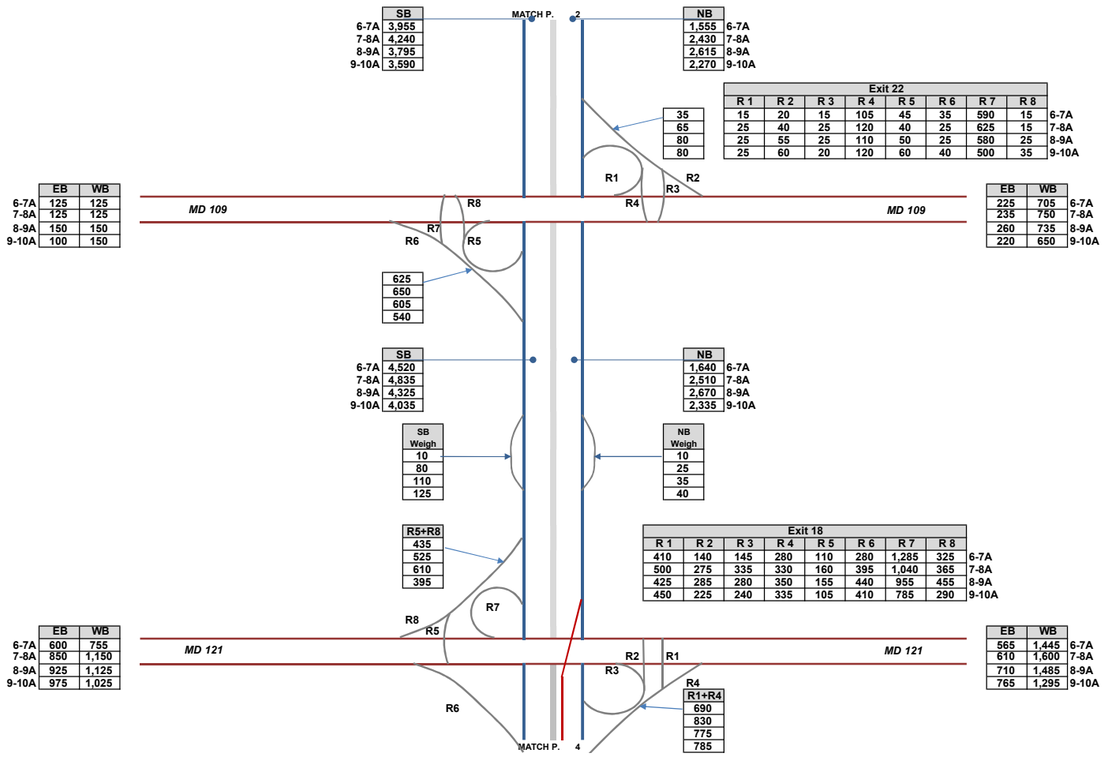
	EB	WB
6-7A	330	125
7-8A	480	210
8-9A	500	170
9-10A	435	135

	EB	WB
	460	975
	570	1,325
	720	1,175
	630	1,010

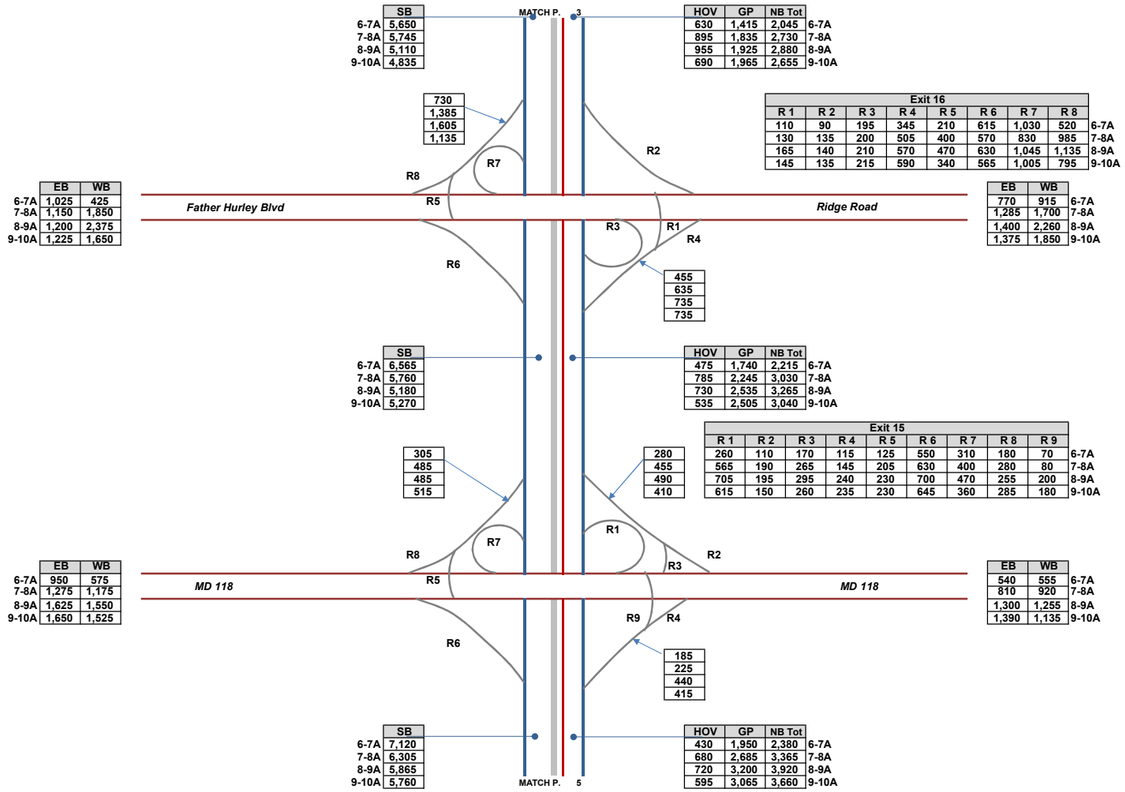
6-7A
7-8A
8-9A
9-10A

SB Ramps						
	EBT	EBR	WBL	WBT	NBL	NBR
6-7A	140	190	450	105	20	255
7-8A	170	310	545	200	10	355
8-9A	225	275	445	145	25	365
9-10A	185	250	395	125	10	345

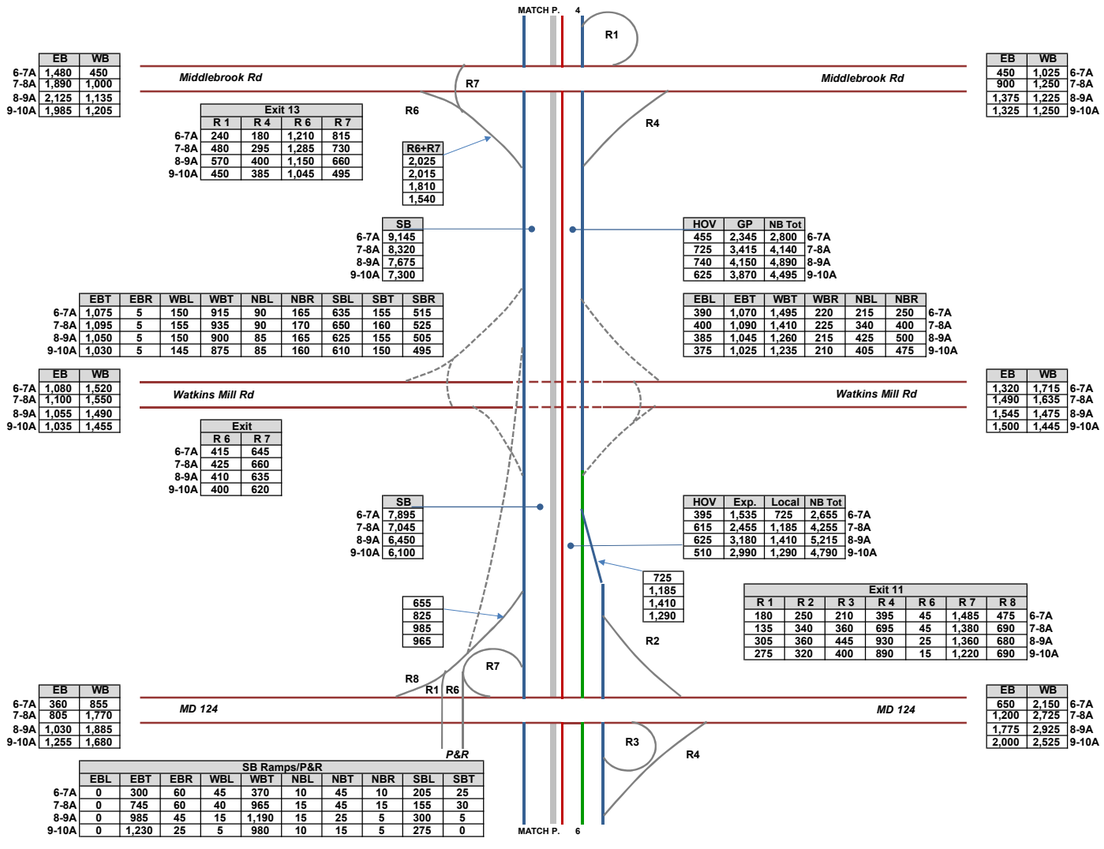
I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	EB	WB
6-7A	1,480	450
7-8A	1,890	1,000
8-9A	2,125	1,135
9-10A	1,985	1,205

	EB	WB	
	450	1,025	6-7A
	900	1,250	7-8A
	1,375	1,225	8-9A
	1,325	1,250	9-10A

	Exit 13			
	R 1	R 4	R 6	R 7
6-7A	240	180	1,210	815
7-8A	480	295	1,285	730
8-9A	570	400	1,150	660
9-10A	450	385	1,045	495

R6+R7
2,025
2,015
1,810
1,540

	SB
6-7A	9,145
7-8A	8,320
8-9A	7,675
9-10A	7,300

HOV	GP	NB Tot	
455	2,345	2,800	6-7A
725	3,415	4,140	7-8A
740	4,150	4,890	8-9A
625	3,870	4,495	9-10A

	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
6-7A	1,075	5	150	915	90	165	635	155	515
7-8A	1,095	5	155	935	90	170	650	160	525
8-9A	1,050	5	150	900	85	165	625	155	505
9-10A	1,030	5	145	875	85	160	610	150	495

EBL	EBT	WBT	WBR	NBL	NBR	
390	1,070	1,495	220	215	250	6-7A
400	1,090	1,410	225	340	400	7-8A
385	1,045	1,260	215	425	500	8-9A
375	1,025	1,235	210	405	475	9-10A

	EB	WB
6-7A	1,080	1,520
7-8A	1,100	1,550
8-9A	1,055	1,490
9-10A	1,035	1,455

	EB	WB	
	1,320	1,715	6-7A
	1,490	1,635	7-8A
	1,545	1,475	8-9A
	1,500	1,445	9-10A

	Exit	
	R 6	R 7
6-7A	415	645
7-8A	425	660
8-9A	410	635
9-10A	400	620

	SB
6-7A	7,895
7-8A	7,045
8-9A	6,450
9-10A	6,100

HOV	Exp.	Local	NB Tot	
395	1,535	725	2,655	6-7A
615	2,455	1,185	4,255	7-8A
625	3,180	1,410	5,215	8-9A
510	2,990	1,290	4,790	9-10A

725
1,185
1,410
1,290

655
825
985
965

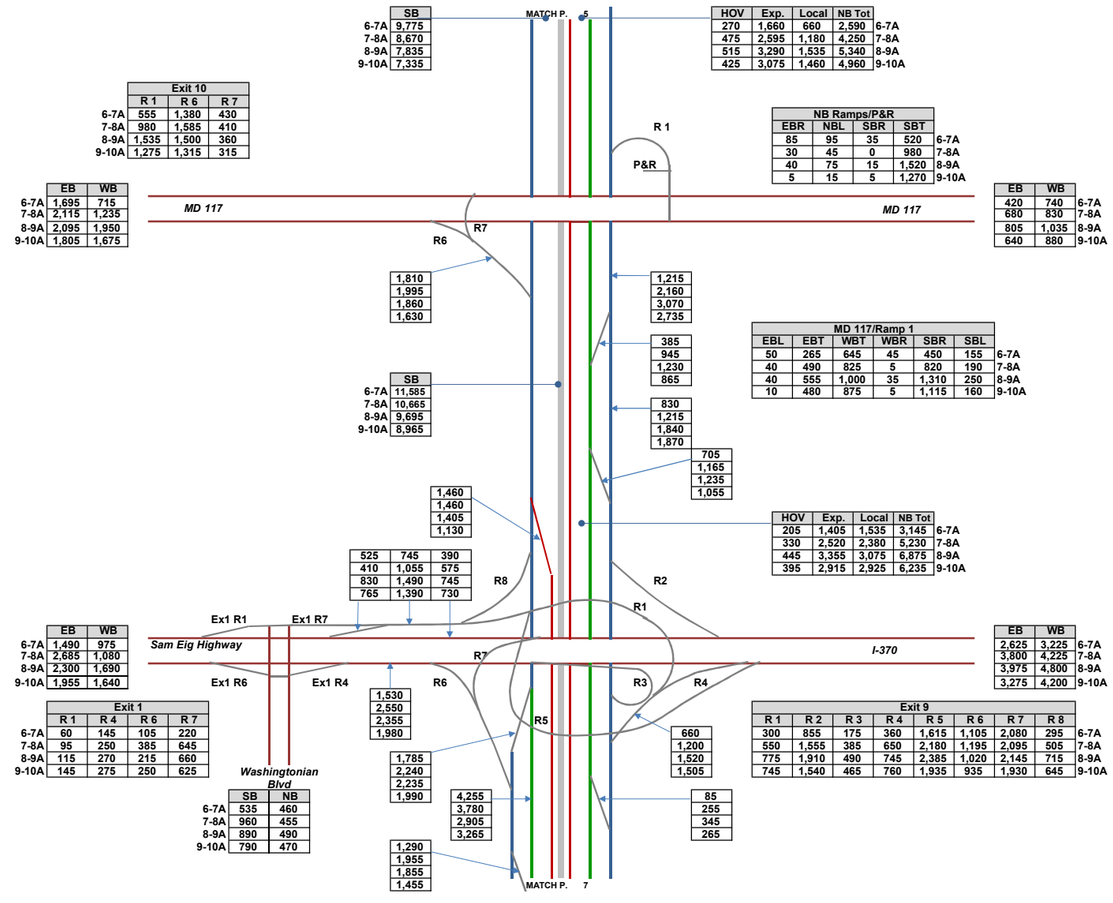
	Exit 11						
	R 1	R 2	R 3	R 4	R 6	R 7	R 8
6-7A	180	250	210	395	45	1,485	475
7-8A	135	340	360	695	45	1,380	690
8-9A	305	360	445	930	25	1,360	680
9-10A	275	320	400	890	15	1,220	690

	EB	WB
6-7A	360	855
7-8A	805	1,770
8-9A	1,030	1,885
9-10A	1,255	1,680

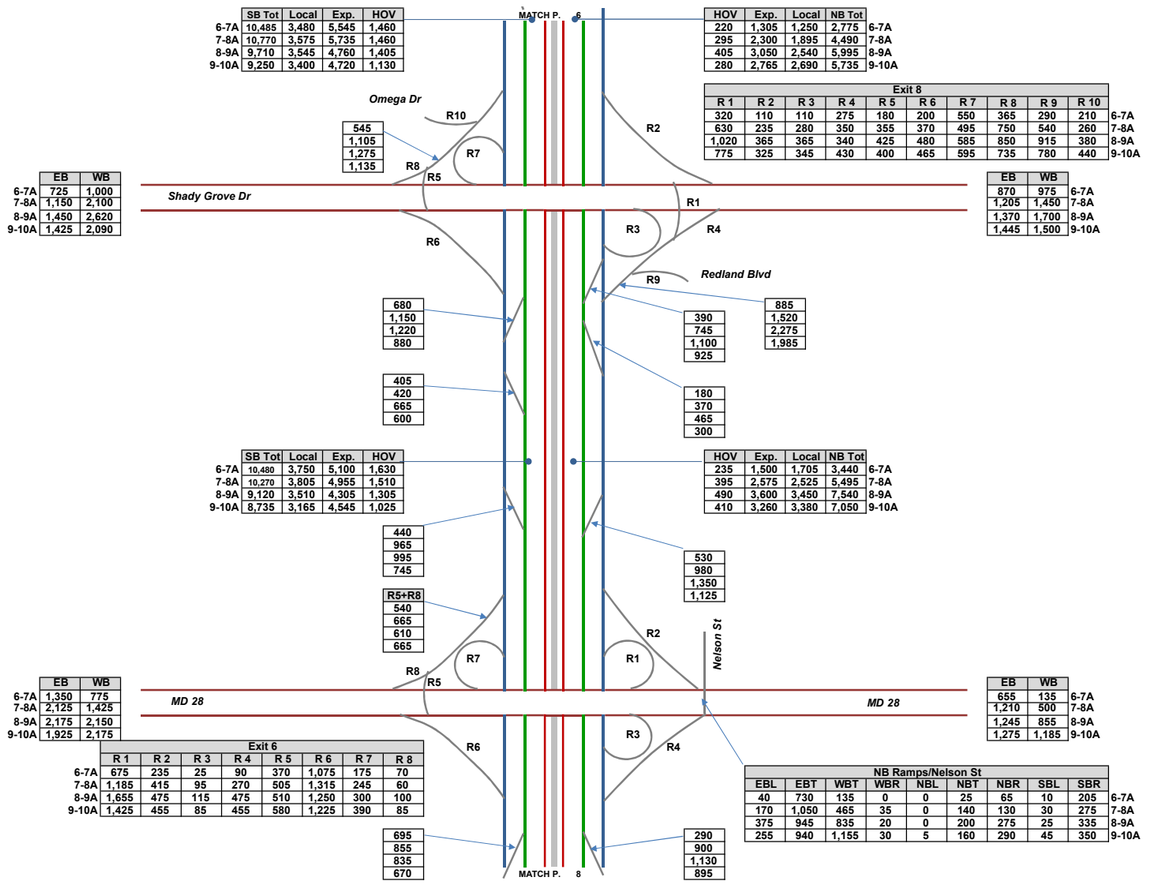
	EB	WB	
	650	2,150	6-7A
	1,200	2,725	7-8A
	1,775	2,925	8-9A
	2,000	2,525	9-10A

	SB Ramps/P&R								
	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
6-7A	0	300	60	45	370	10	45	10	205	25
7-8A	0	745	60	40	965	15	45	15	155	30
8-9A	0	985	45	15	1,190	15	25	5	300	5
9-10A	0	1,230	25	5	980	10	15	5	275	0

I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	SB Tot	Local	Exp.	HOV
6-7A	10,485	3,480	5,545	1,460
7-8A	10,770	3,575	5,735	1,460
8-9A	9,710	3,545	4,760	1,405
9-10A	9,250	3,400	4,720	1,130

HOV	Exp.	Local	NB Tot	
220	1,305	1,250	2,775	6-7A
295	2,300	1,895	4,490	7-8A
405	3,050	2,540	5,995	8-9A
280	2,765	2,690	5,735	9-10A

Exit 8										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	
320	110	110	275	180	200	550	365	290	210	6-7A
630	235	280	350	355	370	495	750	540	260	7-8A
1,020	365	365	340	425	480	585	850	915	380	8-9A
775	325	345	430	400	465	595	735	780	440	9-10A

	EB	WB
6-7A	725	1,000
7-8A	1,150	2,100
8-9A	1,450	2,620
9-10A	1,425	2,090

	EB	WB	
	870	975	6-7A
	1,205	1,450	7-8A
	1,370	1,700	8-9A
	1,445	1,500	9-10A

545
1,105
1,275
1,135

680
1,150
1,220
880

405
420
665
600

390
745
1,100
925

885
1,520
2,275
1,985

180
370
465
300

	SB Tot	Local	Exp.	HOV
6-7A	10,480	3,750	5,100	1,630
7-8A	10,270	3,805	4,955	1,510
8-9A	9,120	3,510	4,305	1,305
9-10A	8,735	3,165	4,545	1,025

HOV	Exp.	Local	NB Tot	
235	1,500	1,705	3,440	6-7A
395	2,575	2,525	5,495	7-8A
490	3,600	3,450	7,540	8-9A
410	3,260	3,380	7,050	9-10A

440
965
995
745

530
980
1,350
1,125

R5+R8
540
665
610
665

	EB	WB
6-7A	1,350	775
7-8A	2,125	1,425
8-9A	2,175	2,150
9-10A	1,925	2,175

	EB	WB	
	655	135	6-7A
	1,210	500	7-8A
	1,245	855	8-9A
	1,275	1,185	9-10A

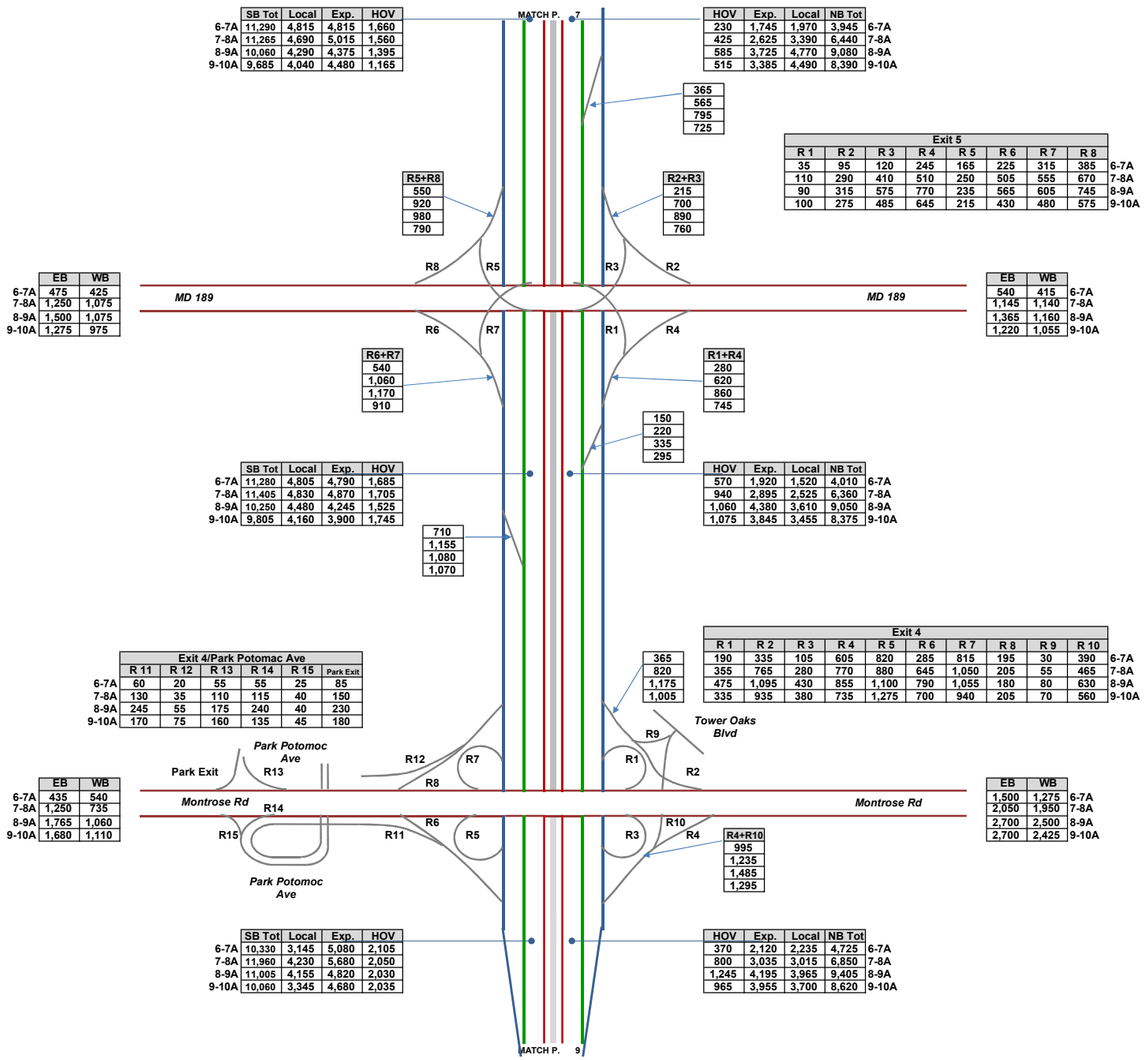
Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	
675	235	25	90	370	1,075	175	70	6-7A
1,185	415	95	270	505	1,315	245	60	7-8A
1,655	475	115	475	510	1,250	300	100	8-9A
1,425	455	85	455	580	1,225	390	85	9-10A

NB Ramps/Nelson St									
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
40	730	135	0	0	25	65	10	205	6-7A
170	1,050	465	35	0	140	130	30	275	7-8A
375	945	835	20	0	200	275	25	335	8-9A
255	940	1,155	30	5	160	290	45	350	9-10A

695
855
835
670

290
900
1,130
895

I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	SB Tot	Local	Exp.	HOV
6-7A	11,290	4,815	4,815	1,660
7-8A	11,265	4,690	5,015	1,560
8-9A	10,060	4,290	4,375	1,395
9-10A	9,685	4,040	4,480	1,165

	HOV	Exp.	Local	NB Tot
6-7A	230	1,745	1,970	3,945
7-8A	425	2,625	3,390	6,440
8-9A	585	3,725	4,770	9,080
9-10A	515	3,385	4,490	8,390

	EB	WB
6-7A	475	425
7-8A	1,250	1,075
8-9A	1,500	1,075
9-10A	1,275	975

	EB	WB
6-7A	540	415
7-8A	1,145	1,140
8-9A	1,365	1,160
9-10A	1,220	1,055

	SB Tot	Local	Exp.	HOV
6-7A	11,280	4,805	4,790	1,685
7-8A	11,405	4,830	4,870	1,705
8-9A	10,250	4,480	4,245	1,525
9-10A	9,805	4,160	3,900	1,745

	HOV	Exp.	Local	NB Tot
6-7A	570	1,920	1,520	4,010
7-8A	940	2,895	2,525	6,360
8-9A	1,060	4,380	3,610	9,050
9-10A	1,075	3,845	3,455	8,375

	SB Tot	Local	Exp.	HOV
6-7A	10,330	3,145	5,080	2,105
7-8A	11,960	4,230	5,680	2,050
8-9A	11,005	4,155	4,820	2,030
9-10A	10,060	3,345	4,680	2,035

	HOV	Exp.	Local	NB Tot
6-7A	370	2,120	2,235	4,725
7-8A	800	3,035	3,015	6,850
8-9A	1,245	4,195	3,965	9,405
9-10A	965	3,955	3,700	8,620

Exit 5								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	
35	95	120	245	165	225	315	385	6-7A
110	290	410	510	250	505	555	670	7-8A
90	315	575	770	235	565	605	745	8-9A
100	275	485	645	215	430	480	575	9-10A

Exit 4										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	
190	335	105	605	820	285	815	195	30	390	6-7A
355	765	280	770	880	645	1,050	205	55	465	7-8A
475	1,095	430	855	1,100	790	1,055	180	60	630	8-9A
335	935	380	735	1,275	700	940	205	70	560	9-10A

Exit 4/Park Potomac Ave						
	R 11	R 12	R 13	R 14	R 15	Park Exit
6-7A	60	20	55	55	25	85
7-8A	130	35	110	115	40	150
8-9A	245	55	175	240	40	230
9-10A	170	75	160	135	45	180

	EB	WB
6-7A	435	540
7-8A	1,250	735
8-9A	1,765	1,060
9-10A	1,680	1,110

	EB	WB
6-7A	1,500	1,275
7-8A	2,050	1,950
8-9A	2,700	2,500
9-10A	2,700	2,425

R5+R8
550
920
980
790

R2+R3
215
700
890
760

R6+R7
540
1,060
1,170
910

R1+R4
280
620
860
745

R4+R10
995
1,235
1,485
1,295

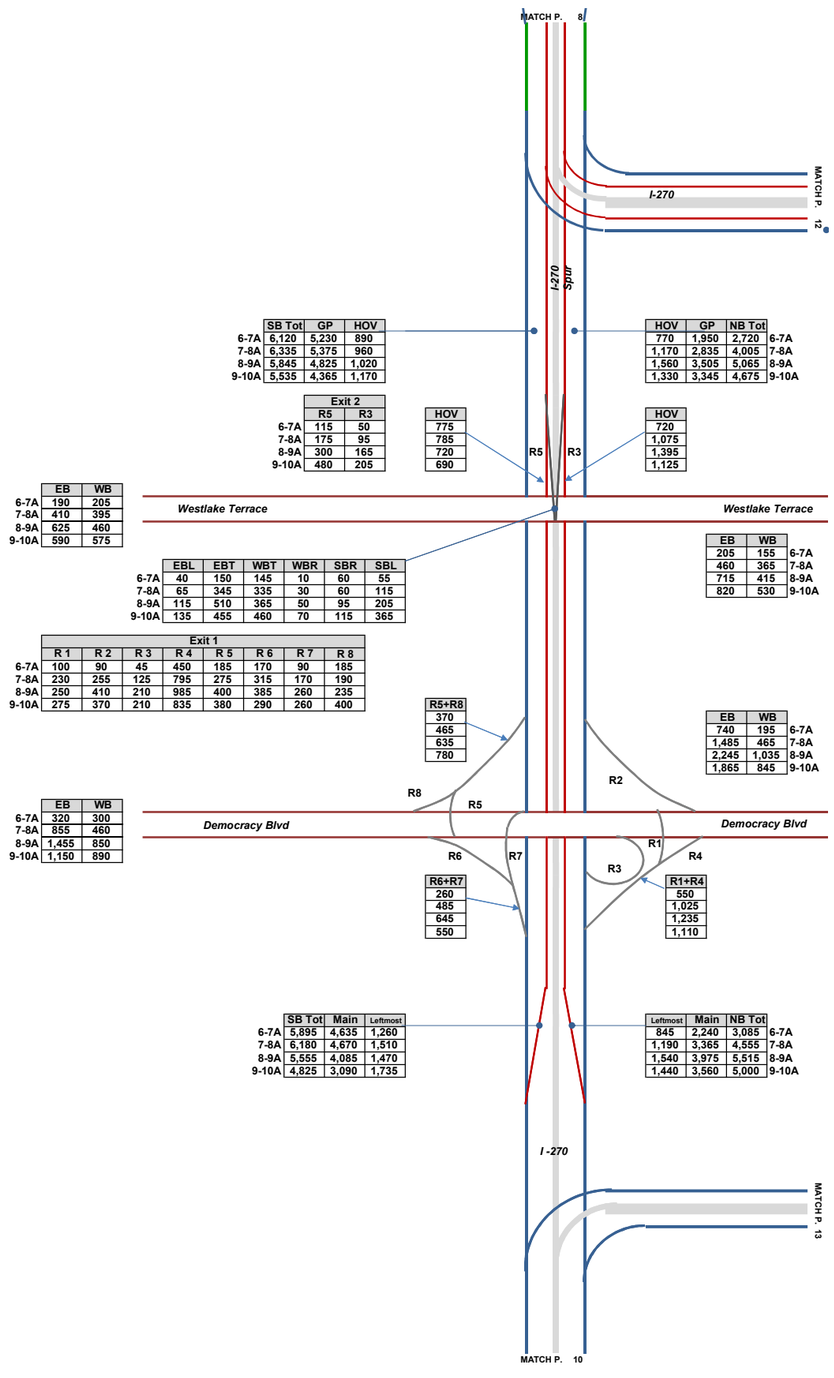
365
565
795
725

150
220
335
295

710
1,155
1,080
1,070

365
820
1,175
1,005

I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	SB Tot	GP	HOV
6-7A	6,120	5,230	890
7-8A	6,335	5,375	960
8-9A	5,845	4,825	1,020
9-10A	5,535	4,365	1,170

	HOV	GP	NB Tot	
	770	1,950	2,720	6-7A
	1,170	2,835	4,005	7-8A
	1,560	3,505	5,065	8-9A
	1,330	3,345	4,675	9-10A

	Exit 2	
	R5	R3
6-7A	115	50
7-8A	175	95
8-9A	300	165
9-10A	480	205

HOV
775
785
720
690

HOV
720
1,075
1,395
1,125

	EB	WB
6-7A	190	205
7-8A	410	395
8-9A	625	460
9-10A	590	575

	EB	WB	
	205	155	6-7A
	460	365	7-8A
	715	415	8-9A
	820	530	9-10A

	EBL	EBT	WBT	WBR	SBR	SBL
6-7A	40	150	145	10	60	55
7-8A	65	345	335	30	60	115
8-9A	115	510	365	50	95	205
9-10A	135	455	460	70	115	365

	Exit 1							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
6-7A	100	90	45	450	185	170	90	185
7-8A	230	255	125	795	275	315	170	190
8-9A	250	410	210	985	400	385	260	235
9-10A	275	370	210	835	380	290	260	400

R5+R8
370
465
635
780

	EB	WB	
	740	195	6-7A
	1,485	465	7-8A
	2,245	1,035	8-9A
	1,865	845	9-10A

	EB	WB
6-7A	320	300
7-8A	855	460
8-9A	1,455	850
9-10A	1,150	890

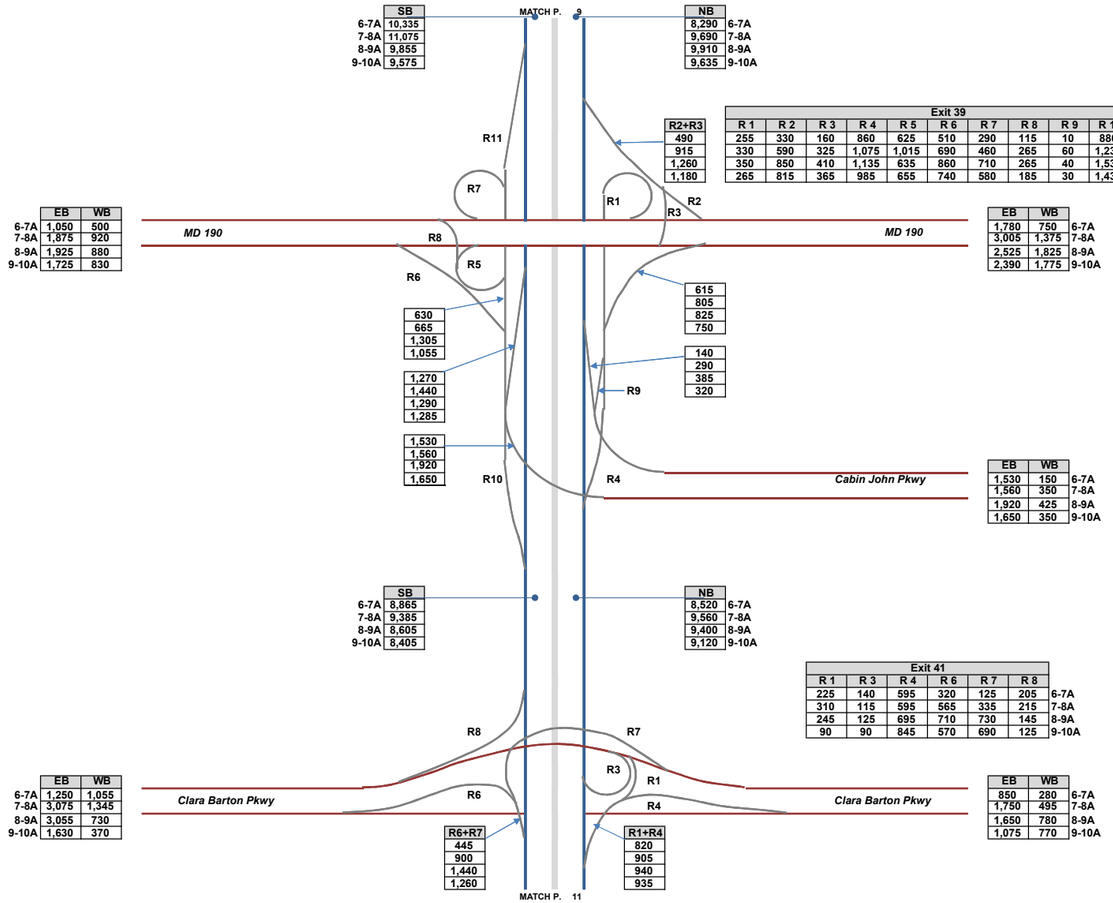
R6+R7
260
485
645
550

R1+R4
550
1,025
1,235
1,110

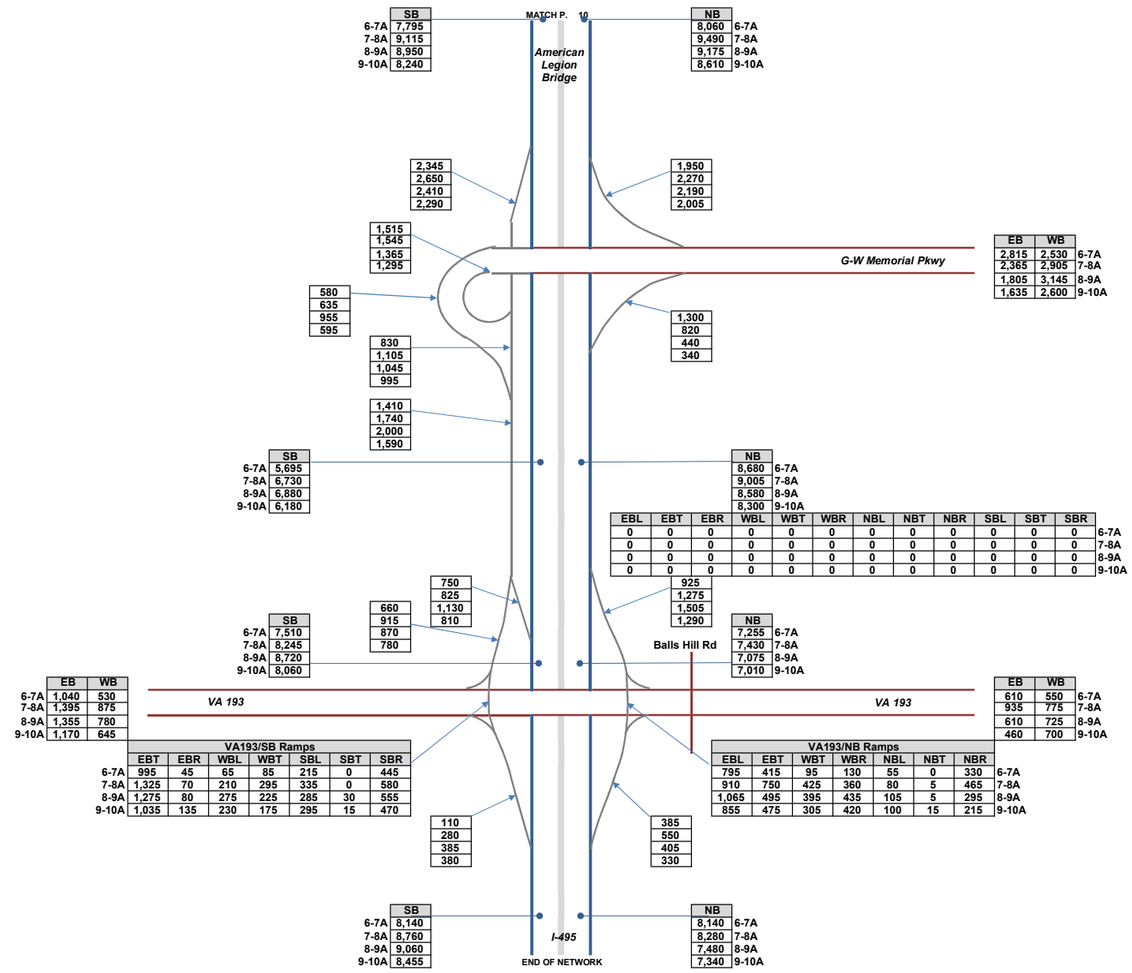
	SB Tot	Main	Leftmost
6-7A	5,895	4,635	1,260
7-8A	6,180	4,670	1,510
8-9A	5,555	4,085	1,470
9-10A	4,825	3,090	1,735

	Leftmost	Main	NB Tot	
	845	2,240	3,085	6-7A
	1,190	3,365	4,555	7-8A
	1,540	3,975	5,515	8-9A
	1,440	3,560	5,000	9-10A

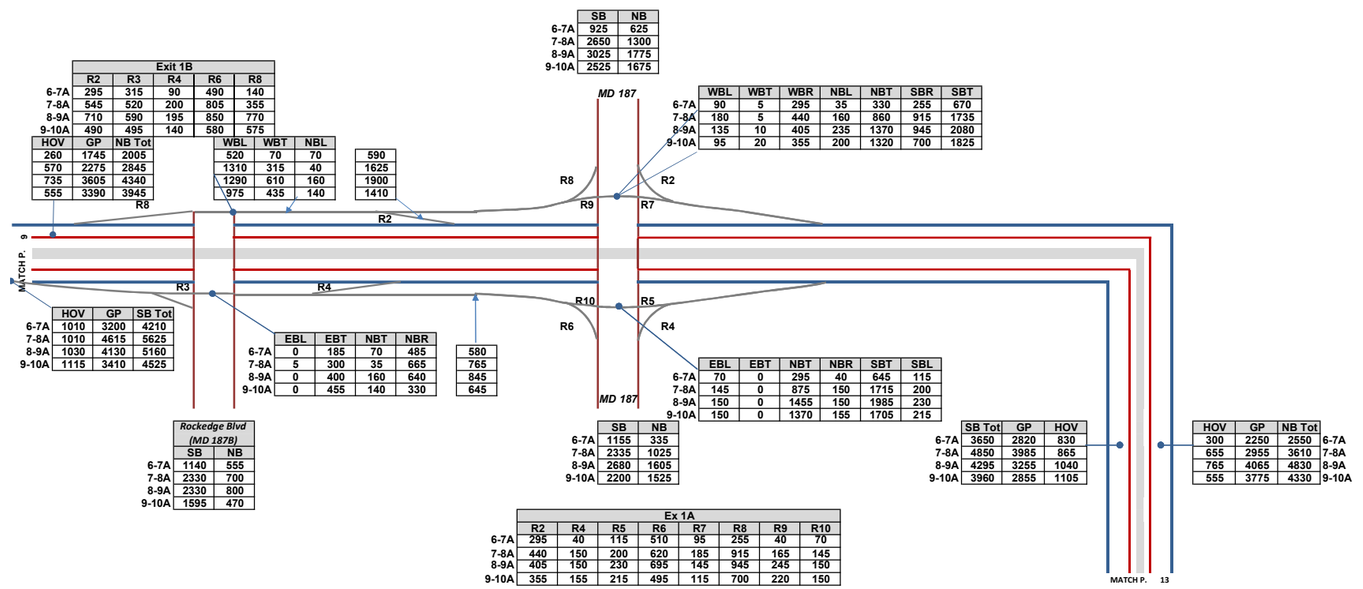
I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



	SB	NB
6-7A	925	625
7-8A	2650	1300
8-9A	3025	1775
9-10A	2525	1675

	WBL	WBT	WBR	NBL	NBT	SBR	SBT
6-7A	90	5	295	35	330	255	670
7-8A	180	5	440	160	860	915	1735
8-9A	135	10	405	235	1370	945	2080
9-10A	95	20	355	200	1320	700	1825

	Exit 1B				
	R2	R3	R4	R6	R8
6-7A	295	315	90	490	140
7-8A	545	520	200	805	355
8-9A	710	590	195	850	770
9-10A	490	495	140	580	575

HOV	GP	NB Tot
260	1745	2005
570	2275	2845
735	3605	4340
555	3390	3945

WBL	WBT	NBL
520	70	70
1310	315	40
1290	610	160
975	435	140

590
1625
1900
1410

	HOV	GP	SB Tot
6-7A	1010	3200	4210
7-8A	1010	4615	5625
8-9A	1030	4130	5160
9-10A	1115	3410	4525

	EBL	EBT	NBT	NBR
6-7A	0	185	70	485
7-8A	5	300	35	665
8-9A	0	400	160	640
9-10A	0	455	140	330

580
765
845
645

	EBL	EBT	NBT	NBR	SBT	SBL
6-7A	70	0	295	40	645	115
7-8A	145	0	875	150	1715	200
8-9A	150	0	1455	150	1985	230
9-10A	150	0	1370	155	1705	215

	Rockedge Blvd (MD 187B)	
	SB	NB
6-7A	1140	555
7-8A	2330	700
8-9A	2330	800
9-10A	1595	470

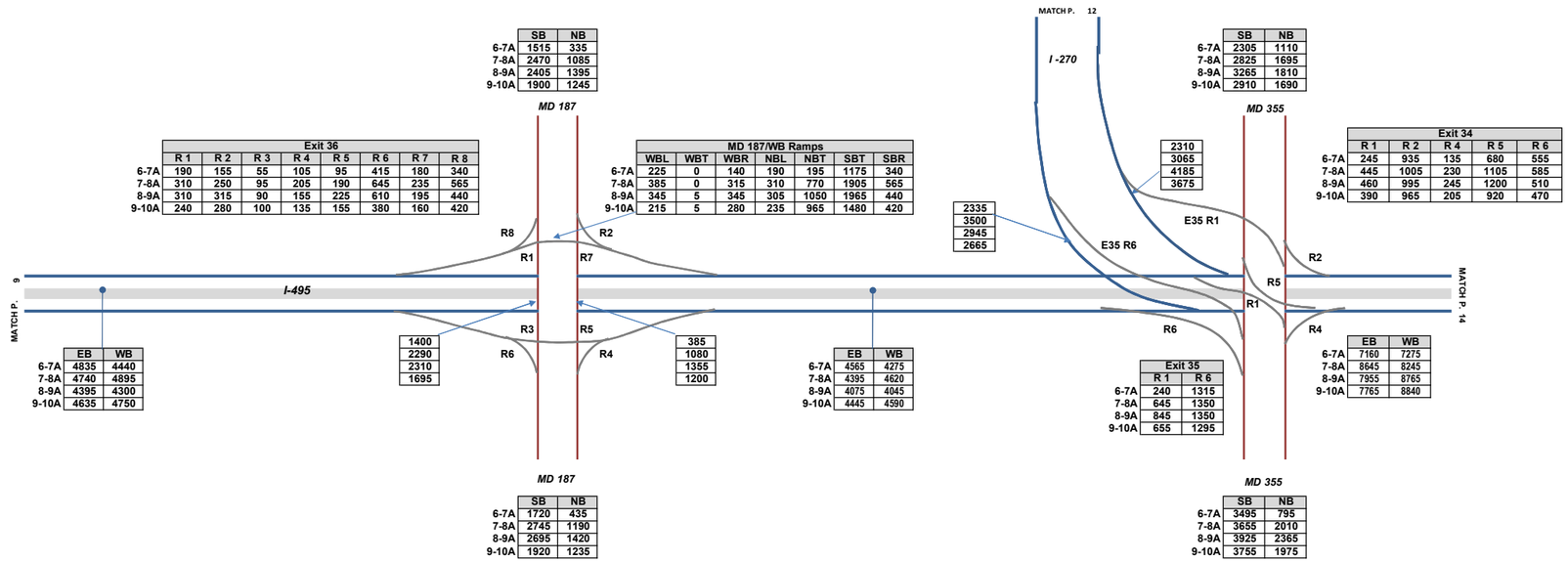
	SB	NB
6-7A	1155	335
7-8A	2335	1025
8-9A	2680	1605
9-10A	2200	1525

	SB Tot	GP	HOV
6-7A	3650	2820	830
7-8A	4850	3985	865
8-9A	4295	3255	1040
9-10A	3960	2855	1105

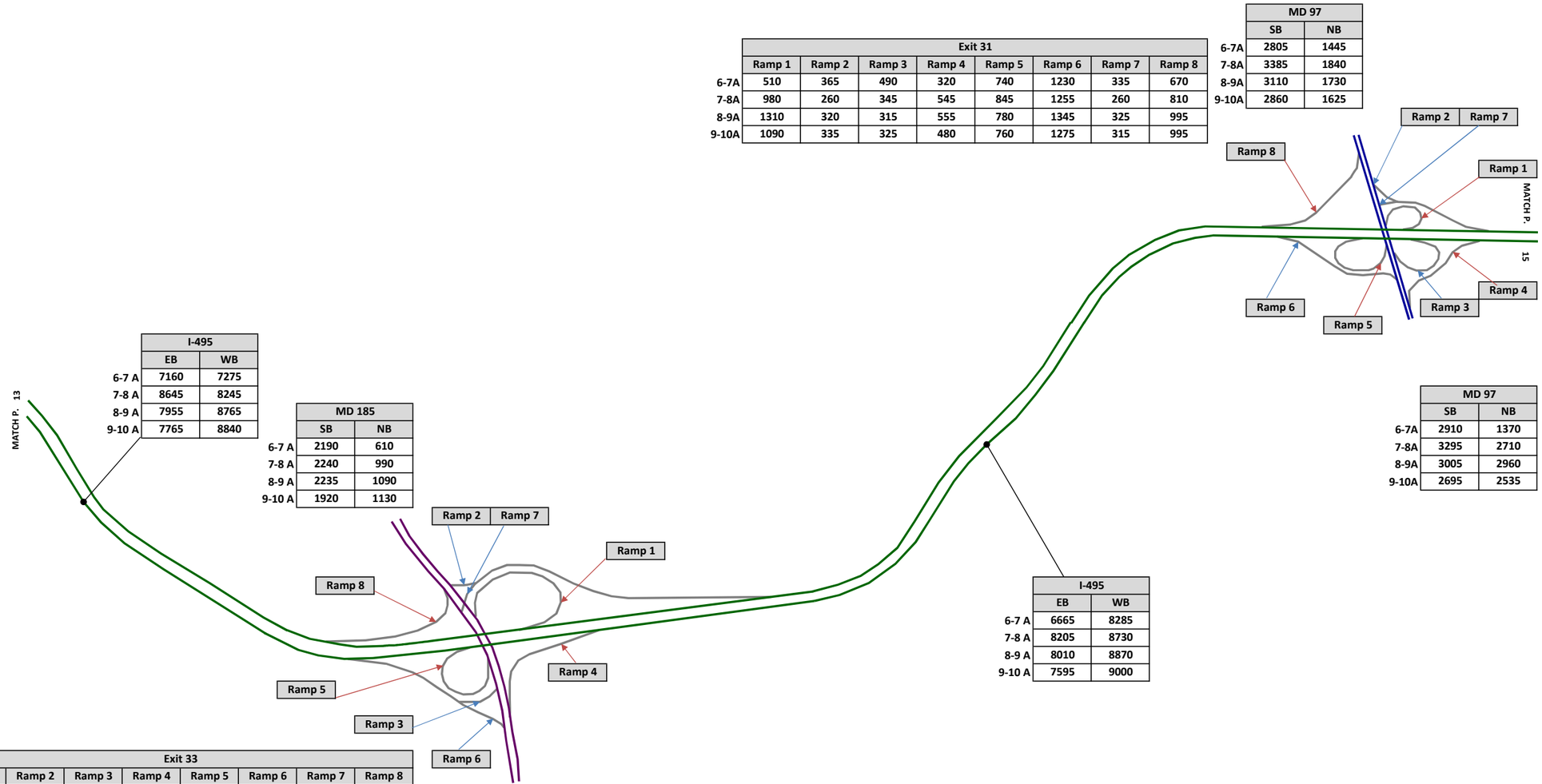
HOV	GP	NB Tot	
300	2250	2550	6-7A
655	2955	3610	7-8A
765	4065	4830	8-9A
555	3775	4330	9-10A

	Ex 1A							
	R2	R4	R5	R6	R7	R8	R9	R10
6-7A	295	40	115	510	95	255	40	70
7-8A	440	150	200	620	185	915	165	145
8-9A	405	150	230	695	145	945	245	150
9-10A	355	155	215	495	115	700	220	150

I-270 & I-495 West Side AM
Future No Build Peak Period Volumes



I-495 North Side AM
Future No Build Peak Period Volumes



	Exit 31							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	510	365	490	320	740	1230	335	670
7-8A	980	260	345	545	845	1255	260	810
8-9A	1310	320	315	555	780	1345	325	995
9-10A	1090	335	325	480	760	1275	315	995

	MD 97	
	SB	NB
6-7A	2805	1445
7-8A	3385	1840
8-9A	3110	1730
9-10A	2860	1625

	I-495	
	EB	WB
6-7 A	7160	7275
7-8 A	8645	8245
8-9 A	7955	8765
9-10 A	7765	8840

	MD 185	
	SB	NB
6-7 A	2190	610
7-8 A	2240	990
8-9 A	2235	1090
9-10 A	1920	1130

	MD 97	
	SB	NB
6-7A	2910	1370
7-8A	3295	2710
8-9A	3005	2960
9-10A	2695	2535

	I-495	
	EB	WB
6-7 A	6665	8285
7-8 A	8205	8730
8-9 A	8010	8870
9-10 A	7595	9000

	Exit 33							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7 A	265	295	290	450	140	795	1700	720
7-8 A	620	355	410	855	185	1070	1460	710
8-9 A	1100	265	355	925	245	760	1710	770
9-10 A	920	245	365	735	235	775	1455	620

	MD 185	
	SB	NB
6-7 A	3825	740
7-8 A	3875	1700
8-9 A	3690	2495
9-10 A	3295	2175

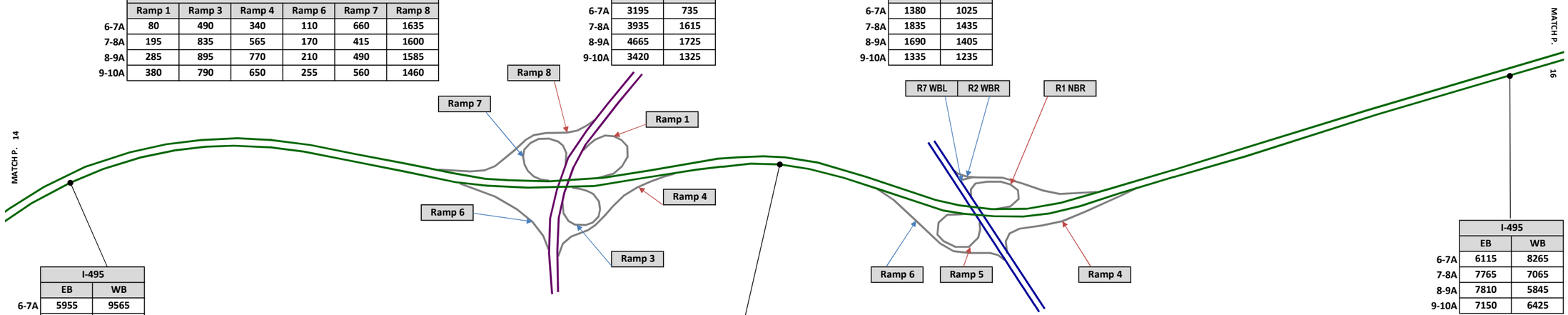
I-495 North Side AM
Future No Build Peak Period Volumes

	Exit 29					
	Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
6-7A	775	345	315	570	465	85
7-8A	850	320	460	660	660	90
8-9A	790	330	490	670	600	120
9-10A	685	345	395	530	615	125

	Exit 30					
	Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
6-7A	80	490	340	110	660	1635
7-8A	195	835	565	170	415	1600
8-9A	285	895	770	210	490	1585
9-10A	380	790	650	255	560	1460

	US 29	
	SB	NB
6-7A	3195	735
7-8A	3935	1615
8-9A	4665	1725
9-10A	3420	1325

	MD 193	
	SB	NB
6-7A	1380	1025
7-8A	1835	1435
8-9A	1690	1405
9-10A	1335	1235



	I-495	
	EB	WB
6-7A	5955	9565
7-8A	7745	8885
8-9A	7585	7565
9-10A	7235	7920

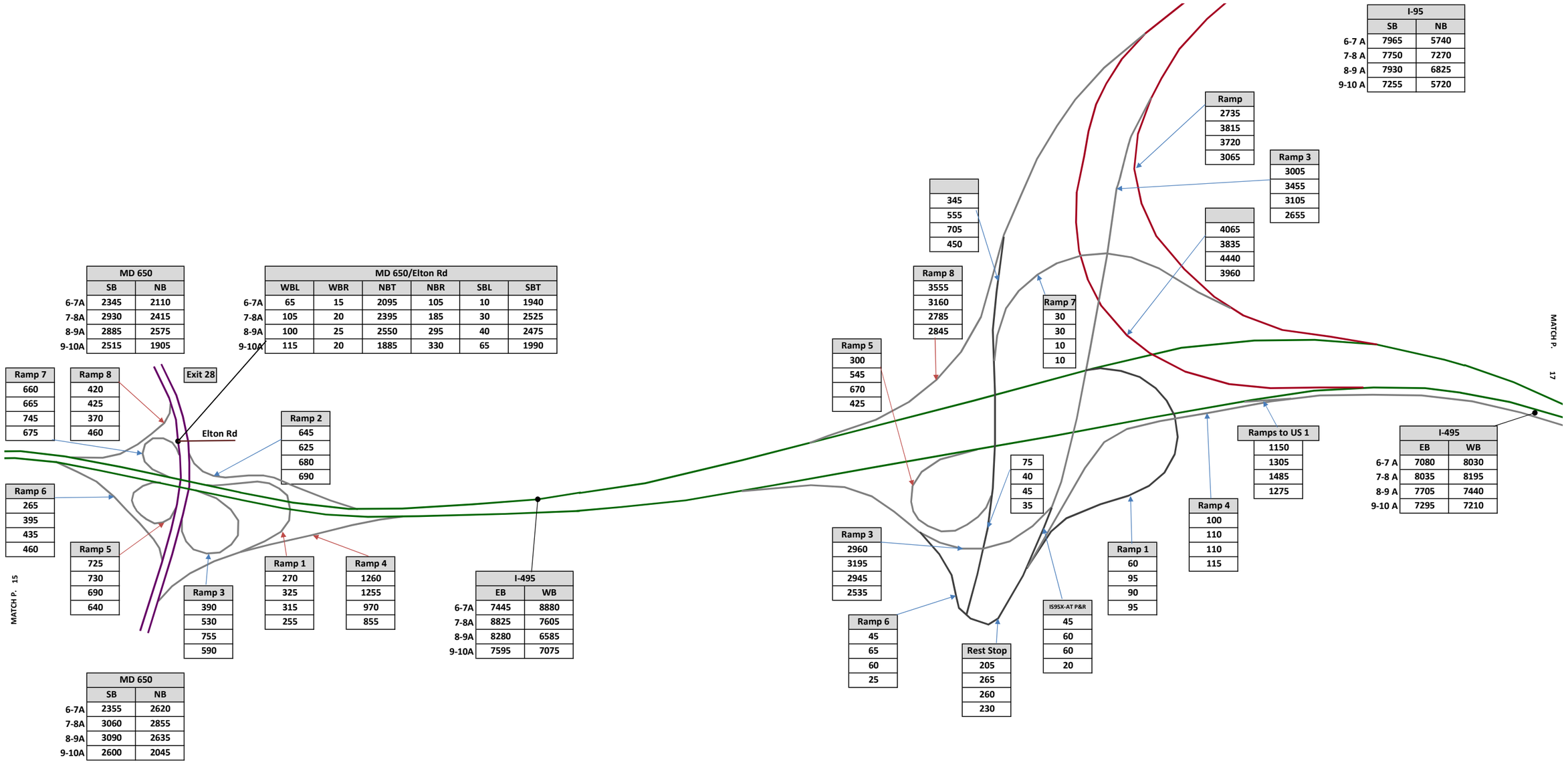
	US 29	
	SB	NB
6-7A	2480	665
7-8A	3045	1540
8-9A	3780	1885
9-10A	2775	1565

	I-495	
	EB	WB
6-7A	5695	8510
7-8A	7305	7505
8-9A	7250	6185
9-10A	6840	6640

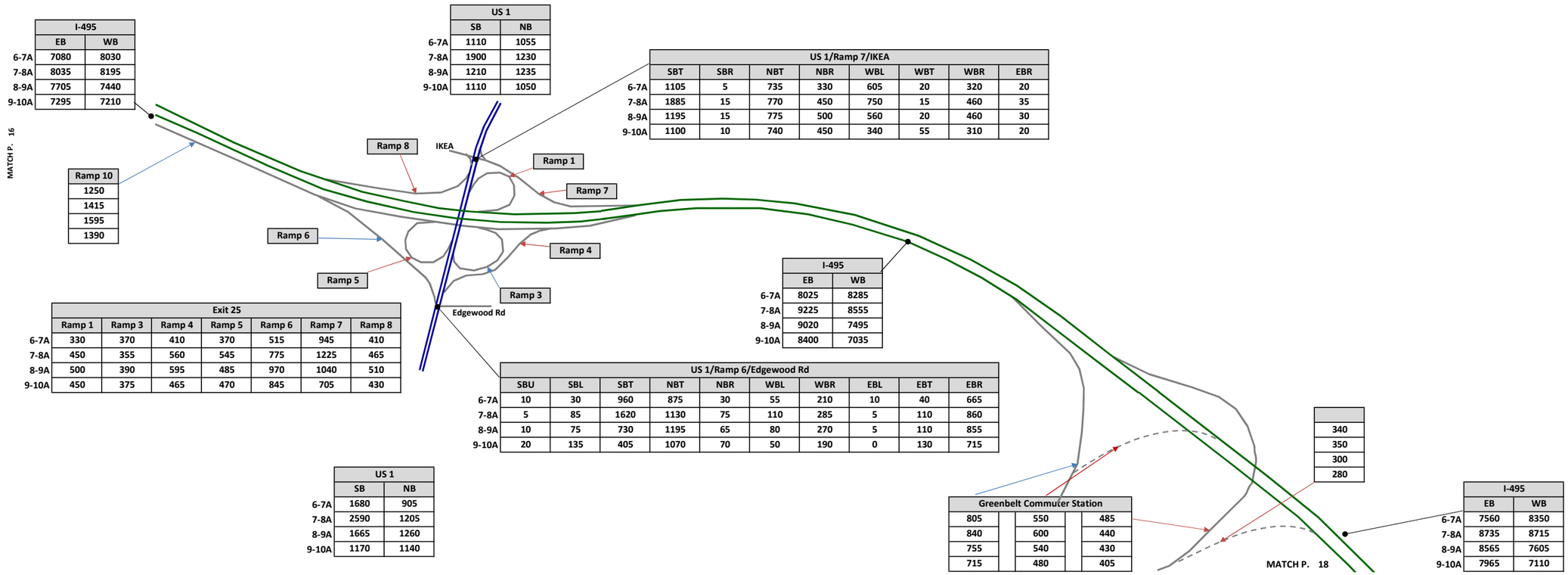
	MD 193	
	SB	NB
6-7A	1405	1645
7-8A	1970	2345
8-9A	1755	2270
9-10A	1620	1915

	I-495	
	EB	WB
6-7A	6115	8265
7-8A	7765	7065
8-9A	7810	5845
9-10A	7150	6425

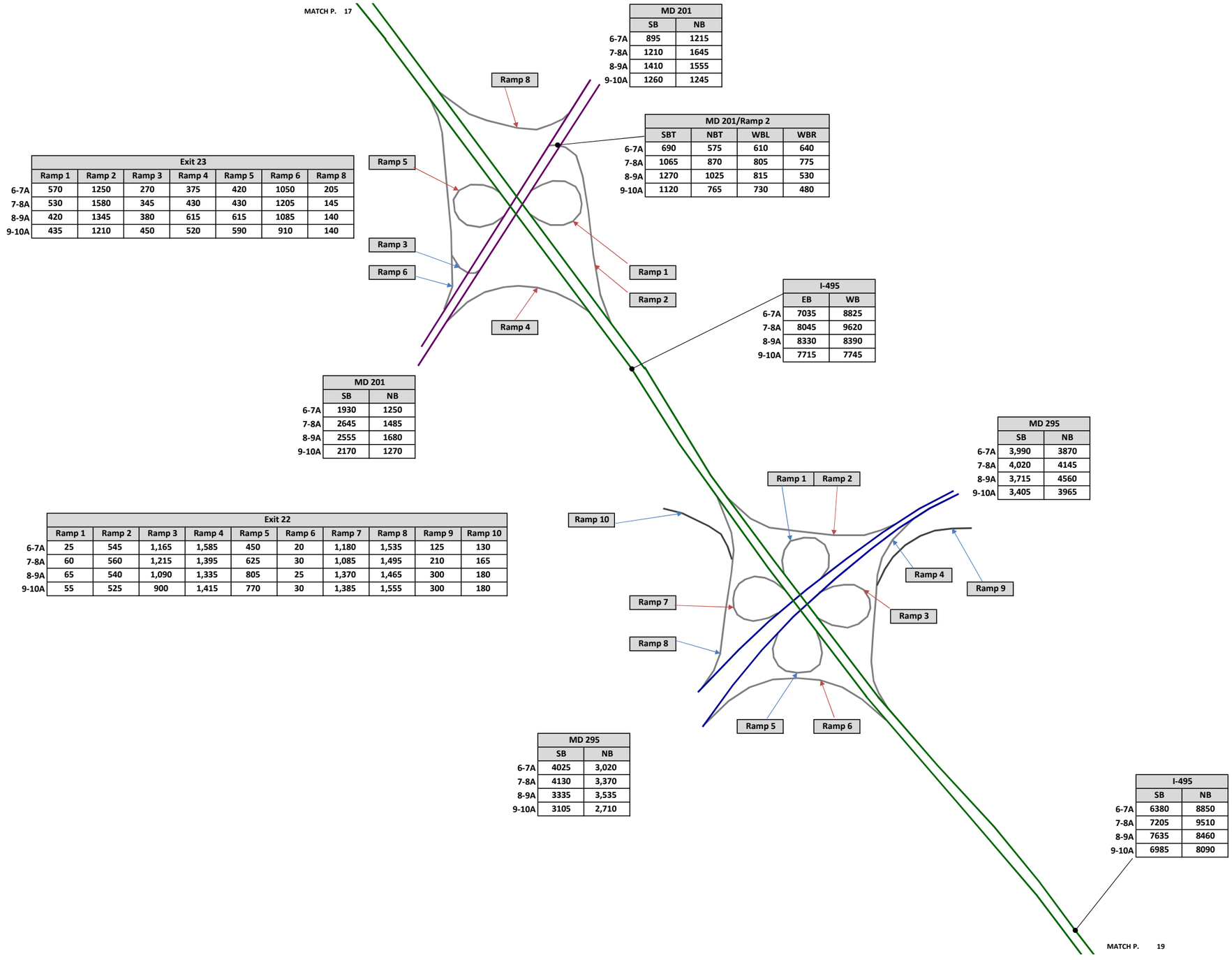
I-495 North Side AM
Future No Build Peak Period Volumes



I-495 Northeast Side AM
Future No Build Peak Period Volumes



I-495 Northeast Side AM
Future No Build Peak Period Volumes



	MD 201	
	SB	NB
6-7A	895	1215
7-8A	1210	1645
8-9A	1410	1555
9-10A	1260	1245

	MD 201/Ramp 2			
	SBT	NBT	WBL	WBR
6-7A	690	575	610	640
7-8A	1065	870	805	775
8-9A	1270	1025	815	530
9-10A	1120	765	730	480

	Exit 23						
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
6-7A	570	1250	270	375	420	1050	205
7-8A	530	1580	345	430	430	1205	145
8-9A	420	1345	380	615	615	1085	140
9-10A	435	1210	450	520	590	910	140

	I-495	
	EB	WB
6-7A	7035	8825
7-8A	8045	9620
8-9A	8330	8390
9-10A	7715	7745

	MD 201	
	SB	NB
6-7A	1930	1250
7-8A	2645	1485
8-9A	2555	1680
9-10A	2170	1270

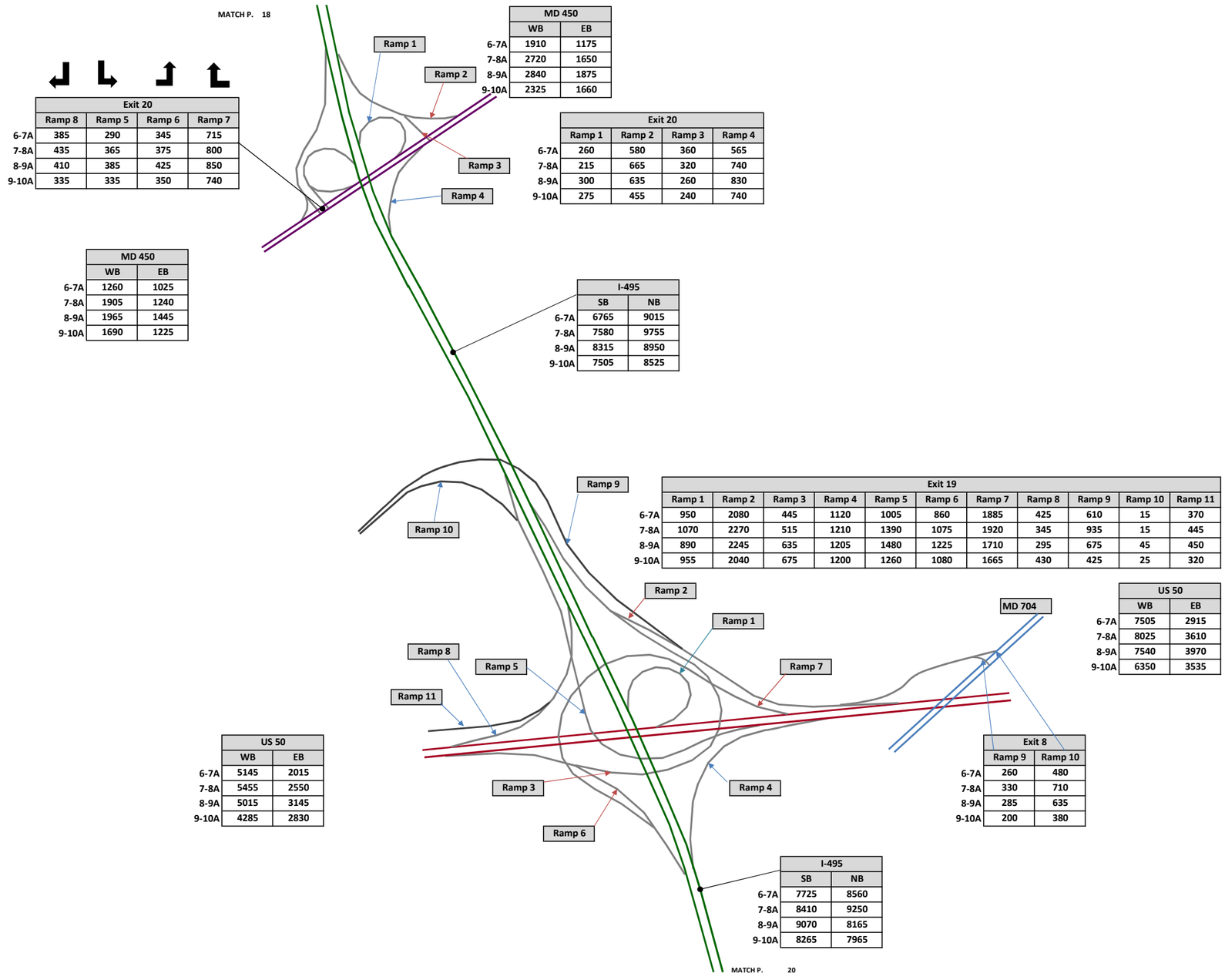
	MD 295	
	SB	NB
6-7A	3,990	3870
7-8A	4,020	4145
8-9A	3,715	4560
9-10A	3,405	3965

	Exit 22									
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
6-7A	25	545	1,165	1,585	450	20	1,180	1,535	125	130
7-8A	60	560	1,215	1,395	625	30	1,085	1,495	210	165
8-9A	65	540	1,090	1,335	805	25	1,370	1,465	300	180
9-10A	55	525	900	1,415	770	30	1,385	1,555	300	180

	MD 295	
	SB	NB
6-7A	4025	3,020
7-8A	4130	3,370
8-9A	3335	3,535
9-10A	3105	2,710

	I-495	
	SB	NB
6-7A	6380	8850
7-8A	7205	9510
8-9A	7635	8460
9-10A	6985	8090

I-495 Northeast Side AM
Future No Build Peak Period Volumes



Exit 20				
	Ramp 8	Ramp 5	Ramp 6	Ramp 7
6-7A	385	290	345	715
7-8A	435	365	375	800
8-9A	410	385	425	850
9-10A	335	335	350	740

MD 450		
	WB	EB
6-7A	1910	1175
7-8A	2720	1650
8-9A	2840	1875
9-10A	2325	1660

Exit 20				
	Ramp 1	Ramp 2	Ramp 3	Ramp 4
6-7A	260	580	360	565
7-8A	215	665	320	740
8-9A	300	635	260	830
9-10A	275	455	240	740

MD 450		
	WB	EB
6-7A	1260	1025
7-8A	1905	1240
8-9A	1965	1445
9-10A	1690	1225

I-495		
	SB	NB
6-7A	6765	9015
7-8A	7580	9755
8-9A	8315	8950
9-10A	7505	8525

Exit 19											
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
6-7A	950	2080	445	1120	1005	860	1885	425	610	15	370
7-8A	1070	2270	515	1210	1390	1075	1920	345	935	15	445
8-9A	890	2245	635	1205	1480	1225	1710	295	675	45	450
9-10A	955	2040	675	1200	1260	1080	1665	430	425	25	320

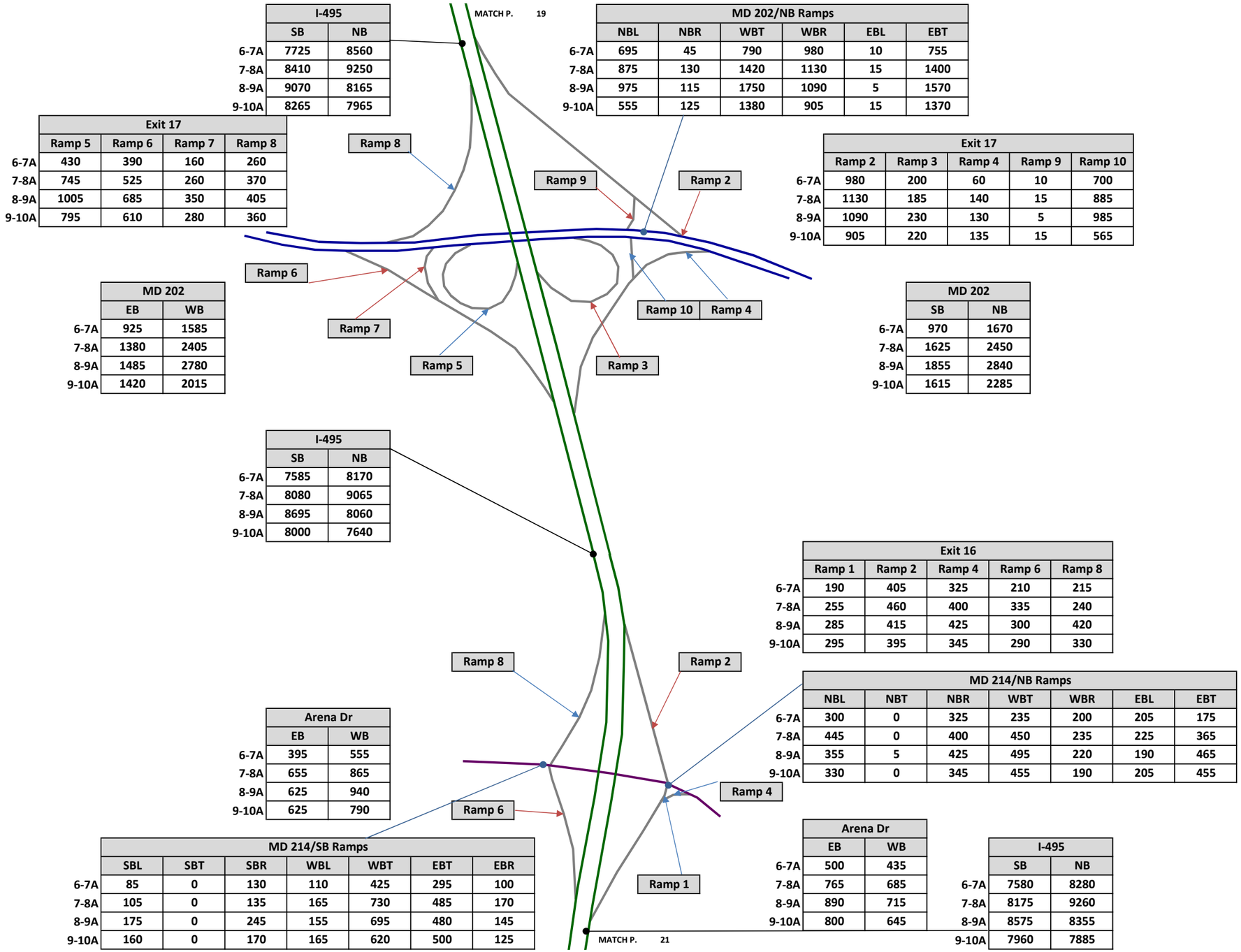
US 50		
	WB	EB
6-7A	7505	2915
7-8A	8025	3610
8-9A	7540	3970
9-10A	6350	3535

US 50		
	WB	EB
6-7A	5145	2015
7-8A	5455	2550
8-9A	5015	3145
9-10A	4285	2830

Exit 8		
	Ramp 9	Ramp 10
6-7A	260	480
7-8A	330	710
8-9A	285	635
9-10A	200	380

I-495		
	SB	NB
6-7A	7725	8560
7-8A	8410	9250
8-9A	9070	8165
9-10A	8265	7965

I-495 East Side AM
Future No Build Peak Period Volumes



I-495		
	SB	NB
6-7A	7725	8560
7-8A	8410	9250
8-9A	9070	8165
9-10A	8265	7965

MD 202/NB Ramps						
	NBL	NBR	WBT	WBR	EBL	EBT
6-7A	695	45	790	980	10	755
7-8A	875	130	1420	1130	15	1400
8-9A	975	115	1750	1090	5	1570
9-10A	555	125	1380	905	15	1370

Exit 17				
	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	430	390	160	260
7-8A	745	525	260	370
8-9A	1005	685	350	405
9-10A	795	610	280	360

Exit 17					
	Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
6-7A	980	200	60	10	700
7-8A	1130	185	140	15	885
8-9A	1090	230	130	5	985
9-10A	905	220	135	15	565

MD 202		
	EB	WB
6-7A	925	1585
7-8A	1380	2405
8-9A	1485	2780
9-10A	1420	2015

MD 202		
	SB	NB
6-7A	970	1670
7-8A	1625	2450
8-9A	1855	2840
9-10A	1615	2285

I-495		
	SB	NB
6-7A	7585	8170
7-8A	8080	9065
8-9A	8695	8060
9-10A	8000	7640

Exit 16					
	Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
6-7A	190	405	325	210	215
7-8A	255	460	400	335	240
8-9A	285	415	425	300	420
9-10A	295	395	345	290	330

MD 214/NB Ramps							
	NBL	NBT	NBR	WBT	WBR	EBL	EBT
6-7A	300	0	325	235	200	205	175
7-8A	445	0	400	450	235	225	365
8-9A	355	5	425	495	220	190	465
9-10A	330	0	345	455	190	205	455

Arena Dr		
	EB	WB
6-7A	395	555
7-8A	655	865
8-9A	625	940
9-10A	625	790

MD 214/SB Ramps							
	SBL	SBT	SBR	WBL	WBT	EBT	EBR
6-7A	85	0	130	110	425	295	100
7-8A	105	0	135	165	730	485	170
8-9A	175	0	245	155	695	480	145
9-10A	160	0	170	165	620	500	125

Arena Dr		
	EB	WB
6-7A	500	435
7-8A	765	685
8-9A	890	715
9-10A	800	645

I-495		
	SB	NB
6-7A	7580	8280
7-8A	8175	9260
8-9A	8575	8355
9-10A	7960	7885

I-495 East Side AM
Future No Build Peak Period Volumes

	Exit 15								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
6-7A	760	580	615	670	460	280	325	245	255
7-8A	985	640	670	1060	605	325	445	355	345
8-9A	875	560	685	875	690	380	550	470	340
9-10A	680	555	665	645	685	410	410	205	295

	MD 214/SB Ramps				
	SBR	WBL	WBT	EBT	EBR
6-7A	245	760	2530	770	280
7-8A	355	985	2055	1055	325
8-9A	470	875	1385	1225	380
9-10A	205	680	995	1195	410

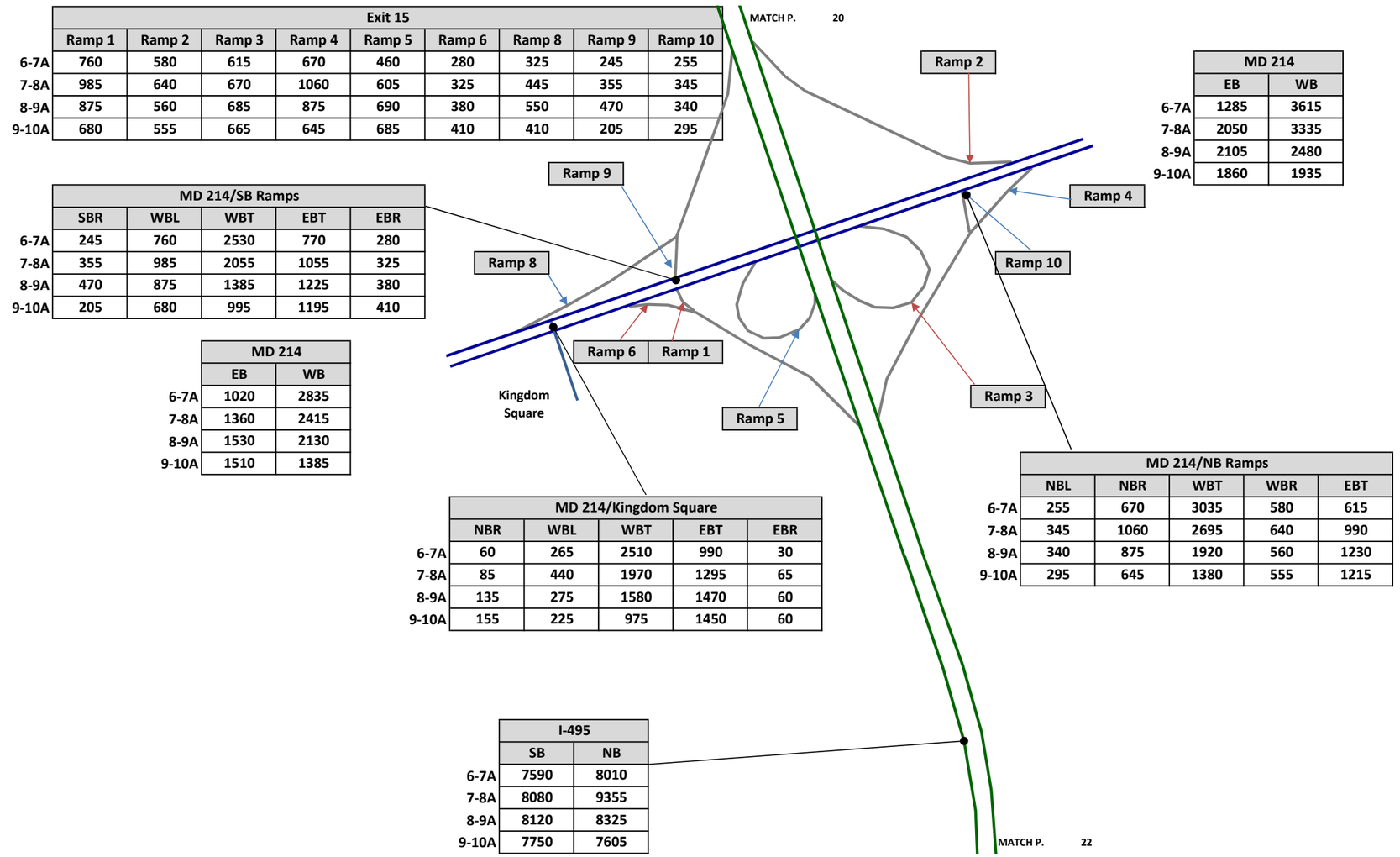
	MD 214	
	EB	WB
6-7A	1020	2835
7-8A	1360	2415
8-9A	1530	2130
9-10A	1510	1385

	MD 214	
	EB	WB
6-7A	1285	3615
7-8A	2050	3335
8-9A	2105	2480
9-10A	1860	1935

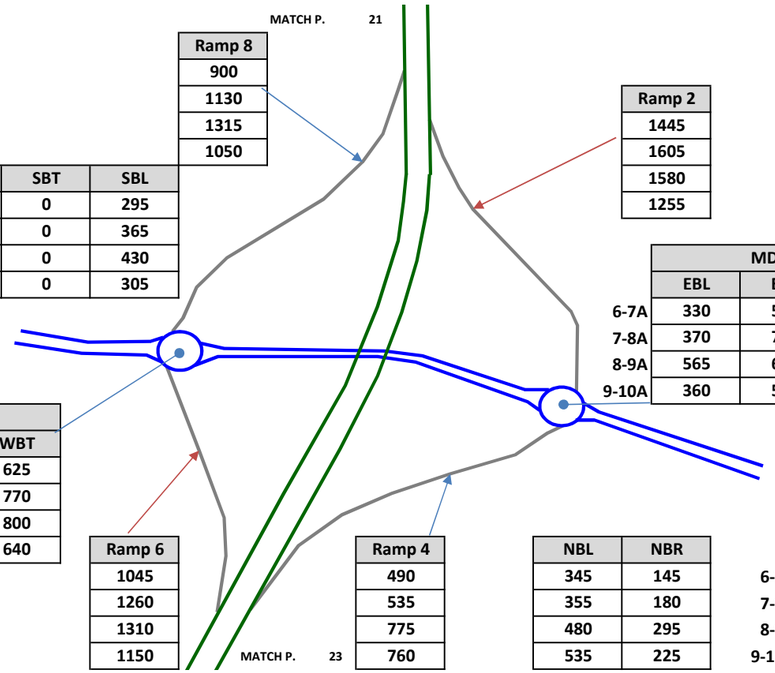
	MD 214/Kingdom Square				
	NBR	WBL	WBT	EBT	EBR
6-7A	60	265	2510	990	30
7-8A	85	440	1970	1295	65
8-9A	135	275	1580	1470	60
9-10A	155	225	975	1450	60

	MD 214/NB Ramps				
	NBL	NBR	WBT	WBR	EBT
6-7A	255	670	3035	580	615
7-8A	345	1060	2695	640	990
8-9A	340	875	1920	560	1230
9-10A	295	645	1380	555	1215

	I-495	
	SB	NB
6-7A	7590	8010
7-8A	8080	9355
8-9A	8120	8325
9-10A	7750	7605



I-495 East Side AM
Future No Build Peak Period Volumes



	MD 221A	
	EB	WB
6-7A	940	1280
7-8A	1180	1535
8-9A	1225	1685
9-10A	1095	1385

Ramp 8
900
1130
1315
1050

SBR	SBT	SBL
605	0	295
765	0	365
885	0	430
745	0	305

Ramp 2
1445
1605
1580
1255

	MD 221A/NB Ramps			
	EBL	EBT	WBT	WBR
6-7A	330	560	780	1115
7-8A	370	730	1080	1235
8-9A	565	630	1170	1015
9-10A	360	590	805	895

	MD 221A/SB Ramps			
	EBT	EBR	WBL	WBT
6-7A	545	395	650	625
7-8A	735	445	815	770
8-9A	765	460	850	800
9-10A	645	450	700	640

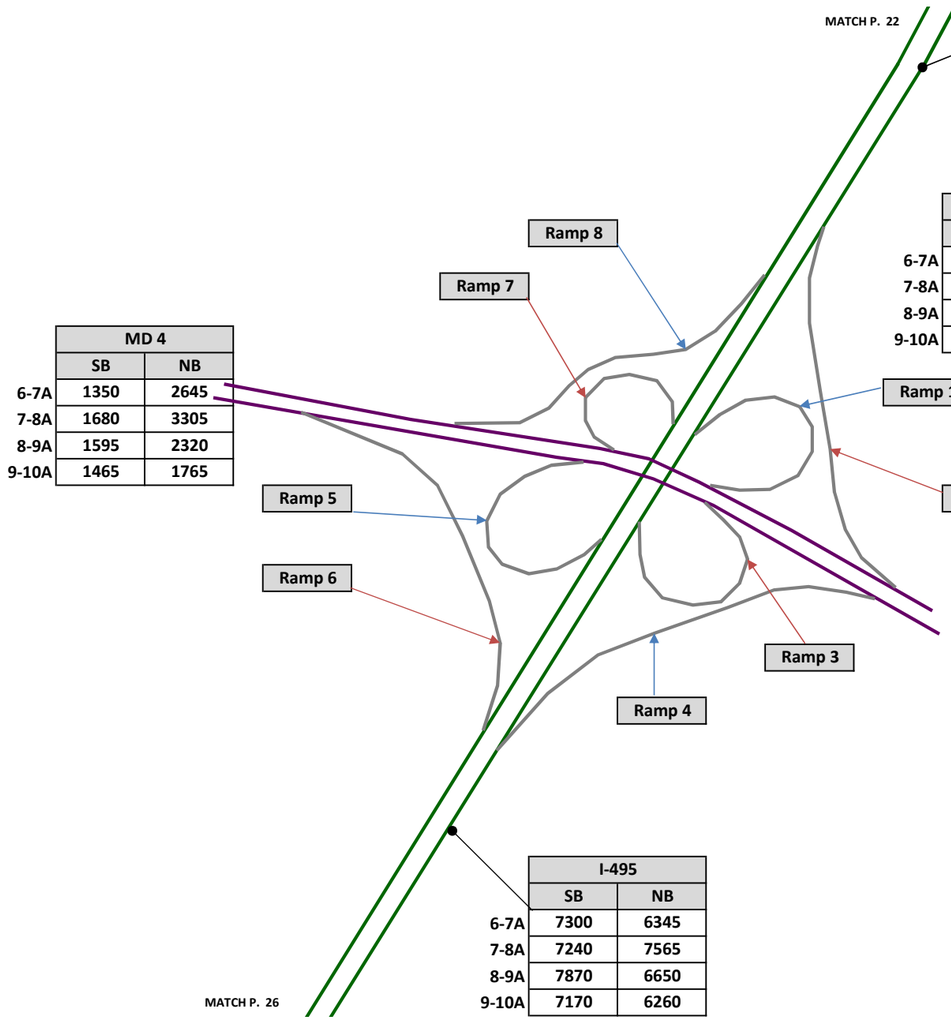
Ramp 6
1045
1260
1310
1150

Ramp 4
490
535
775
760

NBL	NBR
345	145
355	180
480	295
535	225

	MD 221A	
	EB	WB
6-7A	855	1895
7-8A	1060	2315
8-9A	925	2185
9-10A	815	1700

I-495 East Side AM
Future No Build Peak Period Volumes



	I-495	
	SB	NB
6-7A	7735	7055
7-8A	8210	8285
8-9A	8115	7520
9-10A	7850	7110

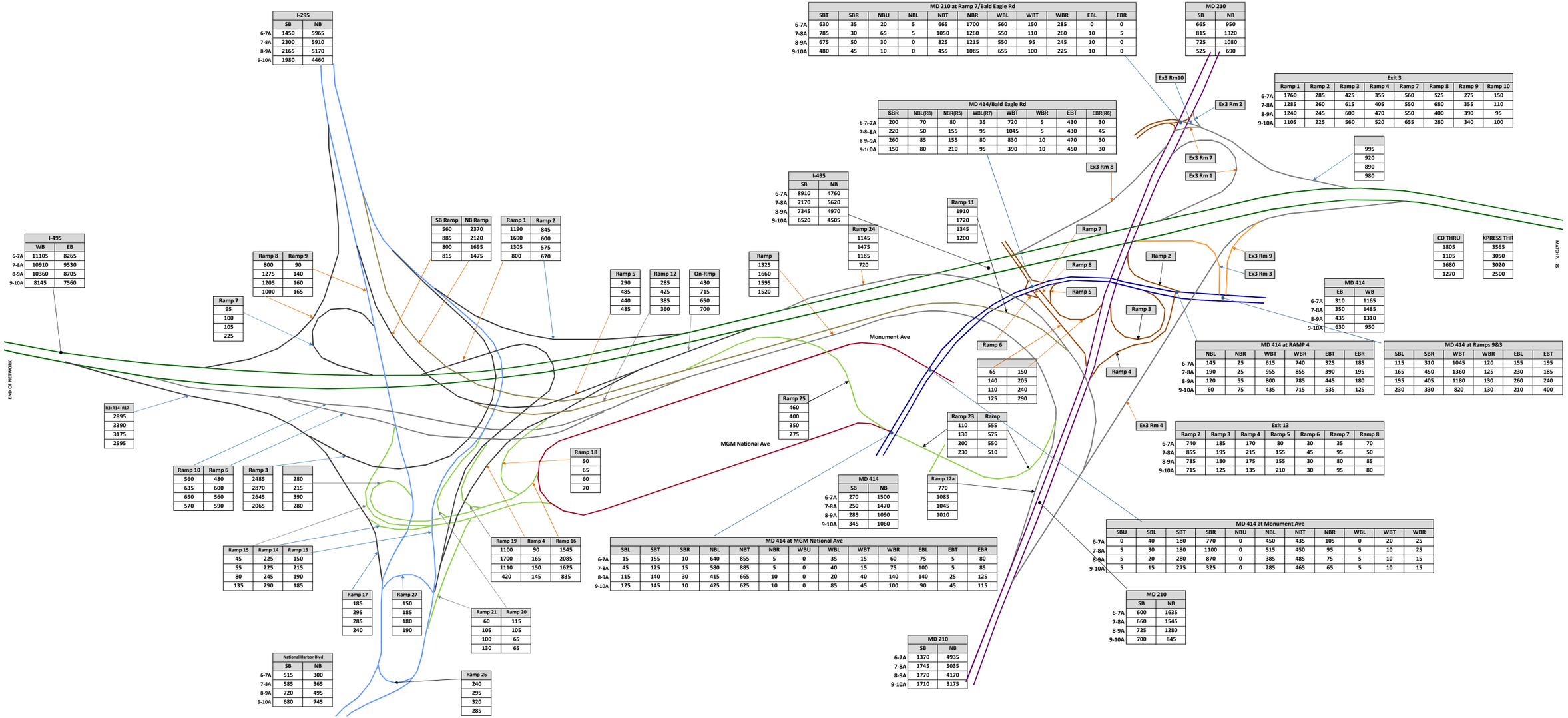
	Exit 11							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
6-7A	710	1440	560	580	975	495	1280	1235
7-8A	770	1375	660	545	850	465	950	1535
8-9A	700	1475	655	560	670	495	860	930
9-10A	590	1325	610	495	750	395	660	985

	MD 4	
	SB	NB
6-7A	1350	2645
7-8A	1680	3305
8-9A	1595	2320
9-10A	1465	1765

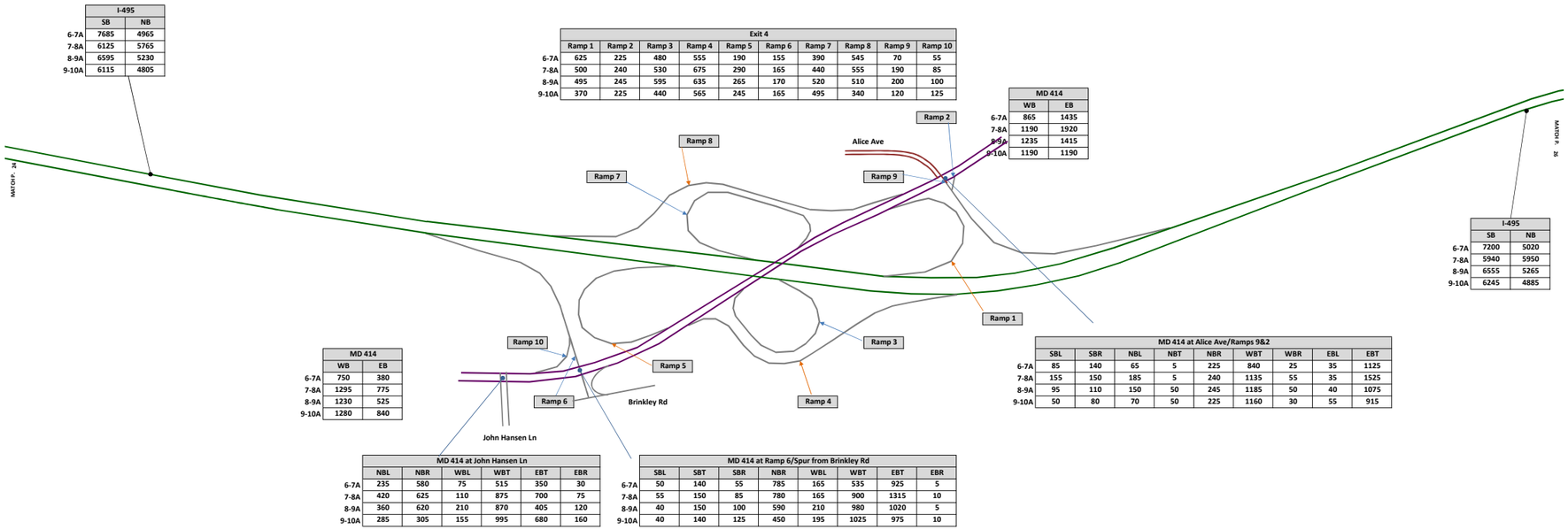
	MD 4	
	SB	NB
6-7A	2000	3120
7-8A	2000	3275
8-9A	1675	2975
9-10A	1705	2175

	I-495	
	SB	NB
6-7A	7300	6345
7-8A	7240	7565
8-9A	7870	6650
9-10A	7170	6260

I-495 South Side AM
Future No Build Peak Period Volumes



I-495 South Side AM
Future No Build Peak Period Volumes



I-495		
	SB	NB
6-7A	7685	4965
7-8A	6125	5765
8-9A	6595	5230
9-10A	6115	4805

Exit 4										
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
6-7A	625	225	480	555	190	155	390	545	70	55
7-8A	500	240	530	675	290	165	440	555	190	85
8-9A	495	245	595	635	265	170	520	510	200	100
9-10A	370	225	440	565	245	165	495	340	120	125

MD 414		
	WB	EB
6-7A	865	1435
7-8A	1190	1920
8-9A	1235	1415
9-10A	1190	1190

I-495		
	SB	NB
6-7A	7200	5020
7-8A	5940	5950
8-9A	6555	5265
9-10A	6245	4885

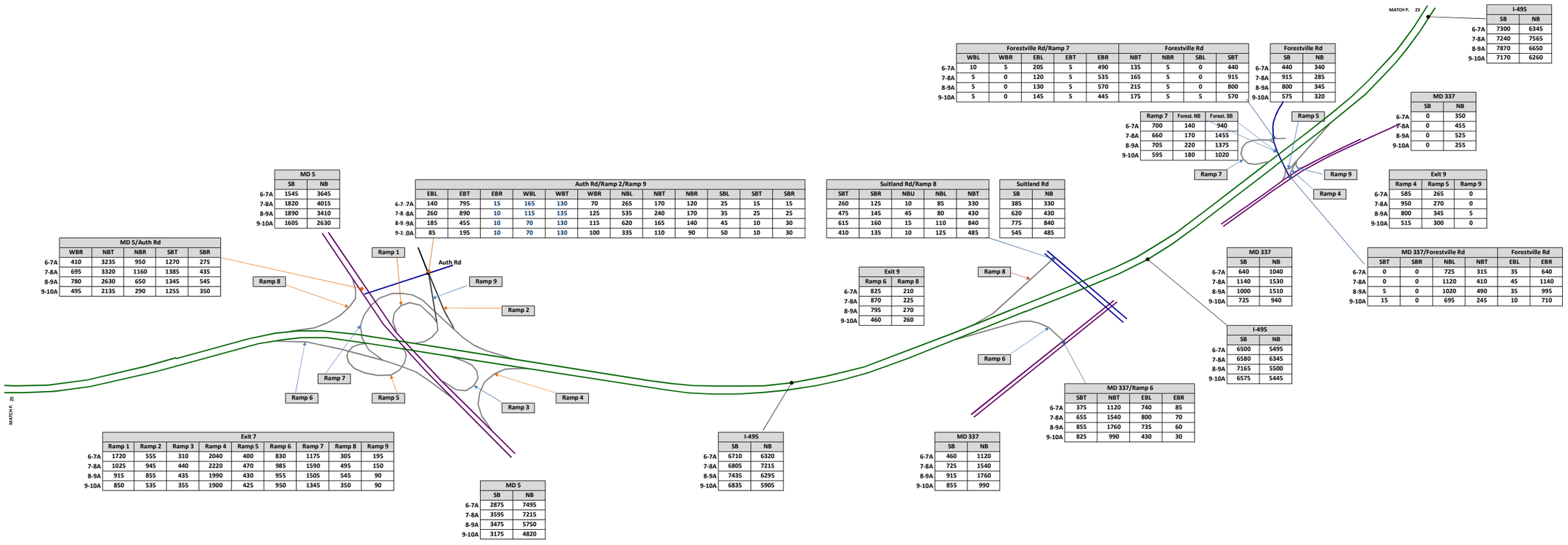
MD 414		
	WB	EB
6-7A	750	380
7-8A	1295	775
8-9A	1230	525
9-10A	1280	840

MD 414 at Alice Ave/Ramps 9&2									
	SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
6-7A	85	140	65	5	225	840	25	35	1125
7-8A	155	150	185	5	240	1135	55	35	1525
8-9A	95	110	150	50	245	1185	50	40	1075
9-10A	50	80	70	50	225	1160	30	55	915

MD 414 at John Hansen Ln						
	NBL	NBR	WBL	WBT	EBT	EBR
6-7A	235	580	75	515	350	30
7-8A	420	625	110	875	700	75
8-9A	360	620	210	870	405	120
9-10A	285	305	155	995	680	160

MD 414 at Ramp 6/Spur from Brinkley Rd								
	SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
6-7A	50	140	55	785	165	535	925	5
7-8A	55	150	85	780	165	900	1315	10
8-9A	40	150	100	590	210	980	1020	5
9-10A	40	140	125	450	195	1025	975	10

I-495 South Side AM
Future No Build Peak Period Volumes



	MD 5	
	SB	NB
6-7A	1545	3645
7-8A	1820	4015
8-9A	1890	3410
9-10A	1605	2630

	Auth Rd/Ramp 2/Ramp 9											
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
6-7 7A	140	795	15	165	130	70	265	170	120	25	15	15
7-8 8A	260	890	10	115	135	125	535	240	170	35	25	25
8-9 9A	185	455	10	70	130	115	620	165	140	45	10	30
9-1 0A	85	195	10	70	130	100	335	110	90	50	10	30

	Suitland Rd/Ramp 8				
	SBT	SBR	NBU	NBL	NBT
	260	125	10	85	330
	475	145	45	80	430
	615	160	15	110	840
	410	135	10	125	485

	Suitland Rd	
	SB	NB
	385	330
	620	430
	775	840
	545	485

	Forestville Rd/Ramp 7					Forestville Rd			
	WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
6-7A	10	5	205	5	490	135	5	0	440
7-8A	5	0	120	5	535	165	5	0	915
8-9A	5	0	130	5	570	215	5	0	800
9-10A	5	0	145	5	445	175	5	5	570

	Forestville Rd	
	SB	NB
6-7A	440	340
7-8A	915	285
8-9A	800	345
9-10A	575	320

	I-495	
	SB	NB
6-7A	7300	6345
7-8A	7240	7565
8-9A	7870	6650
9-10A	7170	6260

	Ramp 7	Forest. NB	Forest. SB
6-7A	700	140	940
7-8A	660	170	1455
8-9A	705	220	1375
9-10A	595	180	1020

	MD 337	
	SB	NB
6-7A	0	350
7-8A	0	455
8-9A	0	525
9-10A	0	255

	Exit 9		
	Ramp 4	Ramp 5	Ramp 9
6-7A	585	265	0
7-8A	950	270	0
8-9A	800	345	5
9-10A	515	300	0

	MD 5/Auth Rd				
	WBR	NBT	NBR	SBT	SBR
6-7A	410	3235	950	1270	275
7-8A	695	3320	1160	1385	435
8-9A	780	2630	650	1345	545
9-10A	495	2135	290	1255	350

	Exit 9	
	Ramp 6	Ramp 8
6-7A	825	210
7-8A	870	225
8-9A	795	270
9-10A	460	260

	MD 337	
	SB	NB
6-7A	640	1040
7-8A	1140	1530
8-9A	1000	1510
9-10A	725	940

	MD 337/Forestville Rd				Forestville Rd	
	SBT	SBR	NBL	NBT	EBL	EBR
6-7A	0	0	725	315	35	640
7-8A	0	0	1120	410	45	1140
8-9A	5	0	1020	490	35	995
9-10A	15	0	695	245	10	710

	I-495	
	SB	NB
6-7A	6500	5495
7-8A	6580	6345
8-9A	7165	5500
9-10A	6575	5445

	MD 337/Ramp 6			
	SBT	NBT	EBL	EBR
6-7A	375	1120	740	85
7-8A	655	1540	800	70
8-9A	855	1760	735	60
9-10A	825	990	430	30

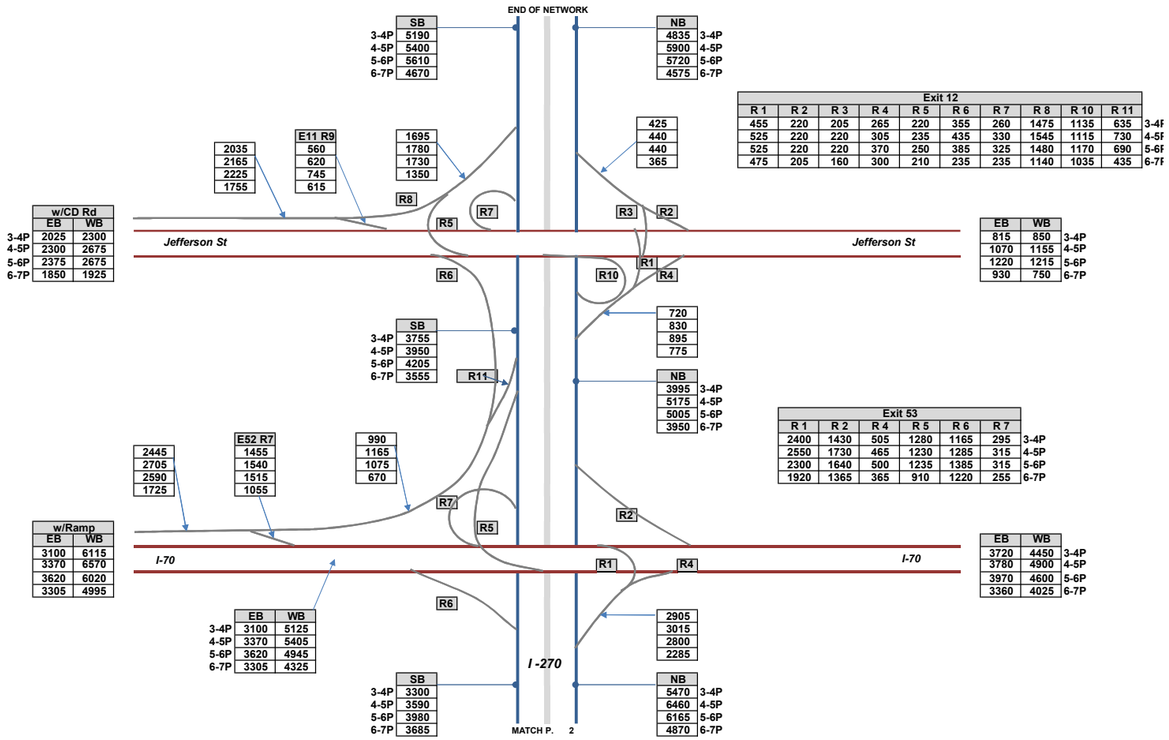
	Exit 7								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
6-7A	1720	555	310	2040	400	830	1175	305	195
7-8A	1025	945	440	2220	470	985	1590	495	150
8-9A	915	855	435	1990	430	955	1505	545	90
9-10A	850	535	355	1900	425	950	1345	350	90

	I-495	
	SB	NB
6-7A	6710	6320
7-8A	6805	7215
8-9A	7435	6295
9-10A	6835	5905

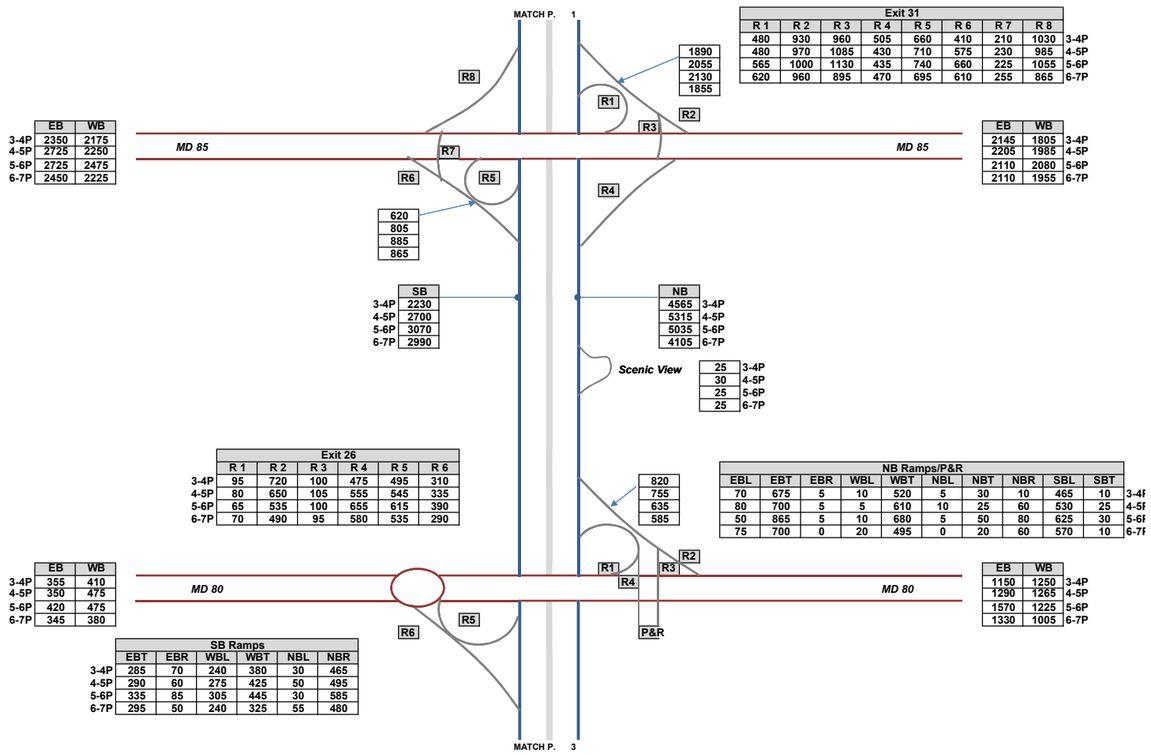
	MD 337	
	SB	NB
6-7A	460	1120
7-8A	725	1540
8-9A	915	1760
9-10A	855	990

	MD 5	
	SB	NB
6-7A	2875	7495
7-8A	3595	7215
8-9A	3475	5750
9-10A	3175	4820

I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



Exit 31								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	
480	930	960	505	660	410	210	1030	3-4P
480	970	1085	430	710	575	230	985	4-5P
565	1000	1130	435	740	660	225	1055	5-6P
620	960	895	470	695	610	255	865	6-7P

	EB	WB
3-4P	2350	2175
4-5P	2725	2250
5-6P	2725	2475
6-7P	2450	2225

	EB	WB
3-4P	2145	1805
4-5P	2205	1985
5-6P	2110	2080
6-7P	2110	1955

	SB
3-4P	2230
4-5P	2700
5-6P	3070
6-7P	2990

	NB
3-4P	4565
4-5P	5315
5-6P	5035
6-7P	4105

3-4P	25
4-5P	30
5-6P	25
6-7P	25

Exit 26						
	R 1	R 2	R 3	R 4	R 5	R 6
3-4P	95	720	100	475	495	310
4-5P	80	650	105	555	545	335
5-6P	65	535	100	655	615	390
6-7P	70	490	95	580	535	290

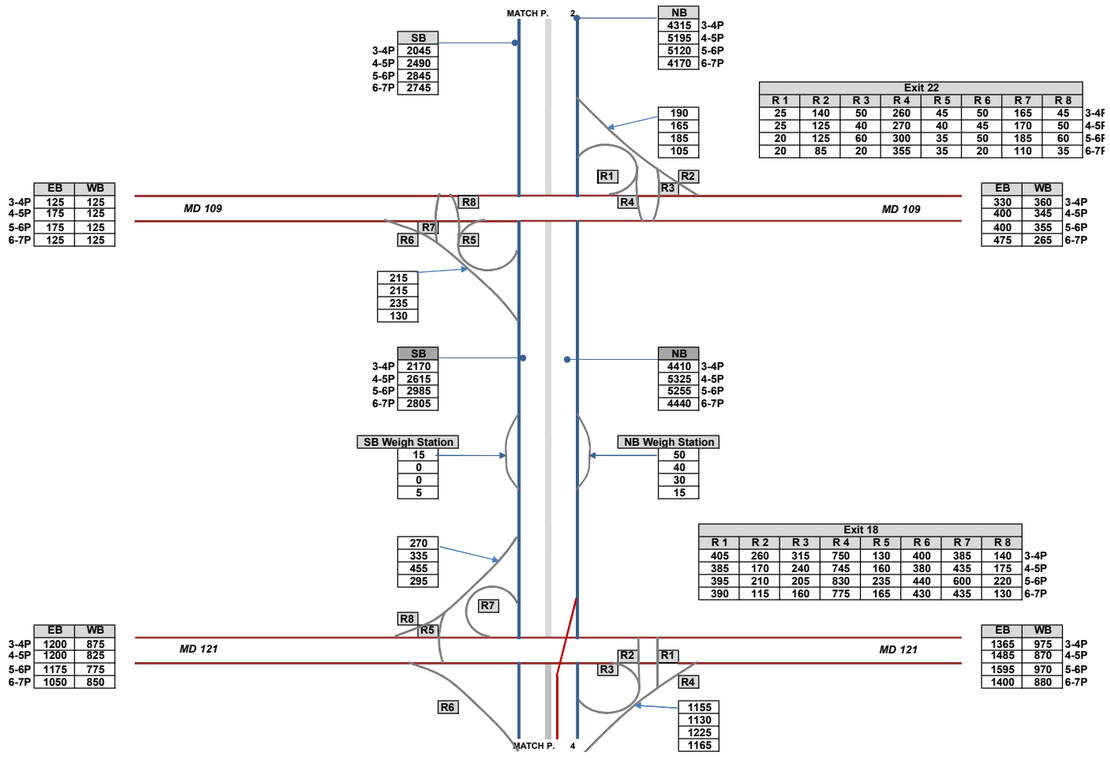
NB Ramps/P&R										
EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	
70	675	5	10	520	5	30	10	465	10	3-4
80	700	5	5	610	10	25	60	530	25	4-5
50	865	5	10	680	5	50	80	625	30	5-6
75	700	0	20	495	0	20	60	570	10	6-7

	EB	WB
3-4P	355	410
4-5P	350	475
5-6P	420	475
6-7P	345	380

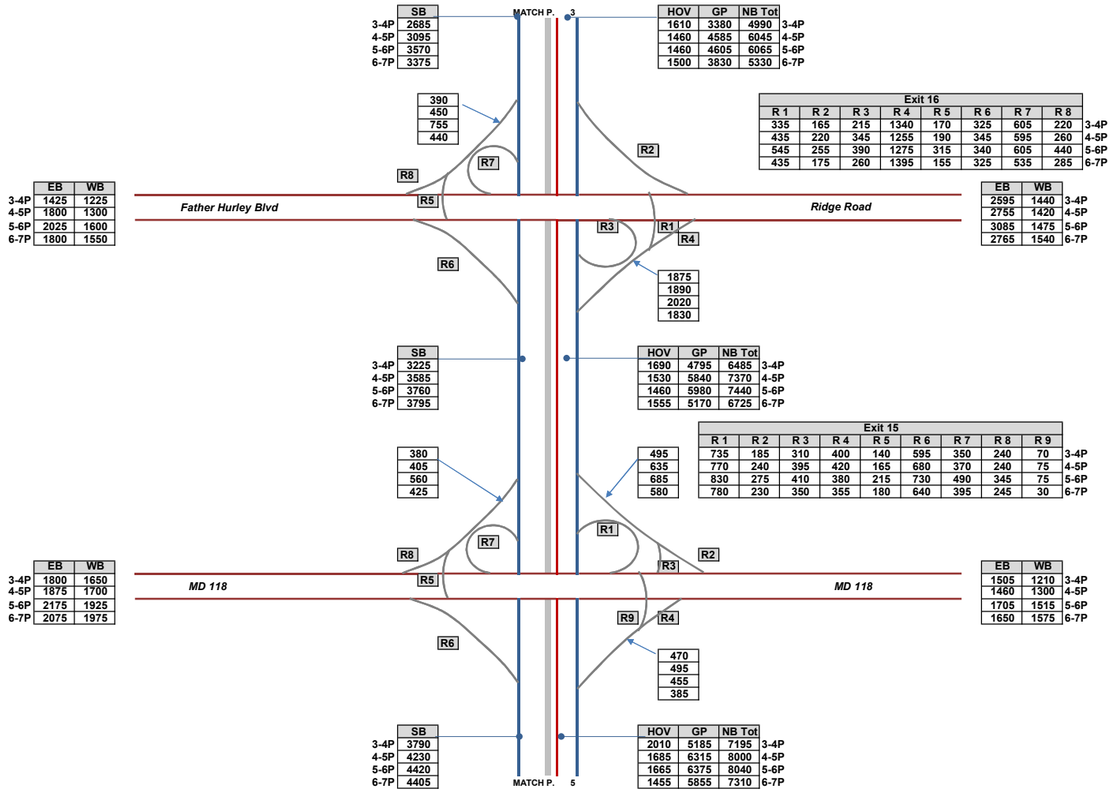
	EB	WB
3-4P	1150	1250
4-5P	1290	1265
5-6P	1570	1225
6-7P	1330	1005

SB Ramps						
	EBT	EBR	WBL	WBT	NBL	NBR
3-4P	285	70	240	380	30	465
4-5P	290	60	275	425	50	495
5-6P	335	85	305	445	30	585
6-7P	295	50	240	325	55	480

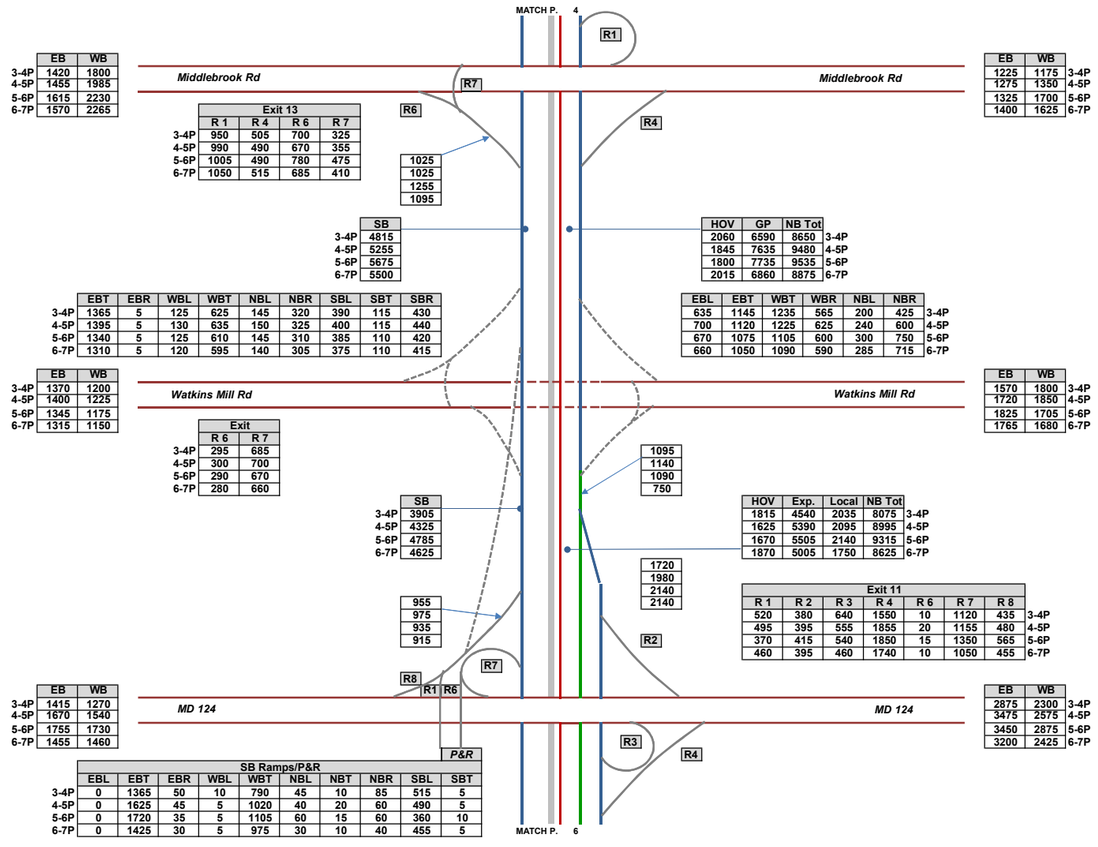
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



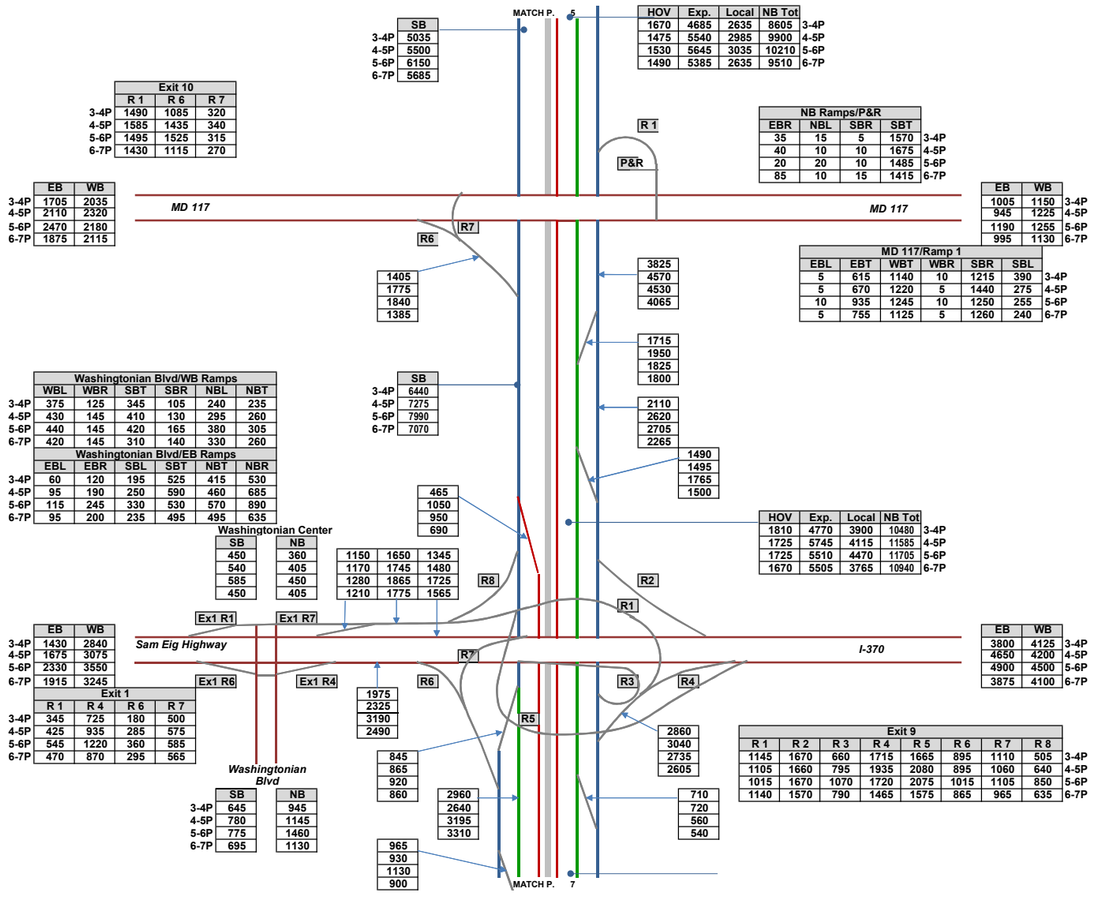
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



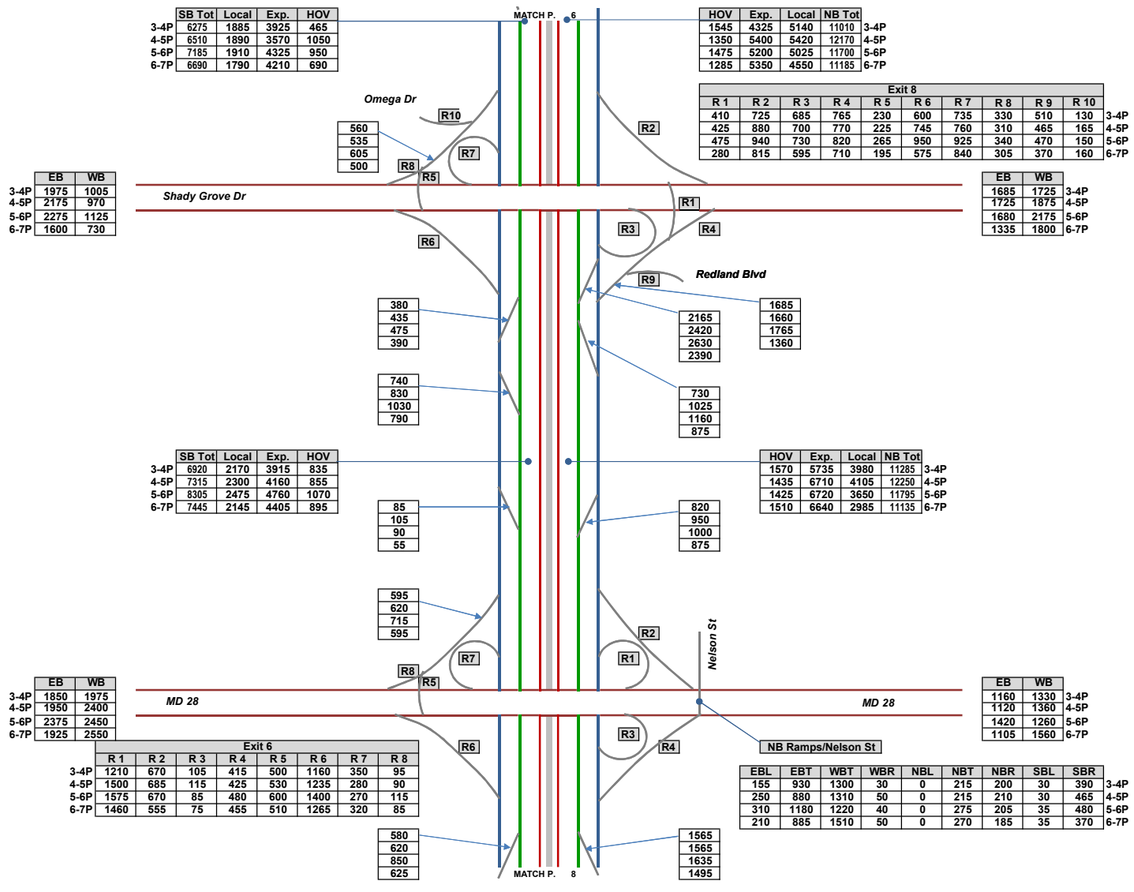
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



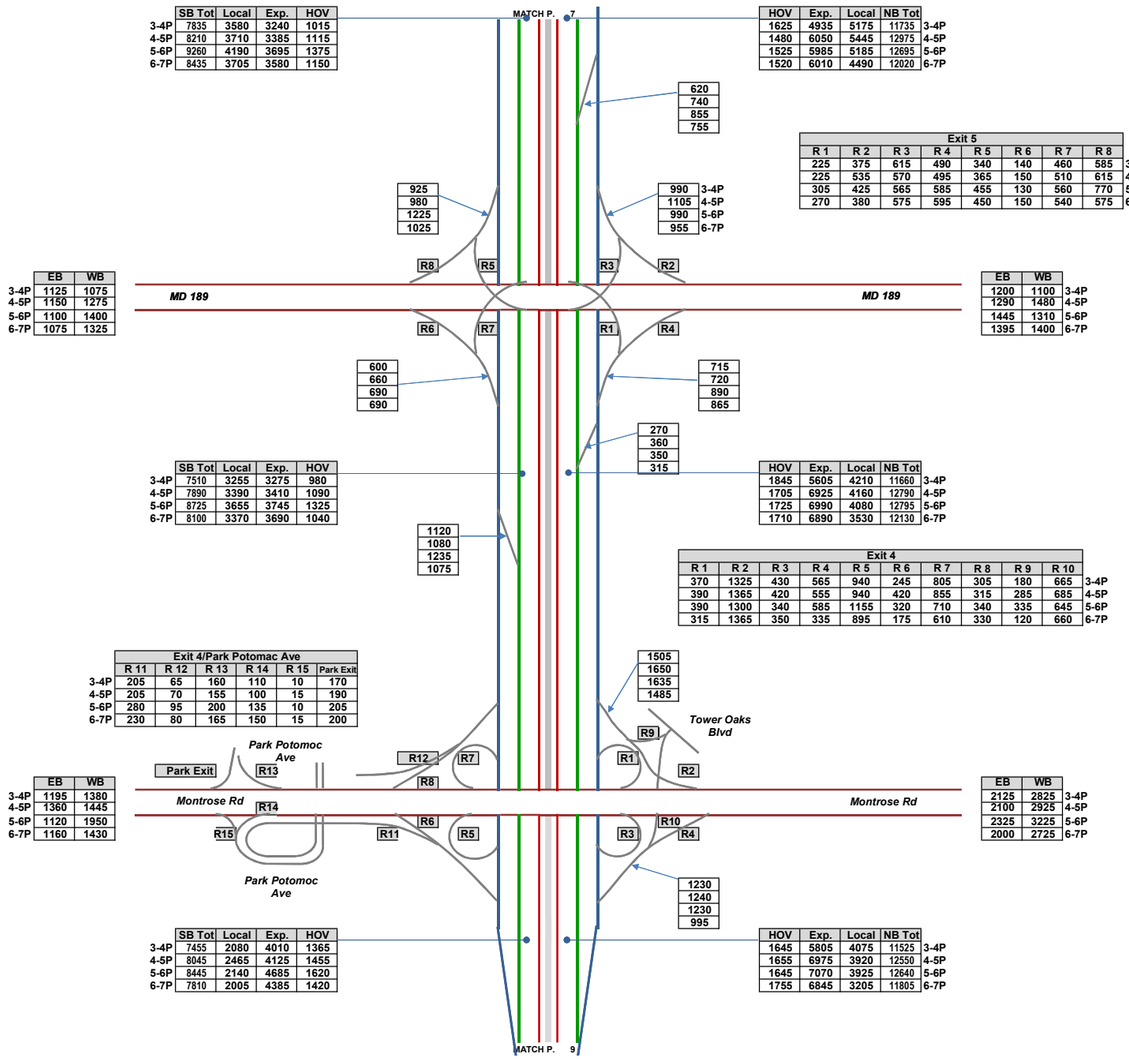
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



	SB Tot	Local	Exp.	HOV
3-4P	7835	3580	3240	1015
4-5P	8210	3710	3385	1115
5-6P	9260	4190	3695	1375
6-7P	8435	3705	3580	1150

	HOV	Exp.	Local	NB Tot
3-4P	1625	4935	5175	11735
4-5P	1480	6050	5445	12975
5-6P	1525	5985	5185	12695
6-7P	1520	6010	4490	12020

Exit 5								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	
225	375	615	490	340	140	460	585	3-4P
225	535	570	495	365	150	510	615	4-5P
305	425	565	585	455	130	560	770	5-6P
270	380	575	595	450	150	540	575	6-7P

	EB	WB
3-4P	1125	1075
4-5P	1150	1275
5-6P	1100	1400
6-7P	1075	1325

	EB	WB
3-4P	1200	1100
4-5P	1290	1480
5-6P	1445	1310
6-7P	1395	1400

	SB Tot	Local	Exp.	HOV
3-4P	7510	3255	3275	980
4-5P	7890	3390	3410	1090
5-6P	8725	3655	3745	1325
6-7P	8100	3370	3690	1040

	HOV	Exp.	Local	NB Tot
3-4P	1845	5605	4210	11660
4-5P	1705	6925	4160	12790
5-6P	1725	6990	4080	12795
6-7P	1710	6890	3530	12130

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	
370	1325	430	565	940	245	805	305	180	665	3-4P
390	1365	420	555	940	420	855	315	285	685	4-5P
390	1300	340	585	1155	320	710	340	335	645	5-6P
315	1365	350	335	895	175	610	330	120	660	6-7P

Exit 4/Park Potomac Ave						
	R 11	R 12	R 13	R 14	R 15	Park Exit
3-4P	205	65	160	110	10	170
4-5P	205	70	155	100	15	190
5-6P	280	95	200	135	10	205
6-7P	230	80	165	150	15	200

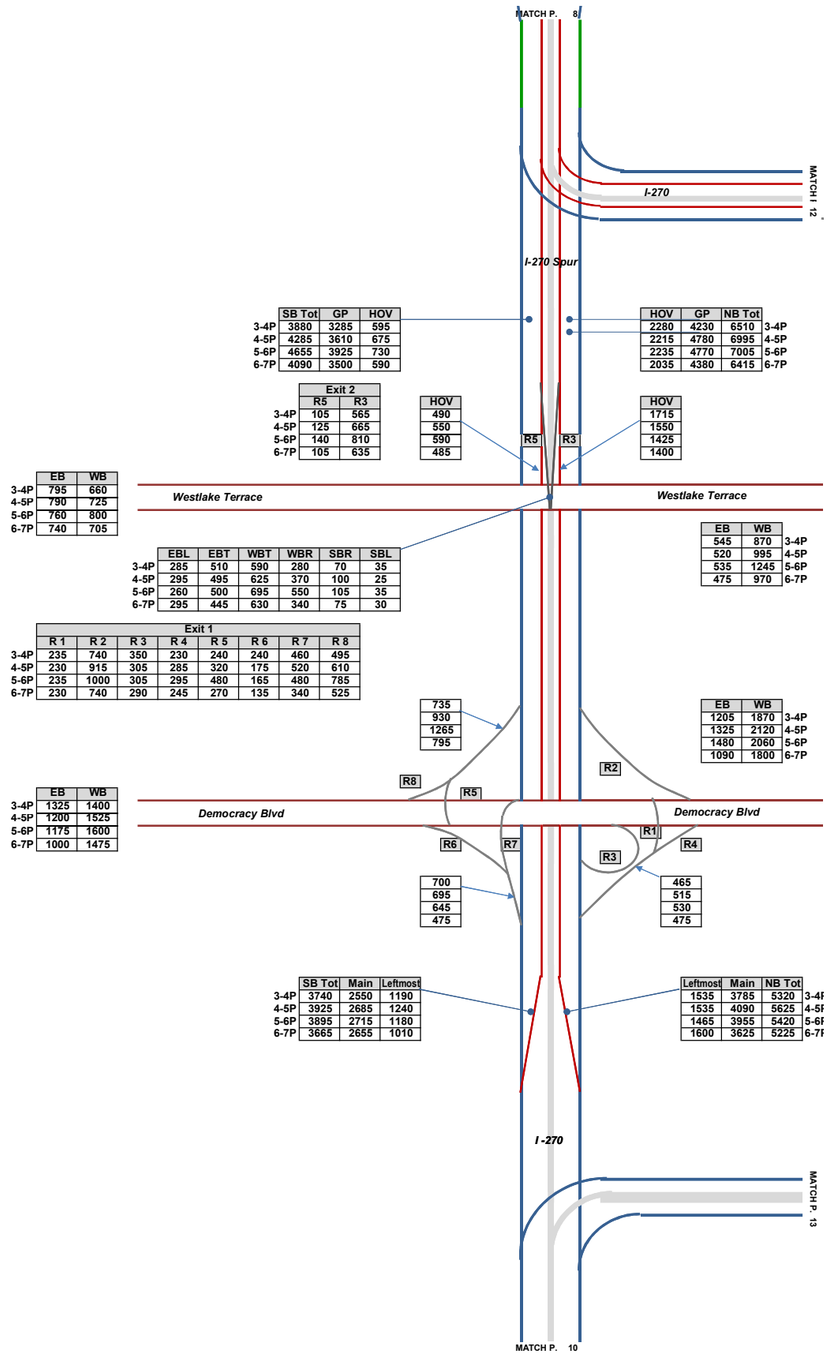
	EB	WB
3-4P	1195	1380
4-5P	1360	1445
5-6P	1120	1950
6-7P	1160	1430

	EB	WB
3-4P	2125	2825
4-5P	2100	2925
5-6P	2325	3225
6-7P	2000	2725

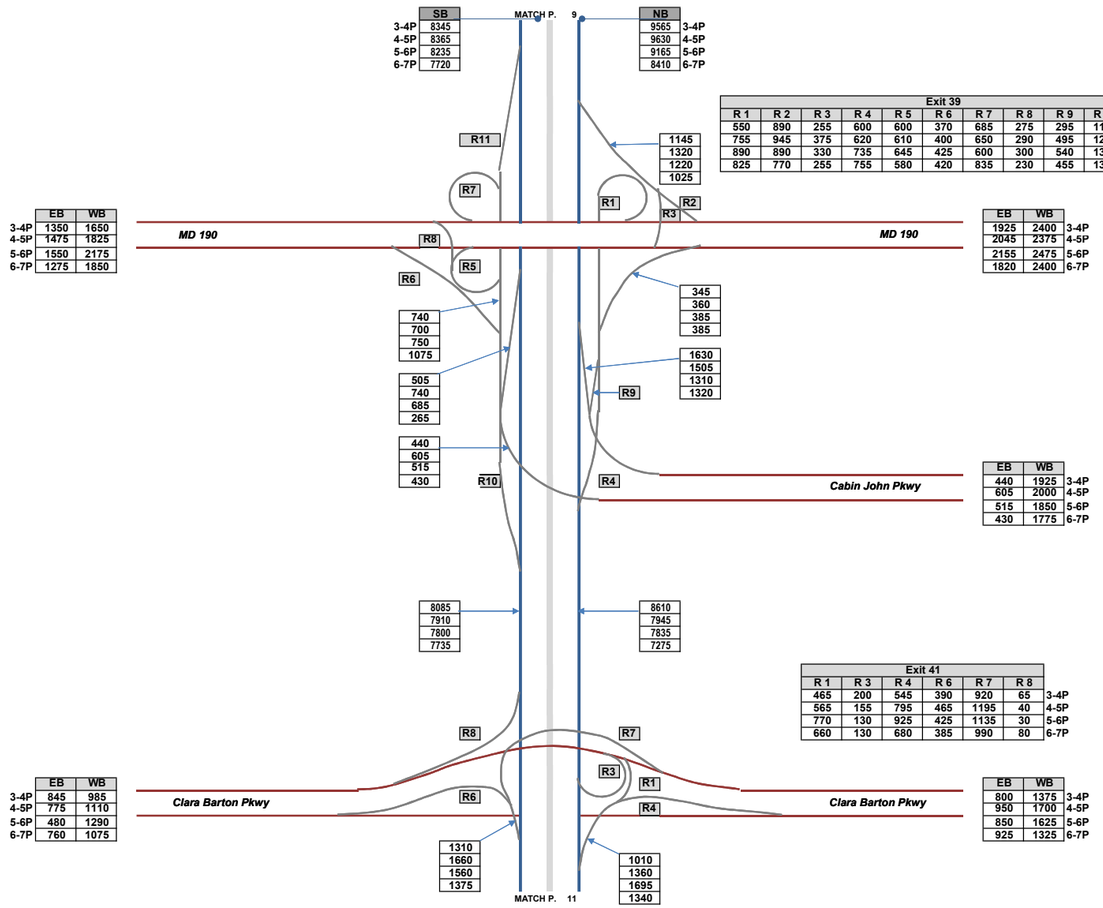
	SB Tot	Local	Exp.	HOV
3-4P	7455	2080	4010	1365
4-5P	8045	2465	4125	1455
5-6P	8445	2140	4685	1620
6-7P	7810	2005	4385	1420

	HOV	Exp.	Local	NB Tot
3-4P	1645	5805	4075	11525
4-5P	1655	6975	3920	12550
5-6P	1645	7070	3925	12640
6-7P	1755	6845	3205	11805

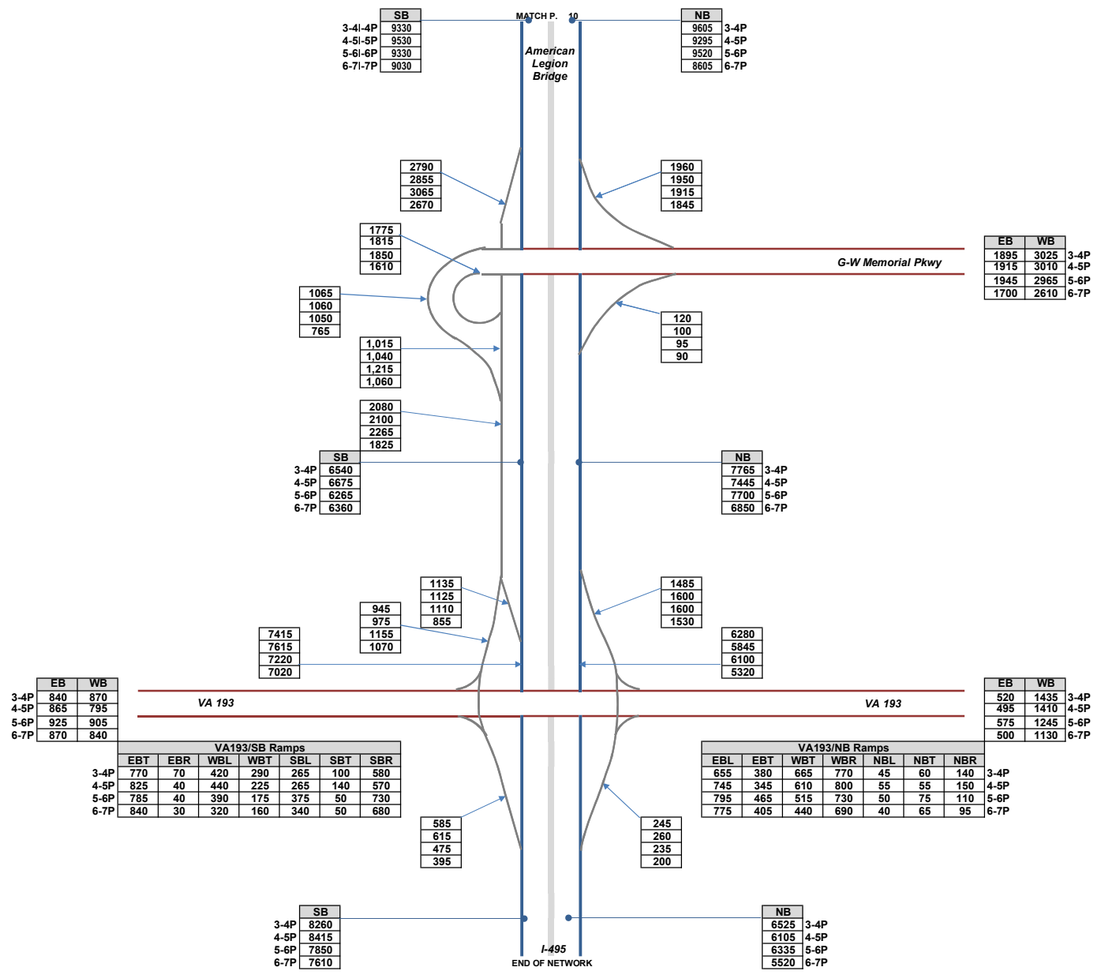
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



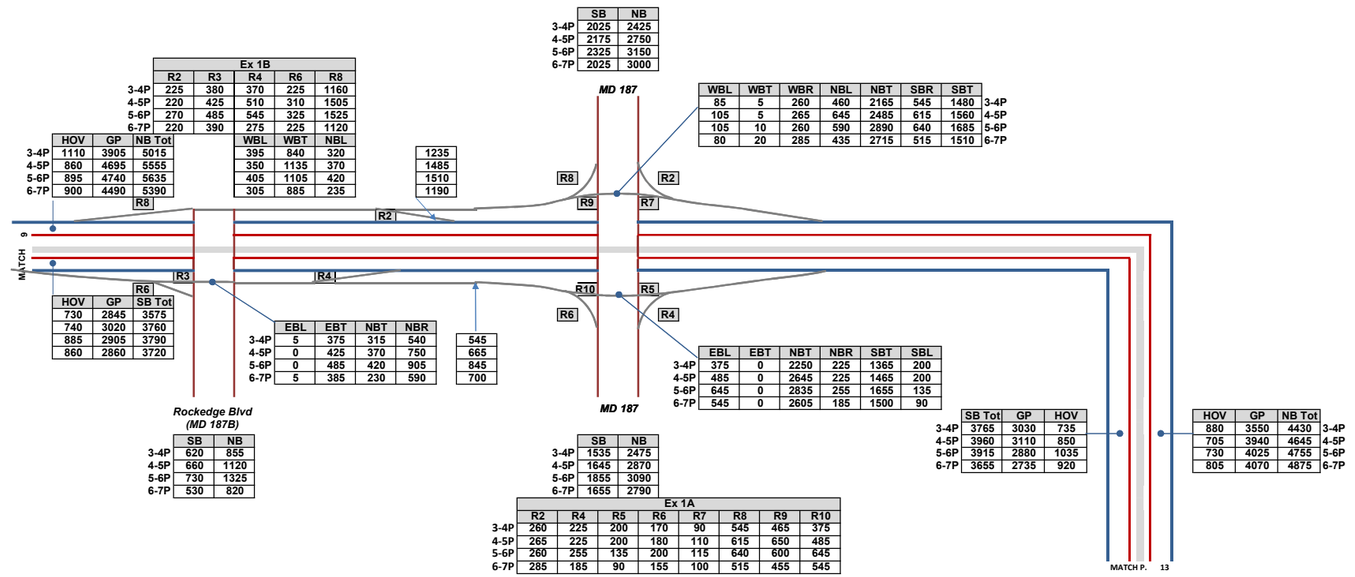
I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



	SB	NB
3-4P	2025	2425
4-5P	2175	2750
5-6P	2325	3150
6-7P	2025	3000

	WBL	WBT	WBR	NBL	NBT	SBR	SBT	
3-4P	85	5	260	460	2165	545	1480	3-4P
4-5P	105	5	265	645	2485	615	1560	4-5P
5-6P	105	10	260	590	2890	640	1685	5-6P
6-7P	80	20	285	435	2715	515	1510	6-7P

	Ex 1B				
	R2	R3	R4	R6	R8
3-4P	225	380	370	225	1160
4-5P	220	425	510	310	1505
5-6P	270	485	545	325	1525
6-7P	220	390	275	225	1120

	HOV	GP	NB Tot
3-4P	1110	3905	5015
4-5P	860	4695	5555
5-6P	895	4740	5635
6-7P	900	4490	5390

	WBL	WBT	NBL
3-4P	395	840	320
4-5P	350	1135	370
5-6P	405	1105	420
6-7P	305	885	235

1235
1485
1510
1190

	HOV	GP	SB Tot
3-4P	730	2845	3575
4-5P	740	3020	3760
5-6P	885	2905	3790
6-7P	860	2860	3720

	EBL	EBT	NBT	NBR
3-4P	5	375	315	540
4-5P	0	425	370	750
5-6P	0	485	420	905
6-7P	5	385	230	590

545
665
845
700

	EBL	EBT	NBT	NBR	SBT	SBL
3-4P	375	0	2250	225	1365	200
4-5P	485	0	2645	225	1465	200
5-6P	645	0	2835	255	1655	135
6-7P	545	0	2605	185	1500	90

	SB	NB
3-4P	620	855
4-5P	660	1120
5-6P	730	1325
6-7P	530	820

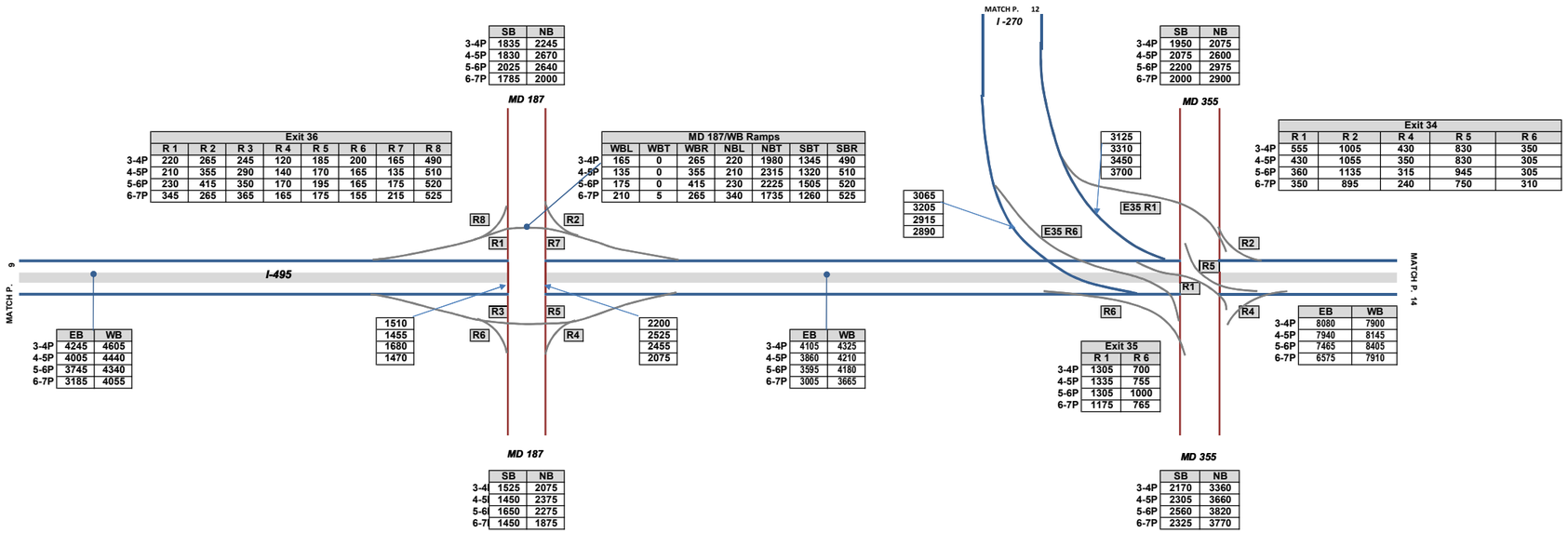
	SB	NB
3-4P	1535	2475
4-5P	1645	2870
5-6P	1855	3090
6-7P	1655	2790

	Ex 1A							
	R2	R4	R5	R6	R7	R8	R9	R10
3-4P	260	225	200	170	90	545	465	375
4-5P	265	225	200	180	110	615	650	485
5-6P	260	255	135	200	115	640	600	645
6-7P	285	185	90	155	100	515	455	545

	SB Tot	GP	HOV
3-4P	3765	3030	735
4-5P	3960	3110	850
5-6P	3915	2880	1035
6-7P	3655	2735	920

	HOV	GP	NB Tot	
3-4P	880	3550	4430	3-4P
4-5P	705	3940	4645	4-5P
5-6P	730	4025	4755	5-6P
6-7P	805	4070	4875	6-7P

I-270 & I-495 West Side PM
Future No Build Peak Period Volumes



	SB	NB
3-4P	1835	2245
4-5P	1830	2670
5-6P	2025	2640
6-7P	1785	2000

Exit 36							
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
3-4P	220	265	245	120	185	200	165	490
4-5P	210	355	290	140	170	165	135	510
5-6P	230	415	350	170	195	165	175	520
6-7P	345	265	365	165	175	155	215	525

MD 187/WB Ramps							
	WBL	WBT	WBR	NBL	NBT	SBT	SBR
3-4P	165	0	265	220	1980	1345	490
4-5P	135	0	355	210	2315	1320	510
5-6P	175	0	415	230	2225	1505	520
6-7P	210	5	265	340	1735	1260	525

	SB	NB
3-4P	1950	2075
4-5P	2075	2600
5-6P	2200	2975
6-7P	2000	2900

Exit 34					
	R 1	R 2	R 4	R 5	R 6
3-4P	555	1005	430	830	350
4-5P	430	1055	350	830	305
5-6P	360	1135	315	945	305
6-7P	350	895	240	750	310

	EB	WB
3-4P	4245	4605
4-5P	4005	4440
5-6P	3745	4340
6-7P	3185	4055

	EB	WB
3-4P	4105	4325
4-5P	3860	4210
5-6P	3595	4180
6-7P	3005	3665

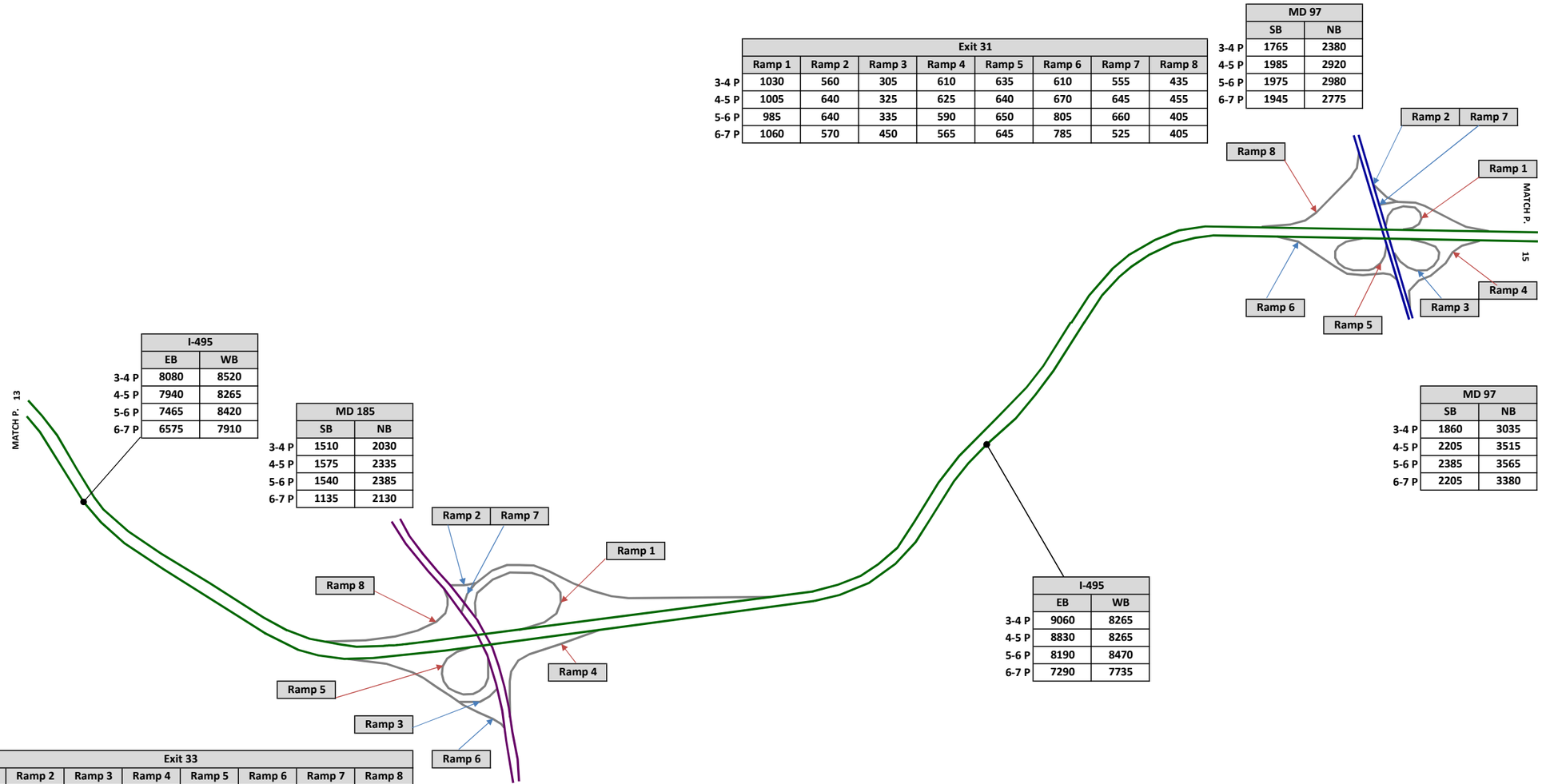
Exit 35		
	R 1	R 6
3-4P	1305	700
4-5P	1335	755
5-6P	1305	1000
6-7P	1175	765

	EB	WB
3-4P	8080	7900
4-5P	7940	8145
5-6P	7465	8405
6-7P	6575	7910

	SB	NB
3-4P	1525	2075
4-5P	1450	2375
5-6P	1650	2275
6-7P	1450	1875

	SB	NB
3-4P	2170	3360
4-5P	2305	3660
5-6P	2560	3820
6-7P	2325	3770

I-495 North Side PM
Future No Build Peak Period Volumes



	Exit 31							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4 P	1030	560	305	610	635	610	555	435
4-5 P	1005	640	325	625	640	670	645	455
5-6 P	985	640	335	590	650	805	660	405
6-7 P	1060	570	450	565	645	785	525	405

	MD 97	
	SB	NB
3-4 P	1765	2380
4-5 P	1985	2920
5-6 P	1975	2980
6-7 P	1945	2775

	I-495	
	EB	WB
3-4 P	8080	8520
4-5 P	7940	8265
5-6 P	7465	8420
6-7 P	6575	7910

	MD 185	
	SB	NB
3-4 P	1510	2030
4-5 P	1575	2335
5-6 P	1540	2385
6-7 P	1135	2130

	MD 97	
	SB	NB
3-4 P	1860	3035
4-5 P	2205	3515
5-6 P	2385	3565
6-7 P	2205	3380

	I-495	
	EB	WB
3-4 P	9060	8265
4-5 P	8830	8265
5-6 P	8190	8470
6-7 P	7290	7735

	Exit 33							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4 P	945	370	325	1520	360	575	775	455
4-5 P	870	430	360	1540	315	605	845	405
5-6 P	890	450	475	1615	280	695	825	335
6-7 P	860	280	505	1590	215	585	785	380

	MD 185	
	SB	NB
3-4 P	2045	3800
4-5 P	2305	3955
5-6 P	2445	3965
6-7 P	1910	3795

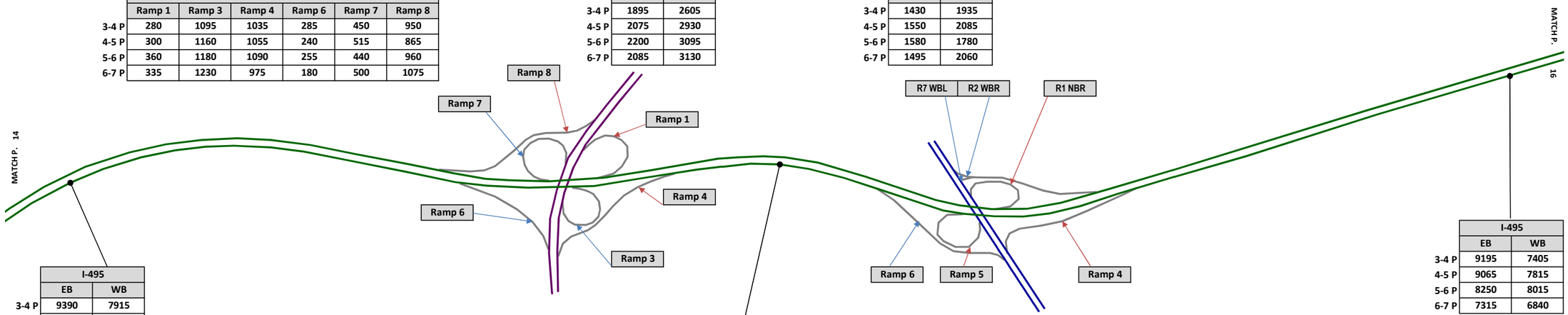
I-495 North Side PM
Future No Build Peak Period Volumes

	Exit 29					
	Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
3-4 P	465	485	600	470	845	250
4-5 P	655	715	675	495	810	315
5-6 P	695	760	605	480	755	450
6-7 P	660	650	505	510	530	395

	Exit 30					
	Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
3-4 P	280	1095	1035	285	450	950
4-5 P	300	1160	1055	240	515	865
5-6 P	360	1180	1090	255	440	960
6-7 P	335	1230	975	180	500	1075

	US 29	
	SB	NB
3-4 P	1895	2605
4-5 P	2075	2930
5-6 P	2200	3095
6-7 P	2085	3130

	MD 193	
	SB	NB
3-4 P	1430	1935
4-5 P	1550	2085
5-6 P	1580	1780
6-7 P	1495	2060



	I-495	
	EB	WB
3-4 P	9390	7915
4-5 P	9100	8090
5-6 P	8290	8380
6-7 P	7265	7365

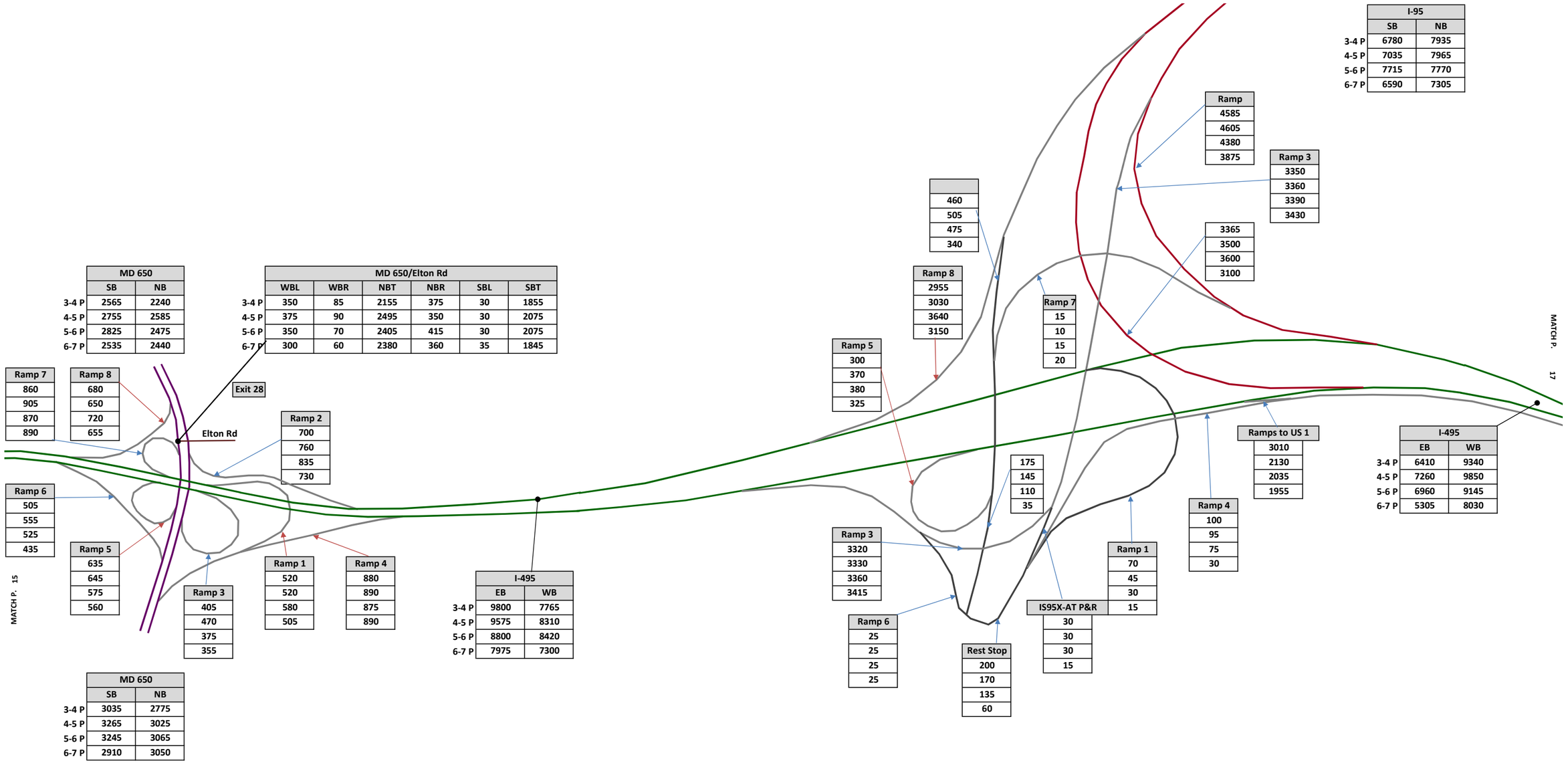
	US 29	
	SB	NB
3-4 P	1830	2775
4-5 P	1965	3125
5-6 P	1935	3365
6-7 P	1690	3210

	I-495	
	EB	WB
3-4 P	8995	7135
4-5 P	8755	7440
5-6 P	7945	7500
6-7 P	6830	6455

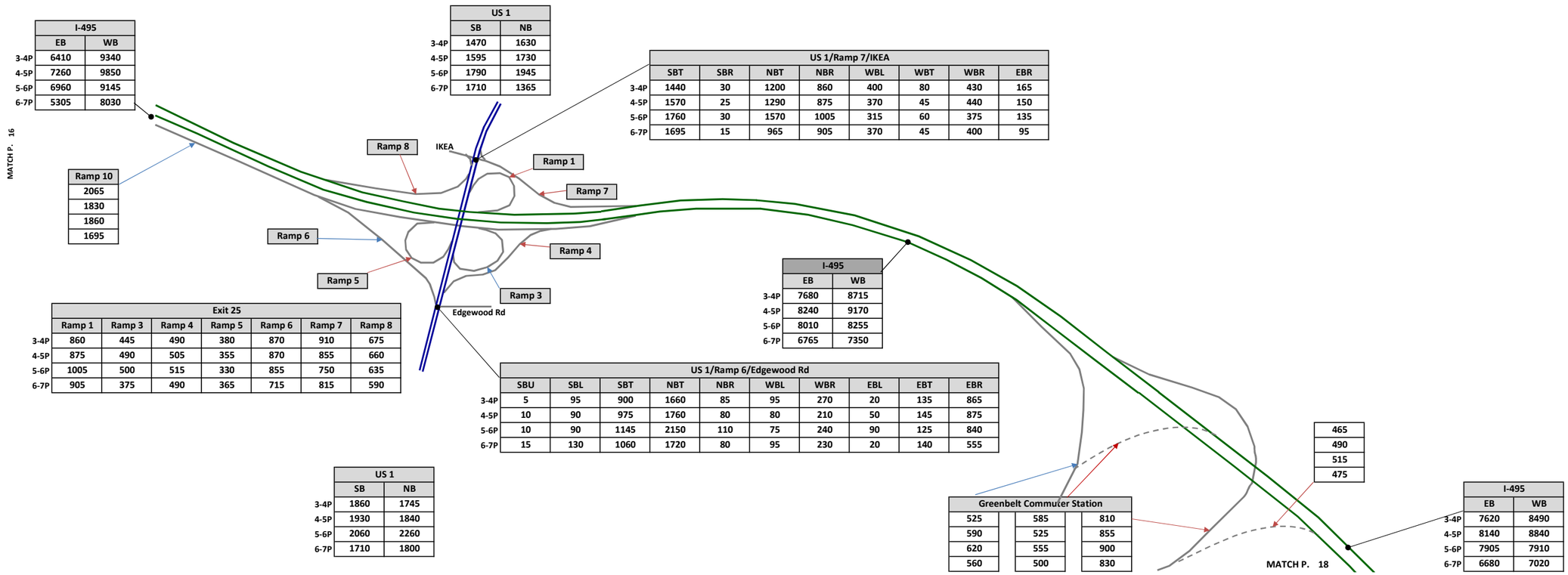
	MD 193	
	SB	NB
3-4 P	2155	2390
4-5 P	2230	2650
5-6 P	2305	2295
6-7 P	1910	2575

	I-495	
	EB	WB
3-4 P	9195	7405
4-5 P	9065	7815
5-6 P	8250	8015
6-7 P	7315	6840

I-495 North Side PM
Future No Build Peak Period Volumes



I-495 Northeast Side PM
Future No Build Peak Period Volumes



I-495		
	EB	WB
3-4P	6410	9340
4-5P	7260	9850
5-6P	6960	9145
6-7P	5305	8030

US 1		
	SB	NB
3-4P	1470	1630
4-5P	1595	1730
5-6P	1790	1945
6-7P	1710	1365

US 1/Ramp 7/IKEA								
	SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
3-4P	1440	30	1200	860	400	80	430	165
4-5P	1570	25	1290	875	370	45	440	150
5-6P	1760	30	1570	1005	315	60	375	135
6-7P	1695	15	965	905	370	45	400	95

Ramp 10
2065
1830
1860
1695

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
860	445	490	380	870	910	675
875	490	505	355	870	855	660
1005	500	515	330	855	750	635
905	375	490	365	715	815	590

I-495		
	EB	WB
3-4P	7680	8715
4-5P	8240	9170
5-6P	8010	8255
6-7P	6765	7350

US 1/Ramp 6/Edgewood Rd									
	SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
3-4P	5	95	900	1660	85	95	270	20	135	865
4-5P	10	90	975	1760	80	80	210	50	145	875
5-6P	10	90	1145	2150	110	75	240	90	125	840
6-7P	15	130	1060	1720	80	95	230	20	140	555

US 1		
	SB	NB
3-4P	1860	1745
4-5P	1930	1840
5-6P	2060	2260
6-7P	1710	1800

Greenbelt Commuter Station		
525	585	810
590	525	855
620	555	900
560	500	830

465
490
515
475

I-495		
	EB	WB
3-4P	7620	8490
4-5P	8140	8840
5-6P	7905	7910
6-7P	6680	7020

I-495 Northeast Side PM
Future No Build Peak Period Volumes

MATCH P. 17

	MD 201	
	SB	NB
3-4P	1380	1390
4-5P	1735	1435
5-6P	1975	1610
6-7P	1720	1230

	MD 201/Ramp 2			
	SBT	NBT	WBL	WBR
3-4P	1165	995	580	395
4-5P	1515	1140	595	295
5-6P	1675	1260	455	350
6-7P	1460	860	480	370

	Exit 23						
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
3-4P	865	975	415	745	650	1020	215
4-5P	935	890	400	780	710	1055	220
5-6P	925	805	350	710	710	1075	300
6-7P	960	850	260	655	695	960	260

	I-495	
	EB	WB
3-4P	7580	8590
4-5P	8175	9155
5-6P	7900	8295
6-7P	6810	6680

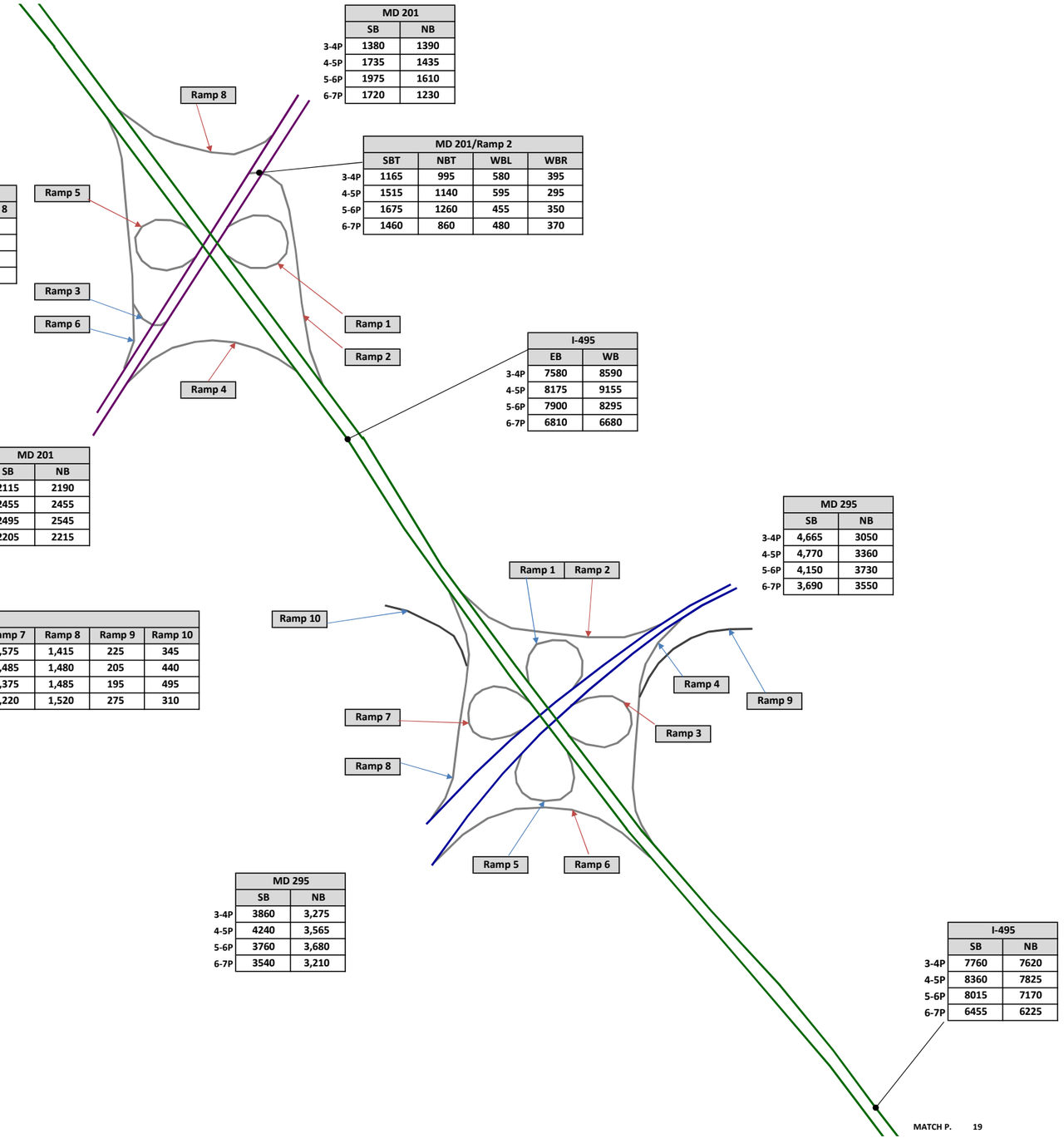
	MD 201	
	SB	NB
3-4P	2115	2190
4-5P	2455	2455
5-6P	2495	2545
6-7P	2205	2215

	MD 295	
	SB	NB
3-4P	4,665	3050
4-5P	4,770	3360
5-6P	4,150	3730
6-7P	3,690	3550

	Exit 22									
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
3-4P	55	700	1,530	980	365	40	1,575	1,415	225	345
4-5P	40	765	1,785	975	290	30	1,485	1,480	205	440
5-6P	35	775	1,550	970	295	25	1,375	1,485	195	495
6-7P	45	595	1,305	1,125	395	30	1,220	1,520	275	310

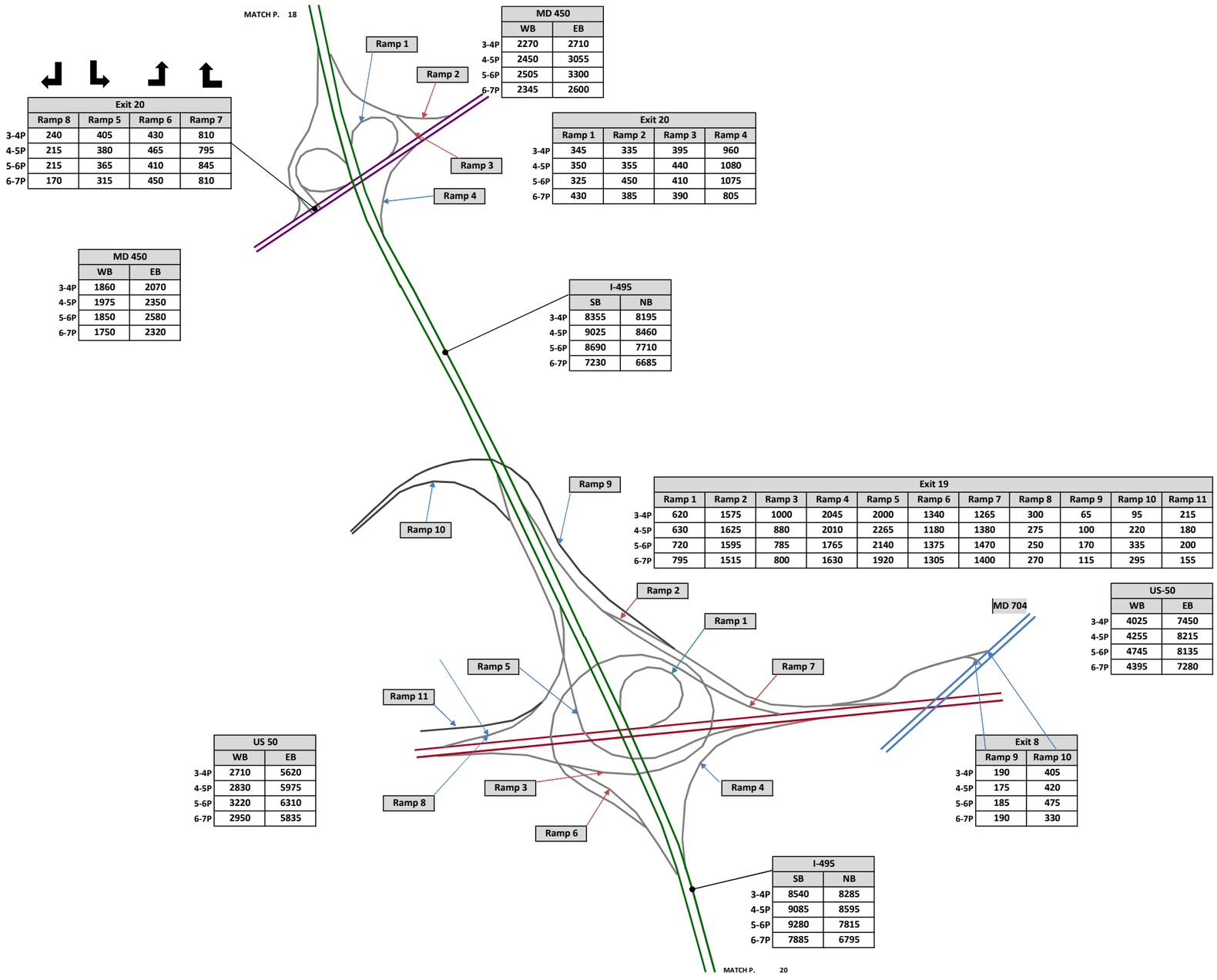
	MD 295	
	SB	NB
3-4P	3860	3,275
4-5P	4240	3,565
5-6P	3760	3,680
6-7P	3540	3,210

	I-495	
	SB	NB
3-4P	7760	7620
4-5P	8360	7825
5-6P	8015	7170
6-7P	6455	6225



MATCH P. 19

I-495 Northeast Side PM
Future No Build Peak Period Volumes



Exit 20				
	Ramp 8	Ramp 5	Ramp 6	Ramp 7
3-4P	240	405	430	810
4-5P	215	380	465	795
5-6P	215	365	410	845
6-7P	170	315	450	810

MD 450		
	WB	EB
3-4P	2270	2710
4-5P	2450	3055
5-6P	2505	3300
6-7P	2345	2600

Exit 20				
	Ramp 1	Ramp 2	Ramp 3	Ramp 4
3-4P	345	335	395	960
4-5P	350	355	440	1080
5-6P	325	450	410	1075
6-7P	430	385	390	805

MD 450		
	WB	EB
3-4P	1860	2070
4-5P	1975	2350
5-6P	1850	2580
6-7P	1750	2320

I-495		
	SB	NB
3-4P	8355	8195
4-5P	9025	8460
5-6P	8690	7710
6-7P	7230	6685

Exit 19											
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
3-4P	620	1575	1000	2045	2000	1340	1265	300	65	95	215
4-5P	630	1625	880	2010	2265	1180	1380	275	100	220	180
5-6P	720	1595	785	1765	2140	1375	1470	250	170	335	200
6-7P	795	1515	800	1630	1920	1305	1400	270	115	295	155

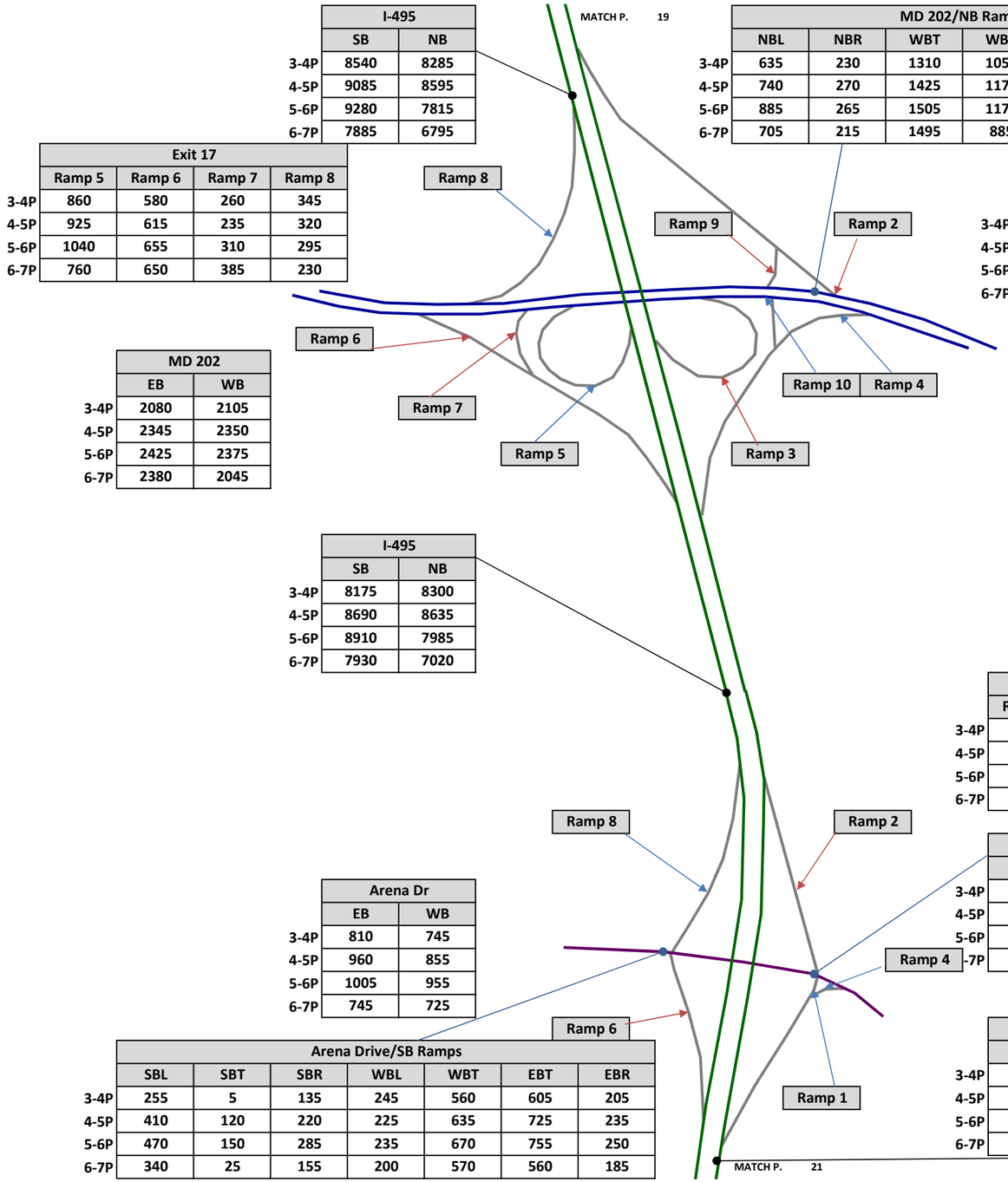
US-50		
	WB	EB
3-4P	4025	7450
4-5P	4255	8215
5-6P	4745	8135
6-7P	4395	7280

US 50		
	WB	EB
3-4P	2710	5620
4-5P	2830	5975
5-6P	3220	6310
6-7P	2950	5835

Exit 8		
	Ramp 9	Ramp 10
3-4P	190	405
4-5P	175	420
5-6P	185	475
6-7P	190	330

I-495		
	SB	NB
3-4P	8540	8285
4-5P	9085	8595
5-6P	9280	7815
6-7P	7885	6795

I-495 East Side PM
Future No Build Peak Period Volumes



I-495		
	SB	NB
3-4P	8540	8285
4-5P	9085	8595
5-6P	9280	7815
6-7P	7885	6795

MD 202/NB Ramps						
	NBL	NBR	WBT	WBR	EBL	EBT
3-4P	635	230	1310	1055	15	2205
4-5P	740	270	1425	1175	10	2540
5-6P	885	265	1505	1175	20	2635
6-7P	705	215	1495	885	15	2325

Exit 17				
	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	860	580	260	345
4-5P	925	615	235	320
5-6P	1040	655	310	295
6-7P	760	650	385	230

Exit 17					
	Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
3-4P	1055	240	235	15	865
4-5P	1175	205	230	10	1010
5-6P	1175	155	225	20	1150
6-7P	885	150	215	15	920

MD 202		
	EB	WB
3-4P	2080	2105
4-5P	2345	2350
5-6P	2425	2375
6-7P	2380	2045

MD 202		
	SB	NB
3-4P	2440	2365
4-5P	2770	2600
5-6P	2860	2680
6-7P	2540	2380

I-495		
	SB	NB
3-4P	8175	8300
4-5P	8690	8635
5-6P	8910	7985
6-7P	7930	7020

Exit 16					
	Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
3-4P	150	455	255	455	395
4-5P	165	475	260	580	750
5-6P	170	445	295	635	905
6-7P	170	405	235	410	520

Arena Drive/SB Ramps							
	NBL	NBT	NBR	WBT	WBR	EBL	EBT
3-4P	150	0	255	655	230	225	685
4-5P	165	0	260	695	225	250	885
5-6P	160	10	295	745	205	230	995
6-7P	165	5	235	605	165	235	665

Arena Dr		
	EB	WB
3-4P	810	745
4-5P	960	855
5-6P	1005	955
6-7P	745	725

Arena Drive/SB Ramps							
	SBL	SBT	SBR	WBL	WBT	EBT	EBR
3-4P	255	5	135	245	560	605	205
4-5P	410	120	220	225	635	725	235
5-6P	470	150	285	235	670	755	250
6-7P	340	25	155	200	570	560	185

Arena Dr		
	EB	WB
3-4P	940	885
4-5P	1145	920
5-6P	1290	950
6-7P	900	770

I-495		
	SB	NB
3-4P	8235	8250
4-5P	8520	8585
5-6P	8640	8005
6-7P	7820	7020

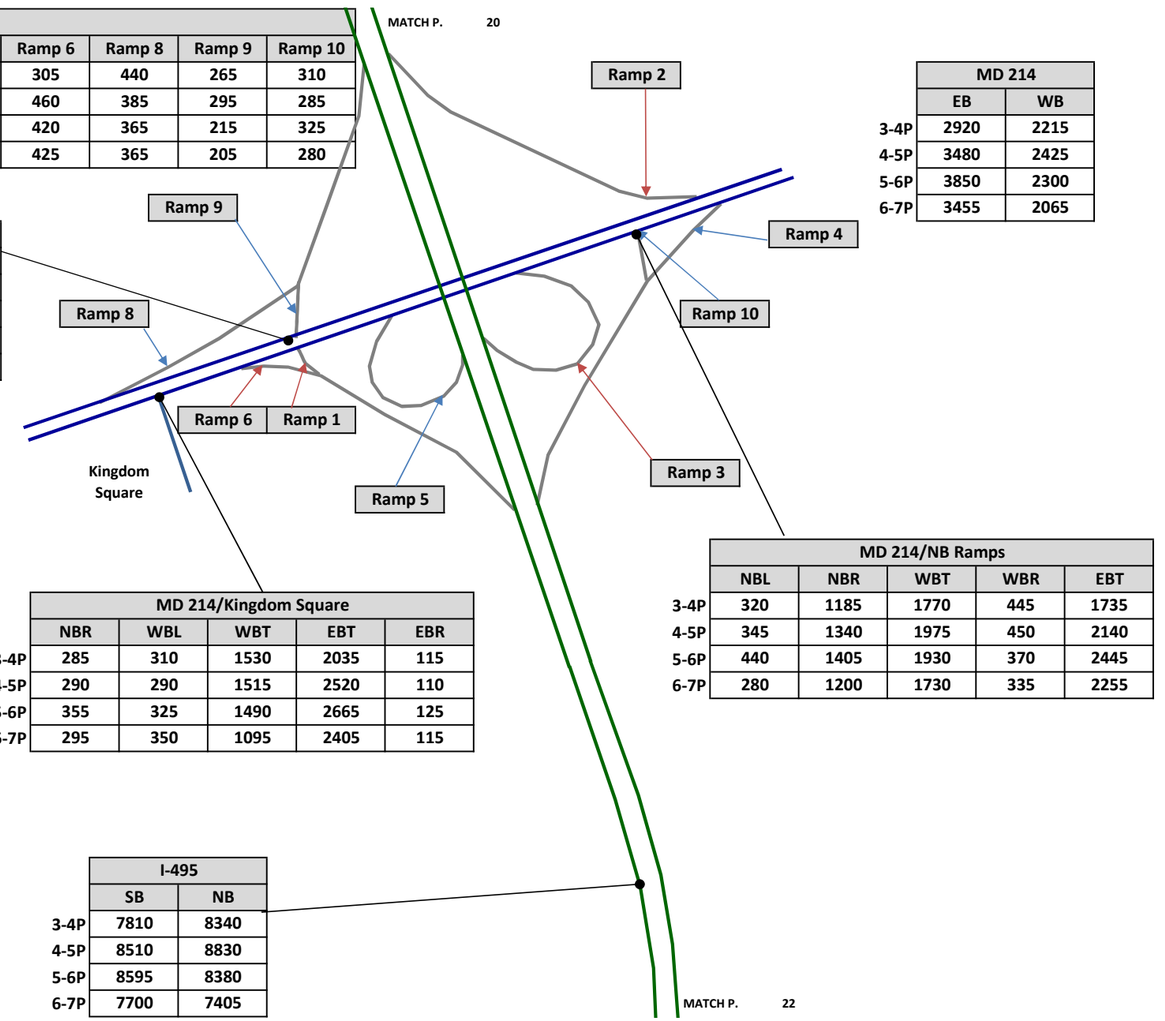
I-495 East Side PM
Future No Build Peak Period Volumes

	Exit 15								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
3-4P	515	445	820	1045	540	305	440	265	310
4-5P	810	450	810	1220	600	460	385	295	285
5-6P	770	370	810	1230	655	420	365	215	325
6-7P	770	335	765	1165	745	425	365	205	280

	MD 214/SB Ramps				
	SBR	WBL	WBT	EBT	EBR
3-4P	265	515	1575	2015	305
4-5P	295	810	1510	2350	460
5-6P	215	770	1600	2600	420
6-7P	205	770	1240	2275	425

	MD 214	
	EB	WB
3-4P	2150	1970
4-5P	2630	1900
5-6P	2790	1855
6-7P	2520	1460

	MD 214	
	EB	WB
3-4P	2920	2215
4-5P	3480	2425
5-6P	3850	2300
6-7P	3455	2065

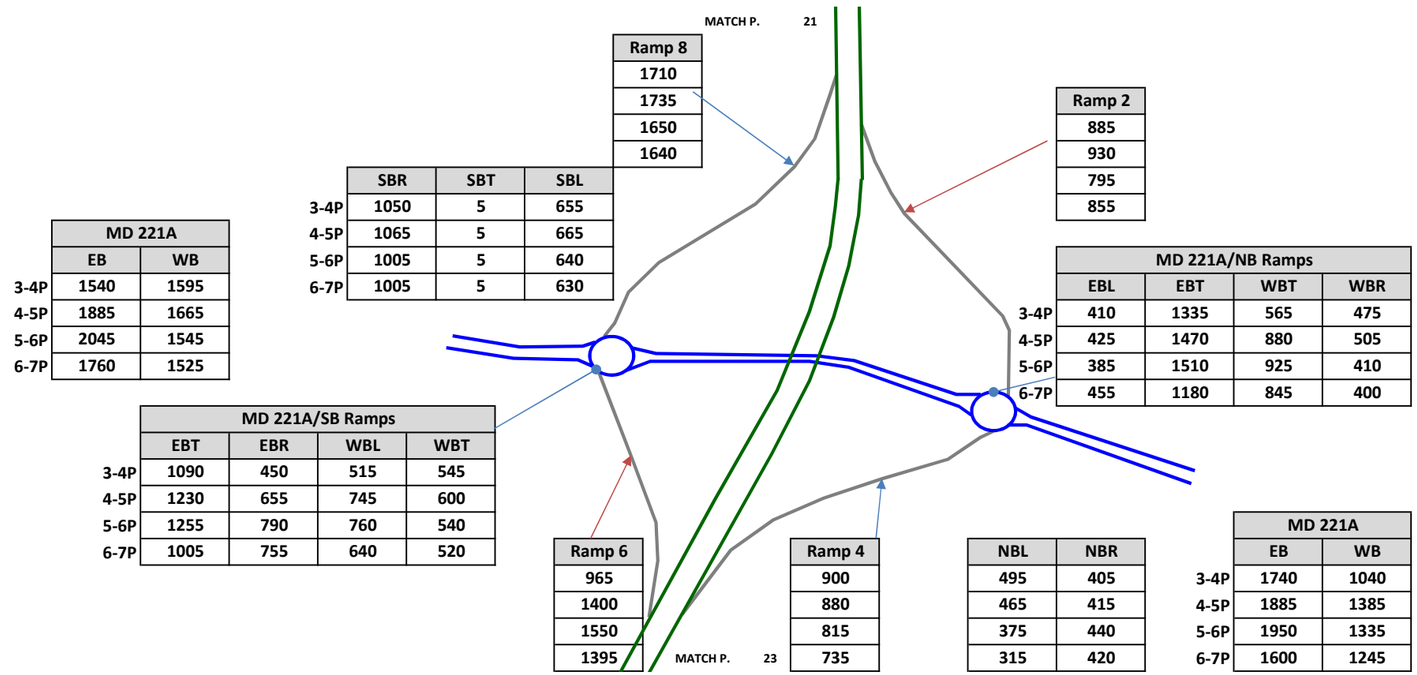


	MD 214/Kingdom Square				
	NBR	WBL	WBT	EBT	EBR
3-4P	285	310	1530	2035	115
4-5P	290	290	1515	2520	110
5-6P	355	325	1490	2665	125
6-7P	295	350	1095	2405	115

	MD 214/NB Ramps				
	NBL	NBR	WBT	WBR	EBT
3-4P	320	1185	1770	445	1735
4-5P	345	1340	1975	450	2140
5-6P	440	1405	1930	370	2445
6-7P	280	1200	1730	335	2255

	I-495	
	SB	NB
3-4P	7810	8340
4-5P	8510	8830
5-6P	8595	8380
6-7P	7700	7405

I-495 East Side PM
Future No Build Peak Period Volumes



	MD 221A	
	EB	WB
3-4P	1540	1595
4-5P	1885	1665
5-6P	2045	1545
6-7P	1760	1525

	Ramp 8
3-4P	1710
4-5P	1735
5-6P	1650
6-7P	1640

	SBR	SBT	SBL
3-4P	1050	5	655
4-5P	1065	5	665
5-6P	1005	5	640
6-7P	1005	5	630

	Ramp 2
3-4P	885
4-5P	930
5-6P	795
6-7P	855

	MD 221A/NB Ramps			
	EBL	EBT	WBT	WBR
3-4P	410	1335	565	475
4-5P	425	1470	880	505
5-6P	385	1510	925	410
6-7P	455	1180	845	400

	MD 221A/SB Ramps			
	EBT	EBR	WBL	WBT
3-4P	1090	450	515	545
4-5P	1230	655	745	600
5-6P	1255	790	760	540
6-7P	1005	755	640	520

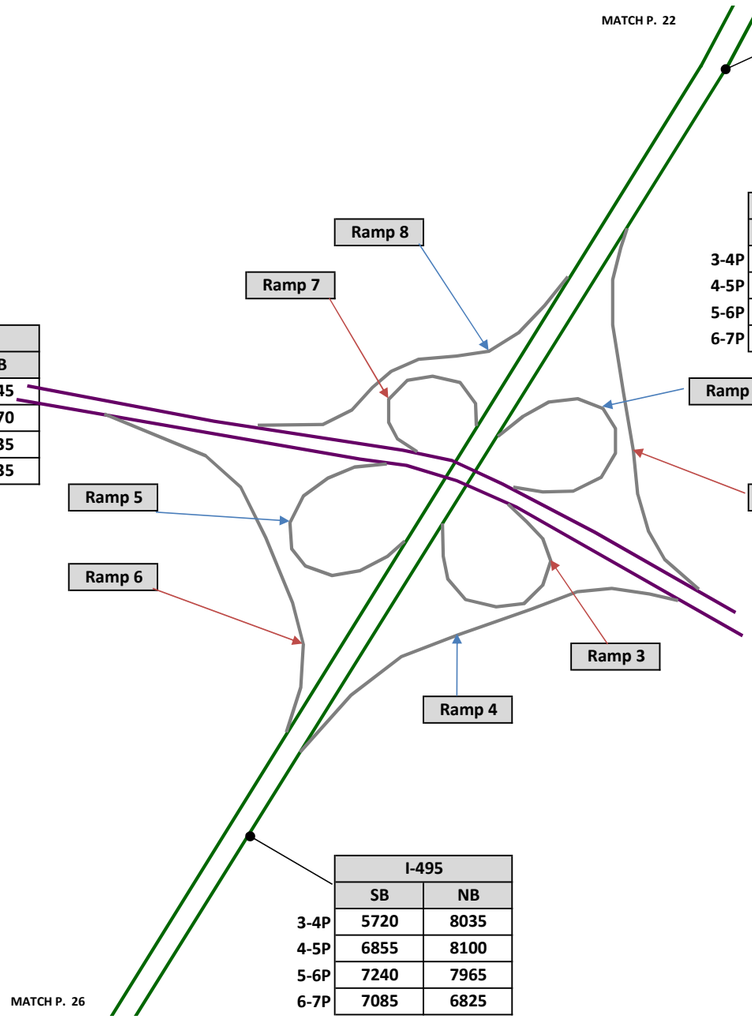
	Ramp 6
3-4P	965
4-5P	1400
5-6P	1550
6-7P	1395

	Ramp 4
3-4P	900
4-5P	880
5-6P	815
6-7P	735

	NBL	NBR
3-4P	495	405
4-5P	465	415
5-6P	375	440
6-7P	315	420

	MD 221A	
	EB	WB
3-4P	1740	1040
4-5P	1885	1385
5-6P	1950	1335
6-7P	1600	1245

I-495 East Side PM
Future No Build Peak Period Volumes



	I-495	
	SB	NB
3-4P	6315	8355
4-5P	7060	8780
5-6P	7700	8400
6-7P	7290	7285

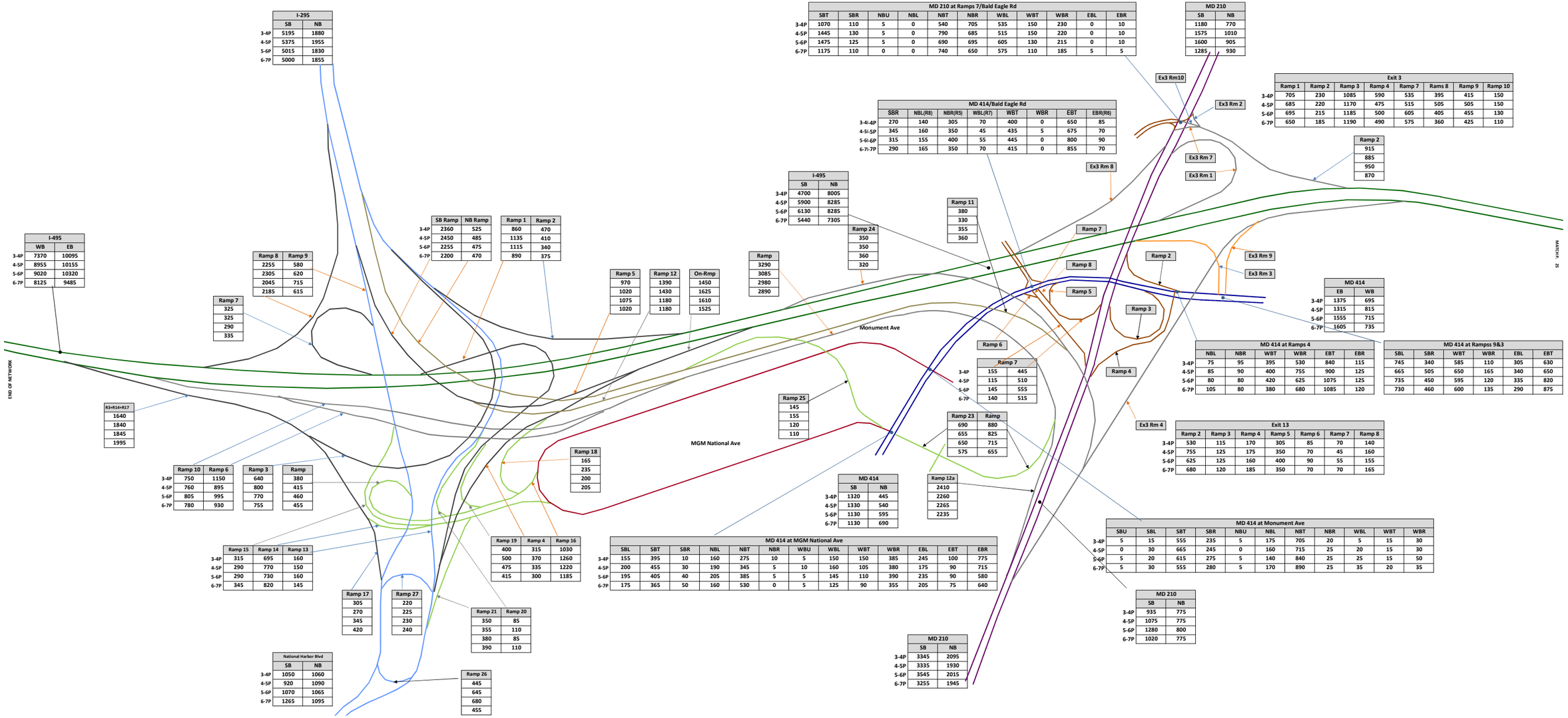
	Exit 11							
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
3-4P	690	1220	835	1045	1025	555	730	855
4-5P	610	1220	905	835	970	805	835	875
5-6P	690	1055	885	815	905	660	700	915
6-7P	725	955	960	730	805	845	670	915

	MD 4	
	SB	NB
3-4P	2350	1945
4-5P	2690	2070
5-6P	2740	2035
6-7P	2565	1835

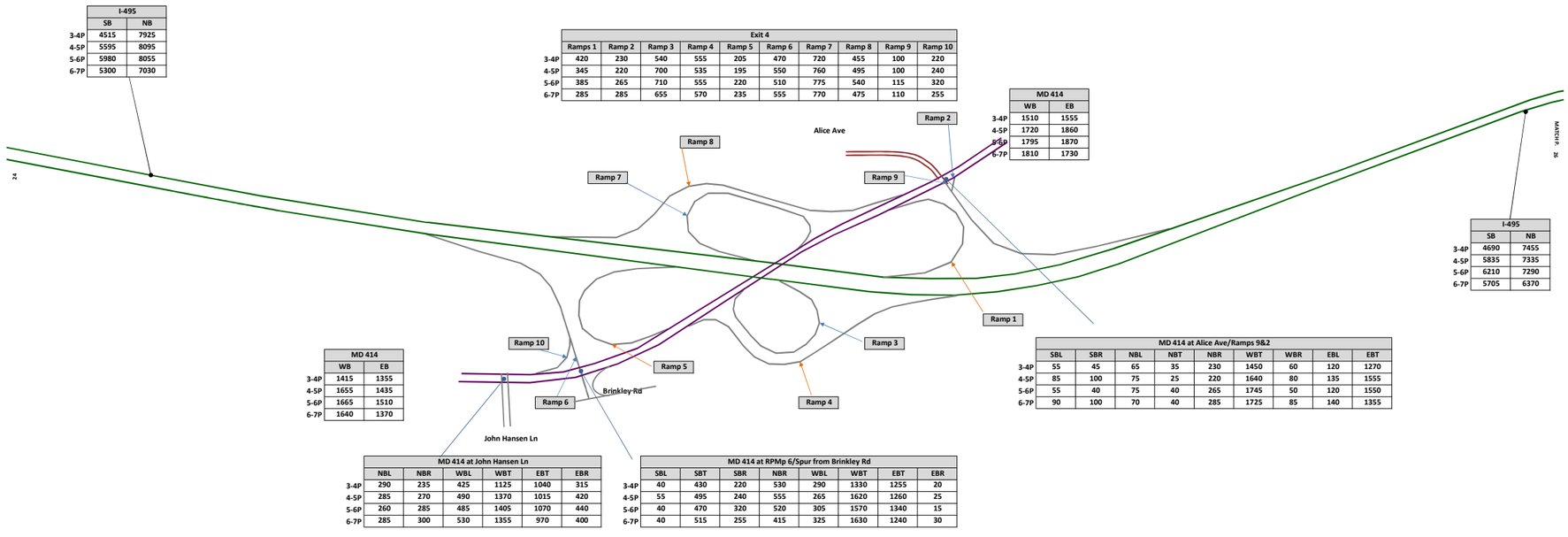
	MD 4	
	SB	NB
3-4P	3040	2295
4-5P	2800	2435
5-6P	2925	2080
6-7P	2295	1805

	I-495	
	SB	NB
3-4P	5720	8035
4-5P	6855	8100
5-6P	7240	7965
6-7P	7085	6825

I-495 South Side PM
Future No Build Peak Period Volumes



I-495 South Side PM
Future No Build Peak Period Volumes



I-495		
	SB	NB
3-4P	4515	7925
4-5P	5595	8095
5-6P	5980	8055
6-7P	5300	7030

Exit 4										
	Ramps 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
3-4P	420	230	540	555	205	470	720	455	100	220
4-5P	345	220	700	535	195	550	760	495	100	240
5-6P	385	265	710	555	220	510	775	540	115	320
6-7P	285	285	655	570	235	555	770	475	110	255

MD 414		
	WB	EB
3-4P	1510	1555
4-5P	1720	1860
5-6P	1795	1870
6-7P	1810	1730

I-495		
	SB	NB
3-4P	4690	7455
4-5P	5835	7335
5-6P	6210	7290
6-7P	5705	6370

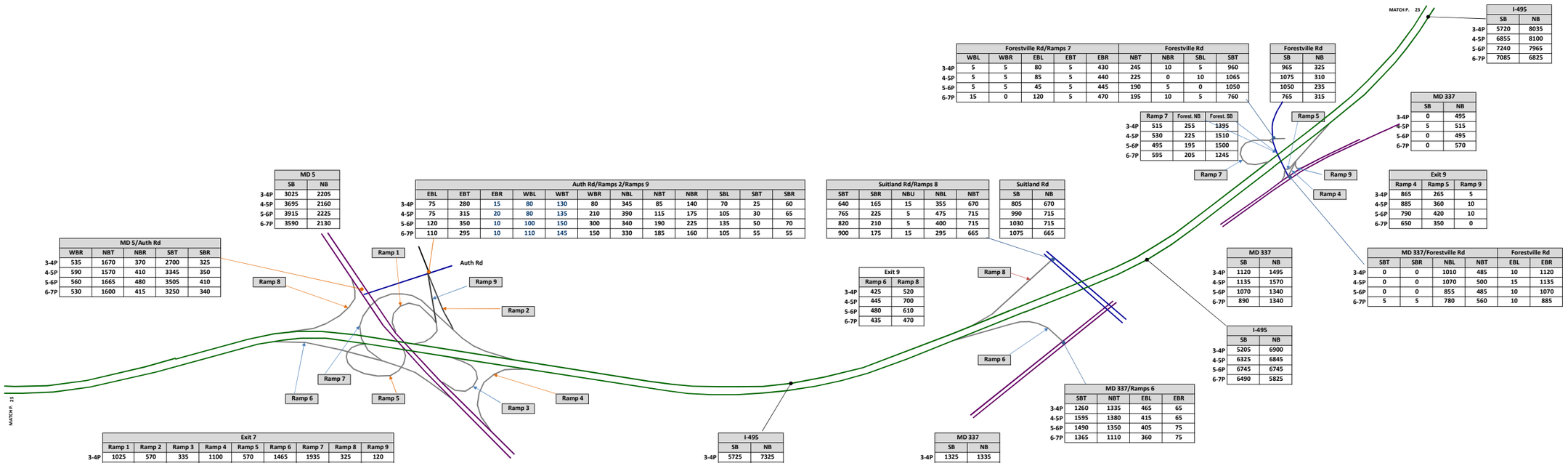
MD 414		
	WB	EB
3-4P	1415	1355
4-5P	1655	1435
5-6P	1665	1510
6-7P	1640	1370

MD 414 at Alice Ave/Ramps 9&2								
	SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
3-4P	55	45	65	35	230	1450	60	120	1270
4-5P	85	100	75	25	220	1640	80	135	1555
5-6P	55	40	75	40	265	1745	50	120	1550
6-7P	90	100	70	40	285	1725	85	140	1355

MD 414 at John Hansen Ln						
	NBL	NBR	WBL	WBT	EBT	EBR
3-4P	290	235	425	1125	1040	315
4-5P	285	270	490	1370	1015	420
5-6P	260	285	485	1405	1070	440
6-7P	285	300	530	1355	970	400

MD 414 at RPMp 6/Spur from Brinkley Rd								
	SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
3-4P	40	430	220	530	290	1330	1255	20
4-5P	55	495	240	555	265	1620	1260	25
5-6P	40	470	320	520	305	1570	1340	15
6-7P	40	515	255	415	325	1630	1240	30

I-495 South Side PM
Future No Build Peak Period Volumes



	Forestville Rd/Ramps 7					Forestville Rd			
	WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
3-4P	5	5	80	5	430	245	10	5	960
4-5P	5	5	85	5	440	225	0	10	1065
5-6P	5	5	45	5	445	190	5	0	1050
6-7P	15	0	120	5	470	195	10	5	760

	Forestville Rd	
	SB	NB
3-4P	965	325
4-5P	1075	310
5-6P	1050	235
6-7P	765	315

	I-495	
	SB	NB
3-4P	5720	8035
4-5P	6855	8100
5-6P	7240	7965
6-7P	7085	6825

	Ramp 7	Forest. NB	Forest. SB
3-4P	515	255	1395
4-5P	530	225	1510
5-6P	495	195	1500
6-7P	595	205	1245

	MD 337	
	SB	NB
3-4P	0	495
4-5P	5	515
5-6P	0	495
6-7P	0	570

	Exit 9		
	Ramp 4	Ramp 5	Ramp 9
3-4P	865	265	5
4-5P	885	360	10
5-6P	790	420	10
6-7P	650	350	0

	MD 337	
	SB	NB
3-4P	1120	1495
4-5P	1135	1570
5-6P	1070	1340
6-7P	890	1340

	MD 337/Forestville Rd				Forestville Rd	
	SBT	SBR	NBL	NBT	EBL	EBR
3-4P	0	0	1010	485	10	1120
4-5P	0	0	1070	500	15	1135
5-6P	0	0	855	485	10	1070
6-7P	5	5	780	560	10	885

	I-495	
	SB	NB
3-4P	5205	6900
4-5P	6325	6845
5-6P	6745	6745
6-7P	6490	5825

	MD 337/Ramps 6			
	SBT	NBT	EBL	EBR
3-4P	1260	1335	465	65
4-5P	1595	1380	415	65
5-6P	1490	1350	405	75
6-7P	1365	1110	360	75

	MD 337	
	SB	NB
3-4P	1325	1335
4-5P	1660	1380
5-6P	1565	1350
6-7P	1440	1110

	I-495	
	SB	NB
3-4P	5725	7325
4-5P	7025	7290
5-6P	7355	7225
6-7P	6960	6260

	Exit 9	
	Ramp 6	Ramp 8
3-4P	425	520
4-5P	445	700
5-6P	480	610
6-7P	435	470

	Suitland Rd/Ramps 8				
	SBT	SBR	NBU	NBL	NBT
3-4P	640	165	15	355	670
4-5P	765	225	5	475	715
5-6P	820	210	5	400	715
6-7P	900	175	15	295	665

	Suitland Rd	
	SB	NB
3-4P	805	670
4-5P	990	715
5-6P	1030	715
6-7P	1075	665

	Auth Rd/Ramps 2/Ramps 9											
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3-4P	75	280	15	80	130	80	345	85	140	70	25	60
4-5P	75	315	20	80	135	210	390	115	175	105	30	65
5-6P	120	350	10	100	150	300	340	190	225	135	50	70
6-7P	110	295	10	110	145	150	330	185	160	105	55	55

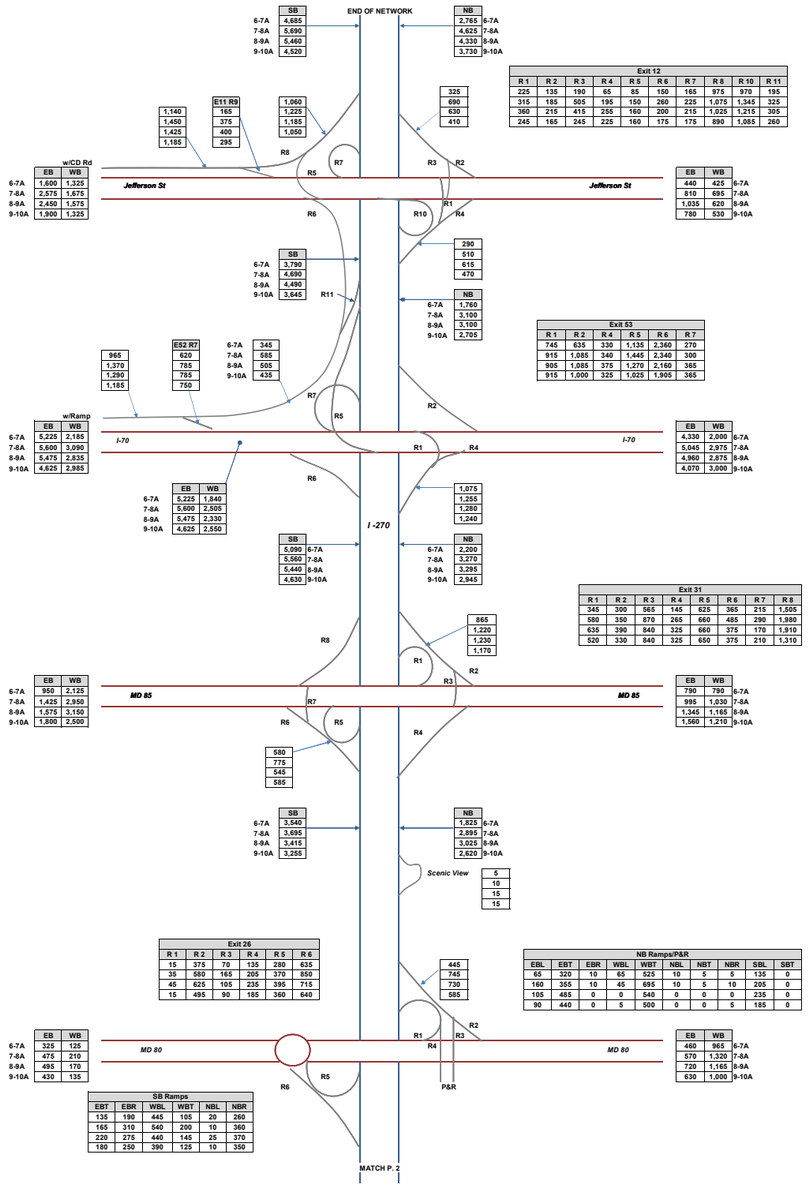
	MD 5	
	SB	NB
3-4P	3025	2205
4-5P	3695	2160
5-6P	3915	2225
6-7P	3590	2130

	MD 5/Auth Rd				
	WBR	NBT	NBR	SBT	SBR
3-4P	535	1670	370	2700	325
4-5P	590	1570	410	3345	350
5-6P	560	1665	480	3505	410
6-7P	530	1600	415	3250	340

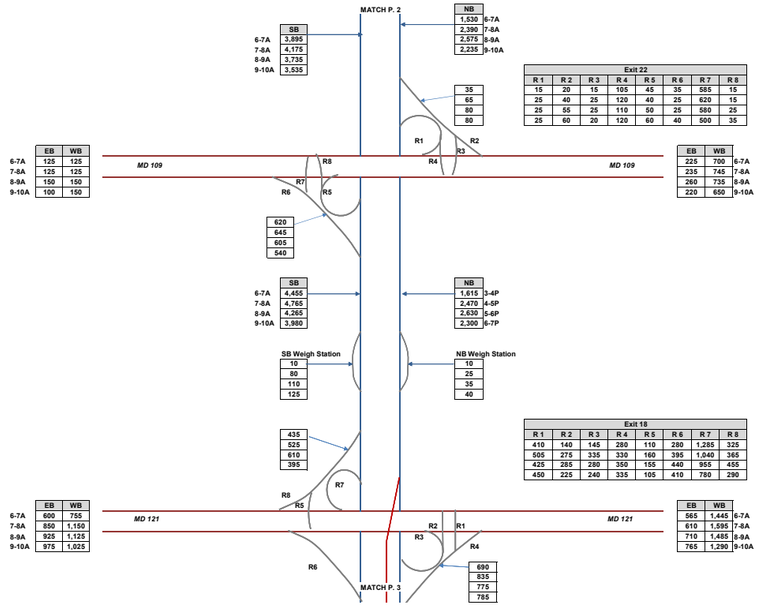
	MD 5	
	SB	NB
3-4P	5530	3830
4-5P	6300	3750
5-6P	6430	3795
6-7P	6085	3645

	Exit 7								
	Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
3-4P	1025	570	335	1100	570	1465	1935	325	120
4-5P	1030	680	365	1155	655	1490	2020	350	130
5-6P	960	755	330	1170	590	1495	1920	410	160
6-7P	785	675	345	1190	565	1520	1880	340	175

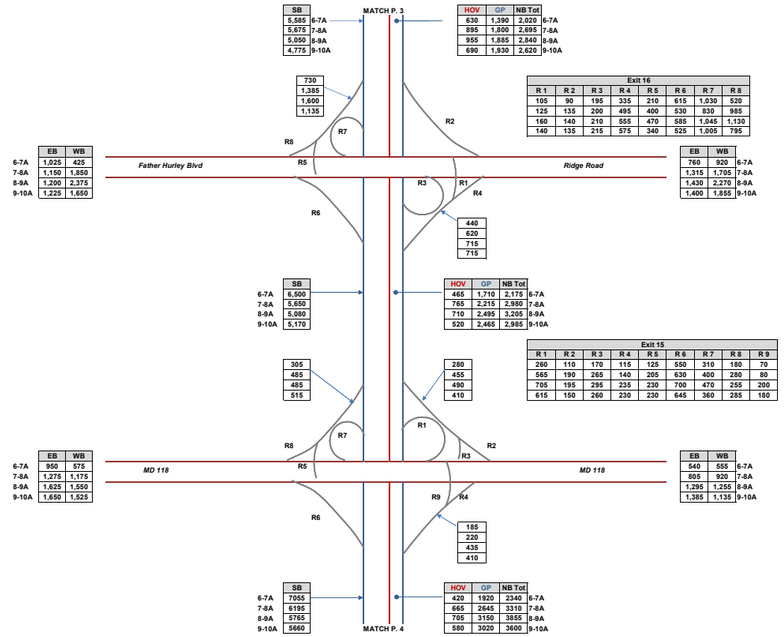
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



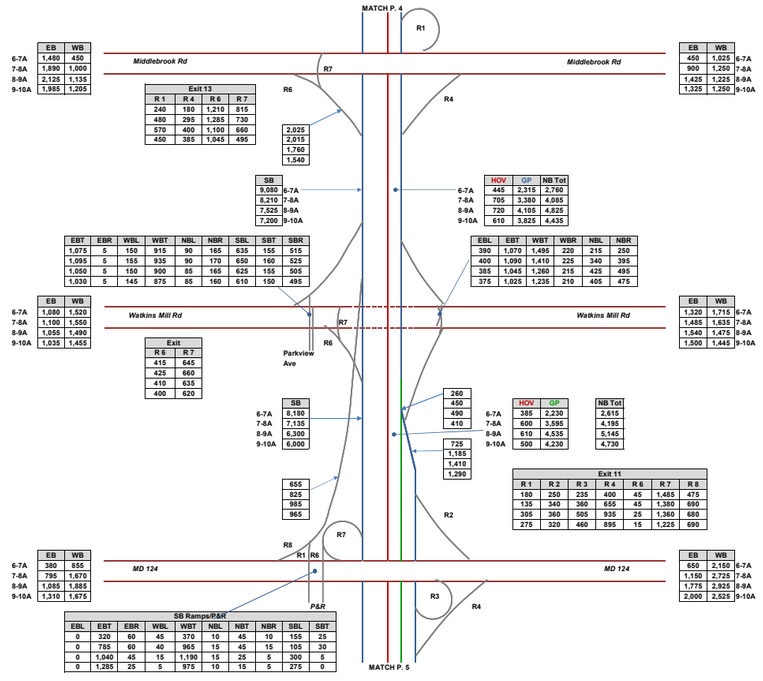
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



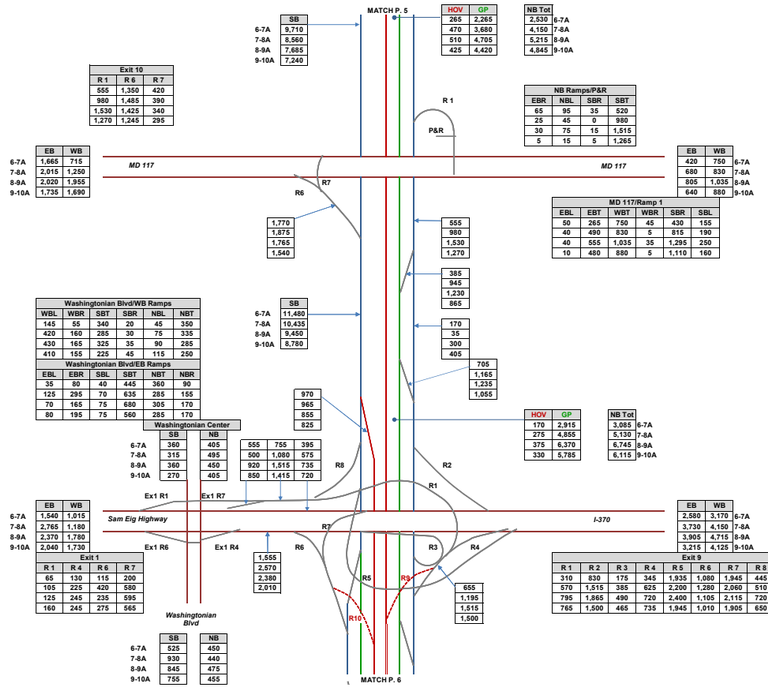
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



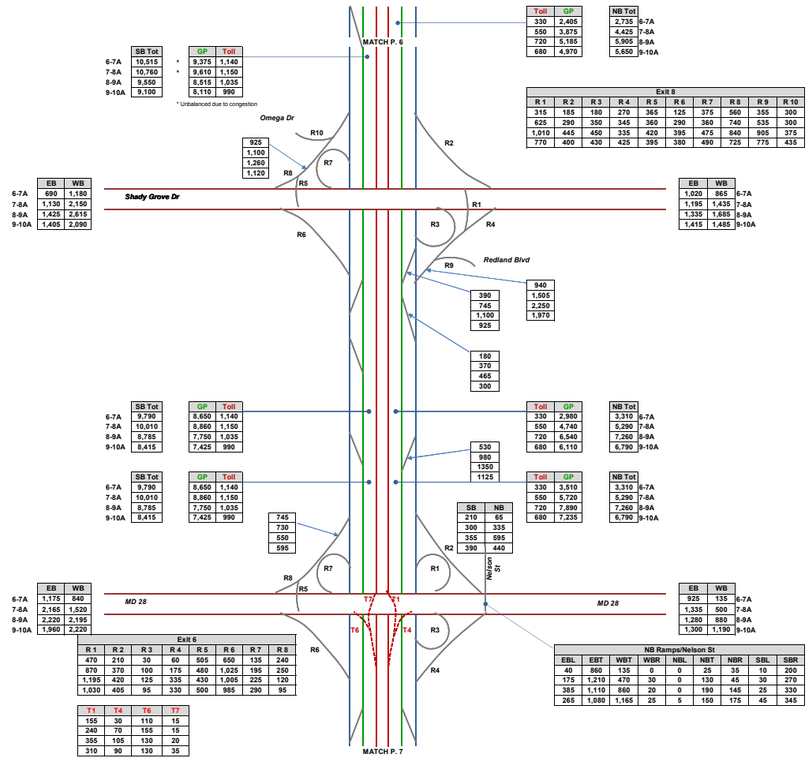
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



	SB Tot		GP	Toll
6-7A	10,515	*	9,375	1,140
7-8A	10,760	*	9,610	1,150
8-9A	9,550		8,515	1,035
9-10A	9,100		8,110	990

* Unbalanced due to congestion

	Toll	GP	NB Tot
6-7A	330	2,405	2,735
7-8A	550	3,875	4,425
8-9A	720	5,185	5,905
9-10A	680	4,970	5,650

Exit 8

R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
315	185	180	270	365	125	375	560	355	300
625	290	350	345	360	290	360	740	535	300
1,010	445	450	335	420	395	475	840	905	375
770	400	430	425	395	380	490	725	775	435

	EB	WB
6-7A	690	1,180
7-8A	1,130	2,150
8-9A	1,425	2,615
9-10A	1,405	2,090

	EB	WB
6-7A	1,020	865
7-8A	1,195	1,435
8-9A	1,335	1,685
9-10A	1,415	1,485

	SB Tot	GP	Toll
6-7A	9,790	8,650	1,140
7-8A	10,010	8,860	1,150
8-9A	8,785	7,750	1,035
9-10A	8,415	7,425	990

	Toll	GP	NB Tot
6-7A	330	2,980	3,310
7-8A	550	4,740	5,290
8-9A	720	6,540	7,260
9-10A	680	6,110	6,790

	SB Tot	GP	Toll
6-7A	9,790	8,650	1,140
7-8A	10,010	8,860	1,150
8-9A	8,785	7,750	1,035
9-10A	8,415	7,425	990

	Toll	GP	NB Tot
6-7A	330	3,510	3,310
7-8A	550	5,720	5,290
8-9A	720	7,890	7,260
9-10A	680	7,235	6,790

	SB	NB
6-7A	210	65
7-8A	300	335
8-9A	355	595
9-10A	390	440

	EB	WB
6-7A	1,175	840
7-8A	2,165	1,520
8-9A	2,220	2,195
9-10A	1,960	2,220

	EB	WB
6-7A	925	135
7-8A	1,335	500
8-9A	1,280	880
9-10A	1,300	1,190

Exit 6

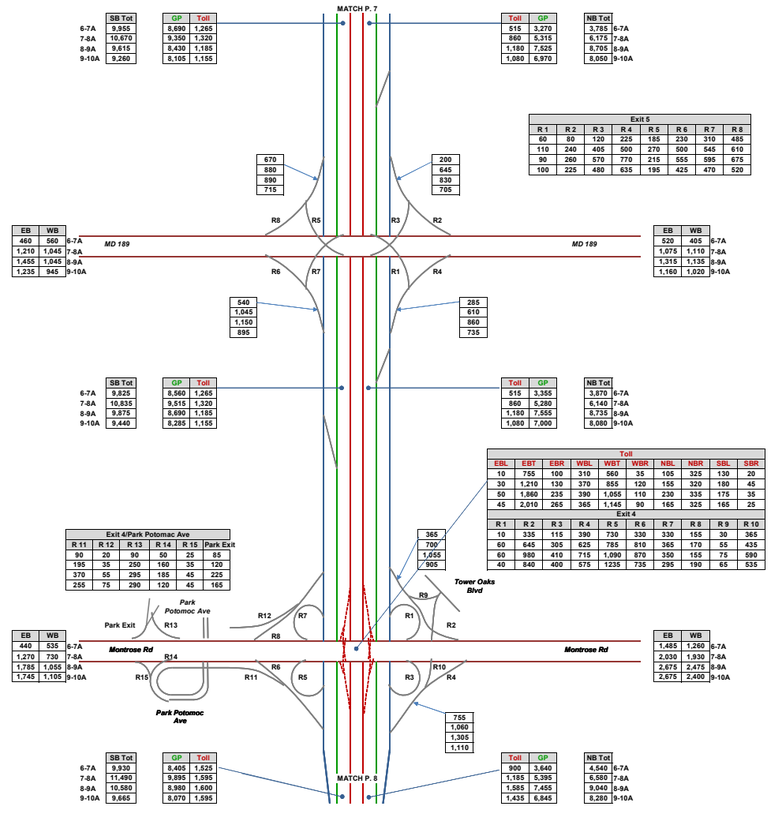
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
470	210	30	60	505	650	135	240
870	370	100	175	480	1,025	195	250
1,195	420	125	335	430	1,005	225	120
1,030	405	95	330	500	985	290	95

T1	T4	T6	T7
155	30	110	15
240	70	155	15
355	105	130	20
310	90	130	35

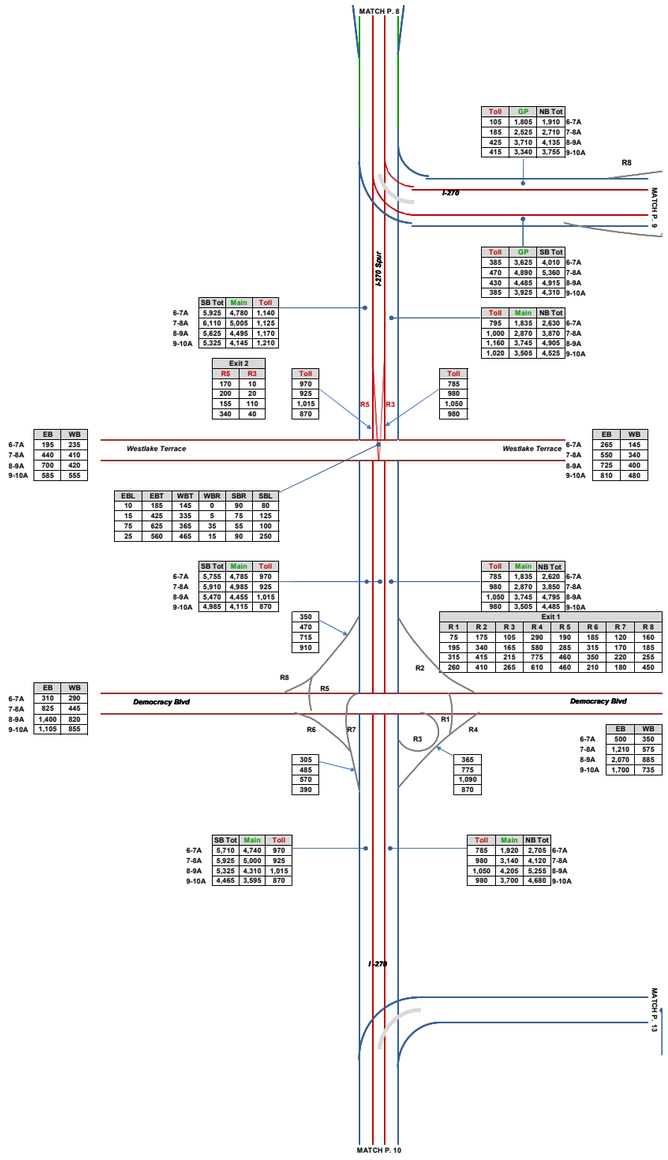
NB Ramps/Nelson St

EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
40	860	135	0	0	25	35	10	200
175	1,210	470	30	0	130	45	30	270
385	1,110	860	20	0	190	145	25	330
265	1,080	1,165	25	5	150	175	45	345

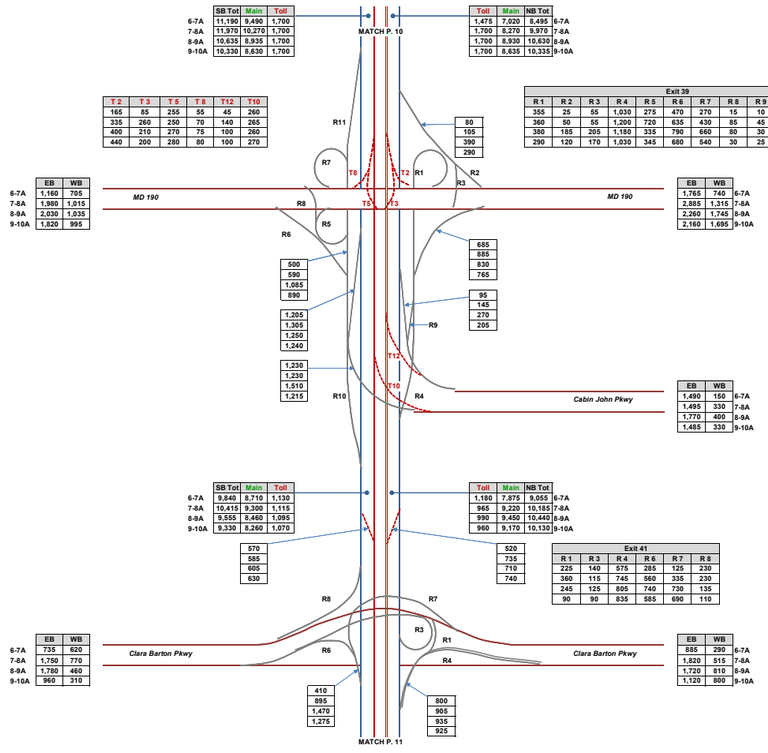
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



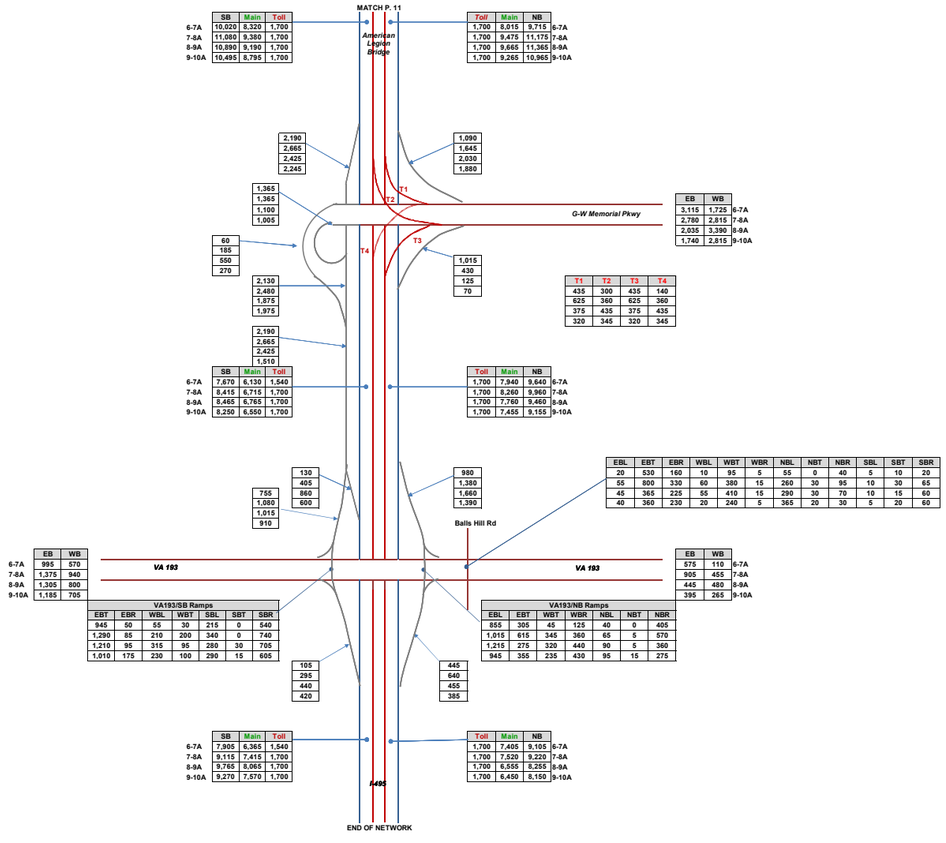
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



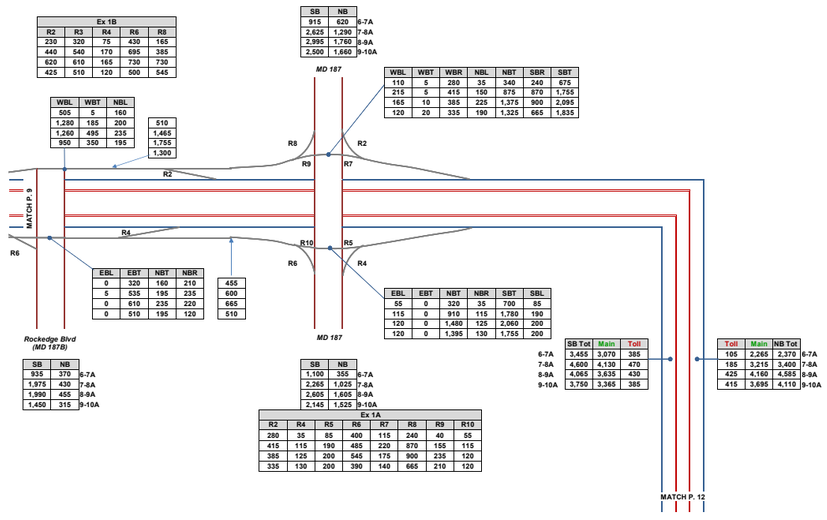
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



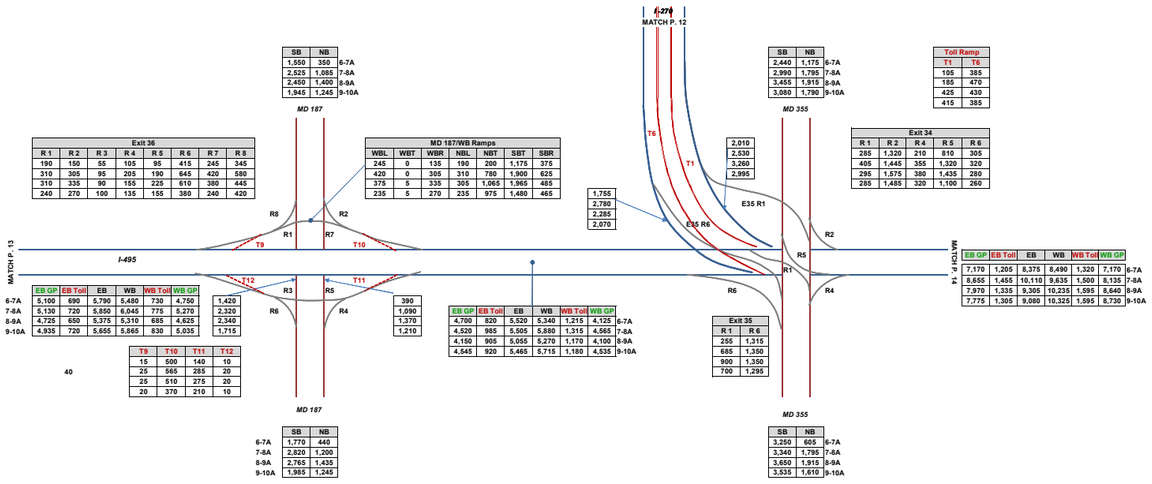
I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 5 Peak Period Volumes



SB	NB	
1,550	350	6-7A
2,525	1,085	7-8A
2,450	1,400	8-9A
1,945	1,245	9-10A

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
190	150	55	105	95	415	245	345
310	305	95	205	190	645	420	580
310	335	90	155	225	610	380	445
240	270	100	135	155	380	240	420

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
245	0	135	190	200	1,175	375
420	0	305	310	780	1,900	625
375	5	335	305	1,065	1,965	485
235	5	270	235	975	1,480	465

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
5,100	690	5,790	5,480	730	4,750	6-7A
5,130	720	5,850	6,045	775	5,270	7-8A
4,725	650	5,375	5,310	685	4,625	8-9A
4,935	720	5,655	5,865	830	5,035	9-10A

T9	T10	T11	T12
15	500	140	10
25	565	285	20
25	510	275	20
20	370	210	10

1,420	
2,320	
2,340	
1,715	

390
1,090
1,370
1,210

SB	NB	
1,770	440	6-7A
2,820	1,200	7-8A
2,765	1,435	8-9A
1,985	1,245	9-10A

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,700	820	5,520	5,340	1,215	4,125	6-7A
4,520	965	5,505	5,880	1,315	4,565	7-8A
4,150	905	5,055	5,270	1,170	4,100	8-9A
4,545	920	5,465	5,715	1,180	4,535	9-10A

1,755
2,780
2,285
2,070

2,010
2,530
3,260
2,995

SB	NB	
2,440	1,175	6-7A
2,990	1,795	7-8A
3,455	1,915	8-9A
3,080	1,790	9-10A

Exit 35	
R 1	R 6
255	1,315
685	1,350
900	1,350
700	1,295

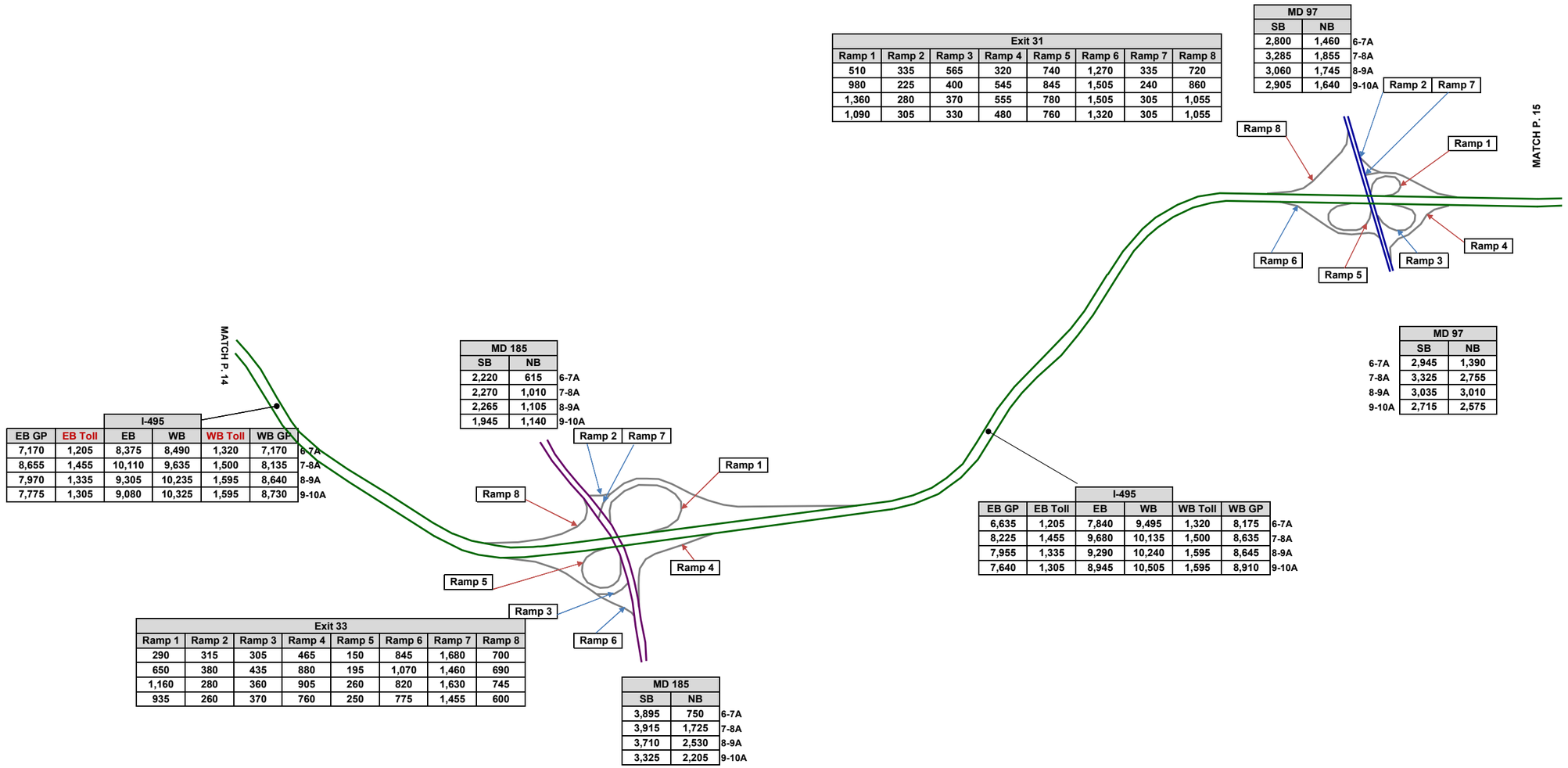
SB	NB	
3,250	605	6-7A
3,340	1,795	7-8A
3,650	1,915	8-9A
3,535	1,610	9-10A

Toll Ramp	
T1	T6
105	385
165	470
425	430
415	385

Exit 34				
R 1	R 2	R 4	R 5	R 6
285	1,320	210	810	305
405	1,445	355	1,320	320
295	1,575	380	1,435	280
285	1,485	320	1,100	260

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,170	1,205	8,375	8,490	1,320	7,170	6-7A
8,655	1,455	10,110	9,635	1,500	8,135	7-8A
7,970	1,335	9,305	10,235	1,595	8,640	8-9A
7,775	1,305	9,080	10,325	1,595	8,730	9-10A

I-495 North Side AM
Future Alternative 5 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
510	335	565	320	740	1,270	335	720
980	225	400	545	845	1,505	240	860
1,360	280	370	555	780	1,505	305	1,055
1,090	305	330	480	760	1,320	305	1,055

MD 97		
SB	NB	
2,800	1,460	6-7A
3,285	1,855	7-8A
3,060	1,745	8-9A
2,905	1,640	9-10A

	MD 97	
	SB	NB
6-7A	2,945	1,390
7-8A	3,325	2,755
8-9A	3,035	3,010
9-10A	2,715	2,575

	I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,170	1,205	8,375	8,490	1,320	7,170	6-7A
8,655	1,455	10,110	9,635	1,500	8,135	7-8A
7,970	1,335	9,305	10,235	1,595	8,640	8-9A
7,775	1,305	9,080	10,325	1,595	8,730	9-10A

MD 185		
SB	NB	
2,220	615	6-7A
2,270	1,010	7-8A
2,265	1,105	8-9A
1,945	1,140	9-10A

	I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,635	1,205	7,840	9,495	1,320	8,175	6-7A
8,225	1,455	9,680	10,135	1,500	8,635	7-8A
7,955	1,335	9,290	10,240	1,595	8,645	8-9A
7,640	1,305	8,945	10,505	1,595	8,910	9-10A

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
290	315	305	465	150	845	1,680	700
650	380	435	880	195	1,070	1,460	690
1,160	280	360	905	260	820	1,630	745
935	260	370	760	250	775	1,455	600

MD 185		
SB	NB	
3,895	750	6-7A
3,915	1,725	7-8A
3,710	2,530	8-9A
3,325	2,205	9-10A

I-495 North Side AM
Future Alternative 5 Peak Period Volumes

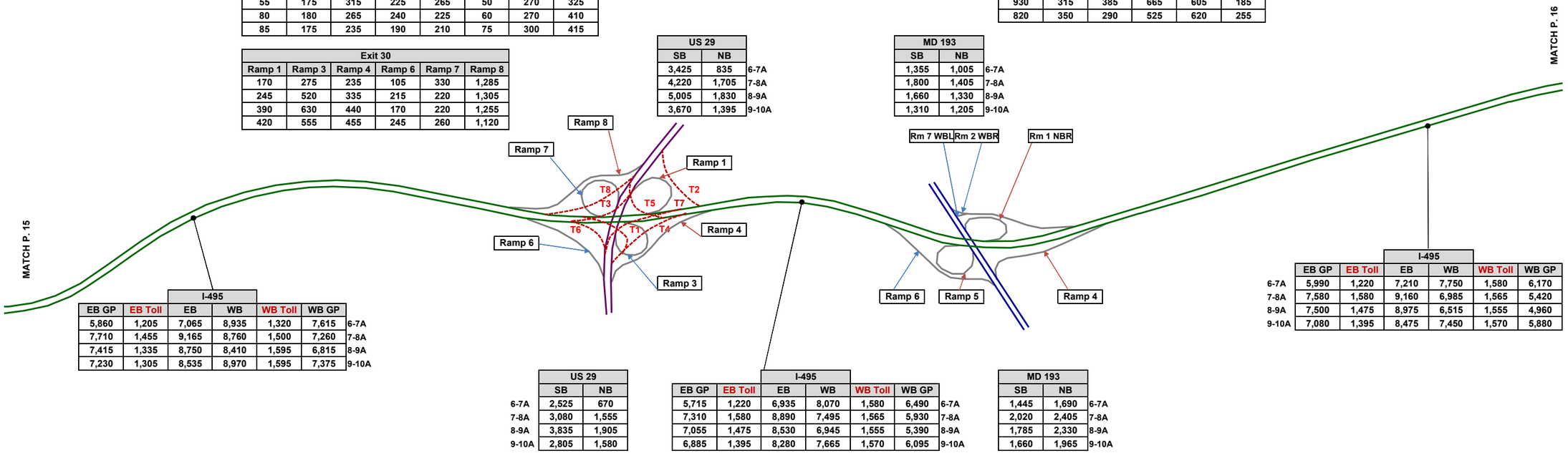
T1	T2	T3	T4	T5	T6	T7	T8
25	205	215	100	160	30	355	275
55	175	315	225	265	50	270	325
80	180	265	240	225	60	270	410
85	175	235	190	210	75	300	415

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
170	275	235	105	330	1,285
245	520	335	215	220	1,305
390	630	440	170	220	1,255
420	555	455	245	260	1,120

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
915	415	185	555	465	180
995	300	305	655	690	185
930	315	385	665	605	185
820	350	290	525	620	255

US 29		
SB	NB	
3,425	835	6-7A
4,220	1,705	7-8A
5,005	1,830	8-9A
3,670	1,395	9-10A

MD 193		
SB	NB	
1,355	1,005	6-7A
1,800	1,405	7-8A
1,660	1,330	8-9A
1,310	1,205	9-10A



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,860	1,205	7,065	8,935	1,320	7,615
7-8A	7,710	1,455	9,165	8,760	1,500	7,260
8-9A	7,415	1,335	8,750	8,410	1,595	6,815
9-10A	7,230	1,305	8,535	8,970	1,595	7,375

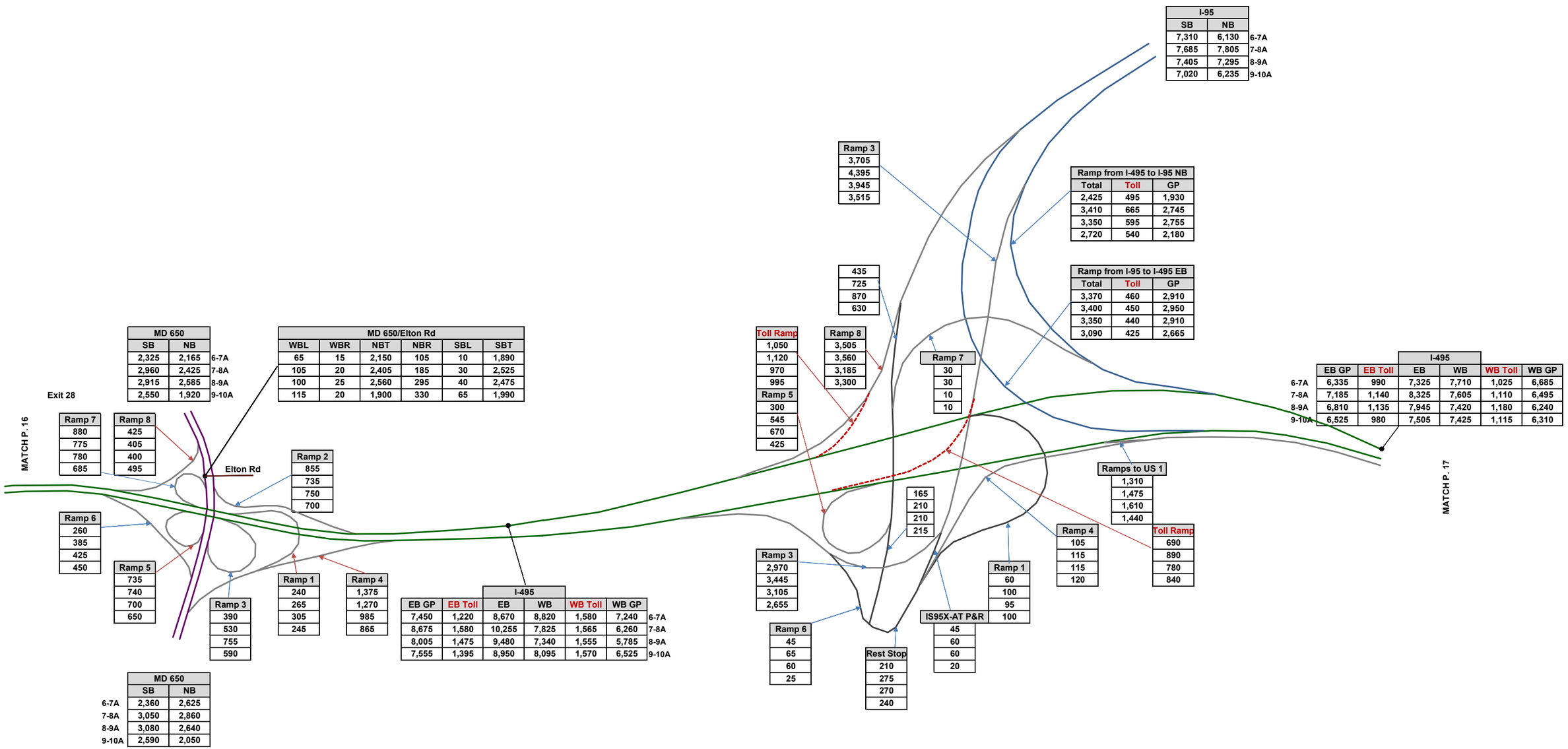
	US 29	
	SB	NB
6-7A	2,525	670
7-8A	3,080	1,555
8-9A	3,835	1,905
9-10A	2,805	1,580

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,715	1,220	6,935	8,070	1,580	6,490
7-8A	7,310	1,580	8,890	7,495	1,565	5,930
8-9A	7,055	1,475	8,530	6,945	1,555	5,390
9-10A	6,885	1,395	8,280	7,665	1,570	6,095

	MD 193	
	SB	NB
6-7A	1,445	1,690
7-8A	2,020	2,405
8-9A	1,785	2,330
9-10A	1,660	1,965

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,990	1,220	7,210	7,750	1,580	6,170
7-8A	7,580	1,580	9,160	6,985	1,565	5,420
8-9A	7,500	1,475	8,975	6,515	1,555	4,960
9-10A	7,080	1,395	8,475	7,450	1,570	5,880

I-495 North Side AM
Future Alternative 5 Peak Period Volumes



I-495 North East Side AM
Future Alternative 5 Peak Period Volumes

	I-495				
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,335	990	7,325	7,710	1,025	6,685	6-7A
7,185	1,140	8,325	7,605	1,110	6,495	7-8A
6,810	1,135	7,945	7,420	1,180	6,240	8-9A
6,525	980	7,505	7,425	1,115	6,310	9-10A

US 1		
SB	NB	
1,135	1,095	6-7A
1,975	1,285	7-8A
1,250	1,290	8-9A
1,170	1,090	9-10A

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,130	5	720	295	660	25	375	20
1,955	20	735	405	820	20	550	30
1,230	20	740	450	610	25	550	30
1,160	10	755	405	370	65	335	20

MATCH P. 17

Ramp 10
1,415
1,590
1,725
1,560

Ramp 8

IKEA

Ramp 1

Ramp 7

Ramp 6

Ramp 4

Ramp 5

Ramp 3

Edgewood Rd

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
295	350	410	495	680	1,060	310
405	335	560	730	945	1,390	355
450	370	595	650	940	1,185	400
405	355	465	630	830	770	360

US 1		
SB	NB	
1,650	895	6-7A
2,570	1,195	7-8A
1,640	1,245	8-9A
1,155	1,130	9-10A

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
10	30	965	865	30	55	190	10	40	630
5	85	1,630	1,120	75	110	235	5	110	830
10	75	735	1,180	65	80	220	5	110	825
20	135	405	1,060	70	50	190	0	130	700

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,625	990	8,615	8,165	1,025	7,140
7-8A	8,785	1,140	9,925	8,235	1,110	7,125
8-9A	8,470	1,135	9,605	7,755	1,180	6,575
9-10A	7,995	980	8,975	7,430	1,115	6,315

T1	T2	T3	T4
145	90	335	280
190	120	385	290
170	155	345	285
145	140	335	300

T2

T1

T3

Greenbelt Commuter Station

810	555	490
845	655	440
760	595	430
720	485	405

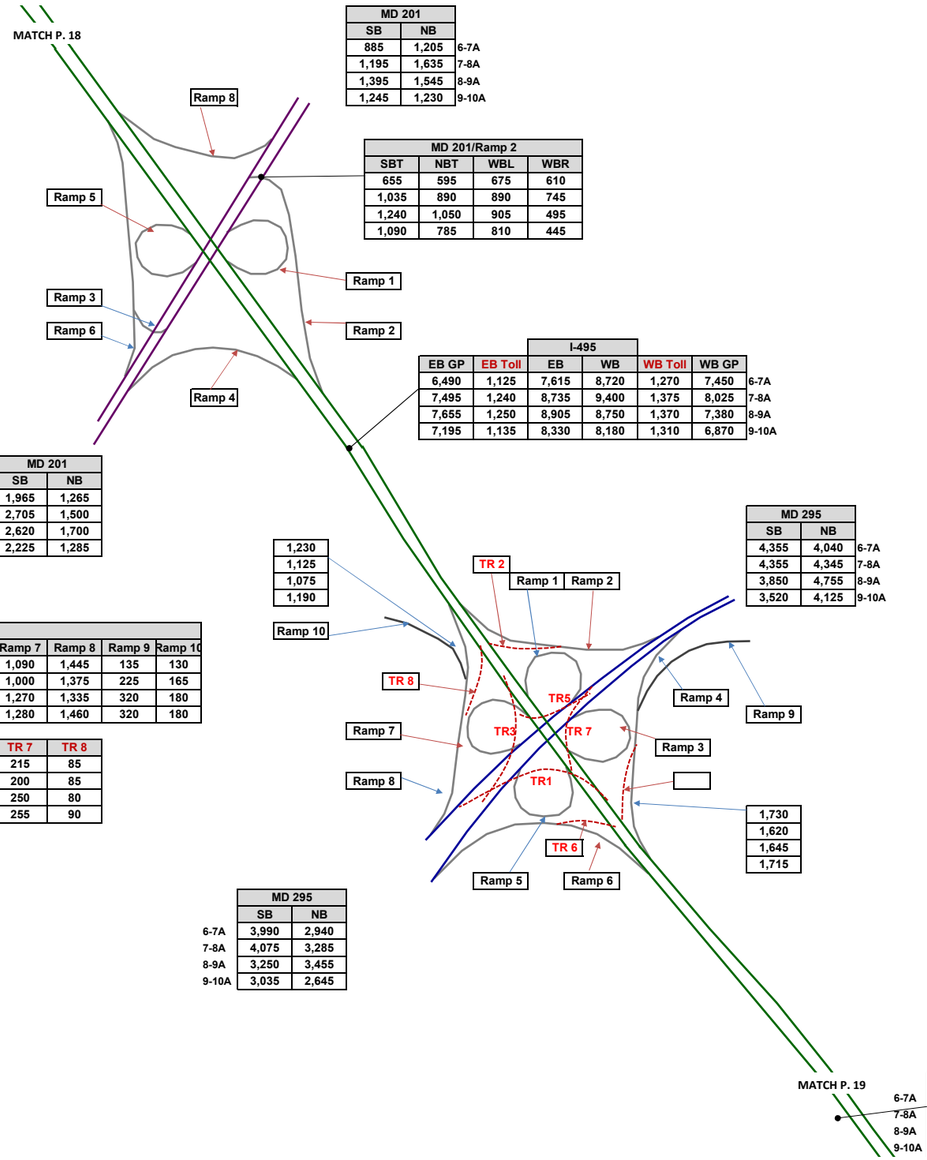
T4

340
350
300
330

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,020	1,125	8,145	8,230	1,270	6,960
7-8A	8,190	1,240	9,430	8,450	1,375	7,075
8-9A	7,895	1,250	9,145	7,920	1,370	6,550
9-10A	7,450	1,135	8,585	7,510	1,310	6,200

MATCH P. 18

I-495 North East Side AM
Future Alternative 5 Peak Period Volumes



Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
565	1,285	270	375	420	1,055	230
525	1,635	345	430	430	1,210	160
415	1,400	380	615	615	1,090	155
430	1,255	450	520	590	915	155

MD 201		
SB	NB	
885	1,205	6-7A
1,195	1,635	7-8A
1,395	1,545	8-9A
1,245	1,230	9-10A

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
655	595	675	610
1,035	890	890	745
1,240	1,050	905	495
1,090	785	810	445

	I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,490	1,125	7,615	8,720	1,270	7,450	6-7A
7,495	1,240	8,735	9,400	1,375	8,025	7-8A
7,655	1,250	8,905	8,750	1,370	7,380	8-9A
7,195	1,135	8,330	8,180	1,310	6,870	9-10A

	MD 201	
	SB	NB
6-7A	1,965	1,265
7-8A	2,705	1,500
8-9A	2,620	1,700
9-10A	2,225	1,285

MD 295		
SB	NB	
4,355	4,040	6-7A
4,355	4,345	7-8A
3,850	4,755	8-9A
3,520	4,125	9-10A

Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
35	545	1,035	1,795	430	15	1,090	1,445	135	130
85	550	1,095	1,585	640	25	1,000	1,375	225	165
100	530	980	1,505	805	15	1,270	1,335	320	180
90	515	805	1,590	720	25	1,280	1,460	320	180

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
5	60	120	200	50	5	215	85
10	70	110	190	70	5	200	85
15	60	100	180	95	10	250	80
15	55	85	195	90	5	255	90

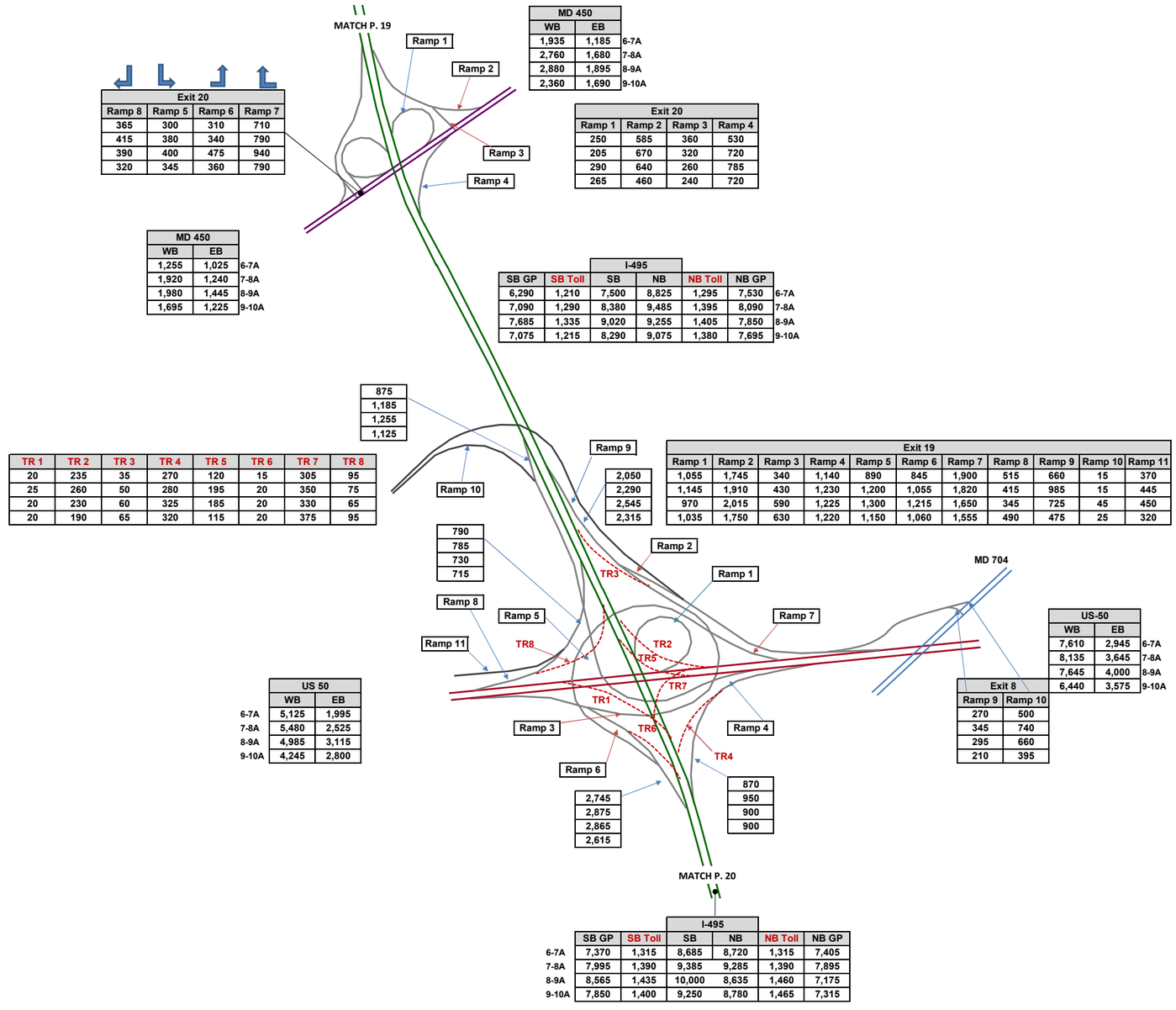
	MD 295	
	SB	NB
6-7A	3,990	2,940
7-8A	4,075	3,285
8-9A	3,250	3,455
9-10A	3,035	2,645

1,230
1,125
1,075
1,190

1,730
1,620
1,645
1,715

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	5,935	1,210	7,145	8,990	1,295	7,695
7-8A	6,755	1,290	8,045	9,550	1,395	8,155
8-9A	7,060	1,335	8,395	9,080	1,405	7,675
9-10A	6,590	1,215	7,805	8,790	1,380	7,410

I-495 North East Side AM
Future Alternative 5 Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
365	300	310	710
415	380	340	790
390	400	475	940
320	345	360	790

MD 450		
WB	EB	
1,935	1,185	6-7A
2,760	1,680	7-8A
2,880	1,895	8-9A
2,360	1,690	9-10A

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
250	585	360	530
205	670	320	720
290	640	260	785
265	460	240	720

MD 450		
WB	EB	
1,255	1,025	6-7A
1,920	1,240	7-8A
1,980	1,445	8-9A
1,695	1,225	9-10A

	I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,290	1,210	7,500	8,825	1,295	7,530	6-7A
7,090	1,290	8,380	9,485	1,395	8,090	7-8A
7,685	1,335	9,020	9,255	1,405	7,850	8-9A
7,075	1,215	8,290	9,075	1,380	7,695	9-10A

875
1,185
1,255
1,125

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	235	35	270	120	15	305	95
25	260	50	280	195	20	350	75
20	230	60	325	185	20	330	65
20	190	65	320	115	20	375	95

2,050
2,290
2,545
2,315

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
1,055	1,745	340	1,140	890	845	1,900	515	660	15	370
1,145	1,910	430	1,230	1,200	1,055	1,820	415	985	15	445
970	2,015	590	1,225	1,300	1,215	1,650	345	725	45	450
1,035	1,750	630	1,220	1,150	1,060	1,555	490	475	25	320

790
785
730
715

US 50		
WB	EB	
5,125	1,995	6-7A
5,480	2,525	7-8A
4,985	3,115	8-9A
4,245	2,800	9-10A

US-50		
WB	EB	
7,610	2,945	6-7A
8,135	3,645	7-8A
7,645	4,000	8-9A
6,440	3,575	9-10A

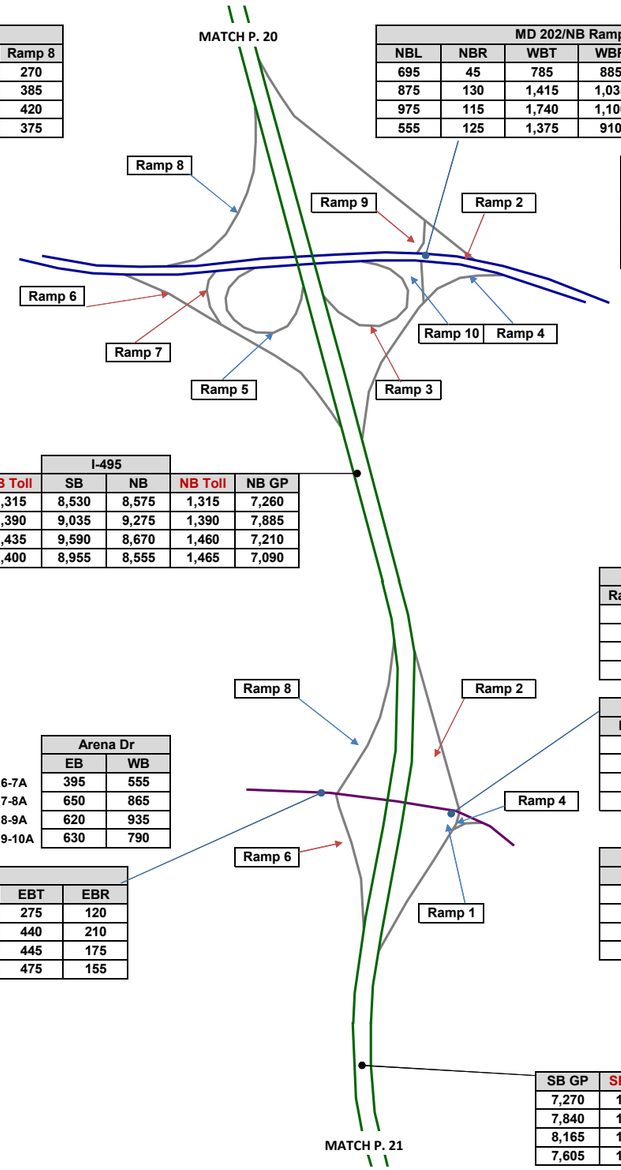
Exit 8	
Ramp 9	Ramp 10
270	500
345	740
295	660
210	395

2,745
2,875
2,865
2,615

870
950
900
900

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,370	1,315	8,685	8,720	1,315	7,405
7-8A	7,995	1,390	9,385	9,285	1,390	7,895
8-9A	8,565	1,435	10,000	8,635	1,460	7,175
9-10A	7,850	1,400	9,250	8,780	1,465	7,315

I-495 East Side AM
Future Alternative 5 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
435	390	160	270
750	525	260	385
1,015	675	350	420
800	600	280	375

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
695	45	785	885	10	760
875	130	1,415	1,035	15	1,405
975	115	1,740	1,100	5	1,590
555	125	1,375	910	15	1,385

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
885	200	210	10	740
1,035	185	220	15	1,005
1,100	230	280	5	1,090
910	220	240	15	680

MD 202		
EB	WB	
925	1,590	6-7A
1,380	2,415	7-8A
1,485	2,785	8-9A
1,420	2,025	9-10A

MD 202		
EB	WB	
1,015	1,670	6-7A
1,755	2,450	7-8A
1,985	2,840	8-9A
1,750	2,285	9-10A

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,215	1,315	8,530	8,575	1,315	7,260
7,645	1,390	9,035	9,275	1,390	7,885
8,155	1,435	9,590	8,670	1,460	7,210
7,555	1,400	8,955	8,555	1,465	7,090

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
320	385	350	250	195
485	435	455	405	210
400	395	495	360	350
345	375	385	350	300

Arena Dr		
EB	WB	
395	555	6-7A
650	865	7-8A
620	935	8-9A
630	790	9-10A

MD 214/NB Ramps							
NBL	NBT	NBR	WBT	WBR	EBL	EBT	
320	0	350	250	180	205	150	6-7A
485	0	455	465	210	225	315	7-8A
395	5	495	510	200	190	390	8-9A
345	0	385	490	170	205	420	9-10A

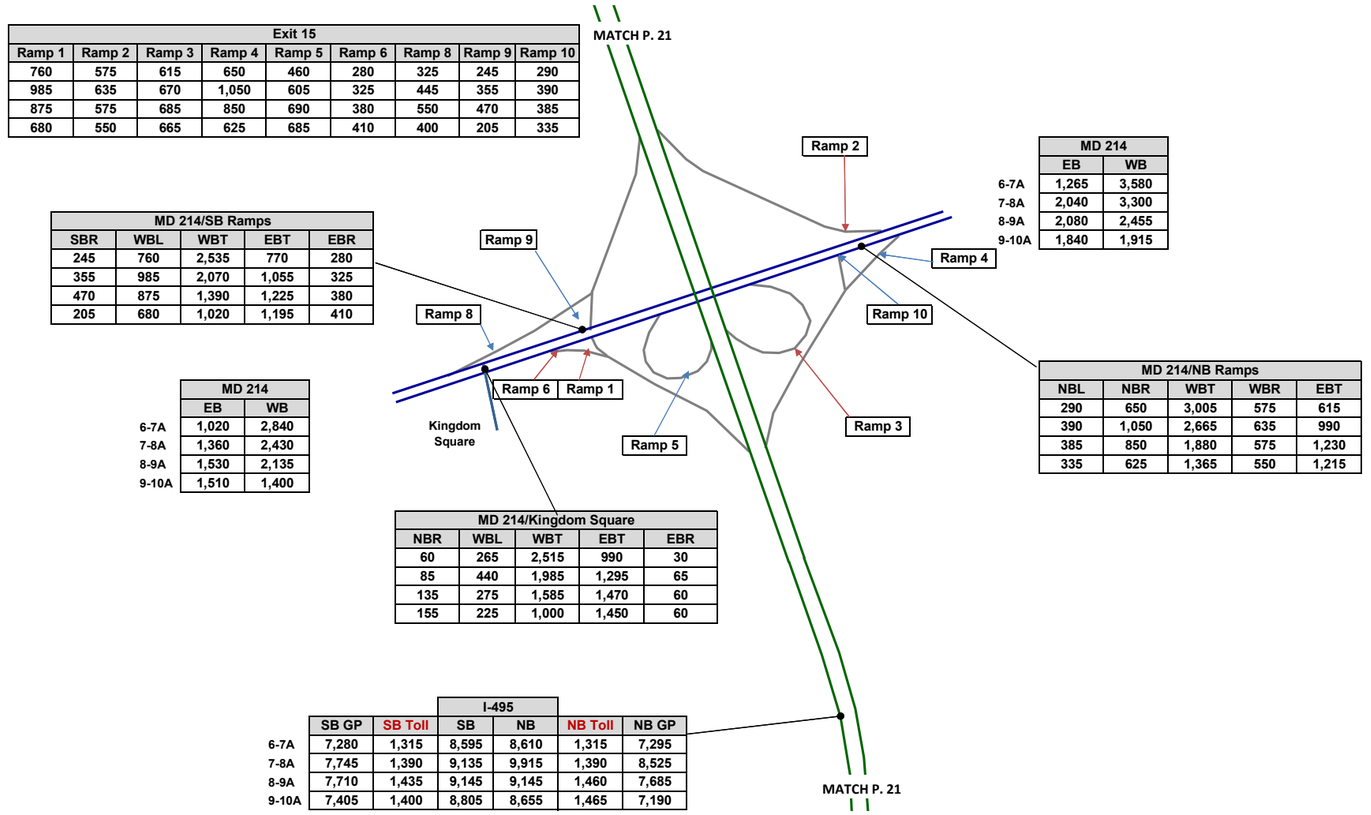
MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
80	0	115	130	440	275	120
100	0	110	195	755	440	210
135	0	215	185	720	445	175
150	0	150	195	640	475	155

Arena Dr	
EB	WB
500	430
770	675
885	710
805	660

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,270	1,315	8,585	8,860	1,315	7,545
7,840	1,390	9,230	9,780	1,390	8,390
8,165	1,435	9,600	9,170	1,460	7,710
7,605	1,400	9,005	8,910	1,465	7,445

6-7A
7-8A
8-9A
9-10A

I-495 East Side AM
Future Alternative 5 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
760	575	615	650	460	280	325	245	290
985	635	670	1,050	605	325	445	355	390
875	575	685	850	690	380	550	470	385
680	550	665	625	685	410	400	205	335

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
245	760	2,535	770	280
355	985	2,070	1,055	325
470	875	1,390	1,225	380
205	680	1,020	1,195	410

MD 214		
	EB	WB
6-7A	1,020	2,840
7-8A	1,360	2,430
8-9A	1,530	2,135
9-10A	1,510	1,400

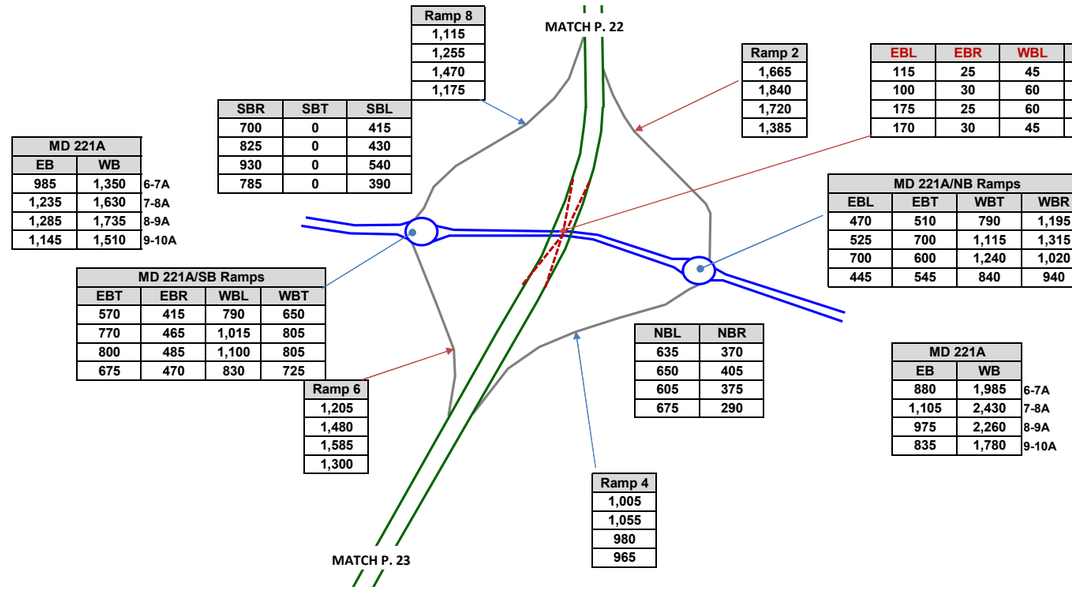
MD 214		
	EB	WB
6-7A	1,265	3,580
7-8A	2,040	3,300
8-9A	2,080	2,455
9-10A	1,840	1,915

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
290	650	3,005	575	615
390	1,050	2,665	635	990
385	850	1,880	575	1,230
335	625	1,365	550	1,215

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
60	265	2,515	990	30
85	440	1,985	1,295	65
135	275	1,585	1,470	60
155	225	1,000	1,450	60

	I-495				
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,280	1,315	8,595	8,610	1,315	7,295
7-8A	7,745	1,390	9,135	9,915	1,390	8,525
8-9A	7,710	1,435	9,145	9,145	1,460	7,685
9-10A	7,405	1,400	8,805	8,655	1,465	7,190

I-495 East Side AM
Future Alternative 5 Peak Period Volumes



Ramp 8
1,115
1,255
1,470
1,175

SBR	SBT	SBL
700	0	415
825	0	430
930	0	540
785	0	390

MD 221A		
EB	WB	
985	1,350	6-7A
1,235	1,630	7-8A
1,285	1,735	8-9A
1,145	1,510	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
570	415	790	650
770	465	1,015	805
800	485	1,100	805
675	470	830	725

Ramp 6
1,205
1,480
1,585
1,300

Ramp 2
1,665
1,840
1,720
1,385

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
115	25	45	225	55	25	110	230
100	30	60	200	55	35	120	260
175	25	60	205	55	30	130	270
170	30	45	200	55	25	100	230

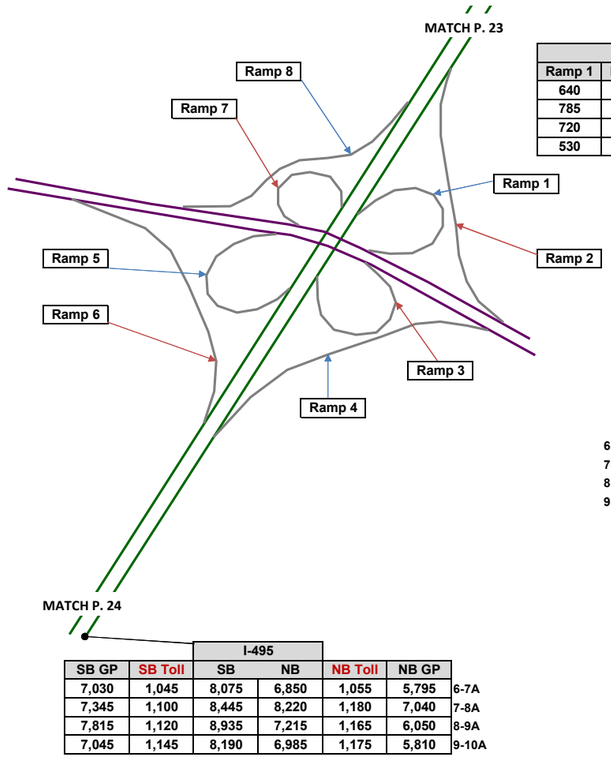
MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
470	510	790	1,195
525	700	1,115	1,315
700	600	1,240	1,020
445	545	840	940

NBL	NBR
635	370
650	405
605	375
675	290

Ramp 4
1,005
1,055
980
965

MD 221A		
EB	WB	
880	1,985	6-7A
1,105	2,430	7-8A
975	2,260	8-9A
835	1,780	9-10A

I-495 East Side AM
Future Alternative 5 Peak Period Volumes



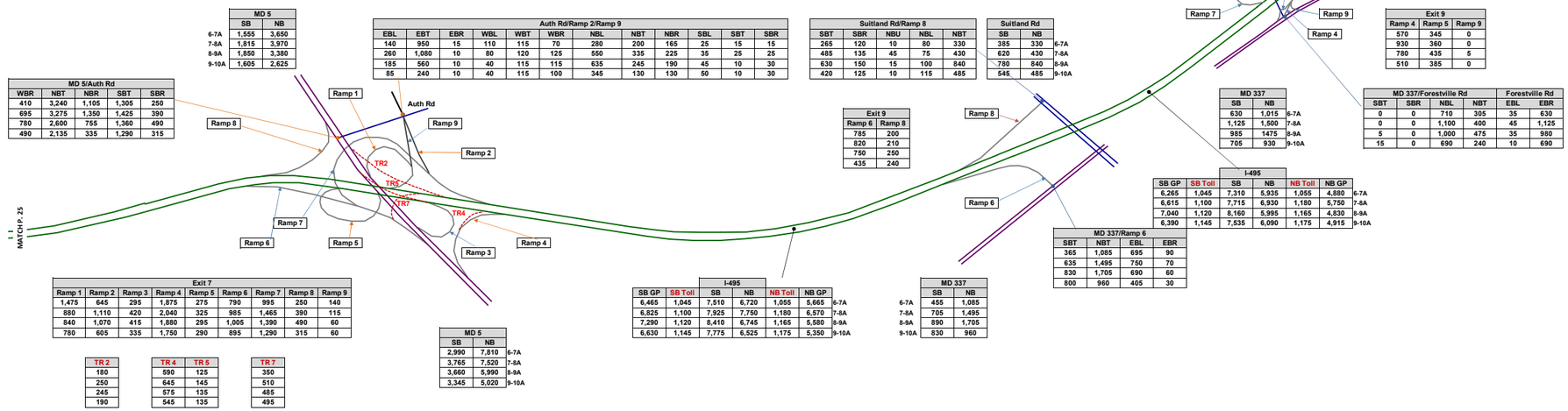
MD 4		
SB	NB	
1,335	2,290	6-7A
1,665	3,070	7-8A
1,580	2,105	8-9A
1,450	1,535	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
640	1,490	570	580	860	495	1,160	1,135
785	1,420	660	595	705	465	950	1,335
720	1,510	665	560	625	495	880	760
530	1,365	620	495	715	395	640	805

	MD 4	
	SB	NB
6-7A	1,710	3,165
7-8A	1,840	3,320
8-9A	1,605	3,015
9-10A	1,645	2,205

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,030	1,045	8,075	6,850	1,055	5,795	6-7A
7,345	1,100	8,445	8,220	1,180	7,040	7-8A
7,815	1,120	8,935	7,215	1,165	6,050	8-9A
7,045	1,145	8,190	6,985	1,175	5,810	9-10A

I-495 South Side AM
Future Alternative 5 Peak Period Volumes



Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
10	5	205	5	555	135	5	0	445
5	0	120	5	605	165	5	0	920
5	0	130	5	640	215	5	0	805
5	0	145	5	505	175	5	5	575

	Forestville Rd	
	SB	NB
6-7A	445	345
7-8A	920	285
8-9A	805	345
9-10A	580	320

Ramp 7	Forest. NB	Forest. SB
765	140	1,010
730	170	1,530
775	220	1,450
655	180	1,085

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,030	1,045	8,075	6,850	1,055	5,795
7-8A	7,345	1,100	8,445	8,220	1,180	7,040
8-9A	7,815	1,120	8,935	7,215	1,165	6,050
9-10A	7,045	1,145	8,190	6,985	1,175	5,810

MD 337	
SB	NB
0	340
0	445
0	510
0	250

(6-7A, 7-8A, 8-9A, 9-10A)

Exit 9		
Ramp 4	Ramp 5	Ramp 9
570	345	0
930	360	0
780	435	5
510	385	0

MD 5	
SB	NB
1,555	3,650
1,815	3,970
1,850	3,380
1,605	2,625

(6-7A, 7-8A, 8-9A, 9-10A)

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
140	950	15	110	115	70	280	200	165	25	15	15
260	1,080	10	80	120	125	550	335	225	35	25	25
185	560	10	40	115	115	635	245	190	45	10	30
85	240	10	40	115	100	345	130	130	50	10	30

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
265	120	10	80	330
485	135	45	75	430
630	150	15	100	840
420	125	10	115	485

Suitland Rd		
SB	NB	
385	330	6-7A
620	430	7-8A
780	840	8-9A
545	485	9-10A

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
410	3,240	1,105	1,305	250
695	3,275	1,350	1,425	390
780	2,600	755	1,360	490
490	2,135	335	1,290	315

Exit 9	
Ramp 6	Ramp 8
785	200
820	210
750	250
435	240

MD 337	
SB	NB
630	1,015
1,125	1,500
985	1475
705	930

(6-7A, 7-8A, 8-9A, 9-10A)

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	710	305	35	630
0	0	1,100	400	45	1,125
5	0	1,000	475	35	980
15	0	690	240	10	690

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,265	1,045	7,310	5,935	1,055	4,880
7-8A	6,615	1,100	7,715	6,930	1,180	5,750
8-9A	7,040	1,120	8,160	5,995	1,165	4,830
9-10A	6,390	1,145	7,535	6,090	1,175	4,915

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
365	1,085	695	90
635	1,495	750	70
830	1,705	690	60
800	960	405	30

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
1,475	645	295	1,875	275	790	995	250	140
880	1,110	420	2,040	325	985	1,465	390	115
840	1,070	415	1,880	295	1,005	1,390	490	60
780	605	335	1,750	290	895	1,290	315	60

TR 2
180
250
245
190

TR 4	TR 5
590	125
645	145
575	135
545	135

TR 7
350
510
485
495

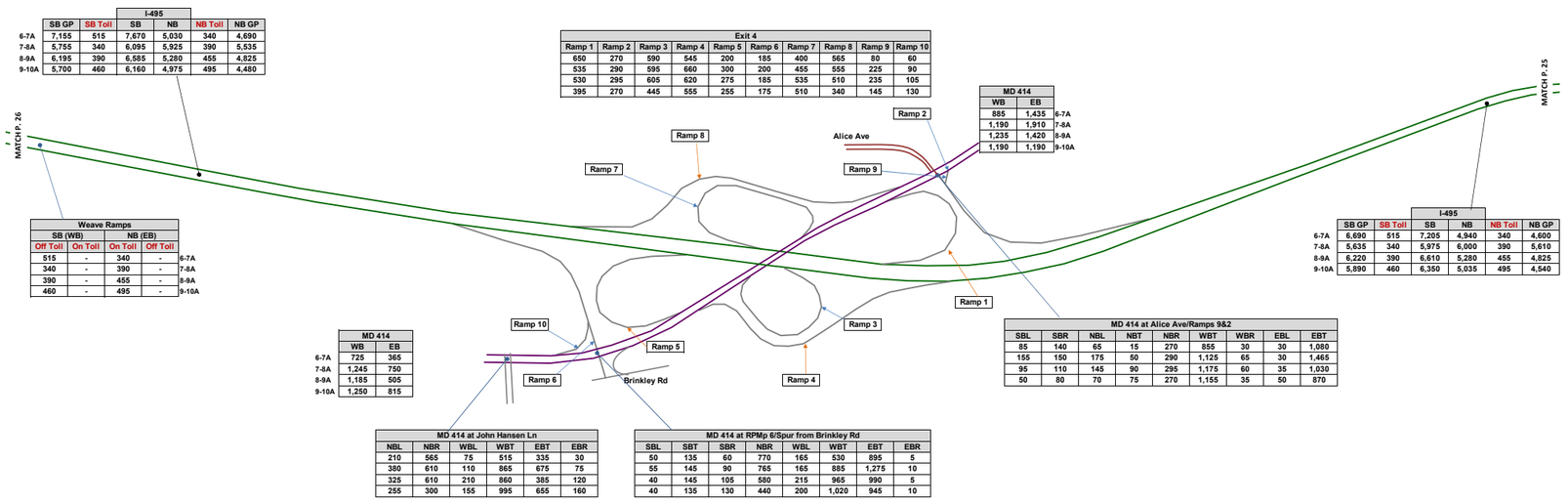
MD 5	
SB	NB
2,990	7,810
3,765	7,520
3,660	5,990
3,345	5,020

(6-7A, 7-8A, 8-9A, 9-10A)

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,465	1,045	7,510	6,720	1,055	5,665
7-8A	6,825	1,100	7,925	7,750	1,180	6,570
8-9A	7,290	1,120	8,410	6,745	1,165	5,580
9-10A	6,630	1,145	7,775	6,525	1,175	5,350

	MD 337	
	SB	NB
6-7A	455	1,085
7-8A	705	1,495
8-9A	890	1,705
9-10A	830	960

I-495 South Side AM
Future Alternative 5 Peak Period Volumes



	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,155	515	7,670	5,030	340	4,690
7-8A	5,755	340	6,095	5,925	390	5,535
8-9A	6,195	390	6,585	5,280	455	4,825
9-10A	5,700	460	6,160	4,975	495	4,480

Weave Ramps				
SB (WB)		NB (EB)		
Off Toll	On Toll	On Toll	Off Toll	
515	-	340	-	6-7A
340	-	390	-	7-8A
390	-	455	-	8-9A
460	-	495	-	9-10A

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
650	270	590	545	200	185	400	565	80	60
535	290	595	660	300	200	455	555	225	90
530	295	605	620	275	185	535	510	235	105
395	270	445	555	255	175	510	340	145	130

MD 414		
WB	EB	
885	1,435	6-7A
1,190	1,910	7-8A
1,235	1,420	8-9A
1,190	1,190	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,690	515	7,205	4,940	340	4,600
7-8A	5,635	340	5,975	6,000	390	5,610
8-9A	6,220	390	6,610	5,280	455	4,825
9-10A	5,890	460	6,350	5,035	495	4,540

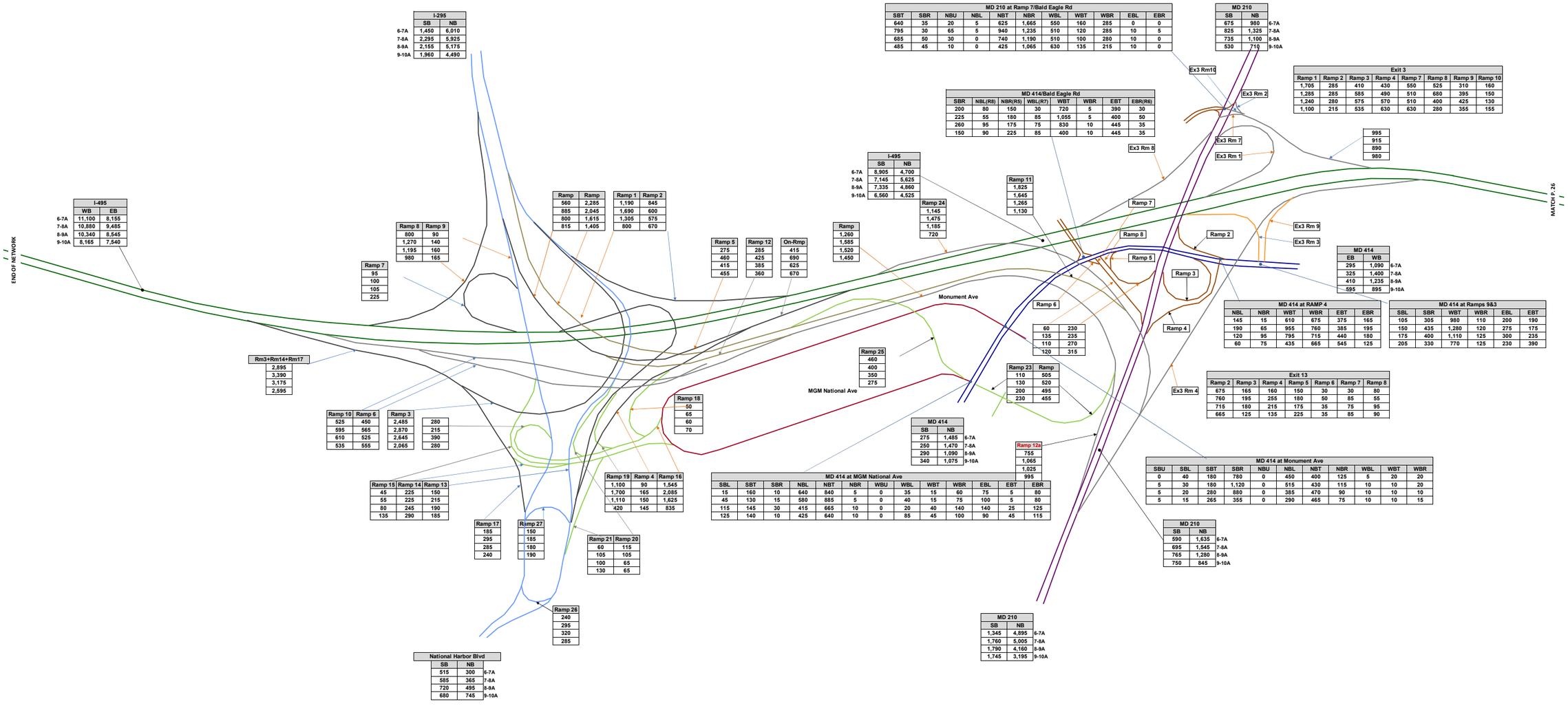
MD 414		
WB	EB	
725	365	6-7A
1,245	750	7-8A
1,185	505	8-9A
1,250	815	9-10A

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
85	140	65	15	270	855	30	30	1,080
155	150	175	50	290	1,125	65	30	1,465
95	110	145	90	295	1,175	60	35	1,030
50	80	70	75	270	1,155	35	50	870

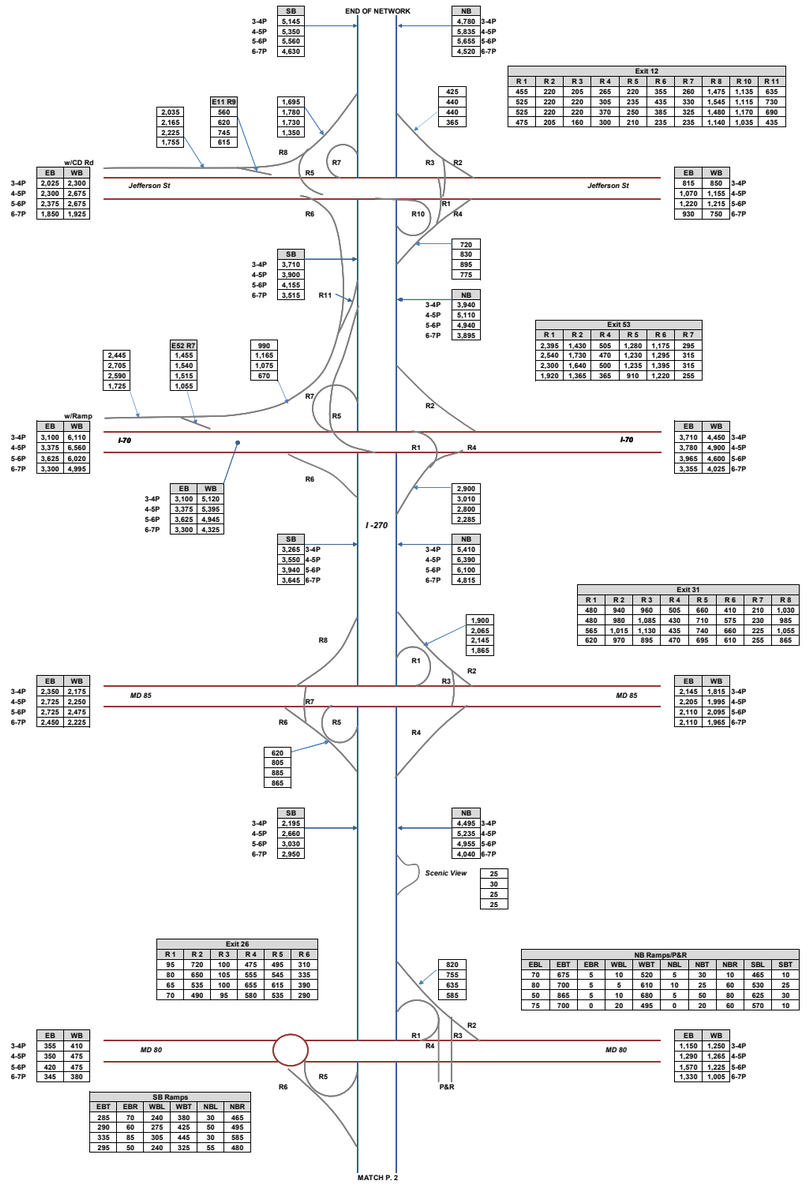
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
210	565	75	515	335	30
380	610	110	865	675	75
325	610	210	860	385	120
255	300	155	995	655	160

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
50	135	60	770	165	530	895	5
55	145	90	765	165	885	1,275	10
40	145	105	580	215	965	990	5
40	135	130	440	200	1,020	945	10

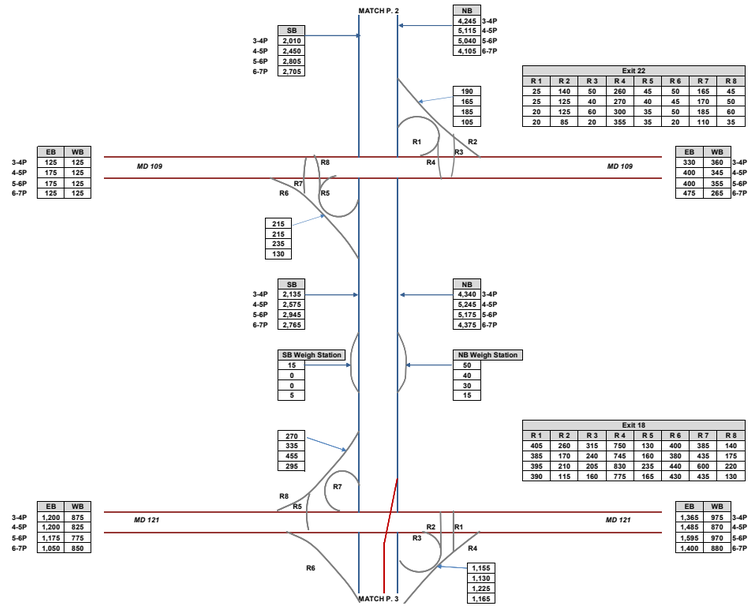
I-495 South Side AM
Future Alternative 5 Peak Period Volumes



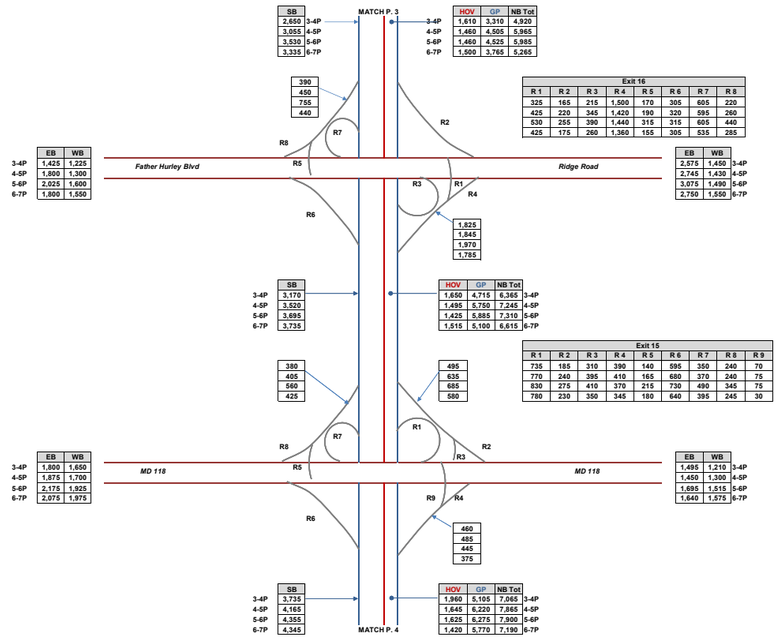
I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



SB	
2,650	3-4P
3,055	4-5P
3,530	5-6P
3,335	6-7P

	HOV	GP	NB Tot	
3-4P	1,610	3,310	4,920	
4-5P	1,460	4,505	5,965	
5-6P	1,460	4,525	5,985	
6-7P	1,500	3,765	5,265	

	EB	WB	
3-4P	1,425	1,225	
4-5P	1,800	1,300	
5-6P	2,025	1,600	
6-7P	1,800	1,550	

	EB	WB	
	2,575	1,450	3-4P
	2,745	1,430	4-5P
	3,075	1,490	5-6P
	2,750	1,550	6-7P

Exit 16							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
325	165	215	1,500	170	305	605	220
425	220	345	1,420	190	320	595	260
530	255	390	1,440	315	315	605	440
425	175	260	1,360	155	305	535	285

390
450
755
440

1,825
1,845
1,970
1,785

SB	
3,170	3-4P
3,520	4-5P
3,695	5-6P
3,735	6-7P

	HOV	GP	NB Tot	
	1,650	4,715	6,365	3-4P
	1,495	5,750	7,245	4-5P
	1,425	5,885	7,310	5-6P
	1,515	5,100	6,615	6-7P

Exit 15								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9
735	185	310	390	140	595	350	240	70
770	240	395	410	165	680	370	240	75
830	275	410	370	215	730	490	345	75
780	230	350	345	180	640	395	245	30

380
405
560
425

495
635
685
580

460
485
445
375

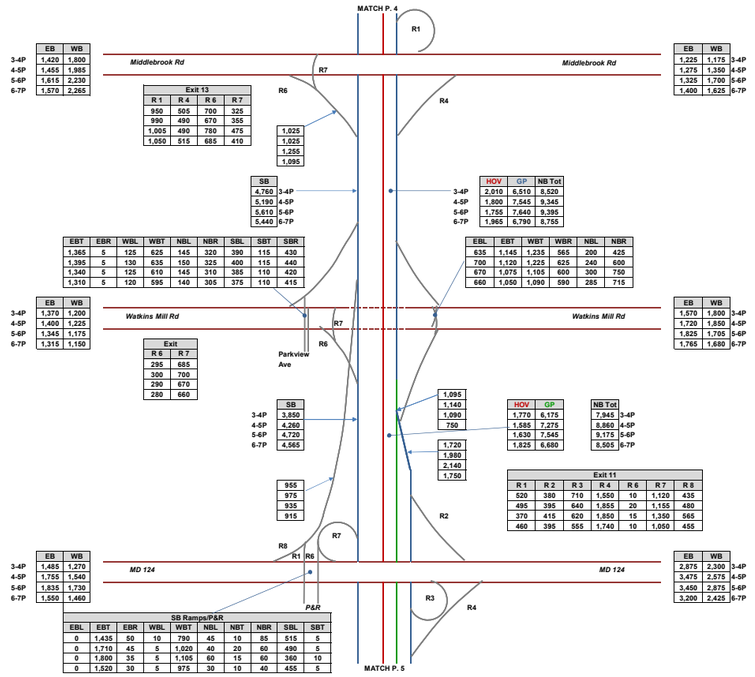
	EB	WB	
3-4P	1,800	1,650	
4-5P	1,875	1,700	
5-6P	2,175	1,925	
6-7P	2,075	1,975	

	EB	WB	
	1,495	1,210	3-4P
	1,450	1,300	4-5P
	1,695	1,515	5-6P
	1,640	1,575	6-7P

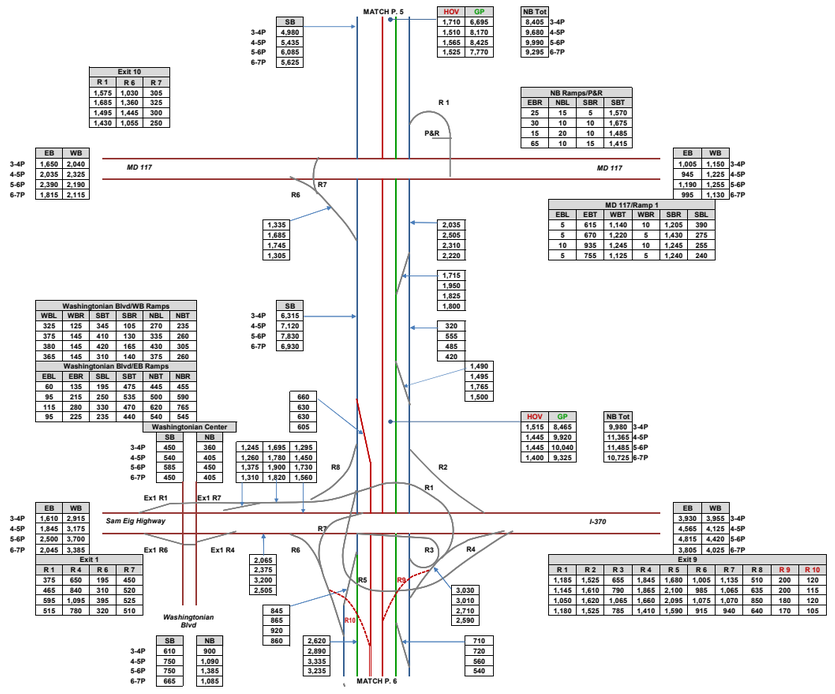
SB	
3,735	3-4P
4,165	4-5P
4,355	5-6P
4,345	6-7P

	HOV	GP	NB Tot	
	1,960	5,105	7,065	3-4P
	1,645	6,220	7,865	4-5P
	1,625	6,275	7,900	5-6P
	1,420	5,770	7,190	6-7P

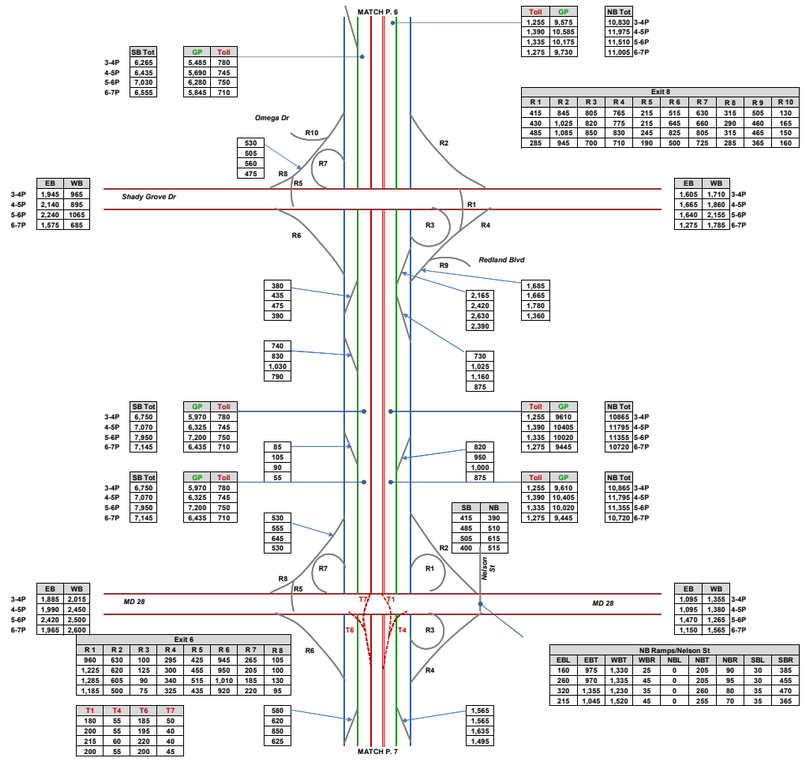
I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



	SB Tot
3-4P	6,265
4-5P	6,435
5-6P	7,030
6-7P	6,555

GP	Toll
5,485	780
5,690	745
6,280	750
5,845	710

Toll	GP
1,255	9,575
1,390	10,585
1,335	10,175
1,275	9,730

NB Tot	
10,830	3-4P
11,975	4-5P
11,510	5-6P
11,005	6-7P

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
415	845	805	765	215	515	630	315	505	130
430	1,025	820	775	215	645	660	290	460	165
485	1,085	850	830	245	825	805	315	465	150
285	945	700	710	190	500	725	285	365	160

	EB	WB
3-4P	1,945	965
4-5P	2,140	895
5-6P	2,240	1065
6-7P	1,575	685

	EB	WB
3-4P	1,605	1,710
4-5P	1,665	1,860
5-6P	1,640	2,155
6-7P	1,275	1,785

530
505
560
475

380
435
475
390

740
830
1,030
790

2,165
2,420
2,630
2,390

1,685
1,665
1,780
1,360

730
1,025
1,160
975

	SB Tot
3-4P	6,750
4-5P	7,070
5-6P	7,950
6-7P	7,145

GP	Toll
5,970	780
6,325	745
7,200	750
6,435	710

Toll	GP
1,255	9610
1,390	10405
1,335	10020
1,275	9445

NB Tot	
10865	3-4P
11795	4-5P
11355	5-6P
10720	6-7P

85
105
90
55

820
950
1,000
875

	SB Tot
3-4P	6,750
4-5P	7,070
5-6P	7,950
6-7P	7,145

GP	Toll
5,970	780
6,325	745
7,200	750
6,435	710

Toll	GP
1,255	9,610
1,390	10,405
1,335	10,020
1,275	9,445

NB Tot	
10,865	3-4P
11,795	4-5P
11,355	5-6P
10,720	6-7P

530
555
645
530

SB	NB
415	390
485	510
505	615
400	515

	EB	WB
3-4P	1,885	2,015
4-5P	1,990	2,450
5-6P	2,420	2,500
6-7P	1,965	2,600

	EB	WB
3-4P	1,095	1,355
4-5P	1,095	1,380
5-6P	1,470	1,265
6-7P	1,150	1,565

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
960	630	100	295	425	945	265	105
1,225	620	125	300	455	950	205	100
1,285	605	90	340	515	1,010	185	130
1,185	500	75	325	435	920	220	95

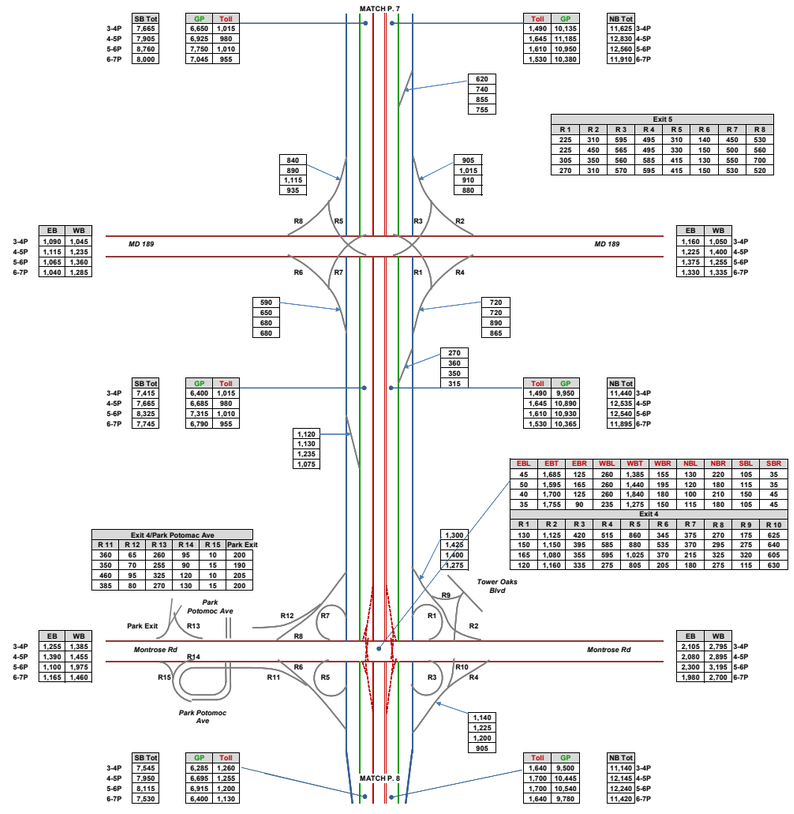
NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
160	975	1,330	25	0	205	90	30	385
260	970	1,335	45	0	205	95	30	455
320	1,355	1,230	35	0	260	80	35	470
215	1,045	1,520	45	0	255	70	35	365

T1	T4	T6	T7
180	55	185	50
200	55	195	40
215	60	220	40
200	55	200	45

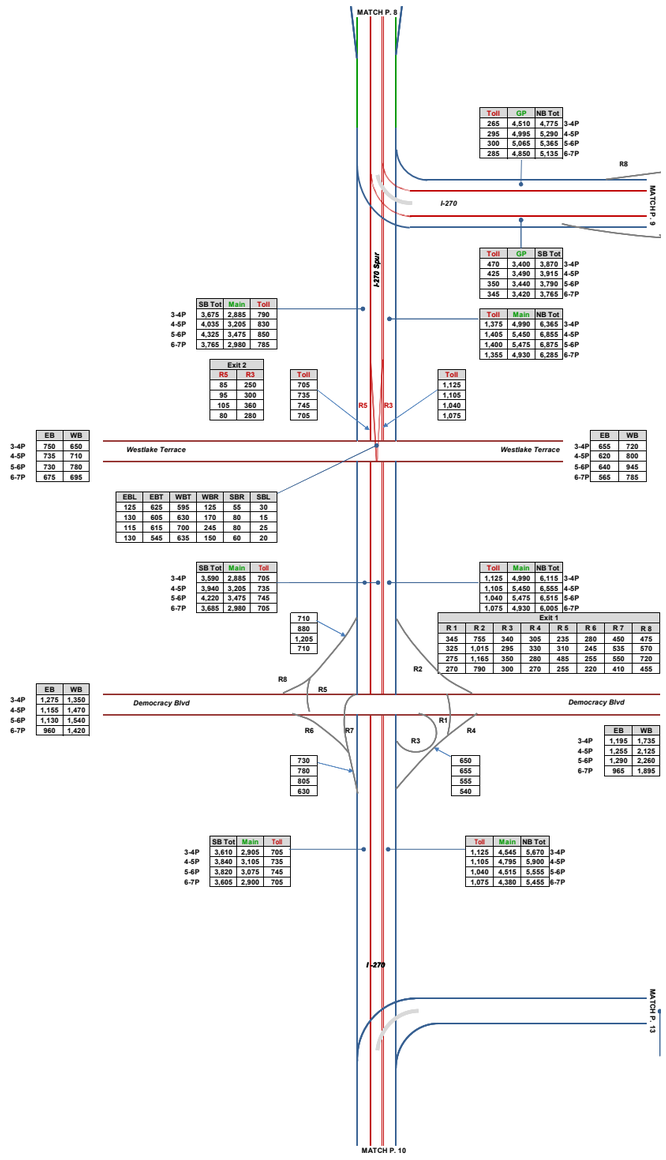
580
620
850
625

1,565
1,565
1,635
1,495

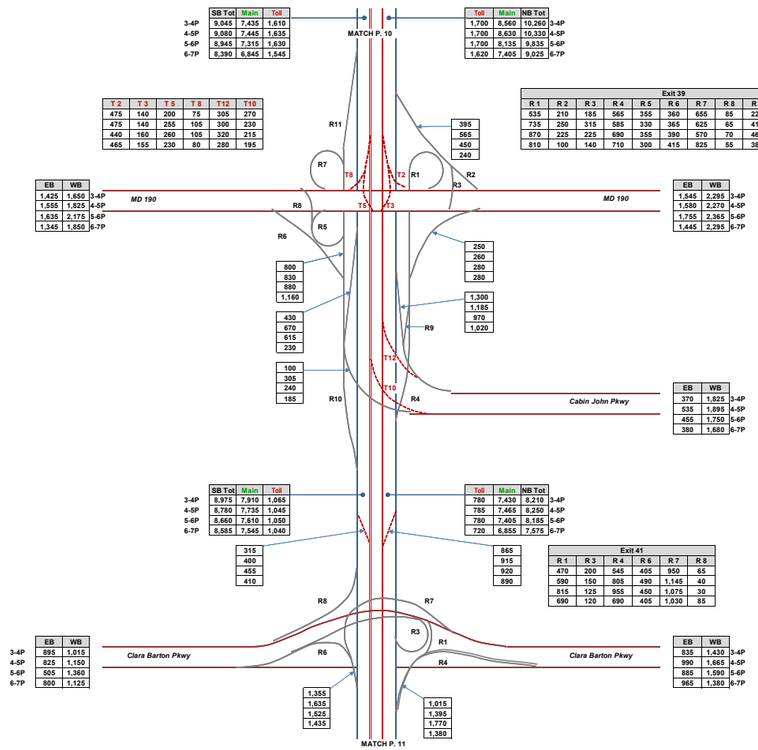
I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



	SB Tot	Main	Toll
3-4P	9,045	7,435	1,610
4-5P	9,080	7,445	1,635
5-6P	8,945	7,315	1,630
6-7P	8,390	6,845	1,545

Toll	Main	NB Tot	
1,700	8,560	10,260	3-4P
1,700	8,630	10,330	4-5P
1,700	8,135	9,835	5-6P
1,620	7,405	9,025	6-7P

T 2	T 3	T 5	T 8	T12	T10
475	140	200	75	305	270
475	140	255	105	300	230
440	160	260	105	320	215
465	155	230	80	280	195

Exit 39										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11
535	210	185	565	355	360	655	85	220	1,490	585
735	250	315	585	330	365	625	65	410	1,560	600
870	225	225	690	355	390	570	70	460	1,645	735
810	100	140	710	300	415	625	55	380	1,620	690

EB	WB	
1,425	1,650	3-4P
1,555	1,825	4-5P
1,635	2,175	5-6P
1,345	1,850	6-7P

EB	WB	
1,545	2,295	3-4P
1,580	2,270	4-5P
1,755	2,365	5-6P
1,445	2,295	6-7P

EB	WB	
370	1,825	3-4P
535	1,895	4-5P
455	1,750	5-6P
380	1,680	6-7P

	SB Tot	Main	Toll
3-4P	8,975	7,910	1,065
4-5P	8,780	7,735	1,045
5-6P	8,660	7,610	1,050
6-7P	8,585	7,545	1,040

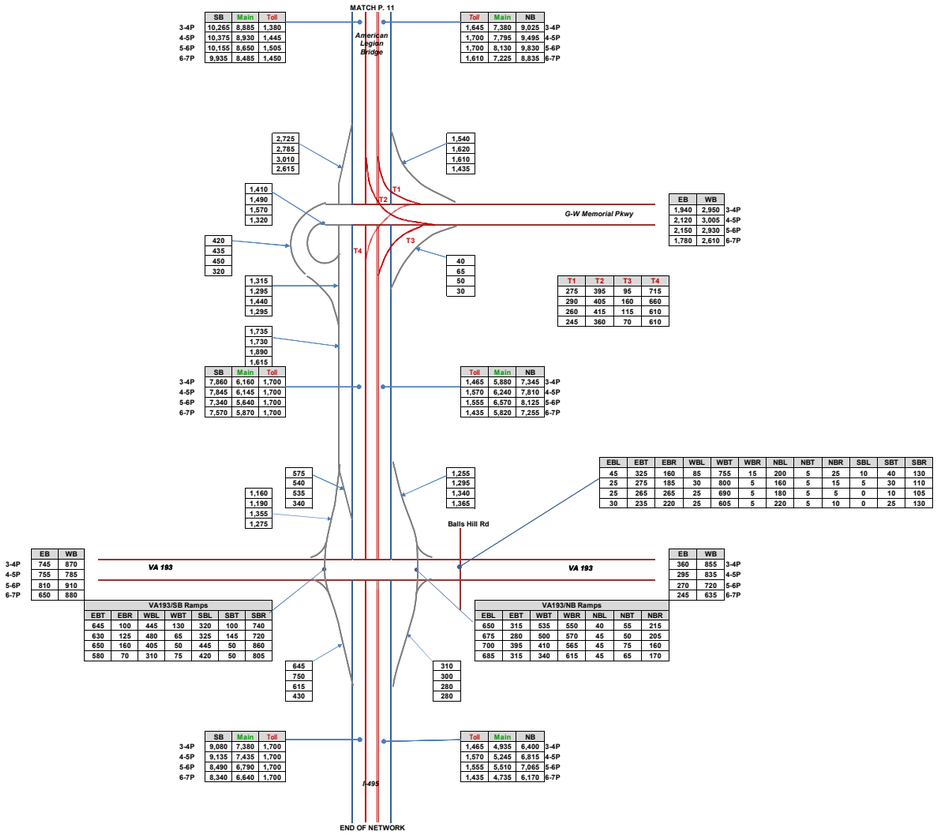
Toll	Main	NB Tot	
780	7,430	8,210	3-4P
785	7,465	8,250	4-5P
780	7,405	8,185	5-6P
720	6,855	7,575	6-7P

Exit 41					
R 1	R 3	R 4	R 6	R 7	R 8
470	200	545	405	950	65
690	150	805	490	1,145	40
815	125	955	450	1,075	30
690	120	690	405	1,030	85

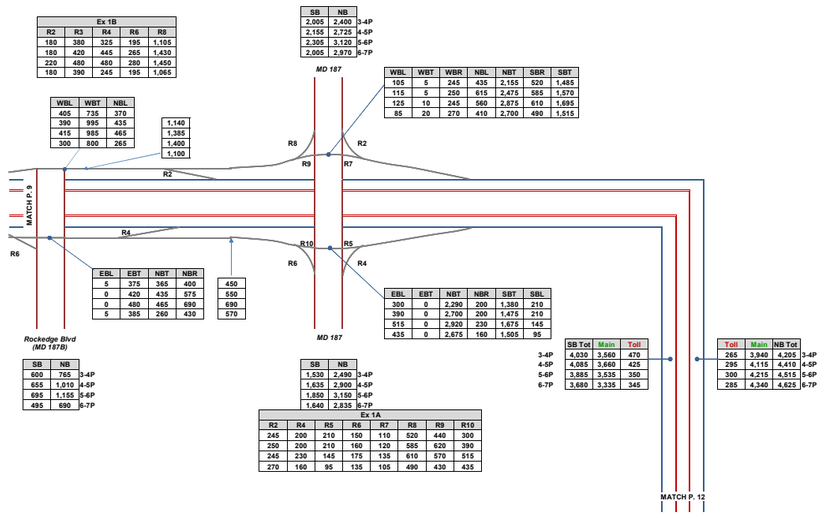
EB	WB	
895	1,015	3-4P
825	1,150	4-5P
505	1,360	5-6P
800	1,125	6-7P

EB	WB	
835	1,430	3-4P
990	1,665	4-5P
885	1,590	5-6P
965	1,380	6-7P

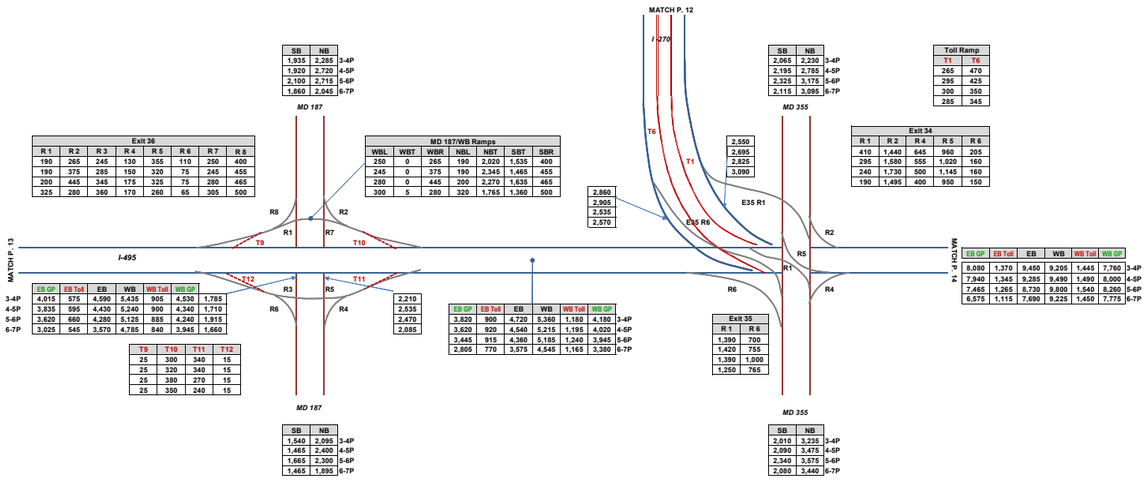
I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 5 Peak Period Volumes



SB	NB	
1,935	2,285	3-4P
1,920	2,729	4-5P
2,100	2,715	5-6P
1,860	2,045	6-7P

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
190	265	245	130	355	110	250	400
190	375	285	150	320	75	245	455
200	445	345	175	325	75	280	465
325	280	360	170	260	65	305	500

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
250	0	265	190	2,020	1,535	400
245	0	375	190	2,345	1,465	455
280	0	445	200	2,270	1,635	465
300	5	280	320	1,765	1,360	500

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,015	575	4,590	5,435	905	4,530	1,785
3,835	595	4,430	5,240	900	4,340	1,710
3,620	660	4,280	5,125	885	4,240	1,915
3,025	545	3,570	4,785	840	3,945	1,660

T9	T10	T11	T12
25	300	340	15
25	320	340	15
25	380	270	15
25	350	240	15

SB	NB	
1,540	2,095	3-4P
1,465	2,400	4-5P
1,665	2,300	5-6P
1,465	1,895	6-7P

2,210
2,535
2,470
2,085

2,860
2,905
2,535
2,570

2,550
2,695
2,825
3,090

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3,820	900	4,720	5,360	1,180	4,180	3-4P
3,620	920	4,540	5,215	1,195	4,020	4-5P
3,445	915	4,360	5,185	1,240	3,945	5-6P
2,805	770	3,575	4,545	1,165	3,380	6-7P

SB	NB	
2,065	2,230	3-4P
2,195	2,785	4-5P
2,325	3,175	5-6P
2,115	3,095	6-7P

Exit 35	
R 1	R 6
1,390	700
1,420	755
1,390	1,000
1,250	765

SB	NB	
2,010	3,235	3-4P
2,090	3,475	4-5P
2,340	3,575	5-6P
2,080	3,440	6-7P

Toll Ramp	
T1	T6
265	470
295	425
300	350
285	345

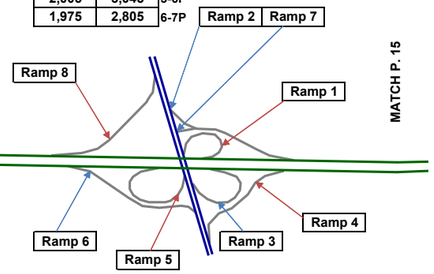
Exit 34					
R 1	R 2	R 4	R 5	R 6	
410	1,440	645	960	205	
295	1,580	555	1,020	160	
240	1,730	500	1,145	160	
190	1,495	400	950	150	

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,080	1,370	9,450	9,205	1,445	7,760	3-4P
7,940	1,345	9,285	9,490	1,490	8,000	4-5P
7,465	1,265	8,730	9,800	1,540	8,260	5-6P
6,575	1,115	7,690	9,225	1,450	7,775	6-7P

I-495 North Side PM
Future Alternative 5 Peak Period Volumes

Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
895	540	300	625	650	610	565	460
915	625	320	640	655	670	660	470
945	630	335	595	655	820	675	420
1,060	540	455	565	645	805	530	420

MD 97		
SB	NB	
1,795	2,405	3-4P
2,015	2,960	4-5P
2,005	3,045	5-6P
1,975	2,805	6-7P



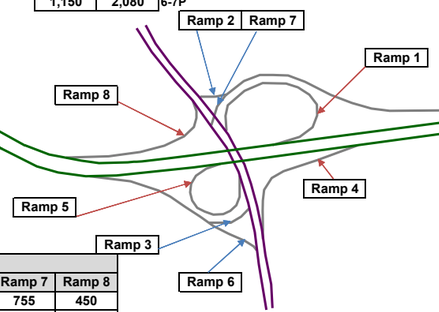
MATCH P. 15

MD 97		
SB	NB	
1,860	3,085	3-4P
2,220	3,570	4-5P
2,425	3,620	5-6P
2,245	3,435	6-7P

MATCH P. 14

MD 185		
SB	NB	
1,530	1,965	3-4P
1,595	2,295	4-5P
1,560	2,360	5-6P
1,150	2,080	6-7P

	I-495				
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,080	1,370	9,450	9,205	1,445	7,760	3-4P
7,940	1,345	9,285	9,490	1,490	8,000	4-5P
7,465	1,265	8,730	9,800	1,540	8,260	5-6P
6,575	1,115	7,690	9,225	1,450	7,775	6-7P



Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
985	385	315	1,600	400	555	755	450
900	460	350	1,625	350	585	840	400
920	480	470	1,690	310	680	820	330
895	295	500	1,665	240	570	775	375

MD 185		
SB	NB	
1,990	3,850	3-4P
2,270	4,010	4-5P
2,420	4,020	5-6P
1,880	3,845	6-7P

	I-495				
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
9,210	1,370	10,580	8,910	1,445	7,465	3-4P
8,980	1,345	10,325	9,490	1,490	8,000	4-5P
8,315	1,265	9,580	9,850	1,540	8,310	5-6P
7,410	1,115	8,525	9,025	1,450	7,575	6-7P

I-495 North Side PM
Future Alternative 5 Peak Period Volumes

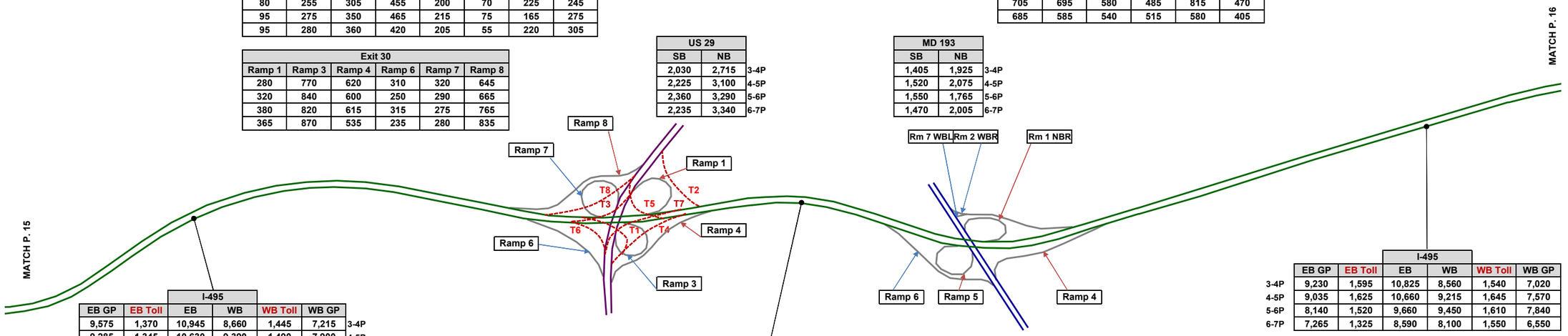
T1	T2	T3	T4	T5	T6	T7	T8
80	225	285	390	190	70	190	240
80	255	305	455	200	70	225	245
95	275	350	465	215	75	165	275
95	280	360	420	205	55	220	305

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
280	770	620	310	320	645
320	840	600	250	290	665
380	820	615	315	275	765
365	870	535	235	280	835

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
475	515	570	465	920	370
670	650	625	490	875	385
705	695	580	485	815	470
685	585	540	515	580	405

US 29		
SB	NB	
2,030	2,715	3-4P
2,225	3,100	4-5P
2,360	3,290	5-6P
2,235	3,340	6-7P

MD 193		
SB	NB	
1,405	1,925	3-4P
1,520	2,075	4-5P
1,550	1,765	5-6P
1,470	2,005	6-7P



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3-4P	9,575	1,370	10,945	8,660	1,445	7,215	3-4P
4-5P	9,285	1,345	10,630	9,390	1,490	7,900	4-5P
5-6P	8,410	1,265	9,675	9,790	1,540	8,250	5-6P
6-7P	7,360	1,115	8,475	8,615	1,450	7,165	6-7P

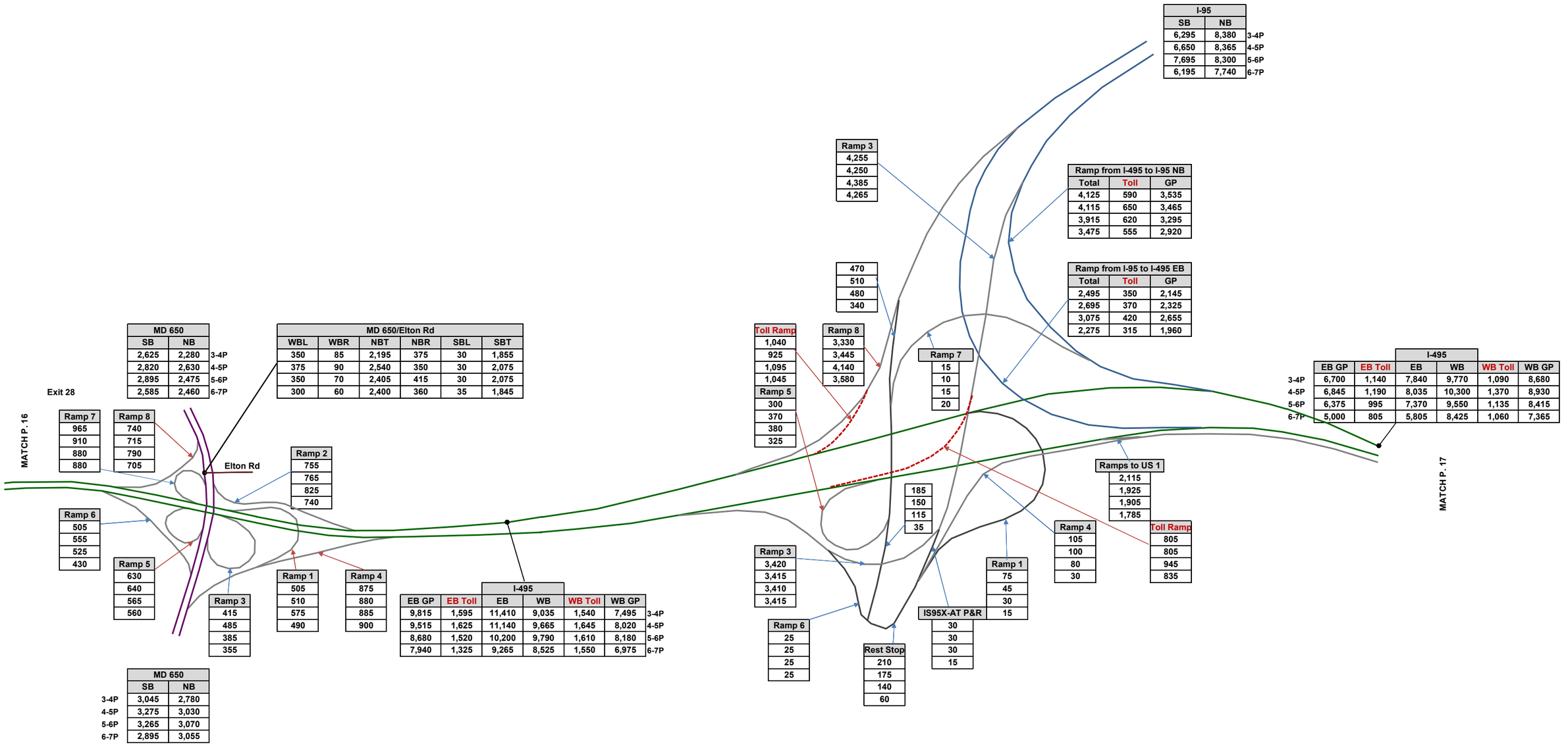
	US 29		
	SB	NB	
3-4P	1,845	2,805	3-4P
4-5P	1,950	3,155	4-5P
5-6P	1,935	3,400	5-6P
6-7P	1,680	3,245	6-7P

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3-4P	9,115	1,595	10,710	8,150	1,540	6,610	3-4P
4-5P	8,795	1,625	10,420	8,850	1,645	7,205	4-5P
5-6P	7,890	1,520	9,410	8,990	1,610	7,380	5-6P
6-7P	6,790	1,325	8,115	7,795	1,550	6,245	6-7P

	MD 193		
	SB	NB	
3-4P	2,230	2,455	3-4P
4-5P	2,290	2,720	4-5P
5-6P	2,350	2,355	5-6P
6-7P	1,940	2,645	6-7P

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3-4P	9,230	1,595	10,825	8,560	1,540	7,020	3-4P
4-5P	9,035	1,625	10,660	9,215	1,645	7,570	4-5P
5-6P	8,140	1,520	9,660	9,450	1,610	7,840	5-6P
6-7P	7,265	1,325	8,590	8,100	1,550	6,550	6-7P

I-495 North Side PM
Future Alternative 5 Peak Period Volumes



I-495 North East Side PM
Future Alternative 5 Peak Period Volumes

	I-495				
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,700	1,140	7,840	9,770	1,090	8,680	3-4P
6,845	1,190	8,035	10,300	1,370	8,930	4-5P
6,375	995	7,370	9,550	1,135	8,415	5-6P
5,000	805	5,805	8,425	1,060	7,365	6-7P

MATCH P. 17

Ramp 10
2,220
2,025
1,985
1,815

US 1		
SB	NB	
1,530	1,705	3-4P
1,630	1,840	4-5P
1,850	2,030	5-6P
1,780	1,445	6-7P

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,495	35	1230	755	445	100	475	150
1,600	30	1355	765	415	70	485	140
1,815	35	1620	890	350	70	410	125
1,760	20	1010	805	405	55	435	85

Ramp 8 · IKEA · Ramp 1 · Ramp 7 · Ramp 6 · Ramp 4 · Ramp 5 · Ramp 3

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
755	500	450	465	960	1,020	620
765	565	455	470	1065	970	605
890	565	520	460	1020	830	580
805	355	505	490	685	895	550

Edgewood Rd

US 1		
SB	NB	
1,805	1,725	3-4P
1,930	1,820	4-5P
2,030	2,235	5-6P
1,685	1,780	6-7P

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,375	1,140	9,515	9,415	1,090	8,325
4-5P	8,165	1,190	9,355	9,900	1,370	8,530
5-6P	7,755	995	8,750	8,910	1,135	7,775
6-7P	6,770	805	7,575	7,965	1,060	6,905

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	905	1640	85	95	270	20	135	805
10	90	980	1,740	80	80	210	50	145	870
10	90	1,150	2,125	110	75	240	90	125	805
15	130	1,065	1,700	80	95	230	20	140	525

T2 · T1 · T3 · Greenbelt Commuter Station · T4

530
595
625
565

590
530
560
505

810
860
905
840

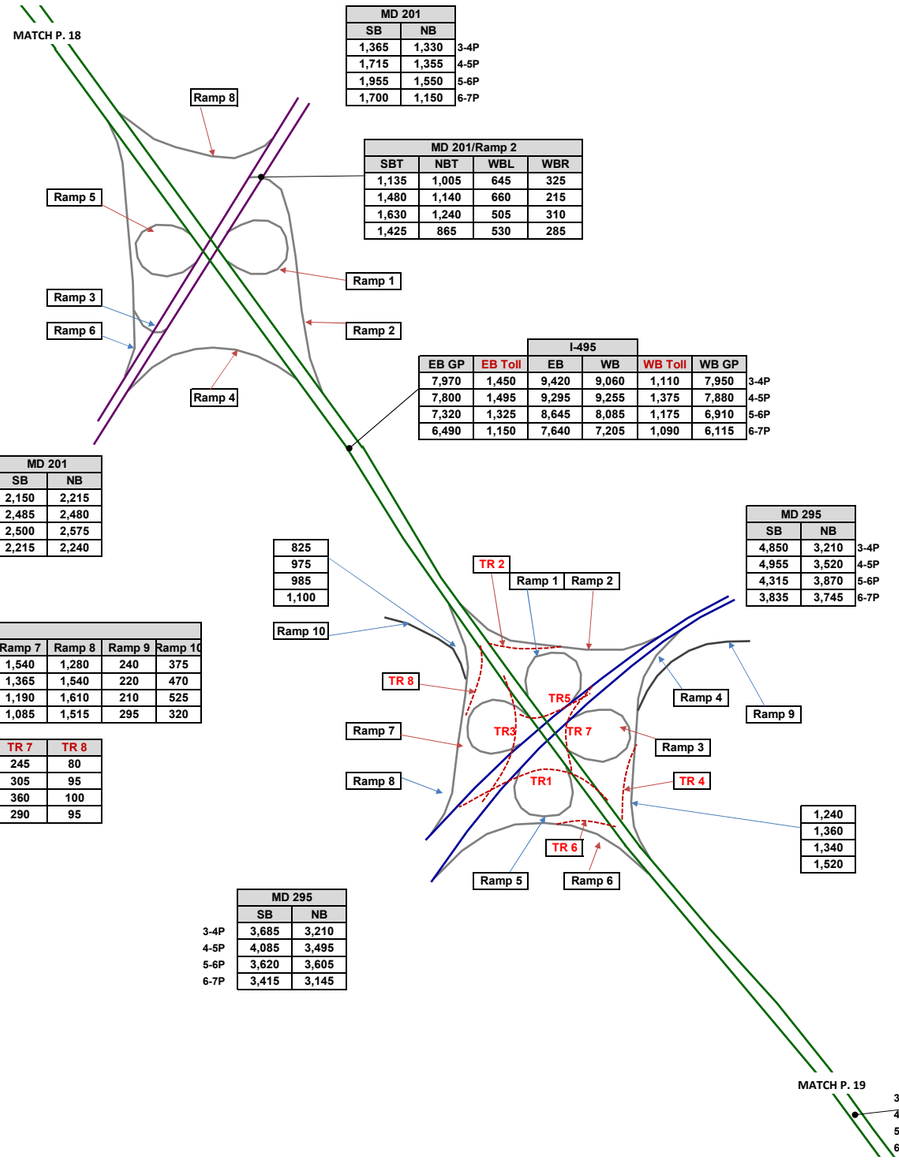
470
495
520
480

T1	T2	T3	T4
105	220	240	415
120	235	240	425
125	245	285	455
115	225	255	460

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,005	1,450	9,455	9,195	1,110	8,085
4-5P	7,760	1,495	9,255	9,570	1,375	8,195
5-6P	7,320	1,325	8,645	8,565	1,175	7,390
6-7P	6,340	1,150	7,490	7,630	1,090	6,540

MATCH P. 18

I-495 North East Side PM
Future Alternative 5 Peak Period Volumes



MD 201		
SB	NB	
1,365	1,330	3-4P
1,715	1,355	4-5P
1,955	1,550	5-6P
1,700	1,150	6-7P

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
1,135	1,005	645	325
1,480	1,140	660	215
1,630	1,240	505	310
1,425	865	530	285

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
875	970	415	750	650	1,020	230
955	875	400	785	710	1,055	235
970	815	350	715	710	1,075	325
965	815	260	670	695	955	275

	I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,970	1,450	9,420	9,060	1,110	7,950	3-4P
7,800	1,495	9,295	9,255	1,375	7,880	4-5P
7,320	1,325	8,645	8,085	1,175	6,910	5-6P
6,490	1,150	7,640	7,205	1,090	6,115	6-7P

MD 201		
SB	NB	
2,150	2,215	3-4P
2,485	2,480	4-5P
2,500	2,575	5-6P
2,215	2,240	6-7P

MD 295		
SB	NB	
4,850	3,210	3-4P
4,955	3,520	4-5P
4,315	3,870	5-6P
3,835	3,745	6-7P

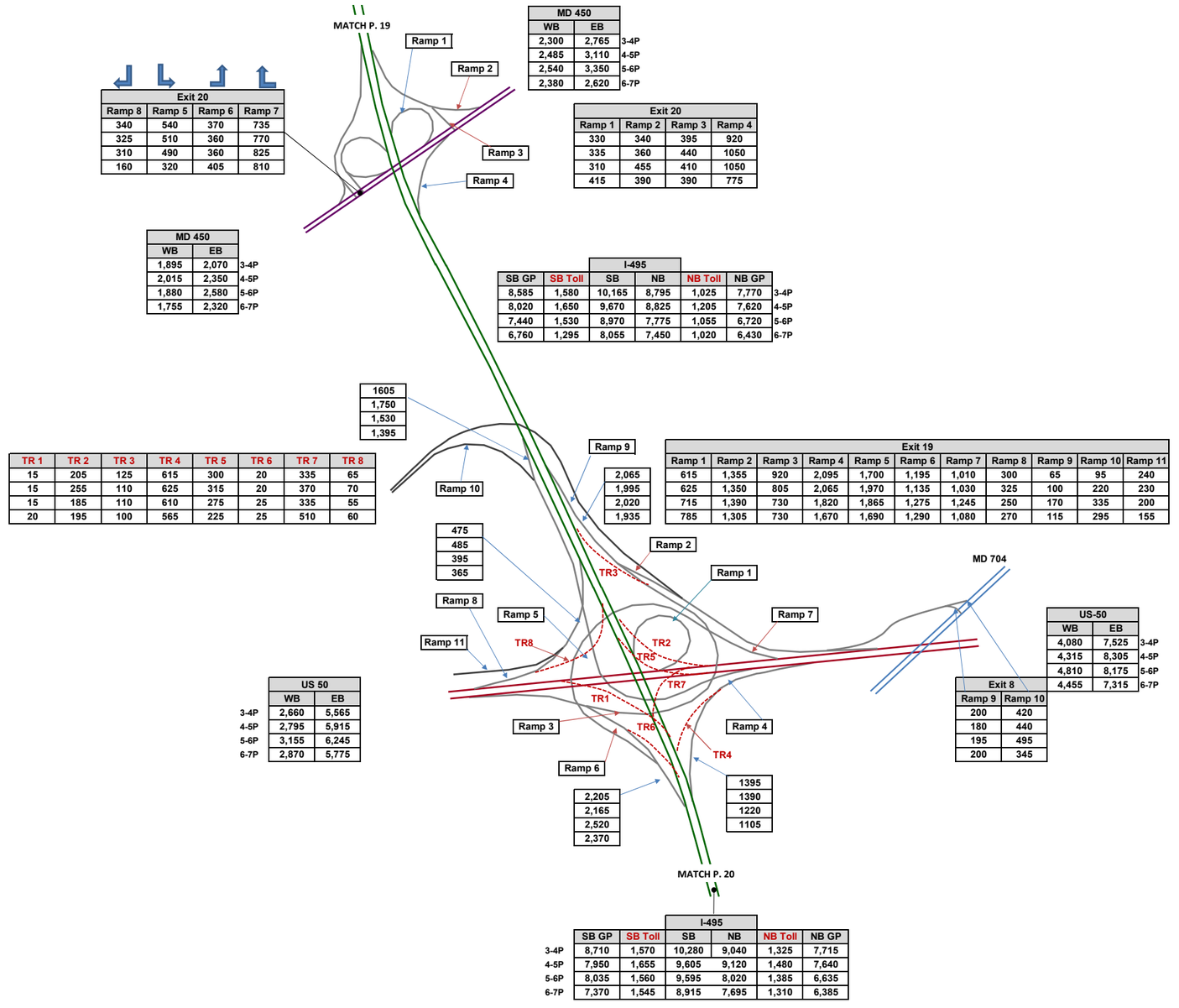
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
45	715	1,375	1,145	355	30	1,540	1,280	240	375
35	780	1,605	1,270	490	25	1,365	1,540	220	470
30	790	1,400	1,280	490	20	1,190	1,610	210	525
40	605	1,160	1,390	475	25	1,085	1,515	295	320

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
10	110	130	145	45	10	245	80
5	145	160	130	60	5	305	95
5	135	140	150	60	5	360	100
5	110	130	165	55	5	290	95

MD 295		
SB	NB	
3,685	3,210	3-4P
4,085	3,495	4-5P
3,620	3,605	5-6P
3,415	3,145	6-7P

	I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,360	1,580	9,940	8,280	1,025	7,255	3-4P
7,725	1,650	9,375	8,240	1,205	7,035	4-5P
7,055	1,530	8,585	7,280	1,055	6,225	5-6P
6,025	1,295	7,320	7,040	1,020	6,020	6-7P

I-495 North East Side PM
Future Alternative 5 Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
340	540	370	735
325	510	360	770
310	490	360	825
160	320	405	810

MD 450		
WB	EB	
2,300	2,765	3-4P
2,485	3,110	4-5P
2,540	3,350	5-6P
2,380	2,620	6-7P

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
330	340	395	920
335	360	440	1050
310	455	410	1050
415	390	390	775

MD 450		
WB	EB	
1,895	2,070	3-4P
2,015	2,350	4-5P
1,880	2,580	5-6P
1,755	2,320	6-7P

	I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,585	1,580	10,165	8,795	1,025	7,770	3-4P
8,020	1,650	9,670	8,825	1,205	7,620	4-5P
7,440	1,530	8,970	7,775	1,055	6,720	5-6P
6,760	1,295	8,055	7,450	1,020	6,430	6-7P

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
15	205	125	615	300	20	335	65
15	255	110	625	315	20	370	70
15	185	110	610	275	25	335	55
20	195	100	565	225	25	510	60

1605
1,750
1,530
1,395

2,065
1,995
2,020
1,935

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
615	1,355	920	2,095	1,700	1,195	1,010	300	65	95	240
625	1,350	805	2,065	1,970	1,135	1,030	325	100	220	230
715	1,390	730	1,820	1,865	1,275	1,245	250	170	335	200
785	1,305	730	1,670	1,690	1,290	1,080	270	115	295	155

475
485
395
365

2,205
2,165
2,520
2,370

1395
1390
1220
1105

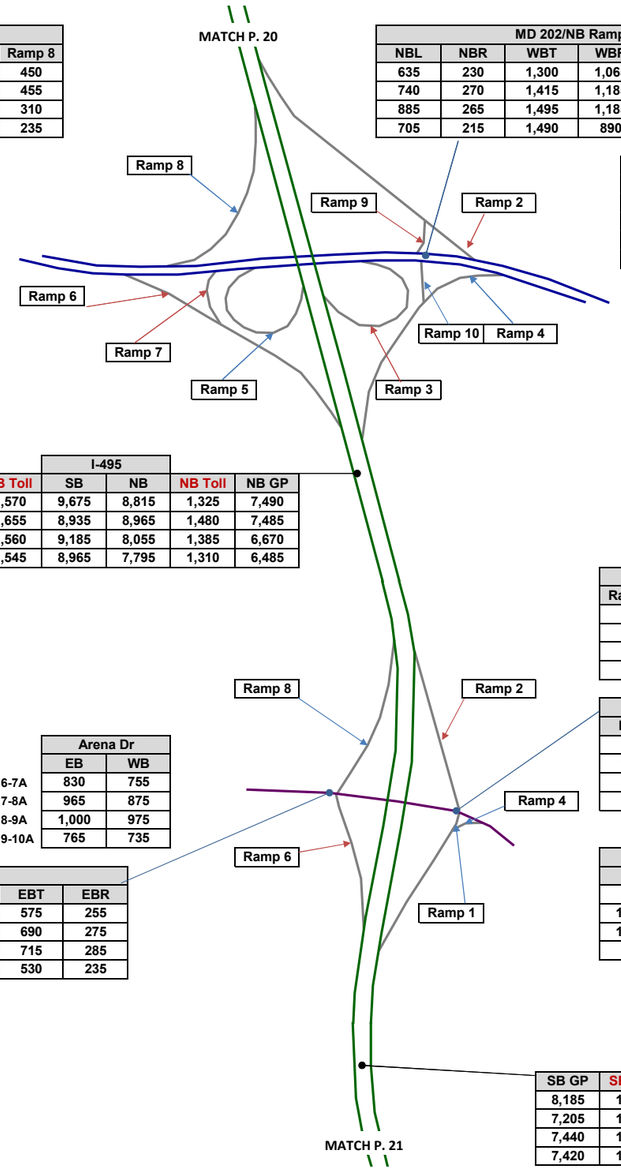
US 50		
WB	EB	
2,660	5,565	3-4P
2,795	5,915	4-5P
3,155	6,245	5-6P
2,870	5,775	6-7P

US-50		
WB	EB	
4,080	7,525	3-4P
4,315	8,305	4-5P
4,810	8,175	5-6P
4,455	7,315	6-7P

Exit 8	
Ramp 9	Ramp 10
200	420
180	440
195	495
200	345

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	8,710	1,570	10,280	9,040	1,325	7,715
4-5P	7,950	1,655	9,605	9,120	1,480	7,640
5-6P	8,035	1,560	9,595	8,020	1,385	6,635
6-7P	7,370	1,545	8,915	7,695	1,310	6,385

I-495 East Side PM
Future Alternative 5 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
970	565	250	450
1,035	595	225	455
1,050	645	305	310
765	660	390	235

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
635	230	1,300	1,065	15	2,230
740	270	1,415	1,185	10	2,570
885	265	1,495	1,185	20	2,655
705	215	1,490	890	15	2,320

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,065	240	230	15	865
1,185	205	235	10	1,010
1,185	155	245	20	1,150
890	150	235	15	920

MD 202		
EB	WB	
2,080	2,135	6-7A
2,345	2,385	7-8A
2,425	2,385	8-9A
2,380	2,040	9-10A

MD 202		
EB	WB	
2,690	2,365	6-7A
3,075	2,600	7-8A
3,165	2,680	8-9A
2,770	2,380	9-10A

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
8,105	1,570	9,675	8,815	1,325	7,490
7,280	1,655	8,935	8,965	1,480	7,485
7,625	1,560	9,185	8,055	1,385	6,670
7,420	1,545	8,965	7,795	1,310	6,485

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
165	415	310	550	470
185	440	315	660	735
185	410	355	710	895
190	370	285	495	495

Arena Dr		
EB	WB	
830	755	6-7A
965	875	7-8A
1,000	975	8-9A
765	735	9-10A

MD 214/NB Ramps							
NBL	NBT	NBR	WBT	WBR	EBL	EBT	
165	0	310	705	200	215	650	6-7A
185	0	315	740	200	240	850	7-8A
175	10	355	795	180	220	960	8-9A
185	5	285	640	145	220	635	9-10A

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
290	5	175	290	580	575	255
400	120	215	265	660	690	275
465	150	280	275	695	715	285
325	25	145	235	590	530	235

Arena Dr	
EB	WB
960	905
1,165	940
1,315	975
920	785

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
8,185	1,570	9,755	8,875	1,325	7,550
7,205	1,655	8,860	9,025	1,480	7,545
7,440	1,560	9,000	8,185	1,385	6,800
7,420	1,545	8,965	7,900	1,310	6,590

6-7A
7-8A
8-9A
9-10A

I-495 East Side PM
Future Alternative 5 Peak Period Volumes

Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	440	820	1,180	555	305	455	265	365
810	445	810	1,335	585	460	370	295	420
780	365	760	1,395	605	390	365	215	505
770	330	750	1,215	735	425	360	205	315

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
265	515	1,605	2,015	305
295	810	1,565	2,350	460
215	780	1,635	2,630	390
205	770	1,260	2,275	425

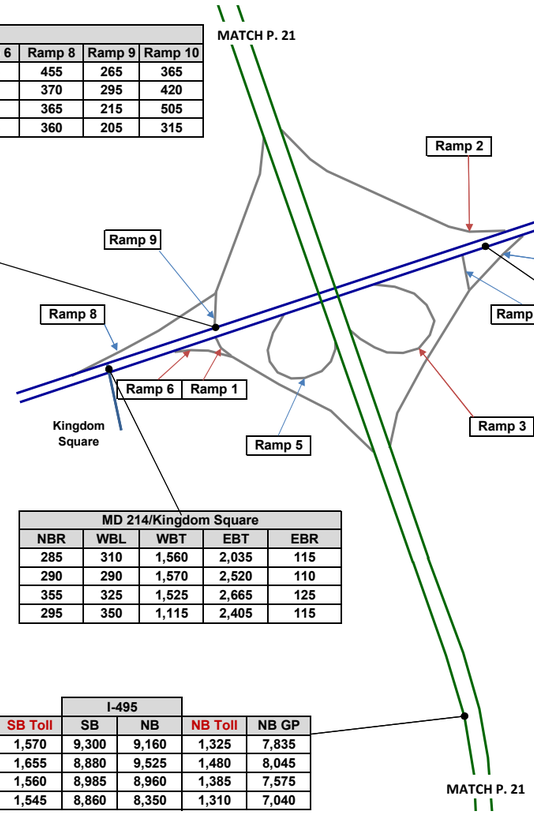
MD 214		
	EB	WB
6-7A	2,150	2,015
7-8A	2,630	1,940
8-9A	2,790	1,890
9-10A	2,520	1,475

MD 214		
	EB	WB
6-7A	2,930	2,195
7-8A	3,460	2,400
8-9A	3,870	2,275
9-10A	3,475	2,045

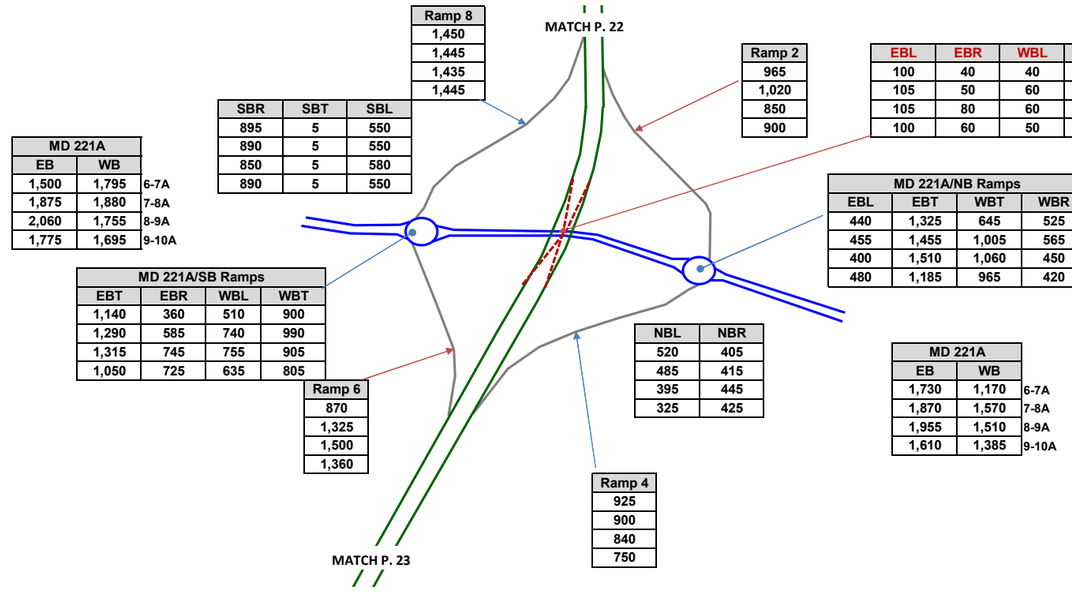
MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
365	1,180	1,755	440	1,750
420	1,335	1,955	445	2,125
505	1,395	1,910	365	2,475
315	1,215	1,715	330	2,260

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
285	310	1,560	2,035	115
290	290	1,570	2,520	110
355	325	1,525	2,665	125
295	350	1,115	2,405	115

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,730	1,570	9,300	9,160	1,325	7,835
7-8A	7,225	1,655	8,880	9,525	1,480	8,045
8-9A	7,425	1,560	8,985	8,960	1,385	7,575
9-10A	7,315	1,545	8,860	8,350	1,310	7,040



I-495 East Side PM
Future Alternative 5 Peak Period Volumes



Ramp 8
1,450
1,445
1,435
1,445

SBR	SBT	SBL
895	5	550
890	5	550
850	5	580
890	5	550

MD 221A		
EB	WB	
1,500	1,795	6-7A
1,875	1,880	7-8A
2,060	1,755	8-9A
1,775	1,695	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,140	360	510	900
1,290	585	740	990
1,315	745	755	905
1,050	725	635	805

Ramp 6
870
1,325
1,500
1,360

Ramp 2
965
1,020
850
900

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
100	40	40	105	65	50	165	325
105	50	60	105	65	50	175	340
105	80	60	110	50	50	150	325
100	60	50	120	45	50	175	275

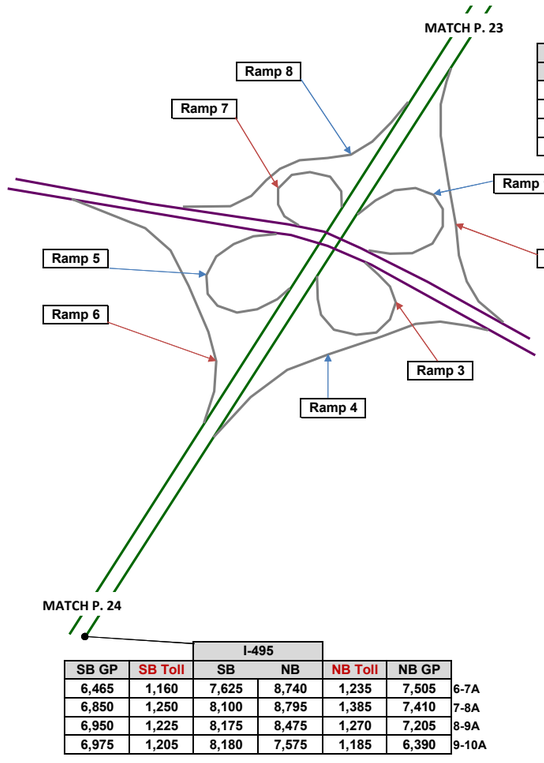
MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
440	1,325	645	525
455	1,455	1,005	565
400	1,510	1,060	450
480	1,185	965	420

NBL	NBR
520	405
485	415
395	445
325	425

Ramp 4
925
900
840
750

MD 221A		
EB	WB	
1,730	1,170	6-7A
1,870	1,570	7-8A
1,955	1,510	8-9A
1,610	1,385	9-10A

I-495 East Side PM
Future Alternative 5 Peak Period Volumes



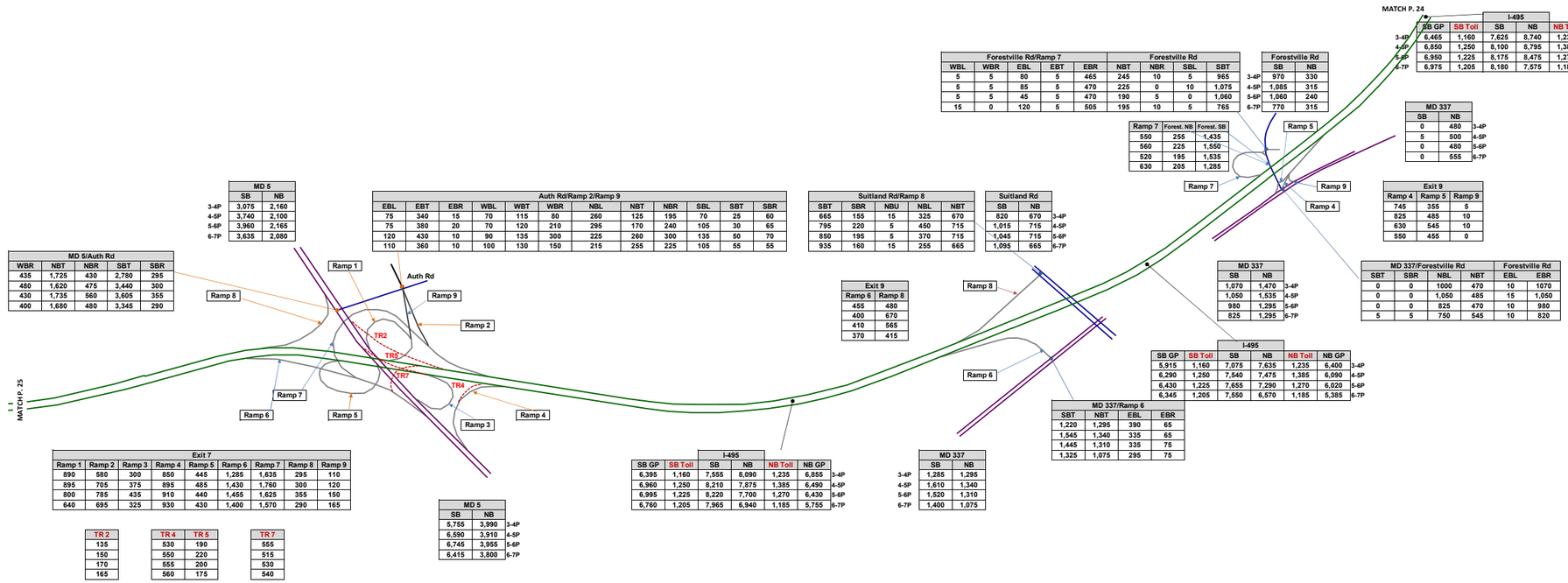
MD 4		
SB	NB	
2,325	1,935	6-7A
2,665	2,025	7-8A
2,715	2,020	8-9A
2,540	1,785	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
700	1,210	825	1,045	1,120	555	730	850
770	1,230	890	835	1,050	810	845	860
750	1,050	875	815	990	660	700	910
695	965	960	730	875	845	680	905

	MD 4	
	SB	NB
6-7A	3,110	2,325
7-8A	2,850	2,470
8-9A	2,985	2,110
9-10A	2,340	1,830

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,465	1,160	7,625	8,740	1,235	7,505	6-7A
6,850	1,250	8,100	8,795	1,385	7,410	7-8A
6,950	1,225	8,175	8,475	1,270	7,205	8-9A
6,975	1,205	8,180	7,575	1,185	6,390	9-10A

I-495 South Side PM
Future Alternative 5 Peak Period Volumes



MD 5	
SB	NB
3,075	2,160
3,740	2,100
3,960	2,165
3,635	2,080

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
435	1,725	430	2,780	295
480	1,620	475	3,440	300
430	1,735	560	3,605	355
400	1,680	480	3,345	290

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
75	340	15	70	115	80	260	125	195	70	25	60
75	380	20	70	120	210	295	170	240	105	30	65
120	430	10	90	135	300	225	260	300	135	50	70
110	360	10	100	130	150	215	255	225	105	55	55

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
890	580	300	850	445	1,285	1,635	295	110
895	705	375	895	485	1,430	1,760	300	120
800	785	435	910	440	1,455	1,625	355	150
640	695	325	930	430	1,400	1,570	290	165

TR 2
135
150
170
165

TR 4	TR 5
530	190
550	220
555	200
560	175

TR 7
555
515
530
540

MD 5		
SB	NB	
5,755	3,990	3-4P
6,590	3,910	4-5P
6,745	3,955	5-6P
6,415	3,800	6-7P

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
665	155	15	325	670
795	220	5	450	715
850	195	5	370	715
935	160	15	255	665

Suitland Rd		
SB	NB	
820	670	3-4P
1,015	715	4-5P
1,045	715	5-6P
1,095	665	6-7P

Exit 9	
Ramp 6	Ramp 8
455	480
400	670
410	565
370	415

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,395	1,160	7,555	8,090	1,235	6,855
6,960	1,250	8,210	7,875	1,385	6,490
6,995	1,225	8,220	7,700	1,270	6,430
6,760	1,205	7,965	6,940	1,185	5,755

	MD 337	
	SB	NB
3-4P	1,285	1,295
4-5P	1,610	1,340
5-6P	1,520	1,310
6-7P	1,400	1,075

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
5	5	80	5	465	245	10	5	965
5	5	85	5	470	225	0	10	1,075
5	5	45	5	470	190	5	0	1,060
15	0	120	5	505	195	10	5	765

	Forestville Rd	
	SB	NB
3-4P	970	330
4-5P	1,085	315
5-6P	1,060	240
6-7P	770	315

Ramp 7	Forest. NB	Forest. SB
550	255	1,435
560	225	1,550
520	195	1,535
630	205	1,285

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,465	1,160	7,625	8,740	1,235	7,505
6,850	1,250	8,100	8,795	1,385	7,410
6,950	1,225	8,175	8,475	1,270	7,205
6,975	1,205	8,180	7,575	1,185	6,390

MD 337	
SB	NB
0	480
5	500
0	480
0	555

Exit 9		
Ramp 4	Ramp 5	Ramp 9
745	355	5
825	485	10
630	545	10
550	455	0

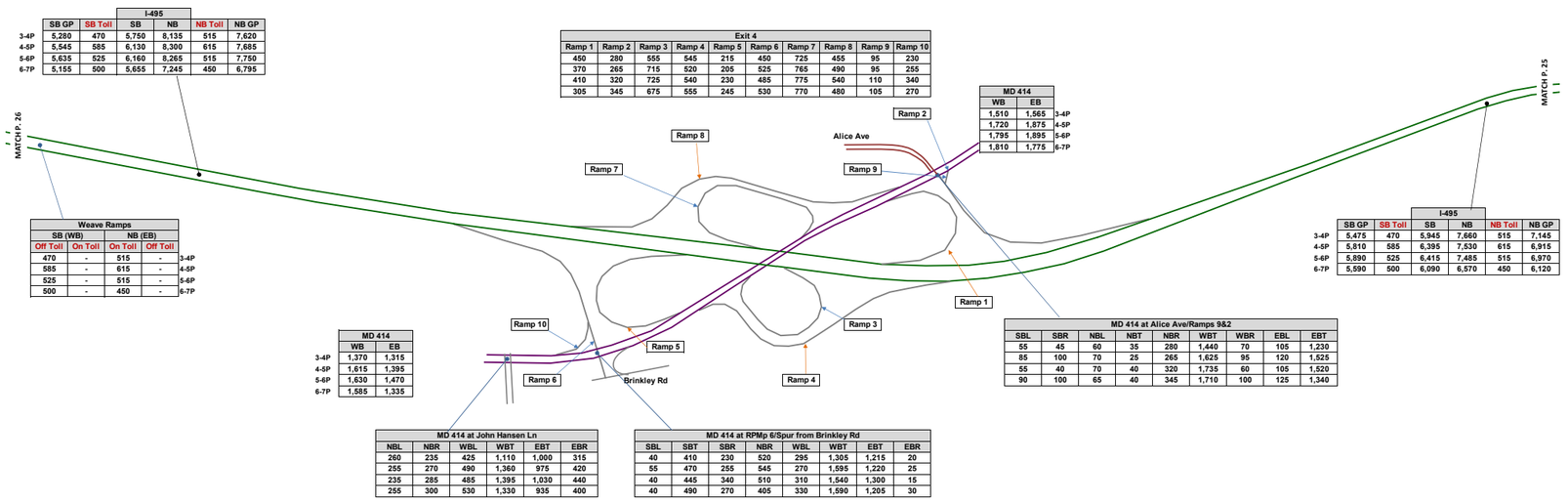
MD 337	
SB	NB
1,070	1,470
1,050	1,535
980	1,295
825	1,295

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	1000	470	10	1070
0	0	1,050	485	15	1,050
0	0	825	470	10	980
5	5	750	545	10	820

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,915	1,160	7,075	7,635	1,235	6,400
6,290	1,250	7,540	7,475	1,385	6,090
6,430	1,225	7,655	7,290	1,270	6,020
6,345	1,205	7,550	6,570	1,185	5,385

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,295	390	65
1,545	1,340	335	65
1,445	1,310	335	75
1,325	1,075	295	75

I-495 South Side PM
Future Alternative 5 Peak Period Volumes



	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,280	470	5,750	8,135	515	7,620
4-5P	5,545	585	6,130	8,300	615	7,685
5-6P	5,635	525	6,160	8,265	515	7,750
6-7P	5,155	500	5,655	7,245	450	6,795

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
450	280	555	545	215	450	725	455	95	230
370	265	715	520	205	525	765	490	95	255
410	320	725	540	230	485	775	540	110	340
305	345	675	555	245	530	770	480	105	270

MD 414		
WB	EB	
1,510	1,565	3-4P
1,720	1,875	4-5P
1,795	1,895	5-6P
1,810	1,775	6-7P

Weave Ramps				
SB (WB)		NB (EB)		
Off Toll	On Toll	On Toll	Off Toll	
470	-	515	-	3-4P
585	-	615	-	4-5P
525	-	515	-	5-6P
500	-	450	-	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,475	470	5,945	7,660	515	7,145
4-5P	5,810	585	6,395	7,530	615	6,915
5-6P	5,890	525	6,415	7,485	515	6,970
6-7P	5,590	500	6,090	6,570	450	6,120

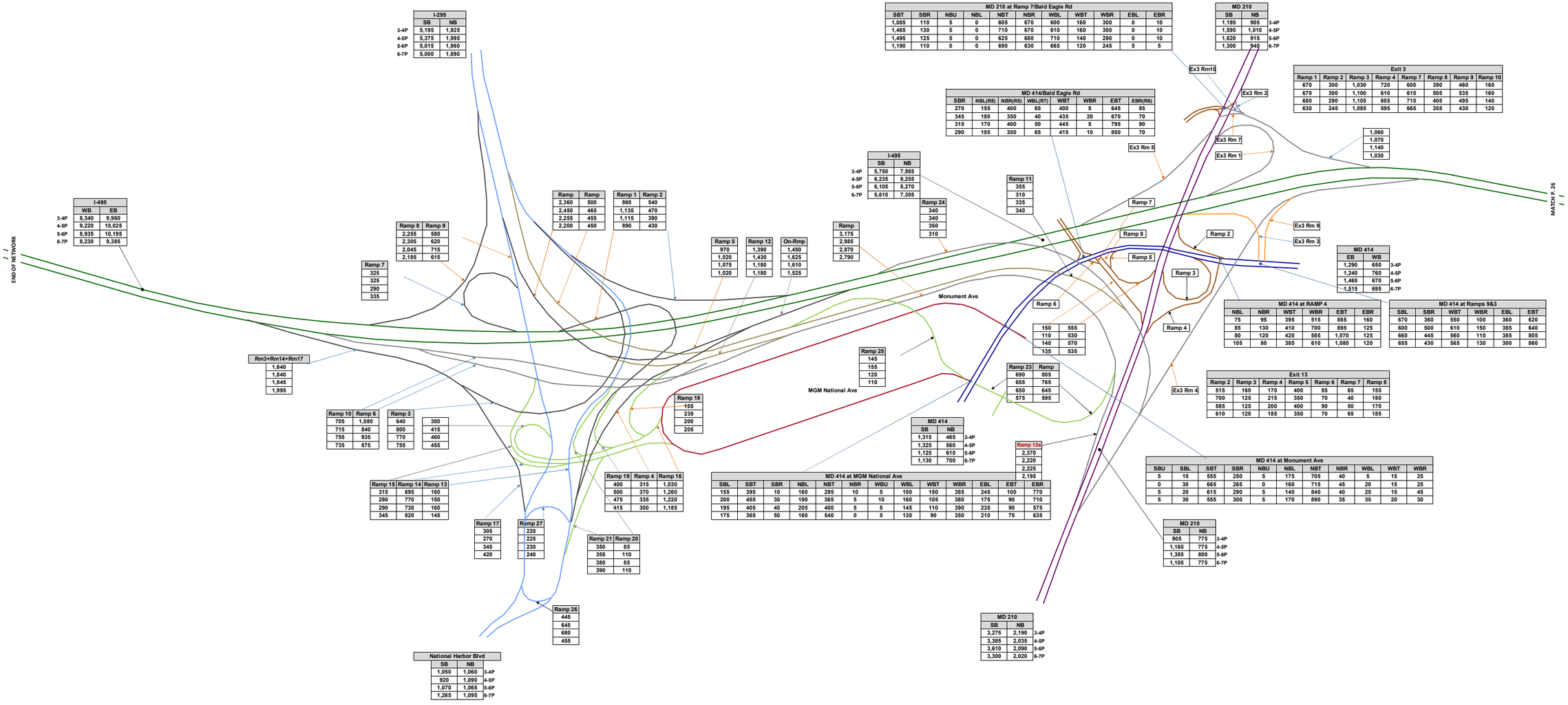
MD 414		
WB	EB	
1,370	1,315	3-4P
1,615	1,395	4-5P
1,630	1,470	5-6P
1,585	1,335	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
55	45	60	35	280	1,440	70	105	1,230
85	100	70	25	265	1,625	95	120	1,525
55	40	70	40	320	1,735	60	105	1,520
90	100	65	40	345	1,710	100	125	1,340

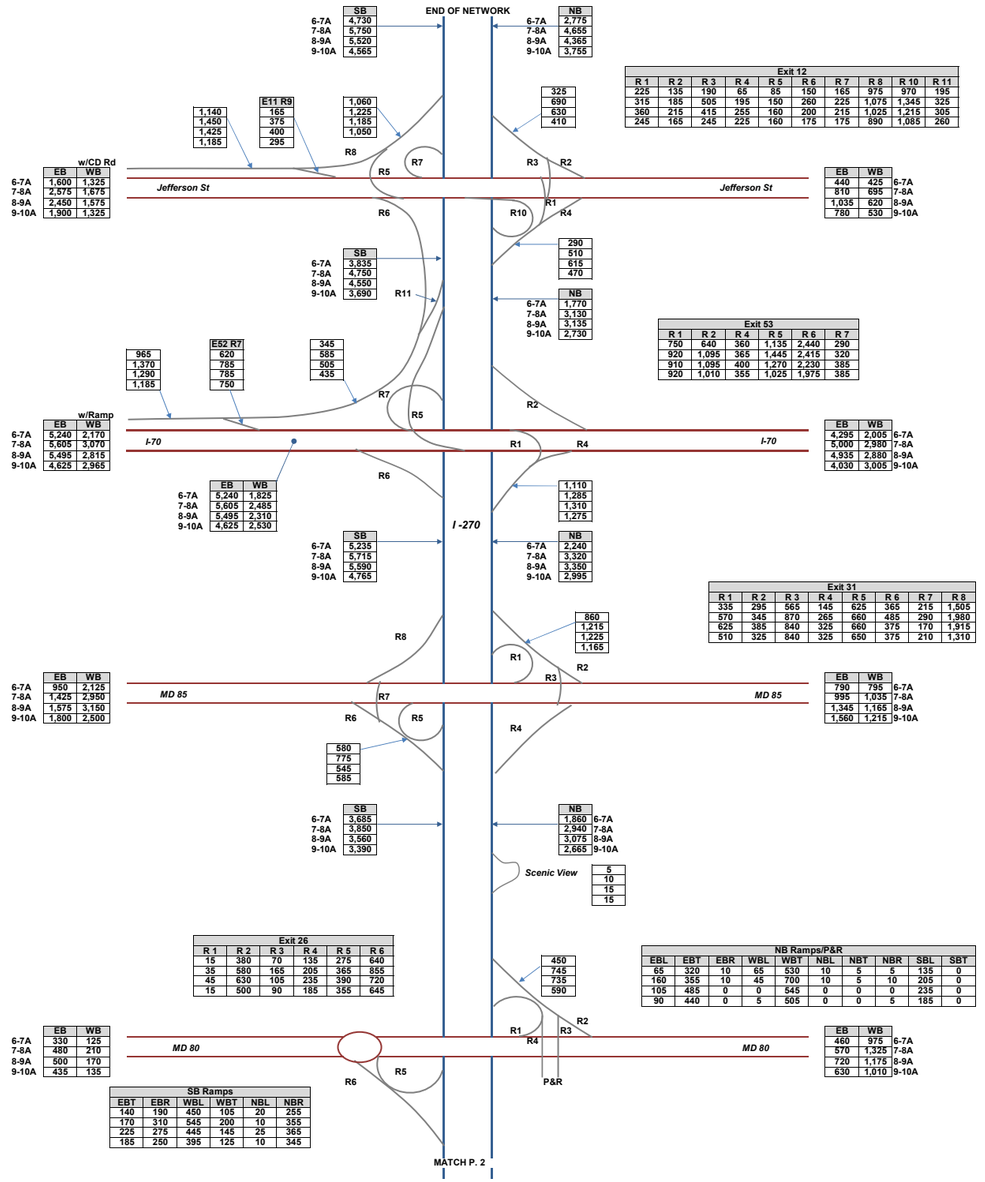
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
260	235	425	1,110	1,000	315
255	270	490	1,360	975	420
235	285	485	1,395	1,030	440
255	300	530	1,330	935	400

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
40	410	230	520	295	1,305	1,215	20
55	470	255	545	270	1,595	1,220	25
40	445	340	510	310	1,540	1,300	15
40	490	270	405	330	1,590	1,205	30

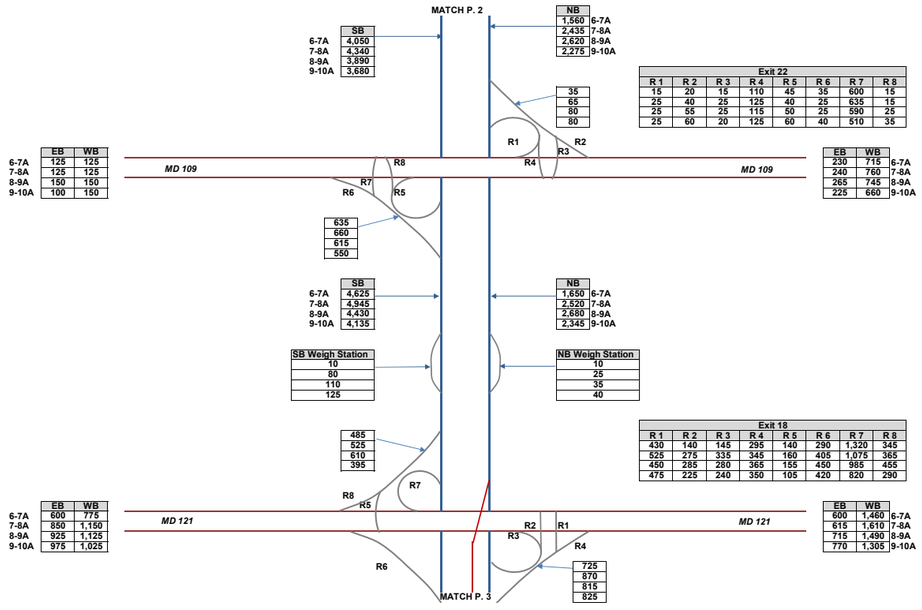
I-495 South Side PM
Future Alternative 5 Peak Period Volumes



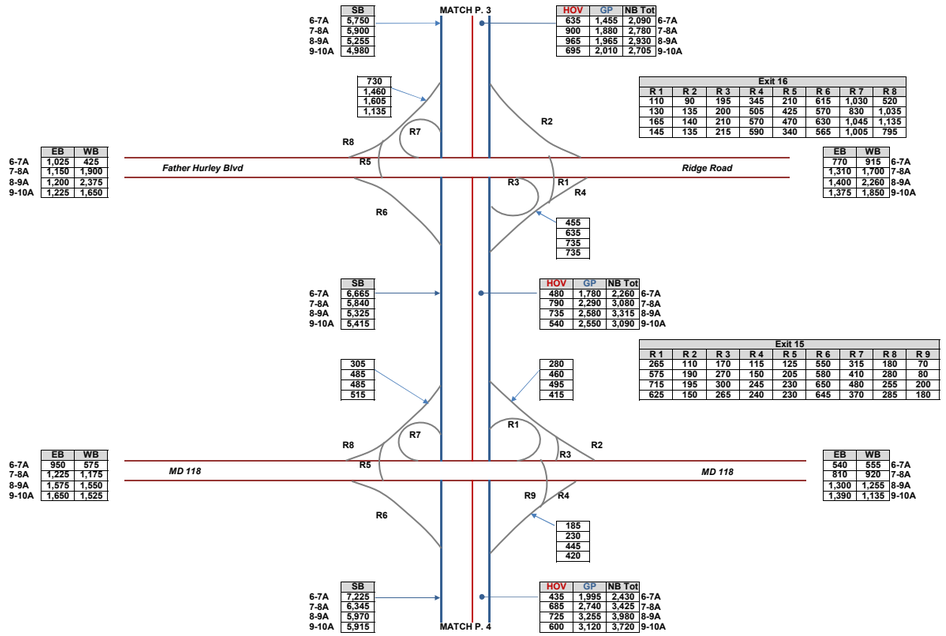
I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



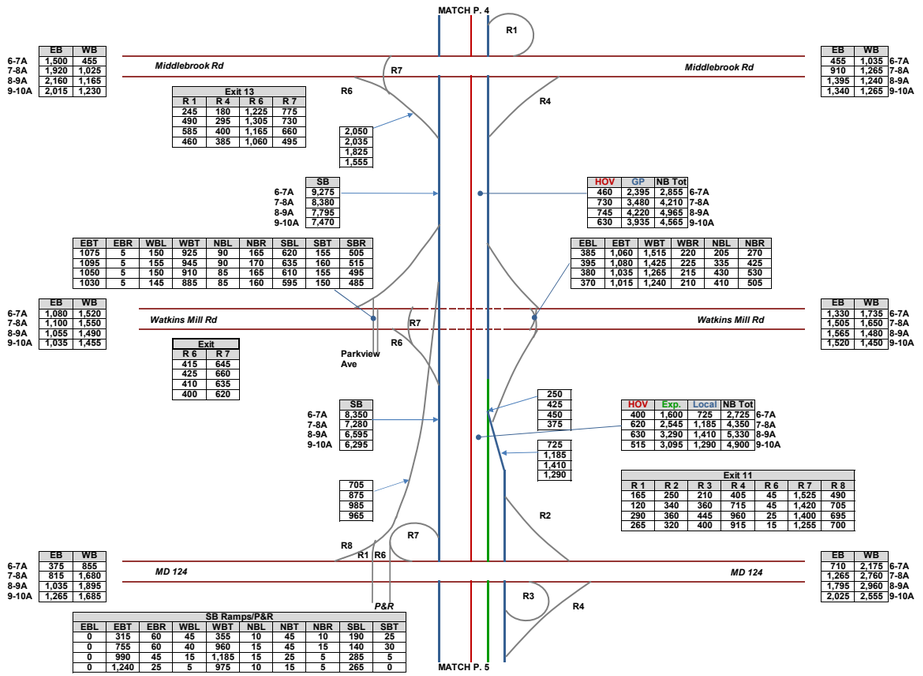
I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



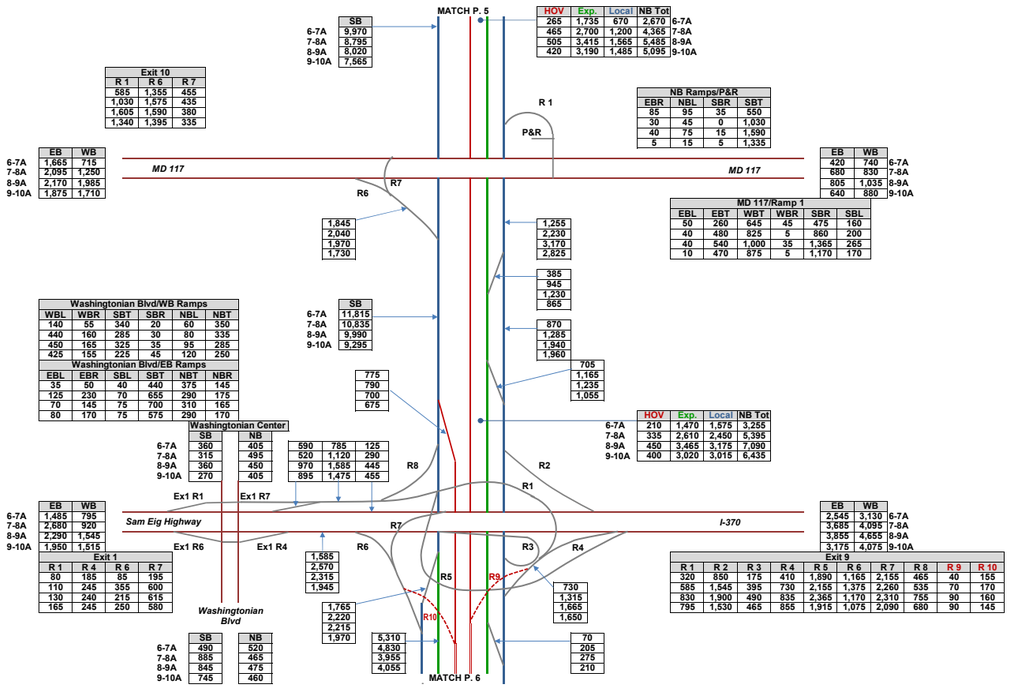
I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



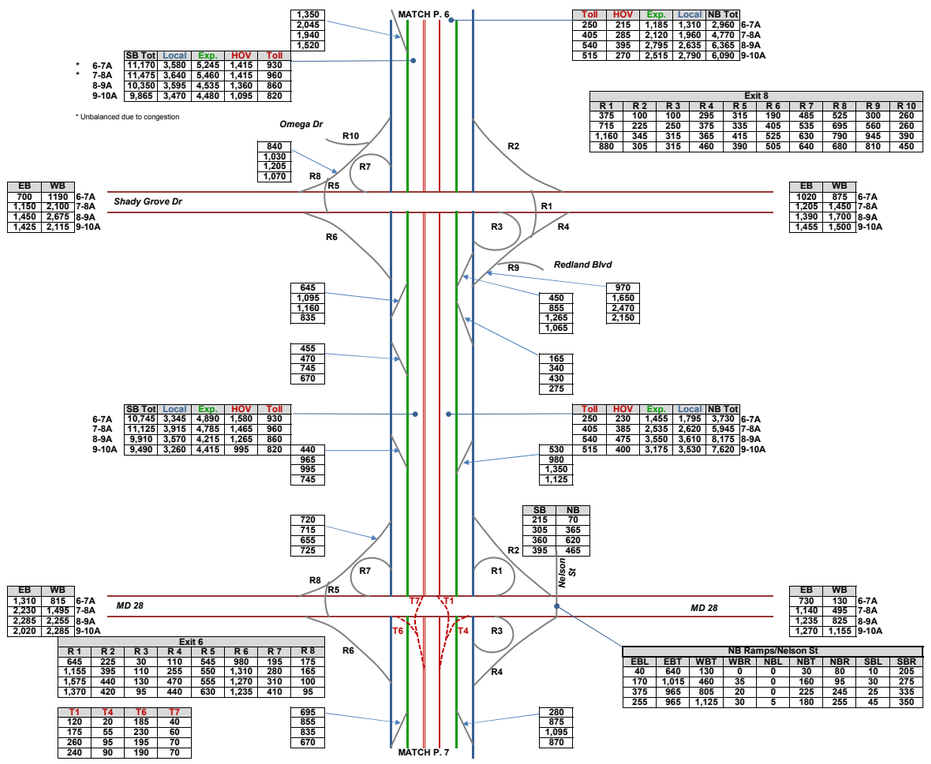
I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



*	SB Tot	Local	Exp.	HOV	Toll
6-7A	11,170	3,580	5,245	1,415	930
7-8A	11,475	3,640	5,460	1,415	960
8-9A	10,350	3,595	4,535	1,360	860
9-10A	9,865	3,470	4,480	1,095	820

* Unbalanced due to congestion

Toll	HOV	Exp.	Local	NB Tot	
250	215	1,185	1,310	2,960	6-7A
405	285	2,120	1,960	4,770	7-8A
540	395	2,795	2,635	6,365	8-9A
515	270	2,515	2,790	6,090	9-10A

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
375	100	100	295	315	190	485	525	300	260
715	225	250	375	335	405	535	695	560	260
1,160	345	315	365	415	525	630	790	945	390
880	305	315	460	390	505	640	680	810	450

EB	WB	
700	1190	6-7A
1,150	2,100	7-8A
1,450	2,675	8-9A
1,425	2,115	9-10A

EB	WB	
1020	875	6-7A
1,205	1,450	7-8A
1,390	1,700	8-9A
1,455	1,500	9-10A

SB Tot	Local	Exp.	HOV	Toll	
10,745	3,345	4,890	1,580	930	6-7A
11,125	3,915	4,785	1,465	960	7-8A
9,910	3,570	4,215	1,265	860	8-9A
9,490	3,260	4,415	995	820	9-10A

Toll	HOV	Exp.	Local	NB Tot	
260	230	1,455	1,795	3,730	6-7A
405	385	2,535	2,620	5,945	7-8A
540	475	3,550	3,610	8,175	8-9A
515	400	3,175	3,530	7,620	9-10A

SB	NB
215	70
305	365
360	620
395	465

EB	WB	
1,310	815	6-7A
2,230	1,495	7-8A
2,285	2,255	8-9A
2,020	2,285	9-10A

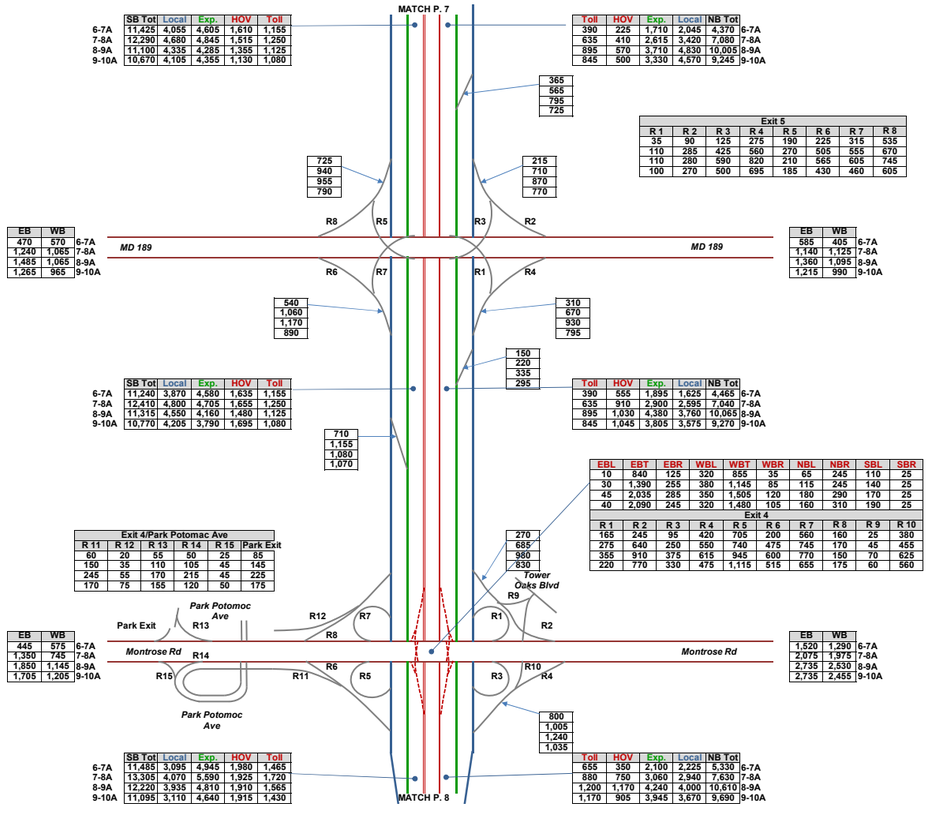
EB	WB	
730	130	6-7A
1,140	495	7-8A
1,235	825	8-9A
1,270	1,155	9-10A

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
645	225	30	110	545	980	195	175
1,155	395	110	255	550	1,310	280	165
1,575	440	130	470	555	1,270	310	100
1,370	420	95	440	630	1,235	410	95

NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
40	640	130	0	0	30	80	10	205
170	1,015	460	35	0	160	95	30	275
375	965	805	20	0	225	245	25	335
255	965	1,125	30	5	180	255	45	350

T1	T4	T6	T7
120	20	185	40
175	55	230	60
260	95	195	70
240	90	190	70

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



	SB Tot	Local	Exp.	HOV	Toll
6-7A	11,425	4,055	4,605	1,610	1,155
7-8A	12,290	4,680	4,845	1,515	1,250
8-9A	11,100	4,335	4,285	1,355	1,125
9-10A	10,670	4,105	4,355	1,130	1,080

Toll	HOV	Exp.	Local	NB Tot	
390	225	1,710	2,045	4,370	6-7A
635	410	2,615	3,420	7,080	7-8A
895	570	3,710	4,830	10,005	8-9A
845	500	3,330	4,570	9,245	9-10A

	EB	WB
6-7A	470	570
7-8A	1,240	1,065
8-9A	1,485	1,065
9-10A	1,265	965

	EB	WB
6-7A	585	405
7-8A	1,140	1,125
8-9A	1,360	1,095
9-10A	1,215	990

	SB Tot	Local	Exp.	HOV	Toll
6-7A	11,240	3,870	4,580	1,635	1,155
7-8A	12,410	4,800	4,705	1,655	1,250
8-9A	11,315	4,550	4,160	1,480	1,125
9-10A	10,770	4,205	3,790	1,695	1,080

Toll	HOV	Exp.	Local	NB Tot	
390	555	1,895	1,625	4,465	6-7A
635	910	2,900	2,595	7,040	7-8A
895	1,030	4,380	3,760	10,065	8-9A
845	1,045	3,805	3,575	9,270	9-10A

	SB Tot	Local	Exp.	HOV	Toll
6-7A	11,485	3,095	4,945	1,980	1,465
7-8A	13,305	4,070	5,590	1,925	1,720
8-9A	12,220	3,935	4,810	1,910	1,565
9-10A	11,095	3,110	4,640	1,915	1,430

Toll	HOV	Exp.	Local	NB Tot	
655	350	2,100	2,225	5,330	6-7A
880	750	3,060	2,940	7,630	7-8A
1,200	1,170	4,240	4,000	10,610	8-9A
1,170	905	3,945	3,670	9,690	9-10A

	EB	WB
6-7A	445	575
7-8A	1,350	745
8-9A	1,850	1,145
9-10A	1,705	1,205

	EB	WB
6-7A	1,520	1,290
7-8A	2,075	1,975
8-9A	2,735	2,530
9-10A	2,735	2,455

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
35	90	125	275	190	225	315	535
110	285	425	560	270	505	555	670
110	280	590	820	210	565	605	745
100	270	500	695	185	430	460	605

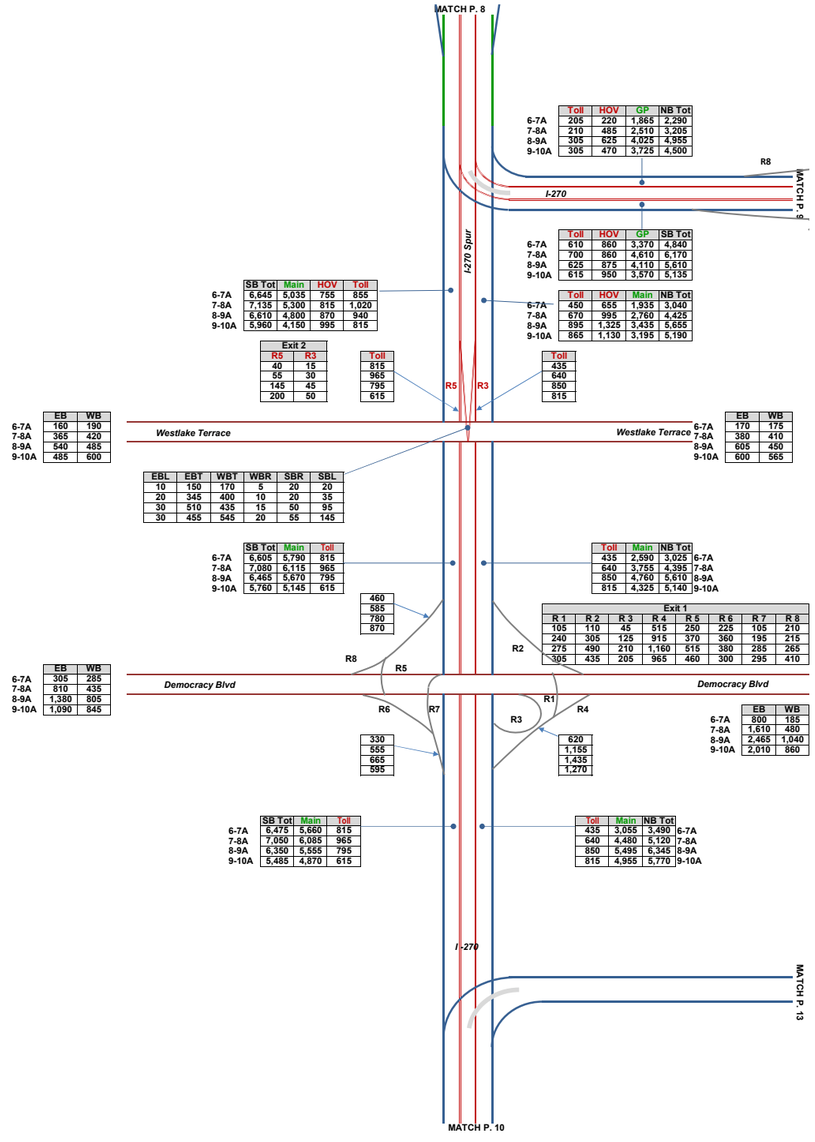
Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
165	245	95	420	705	200	560	160	25	380
275	640	250	550	740	475	745	170	45	455
355	910	375	615	945	600	770	150	70	625
220	770	330	475	1,115	515	655	175	60	560

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
60	20	55	50	25	85
150	35	110	105	45	145
245	55	170	215	45	225
170	75	155	120	50	175

365	725	215	270	710
565	940	710	685	1,155
795	955	870	980	1,080
725	790	770	830	1,070

540	310	150	800	
1,060	670	220	1,005	
1,170	930	335	1,240	
890	795	295	1,035	

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



	Toll	HOV	GP	NB Tot
6-7A	205	220	1,865	2,290
7-8A	210	485	2,510	3,205
8-9A	305	625	4,025	4,955
9-10A	305	470	3,725	4,500

	Toll	HOV	GP	SB Tot
6-7A	610	860	3,370	4,840
7-8A	700	860	4,610	6,170
8-9A	625	875	4,110	5,610
9-10A	615	950	3,570	5,135

	Toll	HOV	Main	NB Tot
6-7A	450	655	1,935	3,040
7-8A	670	995	2,760	4,425
8-9A	895	1,325	3,435	5,655
9-10A	865	1,130	3,195	5,190

	SB Tot	Main	HOV	Toll
6-7A	6,645	5,035	755	855
7-8A	7,135	5,300	815	1,020
8-9A	6,610	4,800	870	940
9-10A	5,960	4,150	995	815

Exit 2	
R5	R3
40	15
55	30
145	45
200	50

Toll
515
965
795
615

Toll
435
640
850
815

	EB	WB
6-7A	160	190
7-8A	365	420
8-9A	540	485
9-10A	485	600

	EB	WB
6-7A	170	175
7-8A	380	410
8-9A	605	450
9-10A	600	565

EBL	EBT	WBT	WBR	SBR	SBL
10	150	170	5	20	20
20	345	400	10	20	35
30	510	435	15	50	95
30	455	545	20	55	145

	SB Tot	Main	Toll
6-7A	6,605	5,790	815
7-8A	7,080	6,115	965
8-9A	6,465	5,670	795
9-10A	5,760	5,145	615

Toll	Main	NB Tot	
435	2,590	3,025	6-7A
640	3,755	4,395	7-8A
850	4,760	5,610	8-9A
815	4,325	5,140	9-10A

460
585
760
870

Exit 1							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
105	110	45	515	250	225	105	210
240	305	125	915	370	360	195	215
275	490	210	1,160	515	380	285	265
305	435	205	965	460	300	295	410

	EB	WB
6-7A	305	285
7-8A	810	435
8-9A	1,380	805
9-10A	1,090	845

	EB	WB
6-7A	800	185
7-8A	1,610	480
8-9A	2,465	1,040
9-10A	2,010	860

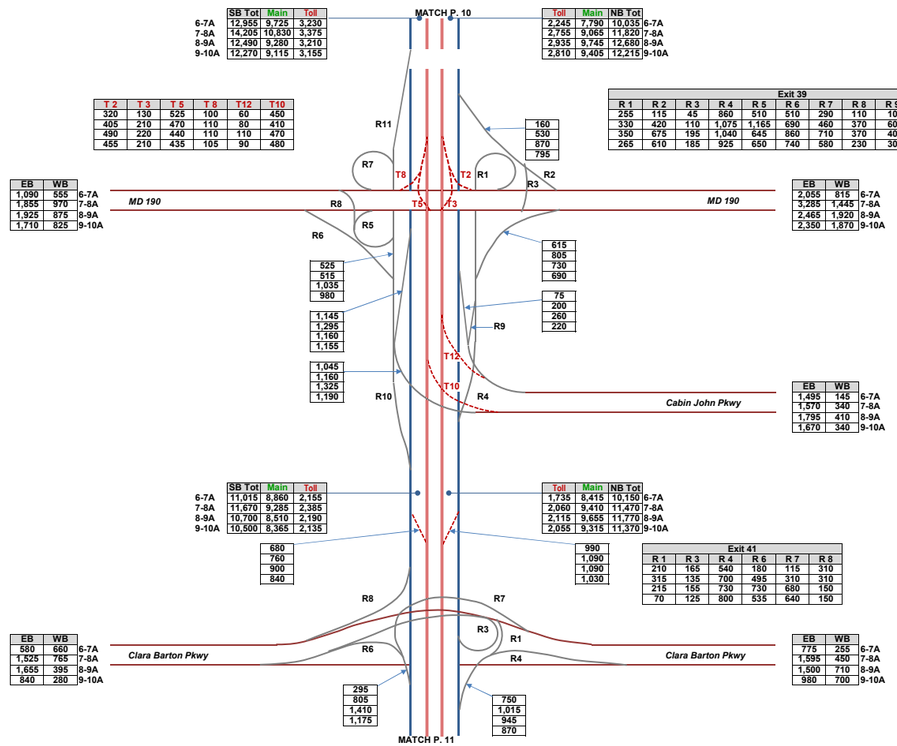
330
555
665
595

620
1,155
1,435
1,270

	SB Tot	Main	Toll
6-7A	6,475	5,660	815
7-8A	7,050	6,085	965
8-9A	6,350	5,555	795
9-10A	5,485	4,870	615

Toll	Main	NB Tot	
435	3,055	3,490	6-7A
640	4,480	5,120	7-8A
850	5,495	6,345	8-9A
815	4,955	5,770	9-10A

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



	SB Tot	Main	Toll
6-7A	12,955	9,725	3,230
7-8A	14,205	10,830	3,375
8-9A	12,490	9,280	3,210
9-10A	12,270	9,115	3,155

Toll	Main	NB Tot	
2,245	7,790	10,035	6-7A
2,755	9,065	11,820	7-8A
2,935	9,745	12,680	8-9A
2,810	9,405	12,215	9-10A

T 2	T 3	T 5	T 8	T12	T10
320	130	525	100	60	450
405	210	470	110	80	410
490	220	440	110	110	470
455	210	435	105	90	480

Exit 39										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11
255	115	45	860	510	510	290	110	10	1,135	855
330	420	110	1,075	1,165	690	460	370	60	1,340	1,590
350	675	195	1,040	645	860	710	370	40	1,730	1,340
265	610	185	925	650	740	580	230	30	1,685	1,280

EB	WB	
1,090	555	6-7A
1,855	970	7-8A
1,925	875	8-9A
1,710	825	9-10A

EB	WB	
2,055	815	6-7A
3,285	1,445	7-8A
2,465	1,920	8-9A
2,350	1,870	9-10A

EB	WB	
1,495	145	6-7A
1,570	340	7-8A
1,795	410	8-9A
1,670	340	9-10A

	SB Tot	Main	Toll
6-7A	11,015	8,860	2,155
7-8A	11,670	9,285	2,385
8-9A	10,700	8,510	2,190
9-10A	10,500	8,365	2,135

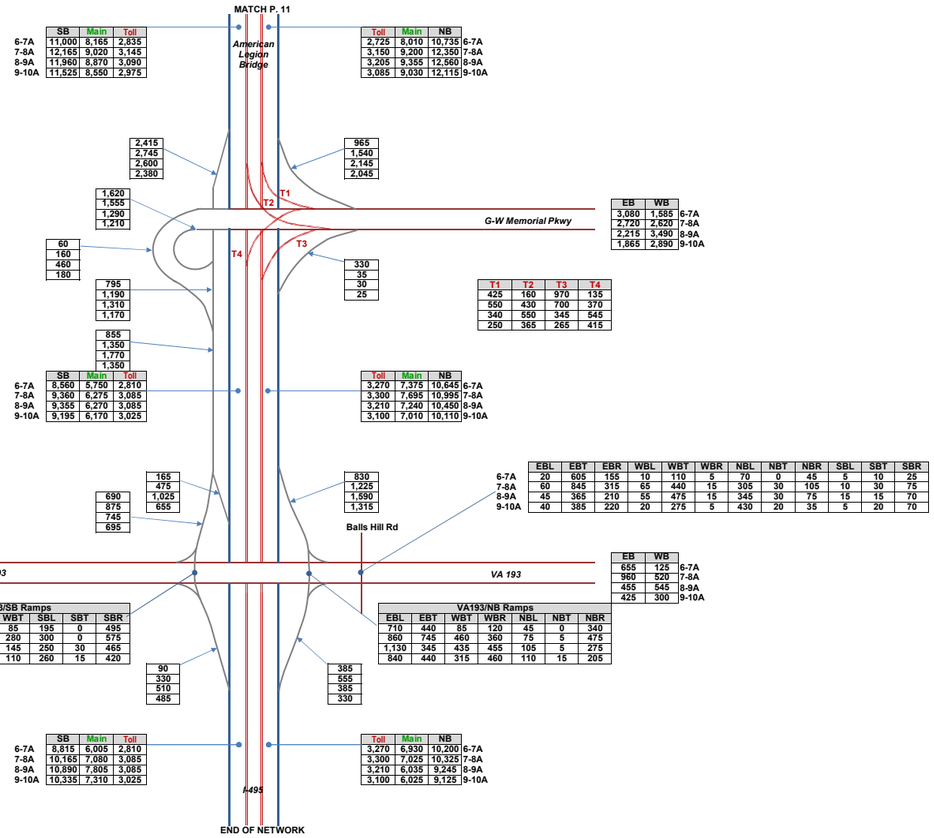
Toll	Main	NB Tot	
1,735	8,415	10,150	6-7A
2,060	9,410	11,470	7-8A
2,115	9,655	11,770	8-9A
2,055	9,315	11,370	9-10A

Exit 41					
R 1	R 3	R 4	R 6	R 7	R 8
210	165	540	180	115	310
315	135	700	495	310	310
215	165	730	730	680	150
70	125	800	535	640	150

EB	WB	
580	660	6-7A
1,525	765	7-8A
1,655	395	8-9A
840	280	9-10A

EB	WB	
775	255	6-7A
1,595	450	7-8A
1,500	710	8-9A
980	700	9-10A

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



	SB	Main	Toll
6-7A	11,000	8,165	2,835
7-8A	12,165	9,020	3,145
8-9A	11,960	8,870	3,090
9-10A	11,525	8,550	2,975

	Toll	Main	NB
6-7A	2,725	8,010	10,735
7-8A	3,150	9,200	12,350
8-9A	3,205	9,355	12,560
9-10A	3,085	9,030	12,115

	EB	WB
6-7A	3,080	1,585
7-8A	2,720	2,620
8-9A	2,215	3,490
9-10A	1,865	2,890

T1	T2	T3	T4
425	160	970	135
550	430	700	370
340	550	345	545
250	365	265	415

	SB	Main	Toll
6-7A	8,560	5,750	2,810
7-8A	9,360	6,275	3,085
8-9A	9,355	6,270	3,085
9-10A	9,195	6,170	3,025

	Toll	Main	NB
6-7A	3,270	7,375	10,645
7-8A	3,300	7,695	10,995
8-9A	3,210	7,240	10,450
9-10A	3,100	7,010	10,110

	SB	Main	Toll
6-7A	8,815	6,005	2,810
7-8A	10,165	7,080	3,085
8-9A	10,890	7,805	3,085
9-10A	10,335	7,310	3,025

	Toll	Main	NB
6-7A	3,270	6,930	10,200
7-8A	3,300	7,025	10,325
8-9A	3,210	6,035	9,245
9-10A	3,100	6,025	9,125

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
6-7A	20	605	155	10	110	5	70	0	45	5	10	25
7-8A	60	845	315	65	440	15	305	30	105	10	30	75
8-9A	45	365	210	55	475	15	345	30	75	15	15	70
9-10A	40	385	220	20	275	5	430	20	35	5	20	70

	EB	WB
6-7A	1,000	580
7-8A	1,380	855
8-9A	1,310	610
9-10A	1,175	530

	EB	WB
6-7A	655	125
7-8A	960	520
8-9A	455	545
9-10A	425	300

VA193/SB Ramps

EBT	EBR	WBL	WBT	SBL	SBT	SBR
955	45	45	85	195	0	495
1,305	75	255	280	300	0	575
1,225	85	395	145	250	30	465
1,020	155	315	110	260	15	420

VA193/NB Ramps

EBL	EBT	WBT	WBR	NBL	NBT	NBR
710	440	85	120	45	0	340
860	745	460	360	75	5	475
1,130	345	435	455	105	5	275
840	440	315	460	110	15	205

2,415
2,745
2,600
2,380

965
1,540
2,145
2,045

1,620
1,555
1,290
1,210

60
160
460
180

330
35
30
25

795
1,190
1,310
1,170

855
1,350
1,770
1,350

690
875
745
695

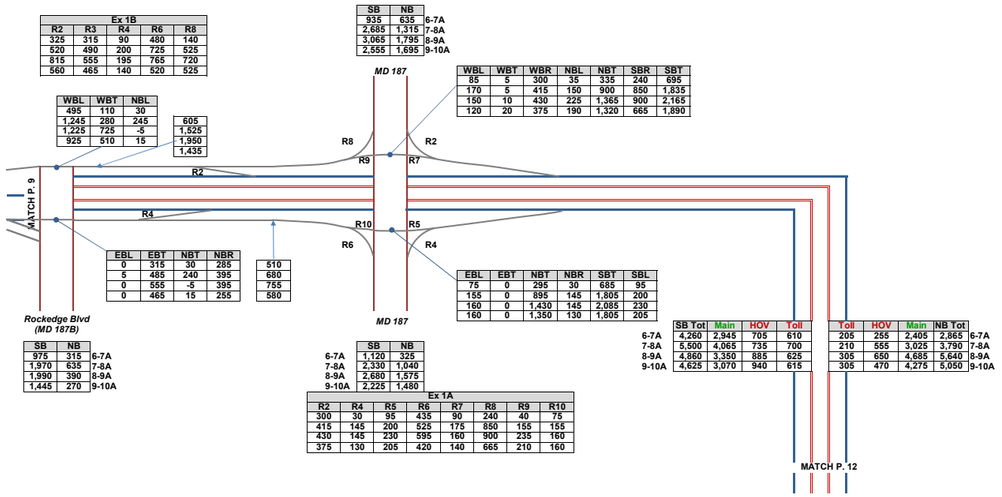
165
475
1,025
655

830
1,225
1,590
1,315

90
330
510
485

385
555
385
330

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



Ex 1B				
R2	R3	R4	R6	R8
325	315	90	480	140
520	490	200	725	525
815	555	195	765	720
560	465	140	520	525

WBL	WBT	NBL	
495	110	30	
1,245	280	245	605
1,225	725	-5	1,525
925	510	15	1,950
			1,435

SB	NB	
935	635	6-7A
2,685	1,315	7-8A
3,065	1,795	8-9A
2,555	1,695	9-10A

WBL	WBT	WBR	NBL	NBT	SBR	SBT
85	5	300	35	335	240	695
170	5	415	150	900	850	1,835
150	10	430	225	1,365	900	2,165
120	20	375	190	1,320	665	1,890

EBL	EBT	NBT	NBR
0	315	30	285
5	485	240	395
0	555	-5	395
0	465	15	255

510
680
755
580

EBL	EBT	NBT	NBR	SBT	SBL
75	0	295	30	685	95
155	0	895	145	1,805	200
160	0	1,430	145	2,085	230
160	0	1,350	130	1,805	205

SB	NB	
975	315	6-7A
1,970	635	7-8A
1,990	390	8-9A
1,445	270	9-10A

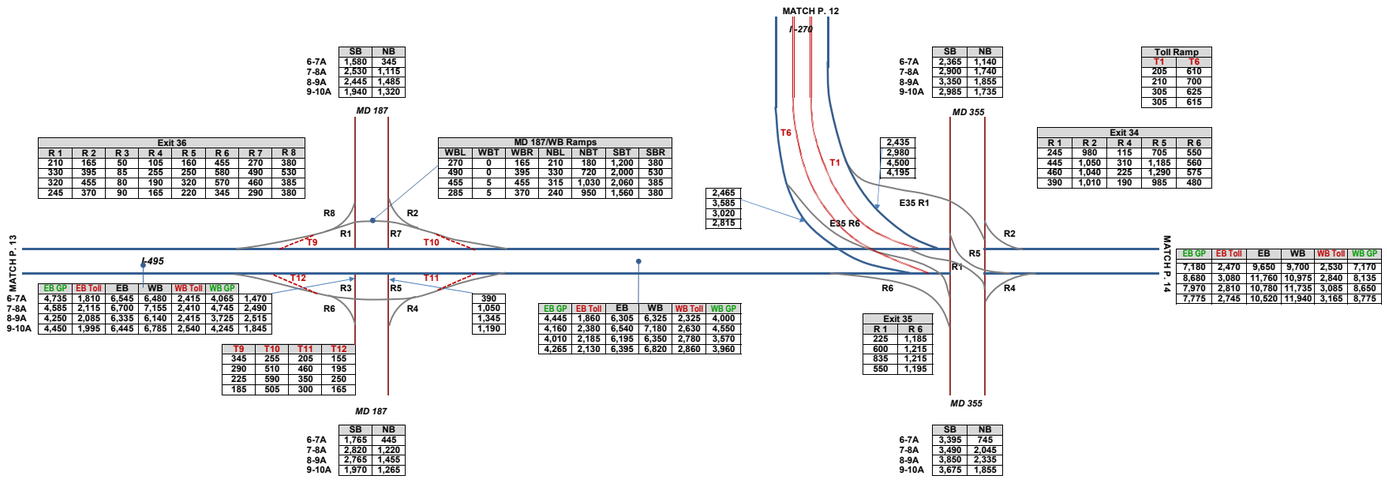
	SB	NB
6-7A	1,120	325
7-8A	2,330	1,040
8-9A	2,680	1,575
9-10A	2,225	1,480

Ex 1A							
R2	R4	R5	R6	R7	R8	R9	R10
300	30	95	435	90	240	40	75
415	145	200	525	175	850	155	155
430	145	230	595	160	900	235	160
375	130	205	420	140	665	210	160

	SB Tot	Main	HOV	Toll
6-7A	4,260	2,945	705	610
7-8A	5,500	4,065	735	700
8-9A	4,860	3,350	885	625
9-10A	4,625	3,070	940	615

Toll	HOV	Main	NB Tot	
205	255	2,405	2,865	6-7A
210	555	3,025	3,790	7-8A
305	650	4,685	5,640	8-9A
305	470	4,275	5,050	9-10A

I-270 & I-495 West Side AM
Future Alternative 8 Peak Period Volumes



	SB	NB
6-7A	1,580	345
7-8A	2,530	1,115
8-9A	2,445	1,485
9-10A	1,940	1,320

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
210	165	50	105	160	455	270	380
330	395	85	255	250	580	490	530
320	455	80	190	320	570	460	385
245	370	90	165	220	345	290	380

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
270	0	165	210	180	1,200	380
490	0	395	330	720	2,000	530
455	5	455	315	1,030	2,060	385
285	5	370	240	950	1,560	380

	SB	NB
6-7A	2,365	1,140
7-8A	2,900	1,740
8-9A	3,350	1,855
9-10A	2,985	1,735

Toll Ramp	
T1	T6
205	610
210	700
305	625
305	615

Exit 34				
R 1	R 2	R 4	R 5	R 6
245	980	115	705	550
445	1,050	310	1,185	560
460	1,040	225	1,290	575
390	1,010	190	985	480

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	4,735	1,810	6,545	6,480	2,415	4,065	1,470
7-8A	4,585	2,115	6,700	7,155	2,410	4,745	2,490
8-9A	4,250	2,085	6,335	6,140	2,415	3,725	2,515
9-10A	4,450	1,995	6,445	6,785	2,540	4,245	1,845

T9	T10	T11	T12
345	255	205	155
290	510	460	195
225	590	350	250
185	505	300	165

390	
1,050	
1,345	
1,190	

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	4,445	1,860	6,305	6,325	2,325	4,000
7-8A	4,160	2,380	6,540	7,180	2,630	4,550
8-9A	4,010	2,185	6,195	6,350	2,780	3,570
9-10A	4,265	2,130	6,395	6,820	2,860	3,960

2,435	
2,980	
4,500	
4,195	

2,465	
3,585	
3,020	
2,815	

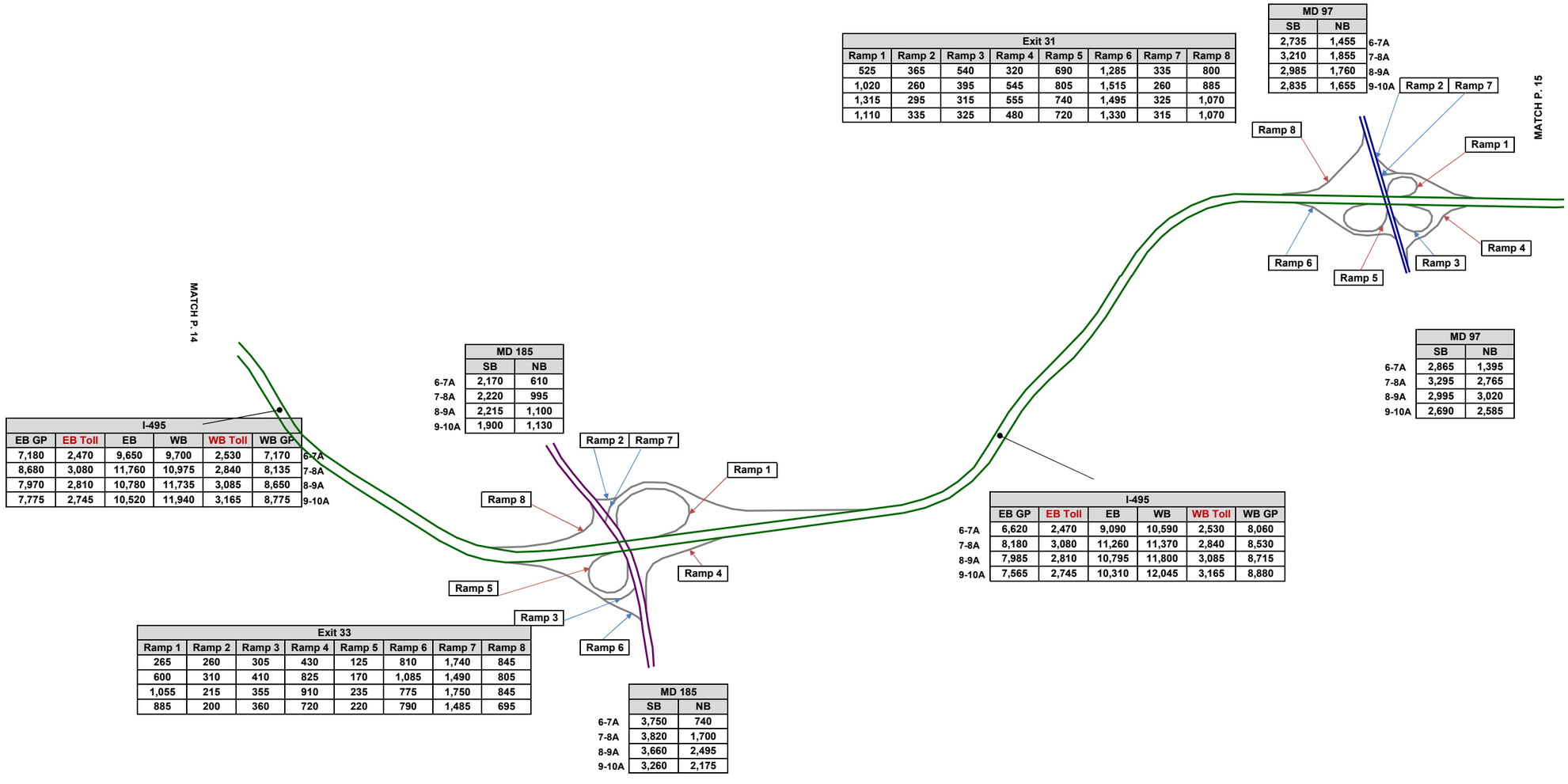
Exit 35	
R 1	R 6
225	1,185
600	1,215
835	1,215
550	1,195

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,180	2,470	9,650	9,700	2,530	7,170
7-8A	8,680	3,080	11,760	10,975	2,840	8,135
8-9A	7,970	2,810	10,780	11,735	3,085	8,650
9-10A	7,775	2,745	10,520	11,940	3,165	8,775

	SB	NB
6-7A	1,765	445
7-8A	2,820	1,220
8-9A	2,765	1,455
9-10A	1,970	1,265

	SB	NB
6-7A	3,395	745
7-8A	3,490	2,045
8-9A	3,850	2,335
9-10A	3,675	1,855

I-495 North Side AM
Future Alternative 8 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
525	365	540	320	690	1,285	335	800
1,020	260	395	545	805	1,515	260	885
1,315	295	315	555	740	1,495	325	1,070
1,110	335	325	480	720	1,330	315	1,070

	MD 97	
	SB	NB
6-7A	2,735	1,455
7-8A	3,210	1,855
8-9A	2,985	1,760
9-10A	2,835	1,655

	MD 97	
	SB	NB
6-7A	2,865	1,395
7-8A	3,295	2,765
8-9A	2,995	3,020
9-10A	2,690	2,585

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,620	2,470	9,090	10,590	2,530	8,060
7-8A	8,180	3,080	11,260	11,370	2,840	8,530
8-9A	7,985	2,810	10,795	11,800	3,085	8,715
9-10A	7,565	2,745	10,310	12,045	3,165	8,880

	MD 185	
	SB	NB
6-7A	2,170	610
7-8A	2,220	995
8-9A	2,215	1,100
9-10A	1,900	1,130

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,180	2,470	9,650	9,700	2,530	7,170
7-8A	8,680	3,080	11,760	10,975	2,840	8,135
8-9A	7,970	2,810	10,780	11,735	3,085	8,650
9-10A	7,775	2,745	10,520	11,940	3,165	8,775

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
265	260	305	430	125	810	1,740	845
600	310	410	825	170	1,085	1,490	805
1,055	215	355	910	235	775	1,750	845
885	200	360	720	220	790	1,485	695

	MD 185	
	SB	NB
6-7A	3,750	740
7-8A	3,820	1,700
8-9A	3,660	2,495
9-10A	3,260	2,175

I-495 North Side AM
Future Alternative 8 Peak Period Volumes

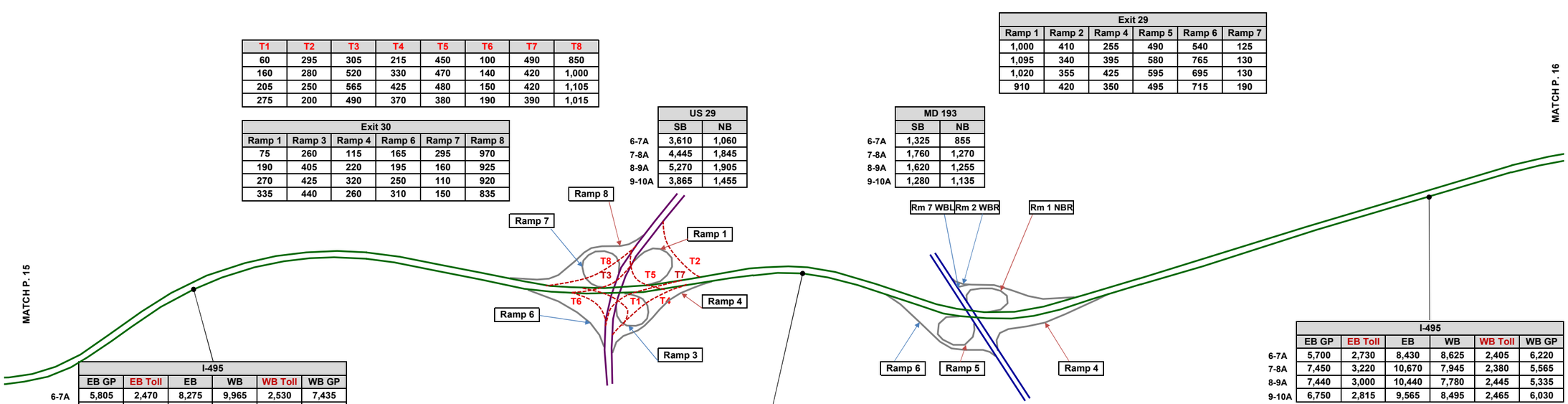
T1	T2	T3	T4	T5	T6	T7	T8
60	295	305	215	450	100	490	850
160	280	520	330	470	140	420	1,000
205	250	565	425	480	150	420	1,105
275	200	490	370	380	190	390	1,015

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
75	260	115	165	295	970
190	405	220	195	160	925
270	425	320	250	110	920
335	440	260	310	150	835

	US 29	
	SB	NB
6-7A	3,610	1,060
7-8A	4,445	1,845
8-9A	5,270	1,905
9-10A	3,865	1,455

	MD 193	
	SB	NB
6-7A	1,325	855
7-8A	1,760	1,270
8-9A	1,620	1,255
9-10A	1,280	1,135

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
1,000	410	255	490	540	125
1,095	340	395	580	765	130
1,020	355	425	595	695	130
910	420	350	495	715	190



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,805	2,470	8,275	9,965	2,530	7,435
7-8A	7,620	3,080	10,700	9,985	2,840	7,145
8-9A	7,470	2,810	10,280	10,035	3,085	6,950
9-10A	7,110	2,745	9,855	10,515	3,165	7,350

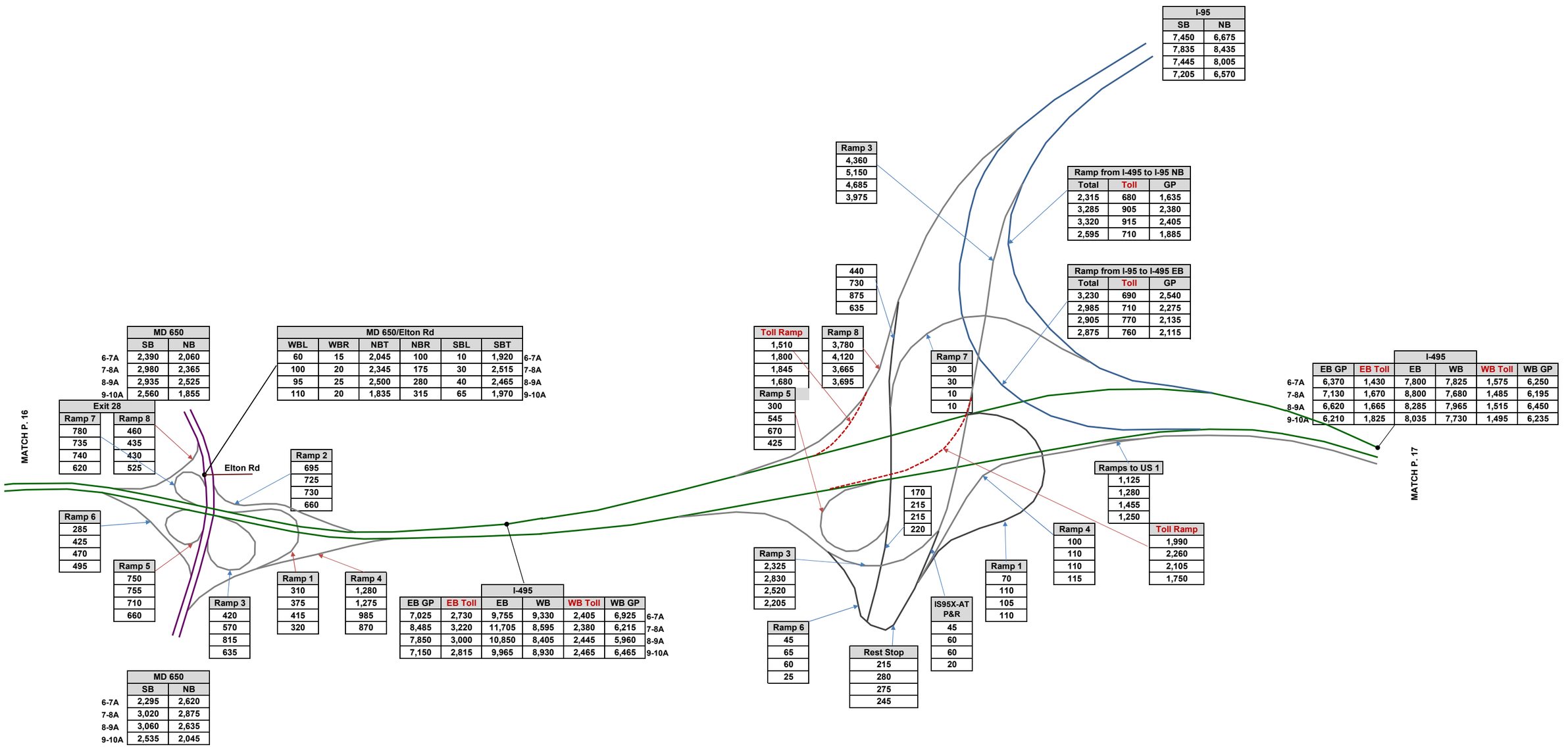
	US 29	
	SB	NB
6-7A	2,390	665
7-8A	2,965	1,540
8-9A	3,695	1,885
9-10A	2,675	1,565

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,495	2,730	8,225	9,090	2,405	6,685
7-8A	7,240	3,220	10,460	8,570	2,380	6,190
8-9A	7,115	3,000	10,115	8,315	2,445	5,870
9-10A	6,620	2,815	9,435	8,795	2,465	6,330

	MD 193	
	SB	NB
6-7A	1,500	1,700
7-8A	2,075	2,420
8-9A	1,850	2,345
9-10A	1,690	1,975

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,700	2,730	8,430	8,625	2,405	6,220
7-8A	7,450	3,220	10,670	7,945	2,380	5,565
8-9A	7,440	3,000	10,440	7,780	2,445	5,335
9-10A	6,750	2,815	9,565	8,495	2,465	6,030

I-495 North Side AM
Future Alternative 8 Peak Period Volumes



I-495 North East Side AM
Future Alternative 8 Peak Period Volumes

I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,370	1,430	7,800	7,825	1,575	6,250	6-7A
7,130	1,670	8,800	7,680	1,485	6,195	7-8A
6,620	1,665	8,285	7,965	1,515	6,450	8-9A
6,210	1,825	8,035	7,730	1,495	6,235	9-10A

US 1		
SB	NB	
1,150	1,070	6-7A
1,975	1,265	7-8A
1,250	1,260	8-9A
1,140	1,050	9-10A

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,145	5	650	315	700	20	420	20
1,960	15	660	430	885	15	605	35
1,235	15	655	480	700	20	605	30
1,130	10	640	430	465	55	410	20

MATCH P. 17

IKEA

Ramp 10
1,225
1,390
1,565
1,365

Ramp 8

Ramp 1

Ramp 7

Ramp 6

Ramp 4

Ramp 5

Ramp 3

Edgewood Rd

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
315	350	540	525	680	1,140	340
430	335	735	775	925	1,505	395
480	370	780	690	920	1,325	460
430	355	610	655	805	930	410

US 1		
SB	NB	
1,645	900	6-7A
2,540	1,200	7-8A
1,615	1,260	8-9A
1,130	1,135	9-10A

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
7,630	1,430	9,060	8,310	1,575	6,735
8,770	1,670	10,440	8,360	1,485	6,875
8,365	1,665	10,030	8,350	1,515	6,835
7,680	1,825	9,505	7,820	1,495	6,325

6-7A
7-8A
8-9A
9-10A

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
10	30	960	875	25	55	260	10	40	630
5	85	1,620	1,130	70	110	350	5	110	810
10	75	730	1,195	60	80	335	5	110	805
20	125	405	1,070	65	50	235	0	130	675

T1	T2	T3	T4
235	105	545	345
245	140	560	340
260	170	545	310
265	170	430	275

T2

T1

T3

Greenbelt Commuter Station

T4

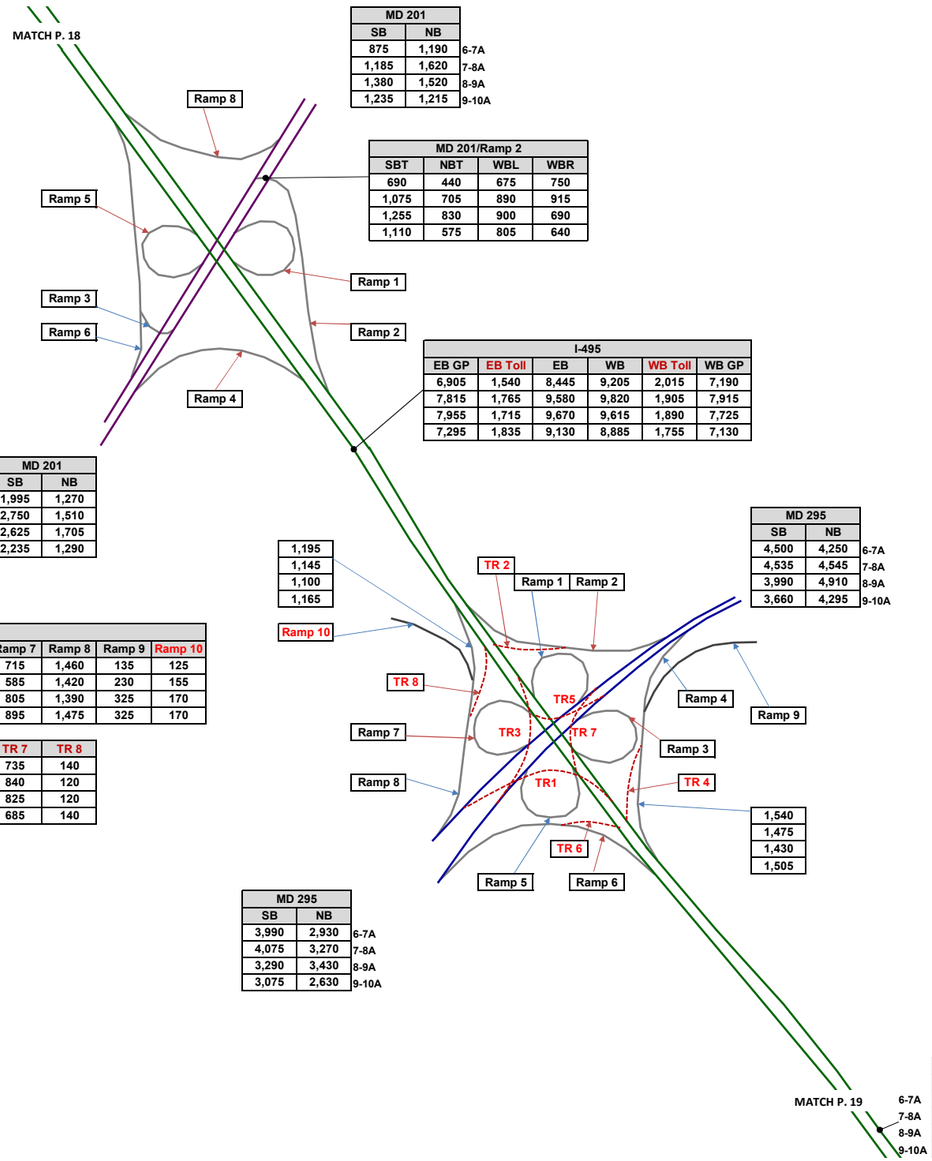
765	650	475
800	705	430
715	640	420
680	575	395

470
430
370
345

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,225	1,540	8,765	8,485	2,015	6,470	6-7A
8,305	1,765	10,070	8,635	1,905	6,730	7-8A
7,970	1,715	9,685	8,570	1,890	6,680	8-9A
7,335	1,835	9,170	8,000	1,755	6,245	9-10A

MATCH P. 18

I-495 North East Side AM
Future Alternative 8 Peak Period Volumes



MD 201		
SB	NB	
875	1,190	6-7A
1,185	1,620	7-8A
1,380	1,520	8-9A
1,235	1,215	9-10A

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
690	440	675	750
1,075	705	890	915
1,255	830	900	690
1,110	575	805	640

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
520	1,425	265	575	410	1,040	185
510	1,805	340	635	420	1,205	110
420	1,590	370	825	605	1,075	125
435	1,445	440	720	580	900	125

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
6,905	1,540	8,445	9,205	2,015	7,190
7,815	1,765	9,580	9,820	1,905	7,915
7,955	1,715	9,670	9,615	1,890	7,725
7,295	1,835	9,130	8,885	1,755	7,130

MD 201		
SB	NB	
1,995	1,270	6-7A
2,750	1,510	7-8A
2,625	1,705	8-9A
2,235	1,290	9-10A

MD 295		
SB	NB	
4,500	4,250	6-7A
4,535	4,545	7-8A
3,990	4,910	8-9A
3,660	4,295	9-10A

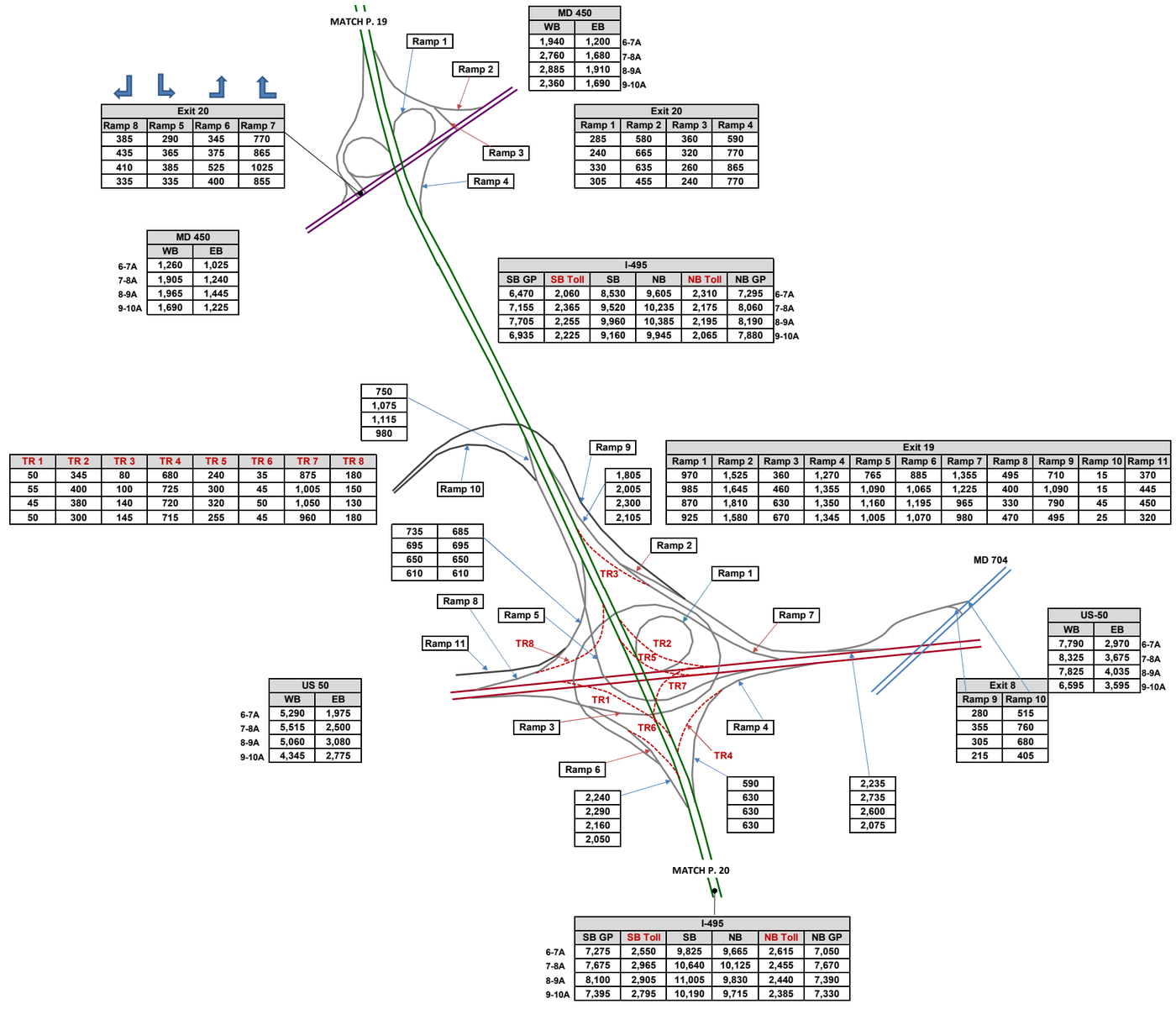
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
25	560	955	1,945	405	10	715	1,460	135	125
60	550	990	1,755	555	15	585	1,420	230	155
85	575	895	1,630	720	10	805	1,390	325	170
80	585	745	1,680	690	15	895	1,475	325	170

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
15	120	140	540	85	10	735	140
35	125	150	510	135	15	840	120
30	120	130	525	180	15	825	120
25	115	100	500	170	15	685	140

MD 295		
SB	NB	
3,990	2,930	6-7A
4,075	3,270	7-8A
3,290	3,430	8-9A
3,075	2,630	9-10A

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,030	2,060	8,090	9,670	2,310	7,360
6,715	2,365	9,080	10,210	2,175	8,035
6,950	2,255	9,205	10,085	2,195	7,890
6,350	2,225	8,575	9,565	2,065	7,500

I-495 North East Side AM
Future Alternative 8 Peak Period Volumes



MD 450	
WB	EB
1,940	1,200
2,760	1,680
2,885	1,910
2,360	1,690

6-7A
7-8A
8-9A
9-10A

Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
385	290	345	770
435	365	375	865
410	385	525	1025
335	335	400	855

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
285	580	360	590
240	665	320	770
330	635	260	865
305	455	240	770

MD 450		
	WB	EB
6-7A	1,260	1,025
7-8A	1,905	1,240
8-9A	1,965	1,445
9-10A	1,690	1,225

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,470	2,060	8,530	9,605	2,310	7,295	6-7A
7,155	2,365	9,520	10,235	2,175	8,060	7-8A
7,705	2,255	9,960	10,385	2,195	8,190	8-9A
6,935	2,225	9,160	9,945	2,065	7,880	9-10A

750
1,075
1,115
980

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
50	345	80	680	240	35	875	180
55	400	100	725	300	45	1,005	150
45	380	140	720	320	50	1,050	130
50	300	145	715	255	45	960	180

1,805
2,005
2,300
2,105

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
970	1,525	360	1,270	765	885	1,355	495	710	15	370
985	1,645	460	1,355	1,090	1,065	1,225	400	1,090	15	445
870	1,810	630	1,350	1,160	1,195	965	330	790	45	450
925	1,580	670	1,345	1,005	1,070	980	470	495	25	320

735	685
695	695
650	650
610	610

US 50		
	WB	EB
6-7A	5,290	1,975
7-8A	5,515	2,500
8-9A	5,060	3,080
9-10A	4,345	2,775

US-50		
WB	EB	
7,790	2,970	6-7A
8,325	3,675	7-8A
7,825	4,035	8-9A
6,595	3,595	9-10A

Exit 8	
Ramp 9	Ramp 10
280	515
355	760
305	680
215	405

2,240
2,290
2,160
2,050

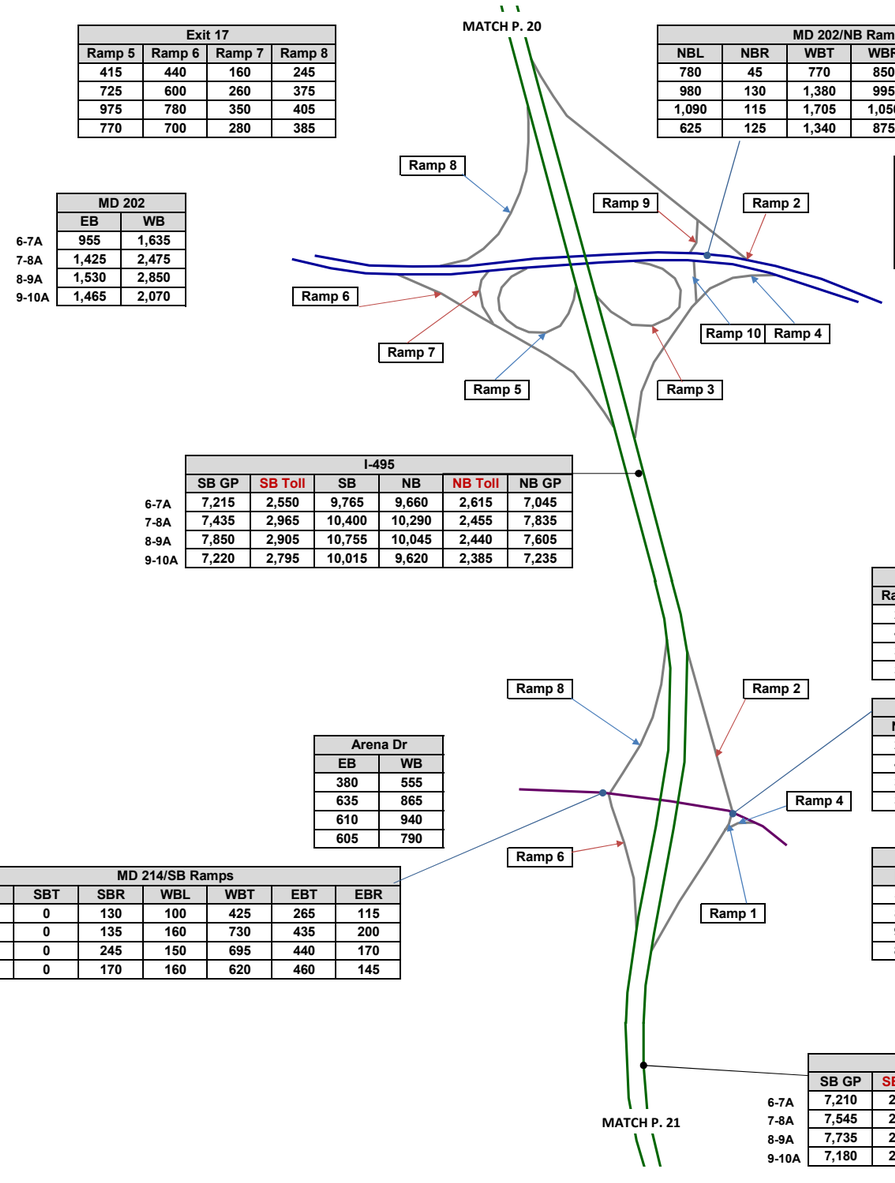
590
630
630
630

2,235
2,735
2,600
2,075

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,275	2,550	9,825	9,665	2,615	7,050
7,675	2,965	10,640	10,125	2,455	7,670
8,100	2,905	11,005	9,830	2,440	7,390
7,395	2,795	10,190	9,715	2,385	7,330

6-7A
7-8A
8-9A
9-10A

I-495 East Side AM
Future Alternative 8 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
415	440	160	245
725	600	260	375
975	780	350	405
770	700	280	385

	MD 202	
	EB	WB
6-7A	955	1,635
7-8A	1,425	2,475
8-9A	1,530	2,850
9-10A	1,465	2,070

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,215	2,550	9,765	9,660	2,615	7,045
7,435	2,965	10,400	10,290	2,455	7,835
7,850	2,905	10,755	10,045	2,440	7,605
7,220	2,795	10,015	9,620	2,385	7,235

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
780	45	770	850	10	700
980	130	1,380	995	15	1,330
1,090	115	1,705	1,050	5	1,465
625	125	1,340	875	15	1,275

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
850	220	250	10	825
995	205	270	15	1,110
1,050	255	320	5	1,205
875	245	290	15	750

	MD 202	
	SB	NB
6-7A	995	1,620
7-8A	1,730	2,375
8-9A	1,900	2,755
9-10A	1,690	2,215

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
280	425	395	215	220
420	480	485	360	250
340	435	485	320	435
310	415	415	305	345

Arena Dr	
EB	WB
380	555
635	865
610	940
605	790

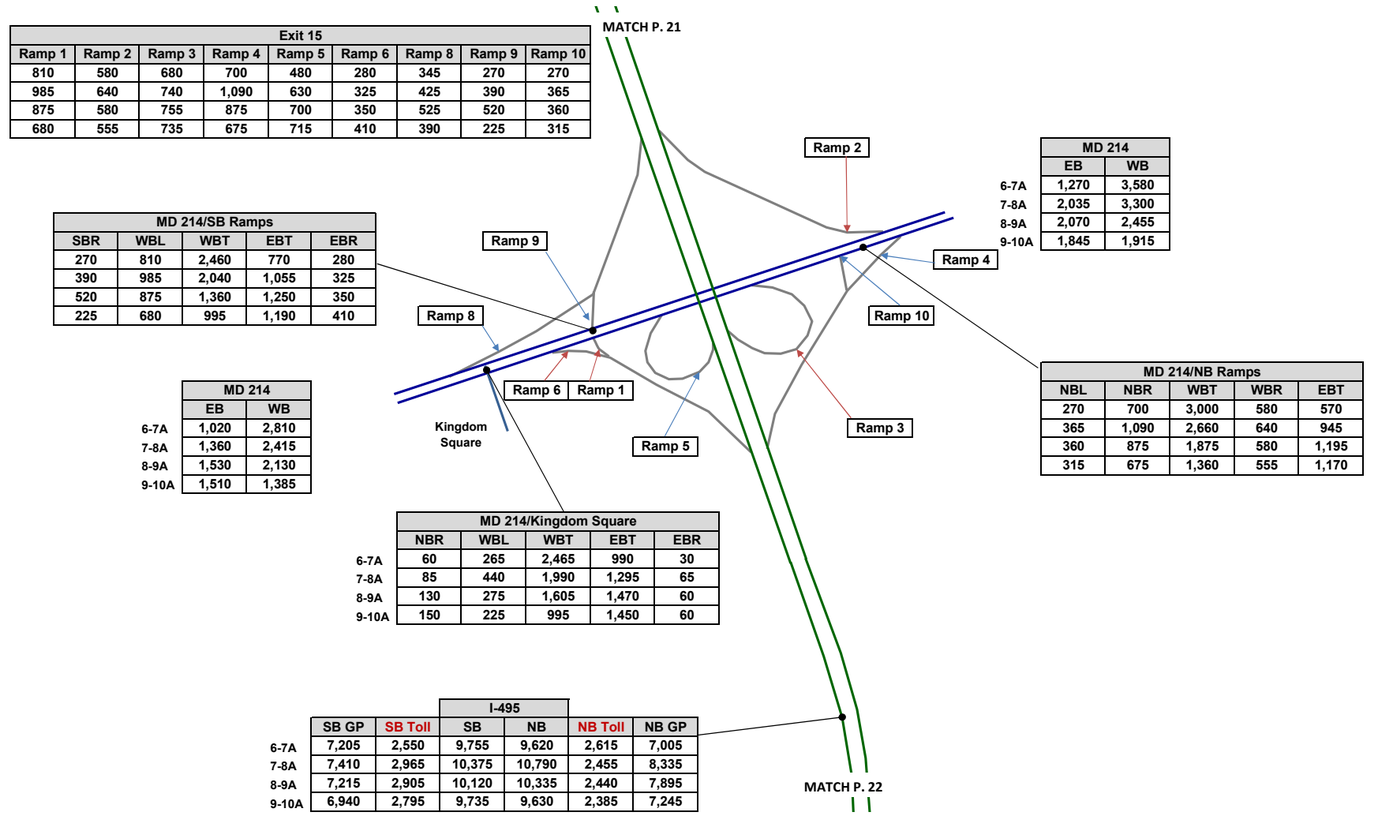
MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
90	0	130	100	425	265	115
115	0	135	160	730	435	200
190	0	245	150	695	440	170
175	0	170	160	620	460	145

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
280	0	395	245	210	215	140
420	0	485	470	245	235	315
335	5	485	510	230	200	430
310	0	415	470	200	215	420

Arena Dr	
EB	WB
535	455
800	715
915	740
835	670

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,210	2,550	9,760	9,910	2,615	7,295
7,545	2,965	10,510	10,715	2,455	8,260
7,735	2,905	10,640	10,435	2,440	7,995
7,180	2,795	9,975	9,930	2,385	7,545

I-495 East Side AM
Future Alternative 8 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
810	580	680	700	480	280	345	270	270
985	640	740	1,090	630	325	425	390	365
875	580	755	875	700	350	525	520	360
680	555	735	675	715	410	390	225	315

MD 214		
	EB	WB
6-7A	1,270	3,580
7-8A	2,035	3,300
8-9A	2,070	2,455
9-10A	1,845	1,915

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
270	810	2,460	770	280
390	985	2,040	1,055	325
520	875	1,360	1,250	350
225	680	995	1,190	410

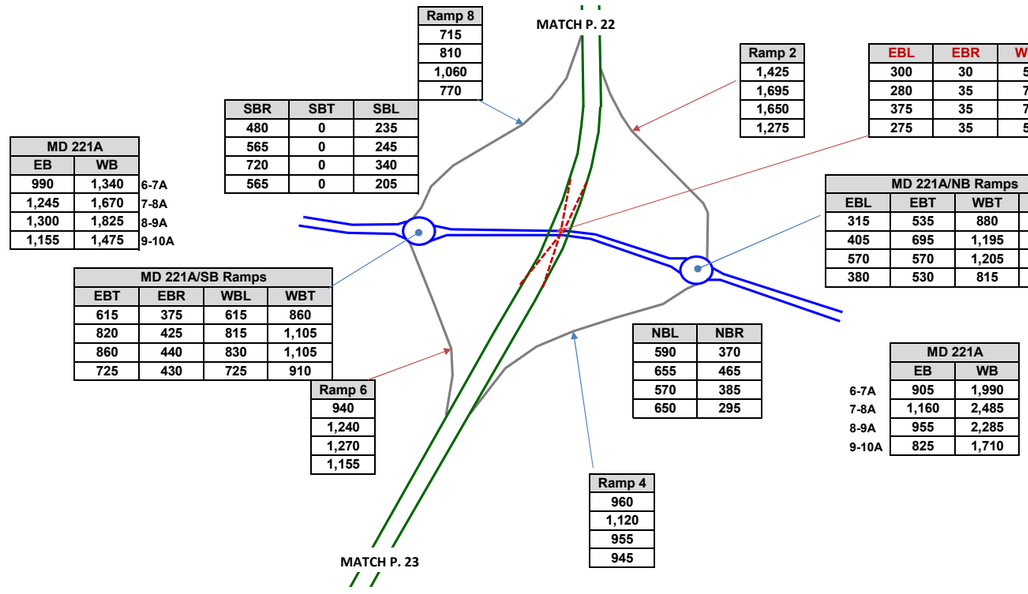
MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
270	700	3,000	580	570
365	1,090	2,660	640	945
360	875	1,875	580	1,195
315	675	1,360	555	1,170

MD 214		
	EB	WB
6-7A	1,020	2,810
7-8A	1,360	2,415
8-9A	1,530	2,130
9-10A	1,510	1,385

MD 214/Kingdom Square					
	NBR	WBL	WBT	EBT	EBR
6-7A	60	265	2,465	990	30
7-8A	85	440	1,990	1,295	65
8-9A	130	275	1,605	1,470	60
9-10A	150	225	995	1,450	60

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,205	2,550	9,755	9,620	2,615	7,005
7-8A	7,410	2,965	10,375	10,790	2,455	8,335
8-9A	7,215	2,905	10,120	10,335	2,440	7,895
9-10A	6,940	2,795	9,735	9,630	2,385	7,245

I-495 East Side AM
Future Alternative 8 Peak Period Volumes



Ramp 8
715
810
1,060
770

SBR	SBT	SBL
480	0	235
565	0	245
720	0	340
565	0	205

MD 221A		
EB	WB	
990	1,340	6-7A
1,245	1,670	7-8A
1,300	1,825	8-9A
1,155	1,475	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
615	375	615	860
820	425	815	1,105
860	440	830	1,105
725	430	725	910

Ramp 6
940
1,240
1,270
1,155

Ramp 2
1,425
1,695
1,650
1,275

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
300	30	55	485	70	40	290	475
280	35	70	480	75	40	310	545
375	35	70	415	65	35	315	580
275	35	55	370	70	30	260	525

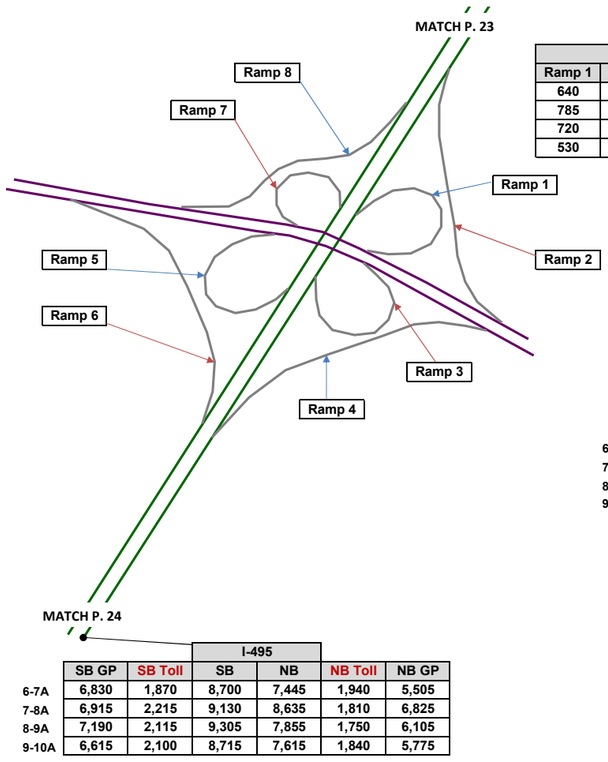
MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
315	535	880	1,110
405	695	1,195	1,290
570	570	1,205	1,080
380	530	815	895

NBL	NBR
590	370
655	465
570	385
650	295

Ramp 4
960
1,120
955
945

MD 221A		
	EB	WB
6-7A	905	1,990
7-8A	1,160	2,485
8-9A	955	2,285
9-10A	825	1,710

I-495 East Side AM
Future Alternative 8 Peak Period Volumes



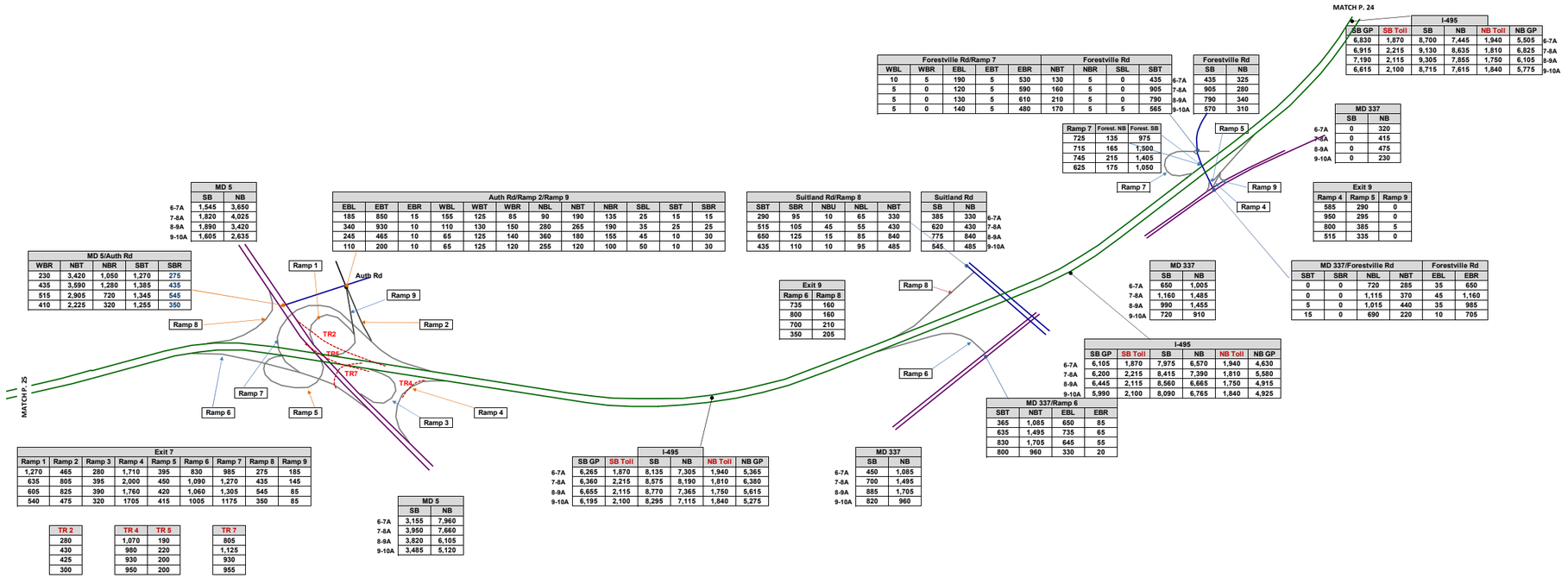
MD 4		
SB	NB	
1,335	2,295	6-7A
1,665	3,075	7-8A
1,580	2,095	8-9A
1,450	1,550	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
640	1,655	590	570	875	425	1,090	1,240
785	1,580	690	550	795	425	910	1,465
720	1,680	685	550	655	465	805	850
530	1,515	640	485	760	385	565	900

	MD 4	
	SB	NB
6-7A	1,765	3,160
7-8A	1,895	3,315
8-9A	1,635	3,010
9-10A	1,670	2,200

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,830	1,870	8,700	7,445	1,940	5,505
7-8A	6,915	2,215	9,130	8,635	1,810	6,825
8-9A	7,190	2,115	9,305	7,855	1,750	6,105
9-10A	6,615	2,100	8,715	7,615	1,840	5,775

I-495 South Side AM
Future Alternative 8 Peak Period Volumes



MD 5		
	SB	NB
6-7A	1,545	3,650
7-8A	1,820	4,025
8-9A	1,890	3,420
9-10A	1,605	2,635

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
230	3,420	1,050	1,270	275
435	3,590	1,280	1,385	435
515	2,905	720	1,345	545
410	2,225	320	1,255	350

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
185	850	15	155	125	85	90	190	135	25	15	15
340	930	10	110	130	150	280	265	190	35	25	25
245	465	10	65	125	140	360	180	155	45	10	30
110	200	10	65	125	120	255	120	100	50	10	30

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
1,270	465	280	1,710	395	830	985	275	185
635	805	395	2,000	450	1,090	1,270	435	145
605	825	390	1,760	420	1,060	1,305	545	85
540	475	320	1705	415	1005	1175	350	85

TR 2
280
430
425
300

TR 4	TR 5
1,070	190
980	220
930	200
950	200

TR 7
805
1,125
930
955

MD 5		
	SB	NB
6-7A	3,155	7,960
7-8A	3,950	7,660
8-9A	3,820	6,105
9-10A	3,485	5,120

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
290	95	10	65	330
515	105	45	55	430
650	125	15	85	840
435	110	10	95	485

Suitland Rd		
SB	NB	
385	330	6-7A
620	430	7-8A
775	840	8-9A
545	485	9-10A

Exit 9	
Ramp 6	Ramp 8
735	160
800	160
700	210
350	205

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,265	1,870	8,135	7,305	1,940	5,365
6,360	2,215	8,575	8,190	1,810	6,380
6,655	2,115	8,770	7,365	1,750	5,615
6,195	2,100	8,295	7,115	1,840	5,275

MD 337		
	SB	NB
6-7A	450	1,085
7-8A	700	1,495
8-9A	885	1,705
9-10A	820	960

Forestville Rd/Ramp 7					Forestville Rd				
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT	
10	5	190	5	530	130	5	0	435	6-7A
5	0	120	5	590	160	5	0	905	7-8A
5	0	130	5	610	210	5	0	790	8-9A
5	0	140	5	480	170	5	5	565	9-10A

Forestville Rd		
SB	NB	
435	325	6-7A
905	280	7-8A
790	340	8-9A
570	310	9-10A

Ramp 7	Forest. NB	Forest. SB
725	135	975
715	165	1,500
745	215	1,405
625	175	1,050

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,830	1,870	8,700	7,445	1,940	5,505
6,915	2,215	9,130	8,635	1,810	6,825
7,190	2,115	9,305	7,855	1,750	6,105
6,615	2,100	8,715	7,615	1,840	5,775

MD 337		
	SB	NB
6-7A	0	320
7-8A	0	415
8-9A	0	475
9-10A	0	230

Exit 9		
Ramp 4	Ramp 5	Ramp 9
585	290	0
950	295	0
800	385	5
515	335	0

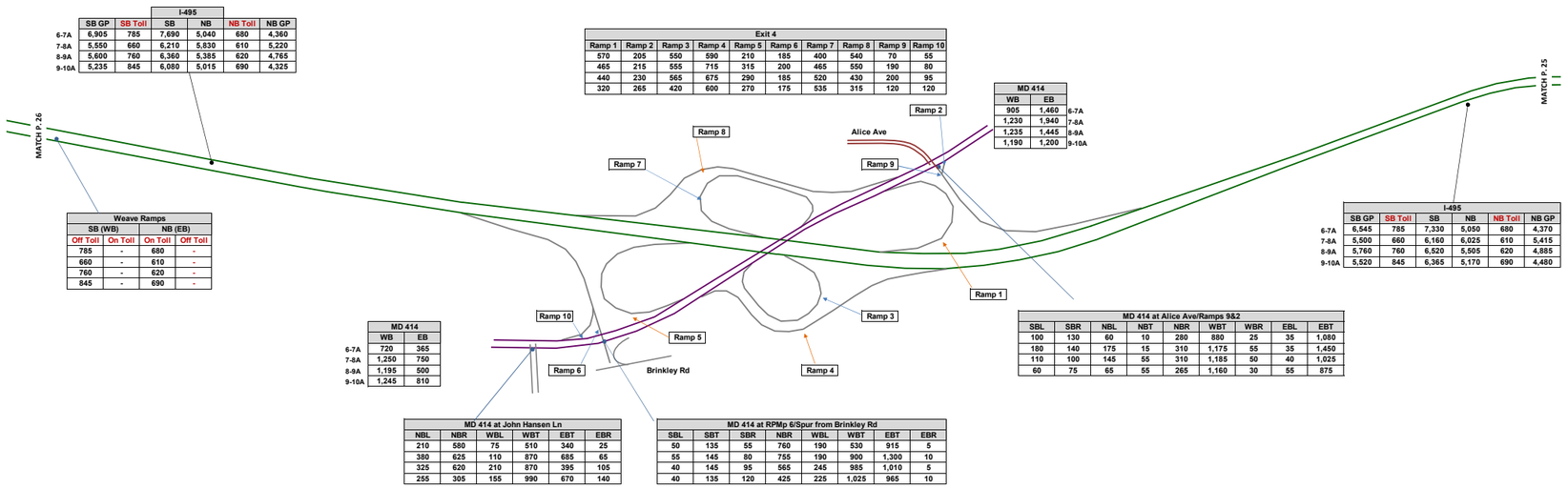
MD 337		
	SB	NB
6-7A	650	1,005
7-8A	1,160	1,485
8-9A	990	1,455
9-10A	720	910

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	720	285	35	650
0	0	1,115	370	45	1,160
5	0	1,015	440	35	985
15	0	690	220	10	705

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,105	1,870	7,975	6,570	1,940	4,630
6,200	2,215	8,415	7,390	1,810	5,580
6,445	2,115	8,560	6,665	1,750	4,915
5,990	2,100	8,090	6,765	1,840	4,925

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
365	1,085	650	85
635	1,495	735	65
830	1,705	645	55
800	960	330	20

I-495 South Side AM
Future Alternative 8 Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,905	785	7,690	5,040	680	4,360
7-8A	5,550	660	6,210	5,830	610	5,220
8-9A	5,600	760	6,360	5,385	620	4,765
9-10A	5,235	845	6,080	5,015	690	4,325

Weave Ramps				
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
785	-	680	-
660	-	610	-
760	-	620	-
845	-	690	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
570	205	550	590	210	185	400	540	70	55
465	215	555	715	315	200	465	550	190	80
440	230	565	675	290	185	520	430	200	95
320	265	420	600	270	175	535	315	120	120

MD 414		
WB	EB	
905	1,460	6-7A
1,230	1,940	7-8A
1,235	1,445	8-9A
1,190	1,200	9-10A

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,545	785	7,330	5,050	680	4,370
7-8A	5,500	660	6,160	6,025	610	5,415
8-9A	5,760	760	6,520	5,505	620	4,885
9-10A	5,520	845	6,365	5,170	690	4,480

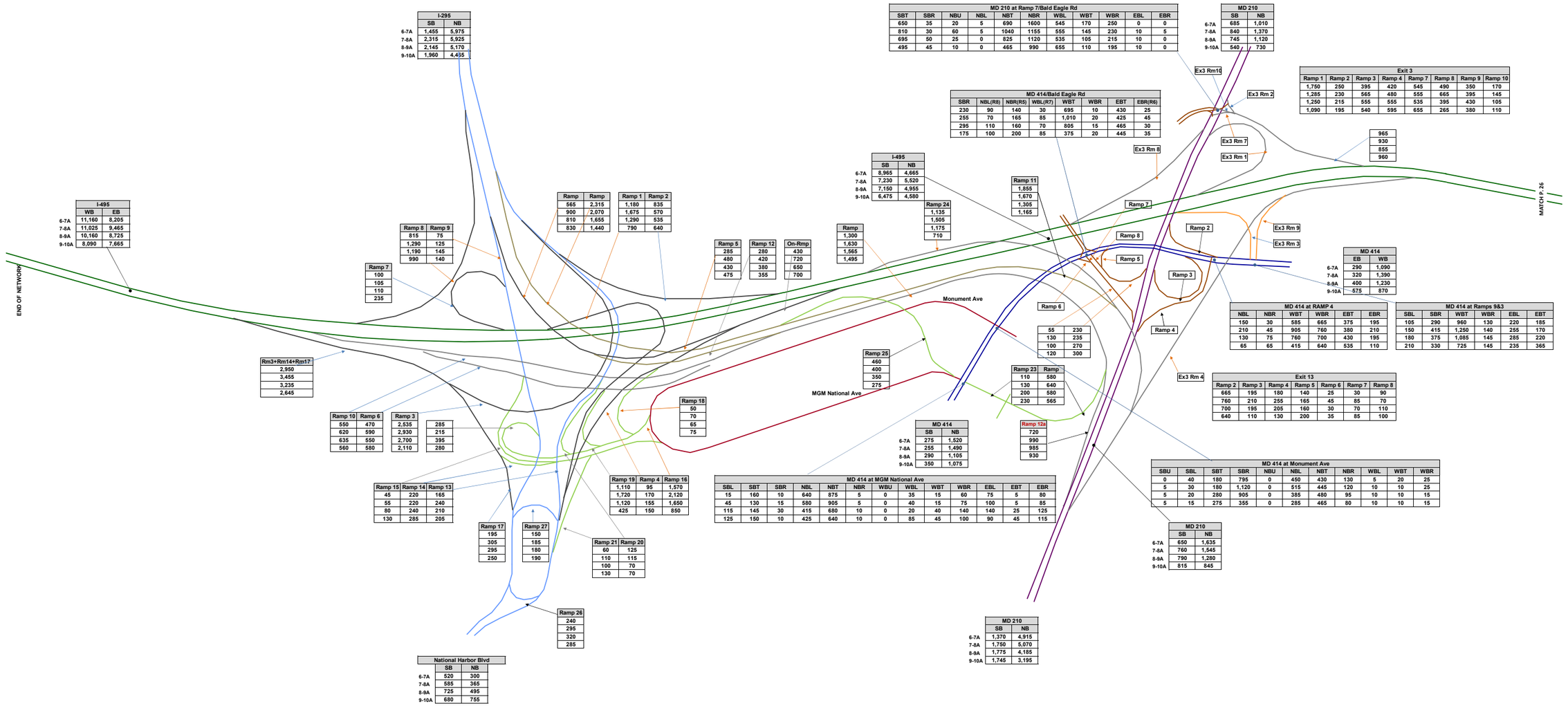
MD 414		
WB	EB	
720	365	6-7A
1,250	750	7-8A
1,195	500	8-9A
1,245	810	9-10A

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
100	130	60	10	280	880	25	35	1,080
180	140	175	15	310	1,175	55	35	1,450
110	100	145	55	310	1,185	50	40	1,025
60	75	65	55	265	1,160	30	55	875

MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
210	580	75	510	340	25
380	625	110	870	685	65
325	620	210	870	395	105
255	305	155	990	670	140

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
50	135	55	760	190	530	915	5
55	145	80	755	190	900	1,300	10
40	145	95	565	245	985	1,010	5
40	135	120	425	225	1,025	965	10

I-495 South Side AM
Future Alternative 8 Peak Period Volumes



I-495		
	WB	EB
6-7A	11,160	8,205
7-8A	11,025	9,465
8-9A	10,160	8,725
9-10A	8,090	7,665

I-295		
	SB	NB
6-7A	1,455	5,975
7-8A	2,315	5,925
8-9A	2,145	5,170
9-10A	1,960	4,435

I-495		
	SB	NB
6-7A	8,965	4,665
7-8A	7,230	5,520
8-9A	7,150	4,955
9-10A	6,475	4,580

MD 210		
	SB	NB
6-7A	685	1,010
7-8A	840	1,370
8-9A	745	1,120
9-10A	540	730

MD 210 at Ramp 7/Bald Eagle Rd											
SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR	EBL	EBR
650	35	20	5	690	1600	545	170	250	0	0
810	30	60	5	1040	1155	555	145	230	10	5
695	50	25	0	825	1120	535	105	215	10	0
495	45	10	0	465	990	655	110	195	10	0

MD 414/Bald Eagle Rd							
SBR	NBL(R8)	NBR(R5)	WBL(R7)	WBT	WBR	EBT	EBR(R6)
230	90	140	30	695	10	430	25
255	70	165	85	1,010	20	425	45
295	110	160	70	805	15	465	30
175	100	200	85	375	20	445	35

Exit 3							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 7	Ramp 8	Ramp 9	Ramp 10
1,750	250	395	420	545	490	350	170
1,285	230	565	480	555	665	395	145
1,250	215	555	555	535	395	430	105
1,090	195	540	595	655	265	380	110

Ramp	Ramp
565	2,315
900	2,070
810	1,655
830	1,440

Ramp 1	Ramp 2
1,180	835
1,675	570
1,290	535
790	640

Ramp 8	Ramp 9
815	75
1,290	125
1,190	145
990	140

Ramp 7
100
105
110
235

Ramp 5
285
480
430
475

Ramp 12
280
420
380
355

On-Rmp
430
720
650
700

Ramp
1,300
1,630
1,565
1,495

Ramp 24
1,135
1,505
1,175
710

Ramp 11
1,855
1,670
1,305
1,165

965
930
855
960

MD 414		
	EB	WB
6-7A	290	1,090
7-8A	320	1,390
8-9A	400	1,230
9-10A	575	870

MD 414 at RAMP 4					
NBL	NBR	WBT	WBR	EBT	EBR
150	30	585	665	375	195
210	45	905	760	380	210
130	75	760	700	430	195
65	65	415	640	535	110

MD 414 at Ramps 9&3					
SBL	SBR	WBT	WBR	EBL	EBT
105	290	960	130	220	185
150	415	1,250	140	255	170
180	375	1,085	145	285	220
210	330	725	145	235	365

Exit 13						
Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
665	195	180	140	25	30	90
760	210	255	165	45	85	70
700	195	205	160	30	70	110
640	110	130	200	35	85	100

Rm3+Rm14+Rm17
2,950
3,455
3,235
2,645

Ramp 10	Ramp 6
550	470
620	590
635	550
560	580

Ramp 3	
2,535	285
2,930	215
2,700	395
2,110	280

Ramp 18
50
70
65
75

Ramp 25
460
400
350
275

Ramp 23	Ramp
110	580
130	640
200	580
230	565

55	230
130	235
100	270
120	300

Ramp 12a
720
990
985
930

MD 414		
	SB	NB
6-7A	275	1,520
7-8A	255	1,490
8-9A	290	1,105
9-10A	350	1,075

Ramp 15	Ramp 14	Ramp 13
45	220	165
55	220	240
80	240	210
130	285	205

Ramp 19	Ramp 4	Ramp 16
1,110	95	1,570
1,720	170	2,120
1,120	155	1,650
425	150	850

Ramp 17
195
305
295
250

Ramp 27
150
185
180
190

Ramp 21	Ramp 20
60	125
110	115
100	70
130	70

Ramp 26
240
295
320
285

MD 414 at MGM National Ave												
SBL	SBT	SBR	NBL	NBT	NBR	WBU	WBL	WBT	WBR	EBL	EBT	EBR
15	160	10	640	875	5	0	35	15	60	75	5	80
45	130	15	580	905	5	0	40	15	75	100	5	85
115	145	30	415	680	10	0	20	40	140	140	25	125
125	150	10	425	640	10	0	85	45	100	90	45	115

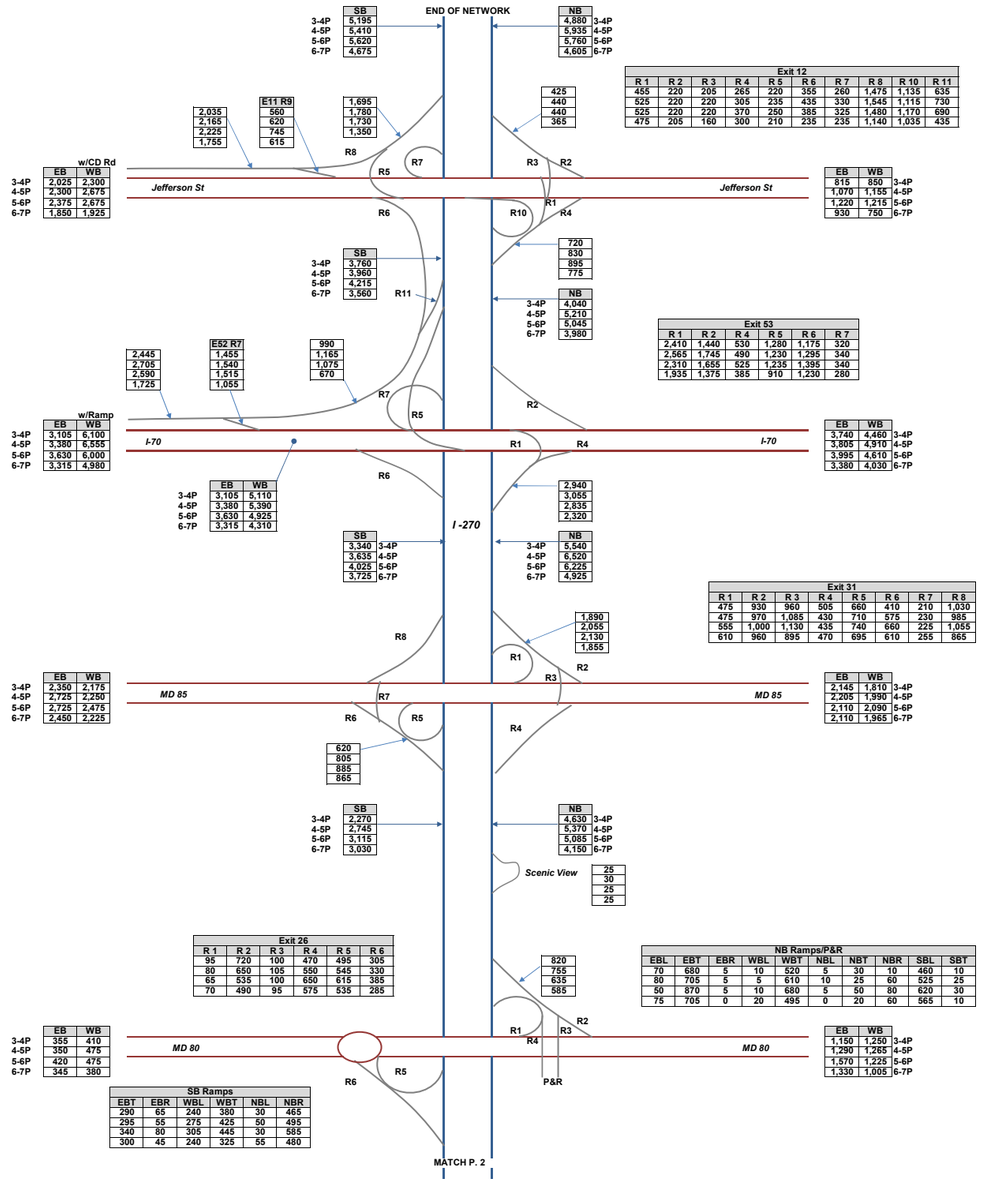
MD 414 at Monument Ave									
SBU	SBL	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR
0	40	180	795	0	450	430	130	5	20	25
5	30	180	1,120	0	515	445	120	10	10	25
5	20	280	905	0	385	480	95	10	10	15
5	15	275	355	0	285	465	80	10	10	15

MD 210		
	SB	NB
6-7A	650	1,635
7-8A	760	1,545
8-9A	790	1,280
9-10A	815	845

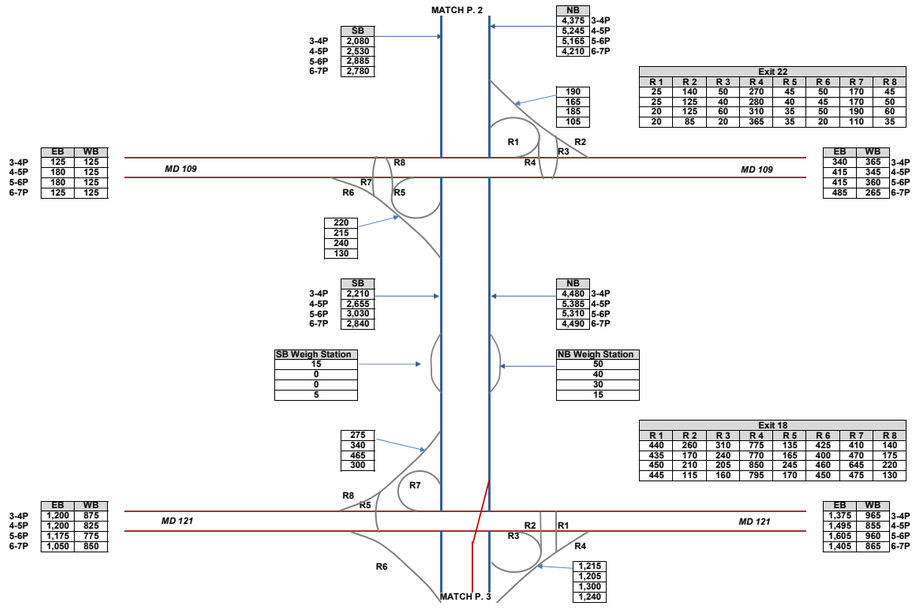
MD 210		
	SB	NB
6-7A	1,370	4,915
7-8A	1,750	5,070
8-9A	1,775	4,185
9-10A	1,745	3,195

National Harbor Blvd		
	SB	NB
6-7A	520	300
7-8A	585	365
8-9A	725	495
9-10A	680	755

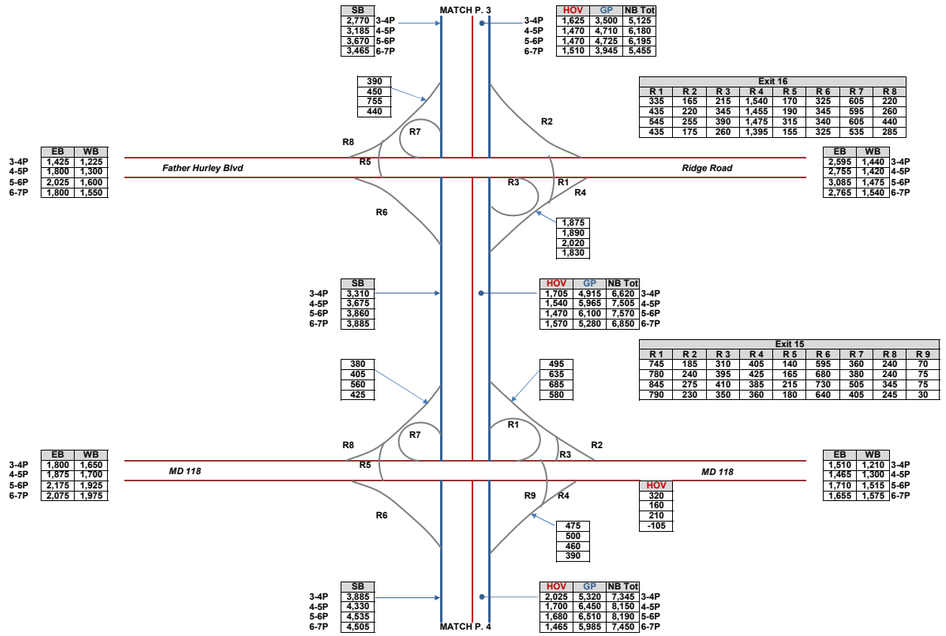
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



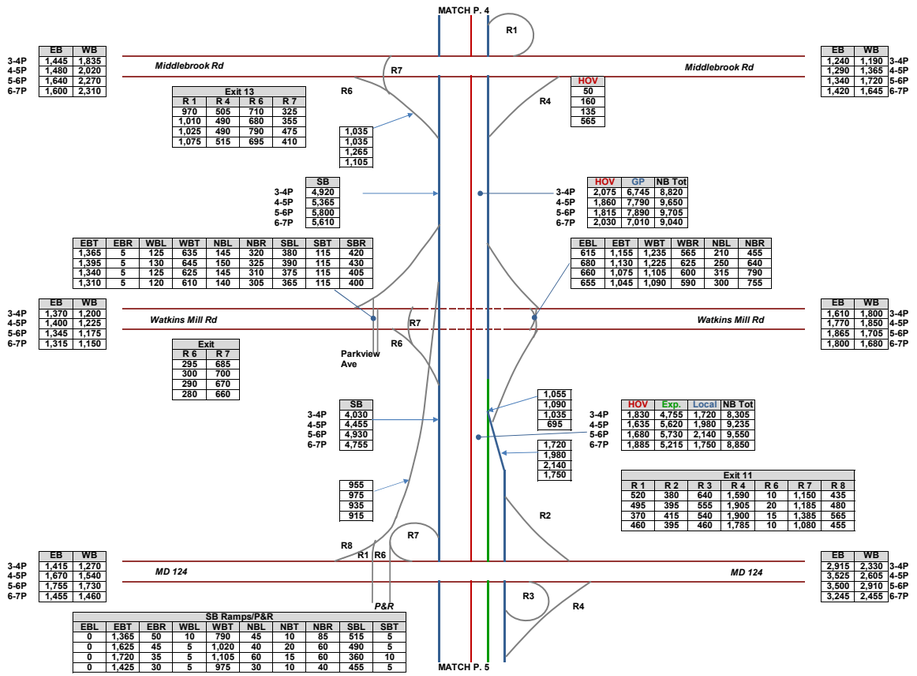
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



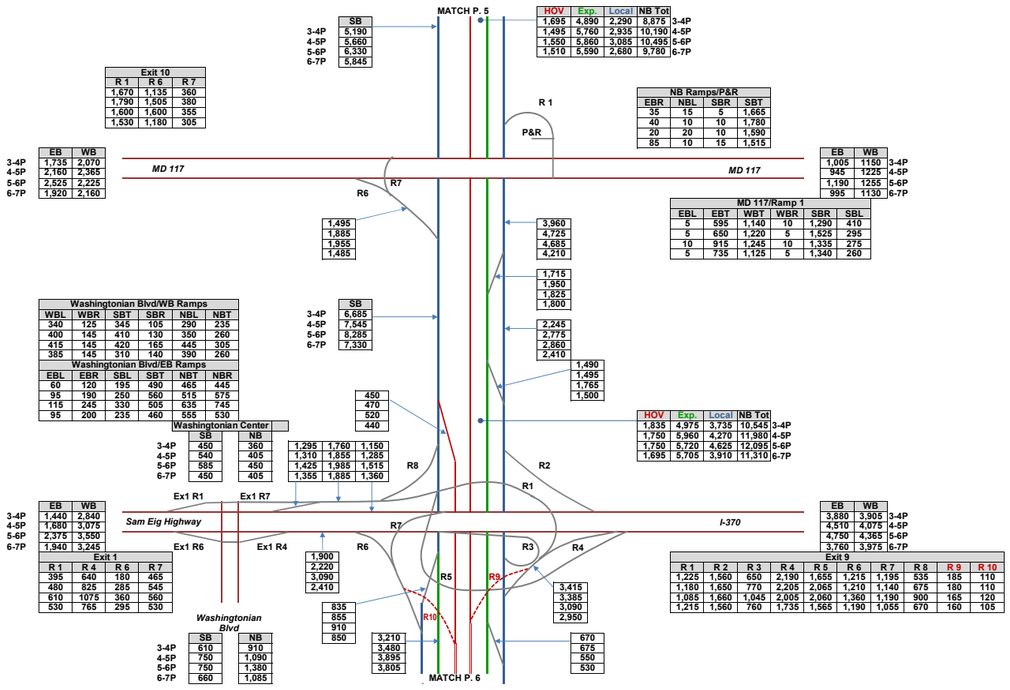
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



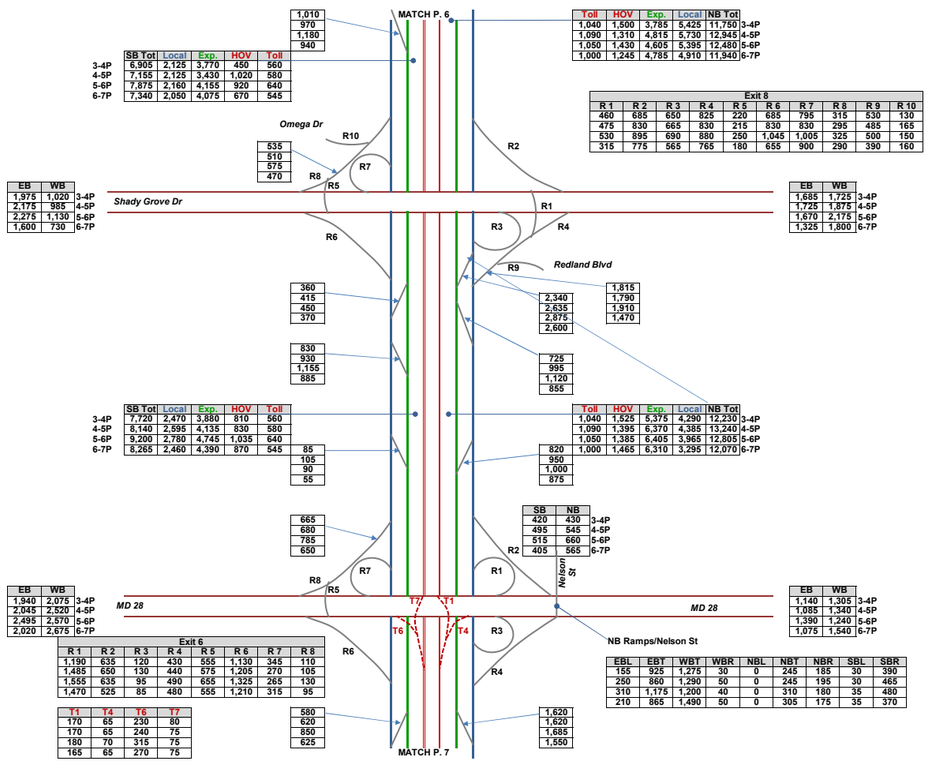
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



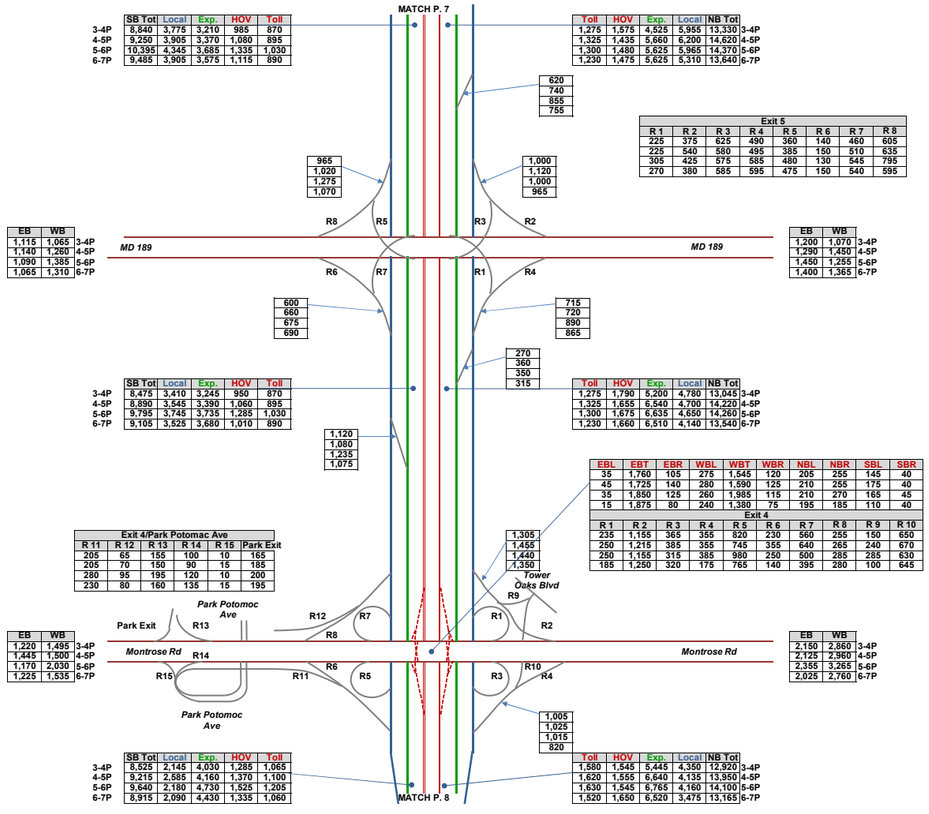
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



	SB Tot	Local	Exp.	HOV	Toll
3-4P	8,840	3,775	3,210	985	870
4-5P	9,250	3,905	3,370	1,080	895
5-6P	10,395	4,345	3,685	1,335	1,030
6-7P	9,485	3,905	3,575	1,115	890

	Toll	HOV	Exp.	Local	NB Tot
3-4P	1,275	1,575	4,525	5,955	13,330
4-5P	1,325	1,435	5,660	6,200	14,620
5-6P	1,300	1,480	5,625	5,965	14,370
6-7P	1,230	1,475	5,625	5,310	13,640

620
740
855
755

965
1,020
1,275
1,070

1,000
1,120
1,000
965

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
225	375	625	490	360	140	460	605
225	540	580	495	385	150	510	635
305	425	575	585	480	130	545	795
270	380	585	595	475	150	540	595

	EB	WB
3-4P	1,115	1,065
4-5P	1,140	1,260
5-6P	1,090	1,385
6-7P	1,065	1,310

	EB	WB
3-4P	1,200	1,070
4-5P	1,290	1,450
5-6P	1,450	1,255
6-7P	1,400	1,365

600
660
675
690

715
720
890
865

270
360
350
315

	SB Tot	Local	Exp.	HOV	Toll
3-4P	8,475	3,410	3,245	950	870
4-5P	8,890	3,545	3,390	1,060	895
5-6P	9,795	3,745	3,735	1,285	1,030
6-7P	9,105	3,525	3,680	1,010	890

	Toll	HOV	Exp.	Local	NB Tot
3-4P	1,275	1,790	5,200	4,780	13,045
4-5P	1,325	1,655	6,540	4,700	14,220
5-6P	1,300	1,675	6,635	4,650	14,260
6-7P	1,230	1,660	6,510	4,140	13,540

1,120
1,080
1,235
1,075

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
	35	1,760	105	275	1,545	120	205	255	145	40
	45	1,725	140	280	1,590	125	210	255	175	40
	35	1,850	125	260	1,985	115	210	270	165	45
	15	1,875	80	240	1,380	75	195	185	110	40

Exit 4								
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
235	1,155	365	355	820	230	560	255	150	650
250	1,215	385	355	745	355	640	265	240	670
250	1,155	315	385	980	250	500	285	285	630
185	1,250	320	175	765	140	395	280	100	645

1,305
1,455
1,440
1,350

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
205	65	155	100	10	165
205	70	150	90	15	185
280	95	195	120	10	200
230	80	160	135	15	195

	EB	WB
3-4P	1,220	1,495
4-5P	1,445	1,500
5-6P	1,170	2,030
6-7P	1,225	1,535

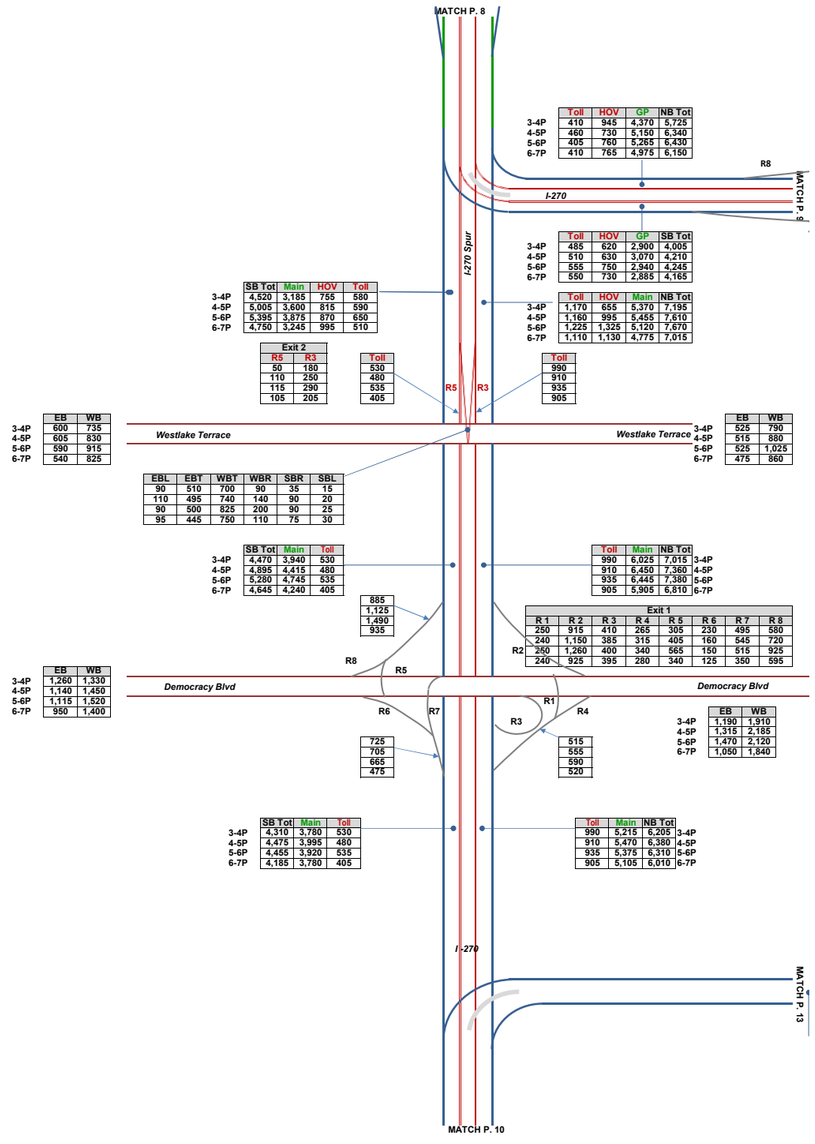
	EB	WB
3-4P	2,150	2,860
4-5P	2,125	2,960
5-6P	2,355	3,265
6-7P	2,025	2,760

1,005
1,025
1,015
820

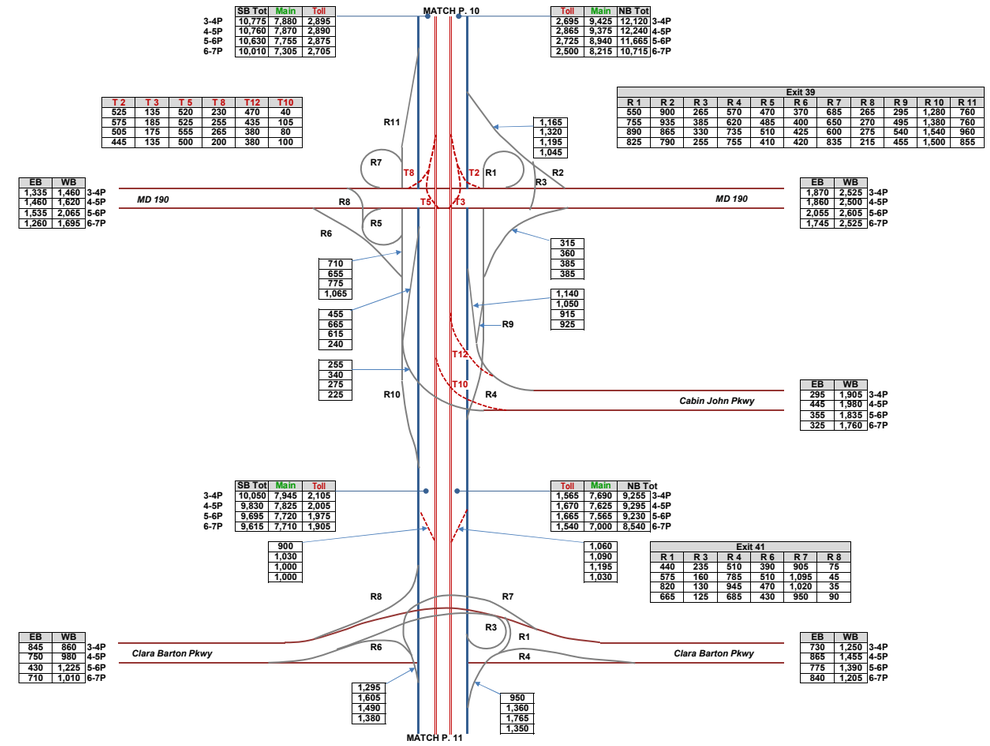
	SB Tot	Local	Exp.	HOV	Toll
3-4P	8,525	2,145	4,030	1,285	1,065
4-5P	9,215	2,585	4,160	1,370	1,100
5-6P	9,640	2,180	4,730	1,525	1,205
6-7P	8,915	2,090	4,430	1,335	1,060

	Toll	HOV	Exp.	Local	NB Tot
3-4P	1,580	1,545	5,445	4,350	12,920
4-5P	1,620	1,555	6,640	4,135	13,950
5-6P	1,630	1,545	6,765	4,160	14,100
6-7P	1,520	1,650	6,520	3,475	13,165

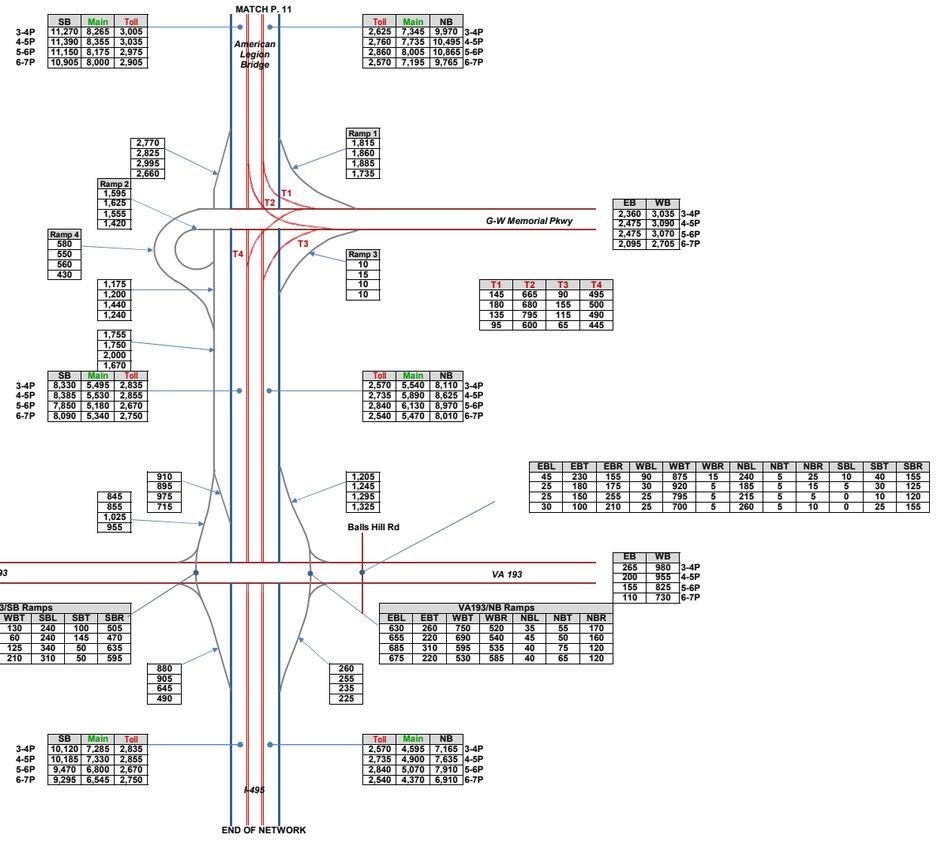
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



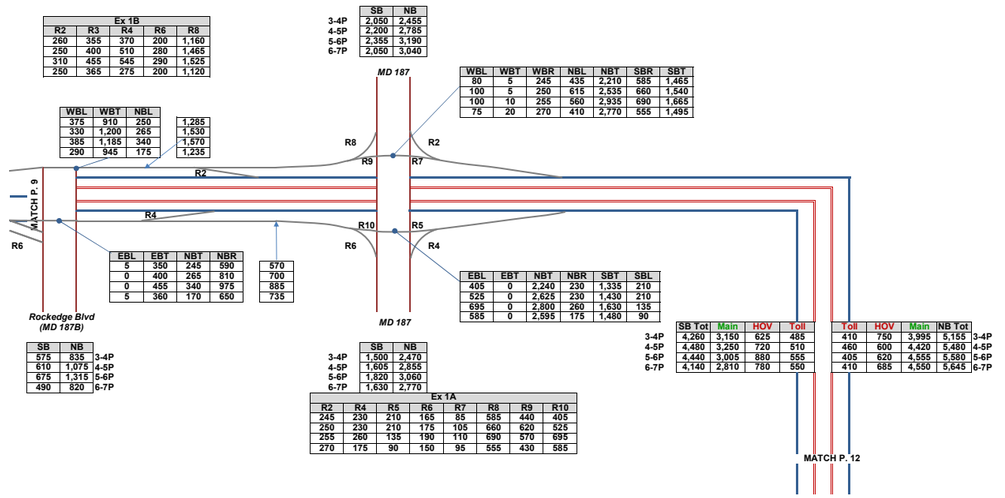
I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



Ex 1B				
R2	R3	R4	R6	R8
260	355	370	200	1,160
250	400	510	280	1,465
310	455	545	290	1,525
290	365	275	200	1,120

WBL	WBT	NBL	
375	910	250	1,285
330	1,200	265	1,530
385	1,185	340	1,570
290	945	175	1,235

	SB	NB
3-4P	2,050	2,455
4-5P	2,200	2,785
5-6P	2,355	3,190
6-7P	2,050	3,040

WBL	WBT	WBR	NBL	NBT	SBR	SBT
80	5	245	435	2,210	585	1,465
100	5	250	615	2,535	660	1,540
100	10	255	560	2,335	690	1,665
75	20	270	410	2,770	555	1,495

EBL	EBT	NBT	NBR	
5	350	245	590	570
0	400	265	810	700
0	455	340	975	885
5	360	170	650	735

EBL	EBT	NBT	NBR	SBT	SBL
405	0	2,240	230	1,335	210
525	0	2,625	230	1,430	210
695	0	2,800	260	1,630	135
585	0	2,595	175	1,480	90

	SB	NB	
3-4P	575	835	3-4P
4-5P	610	1,075	4-5P
5-6P	675	1,315	5-6P
6-7P	490	820	6-7P

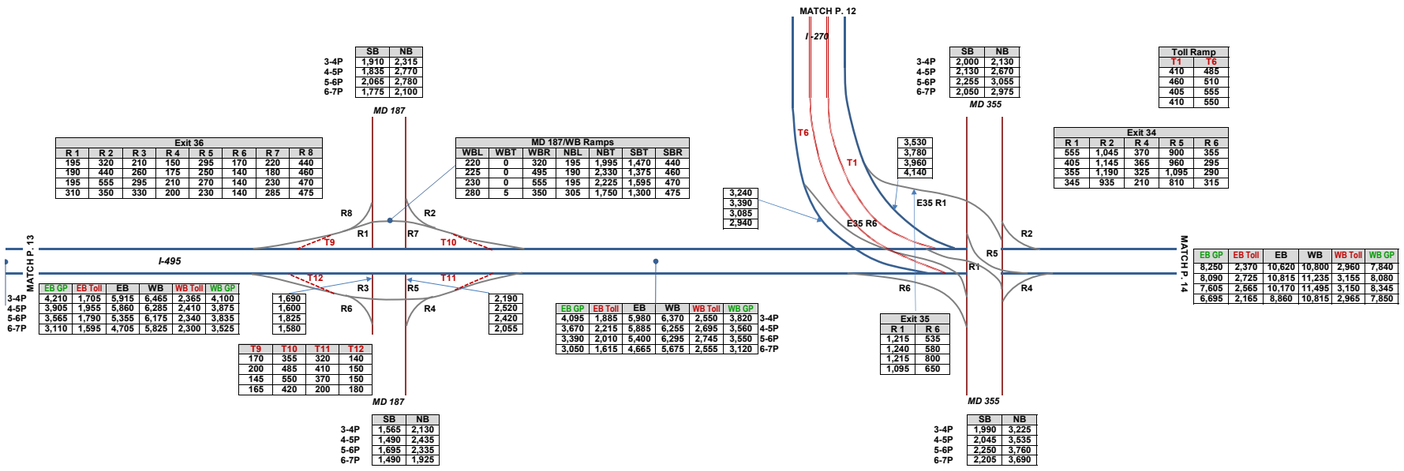
	SB	NB
3-4P	1,500	2,470
4-5P	1,605	2,855
5-6P	1,820	3,060
6-7P	1,630	2,770

Ex 1A							
R2	R4	R5	R6	R7	R8	R9	R10
245	230	210	165	85	585	440	405
250	230	210	175	105	660	620	525
255	260	135	190	110	690	570	695
270	175	90	150	95	555	430	585

	SB Tot	Main	HOV	Toll
3-4P	4,260	3,150	625	485
4-5P	4,480	3,250	720	510
5-6P	4,440	3,005	880	555
6-7P	4,140	2,810	780	550

Toll	HOV	Main	NB Tot	
410	750	3,995	5,155	3-4P
460	600	4,420	5,480	4-5P
405	620	4,555	5,580	5-6P
410	685	4,550	5,645	6-7P

I-270 & I-495 West Side PM
Future Alternative 8 Peak Period Volumes



	SB	NB
3-4P	1,910	2,315
4-5P	1,835	2,770
5-6P	2,065	2,780
6-7P	1,775	2,100

	SB	NB
3-4P	2,000	2,130
4-5P	2,130	2,670
5-6P	2,255	3,055
6-7P	2,050	2,975

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
195	320	210	150	295	170	220	440
190	440	260	175	250	140	180	460
195	555	295	210	270	140	230	470
310	350	330	200	230	140	285	475

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
220	0	320	195	1,995	1,470	440
225	0	495	190	2,330	1,375	460
230	0	555	195	2,225	1,595	470
280	5	350	305	1,750	1,300	475

Exit 34					
R 1	R 2	R 4	R 5	R 6	
555	1,045	370	900	355	
405	1,145	365	960	295	
355	1,190	325	1,095	290	
345	935	210	810	315	

Toll Ramp	
T1	T6
410	485
460	510
405	555
410	550

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	4,210	1,705	5,915	6,465	2,365	4,100
4-5P	3,905	1,955	5,860	6,285	2,410	3,875
5-6P	3,565	1,790	5,355	6,175	2,340	3,835
6-7P	3,110	1,595	4,705	5,825	2,300	3,525

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	4,095	1,885	5,980	6,370	2,550	3,820
4-5P	3,670	2,215	5,885	6,255	2,695	3,560
5-6P	3,390	2,010	5,400	6,295	2,745	3,550
6-7P	3,050	1,615	4,685	5,675	2,555	3,120

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
	8,250	2,370	10,620	10,800	2,960	7,840
	8,090	2,725	10,815	11,235	3,155	8,080
	7,605	2,565	10,170	11,495	3,150	8,345
	6,695	2,165	8,860	10,815	2,965	7,850

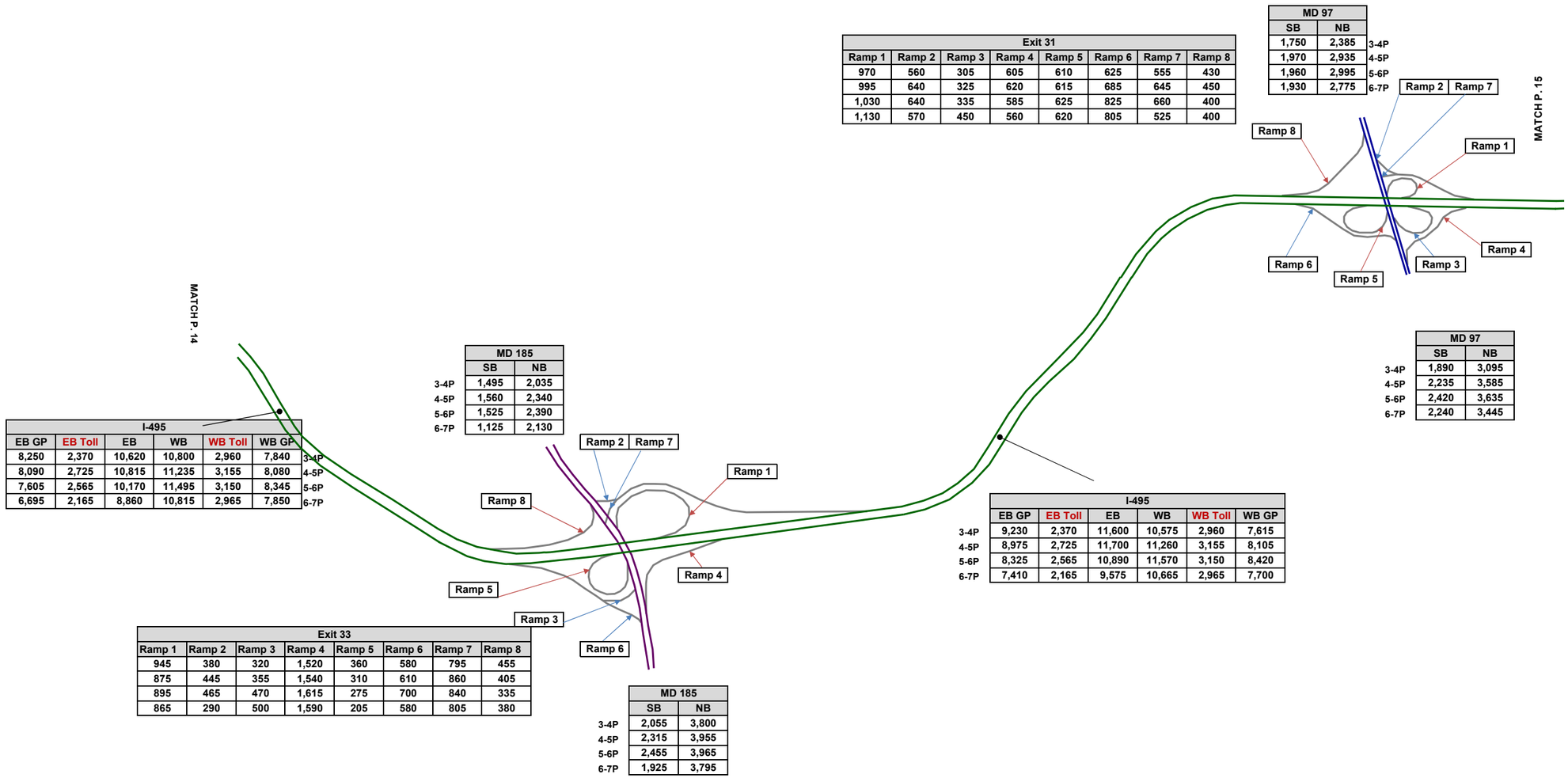
Exit 35	
R 1	R 6
1,215	535
1,240	580
1,215	800
1,095	650

T9	T10	T11	T12
170	355	320	140
200	485	410	150
145	550	370	150
165	420	200	180

	SB	NB
3-4P	1,565	2,130
4-5P	1,490	2,435
5-6P	1,695	2,335
6-7P	1,490	1,925

	SB	NB
3-4P	1,990	3,225
4-5P	2,045	3,535
5-6P	2,250	3,760
6-7P	2,205	3,690

I-495 North Side PM
Future Alternative 8 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
970	560	305	605	610	625	555	430
995	640	325	620	615	685	645	450
1,030	640	335	585	625	825	660	400
1,130	570	450	560	620	805	525	400

	MD 97	
	SB	NB
3-4P	1,750	2,385
4-5P	1,970	2,935
5-6P	1,960	2,995
6-7P	1,930	2,775

	MD 97	
	SB	NB
3-4P	1,890	3,095
4-5P	2,235	3,585
5-6P	2,420	3,635
6-7P	2,240	3,445

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,230	2,370	11,600	10,575	2,960	7,615
4-5P	8,975	2,725	11,700	11,260	3,155	8,105
5-6P	8,325	2,565	10,890	11,570	3,150	8,420
6-7P	7,410	2,165	9,575	10,665	2,965	7,700

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,250	2,370	10,620	10,800	2,960	7,840
4-5P	8,090	2,725	10,815	11,235	3,155	8,080
5-6P	7,605	2,565	10,170	11,495	3,150	8,345
6-7P	6,695	2,165	8,860	10,815	2,965	7,850

	MD 185	
	SB	NB
3-4P	1,495	2,035
4-5P	1,560	2,340
5-6P	1,525	2,390
6-7P	1,125	2,130

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
945	380	320	1,520	360	580	795	455
875	445	355	1,540	310	610	860	405
895	465	470	1,615	275	700	840	335
865	290	500	1,590	205	580	805	380

	MD 185	
	SB	NB
3-4P	2,055	3,800
4-5P	2,315	3,955
5-6P	2,455	3,965
6-7P	1,925	3,795

I-495 North Side PM
Future Alternative 8 Peak Period Volumes

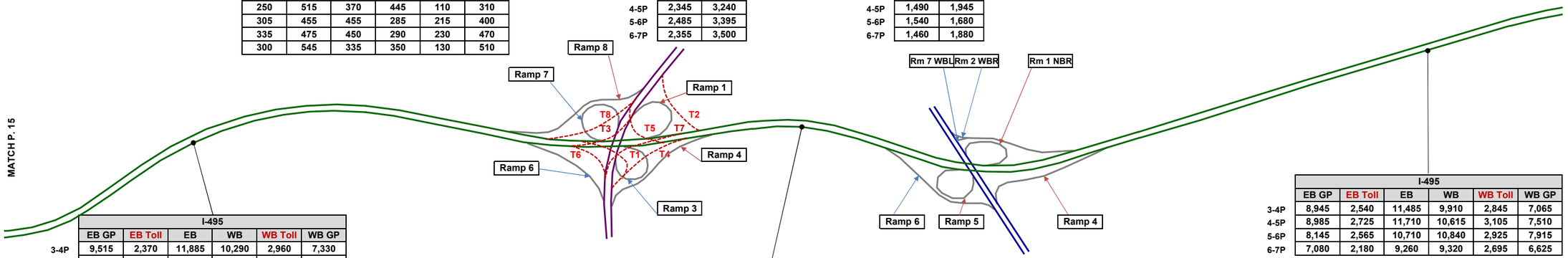
T1	T2	T3	T4	T5	T6	T7	T8
185	415	760	725	325	120	390	735
220	440	910	710	335	135	400	670
255	410	910	725	320	135	340	720
245	390	895	660	360	110	370	785

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
250	515	370	445	110	310
305	455	455	285	215	400
335	475	450	290	230	470
300	545	335	350	130	510

	US 29	
	SB	NB
3-4P	2,140	2,935
4-5P	2,345	3,240
5-6P	2,485	3,395
6-7P	2,355	3,500

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
600	450	505	495	980	335
845	555	500	510	940	345
895	665	460	500	875	430
850	515	445	475	615	375

	MD 193	
	SB	NB
3-4P	1,375	1,815
4-5P	1,490	1,945
5-6P	1,540	1,680
6-7P	1,460	1,880



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,515	2,370	11,885	10,290	2,960	7,330
4-5P	9,200	2,725	11,925	11,100	3,155	7,945
5-6P	8,375	2,565	10,940	11,440	3,150	8,290
6-7P	7,335	2,165	9,500	10,230	2,965	7,265

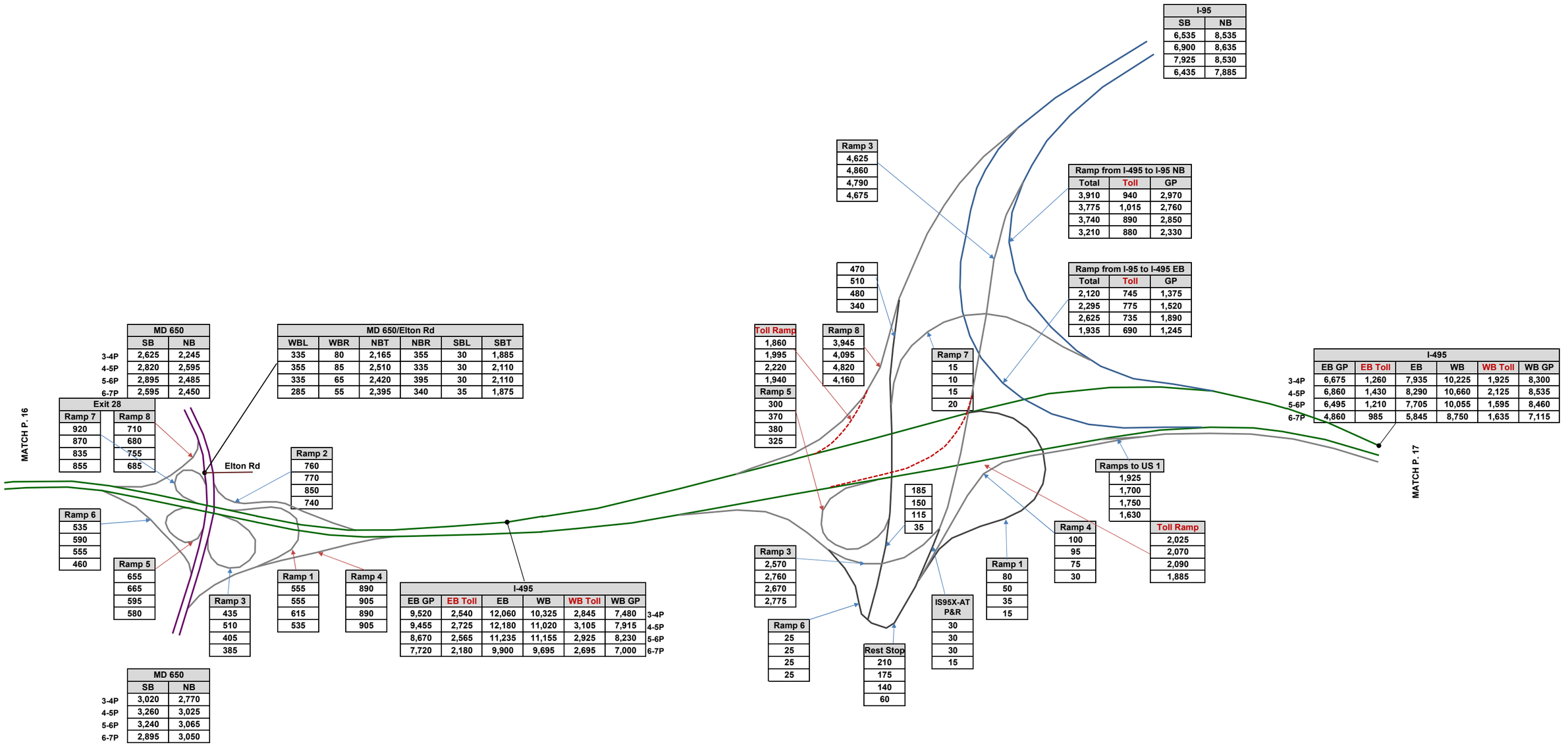
	US 29	
	SB	NB
3-4P	1,835	2,775
4-5P	1,975	3,125
5-6P	1,970	3,365
6-7P	1,660	3,210

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,925	2,540	11,465	9,725	2,845	6,880
4-5P	8,915	2,725	11,640	10,560	3,105	7,455
5-6P	8,060	2,565	10,625	10,640	2,925	7,715
6-7P	6,775	2,180	8,955	9,280	2,695	6,585

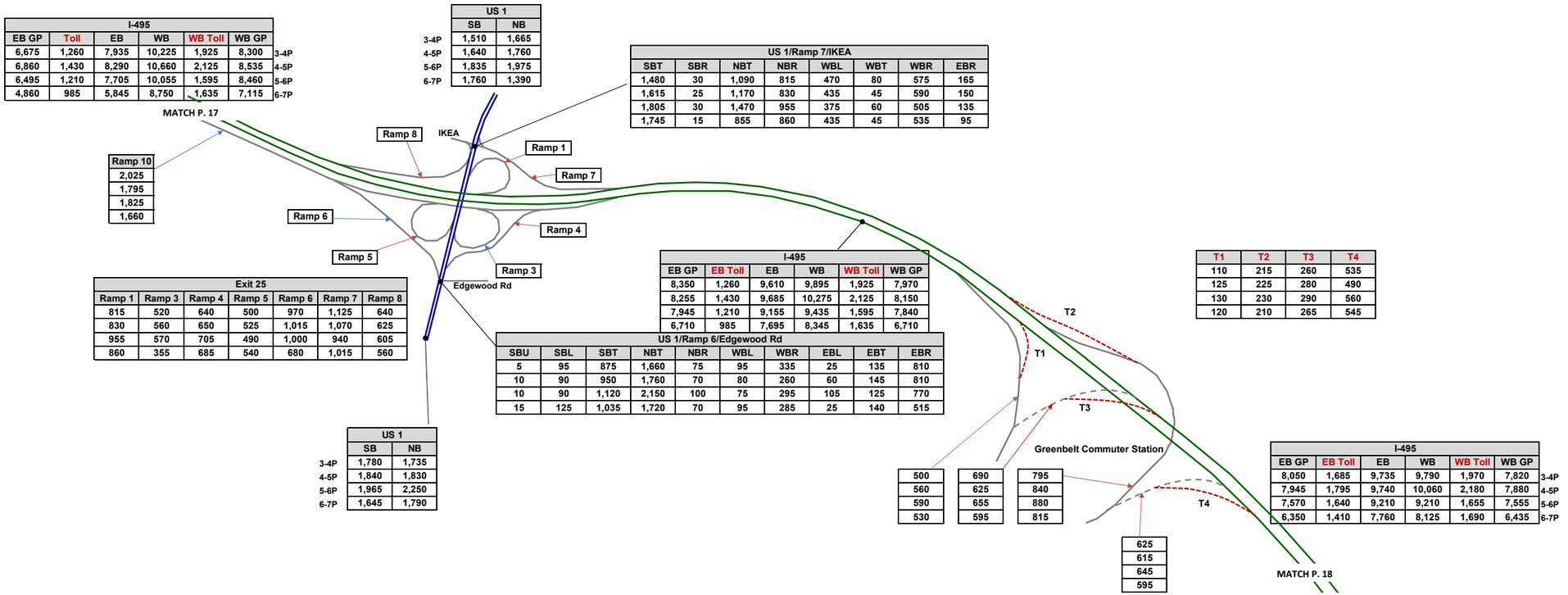
	MD 193	
	SB	NB
3-4P	2,195	2,470
4-5P	2,265	2,735
5-6P	2,345	2,370
6-7P	1,975	2,660

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,945	2,540	11,485	9,910	2,845	7,065
4-5P	8,985	2,725	11,710	10,615	3,105	7,510
5-6P	8,145	2,565	10,710	10,840	2,925	7,915
6-7P	7,080	2,180	9,260	9,320	2,695	6,625

I-495 North Side PM
Future Alternative 8 Peak Period Volumes



I-495 North East Side PM
Future Alternative 8 Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,675	1,260	7,935	10,225	1,925	8,300	3-4P
6,860	1,430	8,290	10,660	2,125	8,535	4-5P
6,495	1,210	7,705	10,055	1,595	8,460	5-6P
4,860	985	5,845	8,750	1,635	7,115	6-7P

Ramp 10
2,025
1,795
1,825
1,660

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
815	520	640	500	970	1,125	640
830	560	650	525	1,015	1,070	625
955	570	705	490	1,000	940	605
860	355	685	540	680	1,015	560

US 1		
	SB	NB
3-4P	1,780	1,735
4-5P	1,840	1,830
5-6P	1,965	2,250
6-7P	1,645	1,790

US 1		
	SB	NB
3-4P	1,510	1,665
4-5P	1,640	1,760
5-6P	1,835	1,975
6-7P	1,760	1,390

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,480	30	1,090	815	470	80	575	165
1,615	25	1,170	830	435	45	590	150
1,805	30	1,470	955	375	60	505	135
1,745	15	855	860	435	45	535	95

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	875	1,660	75	95	335	25	135	810
10	90	950	1,760	70	80	260	60	145	810
10	90	1,120	2,150	100	75	295	105	125	770
15	125	1,035	1,720	70	95	285	25	140	515

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
8,350	1,260	9,610	9,895	1,925	7,970
8,255	1,430	9,685	10,275	2,125	8,150
7,945	1,210	9,155	9,435	1,595	7,840
6,710	985	7,695	8,345	1,635	6,710

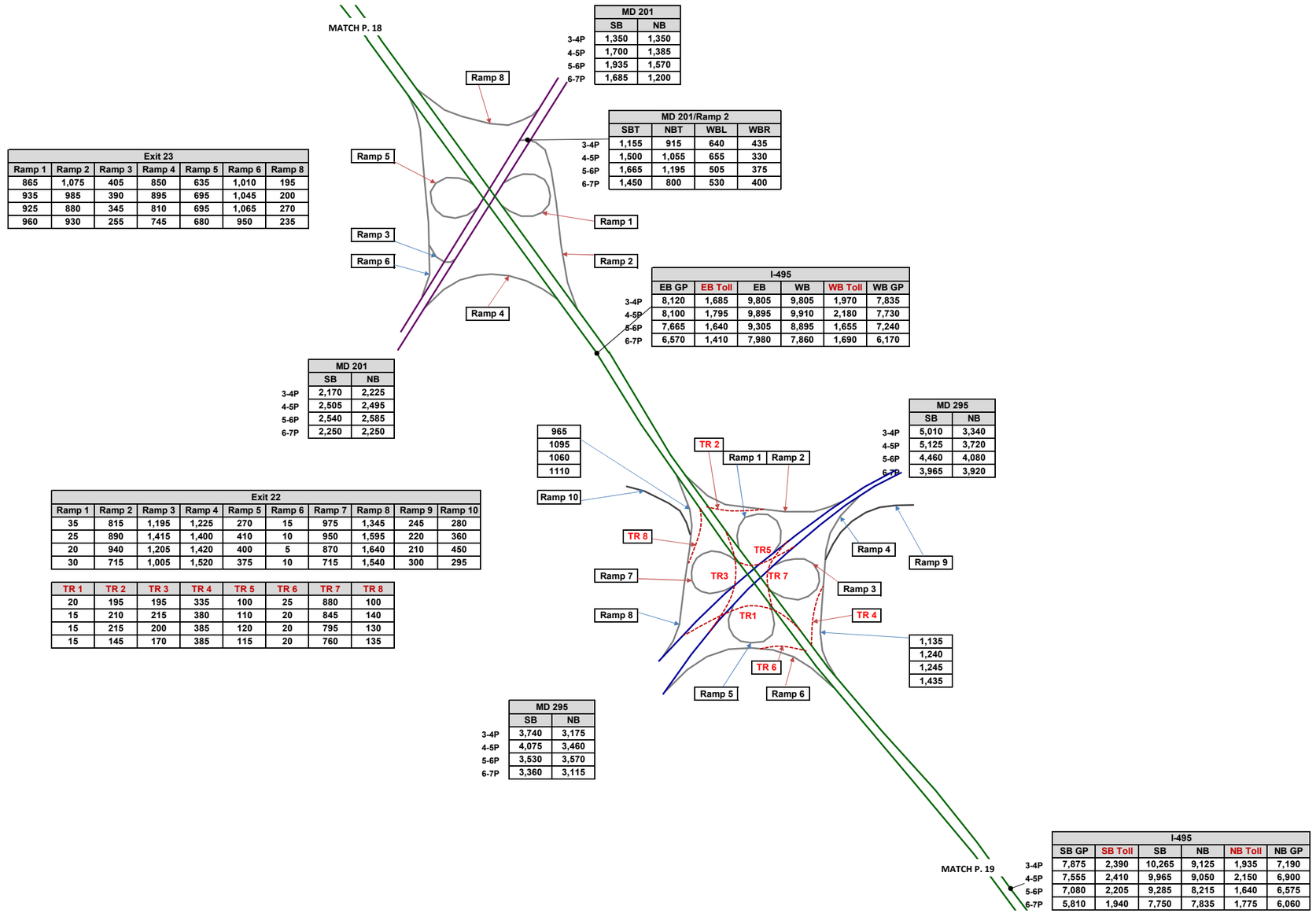
T1	T2	T3	T4
110	215	260	535
125	225	280	490
130	230	290	560
120	210	265	545

500	690	795
560	625	840
590	655	880
530	595	815

625
615
645
595

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,050	1,685	9,735	9,790	1,970	7,820	3-4P
7,945	1,795	9,740	10,060	2,180	7,880	4-5P
7,570	1,640	9,210	9,210	1,655	7,555	5-6P
6,350	1,410	7,760	8,125	1,690	6,435	6-7P

I-495 North East Side PM
Future Alternative 8 Peak Period Volumes



MD 201		
	SB	NB
3-4P	1,350	1,350
4-5P	1,700	1,385
5-6P	1,935	1,570
6-7P	1,685	1,200

MD 201/Ramp 2				
	SBT	NBT	WBL	WBR
3-4P	1,155	915	640	435
4-5P	1,500	1,055	655	330
5-6P	1,665	1,195	505	375
6-7P	1,450	800	530	400

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
865	1,075	405	850	635	1,010	195
935	985	390	895	695	1,045	200
925	880	345	810	695	1,065	270
960	930	255	745	680	950	235

I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,120	1,685	9,805	9,805	1,970	7,835
4-5P	8,100	1,795	9,895	9,910	2,180	7,730
5-6P	7,665	1,640	9,305	8,895	1,655	7,240
6-7P	6,570	1,410	7,980	7,860	1,690	6,170

MD 201		
	SB	NB
3-4P	2,170	2,225
4-5P	2,505	2,495
5-6P	2,540	2,585
6-7P	2,250	2,250

MD 295		
	SB	NB
3-4P	5,010	3,340
4-5P	5,125	3,720
5-6P	4,460	4,080
6-7P	3,965	3,920

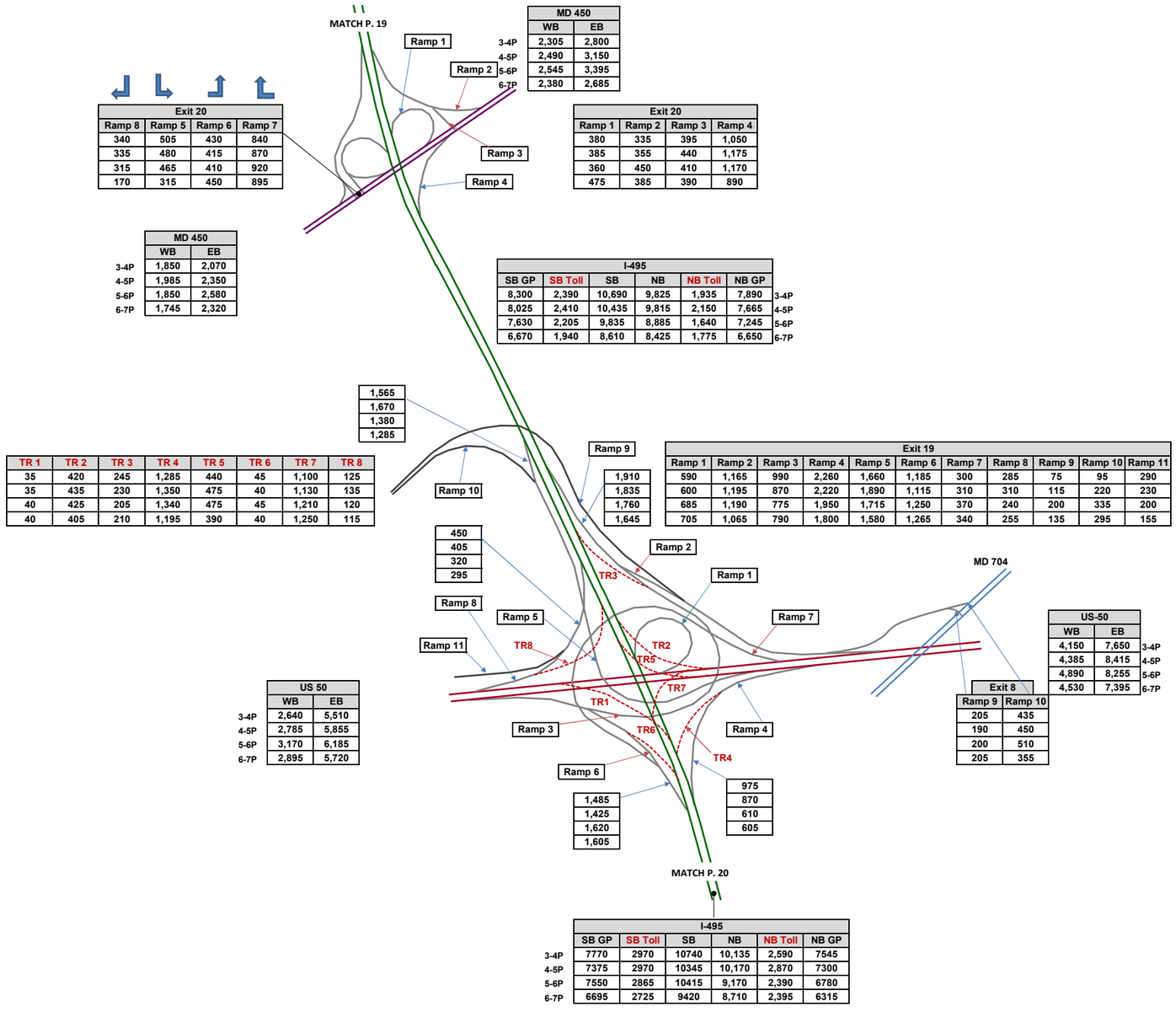
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
35	815	1,195	1,225	270	15	975	1,345	245	280
25	890	1,415	1,400	410	10	950	1,595	220	360
20	940	1,205	1,420	400	5	870	1,640	210	450
30	715	1,005	1,520	375	10	715	1,540	300	295

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	195	195	335	100	25	880	100
15	210	215	380	110	20	845	140
15	215	200	385	120	20	795	130
15	145	170	385	115	20	760	135

MD 295		
	SB	NB
3-4P	3,740	3,175
4-5P	4,075	3,460
5-6P	3,530	3,570
6-7P	3,360	3,115

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,875	2,390	10,265	9,125	1,935	7,190
7,555	2,410	9,965	9,050	2,150	6,900
7,080	2,205	9,285	8,215	1,640	6,575
5,810	1,940	7,750	7,835	1,775	6,060

I-495 North East Side PM
Future Alternative 8 Peak Period Volumes



MD 450		
	WB	EB
3-4P	2,305	2,800
4-5P	2,490	3,150
5-6P	2,545	3,395
6-7P	2,380	2,685

Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
340	505	430	840
335	480	415	870
315	465	410	920
170	315	450	895

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
380	335	395	1,050
385	355	440	1,175
360	450	410	1,170
475	385	390	890

MD 450		
	WB	EB
3-4P	1,850	2,070
4-5P	1,985	2,350
5-6P	1,850	2,580
6-7P	1,745	2,320

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
8,300	2,390	10,690	9,825	1,935	7,890
8,025	2,410	10,435	9,815	2,150	7,665
7,630	2,205	9,835	8,885	1,640	7,245
6,670	1,940	8,610	8,425	1,775	6,650

3-4P
4-5P
5-6P
6-7P

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
35	420	245	1,285	440	45	1,100	125
35	435	230	1,350	475	40	1,130	135
40	425	205	1,340	475	45	1,210	120
40	405	210	1,195	390	40	1,250	115

1,565
1,670
1,380
1,285

1,910
1,835
1,760
1,645

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
590	1,165	990	2,260	1,660	1,185	300	285	75	95	290
600	1,195	870	2,220	1,890	1,115	310	310	115	220	230
685	1,190	775	1,950	1,715	1,250	370	240	200	335	200
705	1,065	790	1,800	1,580	1,265	340	255	135	295	155

450
405
320
295

1,485
1,425
1,620
1,605

975
870
610
605

US 50		
	WB	EB
3-4P	2,640	5,510
4-5P	2,785	5,855
5-6P	3,170	6,185
6-7P	2,895	5,720

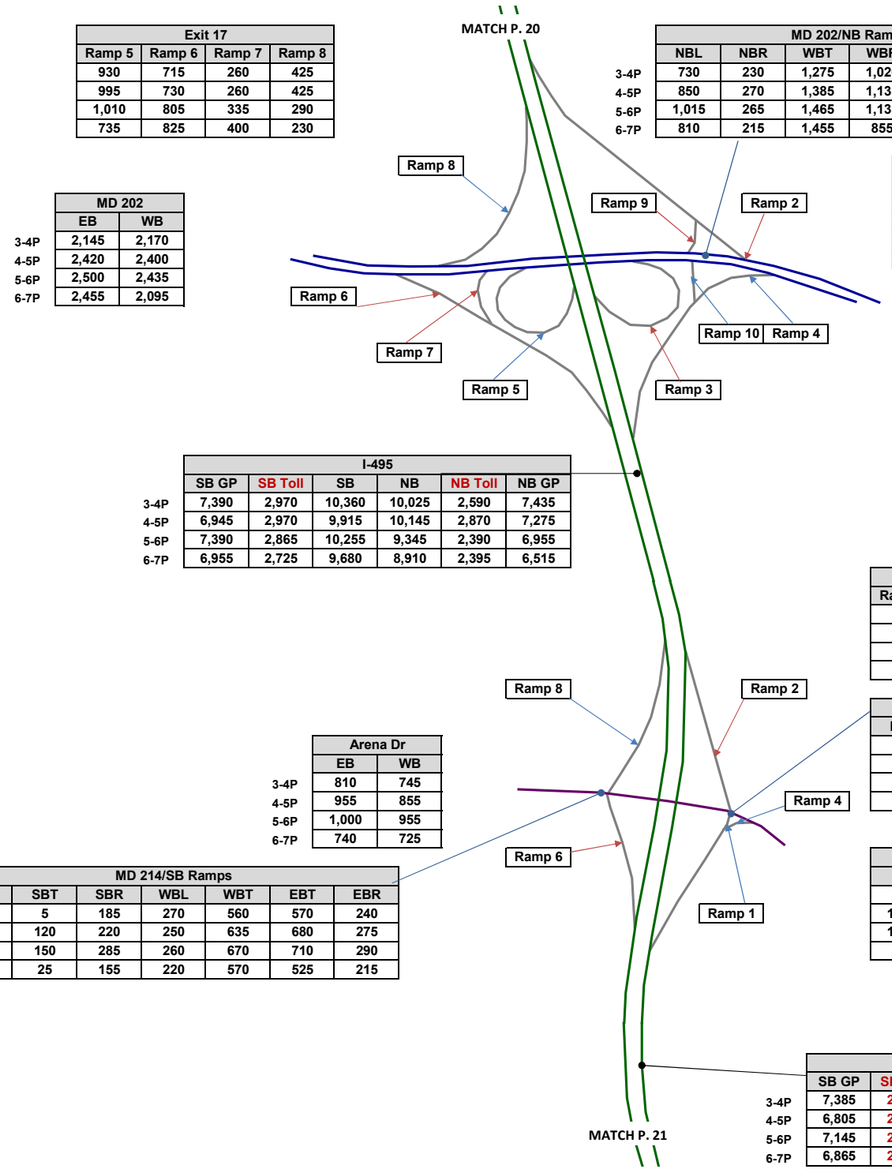
US-50		
	WB	EB
3-4P	4,150	7,650
4-5P	4,385	8,415
5-6P	4,890	8,255
6-7P	4,530	7,395

Exit 8	
Ramp 9	Ramp 10
205	435
190	450
200	510
205	355

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7770	2970	10740	10,135	2,590	7545
7375	2970	10345	10,170	2,870	7300
7550	2865	10415	9,170	2,390	6780
6695	2725	9420	8,710	2,395	6315

3-4P
4-5P
5-6P
6-7P

I-495 East Side PM
Future Alternative 8 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
930	715	260	425
995	730	260	425
1,010	805	335	290
735	825	400	230

	MD 202/NB Ramps					
	NBL	NBR	WBT	WBR	EBL	EBT
3-4P	730	230	1,275	1,020	15	2,080
4-5P	850	270	1,385	1,135	10	2,450
5-6P	1,015	265	1,465	1,135	20	2,515
6-7P	810	215	1,455	855	15	2,185

	MD 202	
	EB	WB
3-4P	2,145	2,170
4-5P	2,420	2,400
5-6P	2,500	2,435
6-7P	2,455	2,095

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,020	265	230	15	960
1,135	225	225	10	1,120
1,135	170	220	20	1,280
855	165	210	15	1,025

	MD 202	
	SB	NB
3-4P	2,540	2,295
4-5P	2,945	2,520
5-6P	3,000	2,600
6-7P	2,610	2,310

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,390	2,970	10,360	10,025	2,590	7,435
4-5P	6,945	2,970	9,915	10,145	2,870	7,275
5-6P	7,390	2,865	10,255	9,345	2,390	6,955
6-7P	6,955	2,725	9,680	8,910	2,395	6,515

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
140	475	310	515	520
155	495	315	645	785
160	465	355	700	945
160	420	285	460	550

	MD 214/NB Ramps						
	NBL	NBT	NBR	WBT	WBR	EBL	EBT
	140	0	310	690	240	235	665
	155	0	315	730	235	260	865
	150	10	355	780	215	240	980
	155	5	285	635	170	245	650

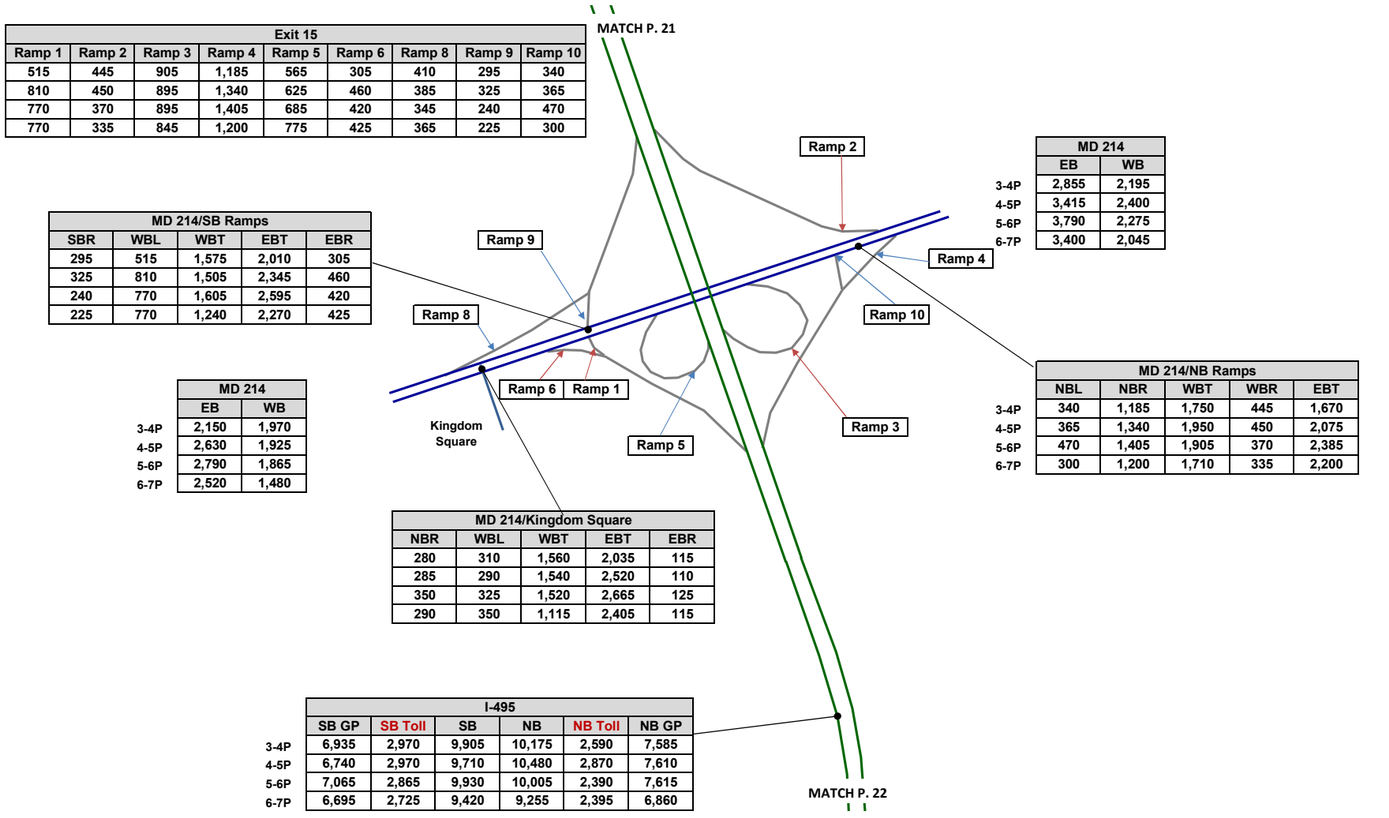
	Arena Dr	
	EB	WB
3-4P	810	745
4-5P	955	855
5-6P	1,000	955
6-7P	740	725

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
330	5	185	270	560	570	240
445	120	220	250	635	680	275
510	150	285	260	670	710	290
370	25	155	220	570	525	215

	Arena Dr		
	EB	WB	
	975	930	3-4P
	1,180	965	4-5P
	1,335	995	5-6P
	935	805	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,385	2,970	10,355	10,000	2,590	7,410
4-5P	6,805	2,970	9,775	10,120	2,870	7,250
5-6P	7,145	2,865	10,010	9,395	2,390	7,005
6-7P	6,865	2,725	9,590	8,935	2,395	6,540

I-495 East Side PM
Future Alternative 8 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	445	905	1,185	565	305	410	295	340
810	450	895	1,340	625	460	385	325	365
770	370	895	1,405	685	420	345	240	470
770	335	845	1,200	775	425	365	225	300

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
295	515	1,575	2,010	305
325	810	1,505	2,345	460
240	770	1,605	2,595	420
225	770	1,240	2,270	425

	MD 214	
	EB	WB
3-4P	2,855	2,195
4-5P	3,415	2,400
5-6P	3,790	2,275
6-7P	3,400	2,045

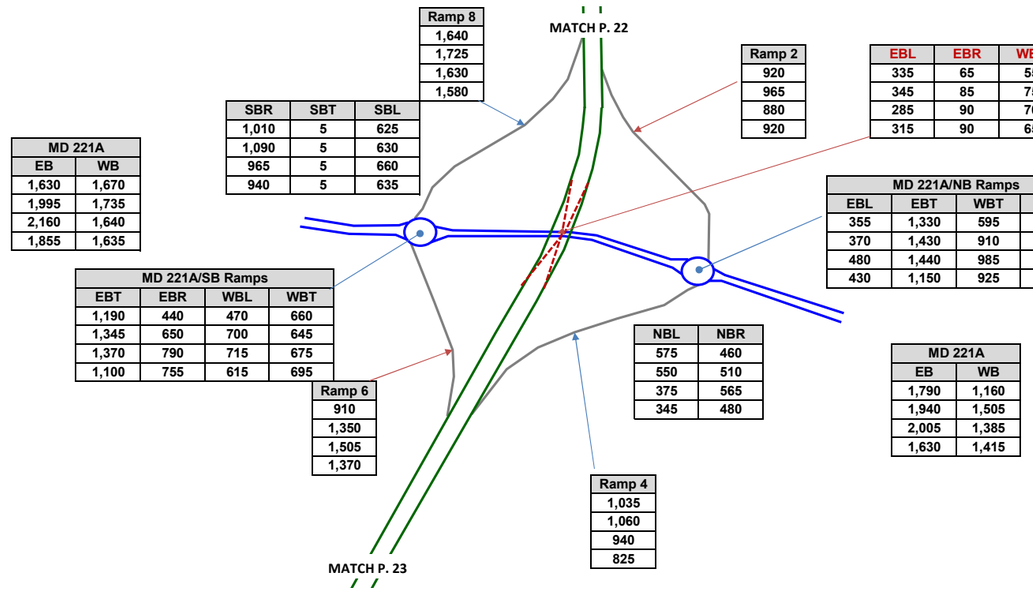
	MD 214	
	EB	WB
3-4P	2,150	1,970
4-5P	2,630	1,925
5-6P	2,790	1,865
6-7P	2,520	1,480

MD 214/NB Ramps					
	NBL	NBR	WBT	WBR	EBT
3-4P	340	1,185	1,750	445	1,670
4-5P	365	1,340	1,950	450	2,075
5-6P	470	1,405	1,905	370	2,385
6-7P	300	1,200	1,710	335	2,200

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
280	310	1,560	2,035	115
285	290	1,540	2,520	110
350	325	1,520	2,665	125
290	350	1,115	2,405	115

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	6,935	2,970	9,905	10,175	2,590	7,585
4-5P	6,740	2,970	9,710	10,480	2,870	7,610
5-6P	7,065	2,865	9,930	10,005	2,390	7,615
6-7P	6,695	2,725	9,420	9,255	2,395	6,860

I-495 East Side PM
Future Alternative 8 Peak Period Volumes



Ramp 8
1,640
1,725
1,630
1,580

SBR	SBT	SBL
1,010	5	625
1,090	5	630
965	5	660
940	5	635

MD 221A	
EB	WB
1,630	1,670
1,995	1,735
2,160	1,640
1,855	1,635

Ramp 2
920
965
880
920

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
335	65	55	430	60	45	225	385
345	85	75	490	55	45	210	395
285	90	70	305	45	45	220	360
315	90	65	295	40	45	205	360

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
355	1,330	595	565
370	1,430	910	595
480	1,440	985	400
430	1,150	925	490

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,190	440	470	660
1,345	650	700	645
1,370	790	715	675
1,100	755	615	695

Ramp 6
910
1,350
1,505
1,370

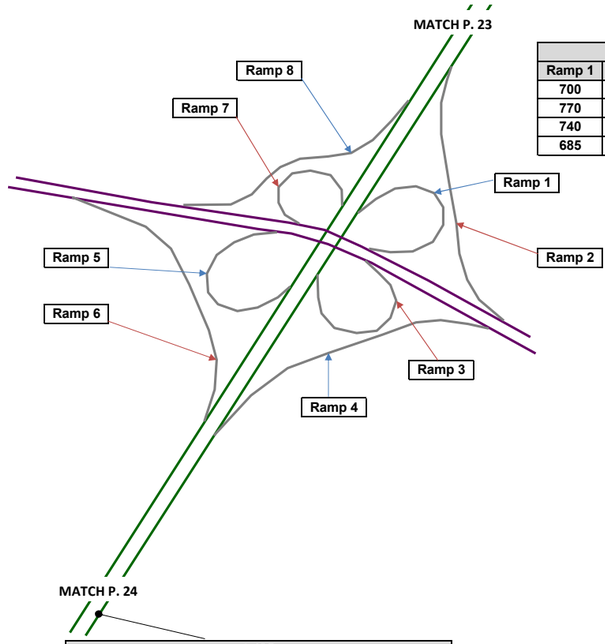
NBL	NBR
575	460
550	510
375	565
345	480

Ramp 4
1,035
1,060
940
825

MD 221A	
EB	WB
1,790	1,160
1,940	1,505
2,005	1,385
1,630	1,415

I-495 East Side PM
Future Alternative 8 Peak Period Volumes

MD 4	
SB	NB
2,325	1,750
2,665	1,870
2,715	1,840
2,540	1,645

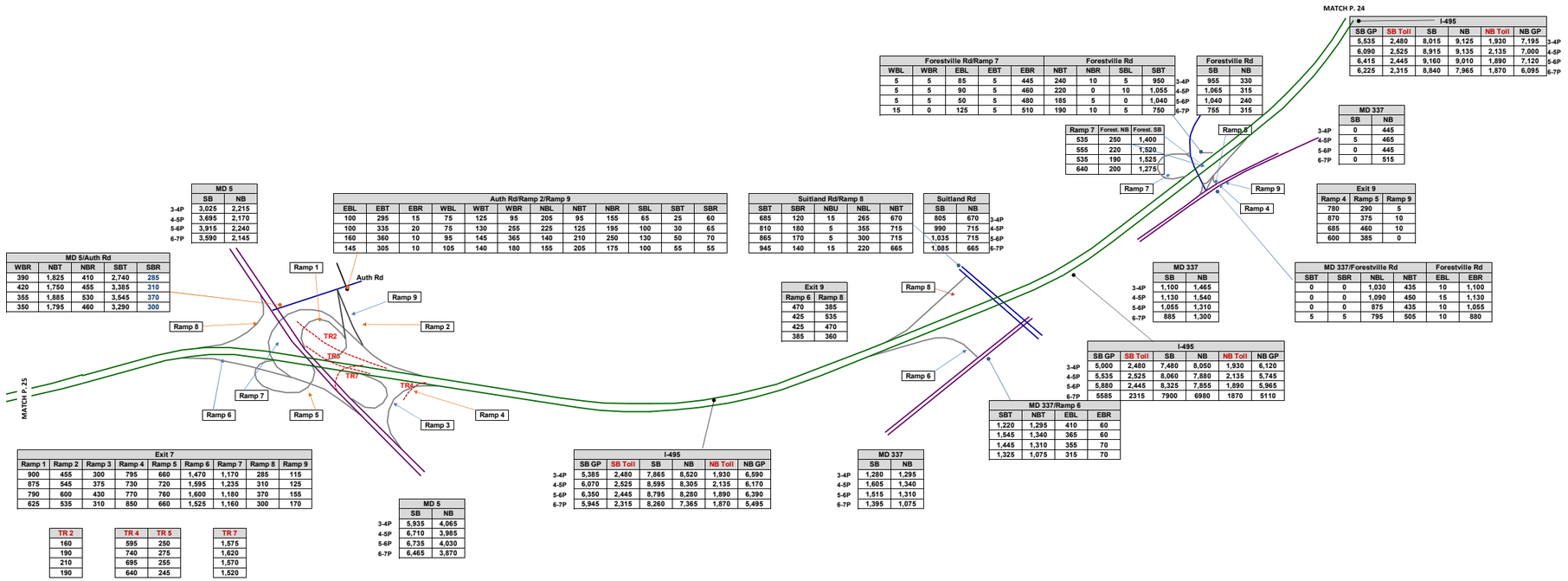


Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
700	1,355	825	975	1,135	545	695	775
770	1,355	890	770	1,075	790	810	800
740	1,170	875	750	1,005	645	675	840
685	1,060	960	665	895	830	645	840

MD 4	
SB	NB
3,065	2,325
2,830	2,465
2,950	2,105
2,310	1,825

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,535	2,480	8,015	9,125	1,930	7,195
6,090	2,525	8,615	9,135	2,135	7,000
6,415	2,445	8,860	9,010	1,890	7,120
6,225	2,315	8,540	7,965	1,870	6,095

I-495 South Side PM
Future Alternative 8 Peak Period Volumes



MD 5		
	SB	NB
3-4P	3,025	2,215
4-5P	3,695	2,170
5-6P	3,915	2,240
6-7P	3,590	2,145

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
390	1,825	410	2,740	285
420	1,750	455	3,385	310
355	1,885	530	3,545	370
350	1,795	460	3,290	300

Auth Rd/Ramp 2/Ramp 9												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
100	295	15	75	125	95	205	95	155	65	25	60
100	335	20	75	130	255	225	125	195	100	30	65
160	360	10	95	145	365	140	210	250	130	50	70
145	305	10	105	140	180	155	205	175	100	55	55

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
685	120	15	265	670
810	180	5	355	715
865	170	5	300	715
945	140	15	220	665

Suitland Rd		
	SB	NB
3-4P	805	670
4-5P	990	715
5-6P	1,035	715
6-7P	1,085	665

Exit 9	
Ramp 6	Ramp 8
470	385
425	535
425	470
385	360

Forestville Rd/Ramp 7					Forestville Rd				
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT	
5	5	85	5	445	240	10	5	950	3-4P
5	5	90	5	460	220	0	10	1,055	4-5P
5	5	50	5	480	185	5	0	1,040	5-6P
15	0	125	5	510	190	10	5	750	6-7P

Forestville Rd		
	SB	NB
3-4P	955	330
4-5P	1,065	315
5-6P	1,040	240
6-7P	755	315

Ramp 7	Forest. NB	Forest. SB
535	250	1,400
555	220	1,520
535	190	1,525
640	200	1,275

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,535	2,480	8,015	9,125	1,930	7,195
4-5P	6,090	2,525	8,915	9,135	2,135	7,000
5-6P	6,415	2,445	9,160	9,010	1,890	7,120
6-7P	6,225	2,315	8,840	7,965	1,870	6,095

MD 337		
	SB	NB
3-4P	0	445
4-5P	5	465
5-6P	0	445
6-7P	0	515

Exit 9		
Ramp 4	Ramp 5	Ramp 9
780	290	5
870	375	10
685	460	10
600	385	0

MD 337		
	SB	NB
3-4P	1,100	1,465
4-5P	1,130	1,540
5-6P	1,055	1,310
6-7P	885	1,300

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	1,030	435	10	1,100
0	0	1,090	450	15	1,130
0	0	875	435	10	1,055
5	5	795	505	10	880

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,000	2,480	7,480	8,050	1,930	6,120
4-5P	5,535	2,525	8,060	7,880	2,135	5,745
5-6P	5,880	2,445	8,325	7,855	1,890	5,965
6-7P	5585	2315	7900	6980	1870	5110

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,295	410	60
1,545	1,340	365	60
1,445	1,310	355	70
1,325	1,075	315	70

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
900	455	300	795	660	1,470	1,170	285	115
875	545	375	730	720	1,595	1,235	310	125
790	600	430	770	760	1,600	1,180	370	155
625	535	310	850	660	1,525	1,160	300	170

TR 2
160
190
210
190

TR 4	TR 5
595	250
740	275
695	255
640	245

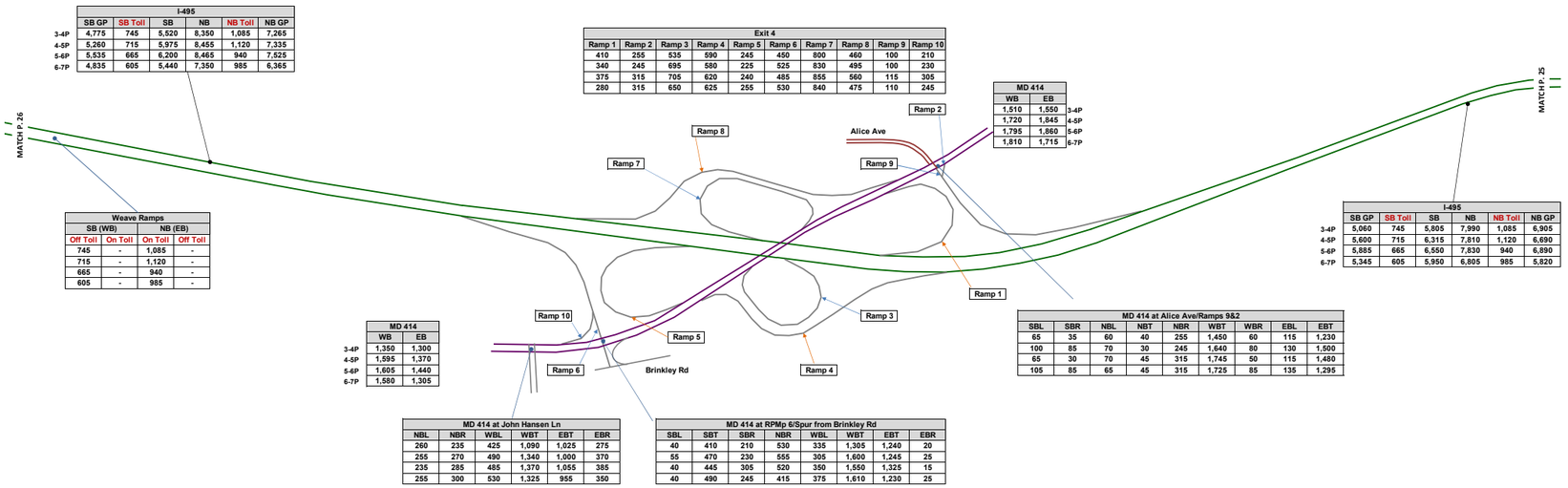
TR 7
1,575
1,620
1,570
1,520

MD 5		
	SB	NB
3-4P	5,935	4,065
4-5P	6,710	3,985
5-6P	6,735	4,030
6-7P	6,465	3,870

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,385	2,480	7,865	8,520	1,930	6,590
4-5P	6,070	2,525	8,595	8,305	2,135	6,170
5-6P	6,350	2,445	8,795	8,280	1,890	6,390
6-7P	5,945	2,315	8,260	7,365	1,870	5,495

MD 337		
	SB	NB
3-4P	1,280	1,295
4-5P	1,605	1,340
5-6P	1,515	1,310
6-7P	1,395	1,075

I-495 South Side PM
Future Alternative 8 Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,775	745	5,520	8,350	1,085	7,265
4-5P	5,260	715	5,975	8,455	1,120	7,335
5-6P	5,535	665	6,200	8,465	940	7,525
6-7P	4,835	605	5,440	7,350	985	6,365

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
745	-	1,085	-
715	-	1,120	-
665	-	940	-
605	-	985	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
410	255	535	590	245	450	800	460	100	210
340	245	695	580	225	525	830	495	100	230
375	315	705	620	240	485	855	560	115	305
280	315	650	625	255	530	840	475	110	245

MD 414		
WB	EB	
1,510	1,550	3-4P
1,720	1,845	4-5P
1,795	1,860	5-6P
1,810	1,715	6-7P

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,060	745	5,805	7,990	1,085	6,905
5,600	715	6,315	7,810	1,120	6,690
5,885	665	6,550	7,830	940	6,890
5,345	605	5,950	6,805	985	5,820

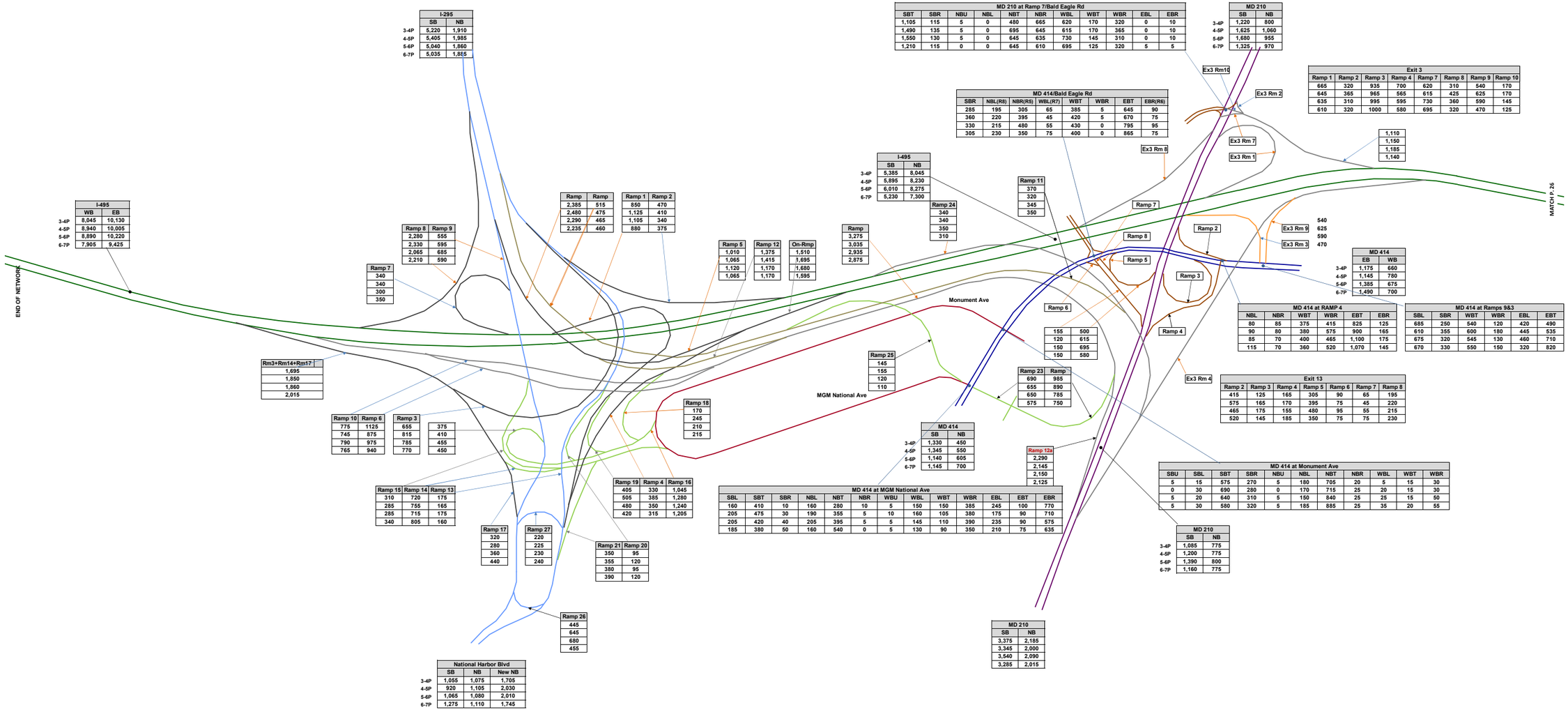
MD 414		
WB	EB	
1,350	1,300	3-4P
1,595	1,370	4-5P
1,605	1,440	5-6P
1,580	1,305	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
65	35	60	40	255	1,450	60	115	1,230
100	85	70	30	245	1,640	80	130	1,500
65	30	70	45	315	1,745	50	115	1,480
105	85	65	45	315	1,725	85	135	1,295

MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
260	235	425	1,090	1,025	275
255	270	490	1,340	1,000	370
235	285	485	1,370	1,055	385
255	300	530	1,325	955	350

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
40	410	210	530	335	1,305	1,240	20
55	470	230	555	305	1,600	1,245	25
40	445	305	520	350	1,550	1,325	15
40	490	245	415	375	1,610	1,230	25

I-495 South Side PM
Future Alternative 8 Peak Period Volumes



I-295		
	SB	NB
3-4P	5,220	1,910
4-5P	5,405	1,985
5-6P	5,040	1,860
6-7P	5,035	1,885

I-495		
	WB	EB
3-4P	8,045	10,130
4-5P	8,940	10,005
5-6P	8,890	10,220
6-7P	7,905	9,425

I-495		
	SB	NB
3-4P	5,385	8,045
4-5P	5,895	8,230
5-6P	6,010	8,275
6-7P	5,230	7,300

MD 210 at Ramp 7/Bald Eagle Rd										
SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR	EBL	EBR
1,105	115	5	0	480	665	620	170	320	0	10
1,490	135	5	0	695	645	615	170	365	0	10
1,550	130	5	0	645	635	730	145	310	0	10
1,210	115	0	0	645	610	695	125	320	5	5

MD 210		
	SB	NB
3-4P	1,220	800
4-5P	1,625	1,060
5-6P	1,680	955
6-7P	1,325	970

MD 414/Bald Eagle Rd							
SBR	NBL(R8)	NBR(R5)	WBL(R7)	WBT	WBR	EBT	EBR(R6)
285	195	305	65	385	5	645	90
360	220	395	45	420	5	670	75
330	215	480	55	430	0	795	95
305	230	350	75	400	0	865	75

Exit 3							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 7	Ramp 8	Ramp 9	Ramp 10
665	320	935	700	620	310	540	170
645	365	965	565	615	425	625	170
635	310	995	595	730	360	590	145
610	320	1000	580	695	320	470	125

1,110	
1,150	
1,185	
1,140	

Ramp	Ramp
2,385	515
2,480	475
2,290	465
2,235	460

Ramp 1	Ramp 2
850	470
1,125	410
1,105	340
880	375

Ramp 8	Ramp 9
2,280	555
2,330	595
2,065	685
2,210	590

Ramp 7
340
340
300
350

Ramp 5
1,010
1,065
1,120
1,065

Ramp 12
1,375
1,415
1,170
1,170

On-Rmp
1,510
1,695
1,680
1,595

Ramp
3,275
3,035
2,935
2,875

Ramp 24
340
340
350
310

Ramp 11
370
320
345
350

540	
625	
590	
470	

MD 414	
EB	WB
1,175	660
1,145	780
1,385	675
1,490	700

MD 414 at RAMP 4					
NBL	NBR	WBT	WBR	EBT	EBR
80	85	375	415	825	125
90	80	380	575	900	165
85	70	400	465	1,100	175
115	70	360	520	1,070	145

MD 414 at Ramps 9&3					
SBL	SBR	WBT	WBR	EBL	EBT
685	250	540	120	420	490
610	355	600	180	445	535
675	320	545	130	460	710
670	330	550	150	320	820

Rm3+Rm14+Rm17
1,695
1,850
1,860
2,015

Ramp 10	Ramp 6
775	1125
745	875
790	975
765	940

Ramp 3	
655	375
815	410
785	455
770	450

Ramp 15	Ramp 14	Ramp 13
310	720	175
285	755	165
285	715	175
340	805	160

Ramp 17
320
280
360
440

Ramp 27
220
225
230
240

Ramp 19	Ramp 4	Ramp 16
405	330	1,045
505	385	1,280
480	350	1,240
420	315	1,205

Ramp 21	Ramp 20
350	95
355	120
380	95
390	120

Ramp 18
170
245
210
215

Ramp 25
145
155
120
110

Ramp 26
445
645
680
455

Ramp 6	
155	500
120	615
150	695
150	580

Ramp 23	Ramp
690	985
655	890
650	785
575	750

Ramp 12a
2,290
2,145
2,150
2,125

MD 414	
SB	NB
1,330	450
1,345	550
1,140	605
1,145	700

MD 414 at MGM National Ave											
SBL	SBT	SBR	NBL	NBT	NBR	WBU	WBL	WBT	WBR	EBL	EBT	EBR
160	410	10	160	280	10	5	150	150	385	245	100	770
205	475	30	190	355	5	10	160	105	380	175	90	710
205	420	40	205	395	5	5	145	110	390	235	90	575
185	380	50	160	540	0	5	130	90	350	210	75	635

MD 210	
SB	NB
3,375	2,185
3,345	2,000
3,540	2,090
3,285	2,015

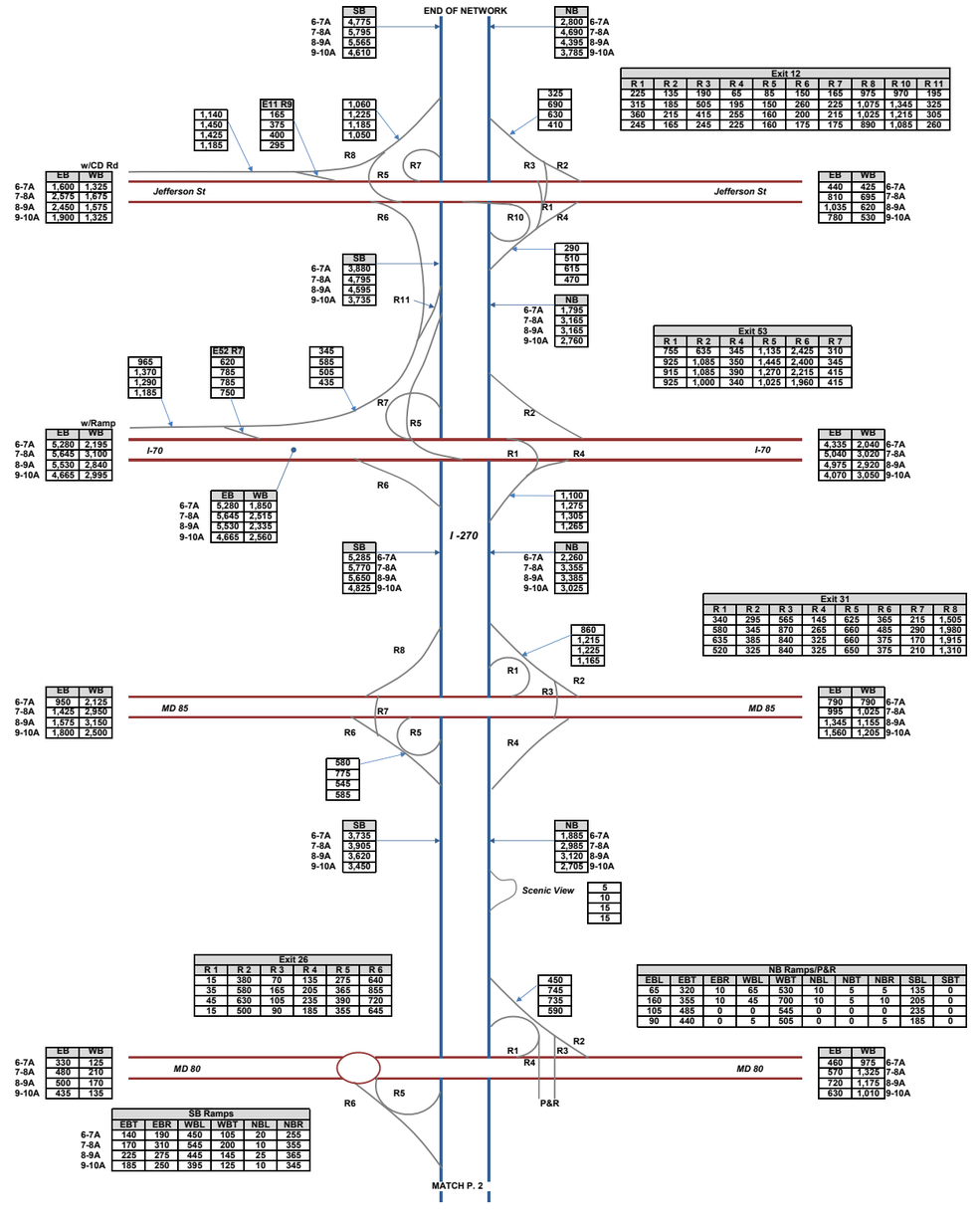
MD 414 at Monument Ave										
SBU	SBL	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR
5	15	575	270	5	180	705	20	5	15	30
0	30	690	280	0	170	715	25	20	15	30
5	20	640	310	5	150	840	25	25	15	50
5	30	580	320	5	185	885	25	35	20	55

MD 210	
SB	NB
1,085	775
1,200	775
1,390	800
1,160	775

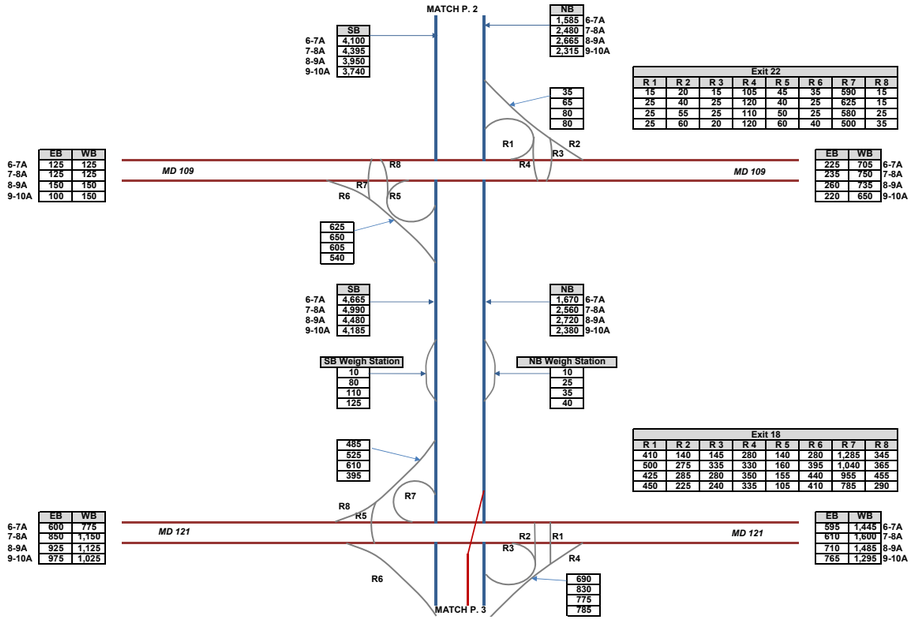
Exit 13						
Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
415	125	165	305	90	65	195
575	165	170	395	75	45	220
465	175	155	480	95	55	215
520	145	185	350	75	75	230

National Harbor Blvd		
SB	NB	New NB
1,055	1,075	1,705
920	1,105	2,030
1,065	1,080	2,010
1,275	1,110	1,745

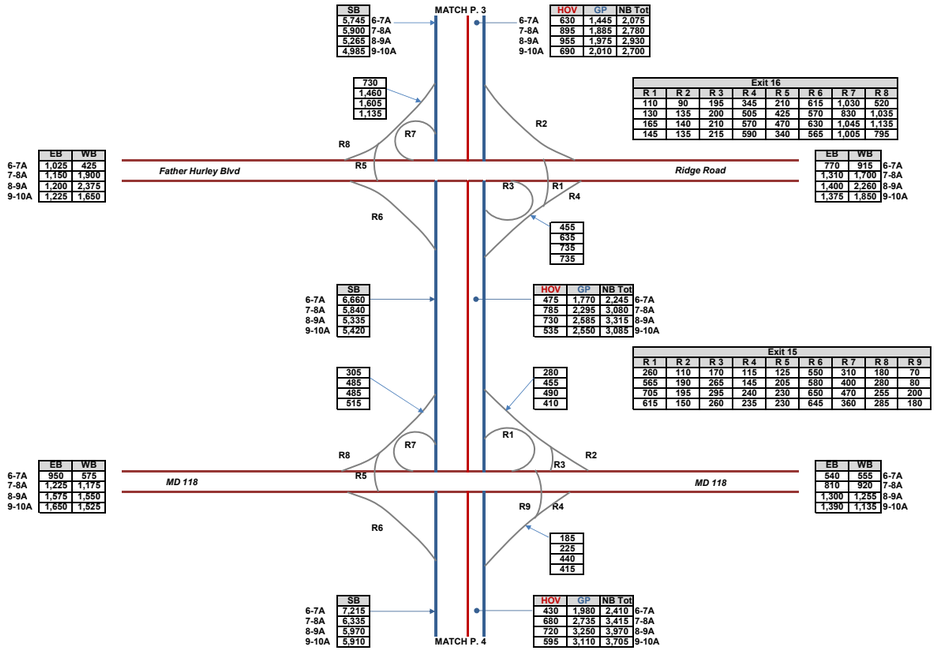
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



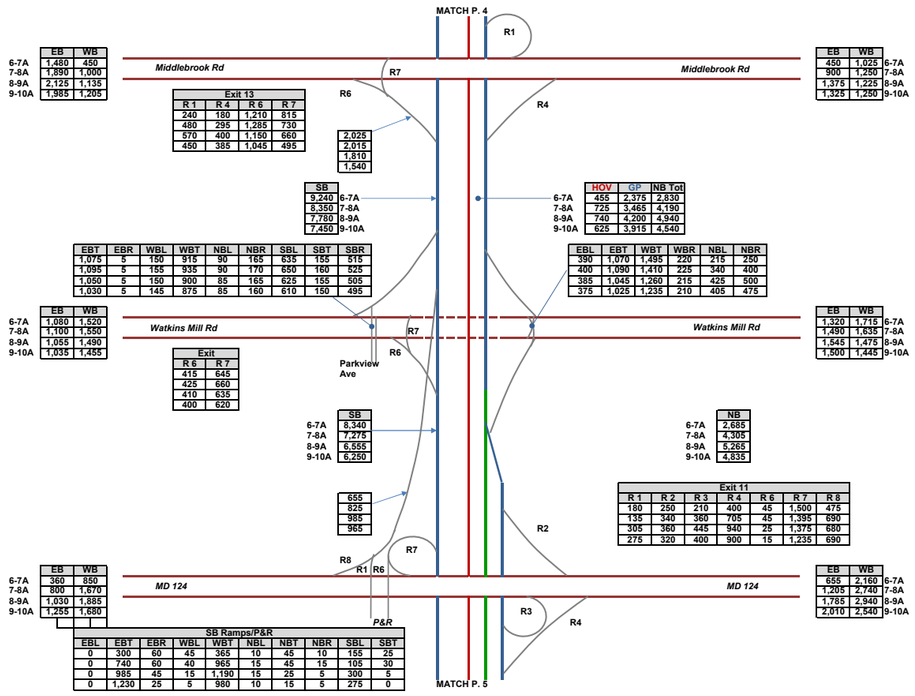
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



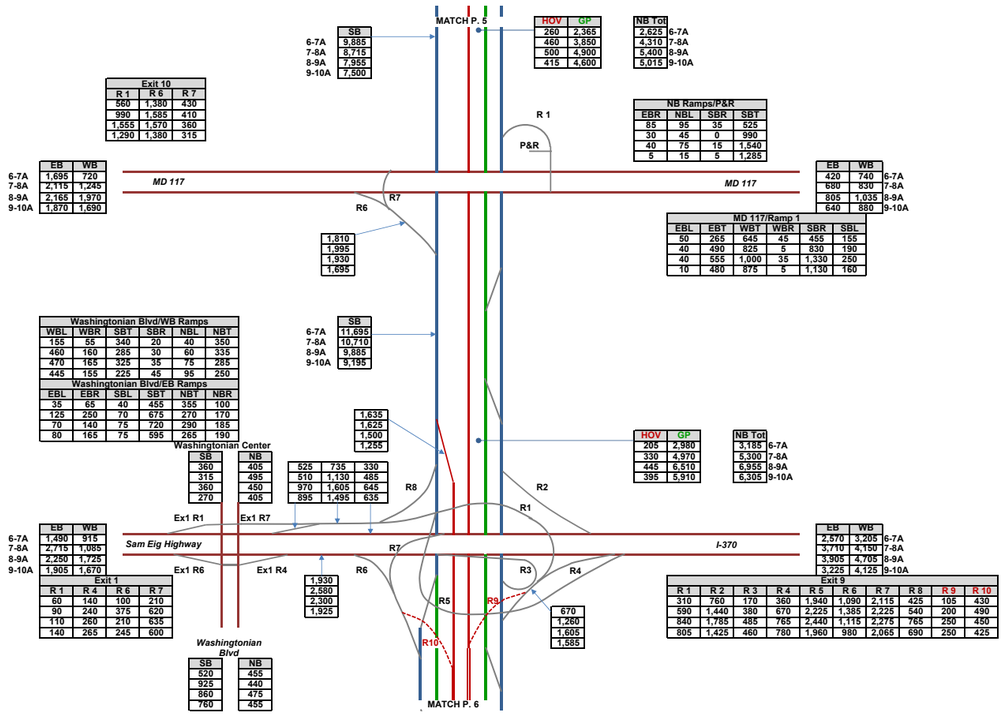
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



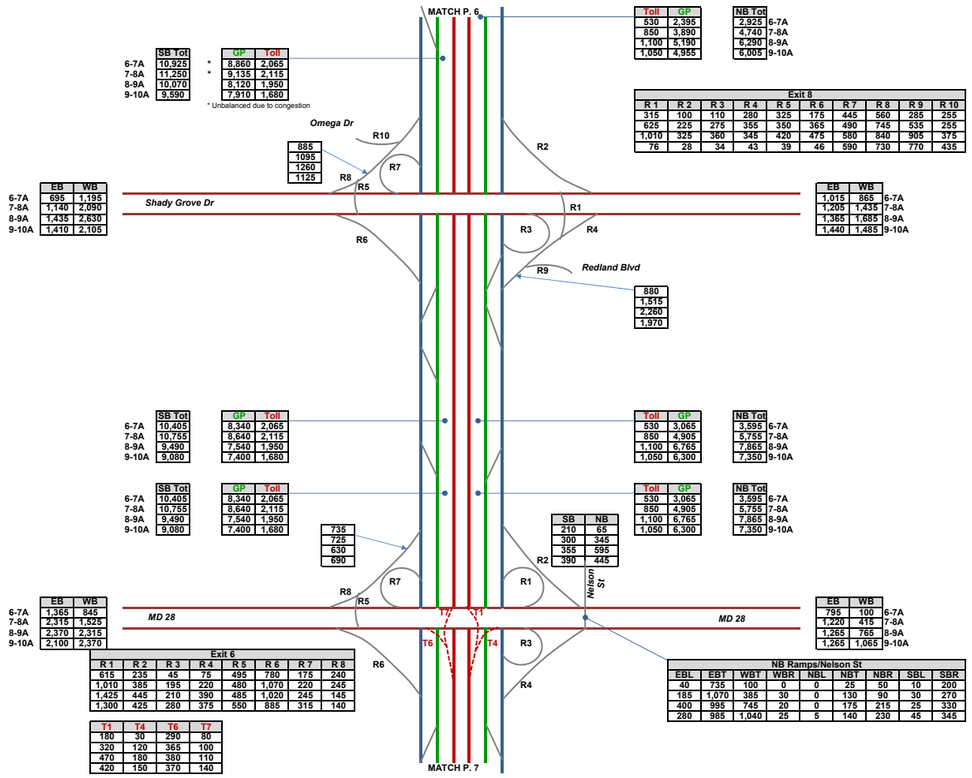
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



	SB Tot
6-7A	10,925
7-8A	11,250
8-9A	10,070
9-10A	9,590

	GP	Toll
*	8,860	2,065
*	9,135	2,115
	8,120	1,950
	7,910	1,680

* Unbalanced due to congestion

Toll	GP
530	2,395
850	3,890
1,100	5,190
1,050	4,955

NB Tot	
2,925	6-7A
4,740	7-8A
6,290	8-9A
6,005	9-10A

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
315	100	110	280	325	175	445	560	285	255
625	225	275	355	350	365	490	745	535	255
1,010	325	360	345	420	475	580	840	905	375
76	28	34	43	39	46	590	730	770	435

	EB	WB
6-7A	695	1,195
7-8A	1,140	2,090
8-9A	1,435	2,630
9-10A	1,410	2,105

EB	WB	
1,015	865	6-7A
1,205	1,435	7-8A
1,365	1,685	8-9A
1,440	1,485	9-10A

885
1095
1260
1125

880
1,515
2,260
1,970

	SB Tot
6-7A	10,405
7-8A	10,755
8-9A	9,490
9-10A	9,080

GP	Toll
8,340	2,065
8,640	2,115
7,540	1,950
7,400	1,680

Toll	GP
530	3,065
850	4,905
1,100	6,765
1,050	6,300

NB Tot	
3,595	6-7A
5,755	7-8A
7,865	8-9A
7,350	9-10A

	SB Tot
6-7A	10,405
7-8A	10,755
8-9A	9,490
9-10A	9,080

GP	Toll
8,340	2,065
8,640	2,115
7,540	1,950
7,400	1,680

Toll	GP
530	3,065
850	4,905
1,100	6,765
1,050	6,300

NB Tot	
3,595	6-7A
5,755	7-8A
7,865	8-9A
7,350	9-10A

735
725
630
690

SB	NB
210	65
300	345
355	595
390	445

	EB	WB
6-7A	1,365	845
7-8A	2,315	1,625
8-9A	2,370	2,315
9-10A	2,100	2,370

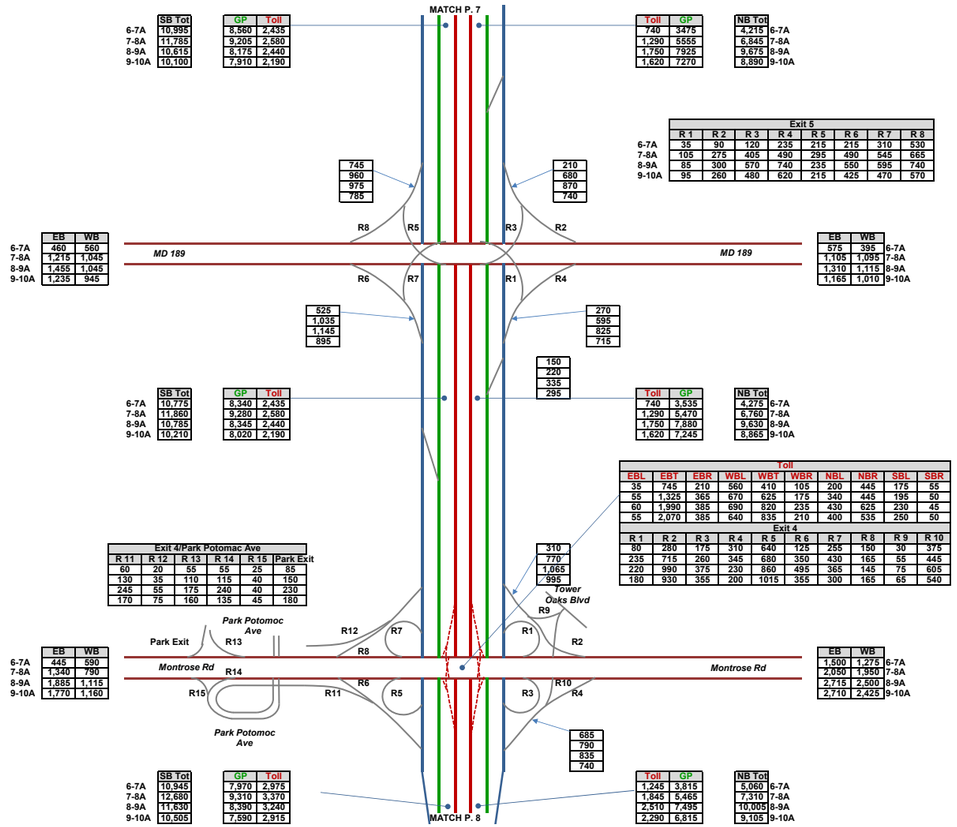
EB	WB	
795	100	6-7A
1,220	415	7-8A
1,265	765	8-9A
1,265	1,065	9-10A

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
615	235	45	75	495	780	175	240
1,010	385	195	220	480	1,070	220	245
1,425	445	210	390	485	1,020	245	145
1,300	425	280	375	550	885	315	140

T1	T4	T6	T7
180	30	290	80
320	120	365	100
470	180	380	110
420	150	370	140

NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
40	735	100	0	0	25	50	10	200
185	1,070	385	30	0	130	90	30	270
400	995	745	20	0	175	215	25	330
280	985	1,040	25	5	140	230	45	345

I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



	SB Tot
6-7A	10,995
7-8A	11,785
8-9A	10,615
9-10A	10,100

GP	Toll
8,560	2,435
9,205	2,580
8,175	2,440
7,910	2,190

Toll	GP
740	3475
1,290	5555
1,750	7925
1,620	7270

NB Tot	
4,215	6-7A
6,845	7-8A
9,675	8-9A
8,890	9-10A

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
35	90	120	235	215	215	310	530
105	275	405	490	295	490	545	665
85	300	570	740	235	550	595	740
95	260	480	620	215	425	470	570

	EB	WB
6-7A	460	560
7-8A	1,215	1,045
8-9A	1,455	1,045
9-10A	1,235	945

EB	WB	
575	395	6-7A
1,105	1,095	7-8A
1,310	1,115	8-9A
1,165	1,010	9-10A

	SB Tot
6-7A	10,775
7-8A	11,860
8-9A	10,785
9-10A	10,210

GP	Toll
8,340	2,435
9,280	2,580
8,345	2,440
8,020	2,190

Toll	GP
740	3,535
1,290	5,470
1,750	7,880
1,620	7,245

NB Tot	
4,279	6-7A
6,760	7-8A
9,630	8-9A
8,865	9-10A

Toll									
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
35	745	210	560	410	105	200	445	175	55
55	1,325	365	670	625	175	340	445	195	50
60	1,990	385	690	820	235	430	625	230	45
55	2,070	385	640	835	210	400	535	250	50

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
80	280	175	310	640	125	255	150	30	375
235	715	260	345	680	350	430	165	55	445
220	990	375	230	860	495	365	145	75	605
180	930	355	200	1015	355	300	165	65	540

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
60	20	55	55	25	85
130	35	110	115	40	150
245	55	175	240	40	230
170	75	160	135	45	180

	EB	WB
6-7A	445	590
7-8A	1,340	790
8-9A	1,885	1,115
9-10A	1,770	1,160

EB	WB	
1,500	1,275	6-7A
2,050	1,950	7-8A
2,715	2,500	8-9A
2,710	2,425	9-10A

	SB Tot
6-7A	10,945
7-8A	12,680
8-9A	11,630
9-10A	10,505

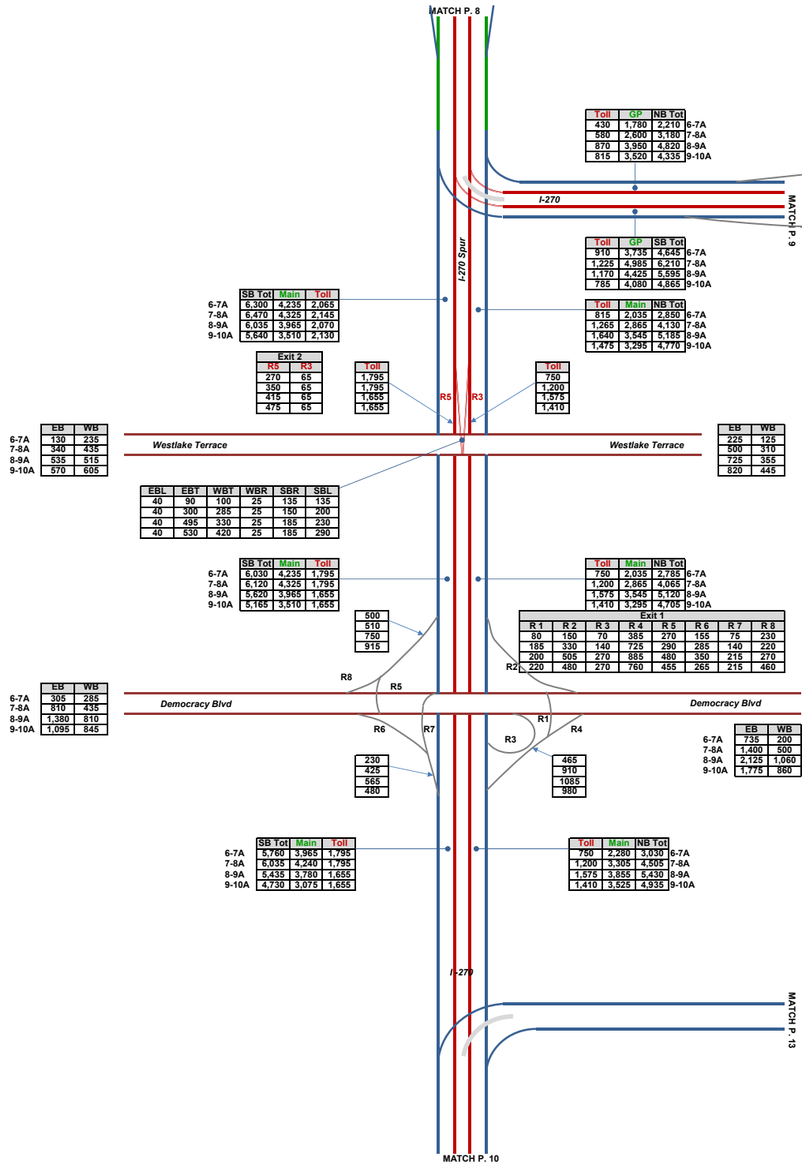
GP	Toll
7,970	2,975
9,310	3,370
8,390	3,240
7,590	2,915

Toll	GP
1,245	3,815
1,845	5,465
2,510	7,495
2,290	6,815

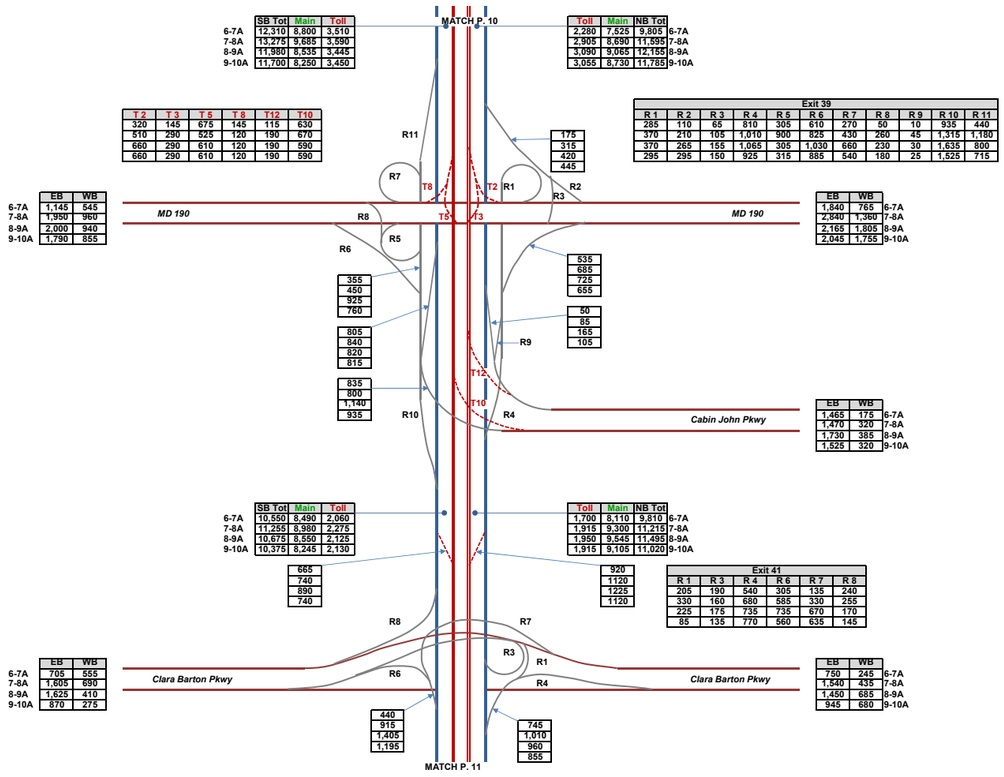
NB Tot	
5,060	6-7A
7,310	7-8A
10,005	8-9A
9,105	9-10A

745	210	
960	680	
975	870	
785	740	
525	270	
1,035	595	
1,145	825	
895	715	
150		
220		
335		
295		
310		
770		
1,065		
995		
	685	
	790	
	835	
	740	

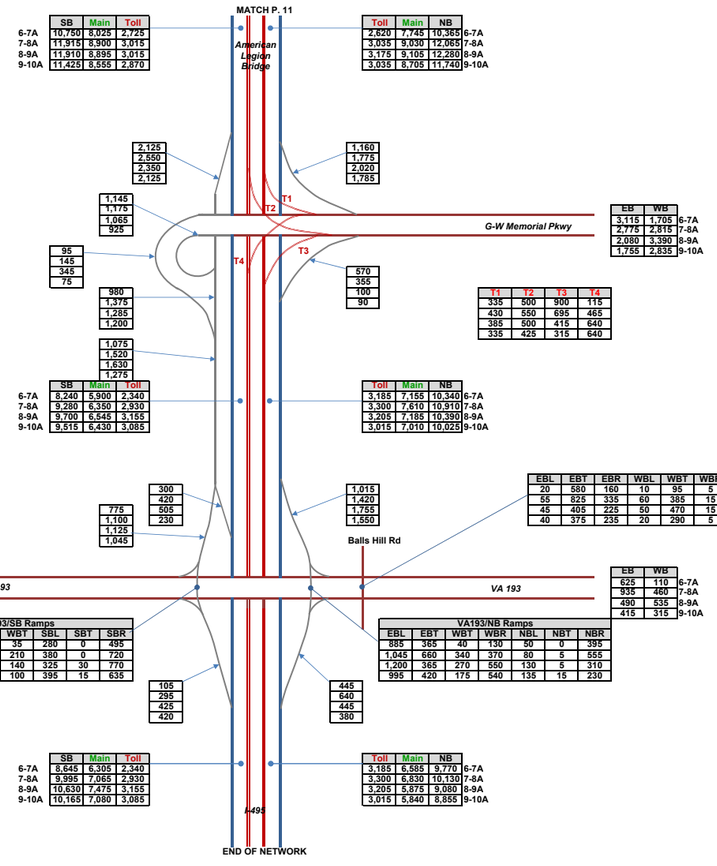
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



	SB Main	SB Toll
6-7A	10,750	8,025	2,725
7-8A	11,315	8,900	3,015
8-9A	11,910	8,895	3,015
9-10A	11,425	8,555	2,870

	NB Toll	NB Main	NB
6-7A	2,620	7,745	10,365
7-8A	3,035	9,030	12,065
8-9A	3,175	9,105	12,280
9-10A	3,035	8,705	11,740

	SB Main	SB Toll
6-7A	8,240	5,900	2,340
7-8A	9,280	6,350	2,930
8-9A	9,700	6,545	3,155
9-10A	9,515	6,430	3,085

	NB Toll	NB Main	NB
6-7A	3,185	7,155	10,340
7-8A	3,300	7,610	10,910
8-9A	3,205	7,185	10,390
9-10A	3,015	7,010	10,025

	SB Main	SB Toll
6-7A	8,645	6,305	2,340
7-8A	9,995	7,065	2,930
8-9A	10,630	7,475	3,155
9-10A	10,165	7,080	3,085

	NB Toll	NB Main	NB
6-7A	3,185	6,585	9,770
7-8A	3,300	6,830	10,130
8-9A	3,205	5,875	9,080
9-10A	3,015	5,840	8,855

	EB	WB
6-7A	3,115	1,705
7-8A	2,775	2,815
8-9A	2,080	3,390
9-10A	1,755	2,835

	T1	T2	T3	T4
	335	500	900	115
	430	550	695	465
	385	500	415	640
	335	425	315	640

	EB	WB
6-7A	625	110
7-8A	935	460
8-9A	490	535
9-10A	415	315

	EB	WB
6-7A	1,020	530
7-8A	1,410	930
8-9A	1,375	910
9-10A	1,215	735

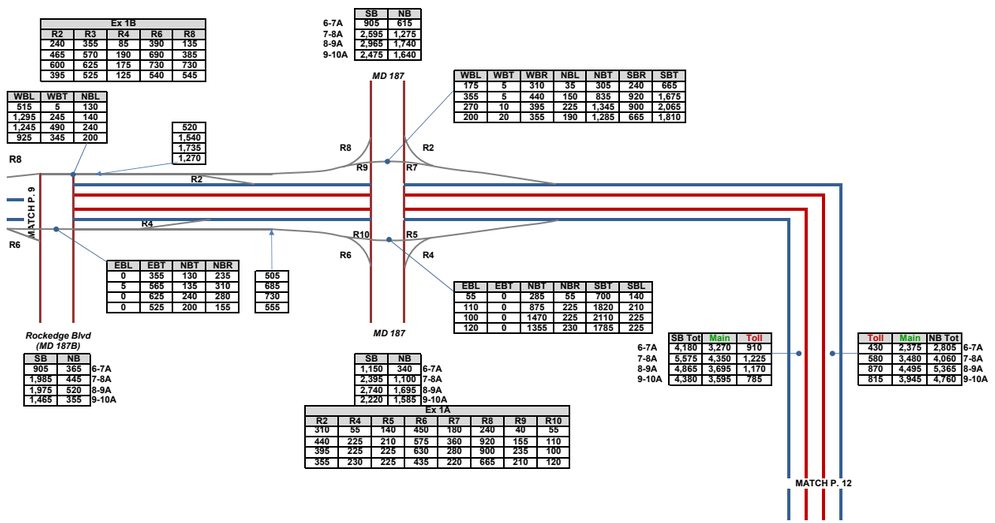
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
20	580	160	10	95	5	55	0	40	5	10	20
55	825	335	60	385	15	260	30	100	10	30	65
45	405	225	50	470	15	290	30	70	15	15	60
40	375	235	20	290	5	365	20	35	5	20	60

VA193/SB Ramps						
EBT	EBR	WBL	WBT	SBL	SBT	SBR
970	50	55	35	280	0	495
1,325	85	210	210	380	0	720
1,240	135	260	140	325	30	770
1,020	195	210	100	395	15	635

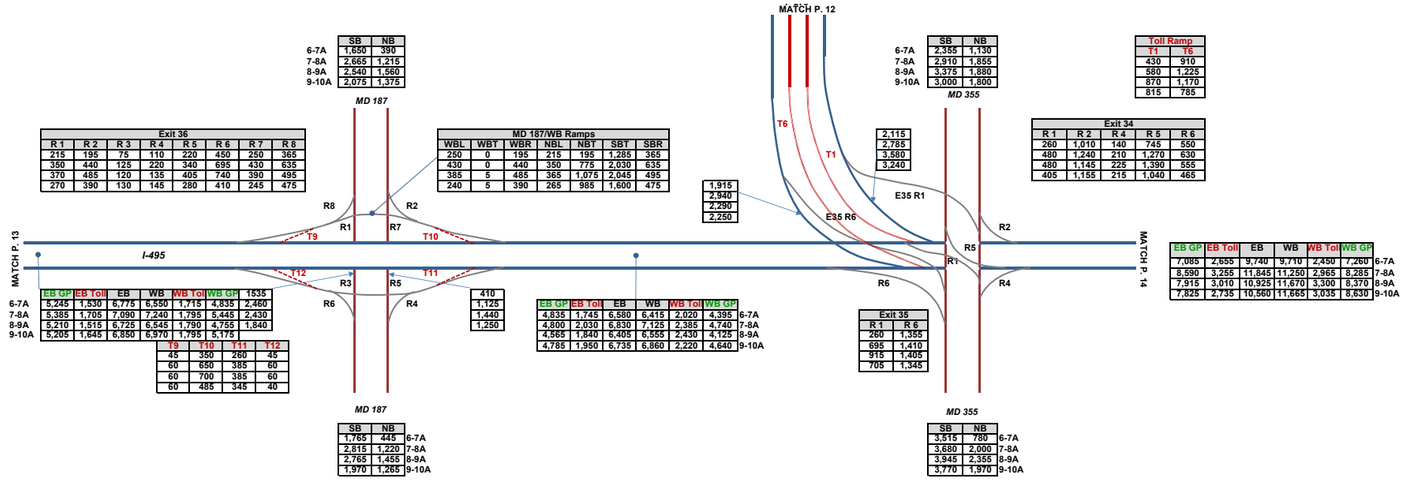
VA193/NB Ramps						
EBL	EBT	WBT	WBR	NBL	NBT	NBR
885	365	40	130	50	0	395
1,045	660	340	370	80	5	555
1,200	365	270	550	130	5	310
995	420	175	540	135	15	230

2,125	2,550	2,350	2,125
1,160	1,775	2,020	1,785
1,145	1,175	1,065	925
95	145	345	75
570	355	100	90
980	1,375	1,285	1,200
1,075	1,520	1,630	1,275
300	420	505	230
775	1,100	1,125	1,045
1,015	1,420	1,755	1,550
105	295	425	420
445	640	445	380

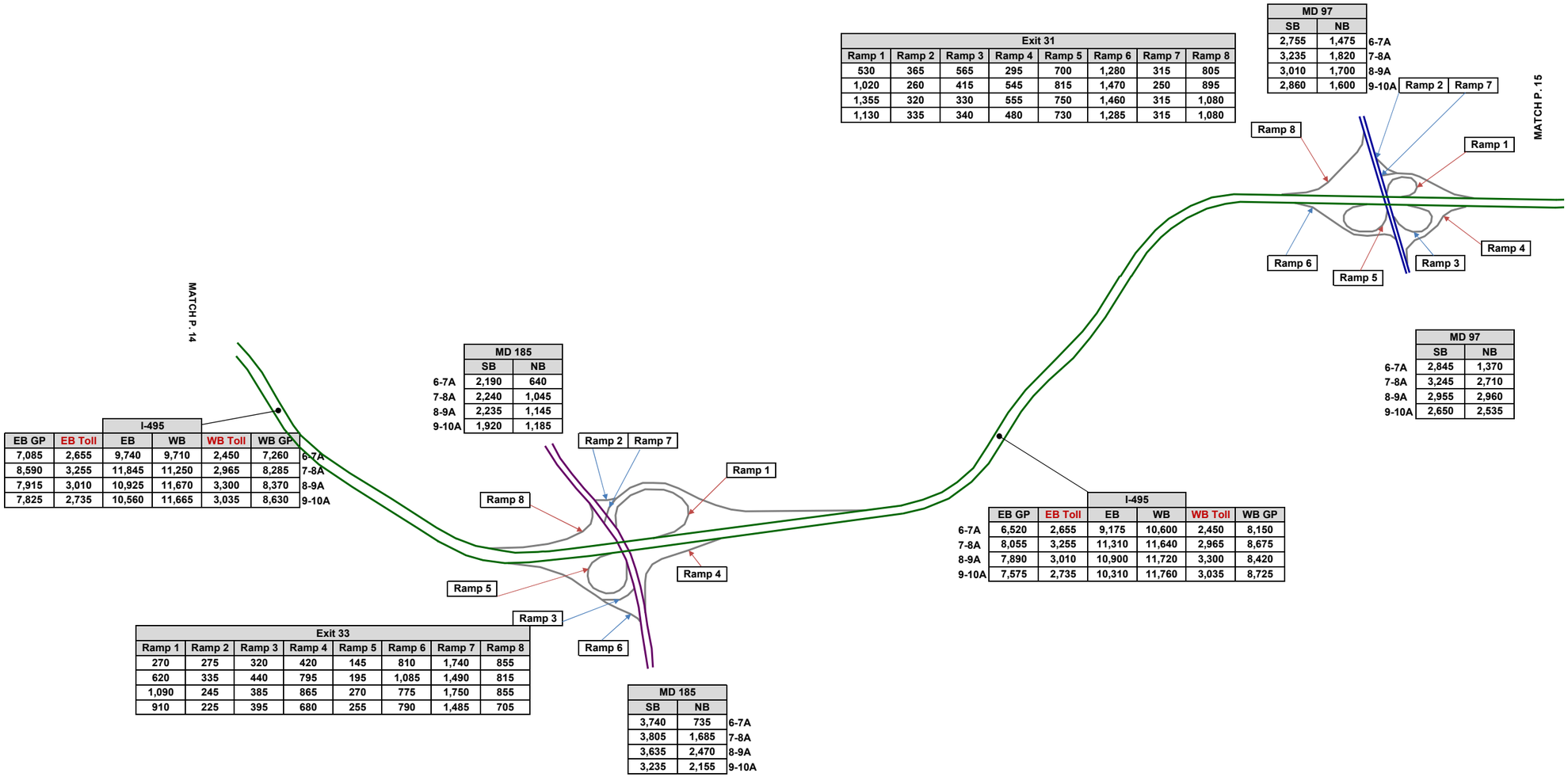
I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 9 Peak Period Volumes



I-495 North Side AM
Future Alternative 9 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
530	365	565	295	700	1,280	315	805
1,020	260	415	545	815	1,470	250	895
1,355	320	330	555	750	1,460	315	1,080
1,130	335	340	480	730	1,285	315	1,080

	MD 97	
	SB	NB
6-7A	2,755	1,475
7-8A	3,235	1,820
8-9A	3,010	1,700
9-10A	2,860	1,600

	MD 97	
	SB	NB
6-7A	2,845	1,370
7-8A	3,245	2,710
8-9A	2,955	2,960
9-10A	2,650	2,535

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,085	2,655	9,740	9,710	2,450	7,260
7-8A	8,590	3,255	11,845	11,250	2,965	8,285
8-9A	7,915	3,010	10,925	11,670	3,300	8,370
9-10A	7,825	2,735	10,560	11,665	3,035	8,630

	MD 185	
	SB	NB
6-7A	2,190	640
7-8A	2,240	1,045
8-9A	2,235	1,145
9-10A	1,920	1,185

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,520	2,655	9,175	10,600	2,450	8,150
7-8A	8,055	3,255	11,310	11,640	2,965	8,675
8-9A	7,890	3,010	10,900	11,720	3,300	8,420
9-10A	7,575	2,735	10,310	11,760	3,035	8,725

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
270	275	320	420	145	810	1,740	855
620	335	440	795	195	1,085	1,490	815
1,090	245	385	865	270	775	1,750	855
910	225	395	680	255	790	1,485	705

	MD 185	
	SB	NB
6-7A	3,740	735
7-8A	3,805	1,685
8-9A	3,635	2,470
9-10A	3,235	2,155

I-495 North Side AM
Future Alternative 9 Peak Period Volumes

T1	T2	T3	T4	T5	T6	T7	T8
60	260	350	215	435	135	665	975
170	260	600	330	460	185	555	1,100
220	270	645	445	475	200	420	1,195
295	260	560	400	375	225	440	1,075

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
75	300	120	130	190	855
180	450	230	170	60	785
250	465	315	225	155	740
340	445	245	275	200	730

	US 29	
	SB	NB
6-7A	3,525	1,105
7-8A	4,345	1,940
8-9A	5,150	2,035
9-10A	3,775	1,550

	MD 193	
	SB	NB
6-7A	1,340	880
7-8A	1,780	1,300
8-9A	1,640	1,290
9-10A	1,295	1,120

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
1,010	470	270	455	500	115
1,105	390	390	570	715	115
1,030	405	415	570	650	115
900	390	335	450	665	175

MATCH P. 15

MATCH P. 16

Ramp 8
Ramp 7
Ramp 1
T8
T2
T3
T5
T7
T6
T1
T4
Ramp 4
Ramp 6
Ramp 3

Rm 7 WBL
Rm 2 WBR
Rm 1 NBR
Ramp 6
Ramp 5
Ramp 4

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,670	2,655	8,325	9,945	2,450	7,495
7-8A	7,530	3,255	10,785	10,235	2,965	7,270
8-9A	7,405	3,010	10,415	9,920	3,300	6,620
9-10A	7,160	2,735	9,895	10,200	3,035	7,165

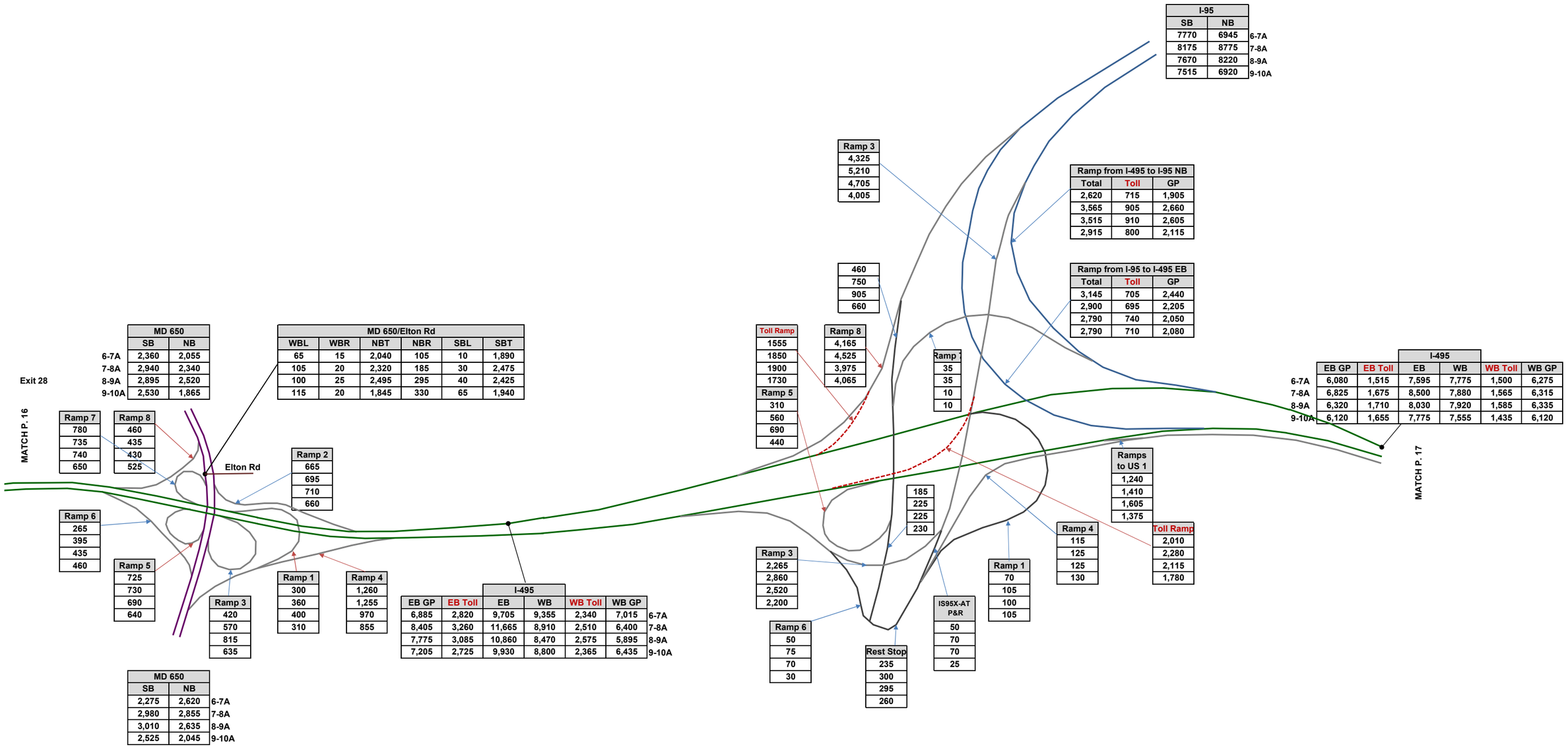
	US 29	
	SB	NB
6-7A	2,380	665
7-8A	2,970	1,540
8-9A	3,740	1,885
9-10A	2,735	1,565

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,360	2,820	8,180	9,095	2,340	6,755
7-8A	7,140	3,260	10,400	8,875	2,510	6,365
8-9A	7,030	3,085	10,115	8,360	2,575	5,785
9-10A	6,685	2,725	9,410	8,660	2,365	6,295

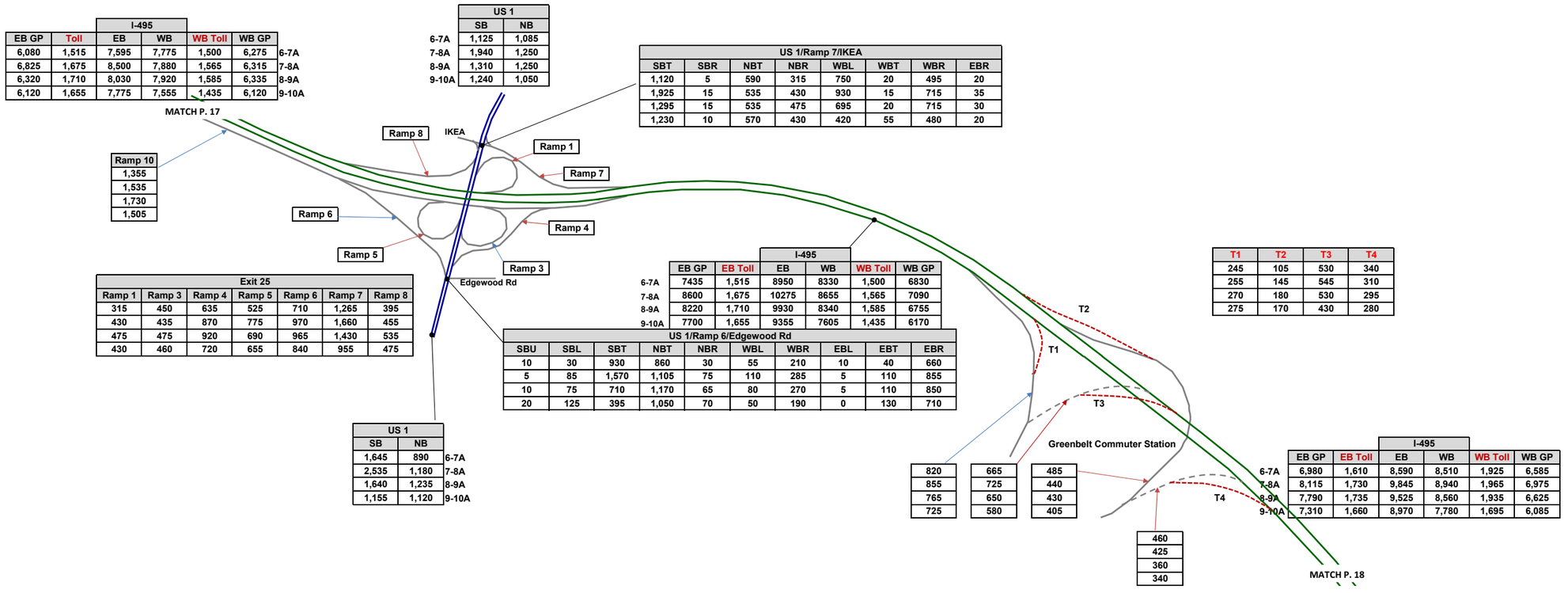
	MD 193		
	SB	NB	
6-7A	1,500	1,690	6-7A
7-8A	2,040	2,405	7-8A
8-9A	1,835	2,330	8-9A
9-10A	1,685	1,965	9-10A

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,585	2,820	8,405	8,670	2,340	6,330
7-8A	7,385	3,260	10,645	8,275	2,510	5,765
8-9A	7,365	3,085	10,450	7,850	2,575	5,275
9-10A	6,805	2,725	9,530	8,325	2,365	5,960

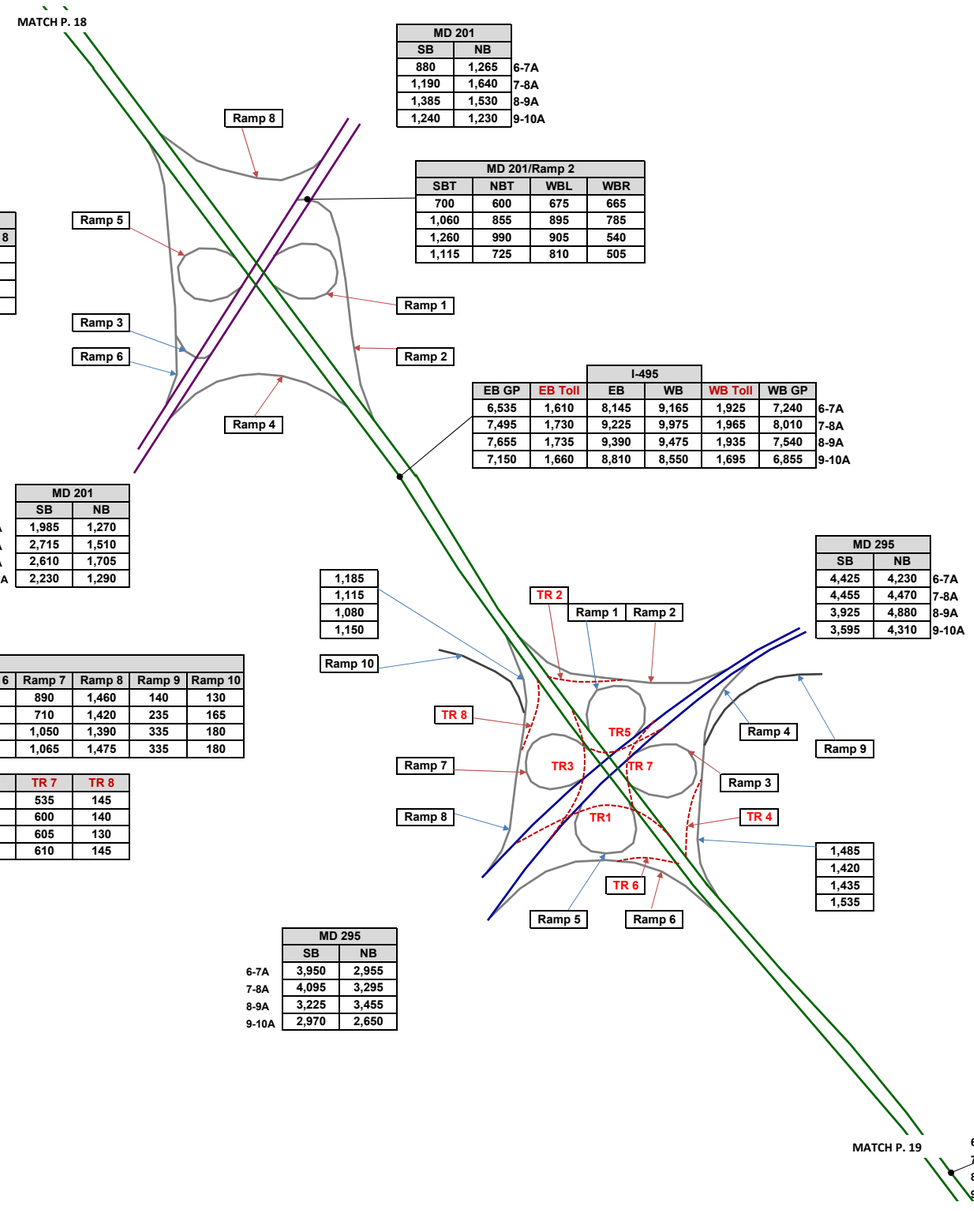
I-495 North Side AM
Future Alternative 9 Peak Period Volumes



I-495 North East Side AM
Future Alternative 9 Peak Period Volumes



I-495 North East Side AM
Future Alternative 9 Peak Period Volumes



MD 201		
SB	NB	
880	1,265	6-7A
1,190	1,640	7-8A
1,385	1,530	8-9A
1,240	1,230	9-10A

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
700	600	675	665
1,060	855	895	785
1,260	990	905	540
1,115	725	810	505

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
505	1,340	260	425	410	1,020	180
515	1,680	335	475	420	1,180	130
405	1,445	370	680	605	1,050	125
420	1,315	435	580	580	885	125

	I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
	6,535	1,610	8,145	9,165	1,925	7,240	6-7A
	7,495	1,730	9,225	9,975	1,965	8,010	7-8A
	7,655	1,735	9,390	9,475	1,935	7,540	8-9A
	7,150	1,660	8,810	8,550	1,695	6,855	9-10A

MD 201		
SB	NB	
1,985	1,270	6-7A
2,715	1,510	7-8A
2,610	1,705	8-9A
2,230	1,290	9-10A

MD 295		
SB	NB	
4,425	4,230	6-7A
4,455	4,470	7-8A
3,925	4,880	8-9A
3,595	4,310	9-10A

1,185
1,115
1,080
1,150

1,485
1,420
1,435
1,535

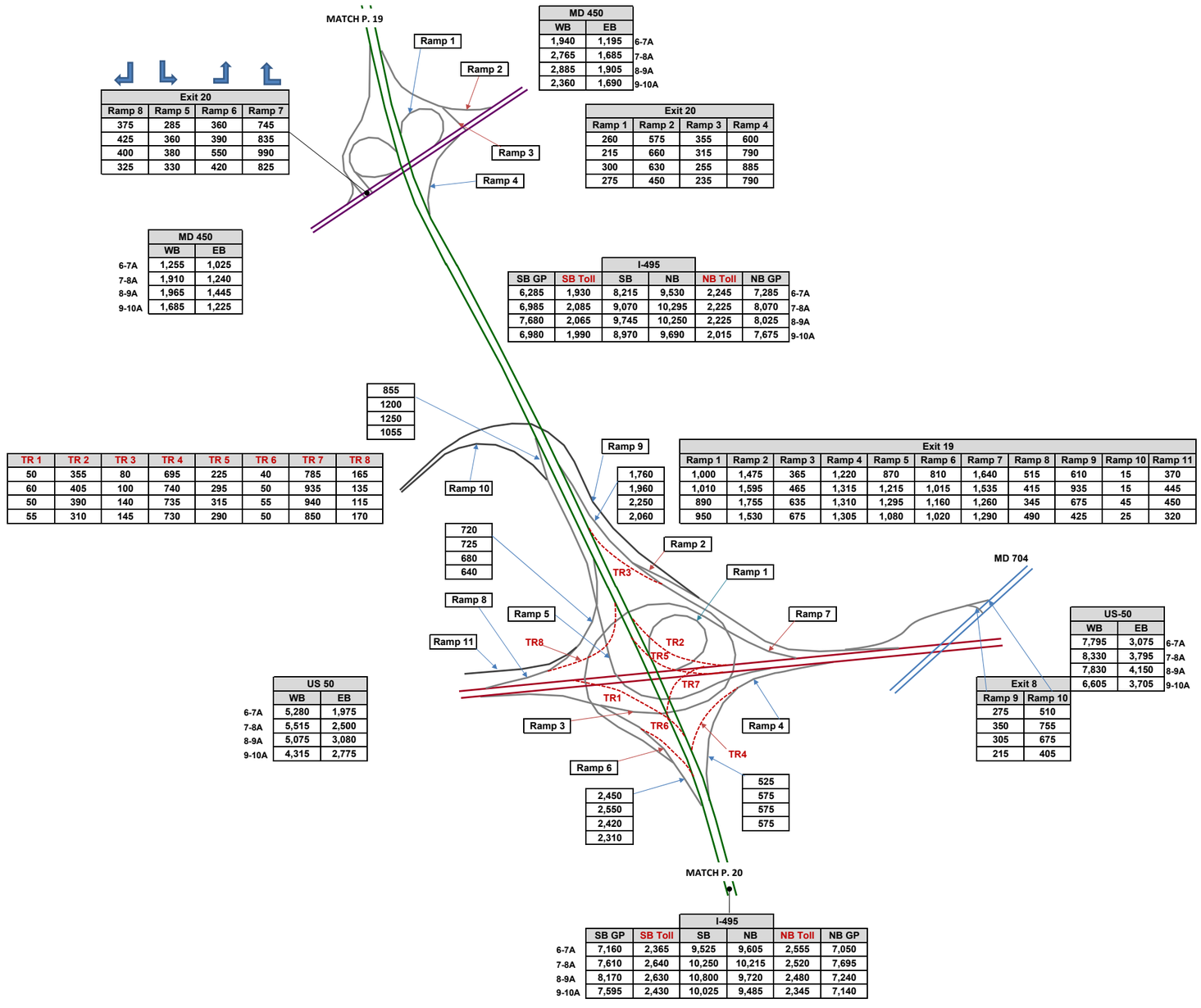
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
25	550	955	1,910	410	10	890	1,460	140	130
60	565	1,000	1,680	560	15	710	1,420	235	165
80	545	895	1,610	715	10	1,050	1,390	335	180
75	530	745	1,705	690	15	1,065	1,475	335	180

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
15	110	150	565	80	10	535	145
35	115	155	495	120	15	600	140
30	110	140	510	160	15	605	130
30	105	110	505	150	15	610	145

MD 295		
SB	NB	
3,950	2,955	6-7A
4,095	3,295	7-8A
3,225	3,455	8-9A
2,970	2,650	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	5,840	1,930	7,770	9,600	2,245	7,355
7-8A	6,545	2,085	8,630	10,265	2,225	8,040
8-9A	6,920	2,065	8,985	9,950	2,225	7,725
9-10A	6,390	1,990	8,380	9,310	2,015	7,295

I-495 North East Side AM
Future Alternative 9 Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
375	285	360	745
425	360	390	835
400	380	550	990
325	330	420	825

MD 450		
WB	EB	
1,940	1,195	6-7A
2,765	1,685	7-8A
2,885	1,905	8-9A
2,360	1,690	9-10A

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
260	575	355	600
215	660	315	790
300	630	255	885
275	450	235	790

MD 450		
WB	EB	
1,255	1,025	6-7A
1,910	1,240	7-8A
1,965	1,445	8-9A
1,685	1,225	9-10A

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,285	1,930	8,215	9,530	2,245	7,285	6-7A
6,985	2,085	9,070	10,295	2,225	8,070	7-8A
7,680	2,065	9,745	10,250	2,225	8,025	8-9A
6,980	1,990	8,970	9,690	2,015	7,675	9-10A

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
50	355	80	695	225	40	785	165
60	405	100	740	295	50	935	135
50	390	140	735	315	55	940	115
55	310	145	730	290	50	850	170

855
1200
1250
1055

1,760
1,960
2,250
2,060

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
1,000	1,475	365	1,220	870	810	1,640	515	610	15	370
1,010	1,595	465	1,315	1,215	1,015	1,535	415	935	15	445
890	1,755	635	1,310	1,295	1,160	1,260	345	675	45	450
950	1,530	675	1,305	1,080	1,020	1,290	490	425	25	320

720
725
680
640

US 50		
WB	EB	
5,280	1,975	6-7A
5,515	2,500	7-8A
5,075	3,080	8-9A
4,315	2,775	9-10A

US-50		
WB	EB	
7,795	3,075	6-7A
8,330	3,795	7-8A
7,830	4,150	8-9A
6,605	3,705	9-10A

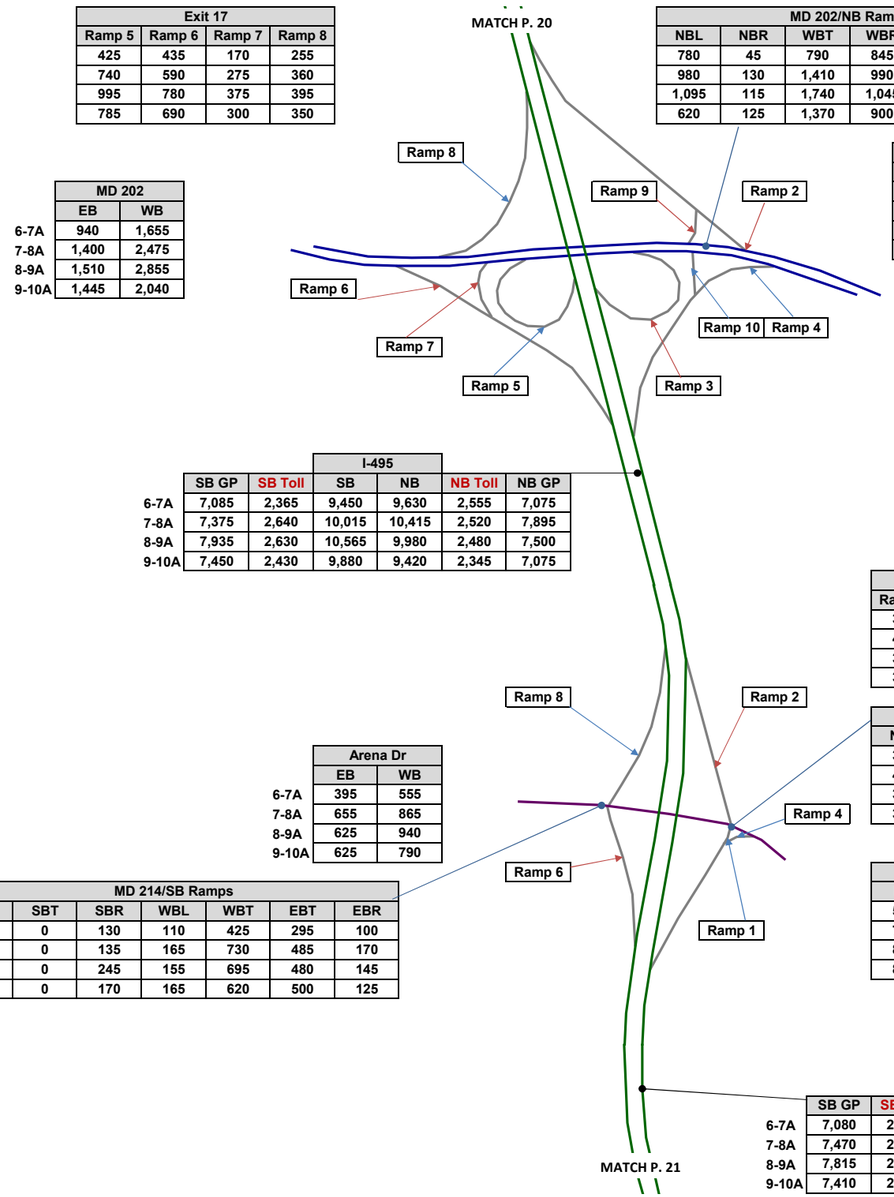
Exit 8	
Ramp 9	Ramp 10
275	510
350	755
305	675
215	405

2,450
2,550
2,420
2,310

525
575
575
575

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,160	2,365	9,525	9,605	2,555	7,050	6-7A
7,610	2,640	10,250	10,215	2,520	7,695	7-8A
8,170	2,630	10,800	9,720	2,480	7,240	8-9A
7,595	2,430	10,025	9,485	2,345	7,140	9-10A

I-495 East Side AM
Future Alternative 9 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
425	435	170	255
740	590	275	360
995	780	375	395
785	690	300	350

	MD 202	
	EB	WB
6-7A	940	1,655
7-8A	1,400	2,475
8-9A	1,510	2,855
9-10A	1,445	2,040

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
780	45	790	845	10	700
980	130	1,410	990	15	1,335
1,095	115	1,740	1,045	5	1,470
620	125	1,370	900	15	1,305

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
845	220	275	10	825
990	200	295	15	1,110
1,045	250	350	5	1,210
900	220	325	15	745

	MD 202	
EB	WB	
1,020	1,635	6-7A
1,760	2,400	7-8A
1,935	2,785	8-9A
1,755	2,270	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,085	2,365	9,450	9,630	2,555	7,075
7-8A	7,375	2,640	10,015	10,415	2,520	7,895
8-9A	7,935	2,630	10,565	9,980	2,480	7,500
9-10A	7,450	2,430	9,880	9,420	2,345	7,075

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
300	405	325	210	215
445	460	400	335	240
360	415	425	300	420
330	395	345	290	330

	Arena Dr	
	EB	WB
6-7A	395	555
7-8A	655	865
8-9A	625	940
9-10A	625	790

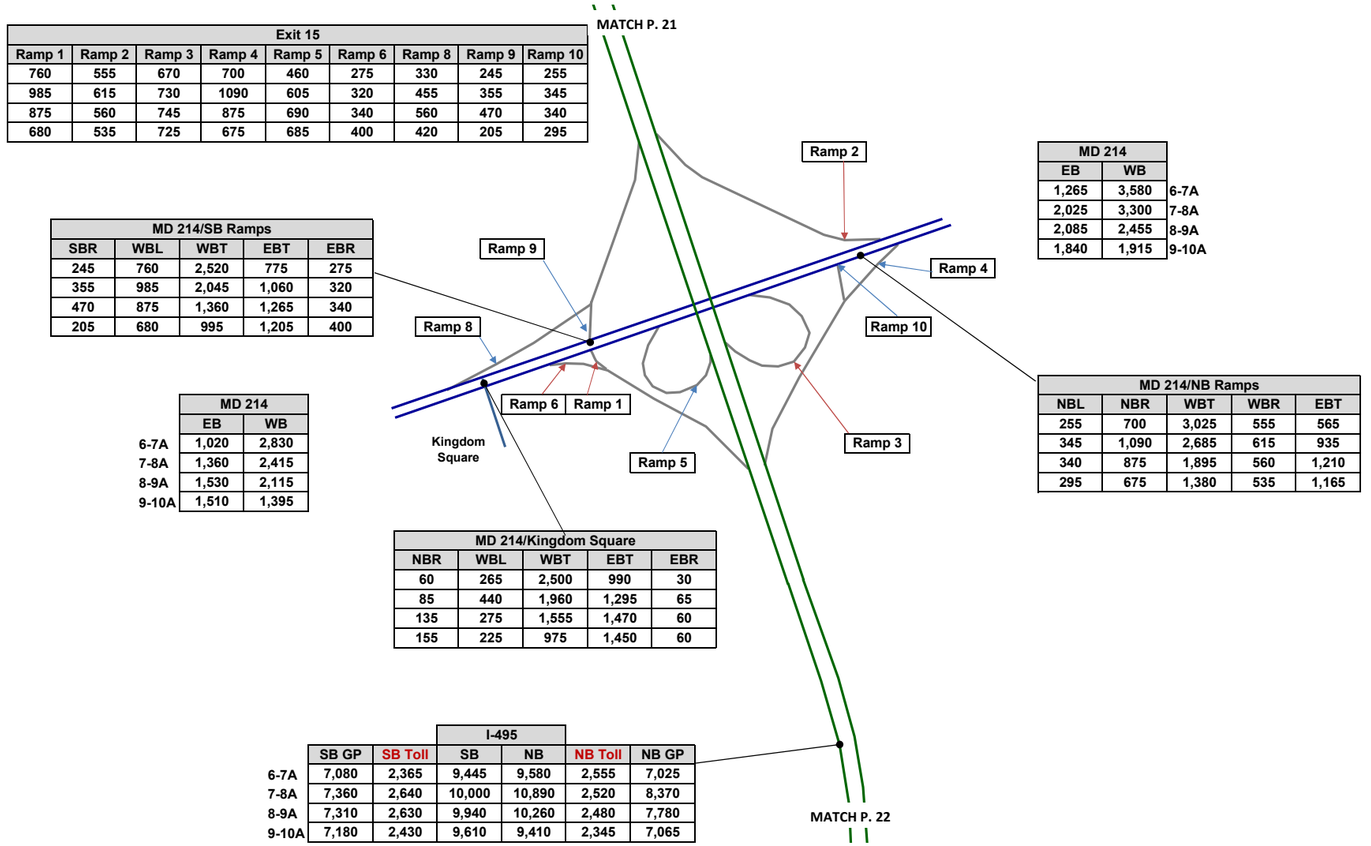
MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
300	0	325	235	200	205	175
445	0	400	450	235	225	365
355	5	425	495	220	190	465
330	0	345	455	190	205	455

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
85	0	130	110	425	295	100
105	0	135	165	730	485	170
175	0	245	155	695	480	145
160	0	170	165	620	500	125

	Arena Dr	
EB	WB	
500	435	6-7A
765	685	7-8A
890	715	8-9A
800	645	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,080	2,365	9,445	9,850	2,555	7,295
7-8A	7,470	2,640	10,110	10,800	2,520	8,280
8-9A	7,815	2,630	10,445	10,350	2,480	7,870
9-10A	7,410	2,430	9,840	9,700	2,345	7,355

I-495 East Side AM
Future Alternative 9 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
760	555	670	700	460	275	330	245	255
985	615	730	1090	605	320	455	355	345
875	560	745	875	690	340	560	470	340
680	535	725	675	685	400	420	205	295

MD 214		
EB	WB	
1,265	3,580	6-7A
2,025	3,300	7-8A
2,085	2,455	8-9A
1,840	1,915	9-10A

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
245	760	2,520	775	275
355	985	2,045	1,060	320
470	875	1,360	1,265	340
205	680	995	1,205	400

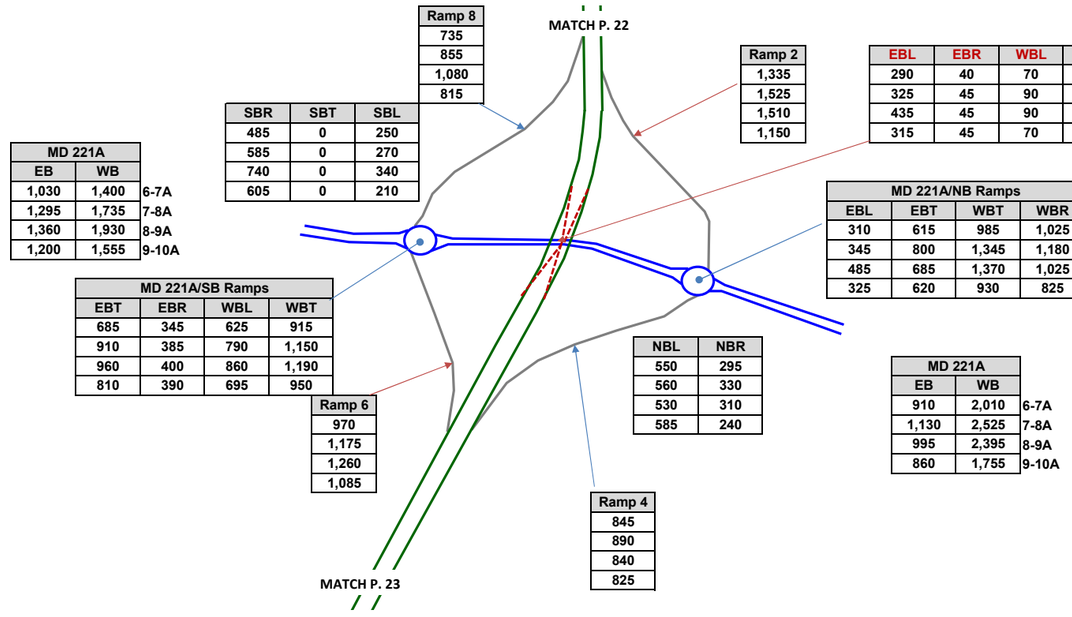
MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
255	700	3,025	555	565
345	1,090	2,685	615	935
340	875	1,895	560	1,210
295	675	1,380	535	1,165

	MD 214	
	EB	WB
6-7A	1,020	2,830
7-8A	1,360	2,415
8-9A	1,530	2,115
9-10A	1,510	1,395

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
60	265	2,500	990	30
85	440	1,960	1,295	65
135	275	1,555	1,470	60
155	225	975	1,450	60

			I-495			
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,080	2,365	9,445	9,580	2,555	7,025
7-8A	7,360	2,640	10,000	10,890	2,520	8,370
8-9A	7,310	2,630	9,940	10,260	2,480	7,780
9-10A	7,180	2,430	9,610	9,410	2,345	7,065

I-495 East Side AM
Future Alternative 9 Peak Period Volumes



Ramp 8
735
855
1,080
815

SBR	SBT	SBL
485	0	250
585	0	270
740	0	340
605	0	210

MD 221A		
EB	WB	
1,030	1,400	6-7A
1,295	1,735	7-8A
1,360	1,930	8-9A
1,200	1,555	9-10A

Ramp 2
1,335
1,525
1,510
1,150

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
290	40	70	500	105	60	260	470
325	45	90	515	110	65	270	530
435	45	90	410	100	55	295	550
315	45	70	390	110	45	240	480

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
310	615	985	1,025
345	800	1,345	1,180
485	685	1,370	1,025
325	620	930	825

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
685	345	625	915
910	385	790	1,150
960	400	860	1,190
810	390	695	950

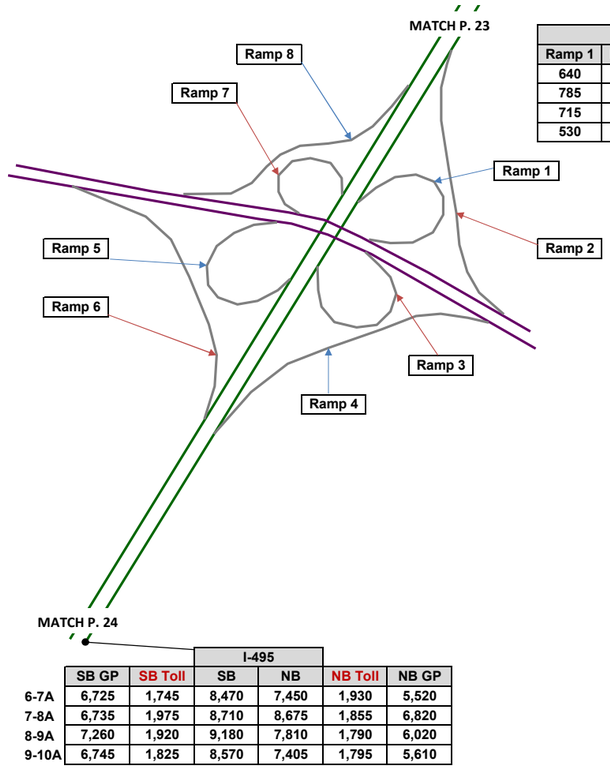
Ramp 6
970
1,175
1,260
1,085

NBL	NBR
550	295
560	330
530	310
585	240

Ramp 4
845
890
840
825

MD 221A		
EB	WB	
910	2,010	6-7A
1,130	2,525	7-8A
995	2,395	8-9A
860	1,755	9-10A

I-495 East Side AM
Future Alternative 9 Peak Period Volumes



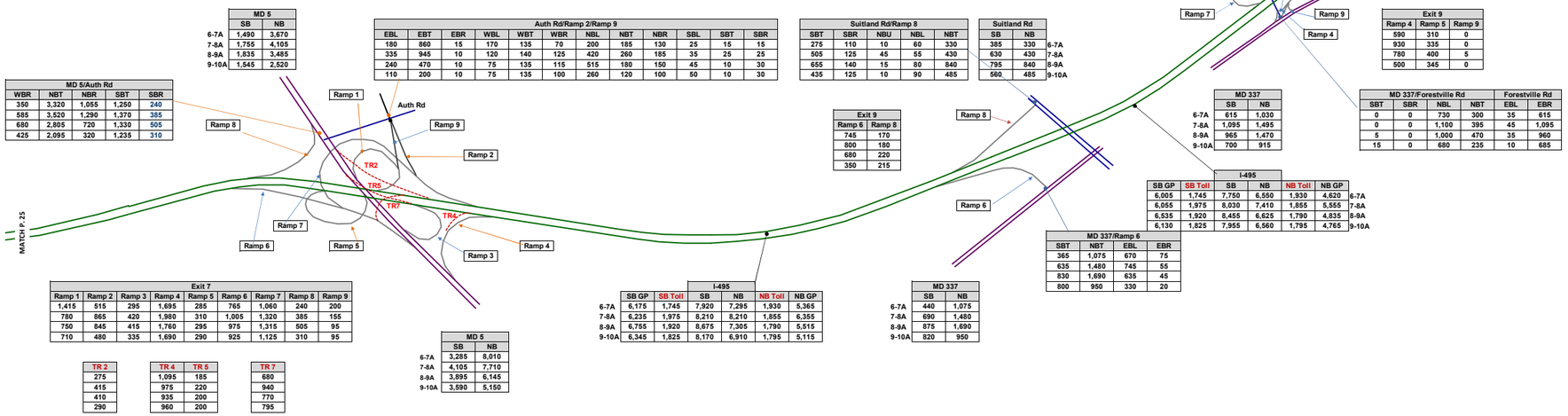
MD 4		
SB	NB	
1,335	2,325	6-7A
1,665	3,110	7-8A
1,580	2,120	8-9A
1,450	1,570	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
640	1,600	625	570	940	465	1,135	1,250
785	1,525	725	550	830	410	930	1,455
715	1,625	730	550	675	450	845	850
530	1,465	680	485	785	375	605	900

MD 4		
SB	NB	
1,755	3,170	6-7A
1,910	3,325	7-8A
1,625	3,025	8-9A
1,665	2,210	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,725	1,745	8,470	7,450	1,930	5,520
7-8A	6,735	1,975	8,710	8,675	1,855	6,820
8-9A	7,260	1,920	9,180	7,810	1,790	6,020
9-10A	6,745	1,825	8,570	7,405	1,795	5,610

I-495 South Side AM
Future Alternative 9 Peak Period Volumes



	MD 5	
	SB	NB
6-7A	1,490	3,670
7-8A	1,755	4,105
8-9A	1,835	3,485
9-10A	1,545	2,520

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
350	3,320	1,055	1,250	240
585	3,520	1,290	1,370	385
680	2,805	720	1,330	505
425	2,095	320	1,235	310

Auth Rd/Ramp 2/Ramp 9												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
180	860	15	170	135	70	200	185	130	25	15	15
335	945	10	120	140	125	420	260	185	35	25	25
240	470	10	75	135	115	515	180	150	45	10	30
110	200	10	75	135	100	260	120	100	50	10	30

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
1,415	515	295	1,695	285	765	1,060	240	200
780	865	420	1,980	310	1,005	1,320	385	155
750	845	415	1,760	295	975	1,315	505	95
710	480	335	1,690	290	925	1,125	310	95

TR 2
275
415
410
290

TR 4	TR 5
1,095	185
975	220
935	200
960	200

TR 7
680
940
770
795

MD 5	
SB	NB
3,285	8,010
4,105	7,710
3,895	6,145
3,590	5,150

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
275	110	10	60	330
505	125	45	55	430
655	140	15	80	840
435	125	10	90	485

Suitland Rd	
SB	NB
385	330
630	430
795	840
560	485

Exit 9	
Ramp 8	Ramp 8
745	170
800	180
680	220
350	215

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,175	1,745	7,920	7,295	1,930	5,365
6,235	1,975	8,210	8,210	1,855	6,355
6,755	1,920	8,675	7,305	1,790	5,515
6,345	1,825	8,170	6,910	1,795	5,115

MD 337	
SB	NB
440	1,075
690	1,480
875	1,690
820	950

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
10	5	205	5	510	135	5	0	440
5	0	120	5	555	165	5	0	915
5	0	130	5	590	215	5	0	800
5	0	145	5	465	175	5	5	570

Ramp 7	Forest. NB	Forest. SB
720	140	960
680	170	1,475
725	220	1,395
615	180	1,040

Forestville Rd	
SB	NB
440	345
915	285
800	345
575	320

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,725	1,745	8,470	7,450	1,930	5,520
6,735	1,975	8,710	8,675	1,855	6,820
7,260	1,920	9,180	7,810	1,790	6,020
6,745	1,825	8,570	7,405	1,795	5,610

MD 337	
SB	NB
0	335
0	440
0	505
0	245

Exit 9		
Ramp 4	Ramp 5	Ramp 9
590	310	0
930	335	0
780	400	5
500	345	0

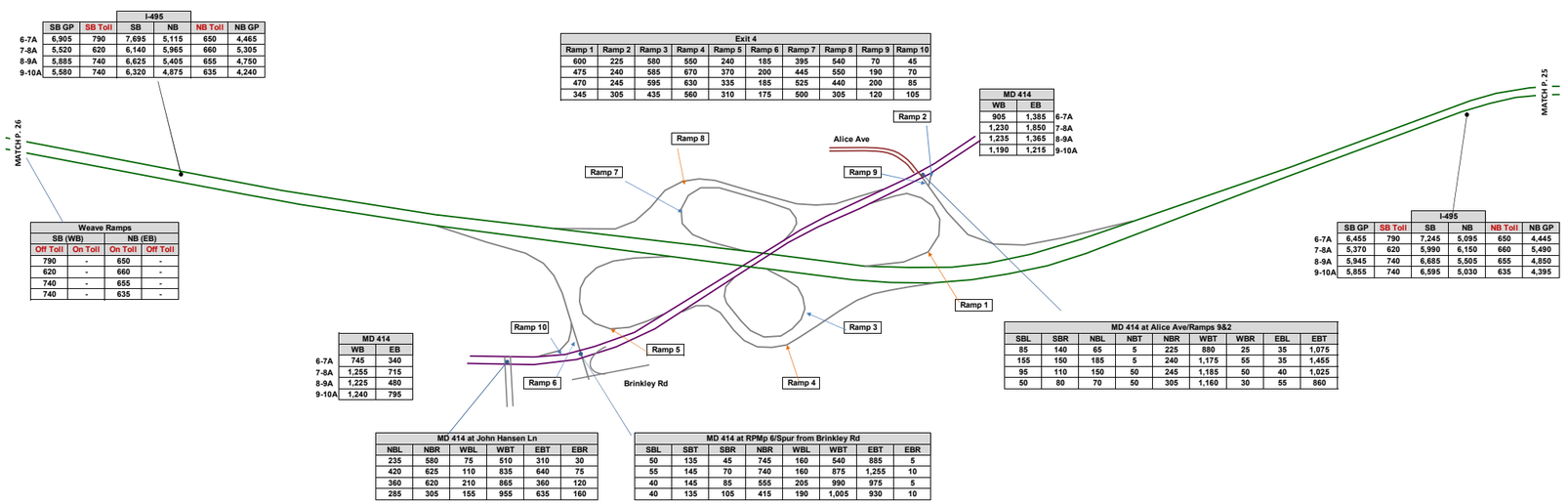
MD 337	
SB	NB
615	1,030
1,095	1,495
965	1,470
700	915

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	730	300	35	615
0	0	1,100	395	45	1,095
5	0	1,000	470	35	960
15	0	680	235	10	685

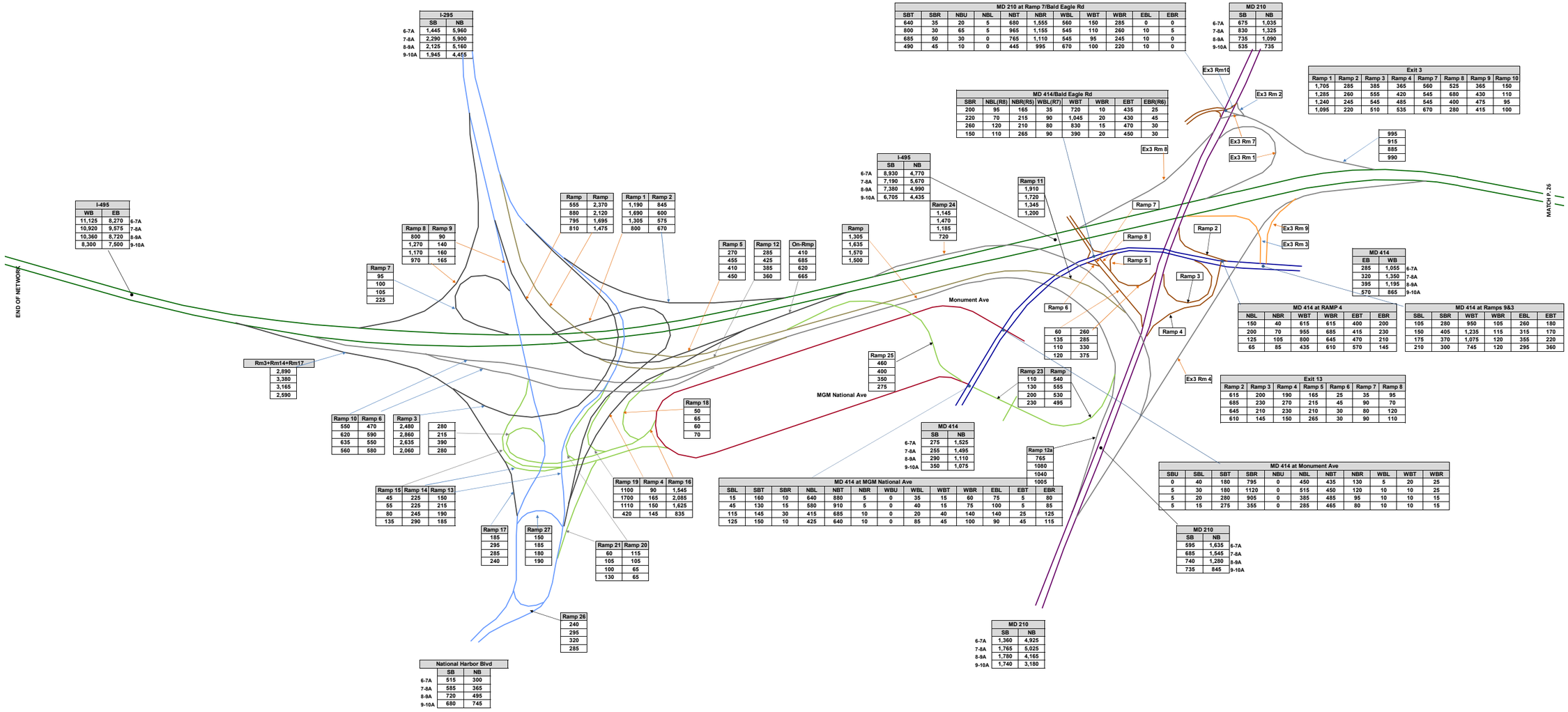
I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,005	1,745	7,750	6,550	1,930	4,620
6,055	1,975	8,030	7,410	1,855	5,555
6,535	1,920	8,455	6,625	1,790	4,835
6,130	1,825	7,955	6,560	1,795	4,765

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
365	1,075	670	75
635	1,480	745	55
830	1,690	635	45
800	950	330	20

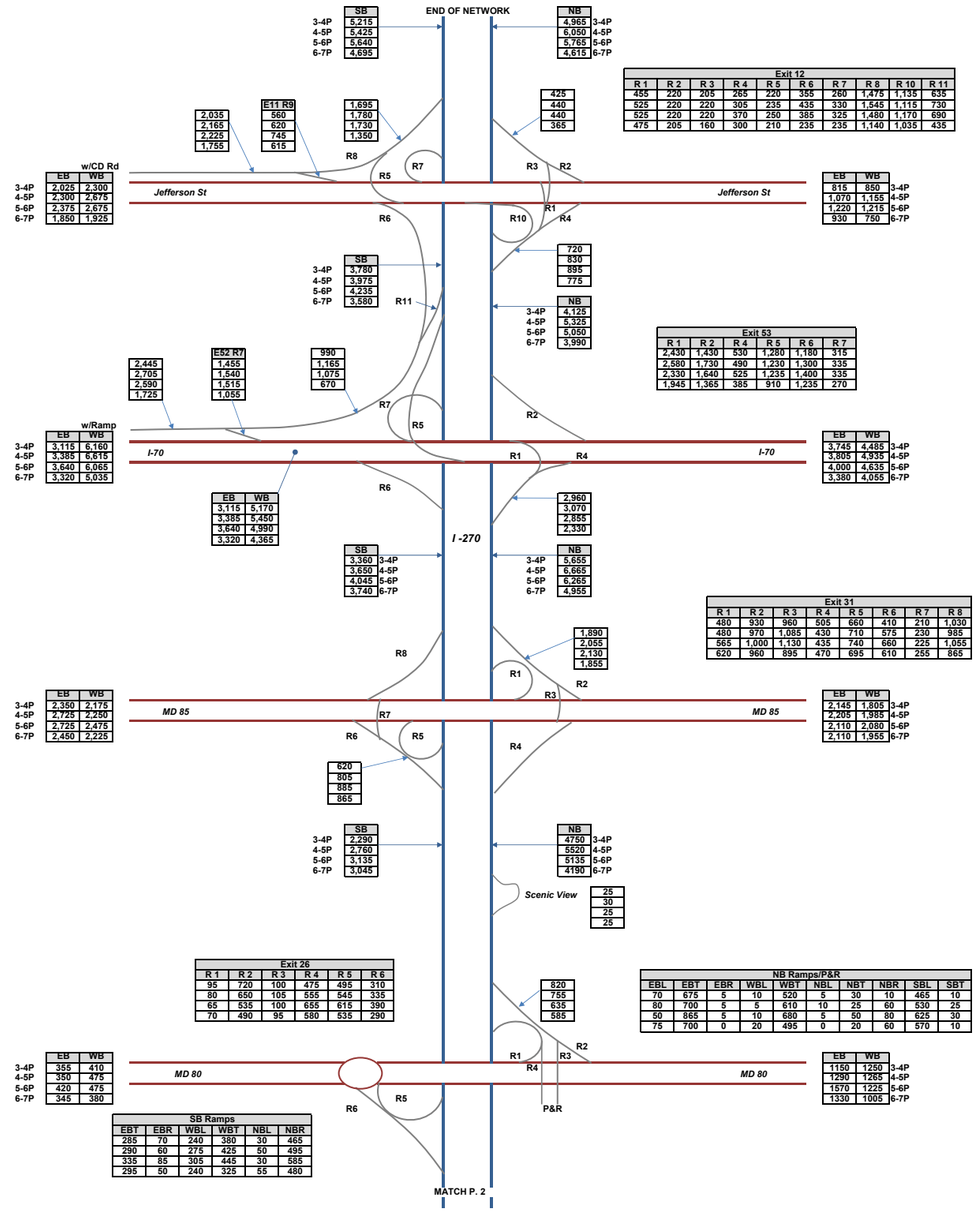
I-495 South Side AM
Future Alternative 9 Peak Period Volumes



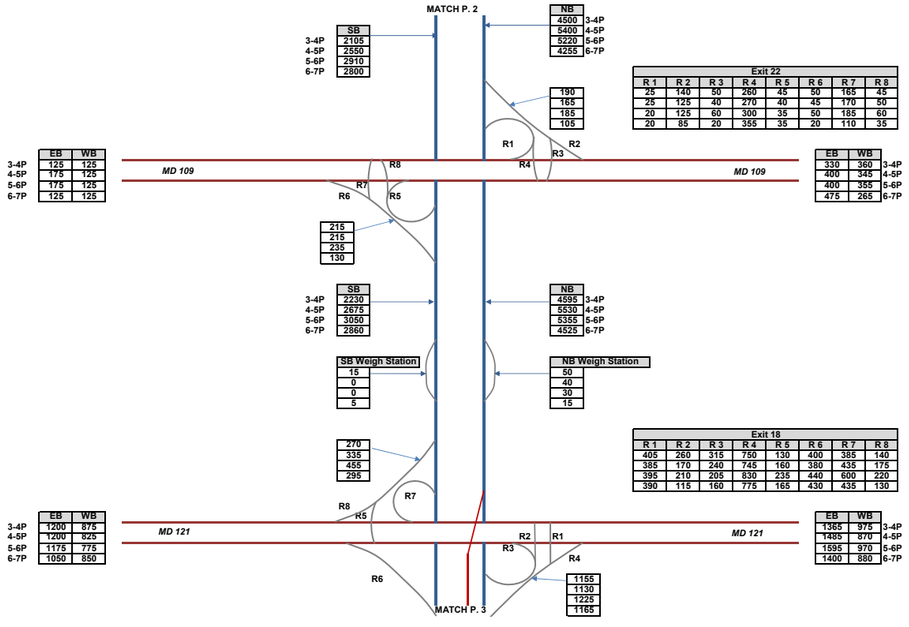
I-495 South Side AM
Future Alternative 9 Peak Period Volumes



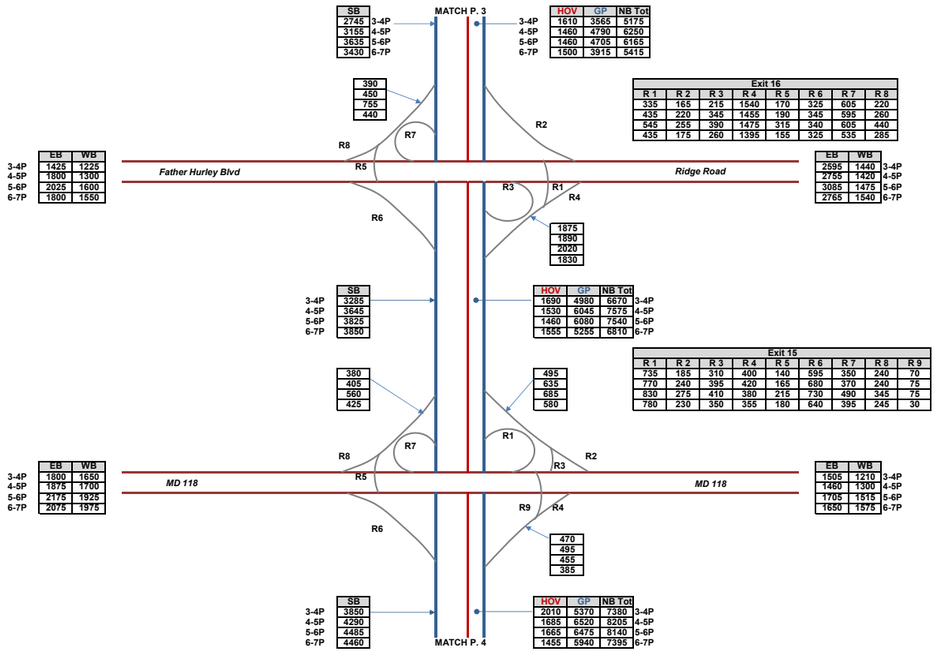
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



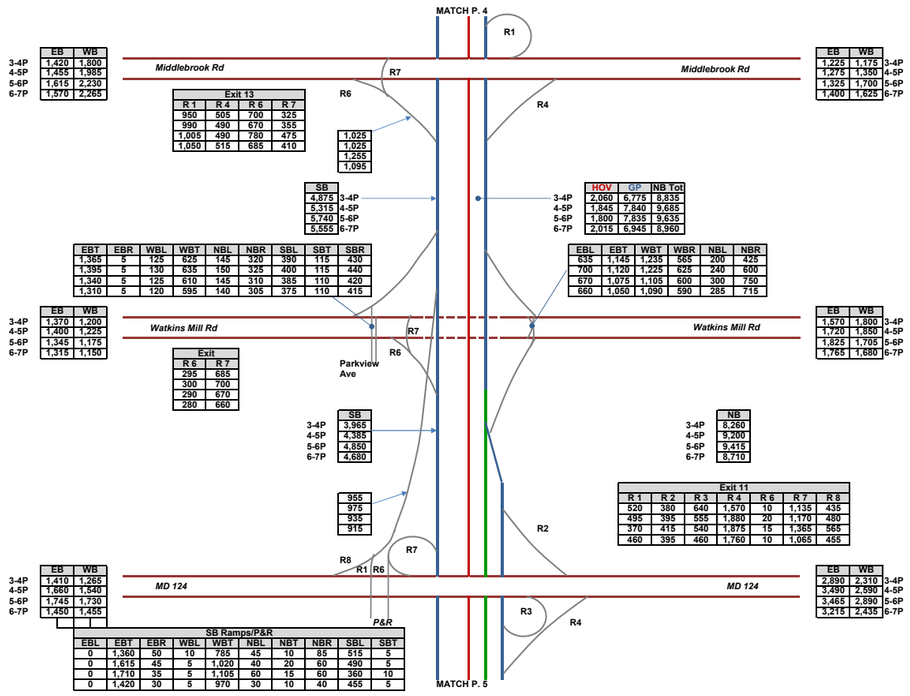
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



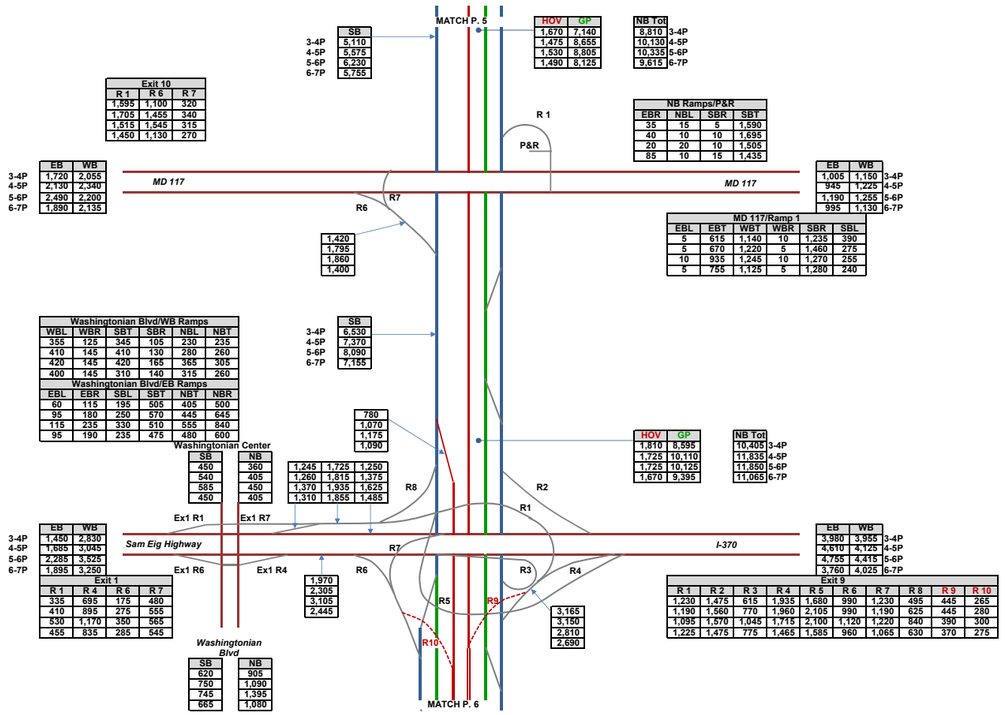
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



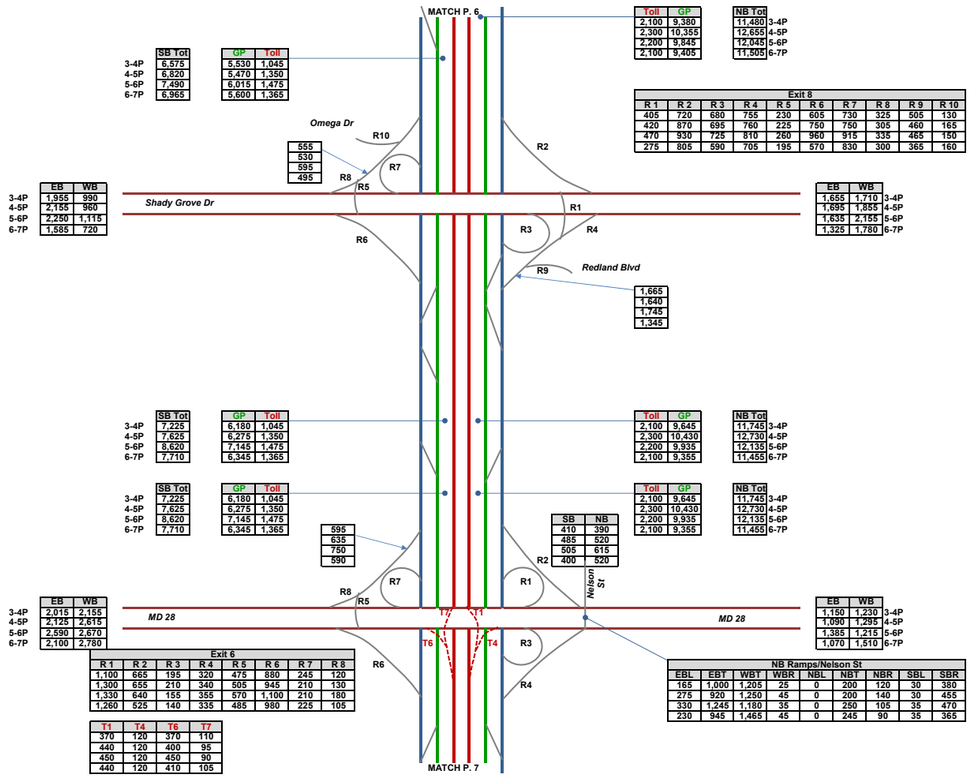
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



	SB Tot
3-4P	6,575
4-5P	6,820
5-6P	7,490
6-7P	6,965

GP	Toll
5,530	1,045
5,470	1,350
6,015	1,475
5,600	1,365

Toll	GP
2,100	9,380
2,300	10,355
2,200	9,845
2,100	9,405

NB Tot	
11,480	3-4P
12,655	4-5P
12,045	5-6P
11,505	6-7P

555
530
595
495

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
405	720	680	755	230	605	730	325	505	130
420	870	695	760	225	750	750	305	460	165
470	930	725	810	260	960	915	335	465	150
275	805	590	705	195	570	830	300	365	160

	EB	WB
3-4P	1,955	990
4-5P	2,155	960
5-6P	2,250	1,115
6-7P	1,585	720

EB	WB	
1,655	1,710	3-4P
1,695	1,855	4-5P
1,635	2,155	5-6P
1,325	1,780	6-7P

1,665
1,640
1,745
1,345

	SB Tot
3-4P	7,225
4-5P	7,625
5-6P	8,620
6-7P	7,710

GP	Toll
6,180	1,045
6,275	1,350
7,145	1,475
6,345	1,365

Toll	GP
2,100	9,645
2,300	10,430
2,200	9,935
2,100	9,355

NB Tot	
11,745	3-4P
12,730	4-5P
12,135	5-6P
11,455	6-7P

	SB Tot
3-4P	7,225
4-5P	7,625
5-6P	8,620
6-7P	7,710

GP	Toll
6,180	1,045
6,275	1,350
7,145	1,475
6,345	1,365

Toll	GP
2,100	9,645
2,300	10,430
2,200	9,935
2,100	9,355

NB Tot	
11,745	3-4P
12,730	4-5P
12,135	5-6P
11,455	6-7P

595
635
750
590

SB	NB
410	390
485	520
505	615
400	520

	EB	WB
3-4P	2,015	2,155
4-5P	2,125	2,615
5-6P	2,590	2,670
6-7P	2,100	2,780

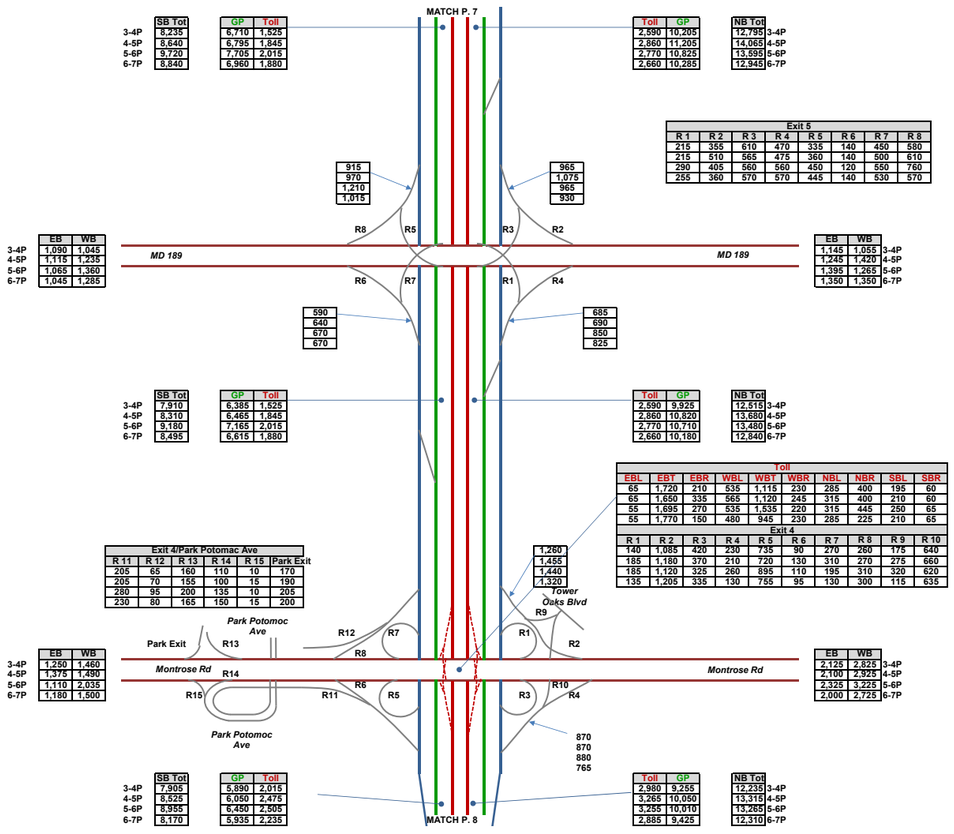
EB	WB	
1,150	1,230	3-4P
1,090	1,295	4-5P
1,385	1,215	5-6P
1,070	1,510	6-7P

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
1,100	665	195	320	475	880	245	120
1,300	655	210	340	505	945	210	130
1,330	640	155	355	570	1,100	210	180
1,260	525	140	335	485	980	225	105

T1	T4	T6	T7
370	120	370	110
440	120	400	95
450	120	450	90
440	120	410	105

NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
165	1,000	1,205	25	0	200	120	30	380
275	920	1,250	45	0	200	140	30	455
330	1,245	1,180	35	0	250	105	35	470
230	945	1,465	45	0	245	90	35	365

I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



	SB Tot
3-4P	8,235
4-5P	8,640
5-6P	9,720
6-7P	8,840

GP	Toll
6,710	1,525
6,795	1,845
7,705	2,015
6,960	1,880

Toll	GP
2,590	10,205
2,860	11,205
2,770	10,825
2,660	10,285

NB Tot	
12,795	3-4P
14,065	4-5P
13,595	5-6P
12,945	6-7P

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
215	355	610	470	335	140	450	580
215	510	565	475	360	140	500	610
290	405	560	560	450	120	550	760
255	360	570	570	445	140	530	570

	EB	WB
3-4P	1,090	1,045
4-5P	1,115	1,235
5-6P	1,065	1,360
6-7P	1,045	1,285

EB	WB	
1,145	1,055	3-4P
1,245	1,420	4-5P
1,395	1,265	5-6P
1,350	1,350	6-7P

915
970
1,210
1,015

965
1,075
965
930

590
540
670
670

685
590
850
825

R8 R5 R3 R2

R6 R7 R1 R4

	SB Tot
3-4P	7,910
4-5P	8,310
5-6P	9,180
6-7P	8,495

GP	Toll
6,385	1,525
6,465	1,845
7,165	2,015
6,615	1,880

Toll	GP
2,590	9,925
2,860	10,820
2,770	10,710
2,660	10,180

NB Tot	
12,515	3-4P
13,680	4-5P
13,480	5-6P
12,840	6-7P

Toll									
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
65	1,720	210	535	1,115	230	285	400	195	60
65	1,650	335	565	1,120	245	315	400	210	60
55	1,695	270	535	1,535	220	315	445	260	65
55	1,770	150	480	945	230	285	225	210	65

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
140	1,085	420	230	735	90	270	260	175	640
185	1,180	370	210	720	130	310	270	275	660
185	1,120	325	260	895	110	195	310	320	620
135	1,205	335	130	755	95	130	300	115	635

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
205	65	160	110	10	170
205	70	155	100	15	190
280	95	200	135	10	205
230	80	165	150	15	200

1,260
1,455
1,440
1,320

R12 R7 R1 R9 R8 R2

R15 R11 R5 R3 R6 R10 R4

	EB	WB
3-4P	1,250	1,460
4-5P	1,375	1,490
5-6P	1,110	2,035
6-7P	1,180	1,500

EB	WB	
2,125	2,325	3-4P
2,100	2,925	4-5P
2,325	3,225	5-6P
2,000	2,725	6-7P

870
870
880
765

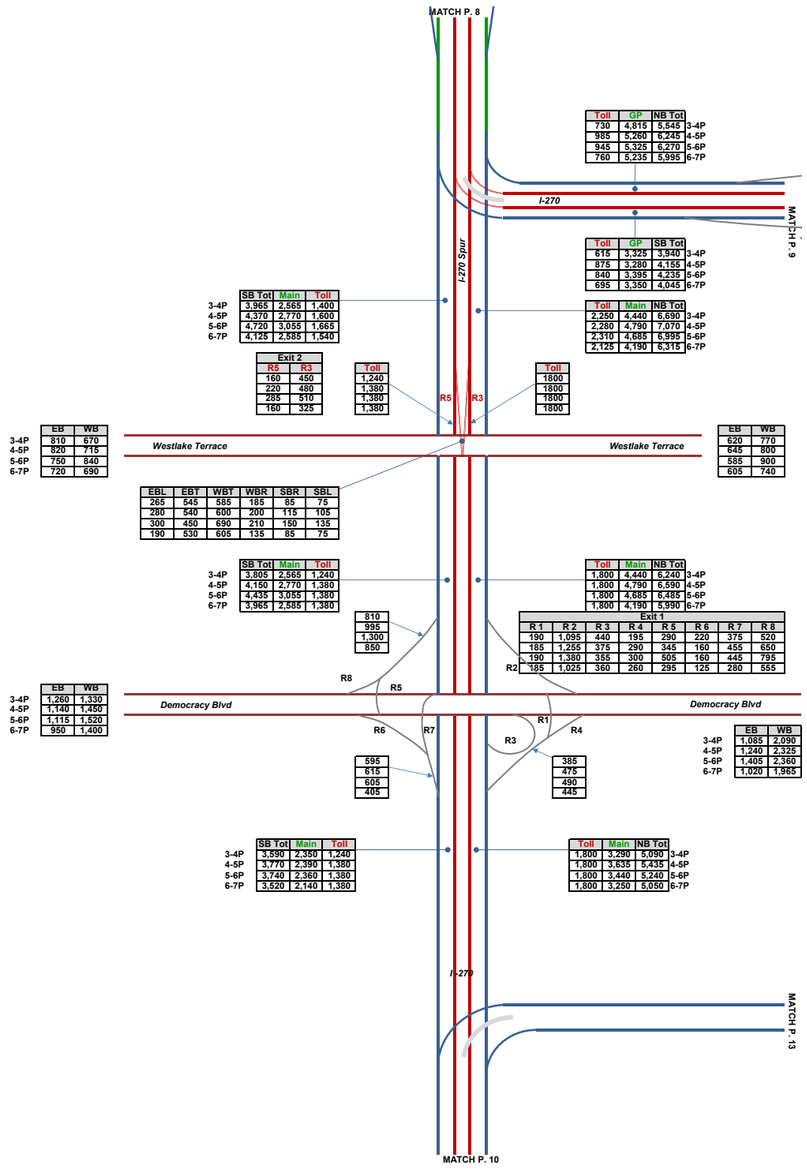
	SB Tot
3-4P	7,905
4-5P	8,525
5-6P	8,955
6-7P	8,170

GP	Toll
5,890	2,015
6,050	2,475
6,450	2,505
5,935	2,235

Toll	GP
2,980	9,255
3,265	10,050
3,255	10,010
2,885	9,425

NB Tot	
12,235	3-4P
13,315	4-5P
13,265	5-6P
12,310	6-7P

I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



	Toll	GP	NB Tot
3-4P	730	4,815	5,545
4-5P	985	5,260	6,245
5-6P	945	5,325	6,270
6-7P	760	5,235	5,995

	Toll	GP	SB Tot
3-4P	615	3,325	3,940
4-5P	875	3,280	4,155
5-6P	840	3,395	4,235
6-7P	695	3,350	4,045

	SB Tot	Main	Toll
3-4P	3,965	2,565	1,400
4-5P	4,370	2,770	1,600
5-6P	4,720	3,055	1,665
6-7P	4,125	2,585	1,540

	Toll	Main	NB Tot
3-4P	2,250	4,440	6,690
4-5P	2,280	4,790	7,070
5-6P	2,310	4,685	6,995
6-7P	2,125	4,190	6,315

Exit 2	
R5	R3
160	450
220	480
285	510
160	325

Toll
1,240
1,380
1,380
1,380

Toll
1800
1800
1800
1800

	EB	WB
3-4P	810	670
4-5P	820	715
5-6P	750	840
6-7P	720	690

	EB	WB
3-4P	620	770
4-5P	645	800
5-6P	585	900
6-7P	605	740

EBL	EBT	WBT	WBR	SBR	SBL
265	545	585	185	85	75
280	540	600	200	115	105
300	450	690	210	150	135
190	530	605	135	85	75

	SB Tot	Main	Toll
3-4P	3,805	2,565	1,240
4-5P	4,150	2,770	1,380
5-6P	4,435	3,055	1,380
6-7P	3,965	2,585	1,380

	Toll	Main	NB Tot
3-4P	1,800	4,440	6,240
4-5P	1,800	4,790	6,590
5-6P	1,800	4,685	6,485
6-7P	1,800	4,190	5,990

810
995
1,300
850

Exit 1							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
190	1,095	440	195	290	220	375	520
185	1,255	375	290	345	160	455	650
190	1,380	355	300	505	160	445	795
185	1,025	360	260	295	125	280	555

	EB	WB
3-4P	1,260	1,330
4-5P	1,140	1,450
5-6P	1,115	1,520
6-7P	950	1,400

	EB	WB
3-4P	1,085	2,090
4-5P	1,240	2,325
5-6P	1,405	2,360
6-7P	1,020	1,965

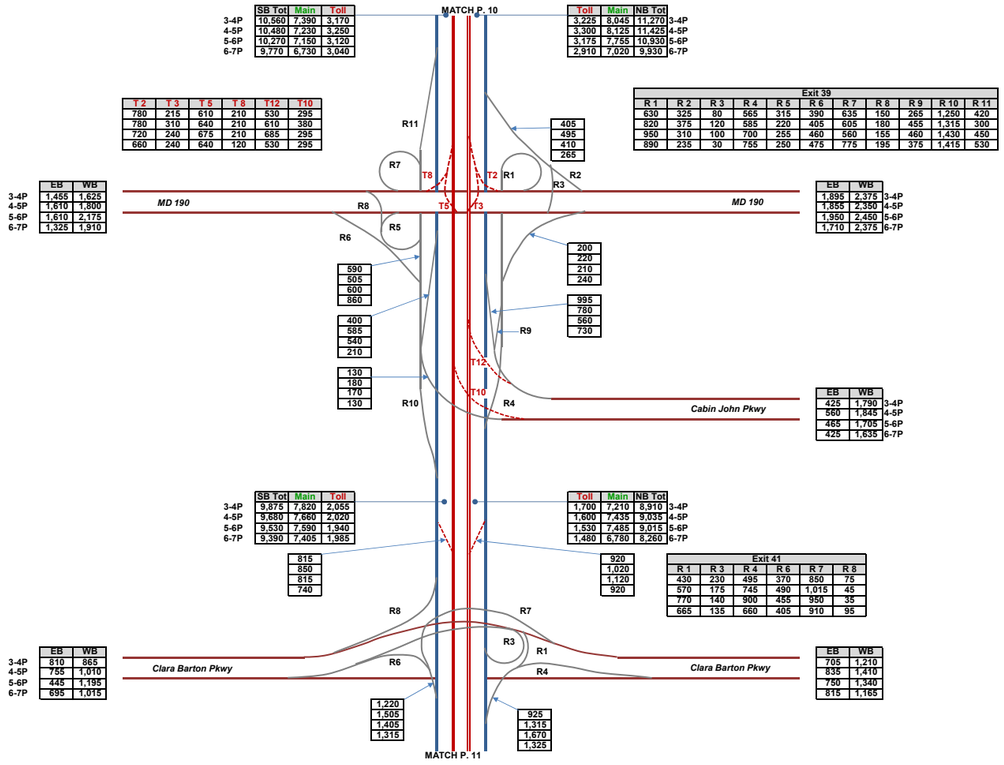
595
615
605
405

385
475
490
445

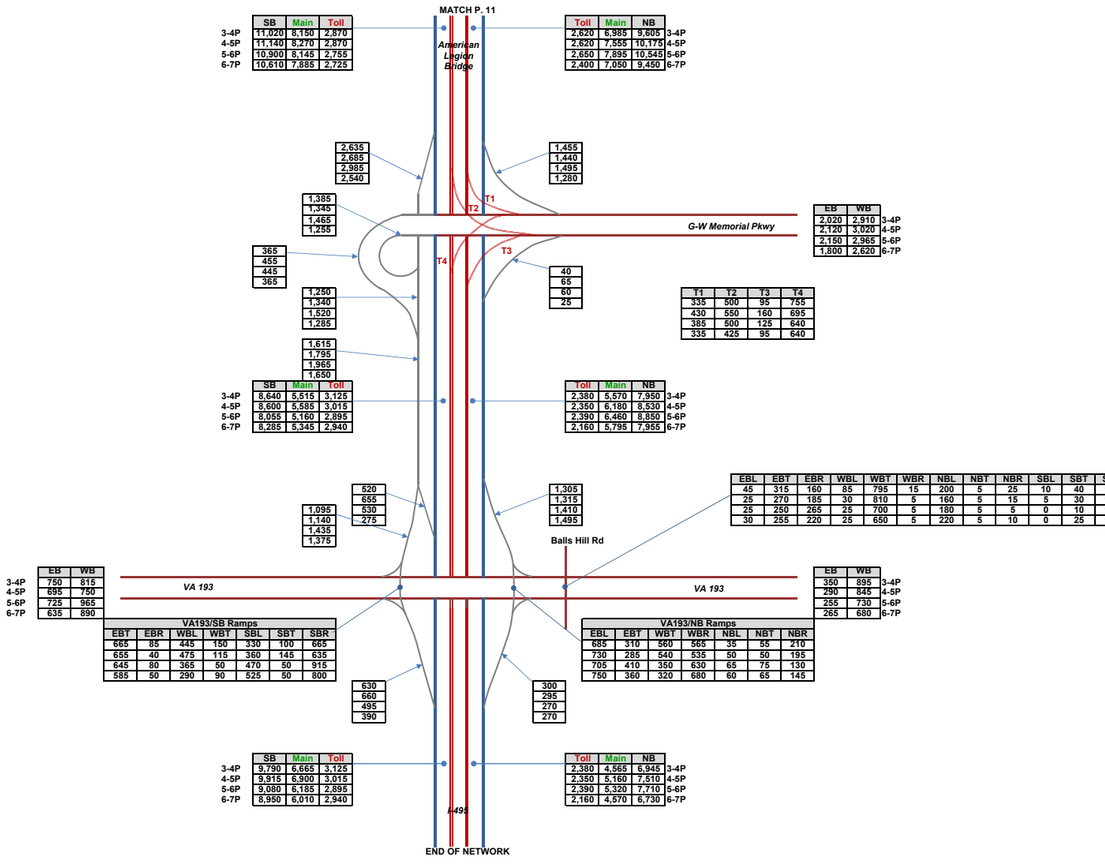
	SB Tot	Main	Toll
3-4P	3,590	2,350	1,240
4-5P	3,770	2,390	1,380
5-6P	3,740	2,360	1,380
6-7P	3,520	2,140	1,380

	Toll	Main	NB Tot
3-4P	1,800	3,290	5,090
4-5P	1,800	3,635	5,435
5-6P	1,800	3,440	5,240
6-7P	1,800	3,250	5,050

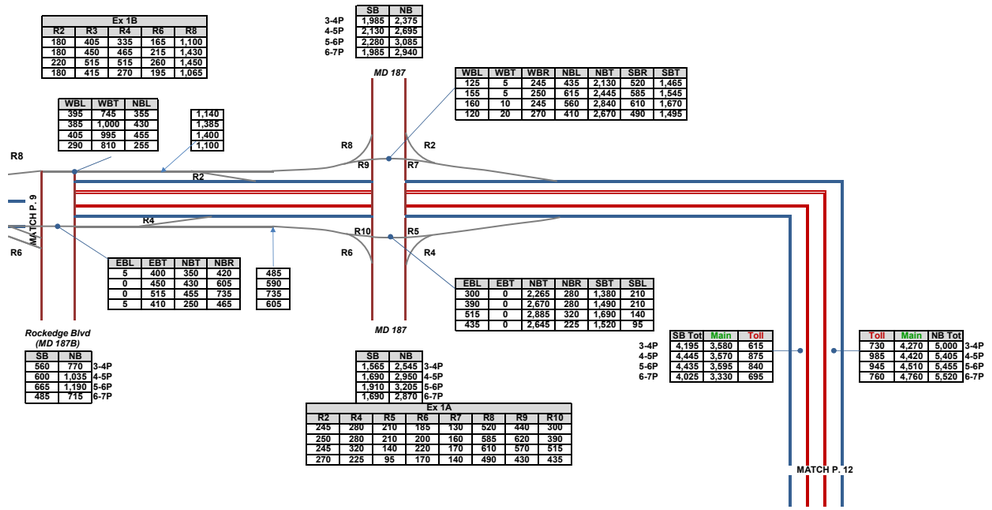
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



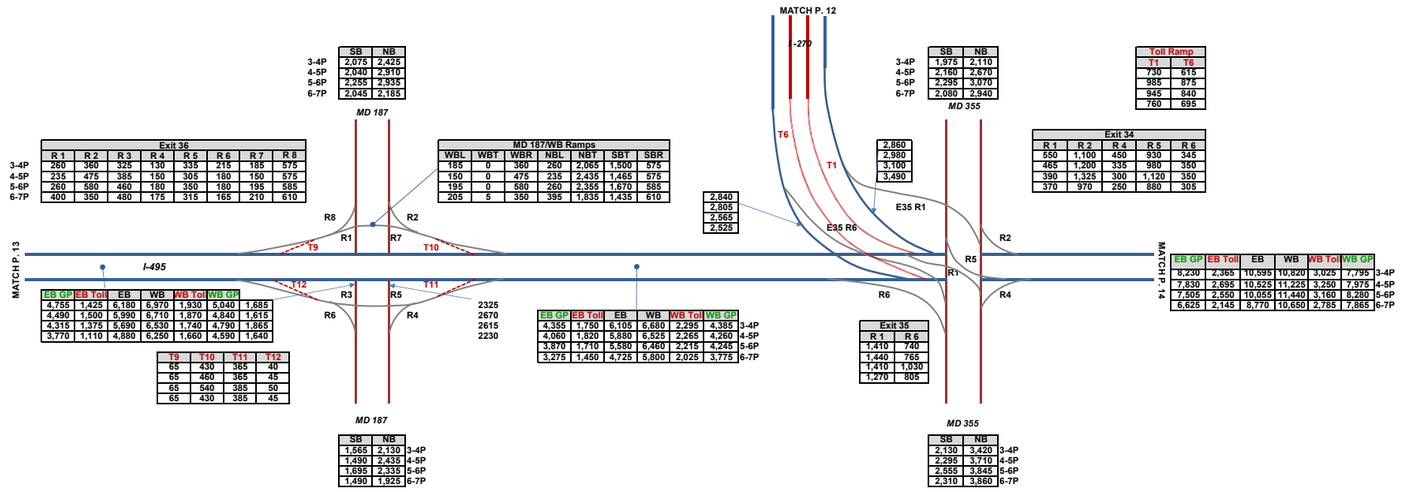
I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 9 Peak Period Volumes



	SB	NB
3-4P	2,075	2,425
4-5P	2,040	2,910
5-6P	2,255	2,935
6-7P	2,045	2,185

	SB	NB
3-4P	1,975	2,110
4-5P	2,160	2,670
5-6P	2,295	3,070
6-7P	2,080	2,940

Toll Ramp	
T1	T6
730	615
985	875
945	840
760	695

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
260	360	325	130	335	215	185	575
235	475	385	150	305	180	150	575
260	580	460	180	350	180	195	585
400	350	480	175	315	165	210	610

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
185	0	360	260	2,065	1,500	575
150	0	475	235	2,435	1,465	575
195	0	580	260	2,355	1,670	585
205	5	350	395	1,835	1,435	610

Exit 34				
R 1	R 2	R 4	R 5	R 6
550	1,100	450	930	345
465	1,200	335	980	350
390	1,325	300	1,120	350
370	970	250	880	305

2,860
2,980
3,100
3,490

2,840
2,805
2,565
2,525

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,755	1,425	6,180	6,970	1,930	5,040	1,685
4,490	1,500	5,990	6,710	1,870	4,840	1,615
4,315	1,375	5,690	6,530	1,740	4,790	1,865
3,770	1,110	4,880	6,250	1,660	4,590	1,640

T9	T10	T11	T12
65	430	365	40
65	460	365	45
65	540	385	50
65	430	385	45

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,355	1,750	6,105	6,680	2,295	4,385	3-4P
4,060	1,820	5,880	6,525	2,265	4,260	4-5P
3,870	1,710	5,580	6,460	2,215	4,245	5-6P
3,275	1,450	4,725	5,800	2,025	3,775	6-7P

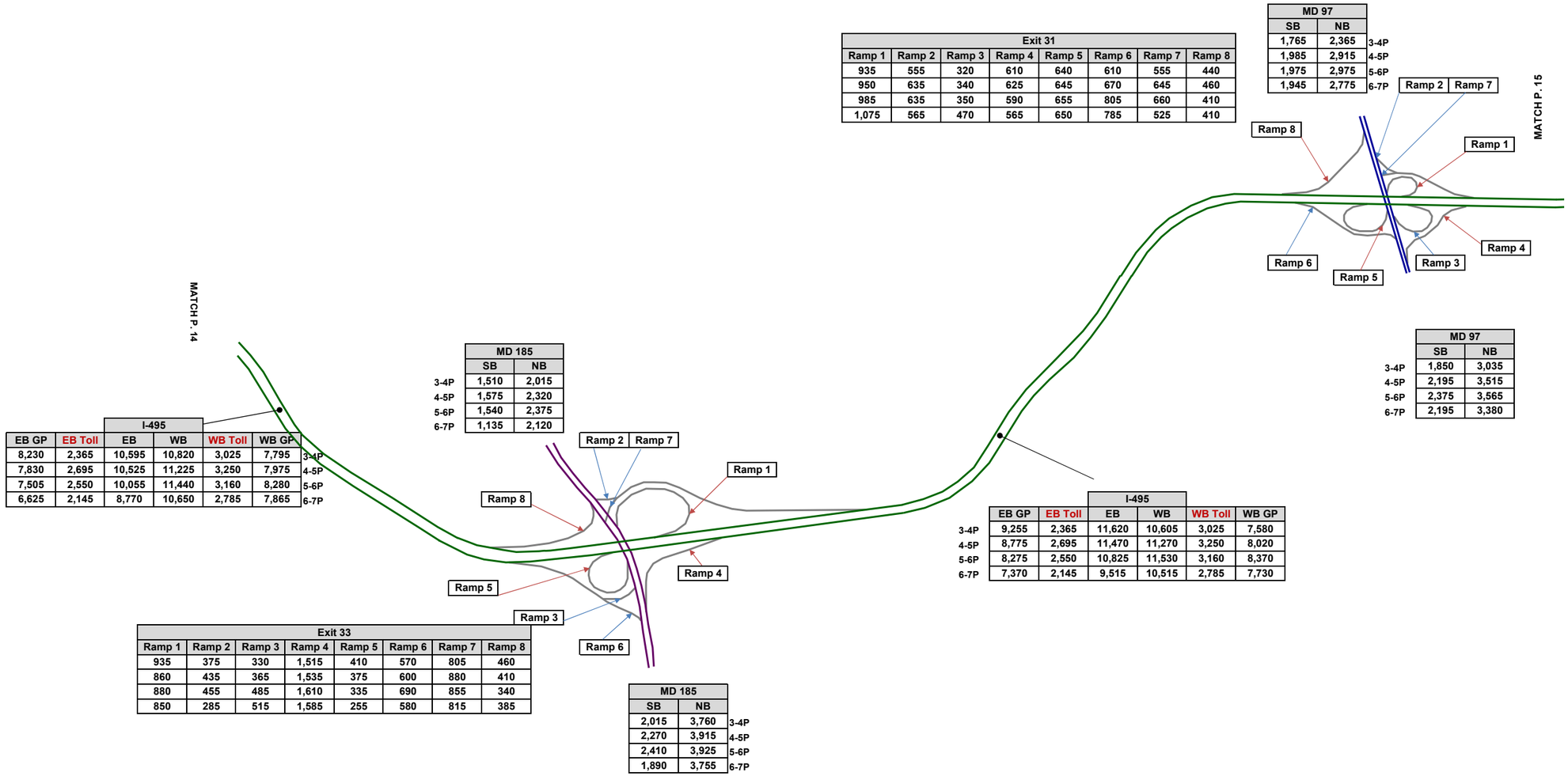
Exit 35	
R 1	R 6
1,410	740
1,440	765
1,410	1,030
1,270	805

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,230	2,365	10,595	10,620	3,025	7,795	3-4P
7,830	2,695	10,525	11,225	3,250	7,975	4-5P
7,505	2,550	10,055	11,440	3,160	8,280	5-6P
6,625	2,145	8,770	10,650	2,785	7,865	6-7P

SB	NB	
1,565	2,130	3-4P
1,490	2,435	4-5P
1,695	2,335	5-6P
1,490	1,925	6-7P

SB	NB	
2,130	3,420	3-4P
2,295	3,710	4-5P
2,555	3,845	5-6P
2,310	3,860	6-7P

I-495 North Side PM
Future Alternative 9 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
935	555	320	610	640	610	555	440
950	635	340	625	645	670	645	460
985	635	350	590	655	805	660	410
1,075	565	470	565	650	785	525	410

	MD 97	
	SB	NB
3-4P	1,765	2,365
4-5P	1,985	2,915
5-6P	1,975	2,975
6-7P	1,945	2,775

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,230	2,365	10,595	10,820	3,025	7,795
4-5P	7,830	2,695	10,525	11,225	3,250	7,975
5-6P	7,505	2,550	10,055	11,440	3,160	8,280
6-7P	6,625	2,145	8,770	10,650	2,785	7,865

	MD 185	
	SB	NB
3-4P	1,510	2,015
4-5P	1,575	2,320
5-6P	1,540	2,375
6-7P	1,135	2,120

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
935	375	330	1,515	410	570	805	460
860	435	365	1,535	375	600	880	410
880	455	485	1,610	335	690	855	340
850	285	515	1,585	255	580	815	385

	MD 185	
	SB	NB
3-4P	2,015	3,760
4-5P	2,270	3,915
5-6P	2,410	3,925
6-7P	1,890	3,755

	MD 97	
	SB	NB
3-4P	1,850	3,035
4-5P	2,195	3,515
5-6P	2,375	3,565
6-7P	2,195	3,380

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,255	2,365	11,620	10,605	3,025	7,580
4-5P	8,775	2,695	11,470	11,270	3,250	8,020
5-6P	8,275	2,550	10,825	11,530	3,160	8,370
6-7P	7,370	2,145	9,515	10,515	2,785	7,730

I-495 North Side PM
Future Alternative 9 Peak Period Volumes

T1	T2	T3	T4	T5	T6	T7	T8
200	355	795	775	360	135	395	705
235	375	955	760	355	155	405	715
270	380	955	770	325	150	345	705
260	365	940	705	330	120	395	800

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
245	445	320	460	120	340
305	375	405	290	225	355
345	395	410	330	260	485
300	460	290	340	120	495

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,575	2,365	11,940	10,340	3,025	7,315
4-5P	9,035	2,695	11,730	11,140	3,250	7,890
5-6P	8,365	2,550	10,915	11,430	3,160	8,270
6-7P	7,330	2,145	9,475	10,120	2,785	7,335

	US 29	
	SB	NB
3-4P	2,090	2,830
4-5P	2,290	3,125
5-6P	2,430	3,300
6-7P	2,300	3,420

	US 29	
	SB	NB
3-4P	1,795	2,775
4-5P	1,940	3,125
5-6P	2,000	3,365
6-7P	1,650	3,210

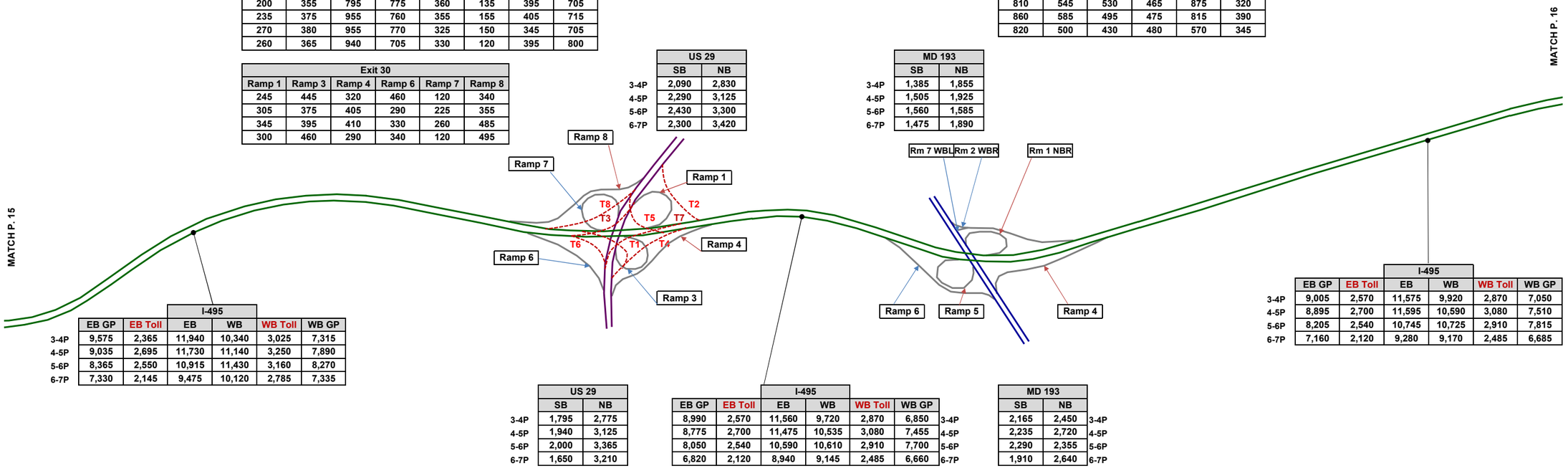
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,990	2,570	11,560	9,720	2,870	6,850
4-5P	8,775	2,700	11,475	10,535	3,080	7,455
5-6P	8,050	2,540	10,590	10,610	2,910	7,700
6-7P	6,820	2,120	8,940	9,145	2,485	6,660

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
575	470	490	440	915	305
810	545	530	465	875	320
860	585	495	475	815	390
820	500	430	480	570	345

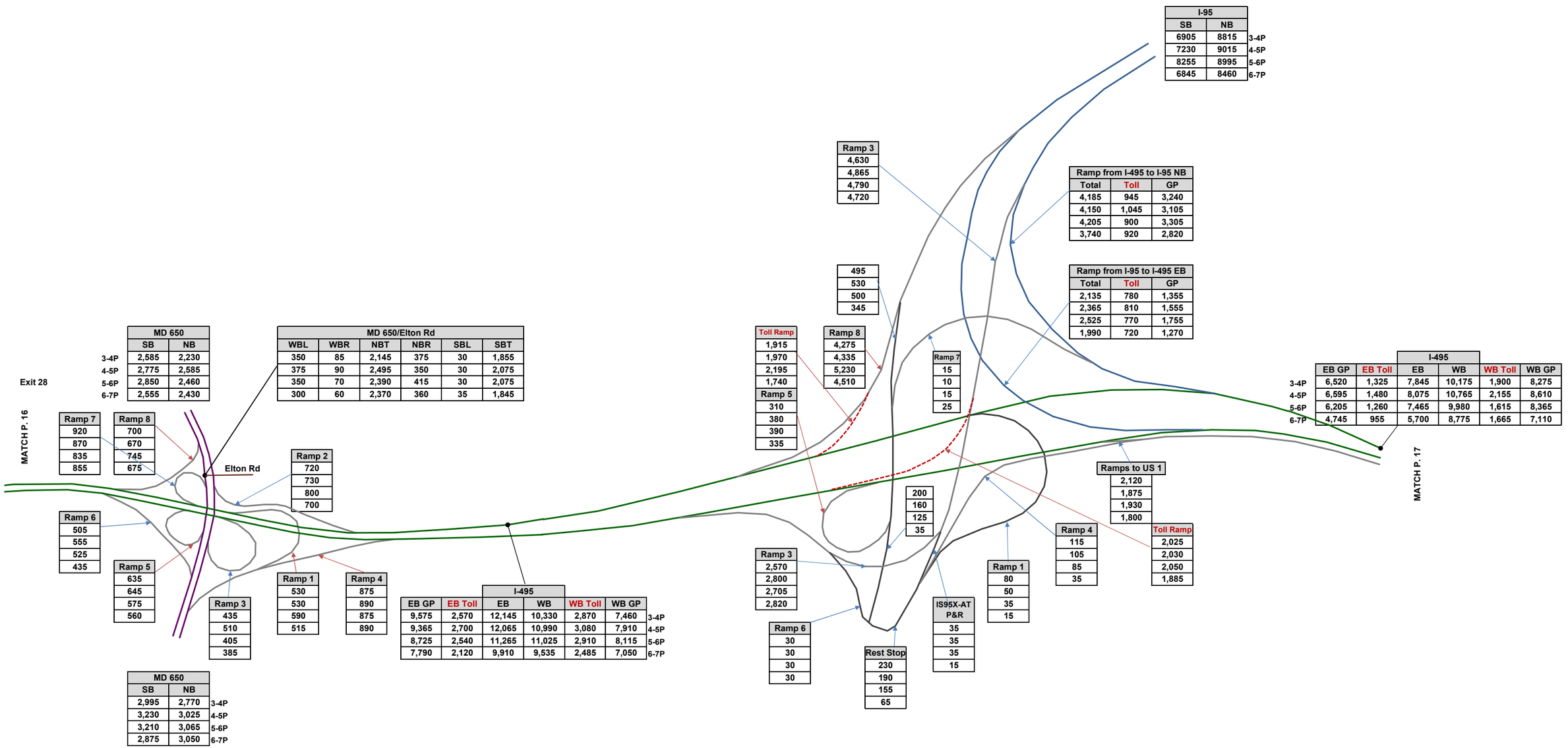
	MD 193	
	SB	NB
3-4P	1,385	1,855
4-5P	1,505	1,925
5-6P	1,560	1,585
6-7P	1,475	1,890

	MD 193	
	SB	NB
3-4P	2,165	2,450
4-5P	2,235	2,720
5-6P	2,290	2,355
6-7P	1,910	2,640

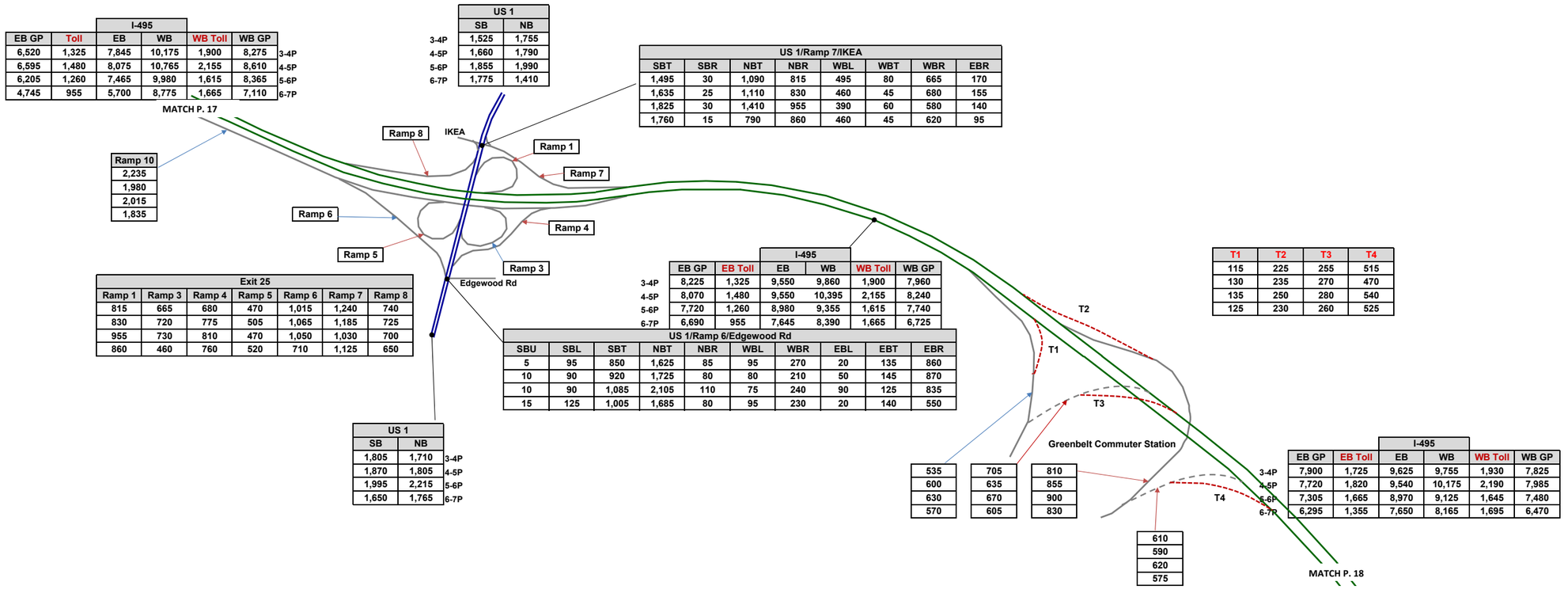
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,005	2,570	11,575	9,920	2,870	7,050
4-5P	8,895	2,700	11,595	10,590	3,080	7,510
5-6P	8,205	2,540	10,745	10,725	2,910	7,815
6-7P	7,160	2,120	9,280	9,170	2,485	6,685



I-495 North Side PM
Future Alternative 9 Peak Period Volumes



I-495 North East Side PM
Future Alternative 9 Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,520	1,325	7,845	10,175	1,900	8,275	3-4P
6,595	1,480	8,075	10,765	2,155	8,610	4-5P
6,205	1,260	7,465	9,980	1,615	8,365	5-6P
4,745	955	5,700	8,775	1,665	7,110	6-7P

Ramp 10
2,235
1,980
2,015
1,835

US 1		
	SB	NB
3-4P	1,525	1,755
4-5P	1,660	1,790
5-6P	1,855	1,990
6-7P	1,775	1,410

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,495	30	1,090	815	495	80	665	170
1,635	25	1,110	830	460	45	680	155
1,825	30	1,410	955	390	60	580	140
1,760	15	790	860	460	45	620	95

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
815	665	680	470	1,015	1,240	740
830	720	775	505	1,065	1,185	725
955	730	810	470	1,050	1,030	700
860	460	760	520	710	1,125	650

US 1		
SB	NB	
1,805	1,710	3-4P
1,870	1,805	4-5P
1,995	2,215	5-6P
1,650	1,765	6-7P

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,225	1,325	9,550	9,860	1,900	7,960	3-4P
8,070	1,480	9,550	10,395	2,155	8,240	4-5P
7,720	1,260	8,980	9,355	1,615	7,740	5-6P
6,690	955	7,645	8,390	1,665	6,725	6-7P

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	850	1,625	85	95	270	20	135	860
10	90	920	1,725	80	80	210	50	145	870
10	90	1,085	2,105	110	75	240	90	125	835
15	125	1,005	1,685	80	95	230	20	140	550

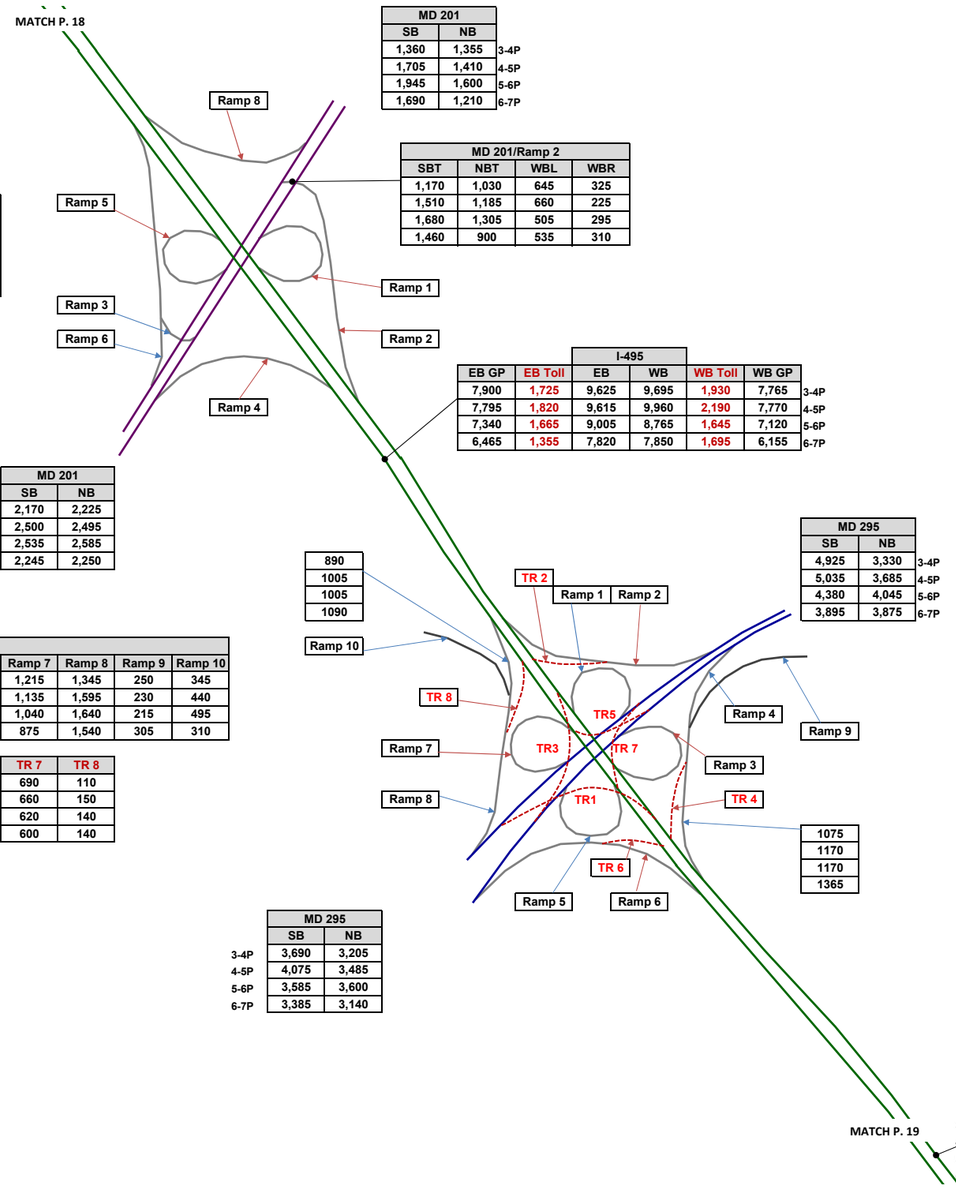
T1	T2	T3	T4
115	225	255	515
130	235	270	470
135	250	280	540
125	230	260	525

535	705	810
600	635	855
630	670	900
570	605	830

610
590
620
575

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,900	1,725	9,625	9,755	1,930	7,825	3-4P
7,720	1,820	9,540	10,175	2,190	7,985	4-5P
7,305	1,665	8,970	9,125	1,645	7,480	5-6P
6,295	1,355	7,650	8,165	1,695	6,470	6-7P

I-495 North East Side PM
Future Alternative 9 Peak Period Volumes



Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
840	970	405	760	635	990	190
905	885	390	795	695	1,025	195
895	800	340	725	695	1,045	265
930	845	250	670	680	930	230

MD 201		
SB	NB	
1,360	1,355	3-4P
1,705	1,410	4-5P
1,945	1,600	5-6P
1,690	1,210	6-7P

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
1,170	1,030	645	325
1,510	1,185	660	225
1,680	1,305	505	295
1,460	900	535	310

	I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,900	1,725	9,625	9,695	1,930	7,765	3-4P
7,795	1,820	9,615	9,960	2,190	7,770	4-5P
7,340	1,665	9,005	8,765	1,645	7,120	5-6P
6,465	1,355	7,820	7,850	1,695	6,155	6-7P

MD 201		
SB	NB	
2,170	2,225	3-4P
2,500	2,495	4-5P
2,535	2,585	5-6P
2,245	2,250	6-7P

MD 295		
SB	NB	
4,925	3,330	3-4P
5,035	3,685	4-5P
4,380	4,045	5-6P
3,895	3,875	6-7P

890
1005
1005
1090

Ramp 10
1075
1170
1170
1365

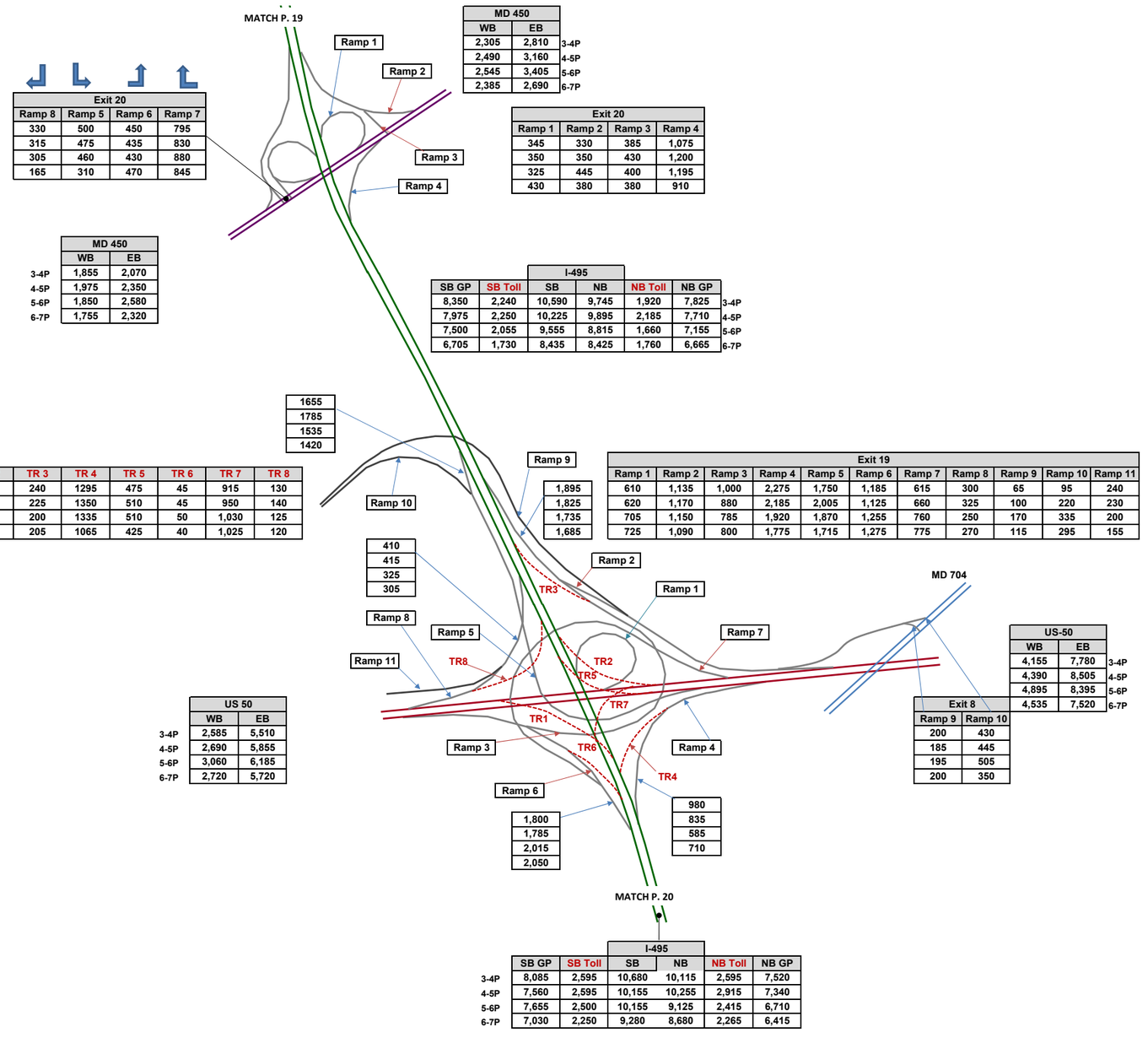
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
35	730	1,200	1,175	310	20	1,215	1,345	250	345
25	800	1,415	1,340	440	15	1,135	1,595	230	440
20	810	1,215	1,360	430	10	1,040	1,640	215	495
25	620	990	1,455	400	15	875	1,540	305	310

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	175	205	350	85	20	690	110
15	190	230	400	95	15	660	150
15	195	210	405	105	15	620	140
20	150	200	395	100	15	600	140

MD 295		
SB	NB	
3,690	3,205	3-4P
4,075	3,485	4-5P
3,585	3,600	5-6P
3,385	3,140	6-7P

	I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,935	2,240	10,175	9,040	1,920	7,120	3-4P
7,500	2,250	9,750	9,125	2,185	6,940	4-5P
6,955	2,055	9,010	8,140	1,660	6,480	5-6P
5,865	1,730	7,595	7,845	1,760	6,085	6-7P

I-495 North East Side PM
Future Alternative 9 Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
330	500	450	795
315	475	435	830
305	460	430	880
165	310	470	845

MD 450		
WB	EB	
2,305	2,810	3-4P
2,490	3,160	4-5P
2,545	3,405	5-6P
2,385	2,690	6-7P

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
345	330	385	1,075
350	350	430	1,200
325	445	400	1,195
430	380	380	910

MD 450		
	WB	EB
3-4P	1,855	2,070
4-5P	1,975	2,350
5-6P	1,850	2,580
6-7P	1,755	2,320

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,350	2,240	10,590	9,745	1,920	7,825	3-4P
7,975	2,250	10,225	9,895	2,185	7,710	4-5P
7,500	2,055	9,555	8,815	1,660	7,155	5-6P
6,705	1,730	8,435	8,425	1,760	6,665	6-7P

1655
1785
1535
1420

1,895
1,825
1,735
1,685

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
610	1,135	1,000	2,275	1,750	1,185	615	300	65	95	240
620	1,170	880	2,185	2,005	1,125	660	325	100	220	230
705	1,150	785	1,920	1,870	1,255	760	250	170	335	200
725	1,090	800	1,775	1,715	1,275	775	270	115	295	155

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
35	415	240	1295	475	45	915	130
35	430	225	1350	510	45	950	140
40	420	200	1335	510	50	1,030	125
45	400	205	1065	425	40	1,025	120

410
415
325
305

1,800
1,785
2,015
2,050

980
835
585
710

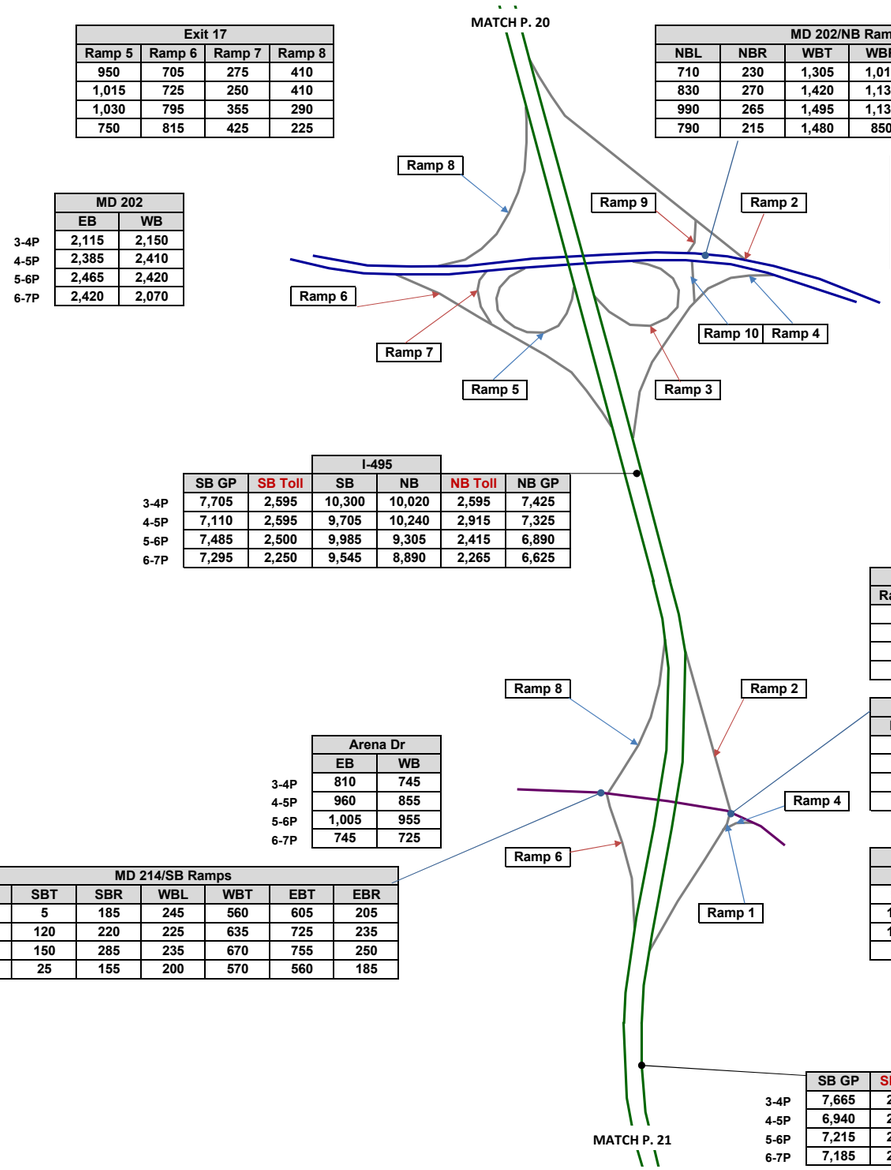
US 50		
WB	EB	
2,585	5,510	3-4P
2,690	5,855	4-5P
3,060	6,185	5-6P
2,720	5,720	6-7P

US-50		
WB	EB	
4,155	7,780	3-4P
4,390	8,505	4-5P
4,895	8,395	5-6P
4,535	7,520	6-7P

Exit 8	
Ramp 9	Ramp 10
200	430
185	445
195	505
200	350

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	8,085	2,595	10,680	10,115	2,595	7,520
4-5P	7,560	2,595	10,155	10,255	2,915	7,340
5-6P	7,655	2,500	10,155	9,125	2,415	6,710
6-7P	7,030	2,250	9,280	8,680	2,265	6,415

I-495 East Side PM
Future Alternative 9 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
950	705	275	410
1,015	725	250	410
1,030	795	355	290
750	815	425	225

	MD 202	
	EB	WB
3-4P	2,115	2,150
4-5P	2,385	2,410
5-6P	2,465	2,420
6-7P	2,420	2,070

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,705	2,595	10,300	10,020	2,595	7,425
4-5P	7,110	2,595	9,705	10,240	2,915	7,325
5-6P	7,485	2,500	9,985	9,305	2,415	6,890
6-7P	7,295	2,250	9,545	8,890	2,265	6,625

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
710	230	1,305	1,015	15	2,085
830	270	1,420	1,130	10	2,440
990	265	1,495	1,130	20	2,510
790	215	1,480	850	15	2,175

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,015	260	255	15	940
1,130	225	250	10	1,100
1,130	170	245	20	1,255
850	165	235	15	1,005

MD 202		
SB	NB	
2,570	2,320	3-4P
2,960	2,550	4-5P
3,020	2,625	5-6P
2,625	2,330	6-7P

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
150	455	255	455	495
165	475	260	580	750
170	445	295	635	905
170	405	235	410	520

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
150	0	255	655	230	225	685
165	0	260	695	225	250	885
160	10	295	745	205	230	995
165	5	235	605	165	235	665

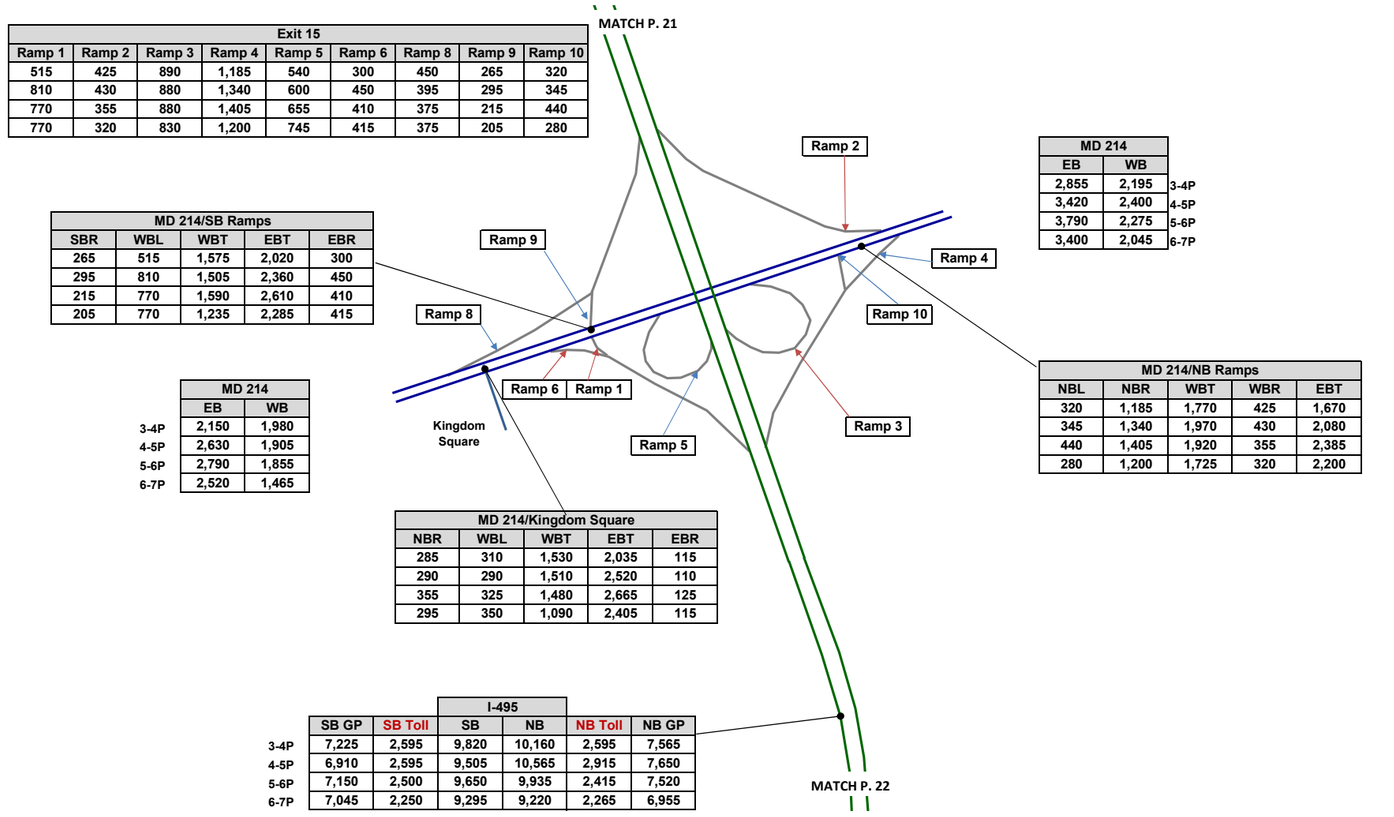
	Arena Dr	
	EB	WB
3-4P	810	745
4-5P	960	855
5-6P	1,005	955
6-7P	745	725

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
305	5	185	245	560	605	205
410	120	220	225	635	725	235
470	150	285	235	670	755	250
340	25	155	200	570	560	185

Arena Dr		
EB	WB	
940	885	3-4P
1,145	920	4-5P
1,290	950	5-6P
900	770	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,665	2,595	10,260	9,970	2,595	7,375
4-5P	6,940	2,595	9,535	10,190	2,915	7,275
5-6P	7,215	2,500	9,715	9,325	2,415	6,910
6-7P	7,185	2,250	9,435	8,890	2,265	6,625

I-495 East Side PM
Future Alternative 9 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	425	890	1,185	540	300	450	265	320
810	430	880	1,340	600	450	395	295	345
770	355	880	1,405	655	410	375	215	440
770	320	830	1,200	745	415	375	205	280

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
265	515	1,575	2,020	300
295	810	1,505	2,360	450
215	770	1,590	2,610	410
205	770	1,235	2,285	415

MD 214		
EB	WB	
2,855	2,195	3-4P
3,420	2,400	4-5P
3,790	2,275	5-6P
3,400	2,045	6-7P

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
320	1,185	1,770	425	1,670
345	1,340	1,970	430	2,080
440	1,405	1,920	355	2,385
280	1,200	1,725	320	2,200

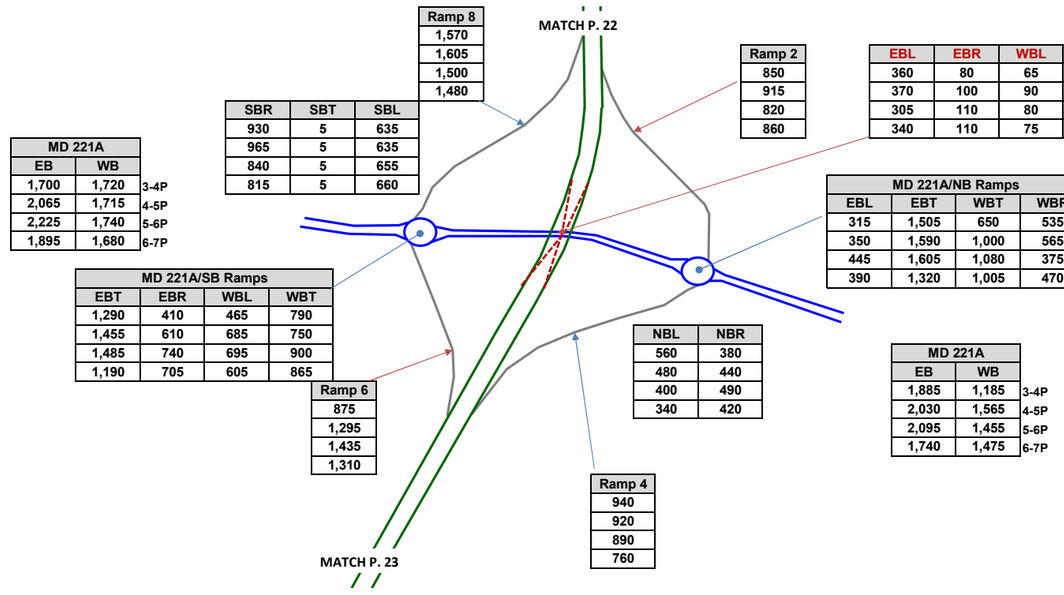
MD 214		
EB	WB	
2,150	1,980	3-4P
2,630	1,905	4-5P
2,790	1,855	5-6P
2,520	1,465	6-7P

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
285	310	1,530	2,035	115
290	290	1,510	2,520	110
355	325	1,480	2,665	125
295	350	1,090	2,405	115

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,225	2,595	9,820	10,160	2,595	7,565
6,910	2,595	9,505	10,565	2,915	7,650
7,150	2,500	9,650	9,935	2,415	7,520
7,045	2,250	9,295	9,220	2,265	6,955

3-4P
4-5P
5-6P
6-7P

I-495 East Side PM
Future Alternative 9 Peak Period Volumes



Ramp 8
1,570
1,605
1,500
1,480

SBR	SBT	SBL
930	5	635
965	5	635
840	5	655
815	5	660

MD 221A		
EB	WB	
1,700	1,720	3-4P
2,065	1,715	4-5P
2,225	1,740	5-6P
1,895	1,680	6-7P

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,290	410	465	790
1,455	610	685	750
1,485	740	695	900
1,190	705	605	865

Ramp 6
875
1,295
1,435
1,310

Ramp 2
850
915
820
860

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
360	80	65	455	90	70	265	475
370	100	90	520	85	70	250	480
305	110	80	320	65	70	255	450
340	110	75	310	60	70	240	450

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
315	1,505	650	535
350	1,590	1,000	565
445	1,605	1,080	375
390	1,320	1,005	470

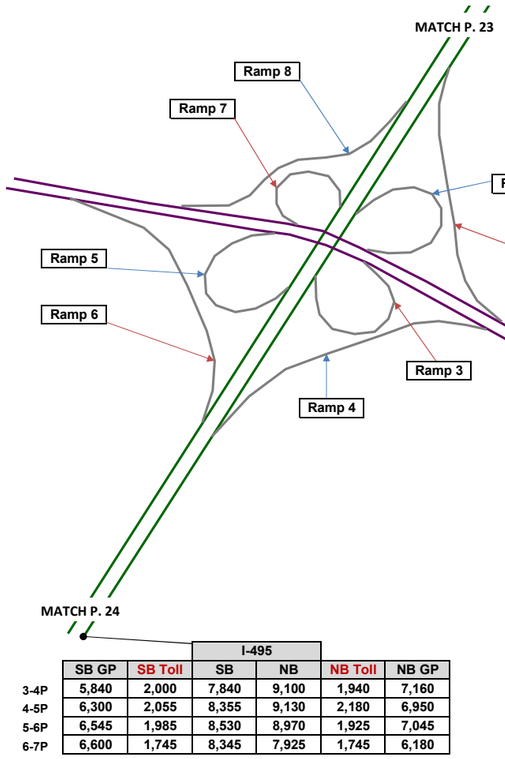
NBL	NBR
560	380
480	440
400	490
340	420

Ramp 4
940
920
890
760

MD 221A		
EB	WB	
1,885	1,185	3-4P
2,030	1,565	4-5P
2,095	1,455	5-6P
1,740	1,475	6-7P

I-495 East Side PM
Future Alternative 9 Peak Period Volumes

MD 4		
SB	NB	
2,325	1,745	3-4P
2,665	1,875	4-5P
2,715	1,850	5-6P
2,540	1,650	6-7P

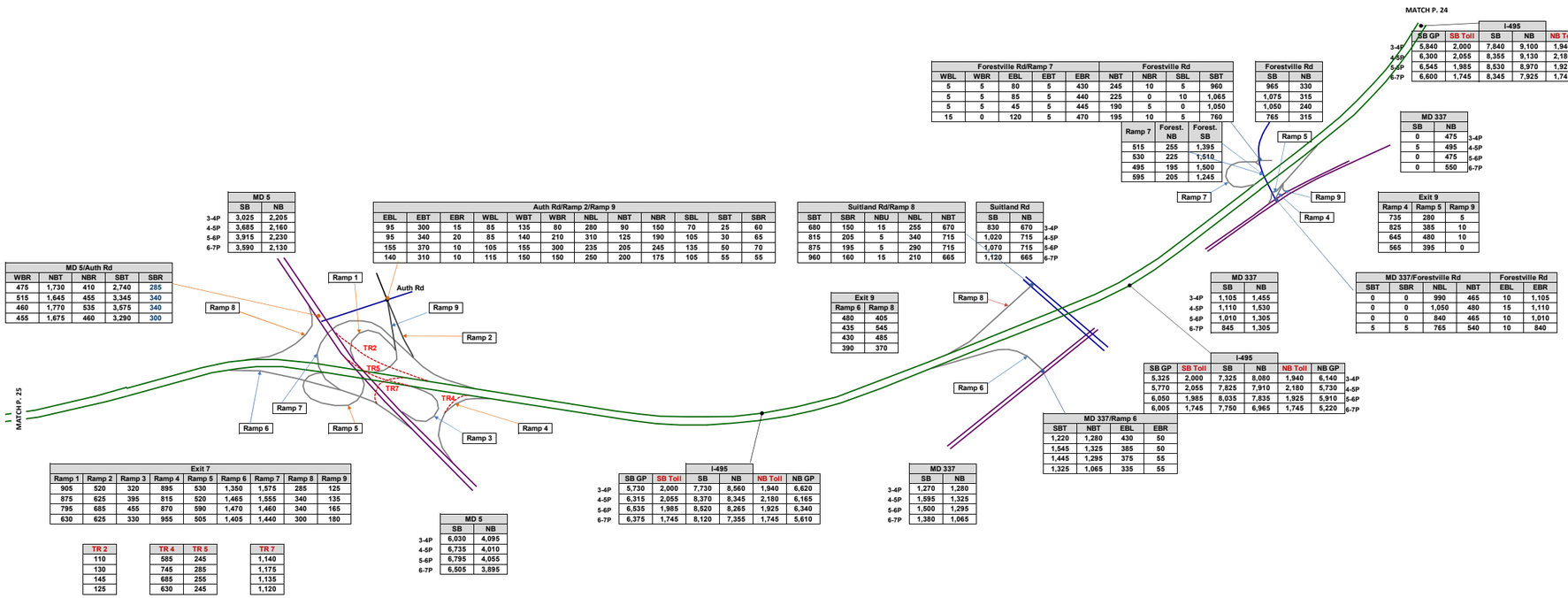


Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
695	1,310	905	1,025	1,185	525	715	745
765	1,310	980	820	1,120	765	820	765
745	1,130	960	800	1,045	625	685	805
690	1,025	1,055	715	930	805	655	805

MD 4		
SB	NB	
3,105	2,330	3-4P
2,860	2,475	4-5P
2,975	2,115	5-6P
2,325	1,835	6-7P

	I-495				
SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,840	2,000	7,840	9,100	1,940	7,160
4-5P	6,300	2,055	8,355	9,130	2,180	6,950
5-6P	6,545	1,985	8,530	8,970	1,925	7,045
6-7P	6,600	1,745	8,345	7,925	1,745	6,180

I-495 South Side PM
Future Alternative 9 Peak Period Volumes



MD 5		
	SB	NB
3-4P	3,025	2,205
4-5P	3,685	2,160
5-6P	3,915	2,230
6-7P	3,590	2,130

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
475	1,730	410	2,740	285
515	1,645	455	3,345	340
460	1,770	535	3,575	340
455	1,675	460	3,290	300

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
95	300	15	85	135	80	280	90	150	70	25	60
95	340	20	85	140	210	310	125	190	105	30	65
155	370	10	105	155	300	235	205	245	135	50	70
140	310	10	115	150	150	250	200	175	105	55	55

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
905	520	320	895	530	1,350	1,575	285	125
875	625	395	815	520	1,465	1,555	340	135
795	685	455	870	590	1,470	1,460	340	165
630	625	330	955	505	1,405	1,440	300	180

TR 2
110
130
145
125

TR 4	TR 5
585	245
745	285
685	255
630	245

TR 7
1,140
1,175
1,135
1,120

MD 5		
	SB	NB
3-4P	6,030	4,095
4-5P	6,735	4,010
5-6P	6,795	4,055
6-7P	6,505	3,895

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
680	150	15	255	670
815	205	5	340	715
875	195	5	290	715
960	160	15	210	665

Suitland Rd		
SB	NB	
830	670	3-4P
1,020	715	4-5P
1,070	715	5-6P
1,120	665	6-7P

Exit 9	
Ramp 8	Ramp 8
480	405
435	545
430	485
390	370

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,730	2,000	7,730	8,560	1,940	6,620
6,315	2,055	8,370	8,345	2,180	6,165
6,535	1,985	8,520	8,265	1,925	6,340
6,375	1,745	8,120	7,355	1,745	5,610

MD 337	
SB	NB
1,270	1,280
1,595	1,325
1,500	1,295
1,380	1,065

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
5	5	80	5	430	245	10	5	960
5	5	85	5	440	225	0	10	1,065
5	5	45	5	445	190	5	0	1,050
15	0	120	5	470	195	10	5	760

Ramp 7	Forest. NB	Forest. SB
515	255	1,395
530	225	1,510
495	195	1,500
595	205	1,245

Forestville Rd	
SB	NB
965	330
1,075	315
1,050	240
765	315

I-495						
EB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,840	2,000	7,840	9,100	1,940	7,160	3-4P
6,300	2,055	8,355	9,130	2,180	6,950	4-5P
6,545	1,985	8,530	8,970	1,925	7,045	5-6P
6,600	1,745	8,345	7,925	1,745	6,180	6-7P

MD 337	
SB	NB
0	475
5	495
0	475
0	550

Exit 9		
Ramp 4	Ramp 5	Ramp 9
735	280	5
825	385	10
645	480	10
565	395	0

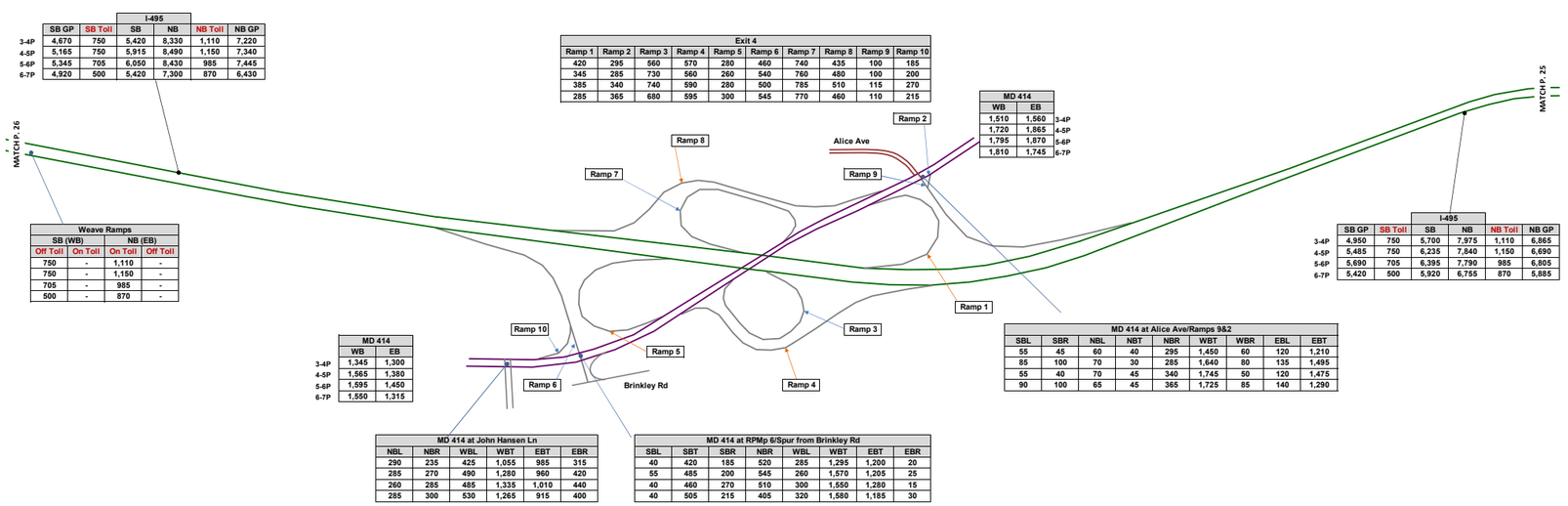
MD 337	
SB	NB
1,105	1,455
1,110	1,530
1,010	1,305
845	1,305

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	990	465	10	1,105
0	0	1,050	480	15	1,110
0	0	840	465	10	1,010
5	5	765	540	10	840

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,325	2,000	7,325	8,080	1,940	6,140
5,770	2,055	7,825	7,910	2,180	5,730
6,050	1,985	8,035	7,835	1,925	5,910
6,005	1,745	7,750	6,965	1,745	5,220

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,280	430	50
1,545	1,325	385	50
1,445	1,295	375	55
1,325	1,065	335	55

I-495 South Side PM
Future Alternative 9 Peak Period Volumes



	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,670	750	5,420	8,330	1,110	7,220
4-5P	5,165	750	5,915	8,490	1,150	7,340
5-6P	5,345	705	6,050	8,430	985	7,445
6-7P	4,920	500	5,420	7,300	870	6,430

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
750	-	1,110	-
750	-	1,150	-
705	-	985	-
500	-	870	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
420	295	560	570	280	460	740	435	100	185
345	285	730	560	260	540	760	480	100	200
385	340	740	590	280	500	785	510	115	270
285	365	680	595	300	545	770	460	110	215

MD 414		
WB	EB	
1,510	1,560	3-4P
1,720	1,865	4-5P
1,795	1,870	5-6P
1,810	1,745	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,950	750	5,700	7,975	1,110	6,865
4-5P	5,485	750	6,235	7,840	1,150	6,690
5-6P	5,690	705	6,395	7,790	985	6,805
6-7P	5,420	500	5,920	6,755	870	5,885

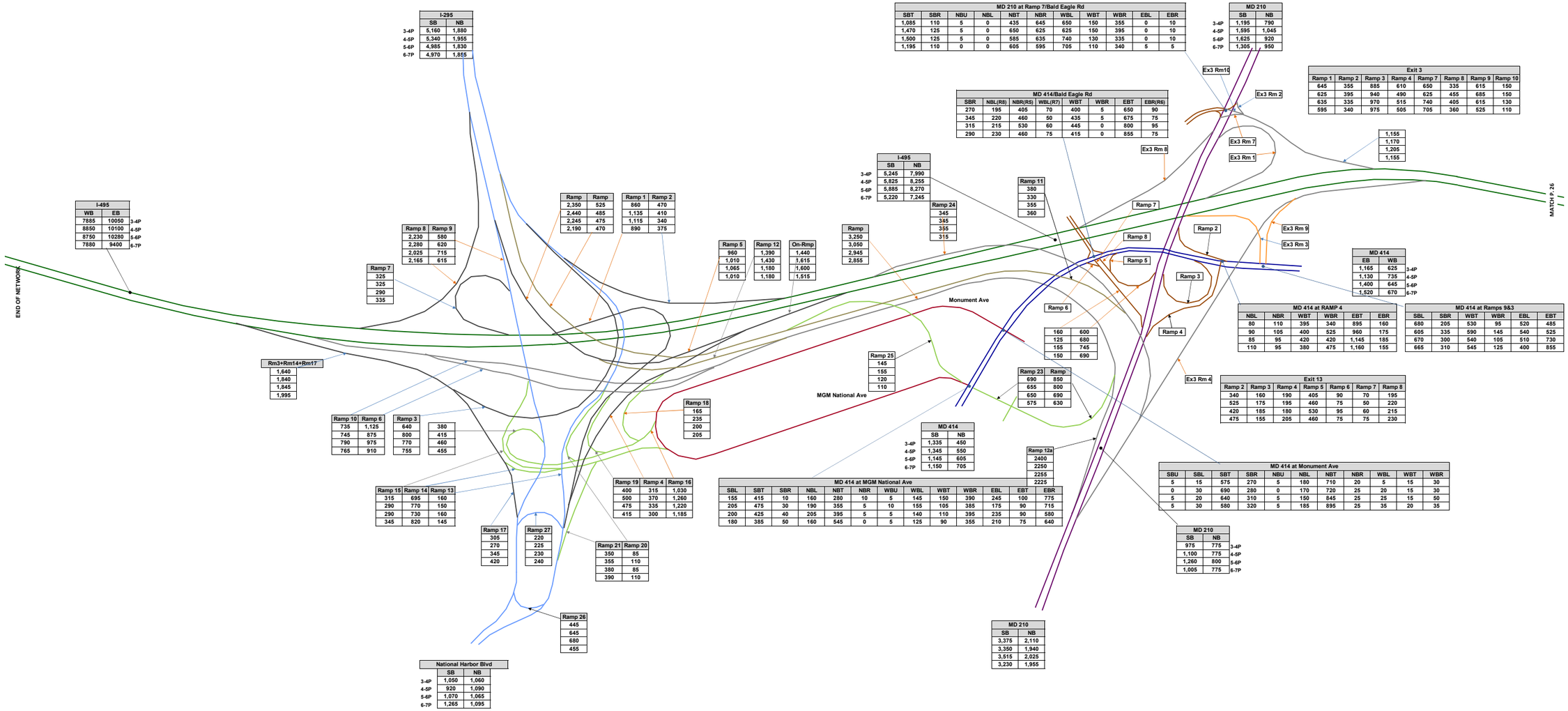
MD 414		
WB	EB	
1,345	1,300	3-4P
1,565	1,380	4-5P
1,595	1,450	5-6P
1,550	1,315	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
55	45	60	40	295	1,450	60	120	1,210
85	100	70	30	285	1,640	80	135	1,495
55	40	70	45	340	1,745	50	120	1,475
90	100	65	45	365	1,725	85	140	1,290

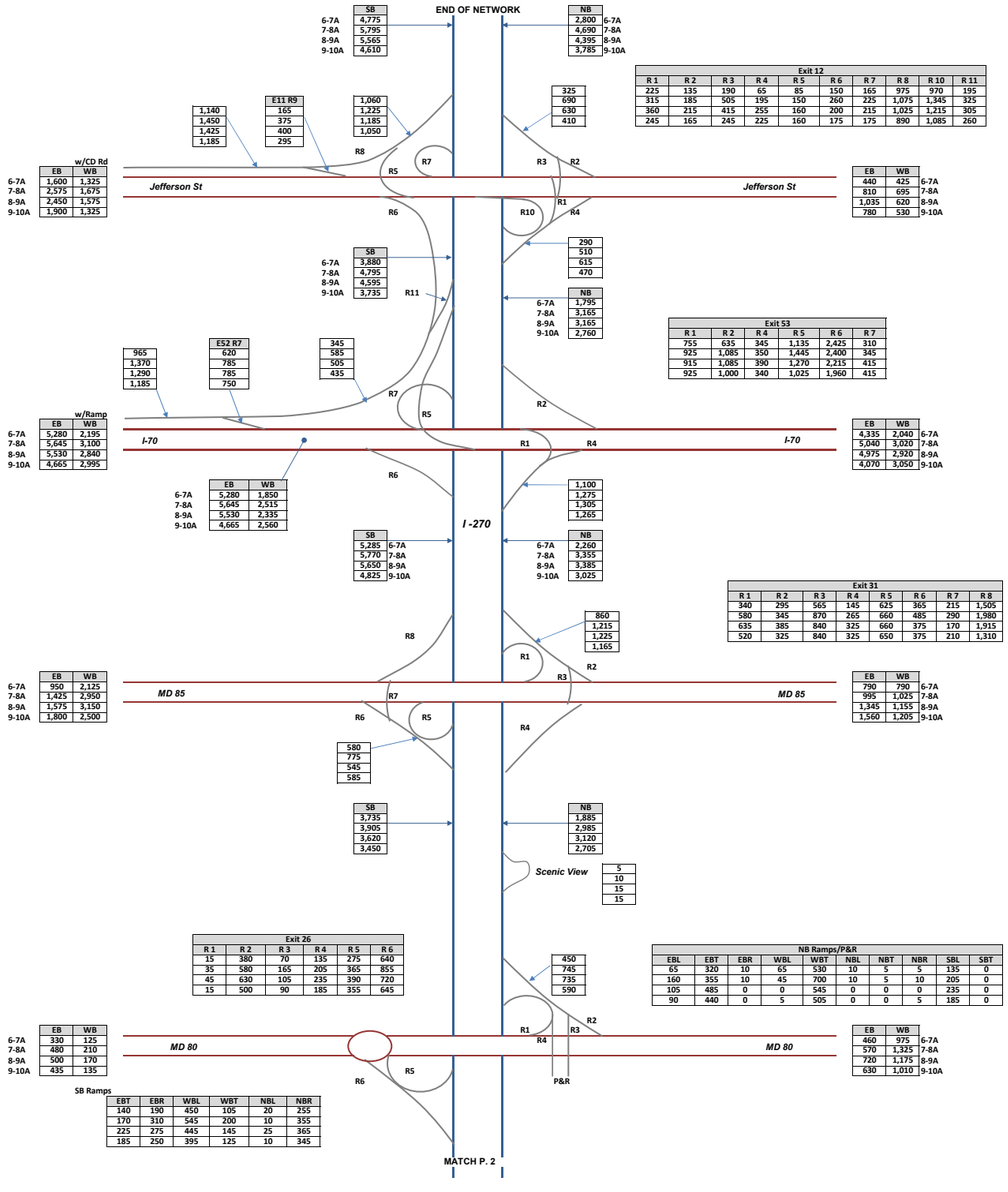
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
290	235	425	1,055	985	315
285	270	490	1,280	960	420
260	285	485	1,335	1,010	440
285	300	530	1,265	915	400

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
40	420	185	520	285	1,295	1,200	20
55	485	200	545	260	1,570	1,205	25
40	460	270	510	300	1,550	1,280	15
40	505	215	405	320	1,580	1,185	30

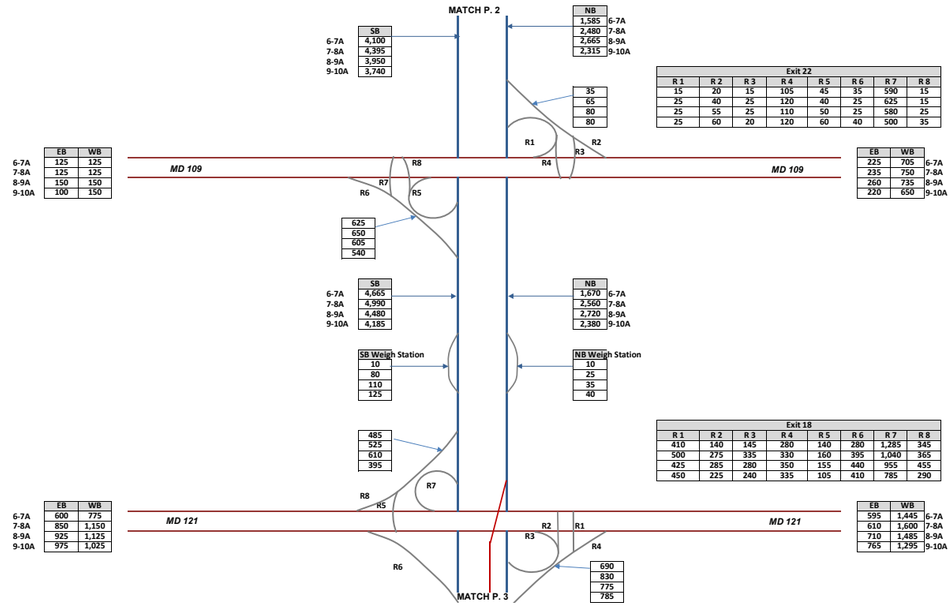
I-495 South Side PM
Future Alternative 9 Peak Period Volumes



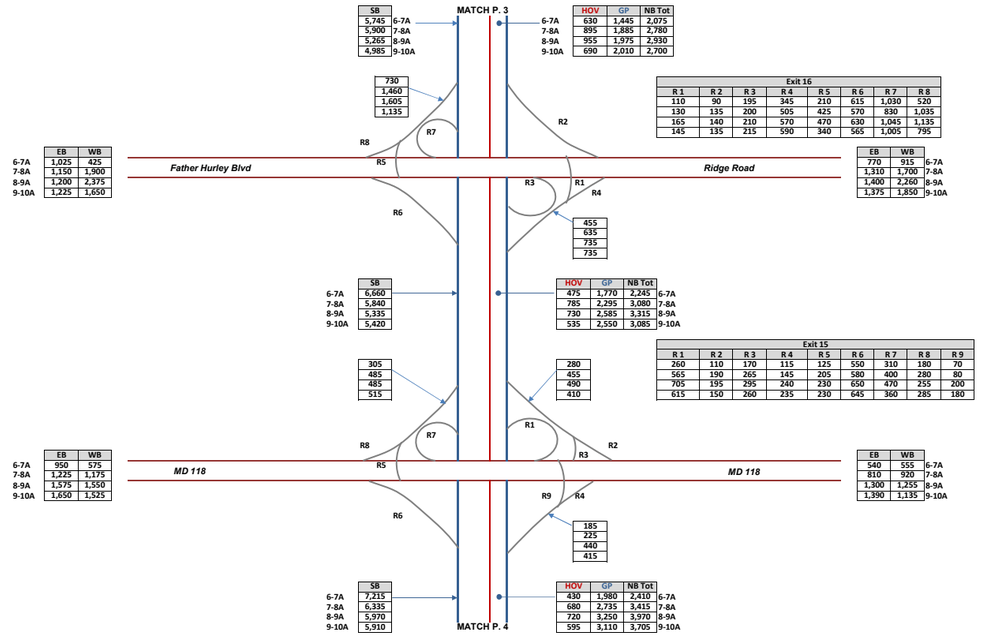
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



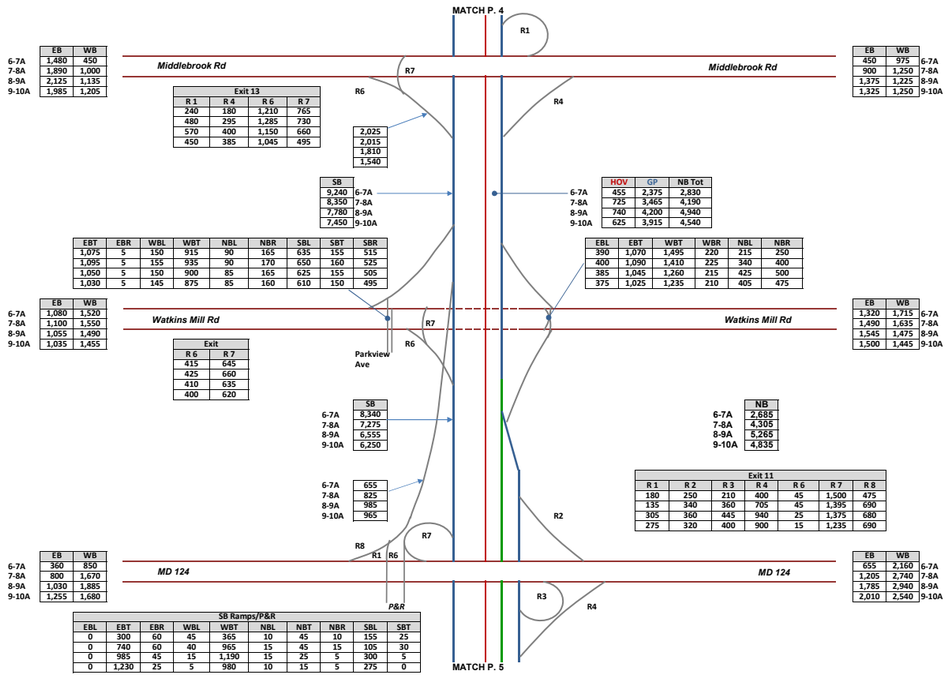
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



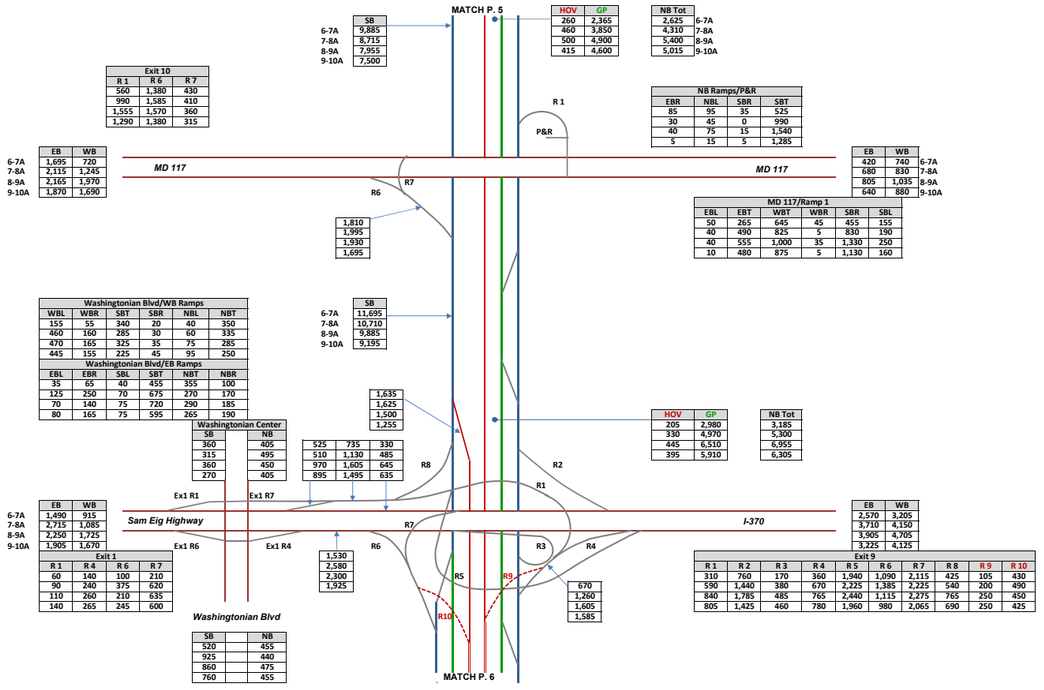
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



	SB
6-7A	9,885
7-8A	8,715
8-9A	7,955
9-10A	7,500

HOV	GP
260	2,365
460	3,850
500	4,900
415	4,600

NB Tot	
2,625	6-7A
4,310	7-8A
5,400	8-9A
5,015	9-10A

Exit 10		
R 1	R 6	R 7
560	1,380	430
990	1,585	410
1,555	1,570	360
1,290	1,380	315

NB Ramps/P&R			
EBR	NBL	SBR	SBT
85	95	35	525
30	45	0	990
40	75	15	1,540
5	15	5	1,285

	EB	WB
6-7A	1,695	720
7-8A	2,115	1,245
8-9A	2,165	1,970
9-10A	1,870	1,690

	EB	WB	
	420	740	6-7A
	680	830	7-8A
	805	1,035	8-9A
	640	880	9-10A

MD 117/Ramp 1					
EBL	EBT	WBT	WBR	SBR	SBL
50	265	645	45	455	155
40	490	825	5	830	190
40	555	1,000	35	1,330	250
10	480	875	5	1,130	160

1,810
1,995
1,930
1,695

Washingtonian Blvd/WB Ramps					
WBL	WBR	SBT	SBR	NBL	NBT
155	55	340	20	40	350
460	160	285	30	60	335
470	165	325	35	75	285
445	155	225	45	95	250

Washingtonian Blvd/EB Ramps					
EBL	EBR	SBL	SBT	NBT	NBR
35	65	40	455	355	100
125	250	70	675	270	170
70	140	75	720	290	185
80	165	75	595	265	190

	SB
6-7A	11,695
7-8A	10,710
8-9A	9,885
9-10A	9,195

Washingtonian Center	
SB	NB
360	405
315	495
360	450
270	405

525	735	330
510	1,130	485
970	1,605	645
895	1,495	635

1,635
1,625
1,500
1,255

HOV	GP
205	2,980
330	4,970
445	6,510
395	5,910

NB Tot
3,185
5,300
6,955
6,305

	EB	WB
6-7A	1,490	915
7-8A	2,715	1,085
8-9A	2,250	1,725
9-10A	1,905	1,670

Exit 1			
R 1	R 4	R 6	R 7
60	140	100	210
90	240	375	620
110	260	210	635
140	265	245	600

1,530
2,580
2,300
1,925

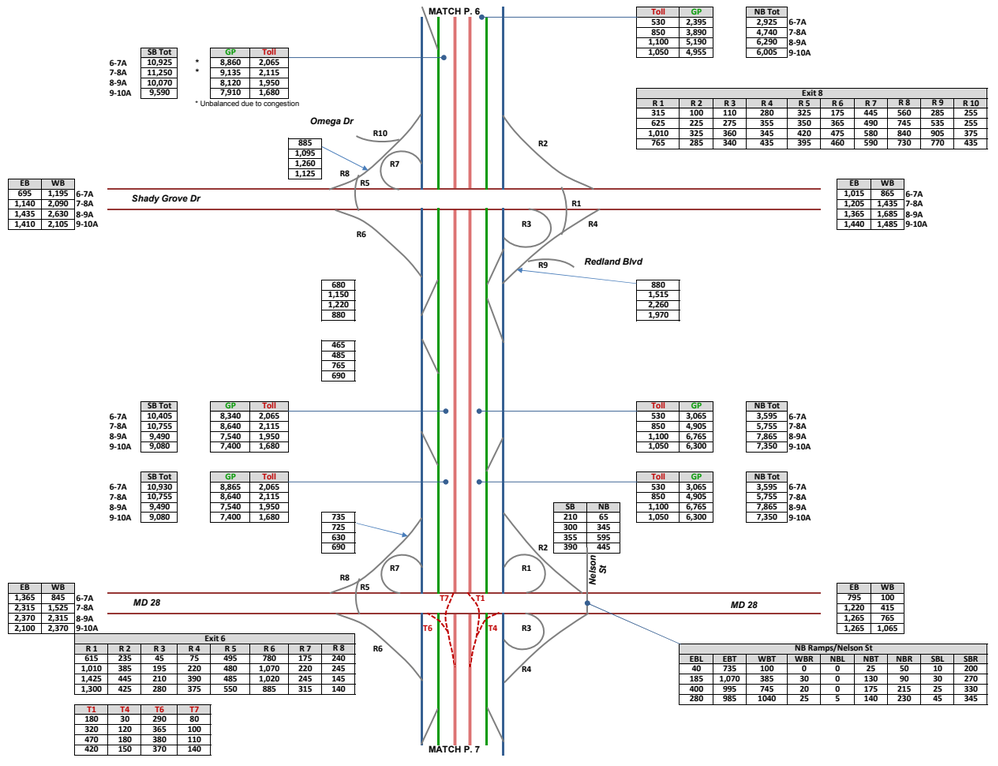
670
1,260
1,605
1,585

	EB	WB
	2,570	3,205
	3,710	4,150
	3,905	4,705
	3,225	4,125

Exit 9										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
310	760	170	360	1,940	1,090	2,115	425	105	430
590	1,440	380	670	2,225	1,385	2,225	540	200	490
840	1,785	485	765	2,440	1,115	2,275	765	250	450
805	1,425	460	780	1,960	980	2,065	690	250	425

	SB		NB
	520		455
	925		440
	860		475
	760		455

I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



	SB Tot
6-7A	10,925
7-8A	11,250
8-9A	10,070
9-10A	9,590

* Unbalanced due to congestion

GP	Toll
8,860	2,065
9,135	2,115
8,120	1,950
7,910	1,680

Toll	GP
530	2,395
850	3,890
1,100	5,190
1,050	4,955

NB Tot	
2,925	6-7A
4,740	7-8A
6,290	8-9A
6,005	9-10A

EB	WB	
695	1,195	6-7A
1,140	2,090	7-8A
1,435	2,630	8-9A
1,410	2,105	9-10A

EB	WB	
1,015	865	6-7A
1,205	1,435	7-8A
1,365	1,685	8-9A
1,440	1,485	9-10A

Exit 8

R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
315	100	110	280	325	175	445	560	285	255
625	225	275	355	350	365	490	745	535	255
1,010	325	360	345	420	475	580	840	905	375
765	285	340	435	395	460	590	730	770	435

	SB Tot
6-7A	10,405
7-8A	10,755
8-9A	9,490
9-10A	9,080

GP	Toll
8,340	2,065
8,640	2,115
7,540	1,950
7,400	1,680

Toll	GP
530	3,065
850	4,905
1,100	6,765
1,050	6,300

NB Tot	
3,595	6-7A
5,755	7-8A
7,865	8-9A
7,350	9-10A

	SB Tot
6-7A	10,930
7-8A	10,755
8-9A	9,490
9-10A	9,080

GP	Toll
8,865	2,065
8,640	2,115
7,540	1,950
7,400	1,680

Toll	GP
530	3,065
850	4,905
1,100	6,765
1,050	6,300

NB Tot	
3,595	6-7A
5,755	7-8A
7,865	8-9A
7,350	9-10A

SB	NB
210	65
300	345
355	595
390	445

EB	WB	
1,365	845	6-7A
2,315	1,525	7-8A
2,370	2,315	8-9A
2,100	2,370	9-10A

EB	WB	
795	100	
1,220	415	
1,265	765	
1,265	1,065	

Exit 6

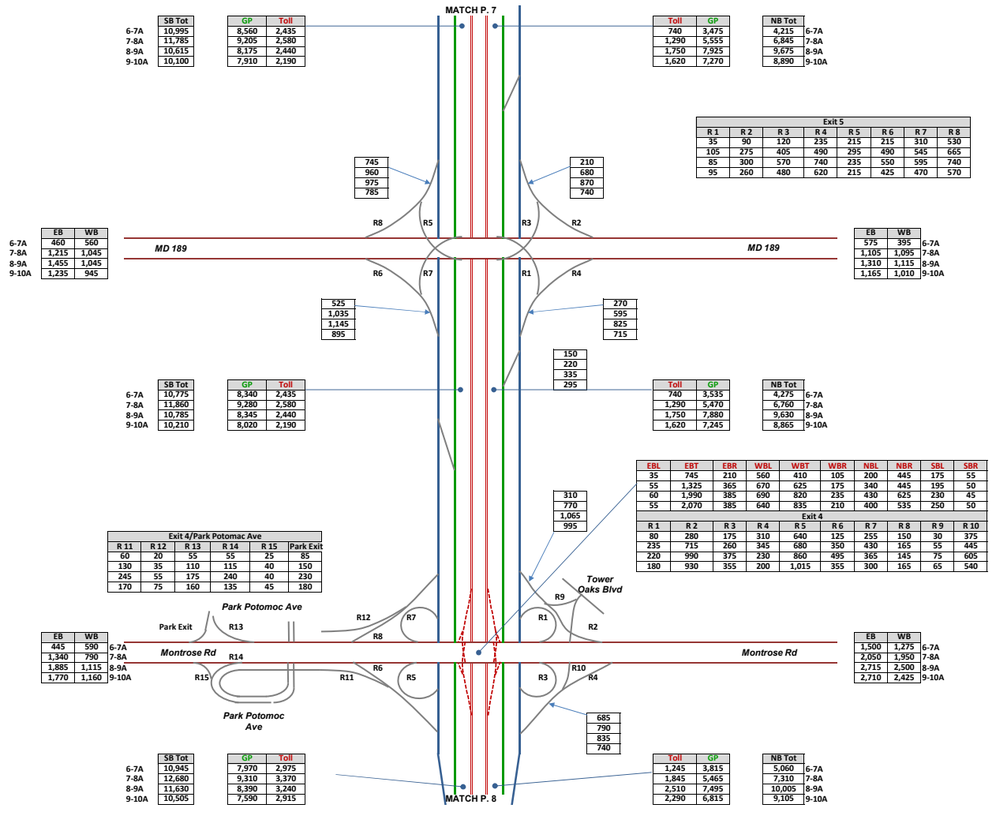
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
615	235	45	75	495	780	175	240
1,010	385	195	220	480	1,070	220	245
1,425	445	210	390	485	1,020	245	145
1,300	425	280	375	550	885	315	140

T1	T4	T6	T7
180	30	290	80
320	120	365	100
470	180	380	110
420	150	370	140

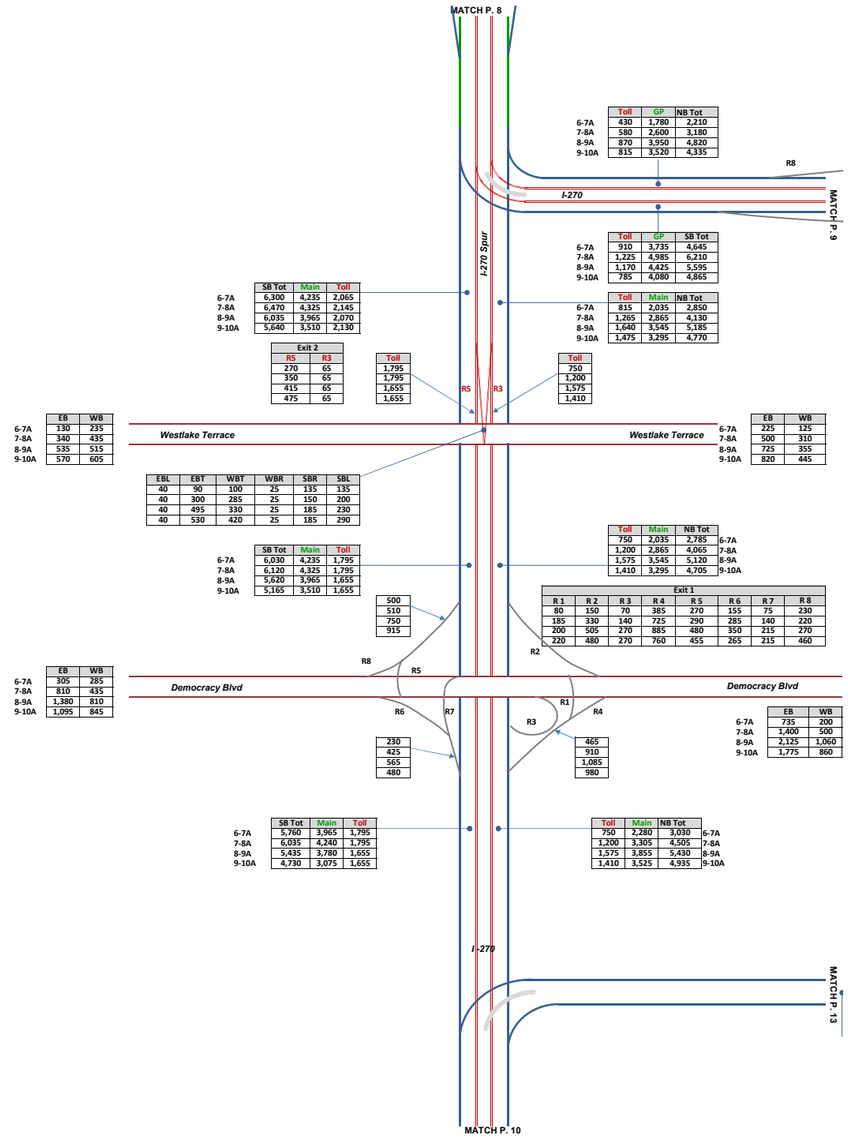
NB Ramps/Nelson St

EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
40	735	100	0	0	25	50	10	200
185	1,070	385	30	0	130	90	30	270
400	995	745	20	0	175	215	25	330
280	985	1040	25	5	140	230	45	345

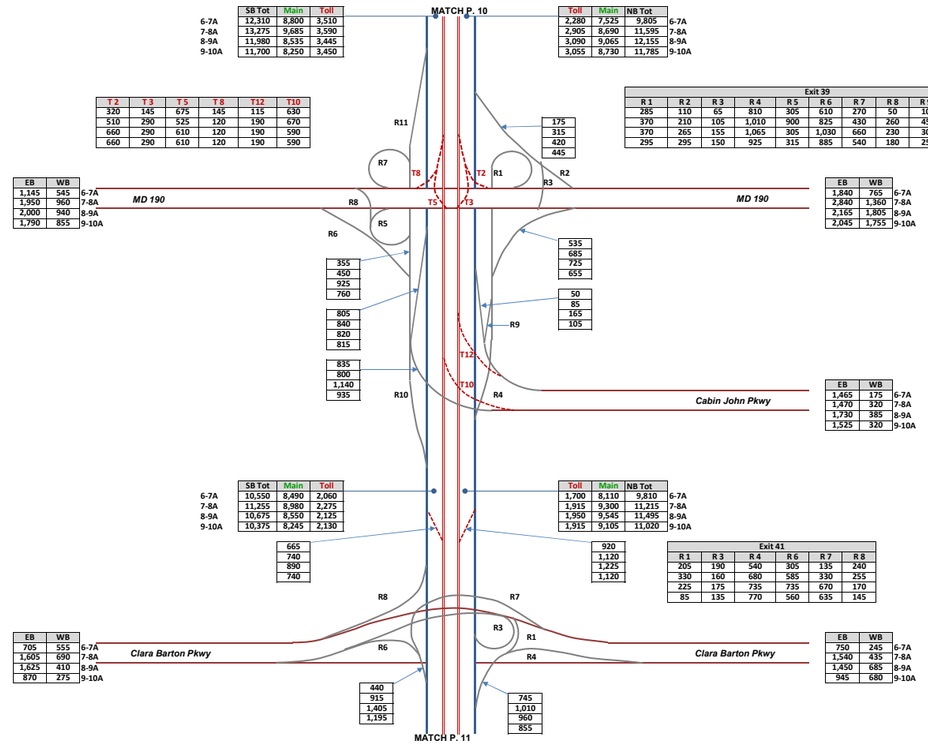
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



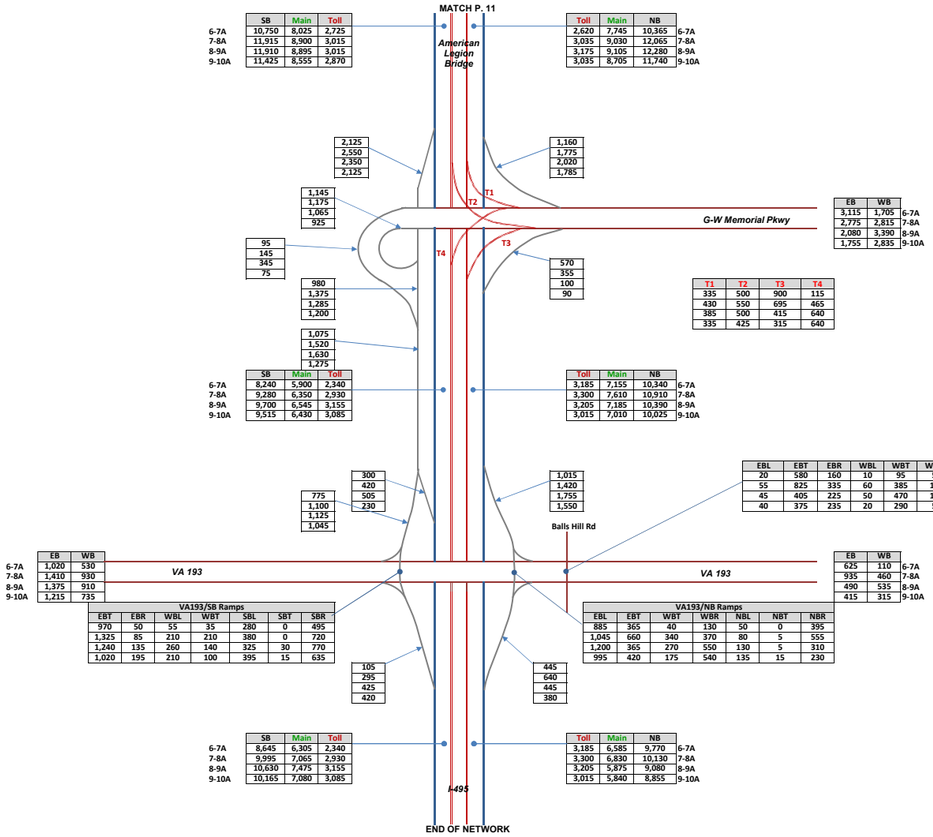
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



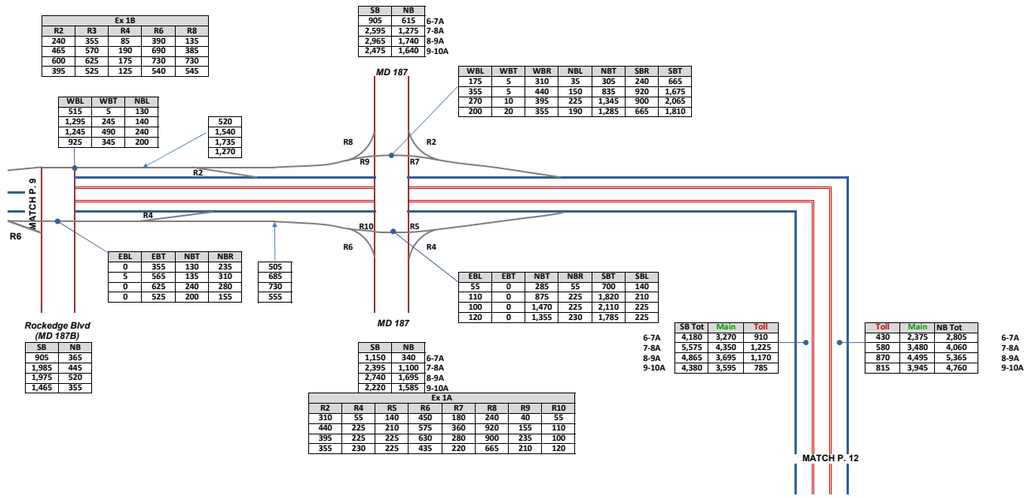
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



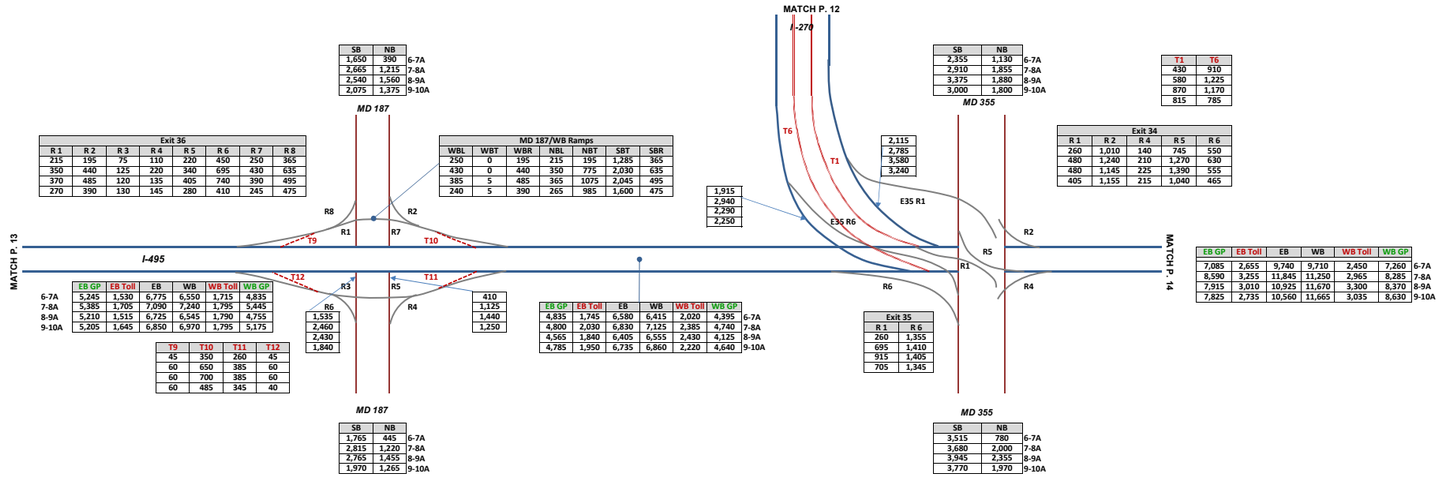
I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 10 Peak Period Volumes



Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
215	195	75	110	220	450	250	365
350	440	125	220	340	695	430	635
370	485	120	135	405	740	390	495
270	390	130	145	280	410	245	475

SB	NB	
1,650	390	6-7A
2,665	1,215	7-8A
2,540	1,560	8-9A
2,075	1,375	9-10A

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
250	0	195	215	195	1,285	365
430	0	440	350	775	2,030	635
385	5	485	365	1075	2,045	495
240	5	390	265	985	1,600	475

1,915
2,940
2,290
2,250

2,115
2,785
3,580
3,240

SB	NB	
2,355	1,130	6-7A
2,910	1,855	7-8A
3,375	1,880	8-9A
3,000	1,800	9-10A

T1	T6
430	910
580	1,225
870	1,170
815	785

Exit 34				
R 1	R 2	R 4	R 5	R 6
260	1,010	140	745	550
480	1,240	210	1,270	630
480	1,145	225	1,390	555
405	1,155	215	1,040	465

	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6-7A	5,245	1,530	6,775	6,550	1,715	4,835	
7-8A	5,385	1,705	7,090	7,240	1,795	5,445	
8-9A	5,210	1,515	6,725	6,545	1,790	4,755	
9-10A	5,205	1,645	6,850	6,970	1,795	5,175	

T9	T10	T11	T12
45	350	260	45
60	650	385	60
60	700	385	60
60	485	345	40

R6
1,535
2,460
2,430
1,840

410
1,125
1,440
1,250

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,835	1,745	6,580	6,415	2,020	4,395	6-7A
4,800	2,030	6,830	7,125	2,385	4,740	7-8A
4,565	1,840	6,405	6,555	2,430	4,125	8-9A
4,785	1,950	6,735	6,860	2,220	4,640	9-10A

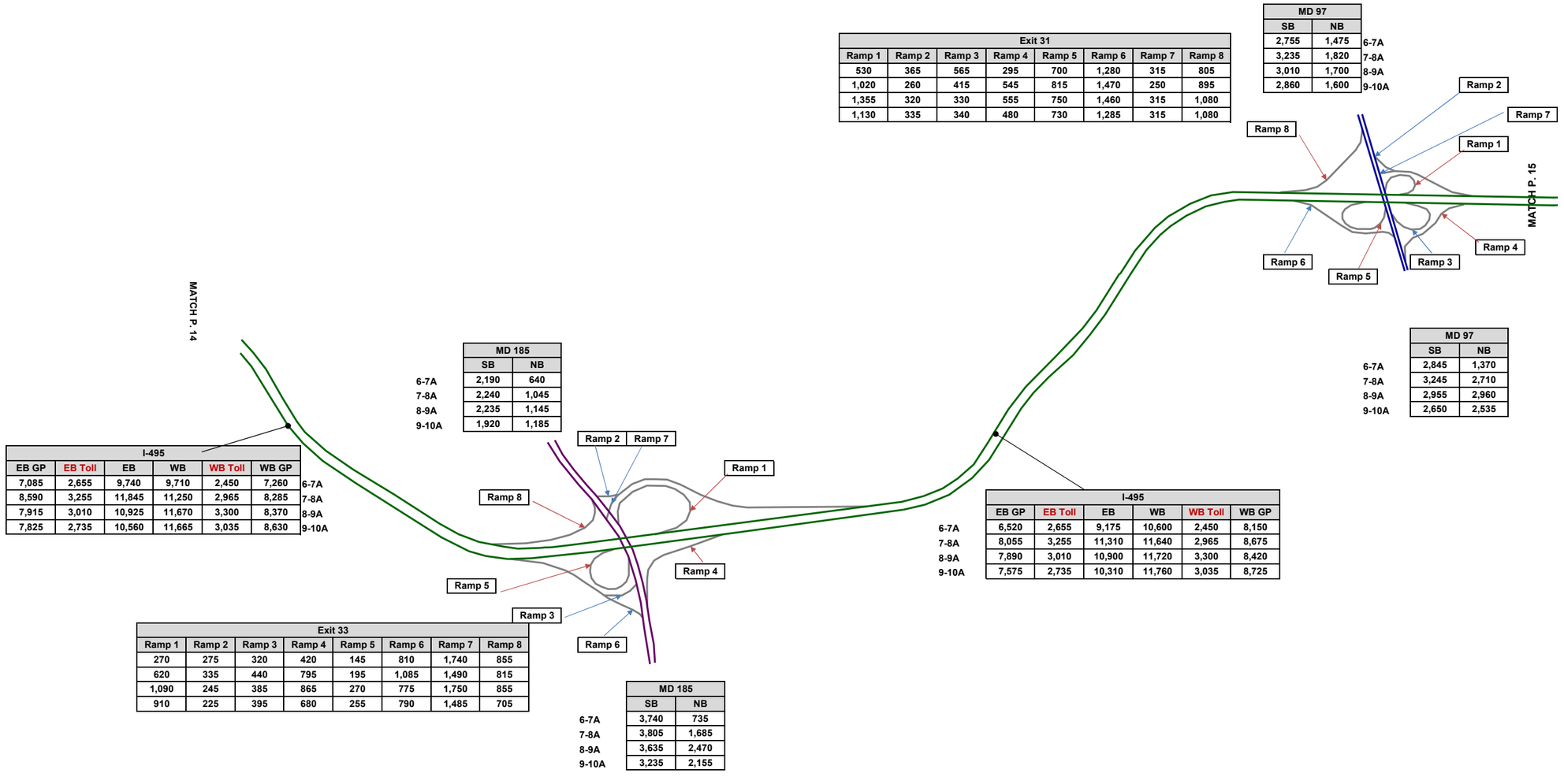
Exit 35	
R 1	R 6
260	1,355
695	1,410
915	1,405
705	1,345

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,085	2,655	9,740	9,710	2,450	7,260	6-7A
8,590	3,255	11,845	11,250	2,965	8,285	7-8A
7,915	3,010	10,925	11,670	3,300	8,370	8-9A
7,825	2,735	10,560	11,665	3,035	8,630	9-10A

SB	NB	
1,765	445	6-7A
2,815	1,220	7-8A
2,765	1,455	8-9A
1,970	1,265	9-10A

SB	NB	
3,515	780	6-7A
3,680	2,000	7-8A
3,945	2,355	8-9A
3,770	1,970	9-10A

I-495 North Side AM
Future Alternative 10 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
530	365	565	295	700	1,280	315	805
1,020	260	415	545	815	1,470	250	895
1,355	320	330	555	750	1,460	315	1,080
1,130	335	340	480	730	1,285	315	1,080

	MD 97	
	SB	NB
6-7A	2,755	1,475
7-8A	3,235	1,820
8-9A	3,010	1,700
9-10A	2,860	1,600

	MD 97	
	SB	NB
6-7A	2,845	1,370
7-8A	3,245	2,710
8-9A	2,955	2,960
9-10A	2,650	2,535

	MD 185	
	SB	NB
6-7A	2,190	640
7-8A	2,240	1,045
8-9A	2,235	1,145
9-10A	1,920	1,185

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,085	2,655	9,740	9,710	2,450	7,260
7-8A	8,590	3,255	11,845	11,250	2,965	8,285
8-9A	7,915	3,010	10,925	11,670	3,300	8,370
9-10A	7,825	2,735	10,560	11,665	3,035	8,630

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,520	2,655	9,175	10,600	2,450	8,150
7-8A	8,055	3,255	11,310	11,640	2,965	8,675
8-9A	7,890	3,010	10,900	11,720	3,300	8,420
9-10A	7,575	2,735	10,310	11,760	3,035	8,725

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
270	275	320	420	145	810	1,740	855
620	335	440	795	195	1,085	1,490	815
1,090	245	385	865	270	775	1,750	855
910	225	395	680	255	790	1,485	705

	MD 185	
	SB	NB
6-7A	3,740	735
7-8A	3,805	1,685
8-9A	3,635	2,470
9-10A	3,235	2,155

I-495 North Side AM
Future Alternative 10 Peak Period Volumes

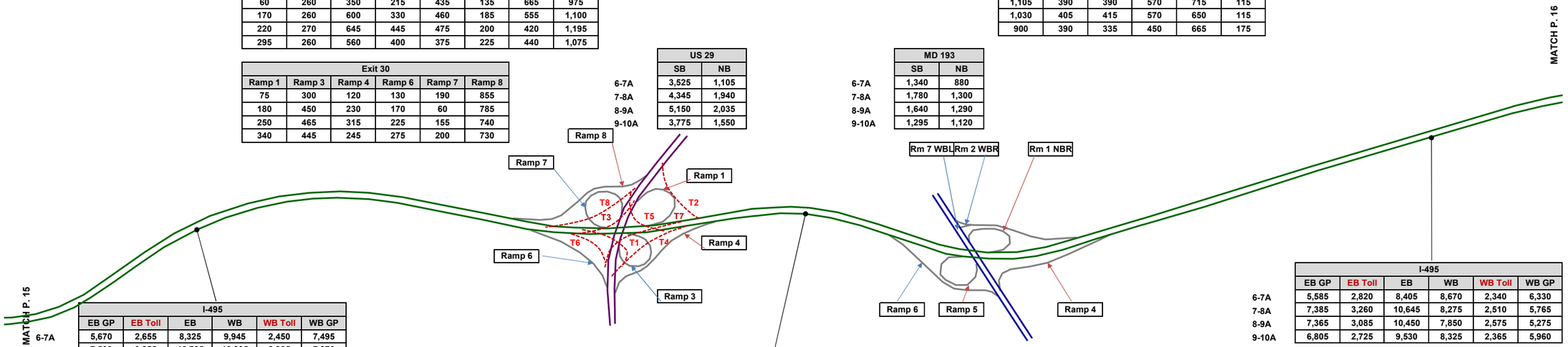
T1	T2	T3	T4	T5	T6	T7	T8
60	260	350	215	435	135	665	975
170	260	600	330	460	185	555	1,100
220	270	645	445	475	200	420	1,195
295	260	560	400	375	225	440	1,075

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
75	300	120	130	190	855
180	450	230	170	60	785
250	465	315	225	155	740
340	445	245	275	200	730

	US 29	
	SB	NB
6-7A	3,525	1,105
7-8A	4,345	1,940
8-9A	5,150	2,035
9-10A	3,775	1,550

	MD 193	
	SB	NB
6-7A	1,340	880
7-8A	1,780	1,300
8-9A	1,640	1,290
9-10A	1,295	1,120

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
1,010	470	270	455	500	115
1,105	390	390	570	715	115
1,030	405	415	570	650	115
900	390	335	450	665	175



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,670	2,655	8,325	9,945	2,450	7,495
7-8A	7,530	3,255	10,785	10,235	2,965	7,270
8-9A	7,405	3,010	10,415	9,920	3,300	6,620
9-10A	7,160	2,735	9,895	10,200	3,035	7,165

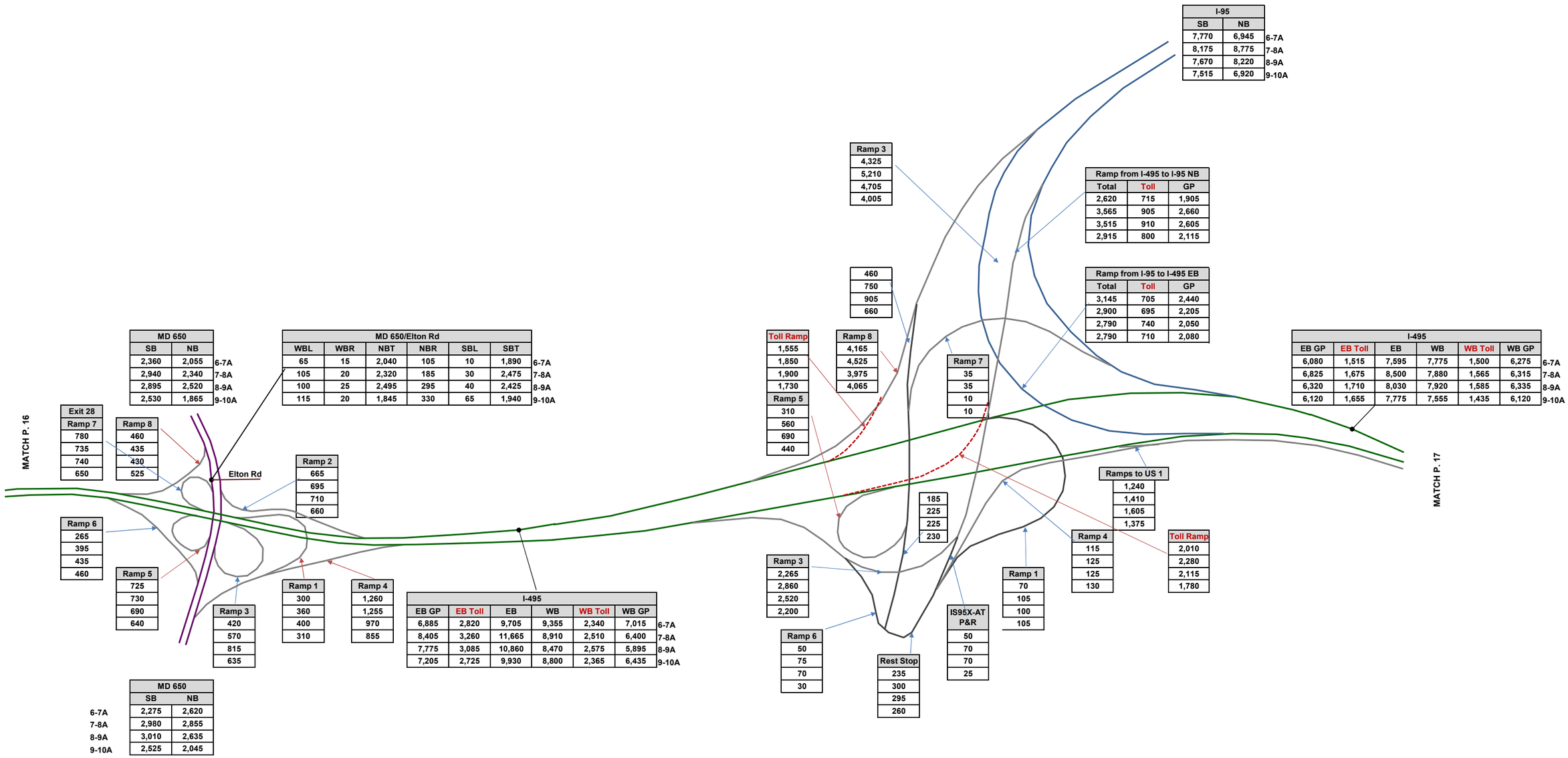
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,585	2,820	8,405	8,670	2,340	6,330
7-8A	7,385	3,260	10,645	8,275	2,510	5,765
8-9A	7,365	3,085	10,450	7,850	2,575	5,275
9-10A	6,805	2,725	9,530	8,325	2,365	5,960

	US 29	
	SB	NB
6-7A	2,380	665
7-8A	2,970	1,540
8-9A	3,740	1,885
9-10A	2,735	1,565

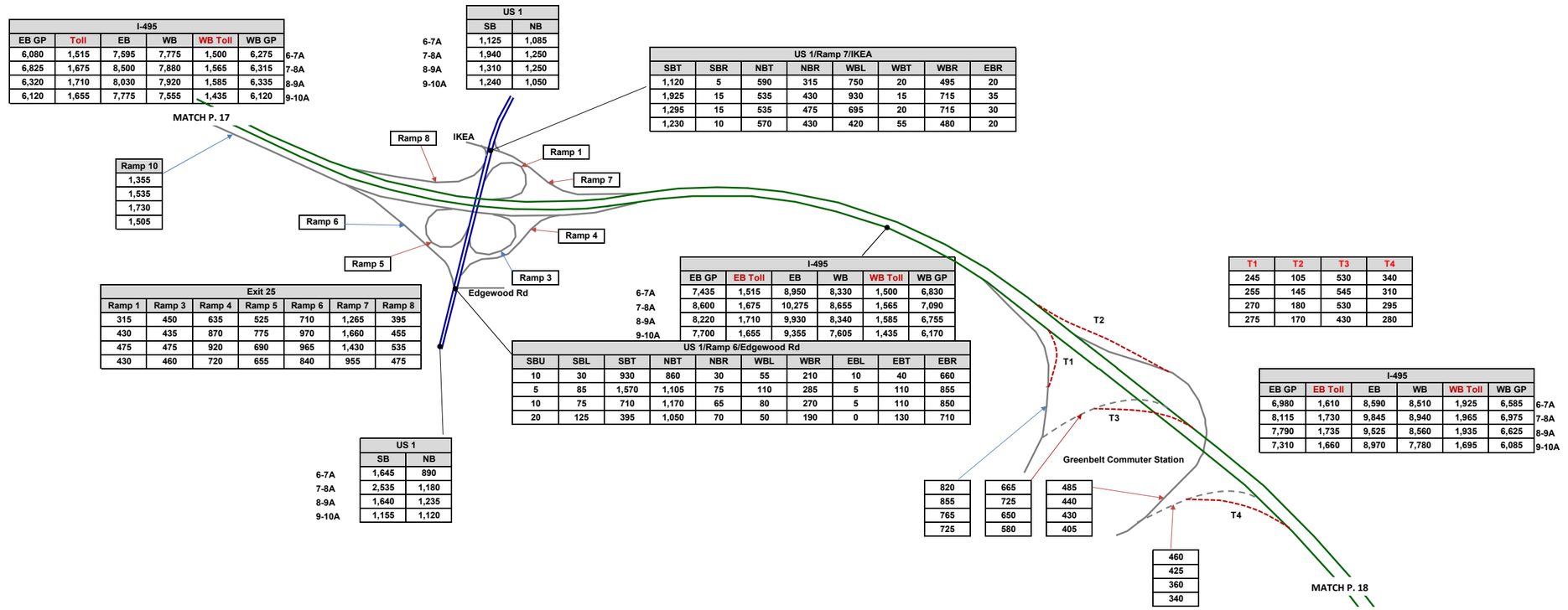
	I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6-7A	5,360	2,820	8,180	9,095	2,340	6,755	6-7A
7-8A	7,140	3,260	10,400	8,875	2,510	6,365	7-8A
8-9A	7,030	3,085	10,115	8,360	2,575	5,785	8-9A
9-10A	6,685	2,725	9,410	8,660	2,365	6,295	9-10A

	MD 193		
	SB	NB	
6-7A	1,500	1,690	6-7A
7-8A	2,040	2,405	7-8A
8-9A	1,835	2,330	8-9A
9-10A	1,685	1,965	9-10A

I-495 North Side AM
Future Alternative 10 Peak Period Volumes



I-495 North East Side AM
Future Alternative 10 Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,080	1,515	7,595	7,775	1,500	6,275	6-7A
6,825	1,675	8,500	7,880	1,565	6,315	7-8A
6,320	1,710	8,030	7,920	1,585	6,335	8-9A
6,120	1,655	7,775	7,555	1,435	6,120	9-10A

US 1		
	SB	NB
6-7A	1,125	1,085
7-8A	1,940	1,250
8-9A	1,310	1,250
9-10A	1,240	1,050

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,120	5	590	315	750	20	495	20
1,925	15	535	430	930	15	715	35
1,295	15	535	475	695	20	715	30
1,230	10	570	430	420	55	480	20

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
315	450	635	525	710	1,265	395
430	435	870	775	970	1,660	455
475	475	920	690	965	1,430	535
430	460	720	655	840	955	475

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,435	1,515	8,950	8,330	1,500	6,830	6-7A
8,600	1,675	10,275	8,655	1,565	7,090	7-8A
8,220	1,710	9,930	8,340	1,585	6,755	8-9A
7,700	1,655	9,355	7,605	1,435	6,170	9-10A

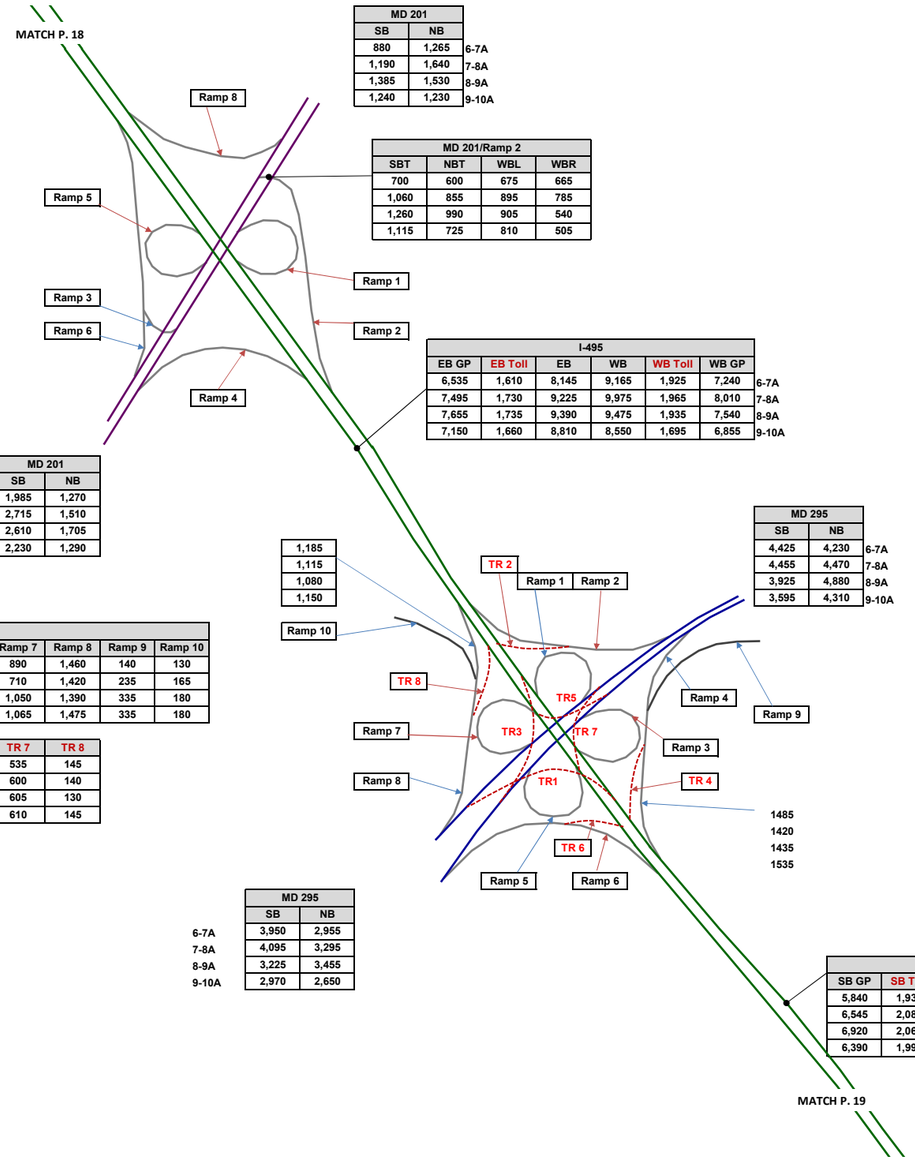
US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
10	30	930	860	30	55	210	10	40	660
5	85	1,570	1,105	75	110	285	5	110	855
10	75	710	1,170	65	80	270	5	110	850
20	125	395	1,050	70	50	190	0	130	710

US 1		
	SB	NB
6-7A	1,645	890
7-8A	2,535	1,180
8-9A	1,640	1,235
9-10A	1,155	1,120

T1	T2	T3	T4
245	105	530	340
255	145	545	310
270	180	530	295
275	170	430	280

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,980	1,610	8,590	8,510	1,925	6,585	6-7A
8,115	1,730	9,845	8,940	1,965	6,975	7-8A
7,790	1,735	9,525	8,560	1,935	6,625	8-9A
7,310	1,660	8,970	7,780	1,695	6,085	9-10A

I-495 North East Side AM
Future Alternative 10 Peak Period Volumes



MD 201		
SB	NB	
880	1,265	6-7A
1,190	1,640	7-8A
1,385	1,530	8-9A
1,240	1,230	9-10A

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
700	600	675	665
1,060	855	895	785
1,260	990	905	540
1,115	725	810	505

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
505	1,340	260	425	410	1,020	180
515	1,680	335	475	420	1,180	130
405	1,445	370	680	605	1,050	125
420	1,315	435	580	580	885	125

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,535	1,610	8,145	9,165	1,925	7,240	6-7A
7,495	1,730	9,225	9,975	1,965	8,010	7-8A
7,655	1,735	9,390	9,475	1,935	7,540	8-9A
7,150	1,660	8,810	8,550	1,695	6,855	9-10A

MD 201	
SB	NB
1,985	1,270
2,715	1,510
2,610	1,705
2,230	1,290

MD 295		
SB	NB	
4,425	4,230	6-7A
4,455	4,470	7-8A
3,925	4,880	8-9A
3,595	4,310	9-10A

1,185
1,115
1,080
1,150

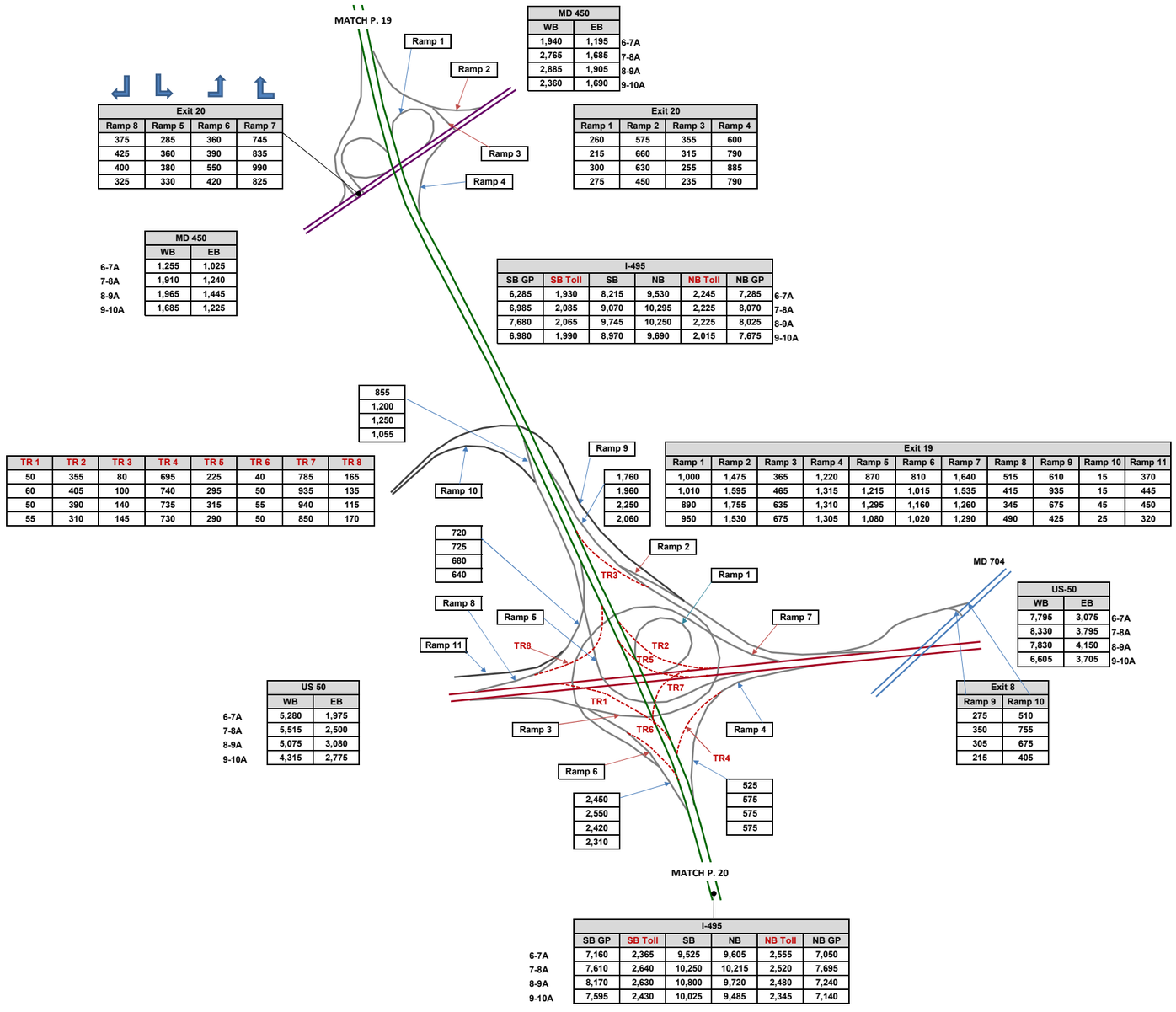
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
25	550	955	1,910	410	10	890	1,460	140	130
60	565	1,000	1,680	560	15	710	1,420	235	165
80	545	895	1,610	715	10	1,050	1,390	335	180
75	530	745	1,705	690	15	1,065	1,475	335	180

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
15	110	150	565	80	10	535	145
35	115	155	495	120	15	600	140
30	110	140	510	160	15	605	130
30	105	110	505	150	15	610	145

MD 295		
SB	NB	
3,950	2,955	6-7A
4,095	3,295	7-8A
3,225	3,455	8-9A
2,970	2,650	9-10A

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,840	1,930	7,770	9,600	2,245	7,355	6-7A
6,545	2,085	8,630	10,265	2,225	8,040	7-8A
6,920	2,065	8,985	9,950	2,225	7,725	8-9A
6,390	1,990	8,380	9,310	2,015	7,295	9-10A

I-495 North East Side AM
Future Alternative 10 Peak Period Volumes



MD 450		
WB	EB	
1,940	1,195	6-7A
2,765	1,685	7-8A
2,885	1,905	8-9A
2,360	1,690	9-10A

Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
375	285	360	745
425	360	390	835
400	380	550	990
325	330	420	825

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
260	575	355	600
215	660	315	790
300	630	255	885
275	450	235	790

MD 450		
WB	EB	
1,255	1,025	6-7A
1,910	1,240	7-8A
1,965	1,445	8-9A
1,685	1,225	9-10A

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,285	1,930	8,215	9,530	2,245	7,285	6-7A
6,985	2,085	9,070	10,295	2,225	8,070	7-8A
7,680	2,065	9,745	10,250	2,225	8,025	8-9A
6,980	1,990	8,970	9,690	2,015	7,675	9-10A

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
50	355	80	695	225	40	785	165
60	405	100	740	295	50	935	135
50	390	140	735	315	55	940	115
55	310	145	730	290	50	850	170

855
1,200
1,250
1,055

1,760
1,960
2,250
2,060

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
1,000	1,475	365	1,220	870	810	1,640	515	610	15	370
1,010	1,595	465	1,315	1,215	1,015	1,535	415	935	15	445
890	1,755	635	1,310	1,295	1,160	1,260	345	675	45	450
950	1,530	675	1,305	1,080	1,020	1,290	490	425	25	320

720
725
680
640

US-50		
WB	EB	
7,795	3,075	6-7A
8,330	3,795	7-8A
7,830	4,150	8-9A
6,605	3,705	9-10A

US 50		
WB	EB	
5,280	1,975	6-7A
5,515	2,500	7-8A
5,075	3,080	8-9A
4,315	2,775	9-10A

Exit 8	
Ramp 9	Ramp 10
275	510
350	755
305	675
215	405

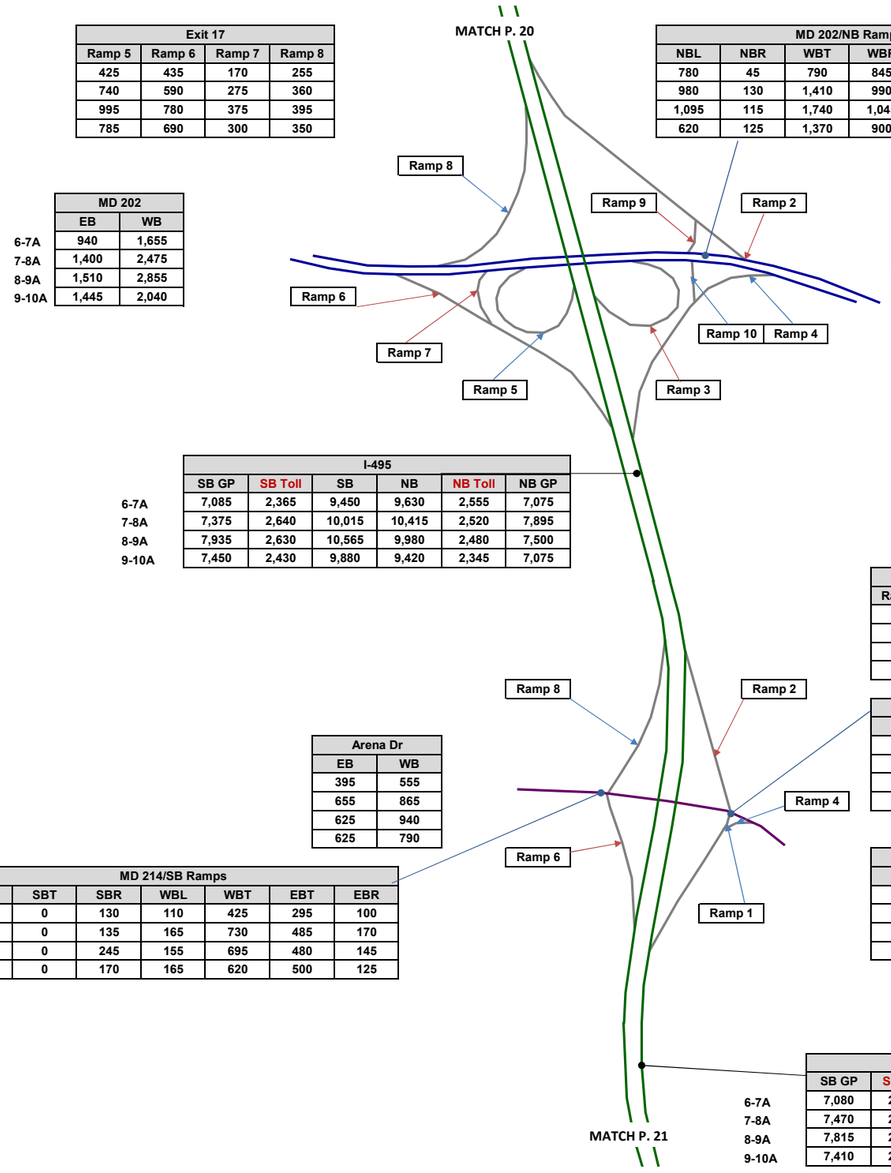
2,450
2,550
2,420
2,310

525
575
575
575

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,160	2,365	9,525	9,605	2,555	7,050
7,610	2,640	10,250	10,215	2,520	7,695
8,170	2,630	10,800	9,720	2,480	7,240
7,595	2,430	10,025	9,485	2,345	7,140

6-7A
7-8A
8-9A
9-10A

I-495 East Side AM
Future Alternative 10 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
425	435	170	255
740	590	275	360
995	780	375	395
785	690	300	350

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
780	45	790	845	10	700
980	130	1,410	990	15	1,335
1,095	115	1,740	1,045	5	1,470
620	125	1,370	900	15	1,305

	MD 202	
	EB	WB
6-7A	940	1,655
7-8A	1,400	2,475
8-9A	1,510	2,855
9-10A	1,445	2,040

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
845	220	275	10	825
990	200	295	15	1110
1,045	250	350	5	1210
900	220	325	15	745

MD 202		
SB	NB	
1,020	1,635	6-7A
1,760	2,400	7-8A
1,935	2,785	8-9A
1,755	2,270	9-10A

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,085	2,365	9,450	9,630	2,555	7,075
7,375	2,640	10,015	10,415	2,520	7,895
7,935	2,630	10,565	9,980	2,480	7,500
7,450	2,430	9,880	9,420	2,345	7,075

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,080	2,365	9,445	9,850	2,555	7,295
7-8A	7,470	2,640	10,110	10,800	2,520	8,280
8-9A	7,815	2,630	10,445	10,350	2,480	7,870
9-10A	7,410	2,430	9,840	9,700	2,345	7,355

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
300	405	325	210	215
445	460	400	335	240
360	415	425	300	420
330	395	345	290	330

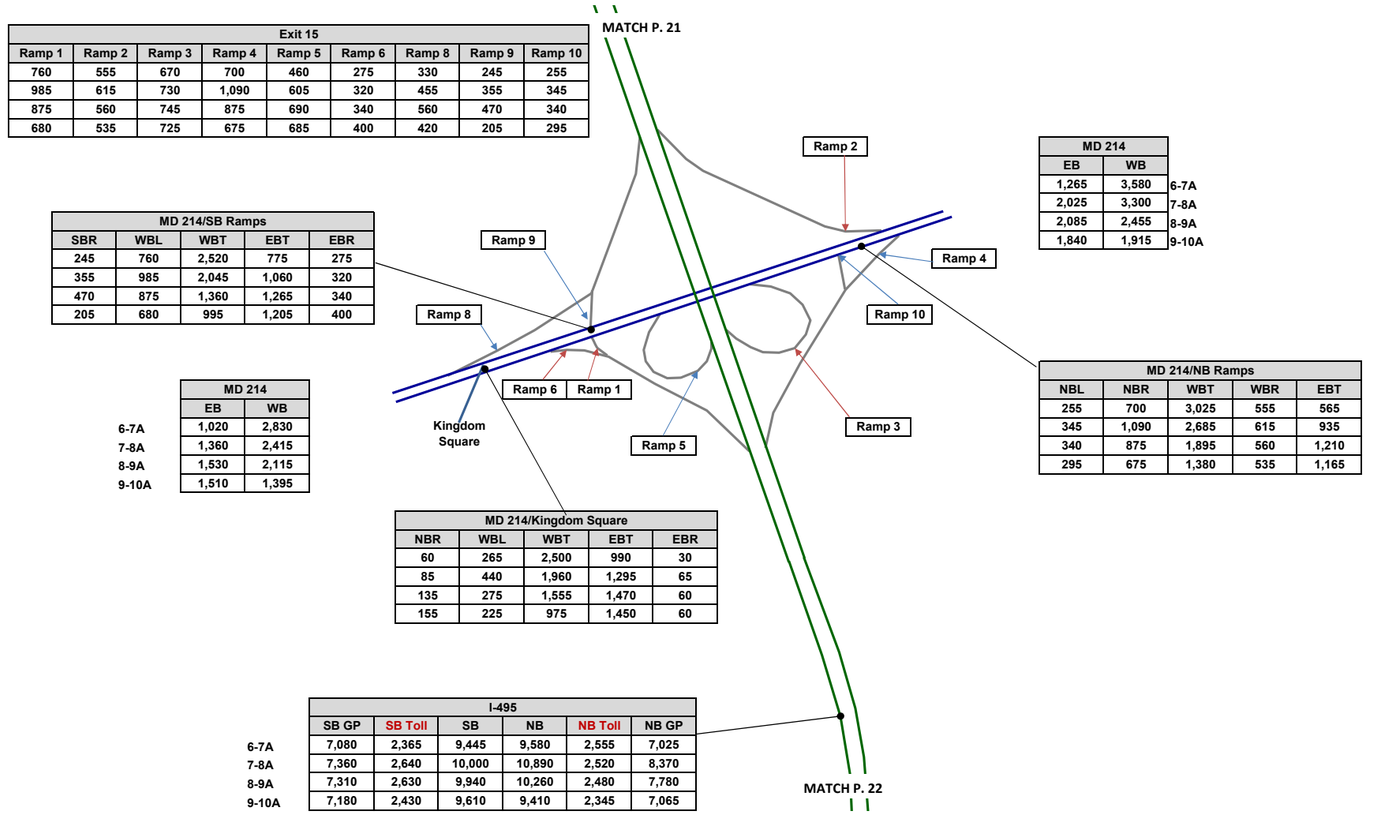
MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
300	0	325	235	200	205	175
445	0	400	450	235	225	365
355	5	425	495	220	190	465
330	0	345	455	190	205	455

Arena Dr		
EB	WB	
500	435	6-7A
765	685	7-8A
890	715	8-9A
800	645	9-10A

Arena Dr	
EB	WB
395	555
655	865
625	940
625	790

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
85	0	130	110	425	295	100
105	0	135	165	730	485	170
175	0	245	155	695	480	145
160	0	170	165	620	500	125

I-495 East Side AM
Future Alternative 10 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
760	555	670	700	460	275	330	245	255
985	615	730	1,090	605	320	455	355	345
875	560	745	875	690	340	560	470	340
680	535	725	675	685	400	420	205	295

MD 214		
EB	WB	
1,265	3,580	6-7A
2,025	3,300	7-8A
2,085	2,455	8-9A
1,840	1,915	9-10A

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
245	760	2,520	775	275
355	985	2,045	1,060	320
470	875	1,360	1,265	340
205	680	995	1,205	400

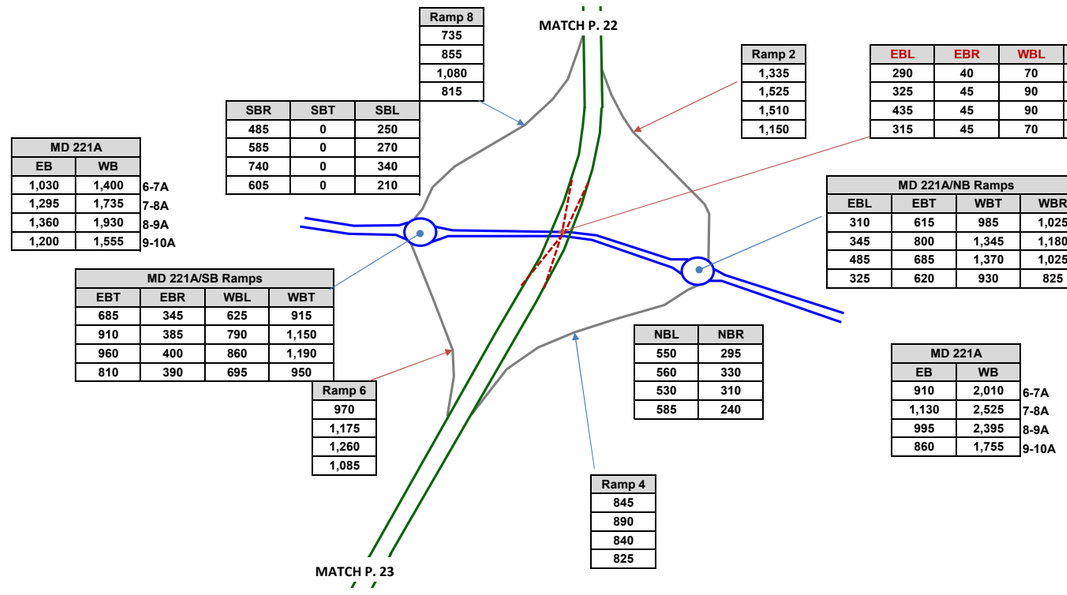
MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
255	700	3,025	555	565
345	1,090	2,685	615	935
340	875	1,895	560	1,210
295	675	1,380	535	1,165

	MD 214	
	EB	WB
6-7A	1,020	2,830
7-8A	1,360	2,415
8-9A	1,530	2,115
9-10A	1,510	1,395

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
60	265	2,500	990	30
85	440	1,960	1,295	65
135	275	1,555	1,470	60
155	225	975	1,450	60

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,080	2,365	9,445	9,580	2,555	7,025
7-8A	7,360	2,640	10,000	10,890	2,520	8,370
8-9A	7,310	2,630	9,940	10,260	2,480	7,780
9-10A	7,180	2,430	9,610	9,410	2,345	7,065

I-495 East Side AM
Future Alternative 10 Peak Period Volumes



Ramp 8
735
855
1,080
815

SBR	SBT	SBL
485	0	250
585	0	270
740	0	340
605	0	210

MD 221A		
EB	WB	
1,030	1,400	6-7A
1,295	1,735	7-8A
1,360	1,930	8-9A
1,200	1,555	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
685	345	625	915
910	385	790	1,150
960	400	860	1,190
810	390	695	950

Ramp 6
970
1,175
1,260
1,085

Ramp 2
1,335
1,525
1,510
1,150

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
290	40	70	500	105	60	260	470
325	45	90	515	110	65	270	530
435	45	90	410	100	55	295	550
315	45	70	390	110	45	240	480

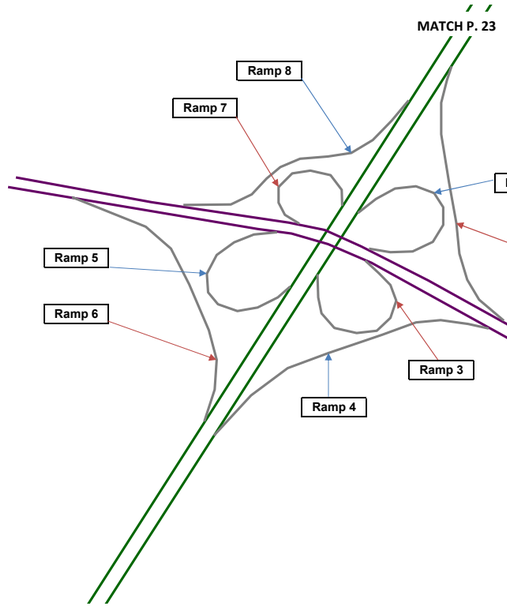
MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
310	615	985	1,025
345	800	1,345	1,180
485	685	1,370	1,025
325	620	930	825

NBL	NBR
550	295
560	330
530	310
585	240

Ramp 4
845
890
840
825

MD 221A		
EB	WB	
910	2,010	6-7A
1,130	2,525	7-8A
995	2,395	8-9A
860	1,755	9-10A

I-495 East Side AM
Future Alternative 10 Peak Period Volumes



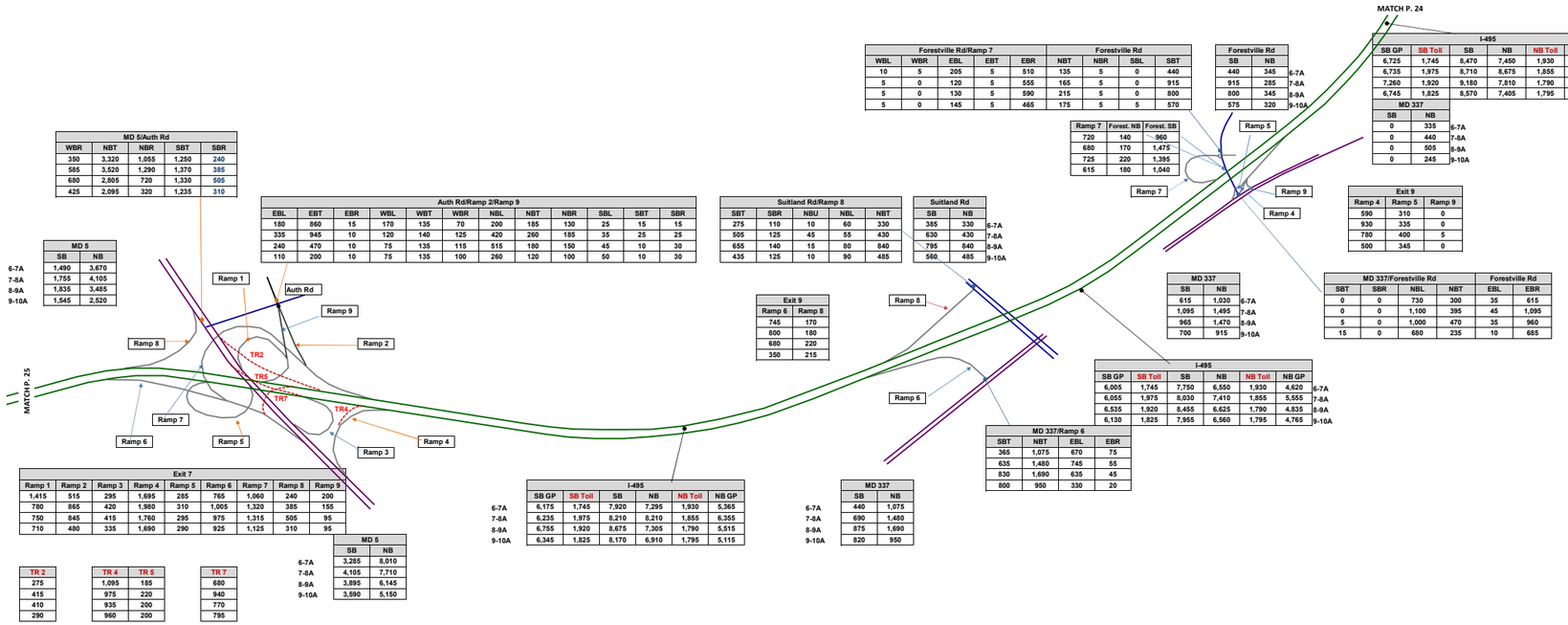
MD 4		
SB	NB	
1,335	2,325	6-7A
1,665	3,110	7-8A
1,580	2,120	8-9A
1,450	1,570	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
640	1,600	625	570	940	465	1,135	1,250
785	1,525	725	550	830	410	930	1,455
715	1,625	730	550	675	450	845	850
530	1,465	680	485	785	375	605	900

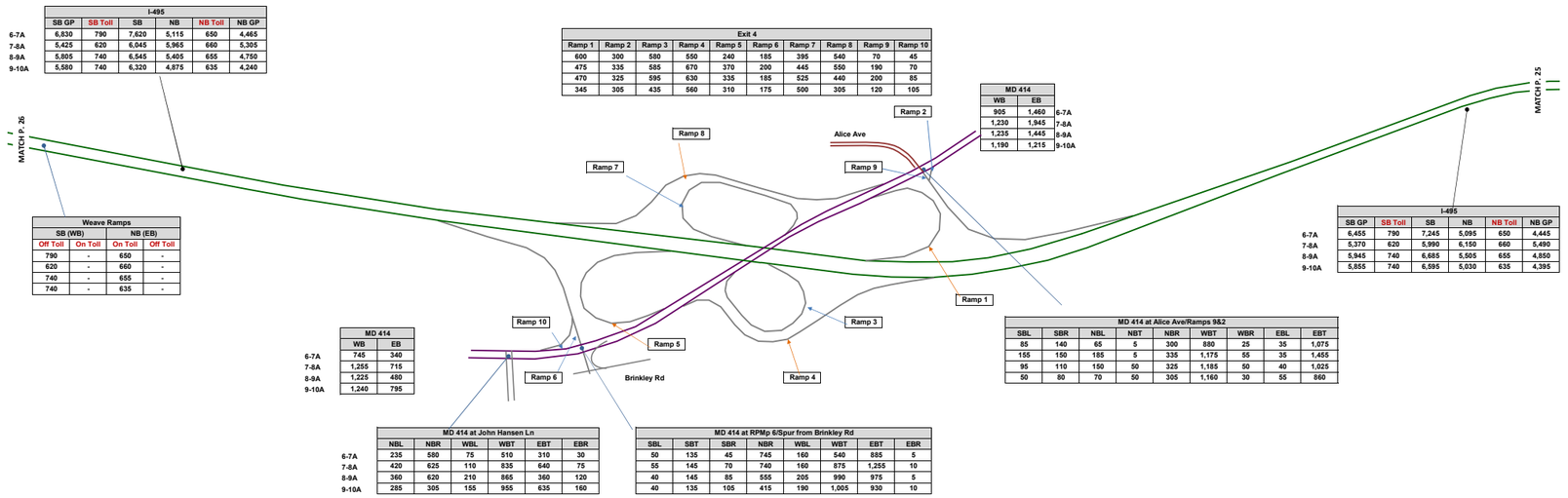
MD 4		
SB	NB	
1,755	3,170	6-7A
1,910	3,325	7-8A
1,625	3,025	8-9A
1,665	2,210	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,725	1,745	8,470	7,450	1,930	5,520
7-8A	6,735	1,975	8,710	8,675	1,855	6,820
8-9A	7,260	1,920	9,180	7,810	1,790	6,020
9-10A	6,745	1,825	8,570	7,405	1,795	5,610

I-495 South Side AM
Future Alternative 10 Peak Period Volumes



I-495 South Side AM
Future Alternative 10 Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,830	790	7,620	5,115	650	4,465
7-8A	5,425	620	6,045	5,965	660	5,305
8-9A	5,805	740	6,545	5,405	655	4,750
9-10A	5,580	740	6,320	4,875	635	4,240

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
600	300	580	550	240	185	395	540	70	45
475	335	585	670	370	200	445	550	190	70
470	325	595	630	335	185	525	440	200	85
345	305	435	560	310	175	500	305	120	105

MD 414		
WB	EB	
905	1,460	6-7A
1,230	1,945	7-8A
1,235	1,445	8-9A
1,190	1,215	9-10A

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
790	-	650	-
620	-	660	-
740	-	655	-
740	-	635	-

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,455	790	7,245	5,095	650	4,445
5,370	620	5,990	6,150	660	5,490
5,945	740	6,685	5,505	655	4,850
5,855	740	6,595	5,030	635	4,395

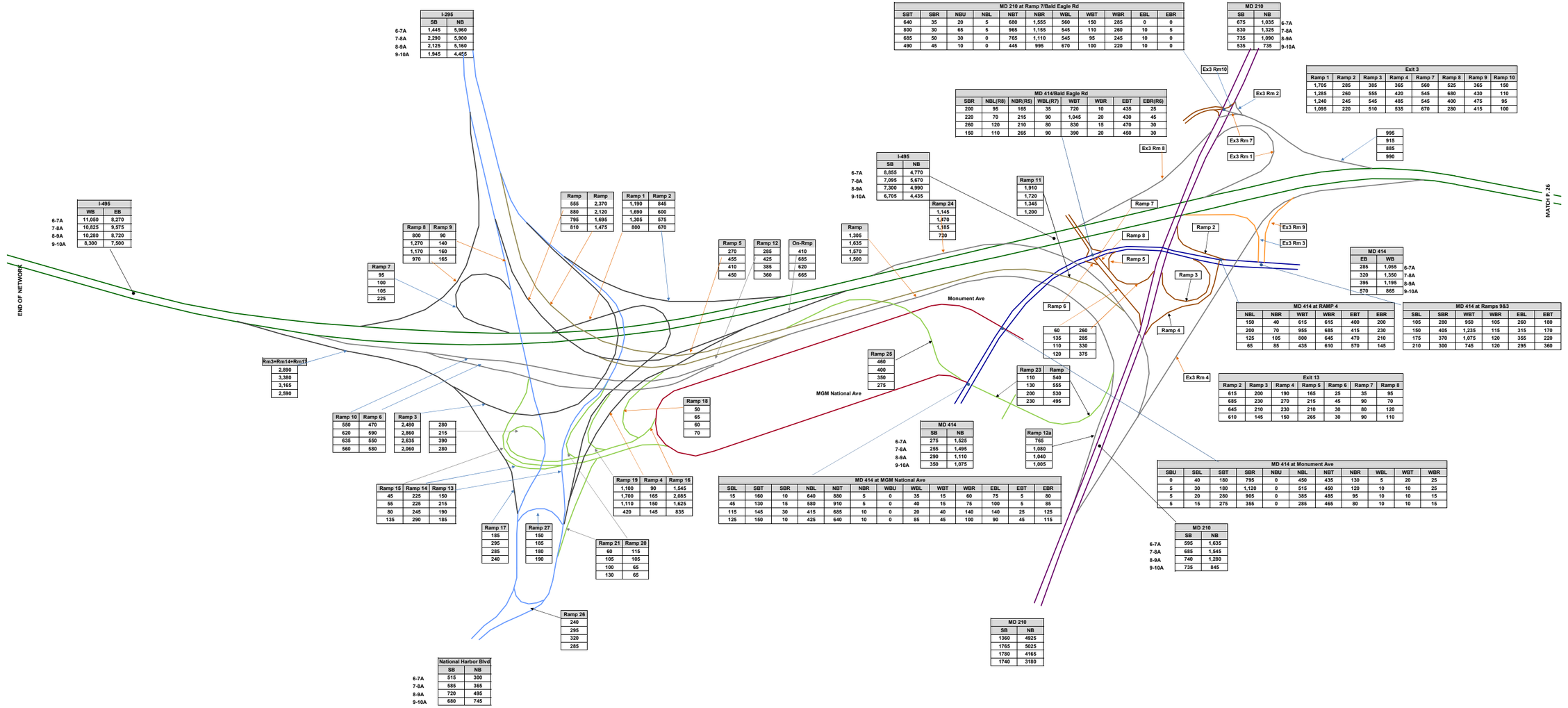
MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
85	140	65	5	300	880	25	35	1,075
155	150	185	5	335	1,175	55	35	1,455
95	110	150	50	325	1,185	50	40	1,025
50	80	70	50	305	1,160	30	55	860

MD 414		
WB	EB	
745	340	6-7A
1,255	715	7-8A
1,225	480	8-9A
1,240	795	9-10A

MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
235	580	75	510	310	30
420	625	110	835	640	75
360	620	210	865	360	120
285	305	155	955	635	160

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
50	135	45	745	160	540	885	5
55	145	70	740	160	875	1,255	10
40	145	85	555	205	990	975	5
40	135	105	415	190	1,005	930	10

I-495 South Side AM
Future Alternative 10 Peak Period Volumes



I-295		
	SB	NB
6-7A	1,445	5,960
7-8A	2,290	5,900
8-9A	2,125	5,160
9-10A	1,945	4,455

I-495		
	WB	EB
6-7A	11,050	8,270
7-8A	10,825	9,575
8-9A	10,280	8,720
9-10A	8,300	7,500

I-495		
	SB	NB
6-7A	8,855	4,770
7-8A	7,095	5,670
8-9A	7,300	4,990
9-10A	6,705	4,435

MD 210 at Ramp 7/Bald Eagle Rd										
SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR	EBL	EBR
640	35	20	5	680	1,555	560	150	285	0	0
800	30	65	5	965	1,155	545	110	260	10	5
685	50	30	0	765	1,110	545	95	245	10	0
490	45	10	0	445	995	670	100	220	10	0

MD 210		
SB	NB	
675	1,035	6-7A
830	1,325	7-8A
735	1,090	8-9A
535	735	9-10A

MD 414/Bald Eagle Rd							
SBR	NBL(R8)	NBR(R5)	WBL(R7)	WBT	WBR	EBT	EBR(R6)
200	95	165	35	720	10	435	25
220	70	215	90	1,045	20	430	45
260	120	210	80	830	15	470	30
150	110	265	90	390	20	450	30

Exit 3							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 7	Ramp 8	Ramp 9	Ramp 10
1,705	285	385	365	560	525	365	150
1,285	260	555	420	545	680	430	110
1,240	245	545	485	545	400	475	95
1,095	220	510	535	670	280	415	100

995		
915		
885		
990		

Ramp	Ramp
555	2,370
880	2,120
795	1,695
810	1,475

Ramp 1	Ramp 2
1,190	845
1,690	600
1,305	575
800	670

Ramp 8	Ramp 9
800	90
1,270	140
1,170	160
970	165

Ramp 7
95
100
105
225

Ramp 5	Ramp 12	On-Rmp
270	285	410
455	425	685
410	385	620
450	360	665

Ramp
1,305
1,635
1,570
1,500

Ramp 24
1,145
1,470
1,185
720

Ramp 11
1,910
1,720
1,345
1,200

Rm3+Rm14+Rm17
2,890
3,380
3,165
2,590

Ramp 10	Ramp 6
550	470
620	590
635	550
560	580

Ramp 3	
2,480	280
2,860	215
2,635	390
2,060	280

Ramp 18
50
65
60
70

Ramp 25
460
400
350
275

Ramp 23	Ramp
110	540
130	555
200	530
230	495

Ramp 6	
60	260
135	285
110	330
120	375

Ramp 15	Ramp 14	Ramp 13
45	225	150
55	225	215
80	245	190
135	290	185

Ramp 17
185
295
285
240

Ramp 27
150
185
180
190

Ramp 19	Ramp 4	Ramp 16
1,100	90	1,545
1,700	165	2,085
1,110	150	1,625
420	145	535

Ramp 21	Ramp 20
60	115
105	105
100	65
130	65

Ramp 26
240
295
320
285

MD 414		
	SB	NB
6-7A	275	1,525
7-8A	255	1,495
8-9A	290	1,110
9-10A	350	1,075

Ramp 12a
765
1,080
1,040
1,005

MD 414 at MGM National Ave												
SBL	SBT	SBR	NBL	NBT	NBR	WBU	WBL	WBT	WBR	EBL	EBT	EBR
15	160	10	640	880	5	0	35	15	60	75	5	80
45	130	15	580	910	5	0	40	15	75	100	5	85
115	145	30	415	685	10	0	20	40	140	140	25	125
125	150	10	425	640	10	0	85	45	100	90	45	115

MD 414		
EB	WB	
285	1,055	6-7A
320	1,350	7-8A
395	1,195	8-9A
570	865	9-10A

MD 414 at RAMP 4					
NBL	NBR	WBT	WBR	EBT	EBR
150	40	615	615	400	200
200	70	955	685	415	230
125	105	800	645	470	210
65	85	435	610	570	145

MD 414 at Ramps 9&3					
SBL	SBR	WBT	WBR	EBL	EBT
105	280	950	105	260	180
150	405	1,235	115	315	170
175	370	1,075	120	355	220
210	300	745	120	295	360

Exit 13						
Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
615	200	190	165	25	35	95
685	230	270	215	45	90	70
645	210	230	210	30	80	120
610	145	150	265	30	90	110

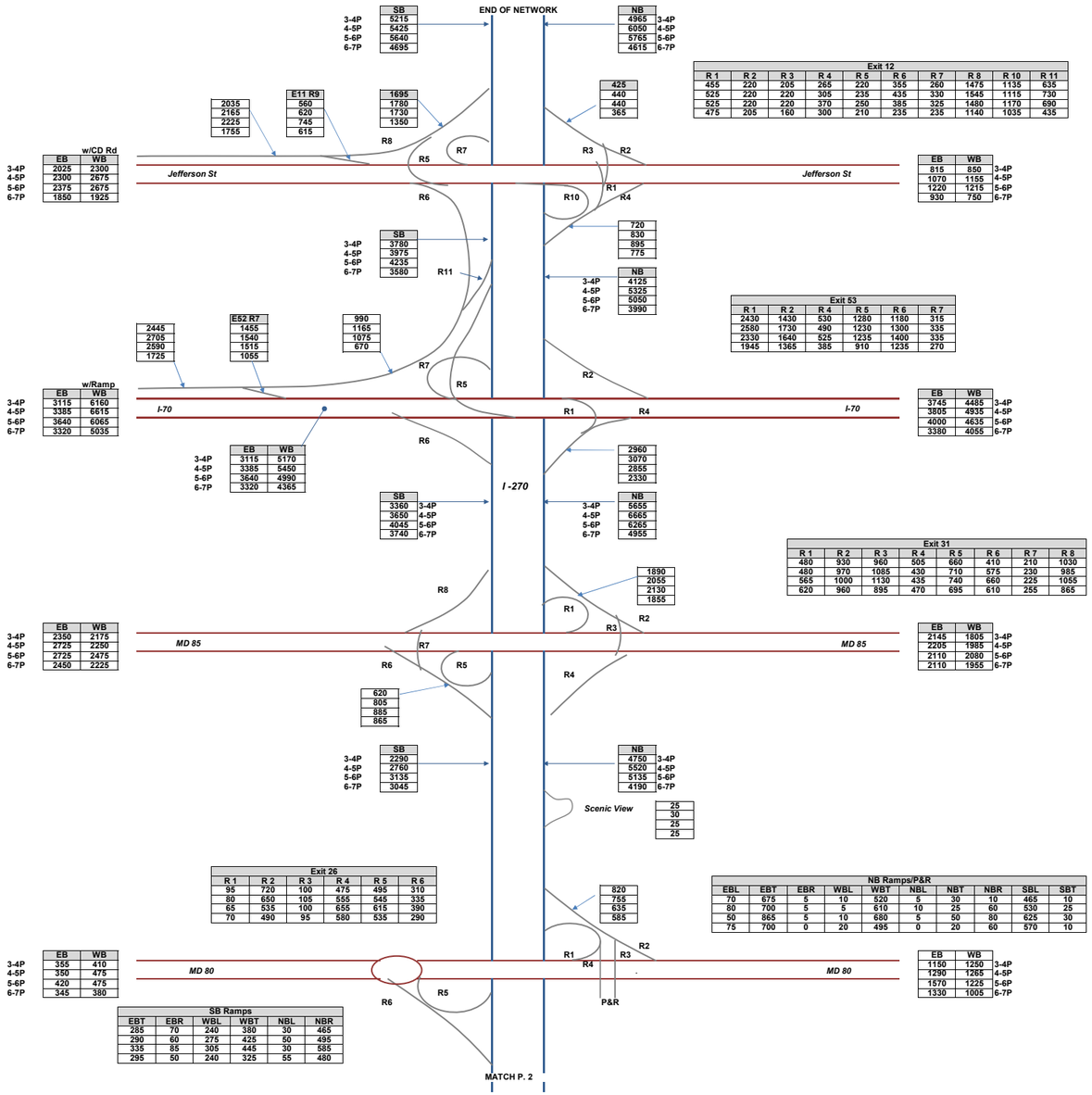
MD 414 at Monument Ave									
SBU	SBL	SBT	SBR	NBU	NBL	NBT	NBR	WBL	WBT	WBR
0	40	180	795	0	450	435	130	5	20	25
5	30	180	1,120	0	515	450	120	10	10	25
5	20	280	905	0	385	485	95	10	10	15
5	15	275	355	0	285	465	80	10	10	15

MD 210		
SB	NB	
595	1,635	6-7A
685	1,545	7-8A
740	1,280	8-9A
735	845	9-10A

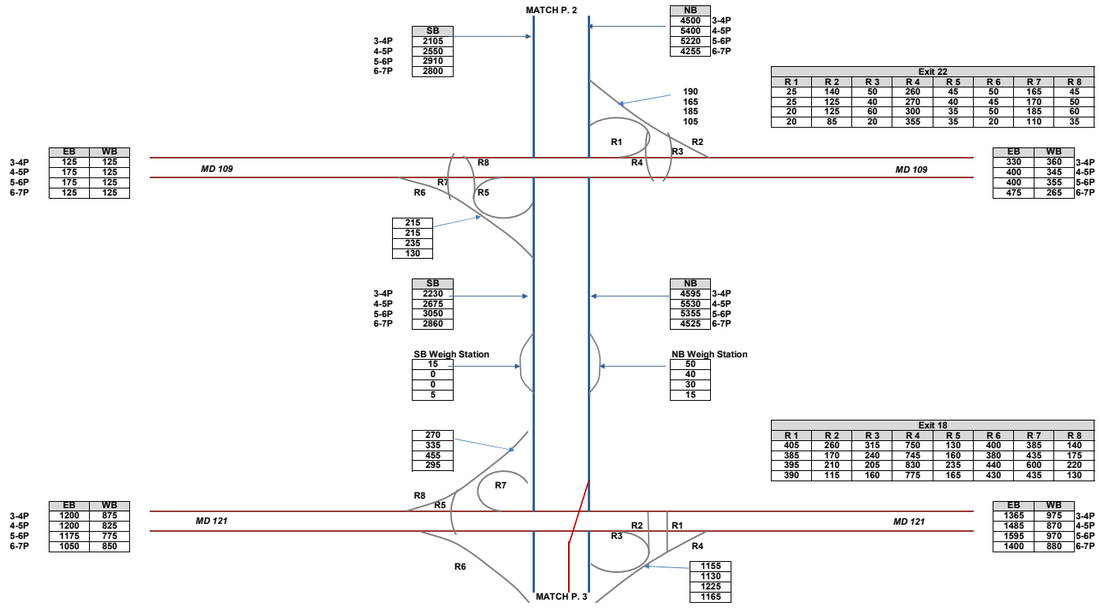
MD 210	
SB	NB
1360	4925
1765	5025
1780	4165
1740	3180

National Harbor Blvd		
	SB	NB
6-7A	515	300
7-8A	585	365
8-9A	720	495
9-10A	680	745

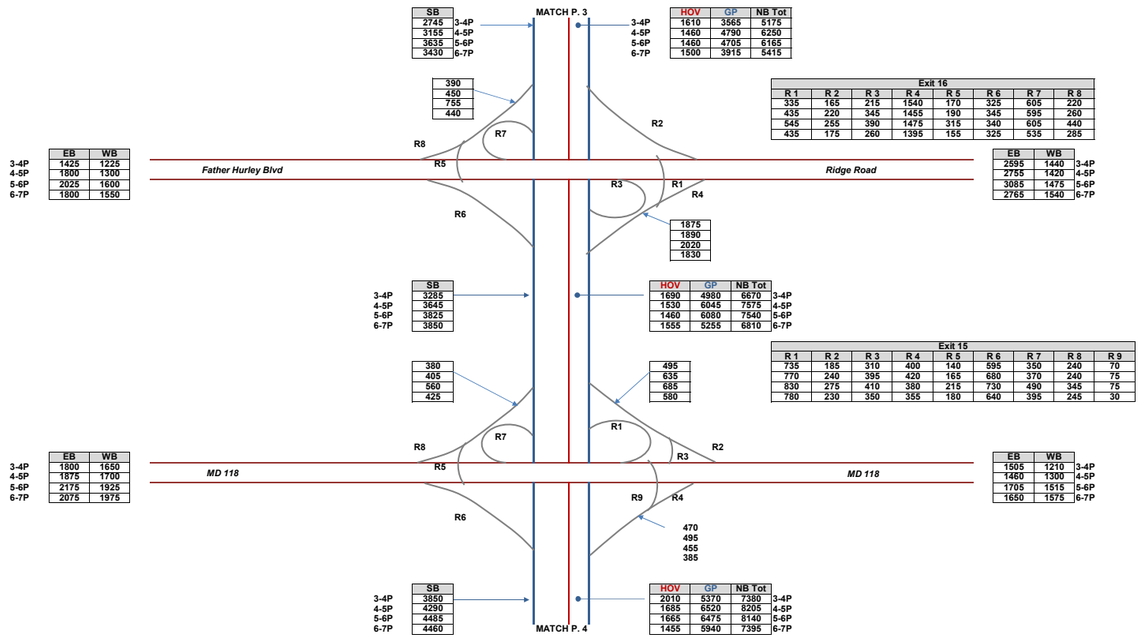
I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



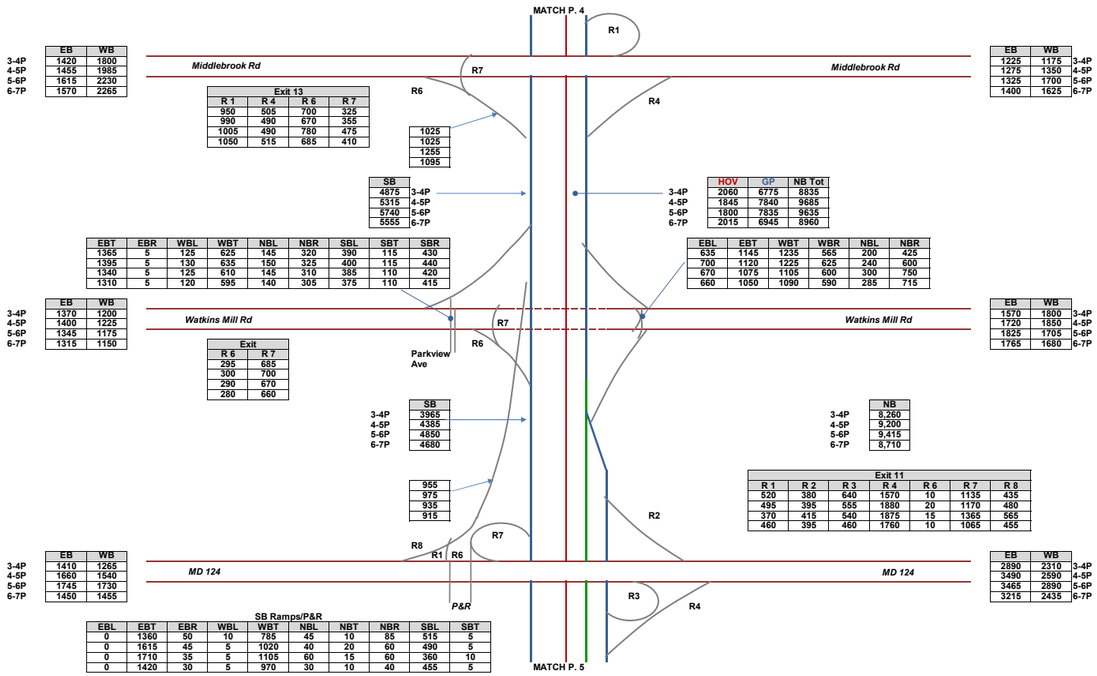
I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



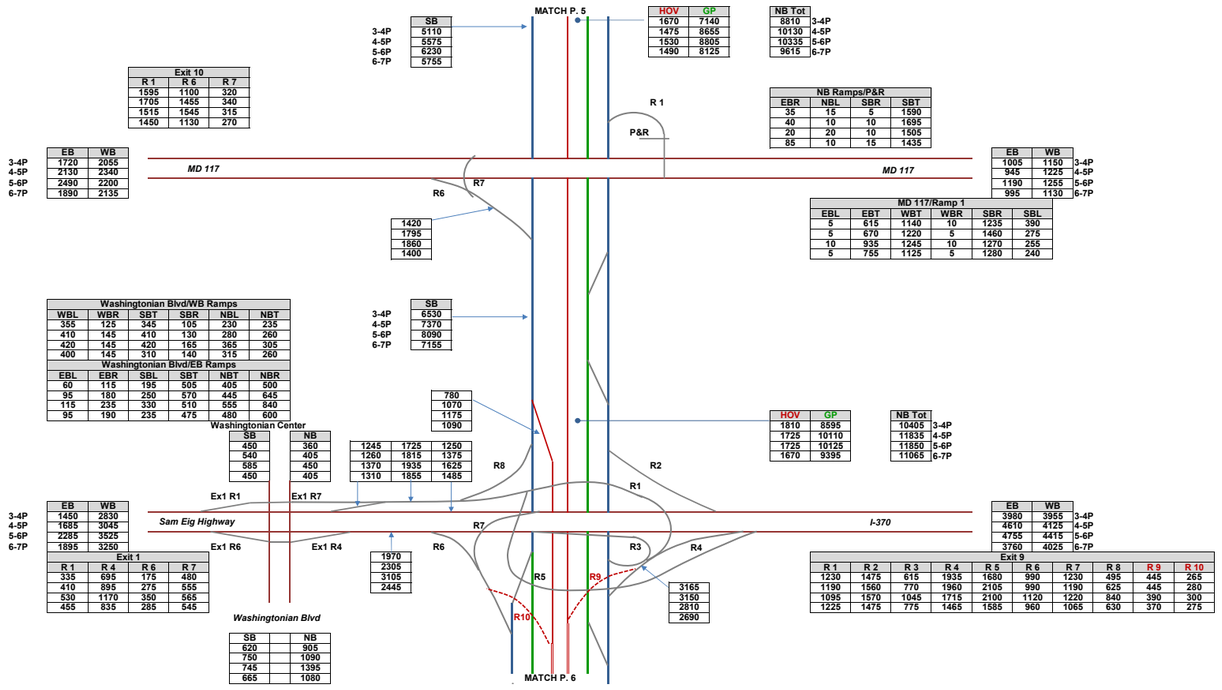
I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



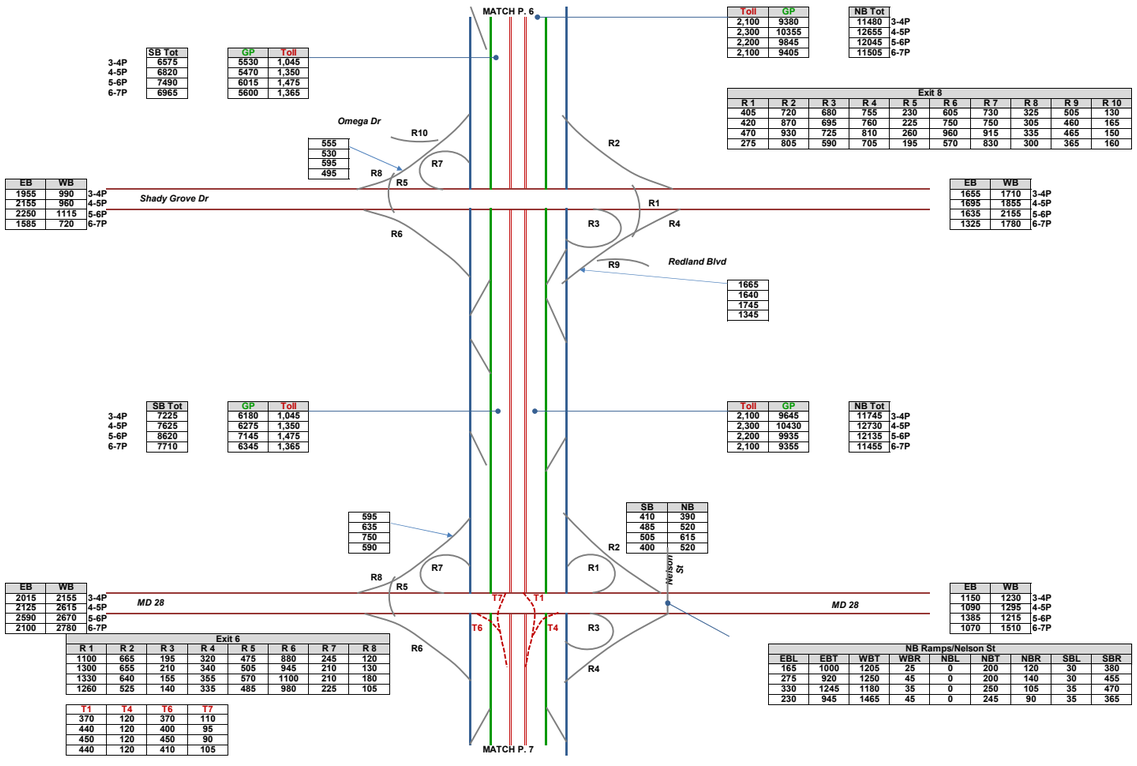
I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



	SB Tot
3-4P	6575
4-5P	6820
5-6P	7490
6-7P	6965

GP	Toll
5530	1,045
5470	1,350
6015	1,475
5600	1,365

Toll	GP
2,100	9380
2,300	10355
2,200	9845
2,100	9405

NB Tot	
11480	3-4P
12655	4-5P
12045	5-6P
11505	6-7P

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
405	720	680	755	230	605	730	325	505	130
420	870	695	760	225	750	750	305	460	165
470	930	725	810	260	960	915	335	465	150
275	805	590	705	195	570	830	300	365	160

EB	WB	
1955	990	3-4P
2155	960	4-5P
2250	1115	5-6P
1585	720	6-7P

EB	WB	
1655	1710	3-4P
1695	1855	4-5P
1635	2155	5-6P
1325	1780	6-7P

555	
530	
595	
495	

1665	
1640	
1745	
1345	

	SB Tot
3-4P	7225
4-5P	7625
5-6P	8620
6-7P	7710

GP	Toll
6180	1,045
6275	1,350
7145	1,475
6345	1,365

Toll	GP
2,100	9645
2,300	10430
2,200	9935
2,100	9355

NB Tot	
11745	3-4P
12730	4-5P
12135	5-6P
11455	6-7P

595	
635	
750	
590	

SB	NB
410	390
485	520
505	615
400	520

EB	WB	
2015	2155	3-4P
2125	2615	4-5P
2590	2670	5-6P
2100	2780	6-7P

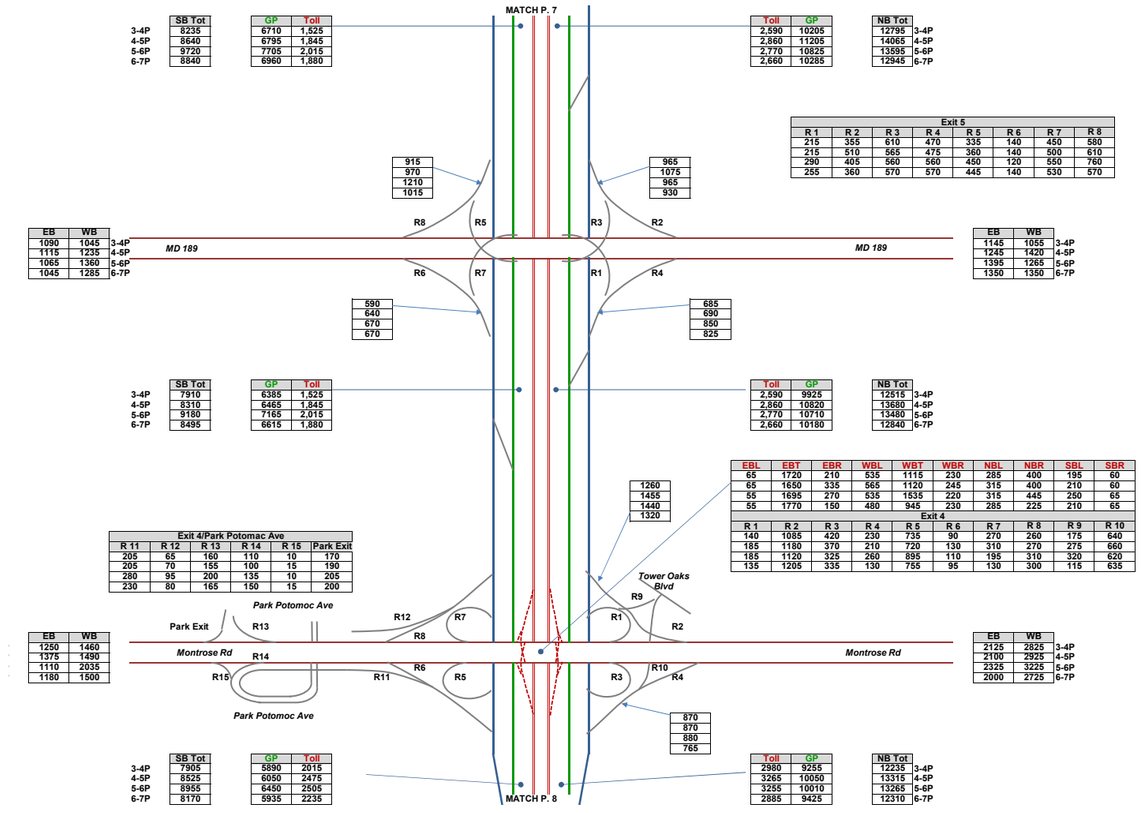
EB	WB	
1150	1230	3-4P
1090	1295	4-5P
1385	1215	5-6P
1070	1510	6-7P

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
1100	665	195	320	475	880	245	120
1300	655	210	340	505	945	210	130
1330	640	155	355	570	1100	210	180
1260	525	140	335	485	980	225	105

T1	T4	T6	T7
370	120	370	110
440	120	400	95
450	120	450	90
440	120	410	105

NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
165	1000	1205	25	0	200	120	30	380
275	920	1250	45	0	200	140	30	455
330	1245	1180	35	0	250	105	35	470
230	945	1465	45	0	245	90	35	365

I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



	SB Tot
3-4P	8235
4-5P	8640
5-6P	9720
6-7P	8840

GP	Toll
6710	1,525
6795	1,845
7705	2,015
6960	1,880

Toll	GP
2,590	10205
2,860	11205
2,770	10825
2,660	10285

NB Tot	
12795	3-4P
14065	4-5P
13595	5-6P
12945	6-7P

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
215	355	610	470	335	140	450	580
215	510	565	475	360	140	500	610
290	405	560	560	450	120	550	760
255	360	570	570	445	140	530	570

915
970
1210
1015

965
1075
965
930

EB	WB	
1090	1045	3-4P
1115	1235	4-5P
1065	1360	5-6P
1045	1285	6-7P

EB	WB	
1145	1055	3-4P
1245	1420	4-5P
1395	1265	5-6P
1350	1350	6-7P

590
640
670
670

685
690
850
825

	SB Tot
3-4P	7910
4-5P	8310
5-6P	9160
6-7P	8495

GP	Toll
6385	1,525
6465	1,845
7165	2,015
6615	1,880

Toll	GP
2,590	9925
2,860	10820
2,770	10710
2,660	10180

NB Tot	
12515	3-4P
13680	4-5P
13480	5-6P
12840	6-7P

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
65	1720	210	535	1115	230	285	400	195	60
65	1650	335	565	1120	245	315	400	210	60
55	1695	270	535	1535	220	315	445	250	65
55	1770	150	480	945	230	285	225	210	65

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
140	1085	420	230	735	90	270	260	175	640
185	1180	370	210	720	130	310	270	275	660
185	1120	325	260	895	110	195	310	320	620
135	1205	335	130	755	95	130	300	115	635

1260
1455
1440
1320

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
205	65	160	110	10	170
205	70	155	100	15	190
280	95	200	135	10	205
230	80	165	150	15	200

EB	WB	
1250	1460	
1375	1490	
1110	2035	
1180	1500	

EB	WB	
2125	2825	3-4P
2100	2925	4-5P
2325	3225	5-6P
2000	2725	6-7P

870
870
880
765

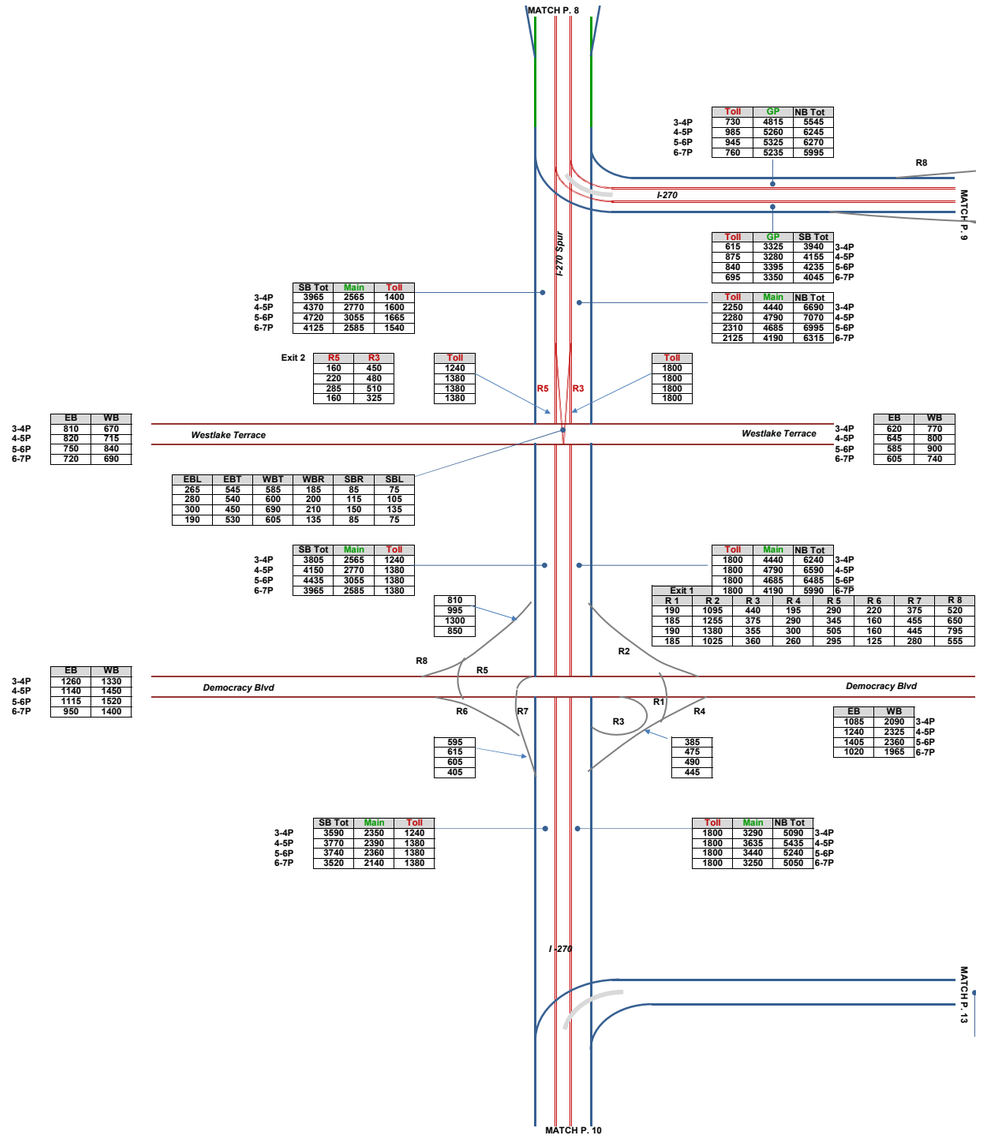
	SB Tot
3-4P	7905
4-5P	8525
5-6P	8955
6-7P	8170

GP	Toll
5890	2015
6050	2475
6450	2505
5935	2235

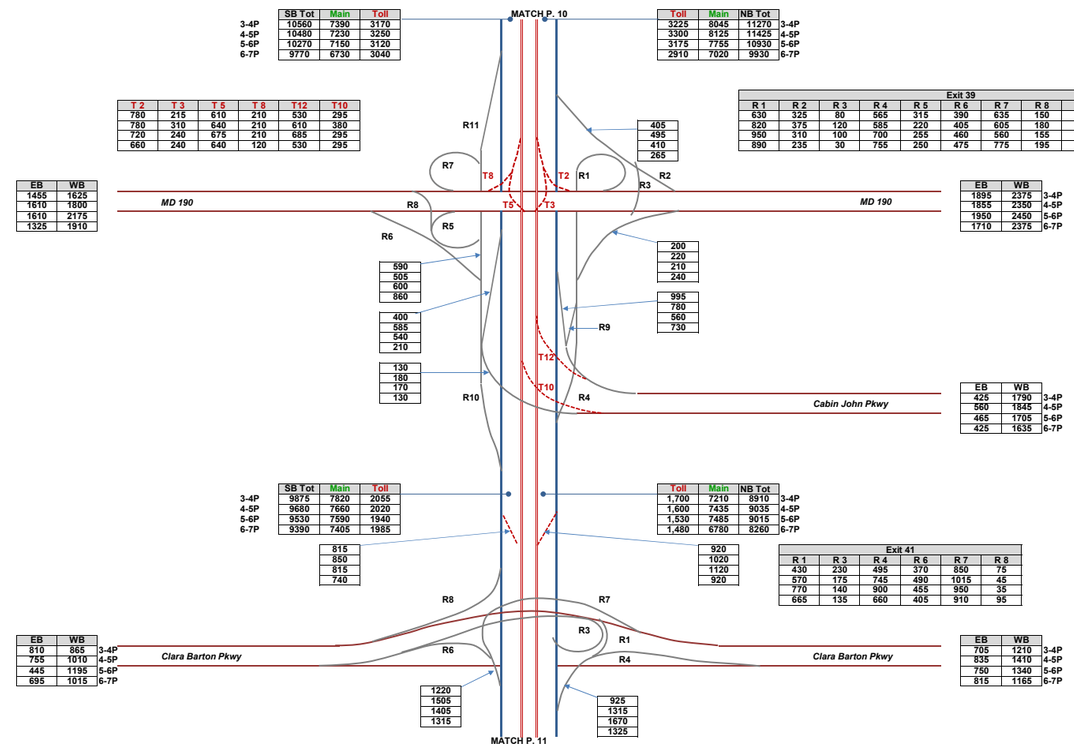
Toll	GP
2980	9255
3265	10050
3255	10010
2885	9425

NB Tot	
12235	3-4P
13315	4-5P
13265	5-6P
12310	6-7P

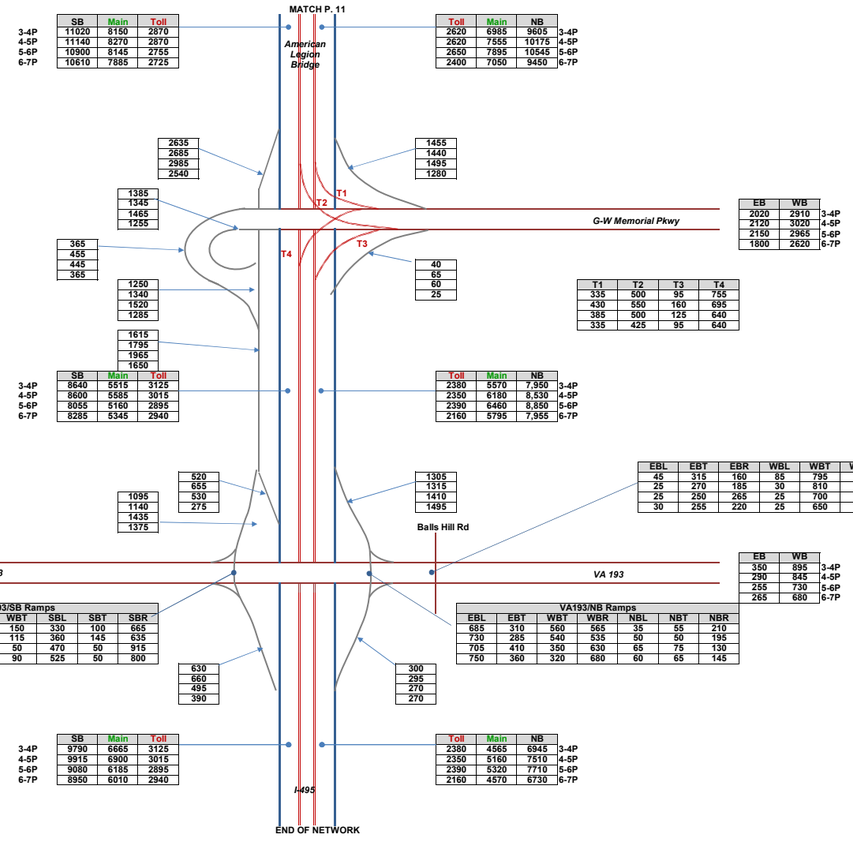
I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



	SB	Main	Toll
3-4P	11020	8150	2870
4-5P	11140	8270	2870
5-6P	10900	8145	2755
6-7P	10610	7885	2725

	Toll	Main	NB
3-4P	2620	6985	9605
4-5P	2620	7555	10175
5-6P	2650	7895	10545
6-7P	2400	7050	9450

	SB	Main	Toll
3-4P	8640	5515	3125
4-5P	8600	5585	3015
5-6P	8055	5160	2895
6-7P	8285	5345	2940

	Toll	Main	NB
3-4P	2380	5570	7,950
4-5P	2350	6180	8,530
5-6P	2390	6460	8,850
6-7P	2160	5795	7,955

	SB	Main	Toll
3-4P	9790	6665	3125
4-5P	9915	6900	3015
5-6P	9080	6185	2895
6-7P	8950	6010	2940

	Toll	Main	NB
3-4P	2380	4565	6945
4-5P	2350	5160	7510
5-6P	2390	5320	7710
6-7P	2160	4570	6730

	EB	WB
3-4P	2020	2910
4-5P	2120	3020
5-6P	2150	2965
6-7P	1800	2620

T1	T2	T3	T4
335	500	95	755
430	550	160	695
385	500	125	640
335	425	95	640

	EB	WB
3-4P	750	815
4-5P	695	750
5-6P	725	965
6-7P	635	890

	EB	WB
3-4P	350	895
4-5P	290	845
5-6P	255	730
6-7P	265	680

VA193/SB Ramps						
EBT	EBR	WBL	WBT	SBL	SBT	SBR
665	85	445	150	330	100	665
655	40	475	115	360	145	635
645	80	365	50	470	50	915
585	50	290	90	525	50	800

VA193/NB Ramps						
EBL	EBT	WBT	WBR	NBL	NBT	NBR
685	310	560	565	35	55	210
730	285	540	535	50	50	195
705	410	350	630	65	75	130
750	360	320	680	60	65	145

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
45	315	160	85	795	15	200	5	25	10	40	130
25	270	185	30	810	5	160	5	15	5	30	105
25	250	265	25	700	5	180	5	5	0	10	100
30	255	220	25	650	5	220	5	10	0	25	130

2635
2685
2985
2540

1455
1440
1495
1280

1385
1345
1465
1255

365
455
445
365

40
65
60
25

1250
1340
1520
1285

1615
1795
1965
1650

520
655
530
275

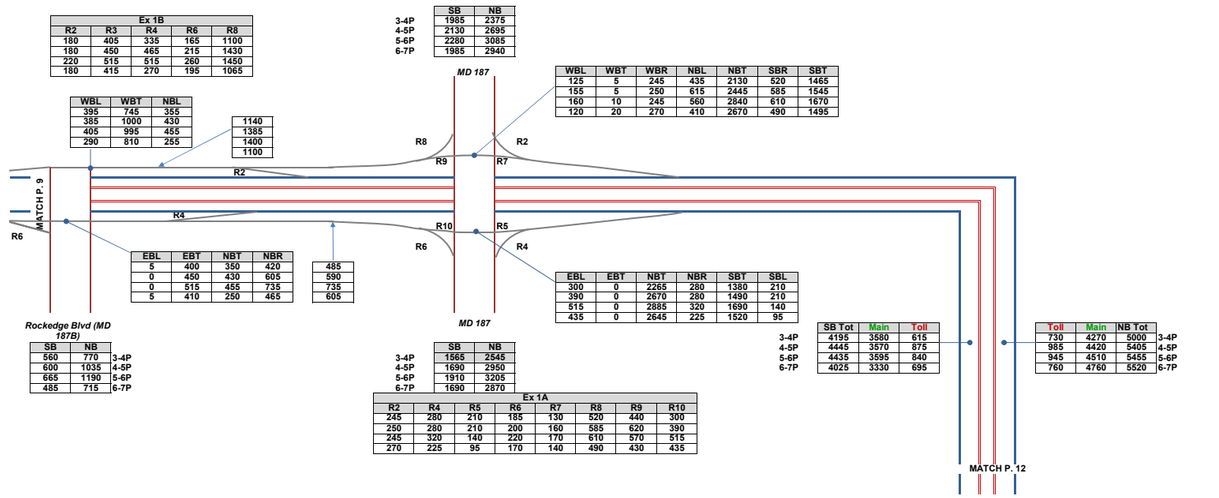
1095
1140
1435
1375

1305
1315
1410
1495

630
660
495
390

300
295
270
270

I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



Ex 1B				
R2	R3	R4	R6	R8
180	405	335	165	1100
180	450	465	215	1430
220	515	515	260	1450
180	415	270	195	1065

WBL	WBT	NBL
395	745	355
385	1000	430
405	995	455
290	810	255

1140
1385
1400
1100

	SB	NB
3-4P	1985	2375
4-5P	2130	2695
5-6P	2280	3085
6-7P	1985	2940

WBL	WBT	WBR	NBL	NBT	SBR	SBT
125	5	245	435	2130	520	1465
155	5	250	615	2445	585	1545
160	10	245	560	2640	610	1670
120	20	270	410	2670	490	1495

EBL	EBT	NBT	NBR
5	400	350	420
0	450	430	605
0	515	455	735
5	410	250	465

485
590
735
605

EBL	EBT	NBT	NBR	SBT	SBL
300	0	2265	280	1380	210
390	0	2670	280	1490	210
515	0	2885	320	1690	140
435	0	2645	225	1520	95

	SB Tot	Main	Toll
3-4P	4195	3580	615
4-5P	4445	3570	875
5-6P	4435	3595	840
6-7P	4025	3330	695

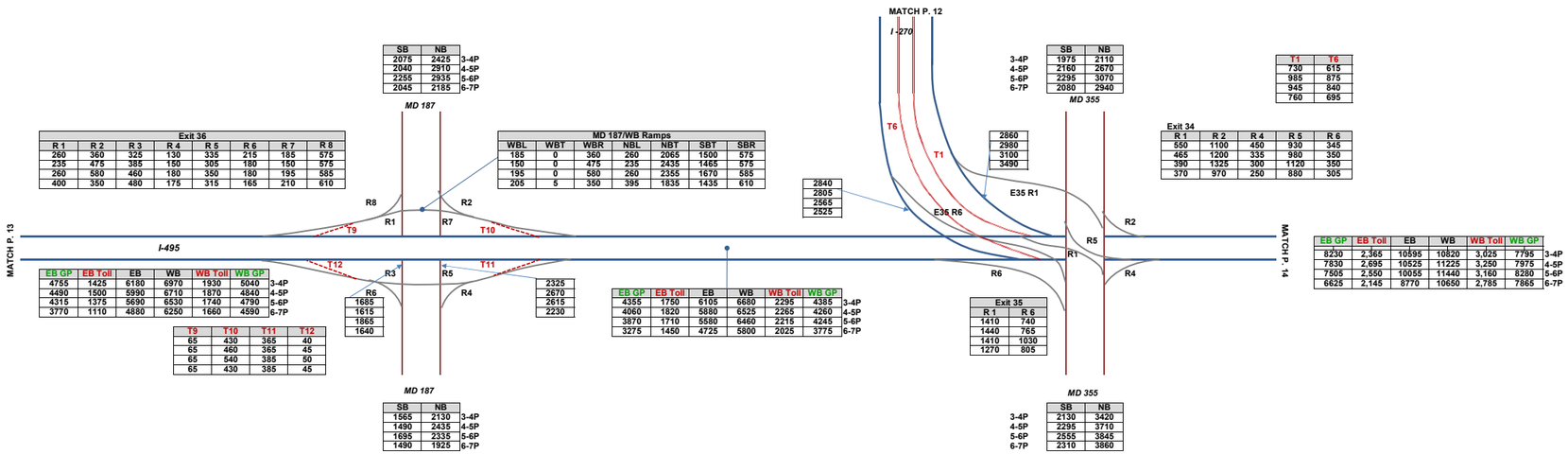
Toll	Main	NB Tot	
730	4270	6000	3-4P
985	4420	5405	4-5P
945	4510	5455	5-6P
760	4760	5820	6-7P

	SB	NB
3-4P	560	770
4-5P	600	1035
5-6P	665	1190
6-7P	485	715

	SB	NB
3-4P	1565	2545
4-5P	1690	2950
5-6P	1910	3205
6-7P	1690	2870

Ex 1A							
R2	R4	R5	R6	R7	R8	R9	R10
245	280	210	185	130	520	440	300
250	280	210	200	160	585	620	390
245	320	140	220	170	610	570	515
270	225	95	170	140	490	430	435

I-270 & I-495 West Side PM
Future Alternative 10 Peak Period Volumes



Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
260	360	325	130	335	215	185	575
235	475	385	150	305	180	150	575
260	580	460	180	350	180	195	585
400	350	480	175	315	165	210	610

SB	NB	
2075	2425	3-4P
2040	2910	4-5P
2255	2935	5-6P
2045	2185	6-7P

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
185	0	360	260	2065	1500	575
150	0	475	235	2435	1465	575
195	0	580	260	2355	1670	585
205	5	350	395	1835	1435	610

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4755	1425	6180	6970	1930	5040	3-4P
4490	1500	5990	6710	1870	4840	4-5P
4315	1375	5690	6530	1740	4790	5-6P
3770	1110	4880	6250	1660	4590	6-7P

T9	T10	T11	T12
65	430	365	40
65	460	365	45
65	540	385	50
65	430	385	45

R6
1685
1615
1865
1640

2325
2670
2615
2230

MD 187	
SB	NB
1665	2130
1490	2435
1695	2335
1490	1925

3-4P
4-5P
5-6P
6-7P

2840
2805
2565
2525

2860
2980
3100
3490

SB	NB	
1975	2110	3-4P
2160	2670	4-5P
2295	3070	5-6P
2080	2940	6-7P

MD 355	
SB	NB
2130	3420
2295	3710
2555	3845
2310	3860

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4355	1750	6105	6680	2295	4385	3-4P
4060	1820	5880	6525	2265	4260	4-5P
3870	1710	5580	6460	2215	4245	5-6P
3275	1450	4725	5800	2025	3775	6-7P

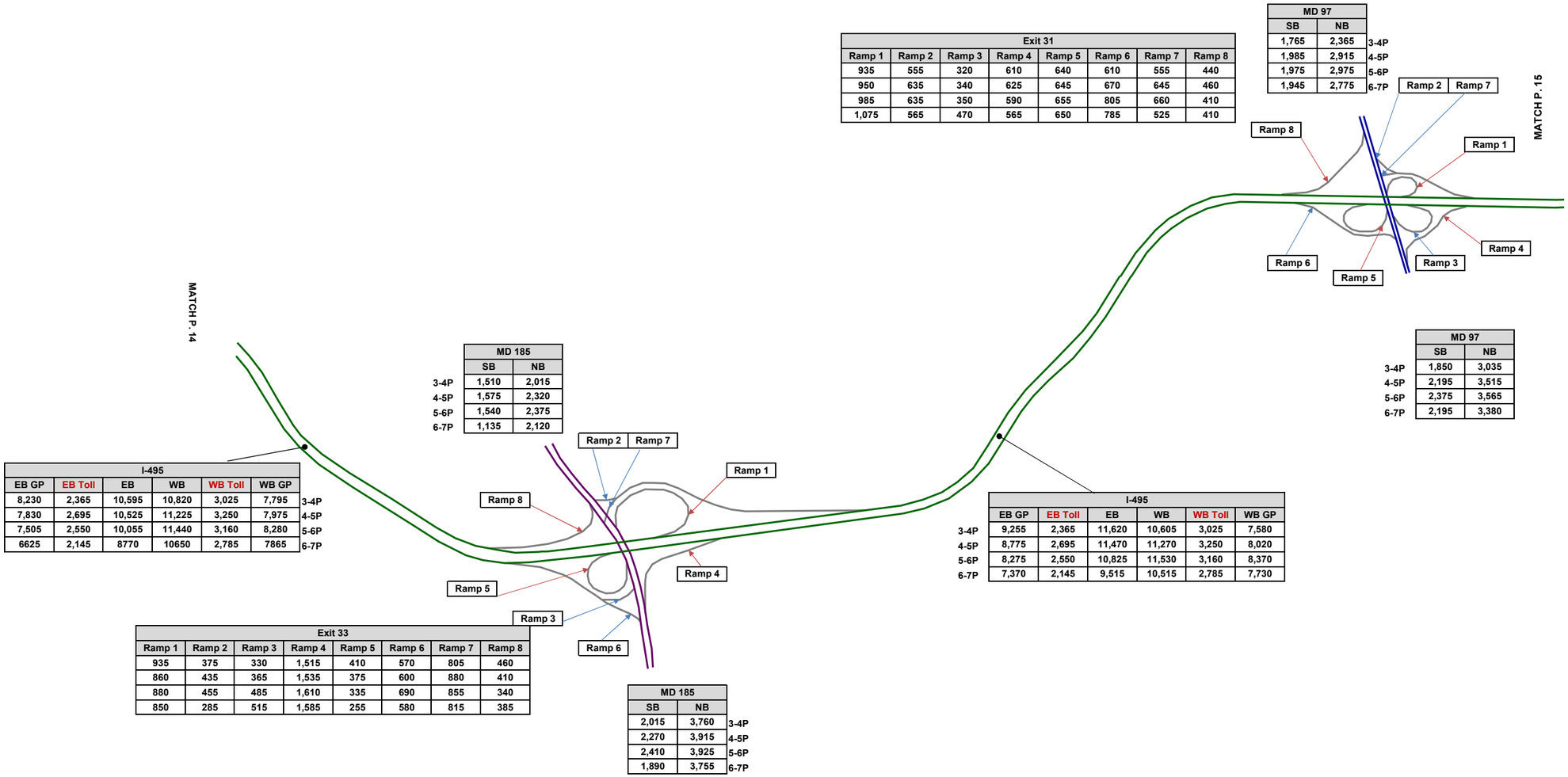
Exit 35	
R 1	R 6
1410	740
1440	765
1410	1030
1270	805

Exit 34				
R 1	R 2	R 4	R 5	R 6
550	1100	450	930	345
465	1200	335	980	350
390	1325	300	1120	350
370	970	250	880	305

T1	T6
730	615
985	875
945	840
760	695

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8230	2,365	10595	10820	3,025	7795	3-4P
7830	2,695	10525	11225	3,250	7975	4-5P
7505	2,550	10055	11440	3,160	8280	5-6P
6625	2,145	8770	10650	2,785	7865	6-7P

I-495 North Side PM
Future Alternative 10 Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
935	555	320	610	640	610	555	440
950	635	340	625	645	670	645	460
985	635	350	590	655	805	660	410
1,075	565	470	565	650	785	525	410

	MD 97	
	SB	NB
3-4P	1,765	2,365
4-5P	1,985	2,915
5-6P	1,975	2,975
6-7P	1,945	2,775

	MD 97	
	SB	NB
3-4P	1,850	3,035
4-5P	2,195	3,515
5-6P	2,375	3,565
6-7P	2,195	3,380

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,255	2,365	11,620	10,605	3,025	7,580
4-5P	8,775	2,695	11,470	11,270	3,250	8,020
5-6P	8,275	2,550	10,825	11,530	3,160	8,370
6-7P	7,370	2,145	9,515	10,515	2,785	7,730

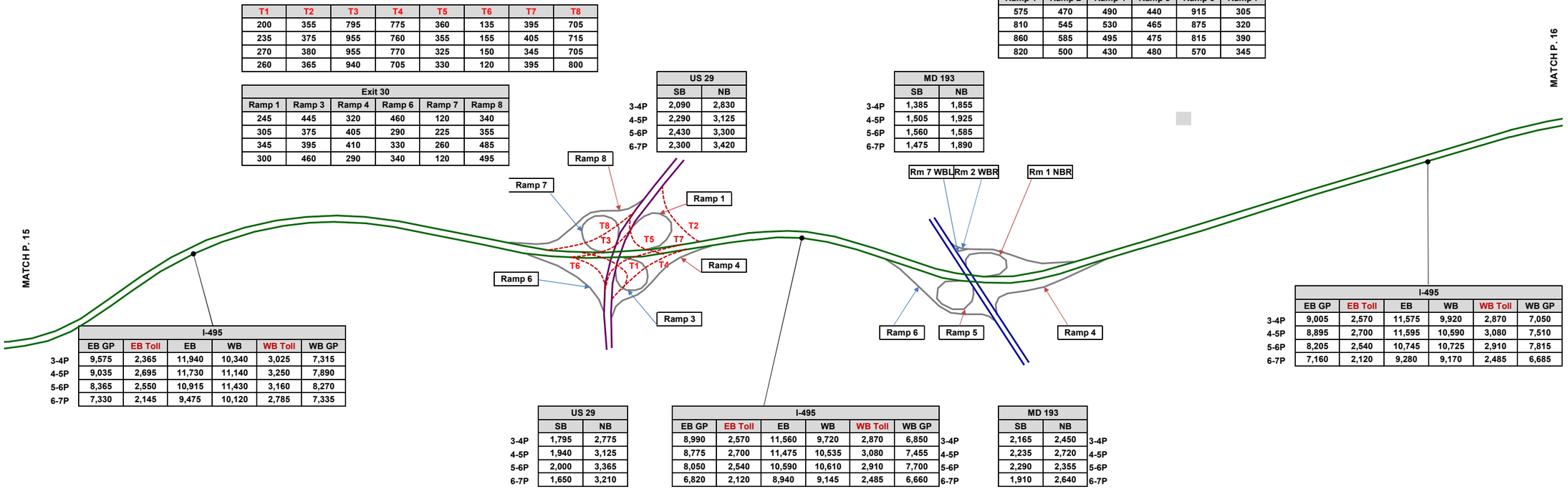
	MD 185	
	SB	NB
3-4P	1,510	2,015
4-5P	1,575	2,320
5-6P	1,540	2,375
6-7P	1,135	2,120

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,230	2,365	10,595	10,820	3,025	7,795
4-5P	7,830	2,695	10,525	11,225	3,250	7,975
5-6P	7,505	2,550	10,055	11,440	3,160	8,280
6-7P	6625	2,145	8770	10650	2,785	7865

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
935	375	330	1,515	410	570	805	460
860	435	365	1,535	375	600	880	410
880	455	485	1,610	335	690	855	340
850	285	515	1,585	255	580	815	385

	MD 185	
	SB	NB
3-4P	2,015	3,760
4-5P	2,270	3,915
5-6P	2,410	3,925
6-7P	1,890	3,755

I-495 North Side PM
Future Alternative 10 Peak Period Volumes



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,575	2,365	11,940	10,340	3,025	7,315
4-5P	9,035	2,695	11,730	11,140	3,250	7,890
5-6P	8,365	2,550	10,915	11,430	3,160	8,270
6-7P	7,330	2,145	9,475	10,120	2,785	7,335

T1	T2	T3	T4	T5	T6	T7	T8
200	355	795	775	360	135	395	705
235	375	955	760	355	155	405	715
270	380	955	770	325	150	345	705
260	365	940	705	330	120	395	800

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
245	445	320	460	120	340
305	375	405	290	225	355
345	395	410	330	260	485
300	460	290	340	120	495

	US 29	
	SB	NB
3-4P	2,090	2,830
4-5P	2,290	3,125
5-6P	2,430	3,300
6-7P	2,300	3,420

	US 29	
	SB	NB
3-4P	1,795	2,775
4-5P	1,940	3,125
5-6P	2,000	3,365
6-7P	1,650	3,210

	I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3-4P	8,990	2,570	11,560	9,720	2,870	6,850	3-4P
4-5P	8,775	2,700	11,475	10,535	3,080	7,455	4-5P
5-6P	8,050	2,540	10,590	10,610	2,910	7,700	5-6P
6-7P	6,820	2,120	8,940	9,145	2,485	6,660	6-7P

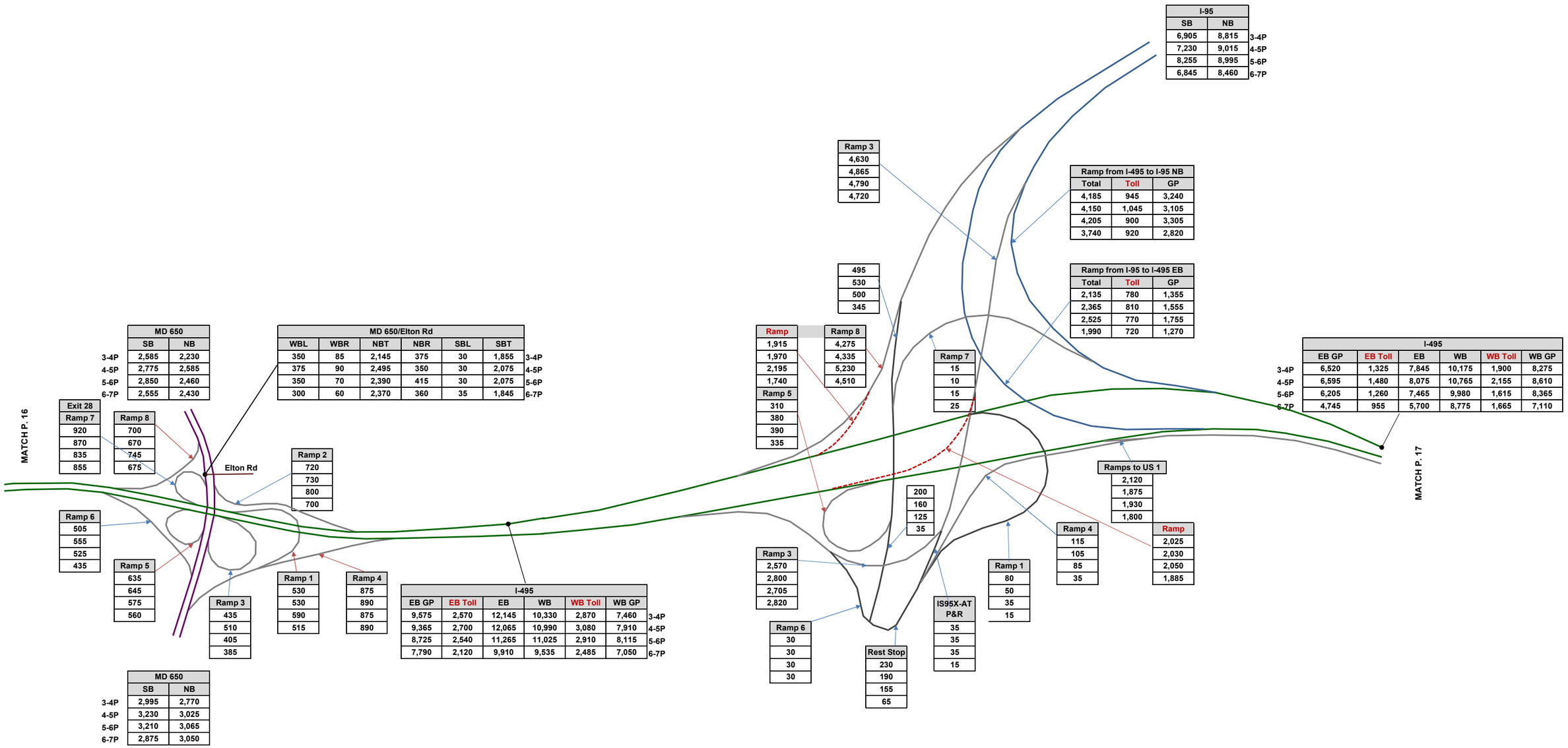
	MD 193		
	SB	NB	
3-4P	1,385	1,855	3-4P
4-5P	1,505	1,925	4-5P
5-6P	1,560	1,585	5-6P
6-7P	1,475	1,890	6-7P

	MD 193		
	SB	NB	
3-4P	2,165	2,450	3-4P
4-5P	2,235	2,720	4-5P
5-6P	2,290	2,355	5-6P
6-7P	1,910	2,640	6-7P

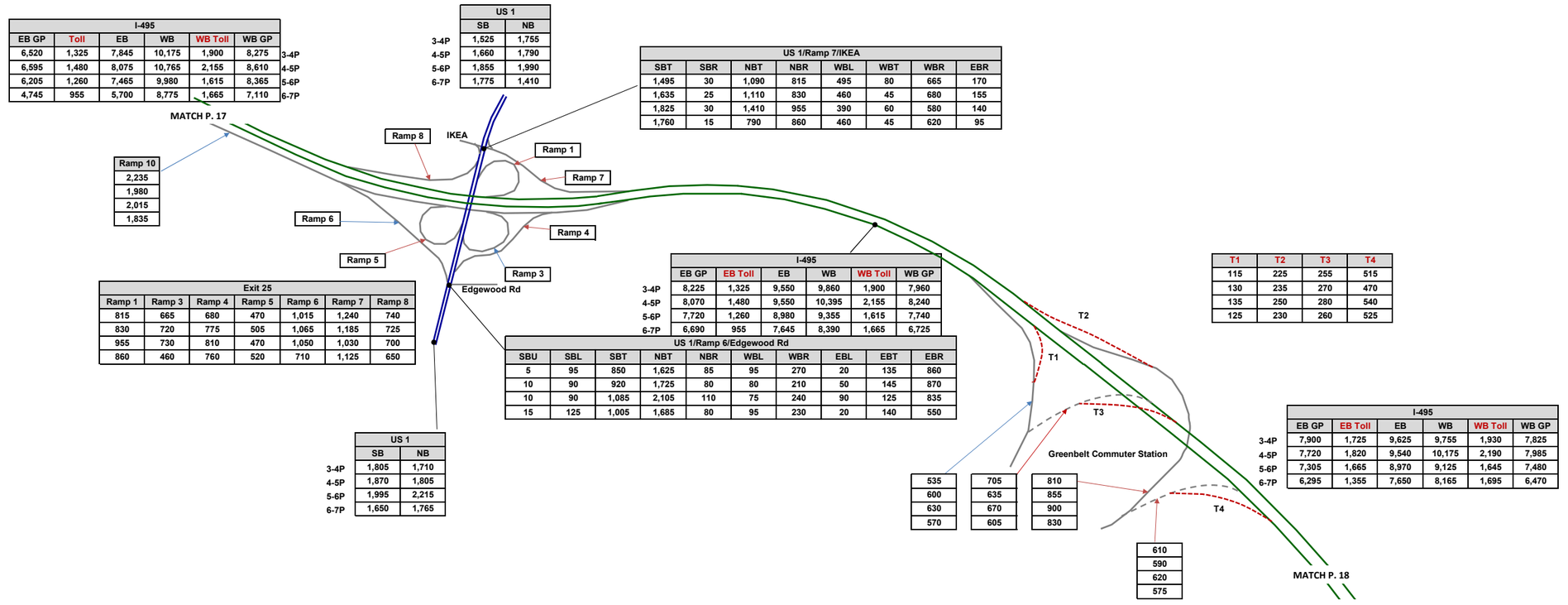
Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
575	470	490	440	915	305
810	545	530	465	875	320
860	585	495	475	815	390
820	500	430	480	570	345

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,005	2,570	11,575	9,920	2,870	7,050
4-5P	8,895	2,700	11,595	10,590	3,080	7,510
5-6P	8,205	2,540	10,745	10,725	2,910	7,815
6-7P	7,160	2,120	9,280	9,170	2,485	6,685

I-495 North Side PM
Future Alternative 10 Peak Period Volumes



I-495 North East Side PM
Future Alternative 10 Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,520	1,325	7,845	10,175	1,900	8,275	3-4P
6,595	1,480	8,075	10,765	2,155	8,610	4-5P
6,205	1,260	7,465	9,980	1,615	8,365	5-6P
4,745	955	5,700	8,775	1,665	7,110	6-7P

	US 1	
	SB	NB
3-4P	1,525	1,755
4-5P	1,660	1,790
5-6P	1,855	1,990
6-7P	1,775	1,410

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,495	30	1,090	815	495	80	665	170
1,635	25	1,110	830	460	45	680	155
1,825	30	1,410	955	390	60	580	140
1,760	15	790	860	460	45	620	95

Ramp 10
2,235
1,980
2,015
1,835

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
815	665	680	470	1,015	1,240	740
830	720	775	505	1,065	1,185	725
955	730	810	470	1,050	1,030	700
860	460	760	520	710	1,125	650

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,225	1,325	9,550	9,860	1,900	7,960	3-4P
8,070	1,480	9,550	10,395	2,155	8,240	4-5P
7,720	1,260	8,980	9,355	1,615	7,740	5-6P
6,690	955	7,645	8,390	1,665	6,725	6-7P

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	850	1,625	85	95	270	20	135	860
10	90	920	1,725	80	80	210	50	145	870
10	90	1,085	2,105	110	75	240	90	125	835
15	125	1,005	1,685	80	95	230	20	140	550

	US 1	
	SB	NB
3-4P	1,805	1,710
4-5P	1,870	1,805
5-6P	1,995	2,215
6-7P	1,650	1,765

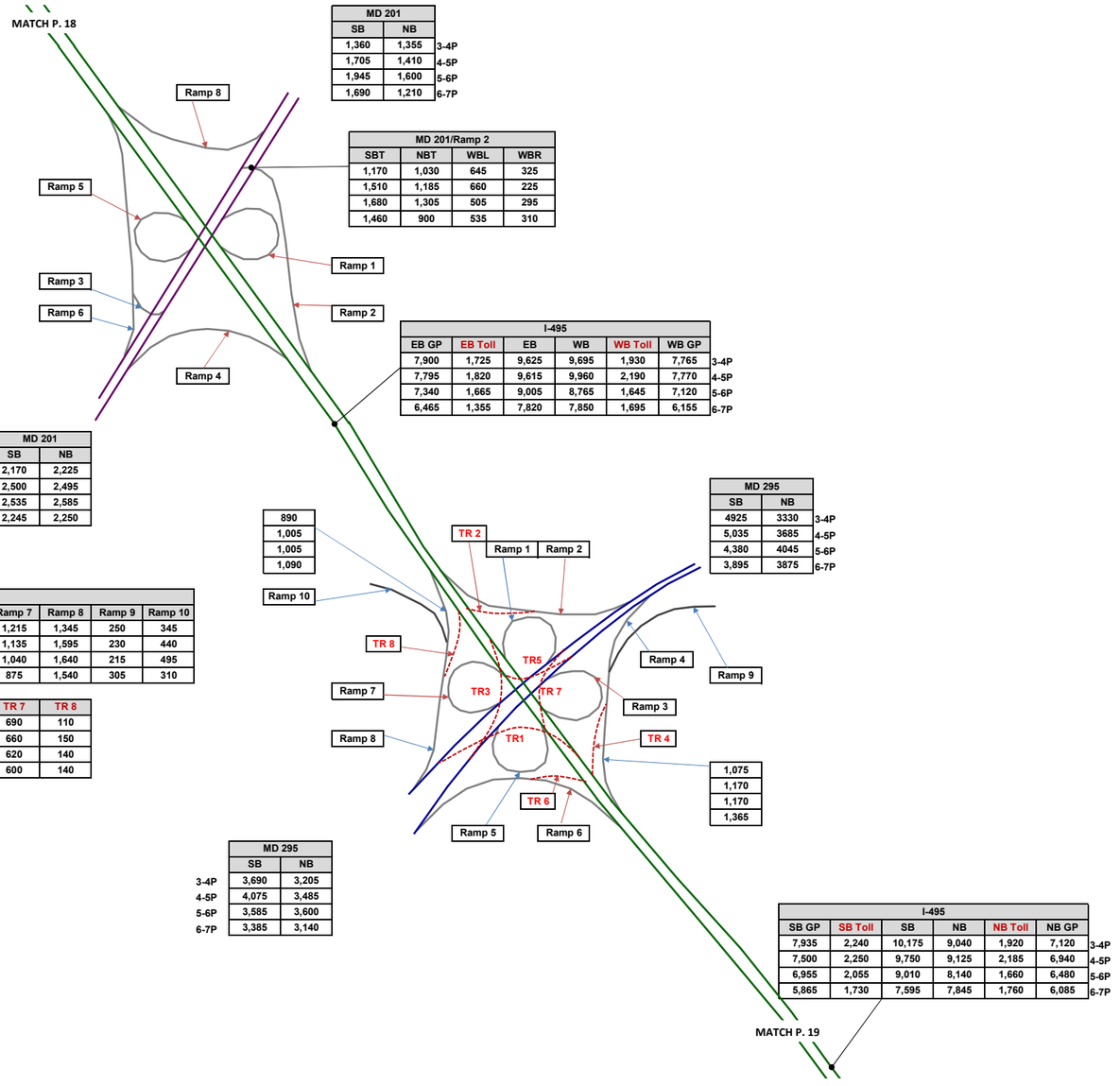
T1	T2	T3	T4
115	225	255	515
130	235	270	470
135	250	280	540
125	230	260	525

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,900	1,725	9,625	9,755	1,930	7,825	3-4P
7,720	1,820	9,540	10,175	2,190	7,985	4-5P
7,305	1,665	8,970	9,125	1,645	7,480	5-6P
6,295	1,355	7,650	8,165	1,695	6,470	6-7P

535	705	810
600	635	855
630	670	900
570	605	830

610
590
620
575

I-495 North East Side PM
Future Alternative 10 Peak Period Volumes



Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
840	970	405	760	635	990	190
905	885	390	795	695	1,025	195
895	800	340	725	695	1,045	265
930	845	250	670	680	930	230

MD 201		
SB	NB	
1,360	1,355	3-4P
1,705	1,410	4-5P
1,945	1,600	5-6P
1,690	1,210	6-7P

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
1,170	1,030	645	325
1,510	1,185	660	225
1,680	1,305	505	295
1,460	900	535	310

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,900	1,725	9,625	9,695	1,930	7,765	3-4P
7,795	1,820	9,615	9,960	2,190	7,770	4-5P
7,340	1,665	9,005	8,765	1,645	7,120	5-6P
6,465	1,355	7,820	7,850	1,695	6,155	6-7P

MD 201		
SB	NB	
2,170	2,225	3-4P
2,500	2,495	4-5P
2,535	2,585	5-6P
2,245	2,250	6-7P

MD 295		
SB	NB	
4925	3330	3-4P
5,035	3685	4-5P
4,380	4045	5-6P
3,895	3875	6-7P

890
1,005
1,005
1,090

1,075
1,170
1,170
1,365

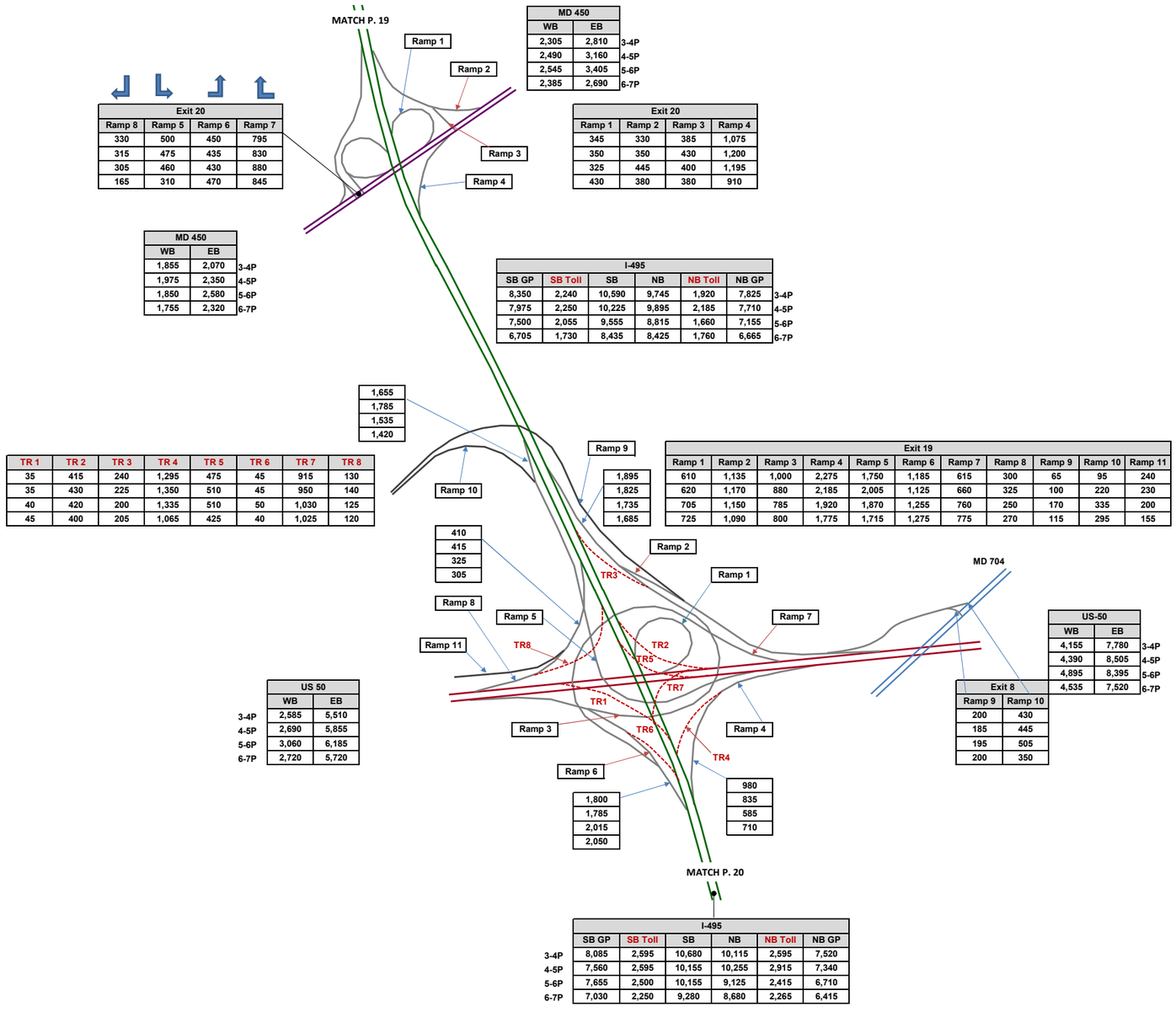
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
35	730	1,200	1,175	310	20	1,215	1,345	250	345
25	800	1,415	1,340	440	15	1,135	1,595	230	440
20	810	1,215	1,360	430	10	1,040	1,640	215	495
25	620	990	1,455	400	15	875	1,540	305	310

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	175	205	350	85	20	690	110
15	190	230	400	95	15	660	150
15	195	210	405	105	15	620	140
20	150	200	395	100	15	600	140

MD 295		
SB	NB	
3,690	3,205	3-4P
4,075	3,485	4-5P
3,585	3,600	5-6P
3,385	3,140	6-7P

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,935	2,240	10,175	9,040	1,920	7,120	3-4P
7,500	2,250	9,750	9,125	2,185	6,940	4-5P
6,955	2,055	9,010	8,140	1,660	6,480	5-6P
5,865	1,730	7,595	7,845	1,760	6,085	6-7P

I-495 North East Side PM
Future Alternative 10 Peak Period Volumes



MD 450		
WB	EB	
2,305	2,810	3-4P
2,490	3,160	4-5P
2,545	3,405	5-6P
2,385	2,690	6-7P

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
345	330	385	1,075
350	350	430	1,200
325	445	400	1,195
430	380	380	910

Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
330	500	450	795
315	475	435	830
305	460	430	880
165	310	470	845

MD 450		
WB	EB	
1,855	2,070	3-4P
1,975	2,350	4-5P
1,850	2,580	5-6P
1,755	2,320	6-7P

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,350	2,240	10,590	9,745	1,920	7,825	3-4P
7,975	2,250	10,225	9,895	2,185	7,710	4-5P
7,500	2,055	9,555	8,815	1,660	7,155	5-6P
6,705	1,730	8,435	8,425	1,760	6,665	6-7P

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
610	1,135	1,000	2,275	1,750	1,185	615	300	65	95	240
620	1,170	880	2,185	2,005	1,125	660	325	100	220	230
705	1,150	785	1,920	1,870	1,255	760	250	170	335	200
725	1,090	800	1,775	1,715	1,275	775	270	115	295	155

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
35	415	240	1,295	475	45	915	130
35	430	225	1,350	510	45	950	140
40	420	200	1,335	510	50	1,030	125
45	400	205	1,065	425	40	1,025	120

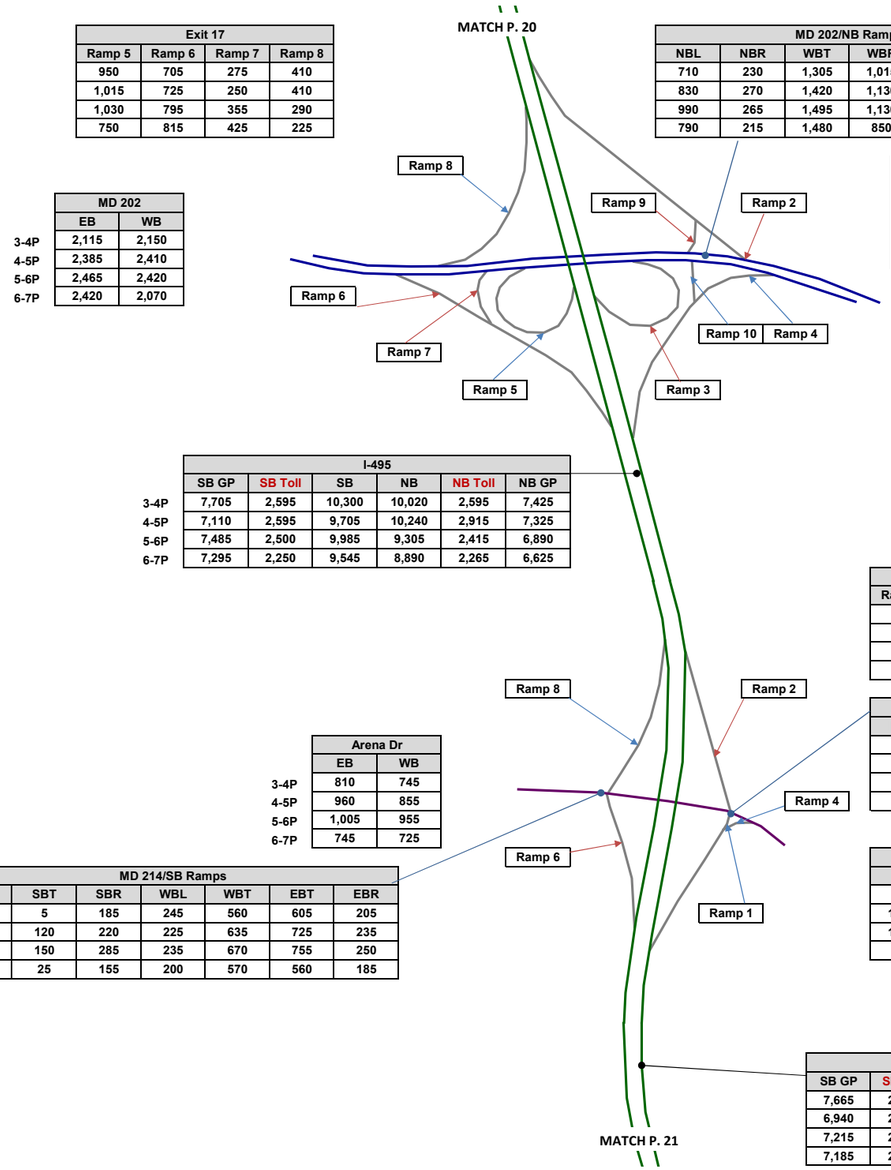
US 50		
WB	EB	
2,585	5,510	3-4P
2,690	5,855	4-5P
3,060	6,185	5-6P
2,720	5,720	6-7P

US-50		
WB	EB	
4,155	7,780	3-4P
4,390	8,505	4-5P
4,895	8,395	5-6P
4,535	7,520	6-7P

Exit 8	
Ramp 9	Ramp 10
200	430
185	445
195	505
200	350

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,085	2,595	10,680	10,115	2,595	7,520	3-4P
7,560	2,595	10,155	10,255	2,915	7,340	4-5P
7,655	2,500	10,155	9,125	2,415	6,710	5-6P
7,030	2,250	9,280	8,680	2,265	6,415	6-7P

I-495 East Side PM
Future Alternative 10 Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
950	705	275	410
1,015	725	250	410
1,030	795	355	290
750	815	425	225

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
710	230	1,305	1,015	15	2,085
830	270	1,420	1,130	10	2,440
990	265	1,495	1,130	20	2,510
790	215	1,480	850	15	2,175

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,015	260	255	15	940
1,130	225	250	10	1,100
1,130	170	245	20	1,255
850	165	235	15	1,005

	MD 202	
	EB	WB
3-4P	2,115	2,150
4-5P	2,385	2,410
5-6P	2,465	2,420
6-7P	2,420	2,070

	MD 202		
	SB	NB	
	2,570	2,320	3-4P
	2,960	2,550	4-5P
	3,020	2,625	5-6P
	2,625	2,330	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,705	2,595	10,300	10,020	2,595	7,425
4-5P	7,110	2,595	9,705	10,240	2,915	7,325
5-6P	7,485	2,500	9,985	9,305	2,415	6,890
6-7P	7,295	2,250	9,545	8,890	2,265	6,625

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
150	455	255	455	495
165	475	260	580	750
170	445	295	635	905
170	405	235	410	520

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
150	0	255	655	230	225	685
165	0	260	695	225	250	885
160	10	295	745	205	230	995
165	5	235	605	165	235	665

	Arena Dr	
	EB	WB
3-4P	810	745
4-5P	960	855
5-6P	1,005	955
6-7P	745	725

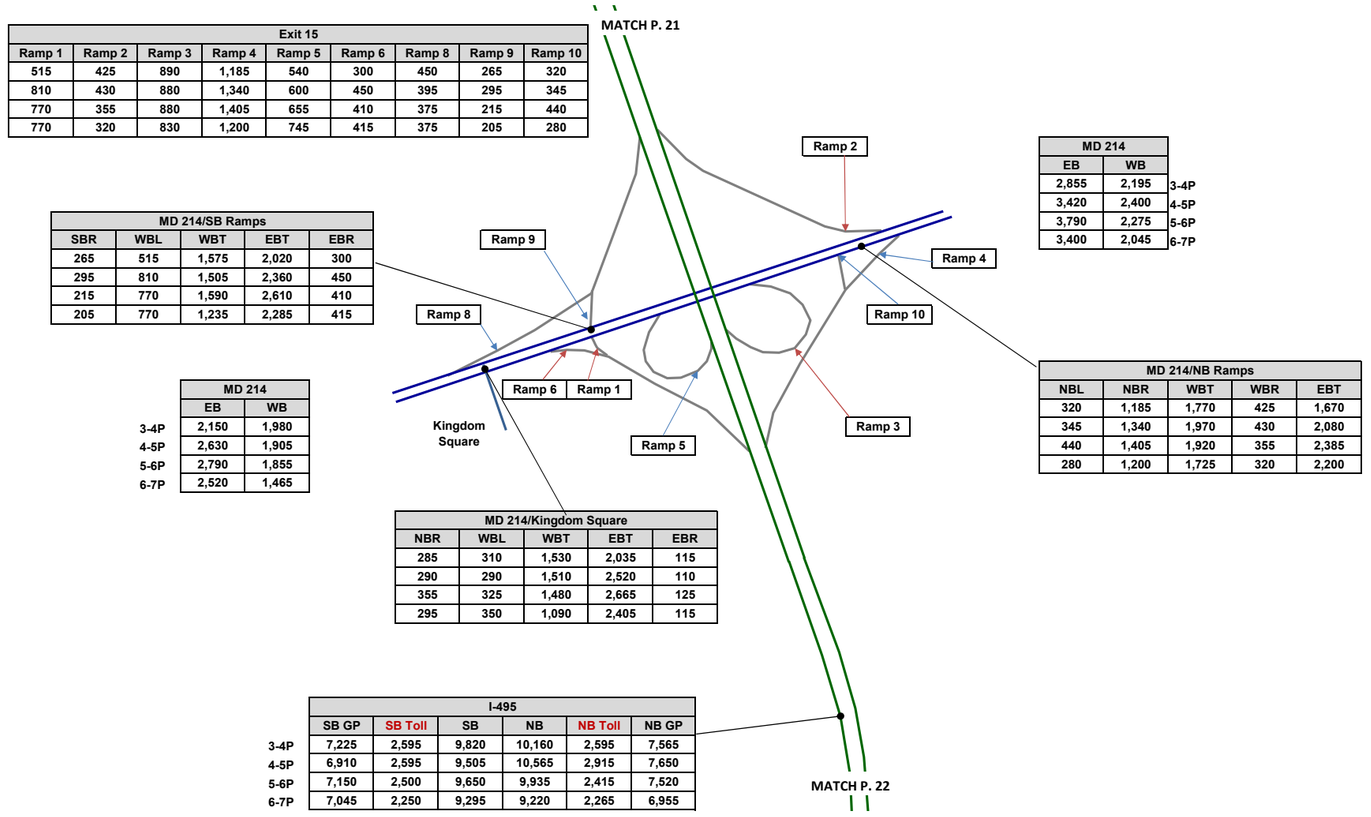
MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
305	5	185	245	560	605	205
410	120	220	225	635	725	235
470	150	285	235	670	755	250
340	25	155	200	570	560	185

	Arena Dr		
	EB	WB	
	940	885	3-4P
	1,145	920	4-5P
	1,290	950	5-6P
	900	770	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
	7,665	2,595	10,260	9,970	2,595	7,375
	6,940	2,595	9,535	10,190	2,915	7,275
	7,215	2,500	9,715	9,325	2,415	6,910
	7,185	2,250	9,435	8,890	2,265	6,625

3-4P
4-5P
5-6P
6-7P

I-495 East Side PM
Future Alternative 10 Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	425	890	1,185	540	300	450	265	320
810	430	880	1,340	600	450	395	295	345
770	355	880	1,405	655	410	375	215	440
770	320	830	1,200	745	415	375	205	280

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
265	515	1,575	2,020	300
295	810	1,505	2,360	450
215	770	1,590	2,610	410
205	770	1,235	2,285	415

MD 214		
EB	WB	
2,855	2,195	3-4P
3,420	2,400	4-5P
3,790	2,275	5-6P
3,400	2,045	6-7P

MD 214		
EB	WB	
2,150	1,980	3-4P
2,630	1,905	4-5P
2,790	1,855	5-6P
2,520	1,465	6-7P

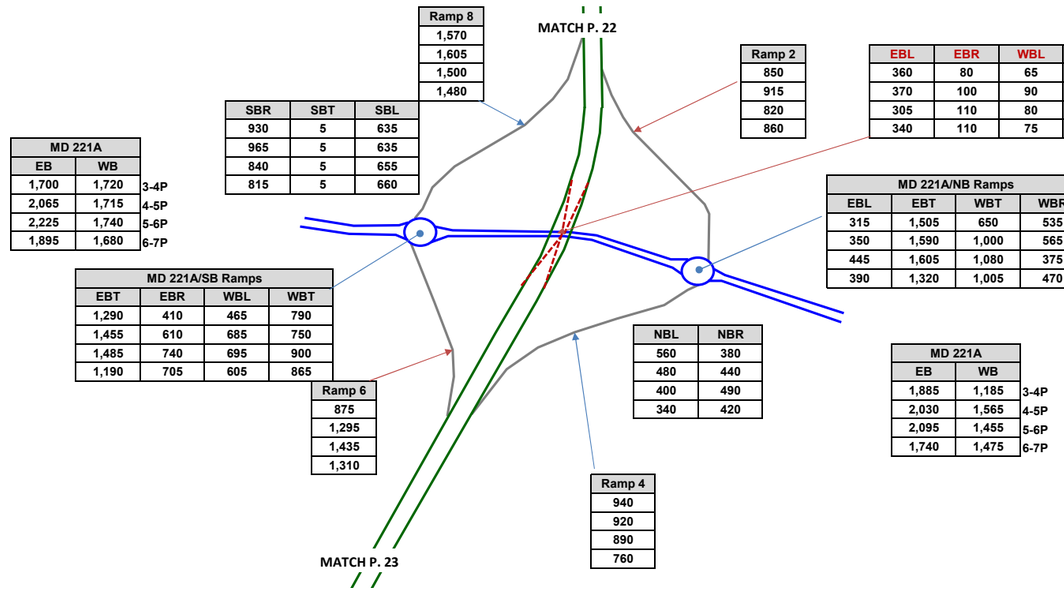
MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
320	1,185	1,770	425	1,670
345	1,340	1,970	430	2,080
440	1,405	1,920	355	2,385
280	1,200	1,725	320	2,200

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
285	310	1,530	2,035	115
290	290	1,510	2,520	110
355	325	1,480	2,665	125
295	350	1,090	2,405	115

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,225	2,595	9,820	10,160	2,595	7,565
6,910	2,595	9,505	10,565	2,915	7,650
7,150	2,500	9,650	9,935	2,415	7,520
7,045	2,250	9,295	9,220	2,265	6,955

3-4P
4-5P
5-6P
6-7P

I-495 East Side PM
Future Alternative 10 Peak Period Volumes



Ramp 8
1,570
1,605
1,500
1,480

SBR	SBT	SBL
930	5	635
965	5	635
840	5	655
815	5	660

MD 221A		
EB	WB	
1,700	1,720	3-4P
2,065	1,715	4-5P
2,225	1,740	5-6P
1,895	1,680	6-7P

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,290	410	465	790
1,455	610	685	750
1,485	740	695	900
1,190	705	605	865

Ramp 6
875
1,295
1,435
1,310

Ramp 2
850
915
820
860

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
360	80	65	455	90	70	265	475
370	100	90	520	85	70	250	480
305	110	80	320	65	70	255	450
340	110	75	310	60	70	240	450

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
315	1,505	650	535
350	1,590	1,000	565
445	1,605	1,080	375
390	1,320	1,005	470

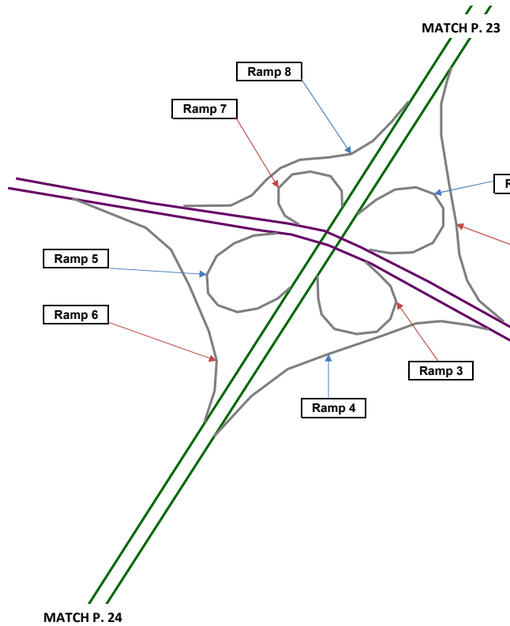
NBL	NBR
560	380
480	440
400	490
340	420

Ramp 4
940
920
890
760

MD 221A		
EB	WB	
1,885	1,185	3-4P
2,030	1,565	4-5P
2,095	1,455	5-6P
1,740	1,475	6-7P

I-495 East Side PM
Future Alternative 10 Peak Period Volumes

MD 4		
SB	NB	
2,325	1,745	3-4P
2,665	1,875	4-5P
2,715	1,850	5-6P
2,540	1,650	6-7P

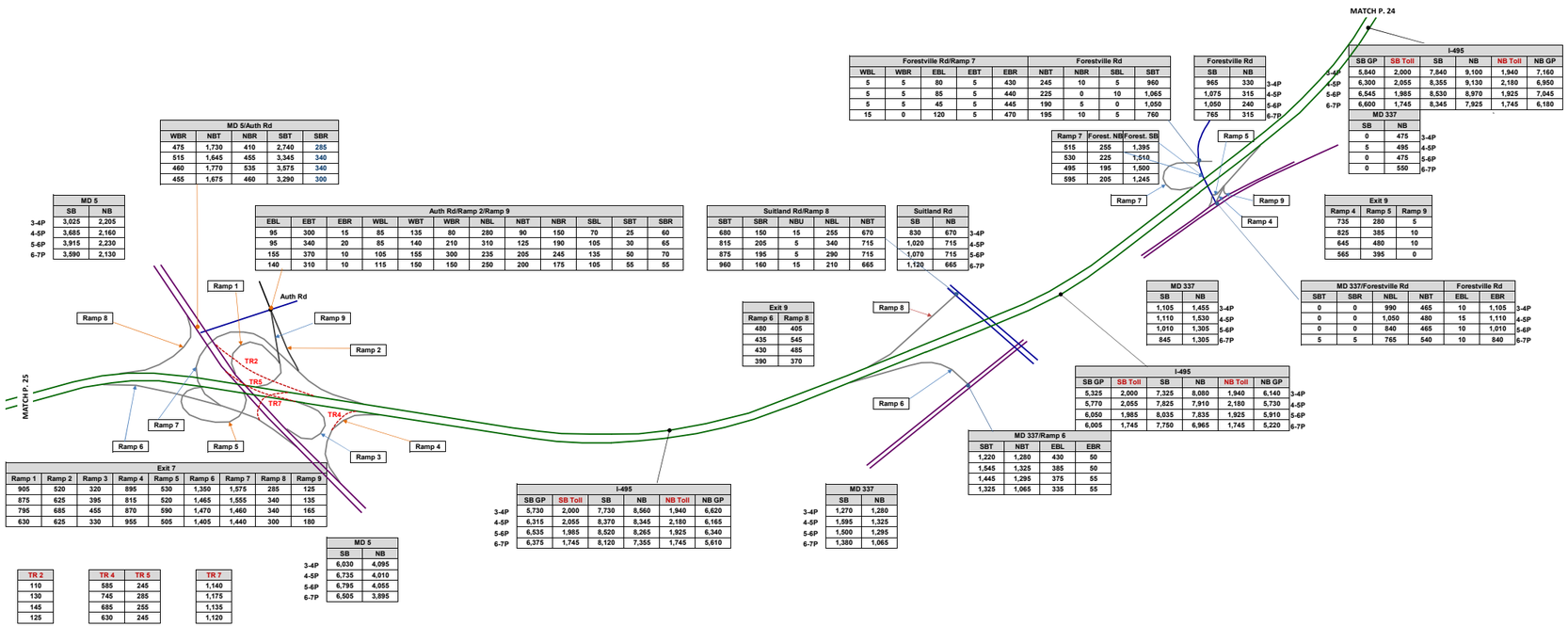


Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
695	1,310	905	1,025	1,185	525	715	745
765	1,310	980	820	1,120	765	820	765
745	1,130	960	800	1,045	625	685	805
690	1,025	1,055	715	930	805	655	805

MD 4		
SB	NB	
3,105	2,330	3-4P
2,860	2,475	4-5P
2,975	2,115	5-6P
2,325	1,835	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,840	2,000	7,840	9,100	1,940	7,160
4-5P	6,300	2,055	8,355	9,130	2,180	6,950
5-6P	6,545	1,985	8,530	8,970	1,925	7,045
6-7P	6,600	1,745	8,345	7,925	1,745	6,180

I-495 South Side PM
Future Alternative 10 Peak Period Volumes



MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
475	1,730	410	2,740	285
515	1,645	455	3,345	340
460	1,770	535	3,575	340
455	1,675	460	3,290	300

	MD 5	
	SB	NB
3-4P	3,025	2,205
4-5P	3,685	2,160
5-6P	3,915	2,230
6-7P	3,590	2,130

Auth Rd/Ramp 2/Ramp 9												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
95	300	15	85	135	80	280	90	150	70	25	60
95	340	20	85	140	210	310	125	190	105	30	65
155	370	10	105	155	300	235	205	245	135	50	70
140	310	10	115	150	150	250	200	175	105	55	55

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
680	150	15	255	670
815	205	5	340	715
875	195	5	290	715
960	160	15	210	665

Suitland Rd		
SB	NB	
830	670	3-4P
1,020	715	4-5P
1,070	715	5-6P
1,120	665	6-7P

Exit 9	
Ramp 6	Ramp 8
480	405
435	545
430	485
390	370

Forestville Rd/Ramp 7								
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
5	5	80	5	430	245	10	5	960
5	5	85	5	440	225	0	10	1,065
5	5	45	5	445	190	5	0	1,050
15	0	120	5	470	195	10	5	760

Forestville Rd		
SB	NB	
965	330	3-4P
1,075	315	4-5P
1,050	240	5-6P
765	315	6-7P

Ramp 7	Forest. NB	Forest. SB
515	255	1,395
530	225	1,510
495	195	1,500
595	205	1,245

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,840	2,000	7,840	9,100	1,940	7,160	3-4P
6,300	2,055	8,355	9,130	2,180	6,950	4-5P
6,545	1,985	8,530	8,970	1,925	7,045	5-6P
6,600	1,745	8,345	7,925	1,745	6,180	6-7P

MD 337	
SB	NB
0	475
5	495
0	475
0	550

Exit 9		
Ramp 4	Ramp 5	Ramp 9
735	280	5
825	385	10
645	480	10
565	395	0

MD 337	
SB	NB
1,105	1,455
1,110	1,530
1,010	1,305
845	1,305

MD 337/Forestville Rd				Forestville Rd		
SBT	SBR	NBL	NBT	EBL	EBR	
0	0	990	465	10	1,105	3-4P
0	0	1,050	480	15	1,110	4-5P
0	0	840	465	10	1,010	5-6P
5	5	765	540	10	840	6-7P

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,325	2,000	7,325	8,080	1,940	6,140	3-4P
5,770	2,055	7,825	7,910	2,180	5,730	4-5P
6,050	1,985	8,035	7,835	1,925	5,910	5-6P
6,005	1,745	7,750	6,965	1,745	5,220	6-7P

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,280	430	50
1,545	1,325	385	50
1,445	1,295	375	55
1,325	1,065	335	55

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
905	520	320	895	530	1,350	1,575	285	125
875	625	395	815	520	1,465	1,555	340	135
795	685	455	870	590	1,470	1,460	340	165
630	625	330	955	505	1,405	1,440	300	180

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,730	2,000	7,730	8,560	1,940	6,620	3-4P
6,315	2,055	8,370	8,345	2,180	6,165	4-5P
6,535	1,985	8,520	8,265	1,925	6,340	5-6P
6,375	1,745	8,120	7,355	1,745	5,610	6-7P

MD 337	
SB	NB
1,270	1,280
1,595	1,325
1,500	1,295
1,380	1,065

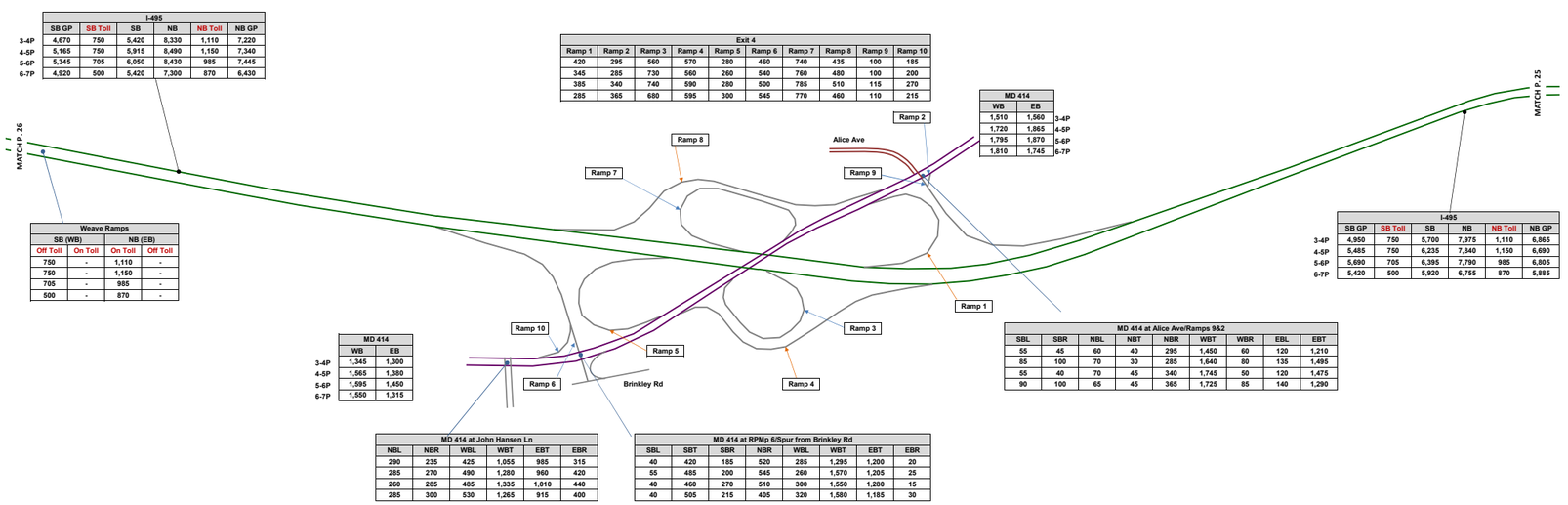
MD 5	
SB	NB
6,030	4,095
6,735	4,010
6,795	4,055
6,505	3,895

TR 2
110
130
145
125

TR 4	TR 5
585	245
745	285
685	255
630	245

TR 7
1,140
1,175
1,135
1,120

I-495 South Side PM
Future Alternative 10 Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,670	750	5,420	8,330	1,110	7,220
4-5P	5,165	750	5,915	8,490	1,150	7,340
5-6P	5,345	705	6,050	8,430	985	7,445
6-7P	4,920	500	5,420	7,300	870	6,430

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
750	-	1,110	-
750	-	1,150	-
705	-	985	-
500	-	870	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
420	295	560	570	280	460	740	435	100	185
345	285	730	560	260	540	760	480	100	200
385	340	740	590	280	500	785	510	115	270
285	365	680	595	300	545	770	460	110	215

MD 414		
WB	EB	
1,510	1,560	3-4P
1,720	1,865	4-5P
1,795	1,870	5-6P
1,810	1,745	6-7P

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,950	750	5,700	7,975	1,110	6,865
4-5P	5,485	750	6,235	7,840	1,150	6,690
5-6P	5,690	705	6,395	7,790	985	6,805
6-7P	5,420	500	5,920	6,755	870	5,885

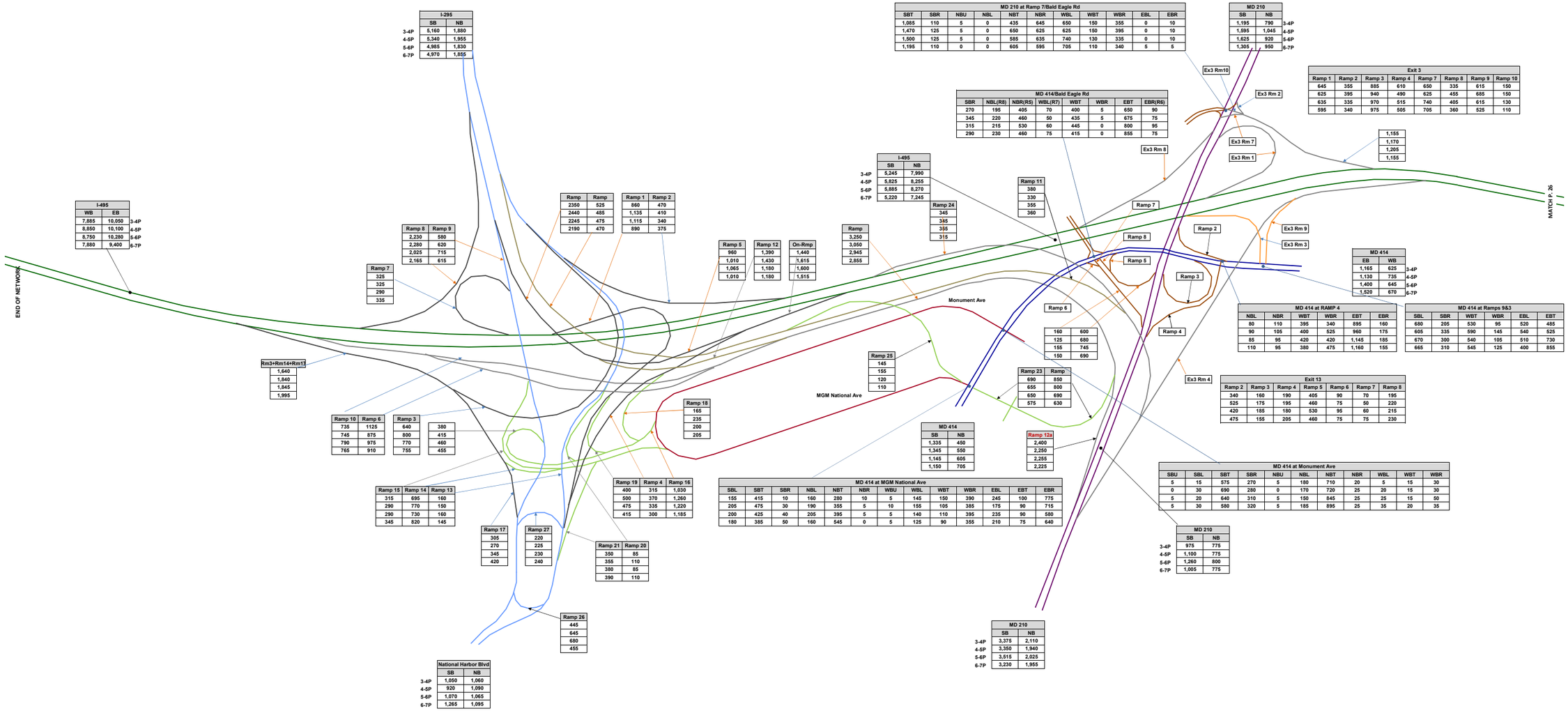
MD 414		
WB	EB	
1,345	1,300	3-4P
1,565	1,380	4-5P
1,595	1,450	5-6P
1,550	1,315	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
55	45	60	40	295	1,450	60	120	1,210
85	100	70	30	285	1,640	80	135	1,495
55	40	70	45	340	1,745	50	120	1,475
90	100	65	45	365	1,725	85	140	1,290

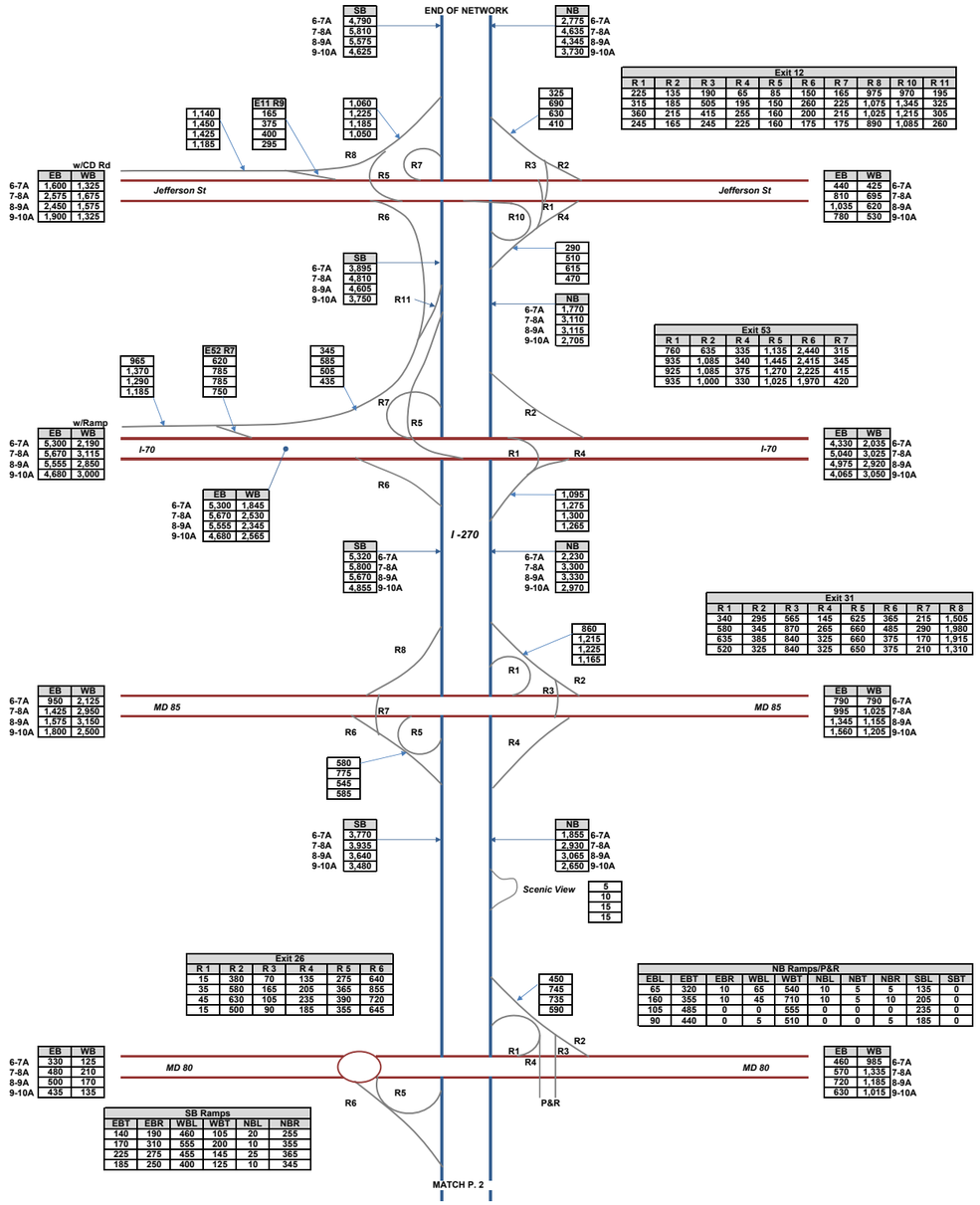
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
290	235	425	1,055	985	315
285	270	490	1,250	960	420
260	285	485	1,335	1,010	440
285	300	530	1,265	915	400

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
40	420	185	520	285	1,295	1,200	20
55	485	200	545	260	1,570	1,205	25
40	460	270	510	300	1,550	1,280	15
40	505	215	405	320	1,580	1,185	30

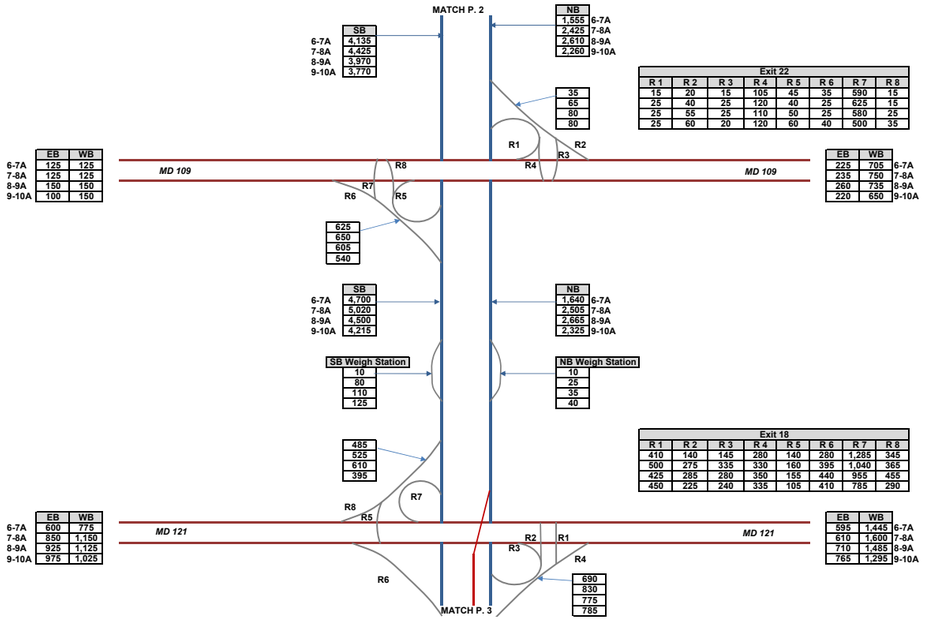
I-495 South Side PM
Future Alternative 10 Peak Period Volumes



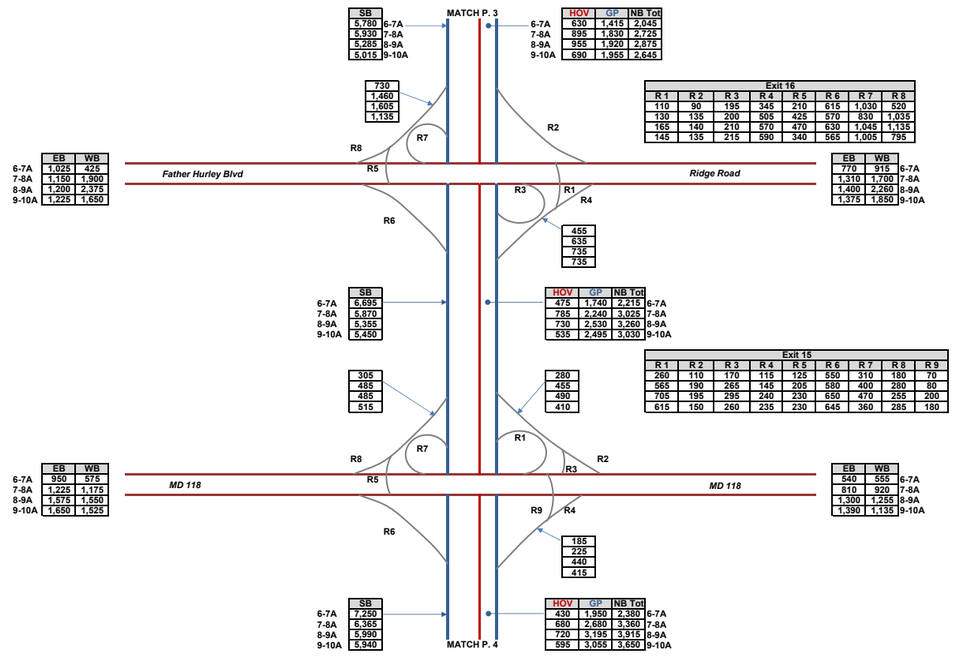
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



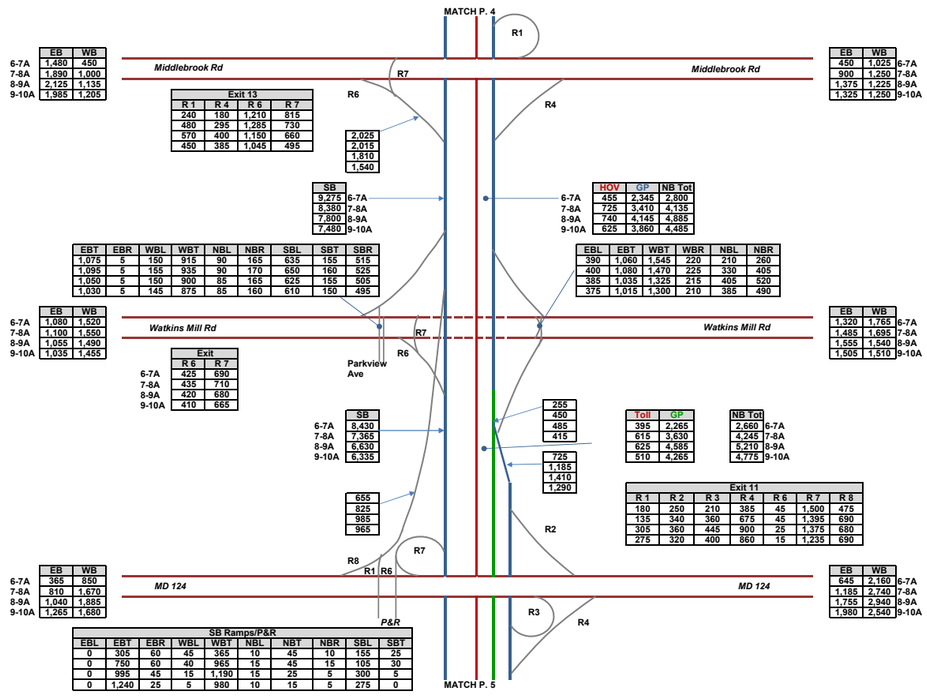
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



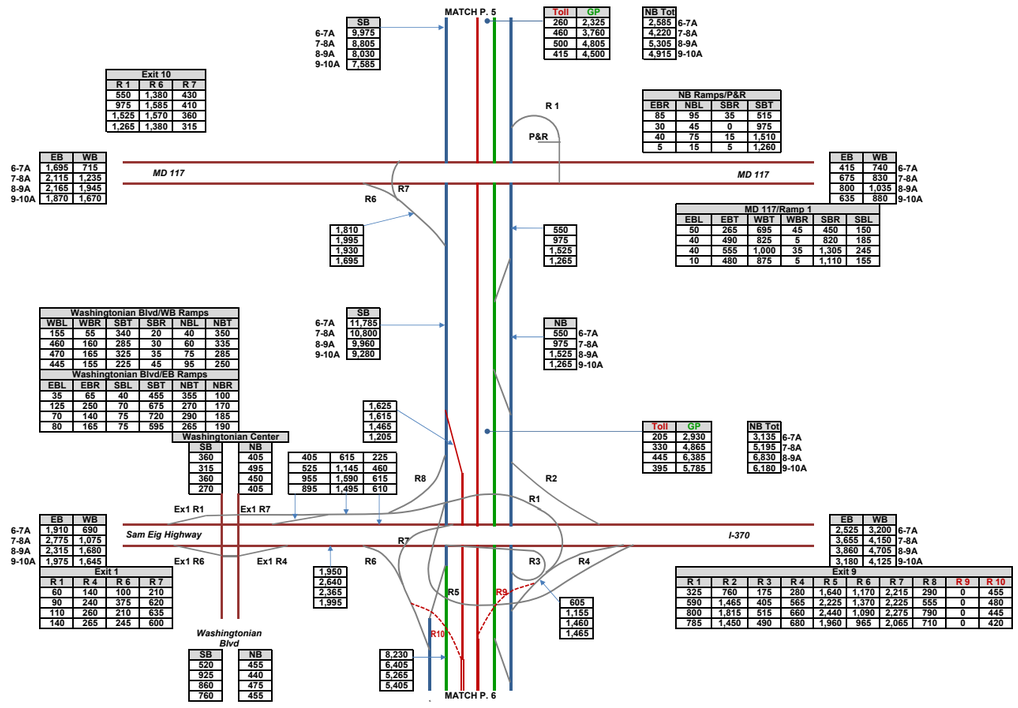
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



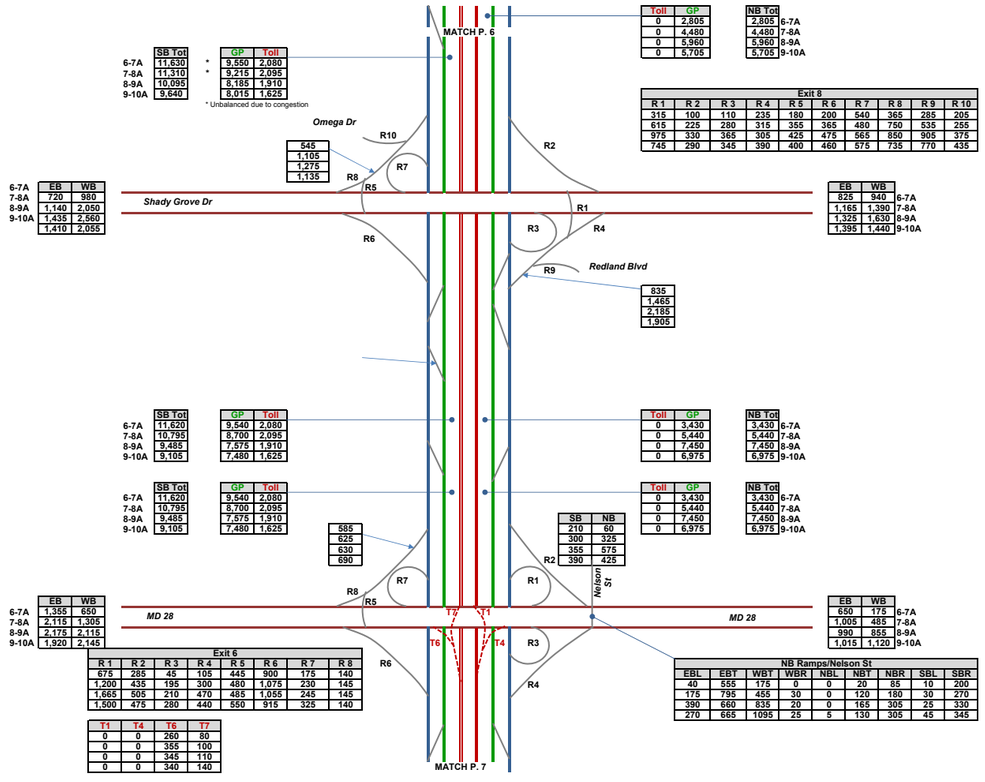
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



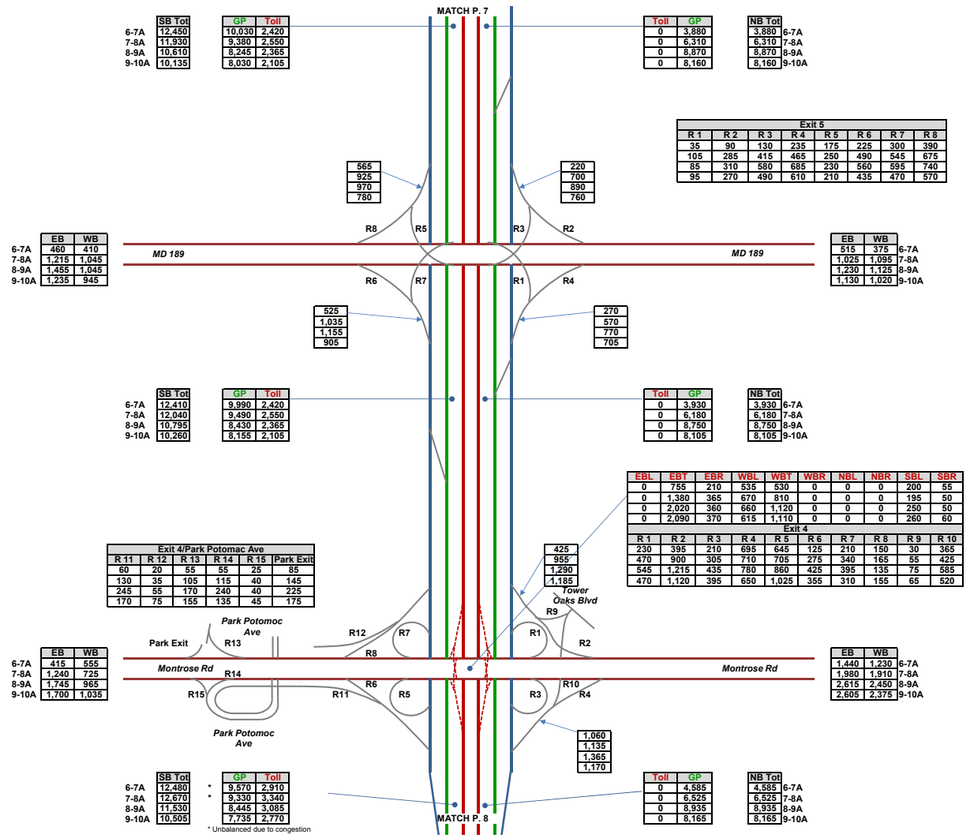
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



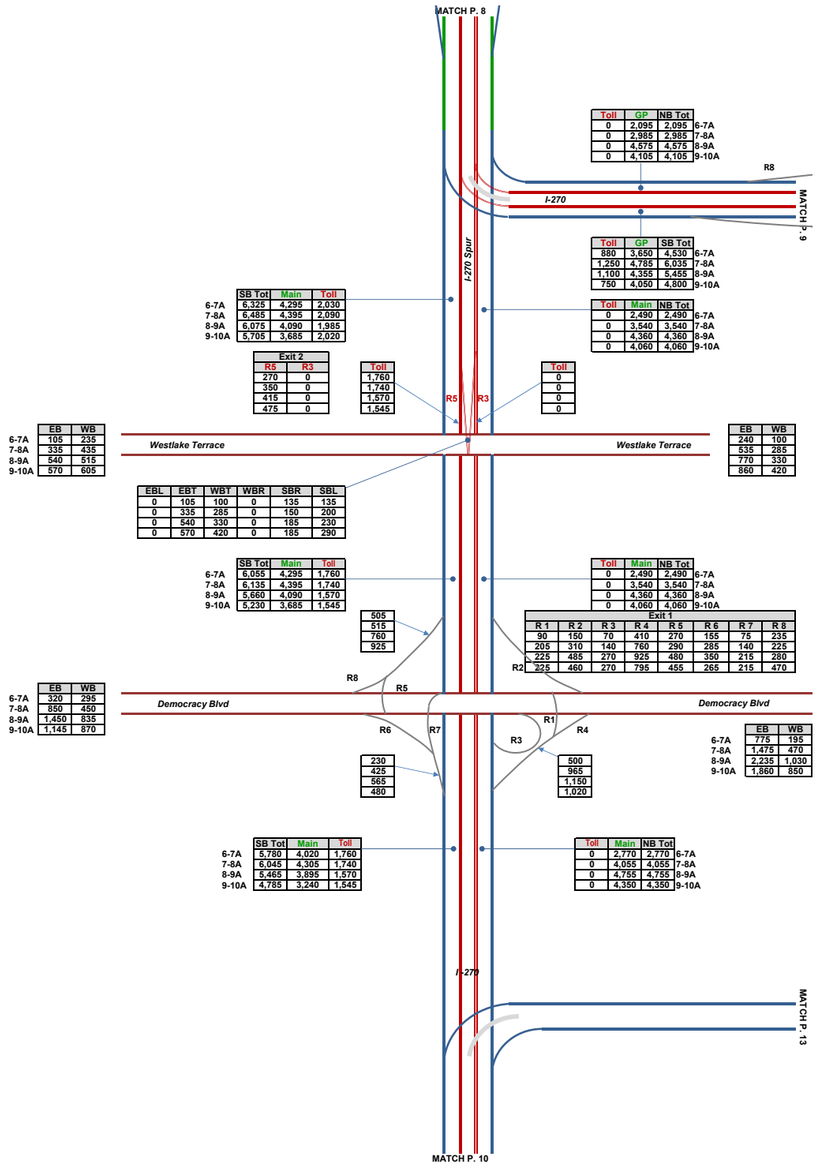
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



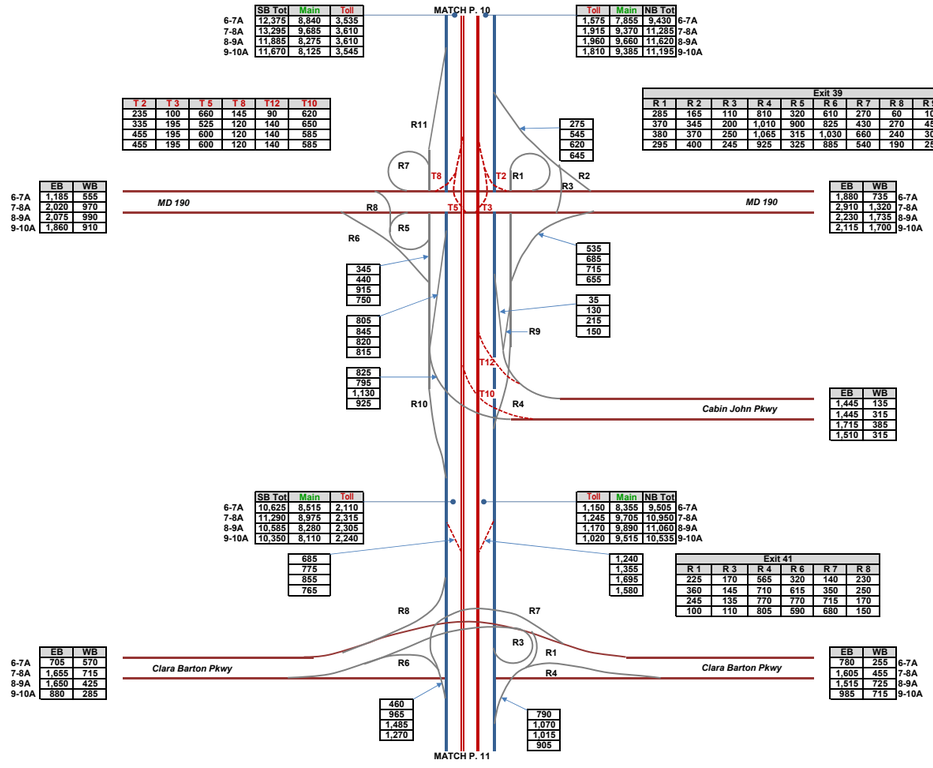
I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



	SB Tot	Main	Toll
6-7A	12,375	8,840	3,535
7-8A	13,295	9,685	3,610
8-9A	11,885	8,275	3,610
9-10A	11,670	8,125	3,545

Toll	Main	NB Tot	
1,575	7,855	9,430	6-7A
1,915	9,370	11,285	7-8A
1,960	9,660	11,620	8-9A
1,810	9,385	11,195	9-10A

T 2	T 3	T 5	T 8	T12	T10
235	100	660	145	90	620
335	195	525	120	140	650
455	195	600	120	140	585
455	195	600	120	140	585

Exit 39										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11
285	165	110	810	320	610	270	60	10	935	455
370	345	200	1,010	900	825	430	270	45	1,315	1,180
380	370	250	1,065	315	1,030	660	240	30	1,635	810
295	400	245	925	325	885	540	190	25	1,525	725

	EB	WB
6-7A	1,185	555
7-8A	2,020	970
8-9A	2,075	990
9-10A	1,860	910

EB	WB	
1,880	735	6-7A
2,910	1,320	7-8A
2,230	1,735	8-9A
2,115	1,700	9-10A

EB	WB	
1,445	135	
1,445	315	
1,715	385	
1,510	315	

	SB Tot	Main	Toll
6-7A	10,625	8,515	2,110
7-8A	11,290	8,975	2,315
8-9A	10,585	8,280	2,305
9-10A	10,350	8,110	2,240

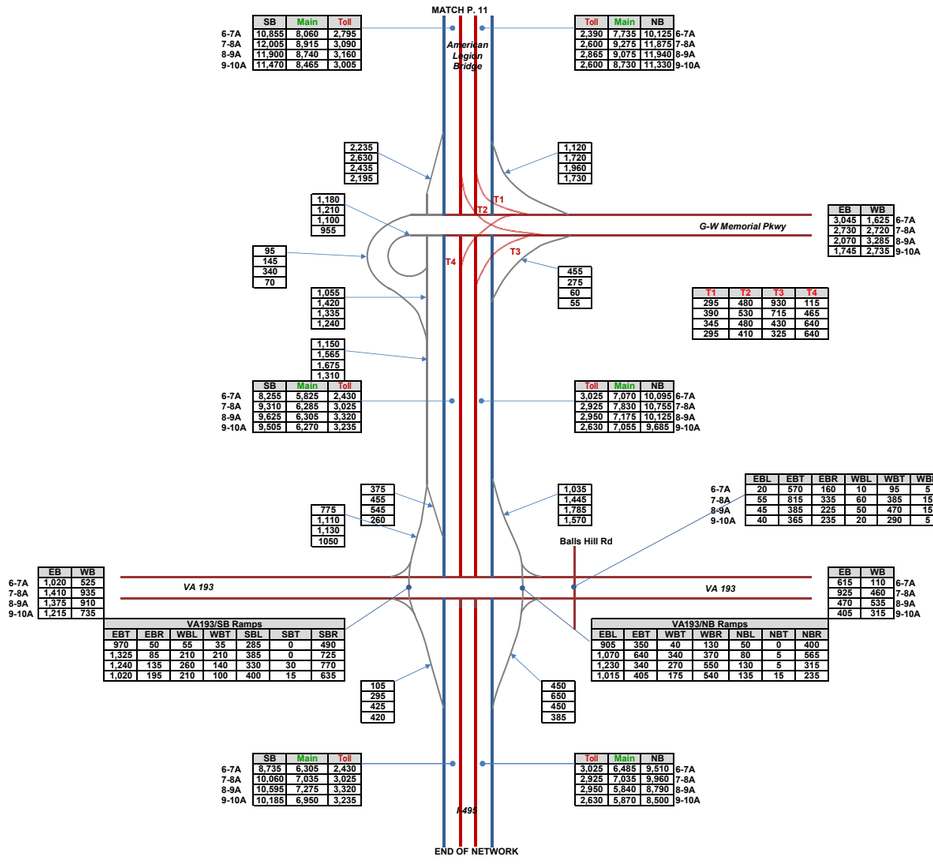
Toll	Main	NB Tot	
1,150	8,355	9,505	6-7A
1,245	9,705	10,950	7-8A
1,170	9,890	11,060	8-9A
1,020	9,515	10,535	9-10A

Exit 41					
R 1	R 3	R 4	R 6	R 7	R 8
225	170	565	320	140	230
360	145	710	615	350	250
245	135	770	770	715	170
100	110	805	590	680	150

	EB	WB
6-7A	705	570
7-8A	1,655	715
8-9A	1,650	425
9-10A	880	285

EB	WB	
780	255	6-7A
1,605	455	7-8A
1,515	725	8-9A
985	715	9-10A

I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



	SB	Main	Toll
6-7A	10,855	8,060	2,795
7-8A	12,005	8,915	3,090
8-9A	11,900	8,740	3,160
9-10A	11,470	8,465	3,005

	Toll	Main	NB
6-7A	2,390	7,735	10,125
7-8A	2,600	9,275	11,875
8-9A	2,865	9,075	11,940
9-10A	2,600	8,730	11,330

	SB	Main	Toll
6-7A	8,255	5,825	2,430
7-8A	9,310	6,285	3,025
8-9A	9,625	6,305	3,320
9-10A	9,505	6,270	3,235

	Toll	Main	NB
6-7A	3,025	7,070	10,095
7-8A	2,925	7,830	10,755
8-9A	2,950	7,175	10,125
9-10A	2,630	7,055	9,685

	SB	Main	Toll
6-7A	8,735	6,305	2,430
7-8A	10,060	7,035	3,025
8-9A	10,595	7,275	3,320
9-10A	10,185	6,950	3,235

	Toll	Main	NB
6-7A	3,025	6,485	9,510
7-8A	2,925	7,035	9,960
8-9A	2,950	5,840	8,790
9-10A	2,630	5,870	8,500

	EB	WB
6-7A	3,045	1,625
7-8A	2,730	2,720
8-9A	2,070	3,285
9-10A	1,745	2,735

	EB	WB
6-7A	1,020	525
7-8A	1,410	935
8-9A	1,375	910
9-10A	1,215	735

	EB	WB
6-7A	615	110
7-8A	925	460
8-9A	470	535
9-10A	405	315

T1	T2	T3	T4
295	480	930	115
390	530	715	465
345	480	430	640
295	410	325	640

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
6-7A	20	570	160	10	95	5	55	0	40	5	10	20
7-8A	55	815	335	60	385	15	260	30	100	10	30	65
8-9A	45	385	225	50	470	15	290	30	70	15	15	60
9-10A	40	365	235	20	290	5	365	20	35	5	20	60

VA193/SB Ramps

EBT	EBR	WBL	WBT	SBL	SBT	SBR
970	50	55	35	285	0	490
1,325	85	210	210	385	0	725
1,240	135	260	140	330	30	770
1,020	195	210	100	400	15	635

VA193/NB Ramps

EBL	EBT	WBT	WBR	NBL	NBT	NBR
905	350	40	130	50	0	400
1,070	640	340	370	80	5	565
1,230	340	270	550	130	5	315
1,015	405	175	540	135	15	235

2,235
2,630
2,435
2,195

1,120
1,720
1,960
1,730

1,180
1,210
1,100
955

95
145
340
70

455
275
60
55

1,055
1,420
1,335
1,240

1,150
1,565
1,675
1,310

375
455
545
260

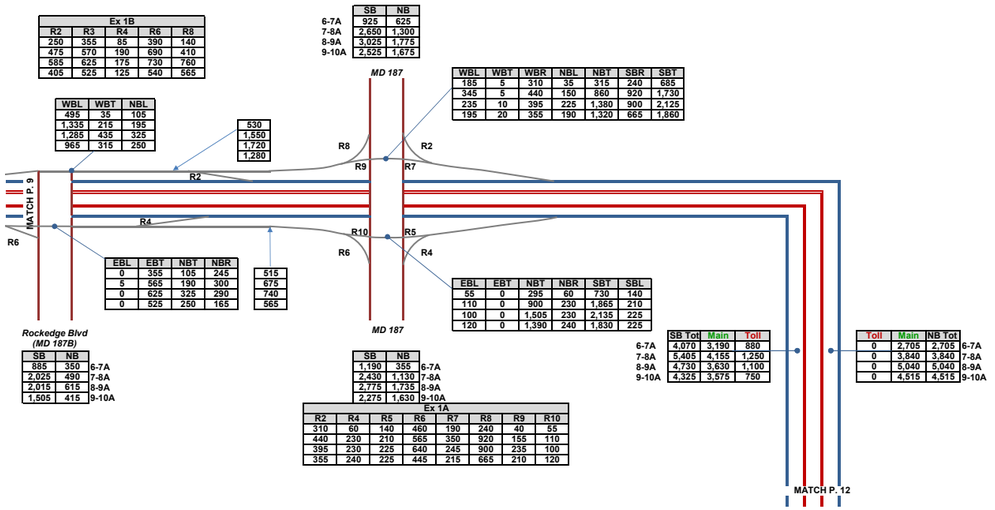
775
1,110
1,130
1050

1,035
1,445
1,785
1,570

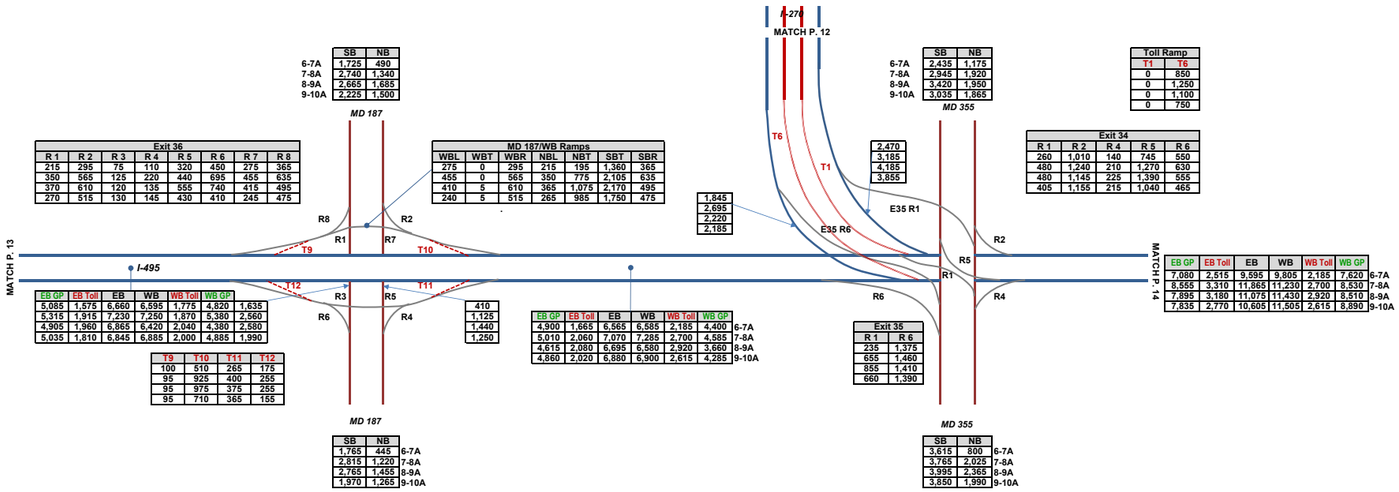
105
295
425
420

450
650
450
385

I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13B Peak Period Volumes



	SB	NB
6-7A	1,725	490
7-8A	2,740	1,340
8-9A	2,665	1,685
9-10A	2,225	1,500

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
215	295	75	110	320	450	275	365
350	565	125	220	440	695	455	635
370	610	120	135	555	740	415	495
270	515	130	145	430	410	245	475

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
275	0	295	215	195	1,360	365
455	0	565	350	775	2,105	635
410	5	610	365	1,075	2,170	495
240	5	515	265	985	1,750	475

	SB	NB
6-7A	2,435	1,175
7-8A	2,945	1,920
8-9A	3,420	1,950
9-10A	3,035	1,865

Toll Ramp	
T1	T6
0	850
0	1,250
0	1,100
0	750

Exit 34				
R 1	R 2	R 4	R 5	R 6
260	1,010	140	745	550
480	1,240	210	1,270	630
480	1,145	225	1,390	555
405	1,155	215	1,040	465

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
5,085	1,575	6,660	6,595	1,775	4,820	1,635
5,315	1,915	7,230	7,250	1,870	5,380	2,560
4,905	1,360	6,865	6,420	2,040	4,380	2,580
5,035	1,810	6,845	6,885	2,000	4,885	1,990

T9	T10	T11	T12
100	510	265	175
95	925	400	255
95	975	375	255
95	710	365	155

	SB	NB
6-7A	1,765	445
7-8A	2,815	1,220
8-9A	2,765	1,455
9-10A	1,970	1,265

410		
1,125		
1,440		
1,250		

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,900	1,665	6,565	6,585	2,185	4,400	6-7A
5,010	2,060	7,070	7,285	2,700	4,585	7-8A
4,615	2,080	6,695	6,580	2,920	3,660	8-9A
4,860	2,020	6,880	6,900	2,615	4,285	9-10A

1,845			
2,695			
2,220			
2,185			

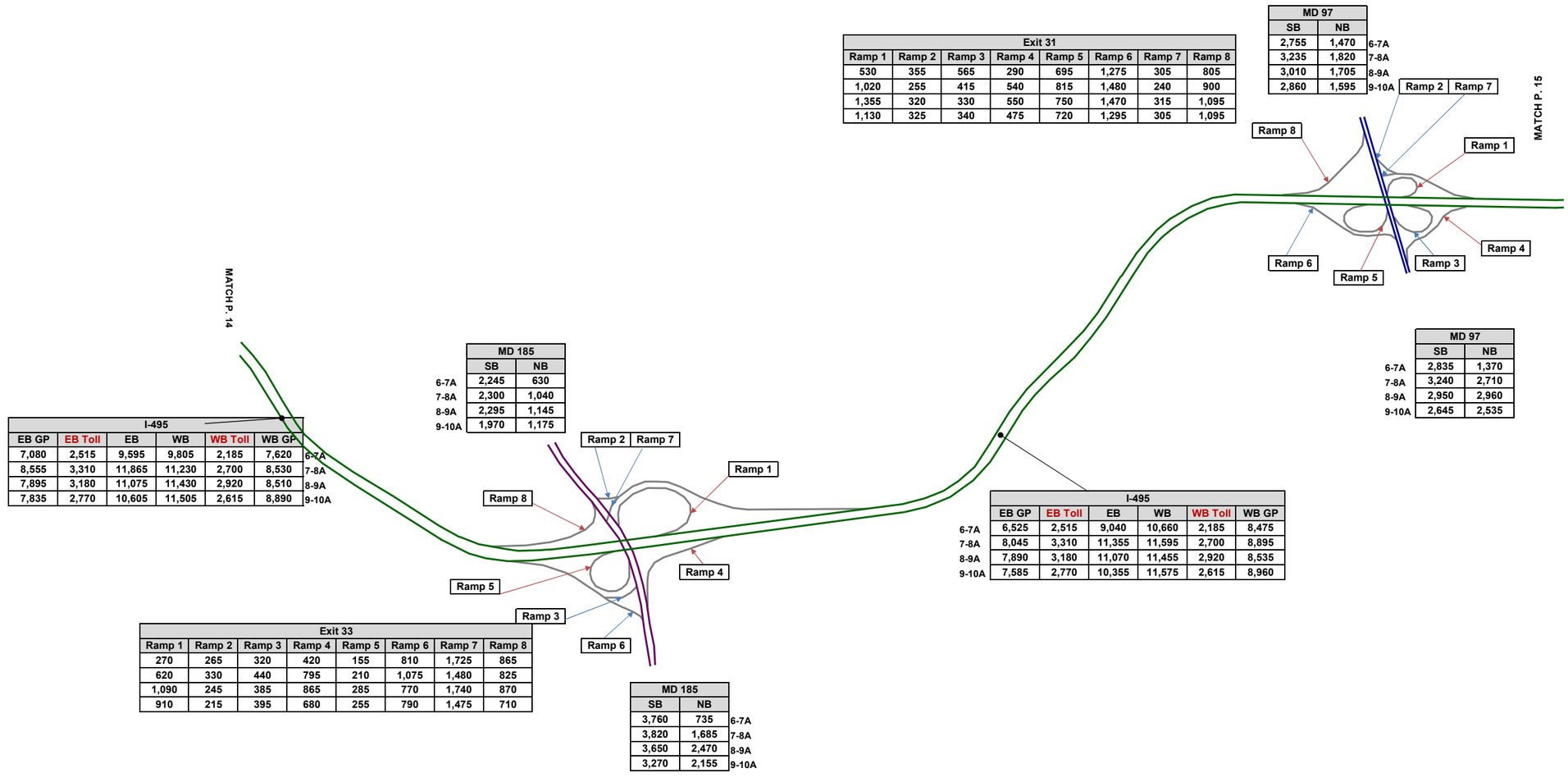
2,470		
3,185		
4,185		
3,855		

Exit 35	
R 1	R 6
235	1,375
655	1,460
855	1,410
660	1,390

	SB	NB
6-7A	3,615	800
7-8A	3,765	2,025
8-9A	3,995	2,365
9-10A	3,850	1,990

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,080	2,515	9,595	9,805	2,185	7,620	6-7A
8,555	3,310	11,865	11,230	2,700	8,530	7-8A
7,895	3,180	11,075	11,430	2,920	8,510	8-9A
7,835	2,770	10,605	11,505	2,615	8,890	9-10A

I-495 North Side AM
Future Alternative 13B Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
530	355	565	290	695	1,275	305	805
1,020	255	415	540	815	1,480	240	900
1,355	320	330	550	750	1,470	315	1,095
1,130	325	340	475	720	1,295	305	1,095

	MD 97	
	SB	NB
6-7A	2,755	1,470
7-8A	3,235	1,820
8-9A	3,010	1,705
9-10A	2,860	1,595

	MD 97	
	SB	NB
6-7A	2,835	1,370
7-8A	3,240	2,710
8-9A	2,950	2,960
9-10A	2,645	2,535

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,525	2,515	9,040	10,660	2,185	8,475
7-8A	8,045	3,310	11,355	11,595	2,700	8,895
8-9A	7,890	3,180	11,070	11,455	2,920	8,535
9-10A	7,585	2,770	10,355	11,575	2,615	8,960

	MD 185	
	SB	NB
6-7A	2,245	630
7-8A	2,300	1,040
8-9A	2,295	1,145
9-10A	1,970	1,175

	MD 185	
	SB	NB
6-7A	3,760	735
7-8A	3,820	1,685
8-9A	3,650	2,470
9-10A	3,270	2,155

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,080	2,515	9,595	9,805	2,185	7,620
7-8A	8,555	3,310	11,865	11,230	2,700	8,530
8-9A	7,895	3,180	11,075	11,430	2,920	8,510
9-10A	7,835	2,770	10,605	11,505	2,615	8,890

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
270	265	320	420	155	810	1,725	865
620	330	440	795	210	1,075	1,480	825
1,090	245	385	865	285	770	1,740	870
910	215	395	680	255	790	1,475	710

I-495 North Side AM
Future Alternative 13B Peak Period Volumes

T1	T2	T3	T4	T5	T6	T7	T8
55	285	325	225	425	125	655	915
150	285	600	320	420	190	565	1,040
215	305	655	415	405	200	460	1,070
285	285	560	395	355	225	480	950

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
110	305	110	125	140	900
210	435	230	170	40	865
250	450	305	225	95	860
350	435	235	250	130	840

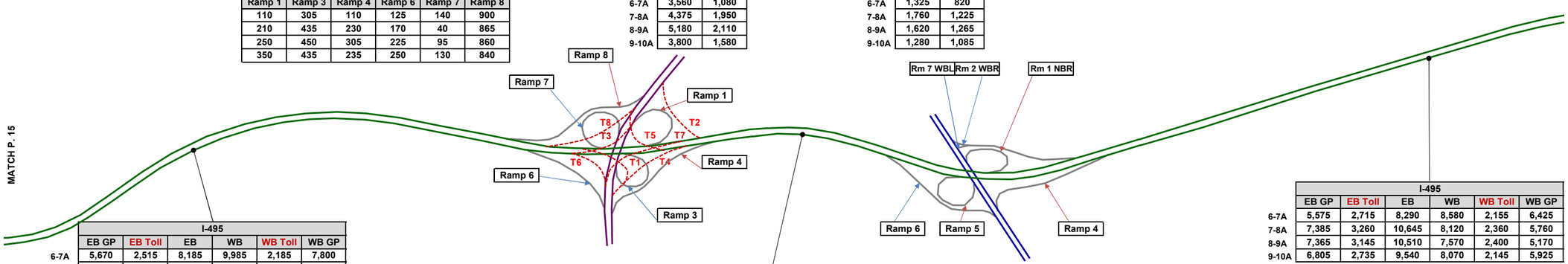
	US 29	
	SB	NB
6-7A	3,560	1,080
7-8A	4,375	1,950
8-9A	5,180	2,110
9-10A	3,800	1,580

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
1,010	410	270	455	500	95
1,105	315	390	580	715	115
1,030	380	415	580	650	115
850	305	335	440	665	165

	MD 193	
	SB	NB
6-7A	1,325	820
7-8A	1,760	1,225
8-9A	1,620	1,265
9-10A	1,280	1,085

MATCH P. 16

MATCH P. 15



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,670	2,515	8,185	9,985	2,185	7,800
7-8A	7,505	3,310	10,815	10,170	2,700	7,470
8-9A	7,390	3,180	10,570	9,640	2,920	6,720
9-10A	7,145	2,770	9,915	9,980	2,615	7,365

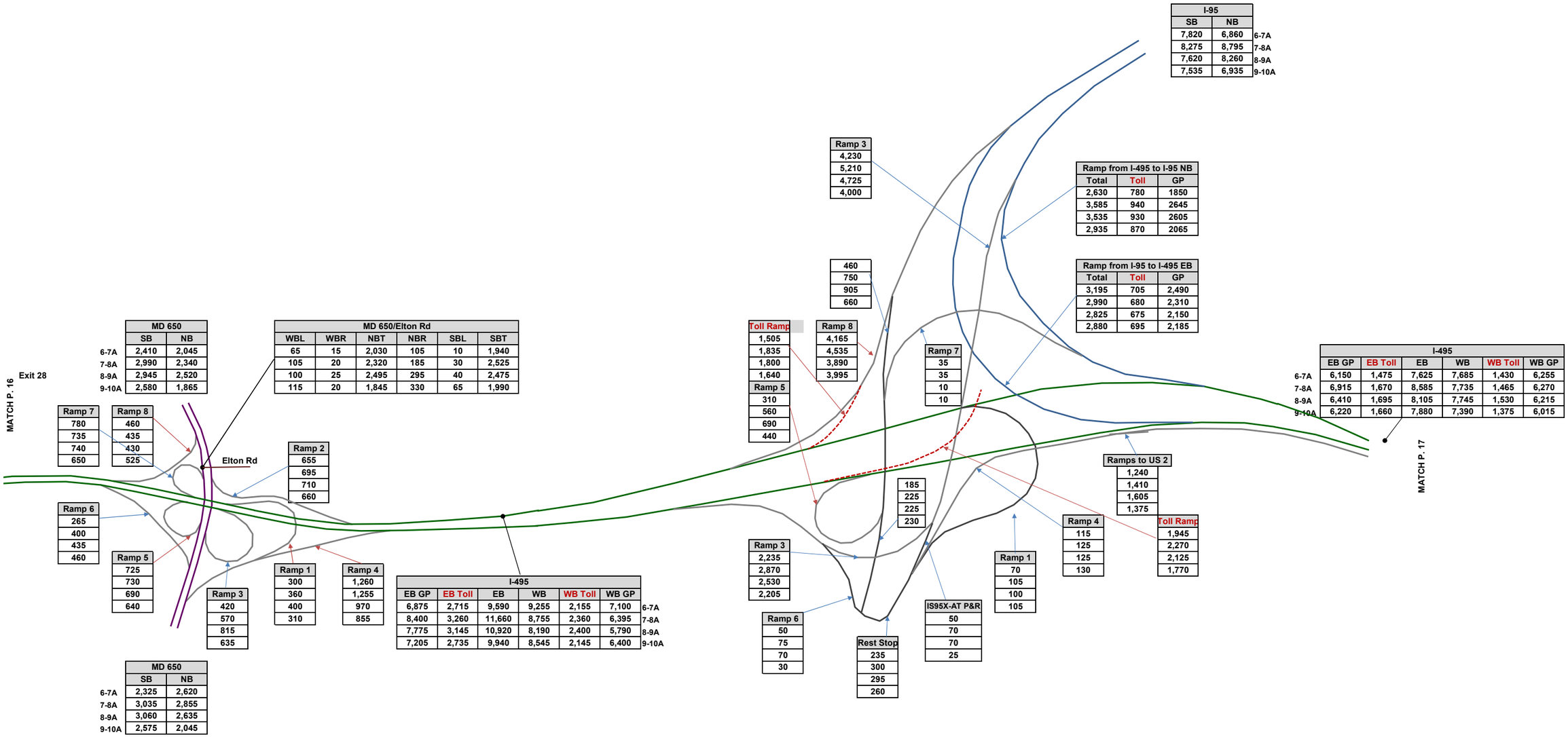
	US 29	
	SB	NB
6-7A	2,365	665
7-8A	3,015	1,540
8-9A	3,825	1,885
9-10A	2,740	1,565

	I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6-7A	5,350	2,715	8,065	9,085	2,155	6,930	6-7A
7-8A	7,130	3,260	10,390	8,795	2,360	6,435	7-8A
8-9A	7,020	3,145	10,165	8,105	2,400	5,705	8-9A
9-10A	6,695	2,735	9,430	8,450	2,145	6,305	9-10A

	MD 193		
	SB	NB	
6-7A	1,465	1,690	6-7A
7-8A	2,010	2,405	7-8A
8-9A	1,805	2,330	8-9A
9-10A	1,670	1,965	9-10A

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,575	2,715	8,290	8,580	2,155	6,425
7-8A	7,385	3,260	10,645	8,120	2,360	5,760
8-9A	7,365	3,145	10,510	7,570	2,400	5,170
9-10A	6,805	2,735	9,540	8,070	2,145	5,925

I-495 North Side AM
Future Alternative 13B Peak Period Volumes



MD 650		
	SB	NB
6-7A	2,410	2,045
7-8A	2,990	2,340
8-9A	2,945	2,520
9-10A	2,580	1,865

MD 650/Elton Rd					
WBL	WBR	NBT	NBR	SBL	SBT
65	15	2,030	105	10	1,940
105	20	2,320	185	30	2,525
100	25	2,495	295	40	2,475
115	20	1,845	330	65	1,990

Ramp 7
780
735
740
650

Ramp 8
460
435
430
525

Ramp 6
265
400
435
460

Ramp 5
725
730
690
640

Ramp 3
420
570
815
635

Ramp 2
655
695
710
660

Ramp 1
300
360
400
310

Ramp 4
1,260
1,255
970
855

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,875	2,715	9,590	9,255	2,155	7,100	6-7A
8,400	3,260	11,660	8,755	2,360	6,395	7-8A
7,775	3,145	10,920	8,190	2,400	5,790	8-9A
7,205	2,735	9,940	8,545	2,145	6,400	9-10A

MD 650		
	SB	NB
6-7A	2,325	2,620
7-8A	3,035	2,855
8-9A	3,060	2,635
9-10A	2,575	2,045

I-95		
SB	NB	
7,820	6,860	6-7A
8,275	8,795	7-8A
7,620	8,260	8-9A
7,535	6,935	9-10A

Ramp 3
4,230
5,210
4,725
4,000

Ramp from I-495 to I-95 NB		
Total	Toll	GP
2,630	780	1850
3,585	940	2645
3,535	930	2605
2,935	870	2065

460
750
905
660

Ramp from I-95 to I-495 EB		
Total	Toll	GP
3,195	705	2,490
2,990	680	2,310
2,825	675	2,150
2,880	695	2,185

Toll Ramp
1,505
1,835
1,800
1,640

Ramp 8
4,165
4,535
3,890
3,995

Ramp 5
310
560
690
440

Ramp 7
35
35
10
10

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,150	1,475	7,625	7,685	1,430	6,255	6-7A
6,915	1,670	8,585	7,735	1,465	6,270	7-8A
6,410	1,695	8,105	7,745	1,530	6,215	8-9A
6,220	1,660	7,880	7,390	1,375	6,015	9-10A

185
225
225
230

Ramps to US 2
1,240
1,410
1,605
1,375

Ramp 3
2,235
2,870
2,530
2,205

Ramp 4
115
125
125
130

Toll Ramp
1,945
2,270
2,125
1,770

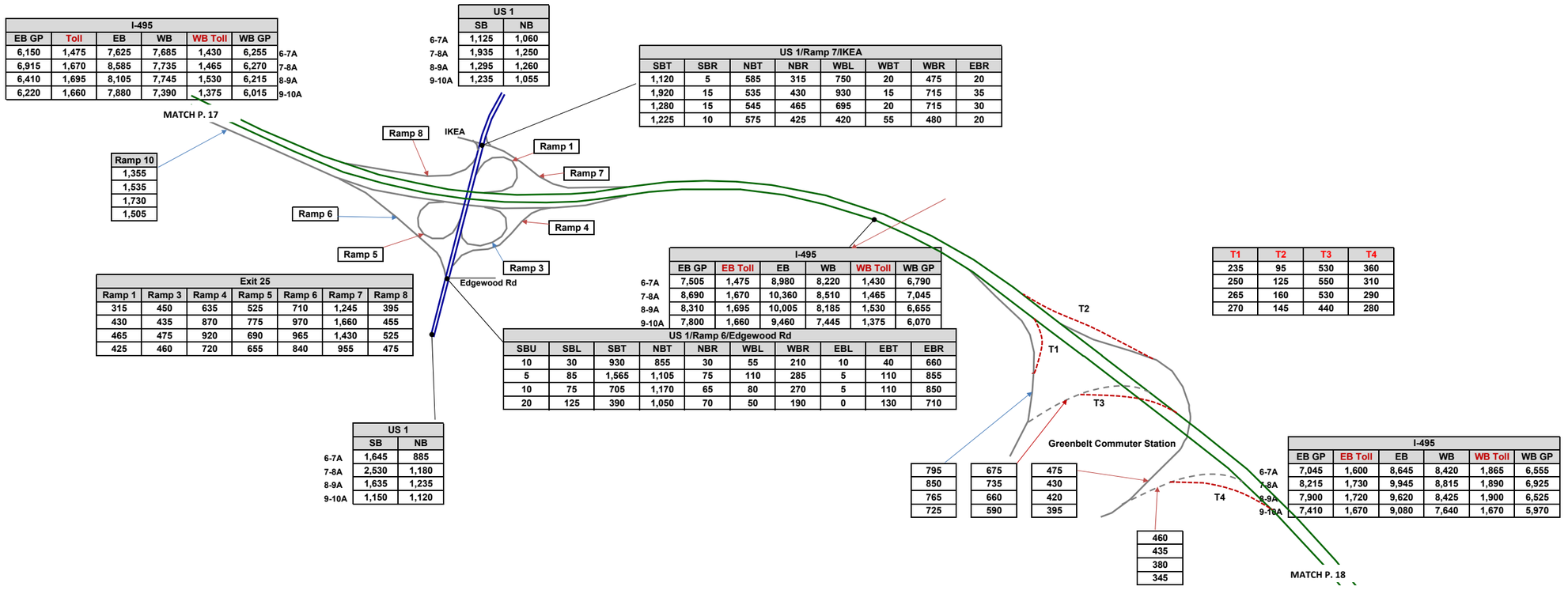
Ramp 1
70
105
100
105

Ramp 6
50
75
70
30

IS95X-AT P&R
50
70
70
25

Rest Stop
235
300
295
260

I-495 North East Side AM
Future Alternative 13B Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,150	1,475	7,625	7,685	1,430	6,255	6-7A
6,915	1,670	8,585	7,735	1,465	6,270	7-8A
6,410	1,695	8,105	7,745	1,530	6,215	8-9A
6,220	1,660	7,880	7,390	1,375	6,015	9-10A

Ramp 10
1,355
1,535
1,730
1,505

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
315	450	635	525	710	1,245	395
430	435	870	775	970	1,660	455
465	475	920	690	965	1,430	525
425	460	720	655	840	955	475

US 1		
	SB	NB
6-7A	1,645	885
7-8A	2,530	1,180
8-9A	1,635	1,235
9-10A	1,150	1,120

US 1		
	SB	NB
6-7A	1,125	1,060
7-8A	1,935	1,250
8-9A	1,295	1,260
9-10A	1,235	1,055

US 1/Ramp 7/IKEA								
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR	
1,120	5	585	315	750	20	475	20	
1,920	15	535	430	930	15	715	35	
1,280	15	545	465	695	20	715	30	
1,225	10	575	425	420	55	480	20	

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,505	1,475	8,980	8,220	1,430	6,790	6-7A
8,690	1,670	10,360	8,510	1,465	7,045	7-8A
8,310	1,695	10,005	8,185	1,530	6,655	8-9A
7,800	1,660	9,460	7,445	1,375	6,070	9-10A

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
10	30	930	855	30	55	210	10	40	660
5	85	1,565	1,105	75	110	285	5	110	855
10	75	705	1,170	65	80	270	5	110	850
20	125	390	1,050	70	50	190	0	130	710

T1	T2	T3	T4
235	95	530	360
250	125	550	310
265	160	530	290
270	145	440	280

795
850
765
725

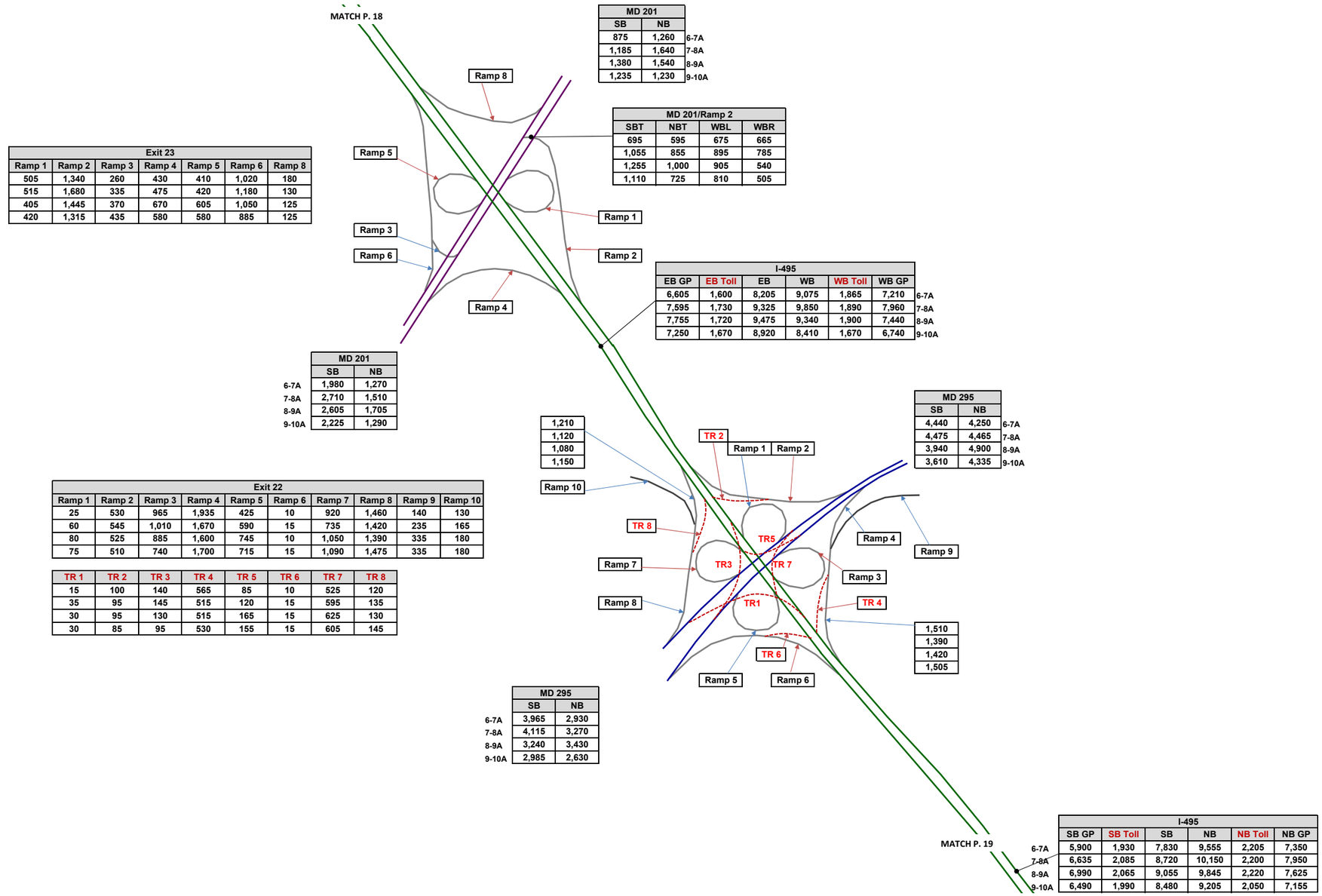
675
735
660
590

475
430
420
395

460
435
380
345

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,045	1,600	8,645	8,420	1,865	6,555	6-7A
8,215	1,730	9,945	8,815	1,890	6,925	7-8A
7,900	1,720	9,620	8,425	1,900	6,525	8-9A
7,410	1,670	9,080	7,640	1,670	5,970	9-10A

I-495 North East Side AM
Future Alternative 13B Peak Period Volumes



Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
505	1,340	260	430	410	1,020	180
515	1,680	335	475	420	1,180	130
405	1,445	370	670	605	1,050	125
420	1,315	435	580	580	885	125

MD 201		
SB	NB	
875	1,260	6-7A
1,185	1,640	7-8A
1,380	1,540	8-9A
1,235	1,230	9-10A

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
695	595	675	665
1,055	855	895	785
1,255	1,000	905	540
1,110	725	810	505

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,605	1,600	8,205	9,075	1,865	7,210	6-7A
7,595	1,730	9,325	9,850	1,890	7,960	7-8A
7,755	1,720	9,475	9,340	1,900	7,440	8-9A
7,250	1,670	8,920	8,410	1,670	6,740	9-10A

	MD 201	
	SB	NB
6-7A	1,980	1,270
7-8A	2,710	1,510
8-9A	2,605	1,705
9-10A	2,225	1,290

MD 295		
SB	NB	
4,440	4,250	6-7A
4,475	4,465	7-8A
3,940	4,900	8-9A
3,610	4,335	9-10A

1,210
1,120
1,080
1,150

1,510
1,390
1,420
1,505

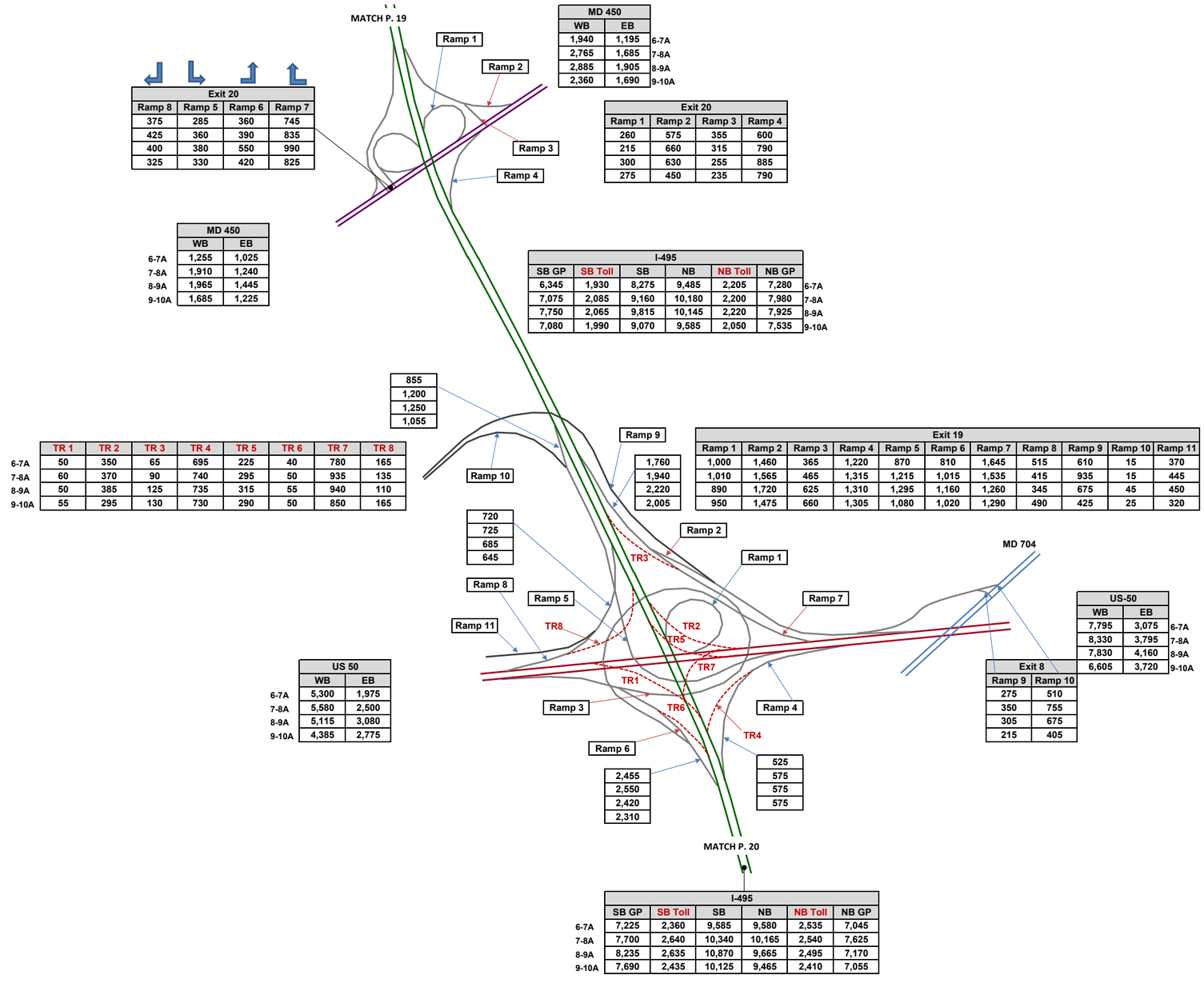
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
25	530	965	1,935	425	10	920	1,460	140	130
60	545	1,010	1,670	590	15	735	1,420	235	165
80	525	885	1,600	745	10	1,050	1,390	335	180
75	510	740	1,700	715	15	1,090	1,475	335	180

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
15	100	140	565	85	10	525	120
35	95	145	515	120	15	595	135
30	95	130	515	165	15	625	130
30	85	95	530	155	15	605	145

	MD 295	
	SB	NB
6-7A	3,965	2,930
7-8A	4,115	3,270
8-9A	3,240	3,430
9-10A	2,985	2,630

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	5,900	1,930	7,830	9,555	2,205	7,350
7-8A	6,635	2,085	8,720	10,150	2,200	7,950
8-9A	6,990	2,065	9,055	9,845	2,220	7,625
9-10A	6,490	1,990	8,480	9,205	2,050	7,155

I-495 North East Side AM
Future Alternative 13B Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
375	285	360	745
425	360	390	835
400	380	550	990
325	330	420	825

MD 450		
WB	EB	
1,940	1,195	6-7A
2,765	1,685	7-8A
2,885	1,905	8-9A
2,360	1,690	9-10A

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
260	575	355	600
215	660	315	790
300	630	255	885
275	450	235	790

	MD 450	
	WB	EB
6-7A	1,255	1,025
7-8A	1,910	1,240
8-9A	1,965	1,445
9-10A	1,685	1,225

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,345	1,930	8,275	9,485	2,205	7,280	6-7A
7,075	2,085	9,160	10,180	2,200	7,980	7-8A
7,750	2,065	9,815	10,145	2,220	7,925	8-9A
7,080	1,990	9,070	9,585	2,050	7,535	9-10A

	TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
6-7A	50	350	65	695	225	40	780	165
7-8A	60	370	90	740	295	50	935	135
8-9A	50	385	125	735	315	55	940	110
9-10A	55	295	130	730	290	50	850	165

855
1,200
1,250
1,055

1,760
1,940
2,220
2,005

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
1,000	1,460	365	1,220	870	810	1,645	515	610	15	370
1,010	1,565	465	1,315	1,215	1,015	1,535	415	935	15	445
890	1,720	625	1,310	1,295	1,160	1,260	345	675	45	450
950	1,475	660	1,305	1,080	1,020	1,290	490	425	25	320

720
725
685
645

US 50		
	WB	EB
6-7A	5,300	1,975
7-8A	5,580	2,500
8-9A	5,115	3,080
9-10A	4,385	2,775

2,455
2,550
2,420
2,310

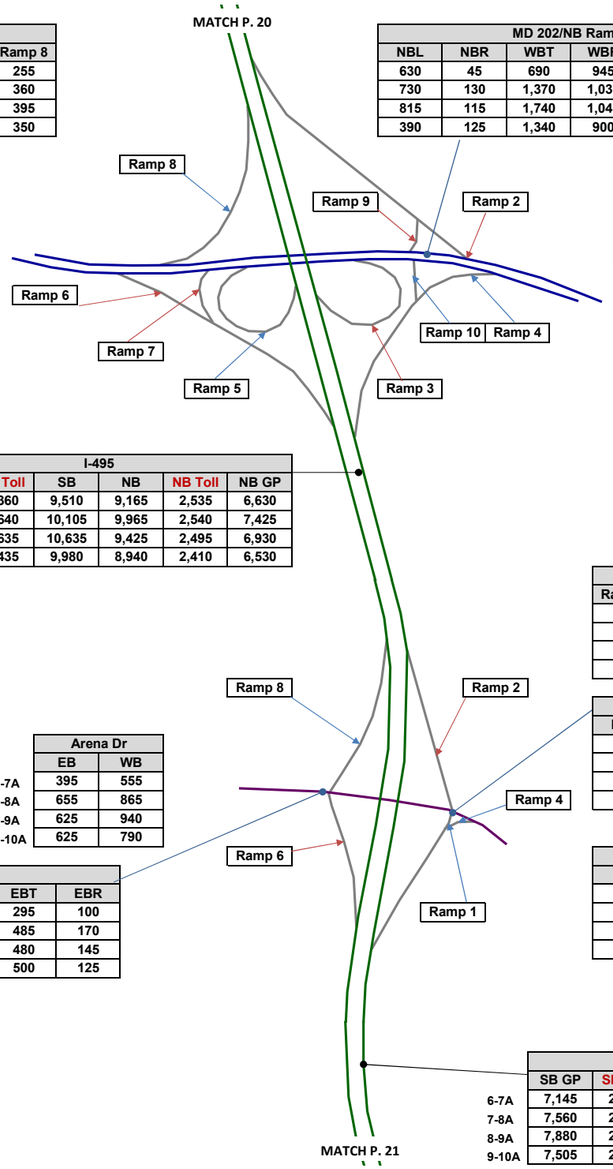
525
575
575
575

US-50		
WB	EB	
7,795	3,075	6-7A
8,330	3,795	7-8A
7,830	4,160	8-9A
6,605	3,720	9-10A

Exit 8	
Ramp 9	Ramp 10
275	510
350	755
305	675
215	405

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,225	2,360	9,585	9,580	2,535	7,045	6-7A
7,700	2,640	10,340	10,165	2,540	7,625	7-8A
8,235	2,635	10,870	9,665	2,495	7,170	8-9A
7,690	2,435	10,125	9,465	2,410	7,055	9-10A

I-495 East Side AM
Future Alternative 13B Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
425	435	170	255
740	590	275	360
995	780	375	395
785	690	300	350

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
630	45	690	945	10	700
730	130	1,370	1,030	15	1,335
815	115	1,740	1,045	5	1,470
390	125	1,340	900	15	1,285

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
945	220	85	10	675
1,030	200	185	15	860
1,045	250	130	5	930
900	240	115	15	515

	MD 202	
	EB	WB
6-7A	940	1,405
7-8A	1,400	2,185
8-9A	1,510	2,575
9-10A	1,445	1,780

MD 202		
SB	NB	
830	1,635	6-7A
1,650	2,400	7-8A
1,715	2,785	8-9A
1,525	2,240	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,150	2,360	9,510	9,165	2,535	6,630
7-8A	7,465	2,640	10,105	9,965	2,540	7,425
8-9A	8,000	2,635	10,635	9,425	2,495	6,930
9-10A	7,545	2,435	9,980	8,940	2,410	6,530

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
300	405	325	210	215
445	460	400	335	240
360	415	425	300	420
330	395	345	290	330

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
300	0	325	235	200	205	175
445	0	400	450	235	225	365
355	5	425	495	220	190	465
330	0	345	455	190	205	455

	Arena Dr	
	EB	WB
6-7A	395	555
7-8A	655	865
8-9A	625	940
9-10A	625	790

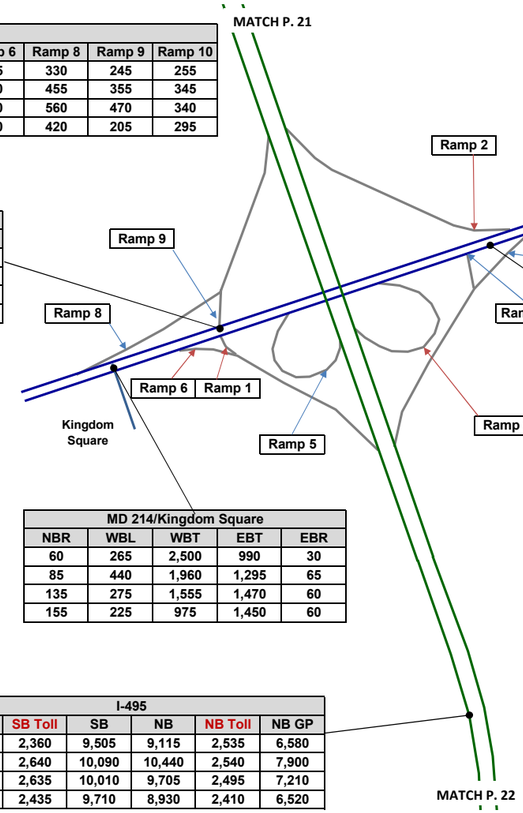
Arena Dr		
EB	WB	
500	435	6-7A
765	685	7-8A
890	715	8-9A
800	645	9-10A

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
85	0	130	110	425	295	100
105	0	135	165	730	485	170
175	0	245	155	695	480	145
160	0	170	165	620	500	125

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,145	2,360	9,505	9,385	2,535	6,850
7-8A	7,560	2,640	10,200	10,350	2,540	7,810
8-9A	7,880	2,635	10,515	9,795	2,495	7,300
9-10A	7,505	2,435	9,940	9,220	2,410	6,810

I-495 East Side AM
Future Alternative 13B Peak Period Volumes

Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
760	555	670	700	460	275	330	245	255
985	615	730	1,090	605	320	455	355	345
875	560	745	875	690	340	560	470	340
680	535	725	675	685	400	420	205	295



MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
245	760	2,520	775	275
355	985	2,045	1,060	320
470	875	1,360	1,265	340
205	680	995	1,205	400

	MD 214	
	EB	WB
6-7A	1,020	2,830
7-8A	1,360	2,415
8-9A	1,530	2,115
9-10A	1,510	1,395

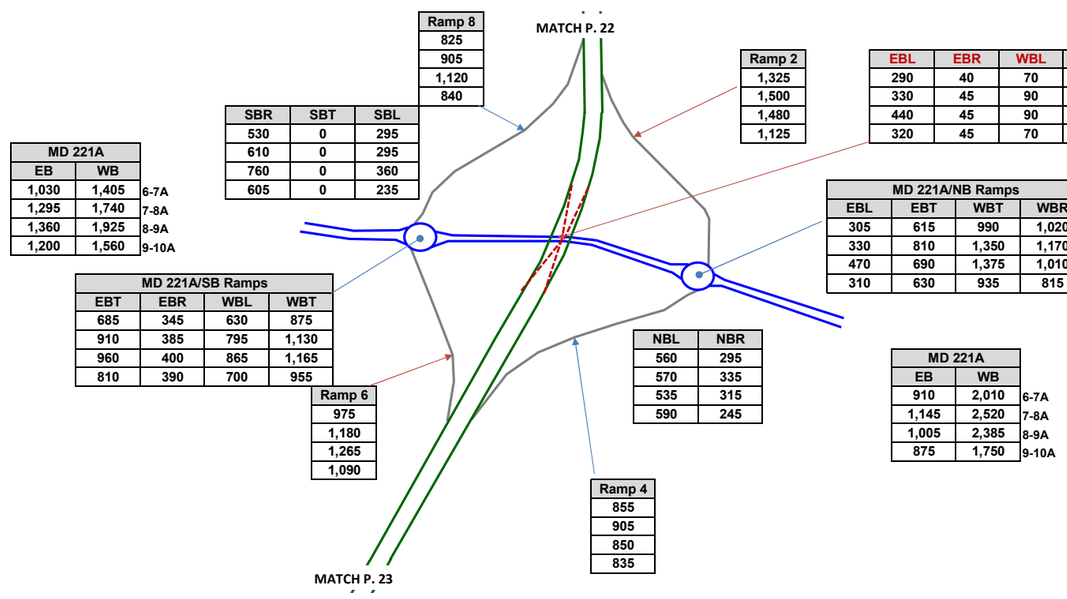
MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
60	265	2,500	990	30
85	440	1,960	1,295	65
135	275	1,555	1,470	60
155	225	975	1,450	60

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,145	2,360	9,505	9,115	2,535	6,580
7-8A	7,450	2,640	10,090	10,440	2,540	7,900
8-9A	7,375	2,635	10,010	9,705	2,495	7,210
9-10A	7,275	2,435	9,710	8,930	2,410	6,520

MD 214		
EB	WB	
1,265	3,580	6-7A
2,025	3,300	7-8A
2,085	2,455	8-9A
1,840	1,915	9-10A

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
255	700	3,025	555	565
345	1090	2,685	615	935
340	875	1,895	560	1,210
295	675	1,380	535	1165

I-495 East Side AM
Future Alternative 13B Peak Period Volumes



Ramp 8
825
905
1,120
840

SBR	SBT	SBL
530	0	295
610	0	295
760	0	360
605	0	235

MD 221A		
EB	WB	
1,030	1,405	6-7A
1,295	1,740	7-8A
1,360	1,925	8-9A
1,200	1,560	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
685	345	630	875
910	385	795	1,130
960	400	865	1,165
810	390	700	955

Ramp 6
975
1,180
1,265
1,090

Ramp 2
1,325
1,500
1,480
1,125

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
290	40	70	495	100	60	210	420
330	45	90	515	105	65	245	505
440	45	90	415	100	55	270	525
320	45	70	390	110	45	215	480

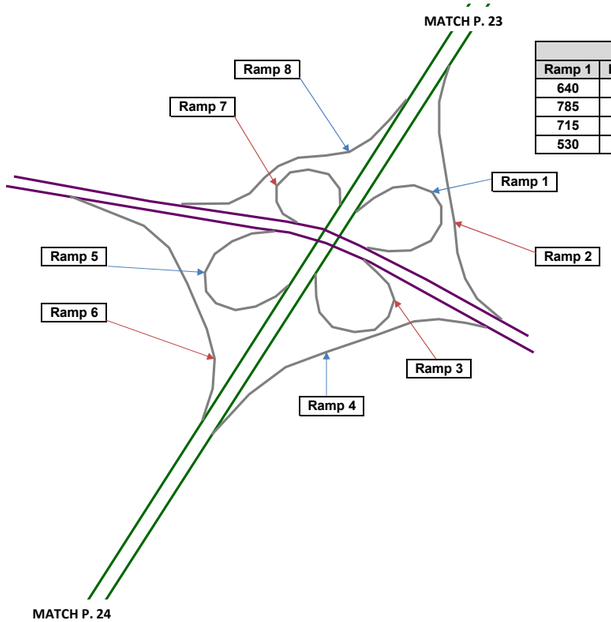
MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
305	615	990	1,020
330	810	1,350	1,170
470	690	1,375	1,010
310	630	935	815

NBL	NBR
560	295
570	335
535	315
590	245

Ramp 4
855
905
850
835

MD 221A		
EB	WB	
910	2,010	6-7A
1,145	2,520	7-8A
1,005	2,385	8-9A
875	1,750	9-10A

I-495 East Side AM
Future Alternative 13B Peak Period Volumes



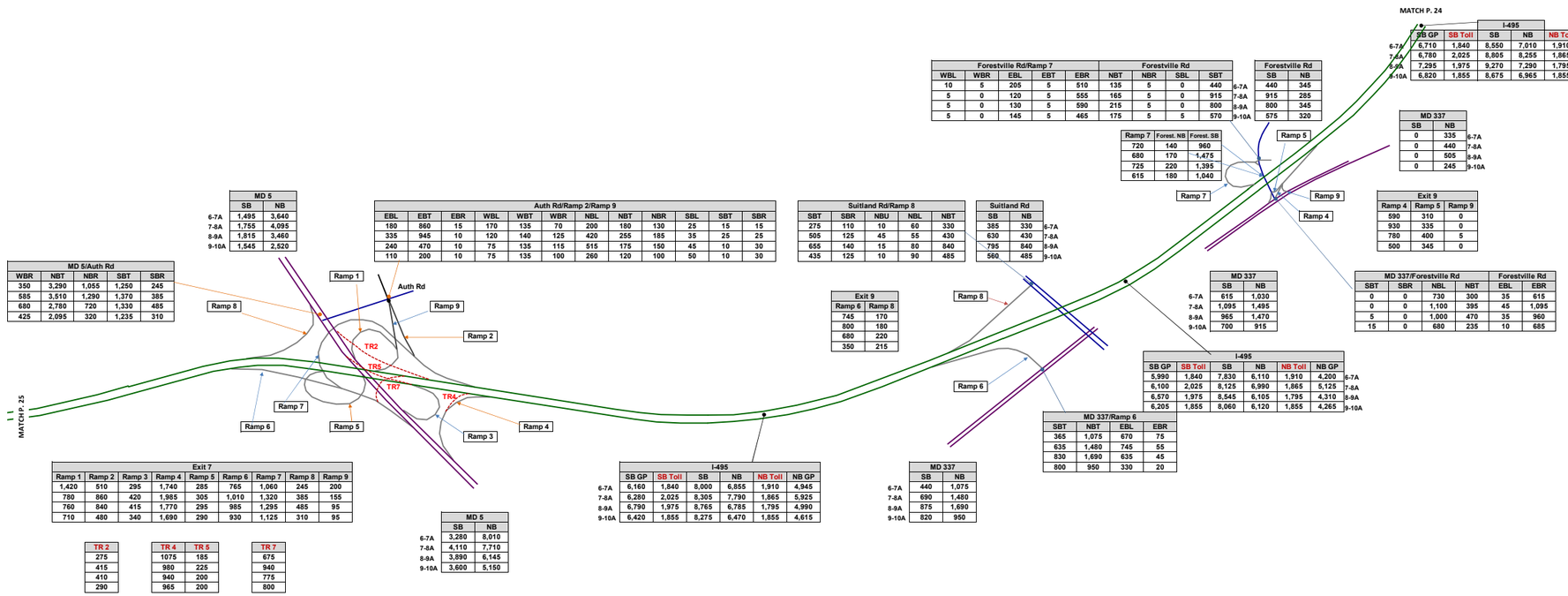
MD 4		
SB	NB	
1,335	2,325	6-7A
1,665	3,110	7-8A
1,580	2,120	8-9A
1,450	1,580	9-10A

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
640	1,595	625	570	940	465	1,140	1,250
785	1,525	725	550	830	410	930	1,455
715	1,620	730	550	675	450	850	850
530	1,455	680	485	785	375	605	900

MD 4		
SB	NB	
1,755	3,170	6-7A
1,910	3,325	7-8A
1,625	3,025	8-9A
1,665	2,210	9-10A

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,710	1,840	8,550	7,010	1,910	5,100
7-8A	6,780	2,025	8,805	8,255	1,865	6,390
8-9A	7,295	1,975	9,270	7,290	1,795	5,495
9-10A	6,820	1,855	8,675	6,965	1,855	5,110

I-495 South Side AM
Future Alternative 13B Peak Period Volumes



MD 5	
SB	NB
1,495	3,640
1,755	4,095
1,815	3,460
1,545	2,520

6-7A
7-8A
8-9A
9-10A

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
350	3,290	1,055	1,250	245
585	3,510	1,290	1,370	385
680	2,780	720	1,330	485
425	2,095	320	1,235	310

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
180	860	15	170	135	70	200	180	130	25	15	15
335	945	10	120	140	125	420	255	185	35	25	25
240	470	10	75	135	115	515	175	150	45	10	30
110	200	10	75	135	100	260	120	100	50	10	30

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
275	110	10	60	330
505	125	45	55	430
655	140	15	80	840
435	125	10	90	485

Suitland Rd	
SB	NB
385	330
630	430
795	840
560	485

6-7A
7-8A
8-9A
9-10A

Exit 9	
Ramp 6	Ramp 8
745	170
800	160
680	220
350	215

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
10	5	205	5	510	135	5	0	440
5	0	120	5	555	165	5	0	915
5	0	130	5	590	215	5	0	800
5	0	145	5	465	175	5	5	570

6-7A
7-8A
8-9A
9-10A

Forestville Rd	
SB	NB
440	345
915	285
800	345
575	320

Ramp 7	Forest. NB	Forest. SB
720	140	960
680	170	1,475
725	220	1,395
615	180	1,040

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,710	1,840	8,550	7,010	1,910	5,100
6,780	2,025	8,805	8,255	1,865	6,390
7,295	1,975	9,270	7,290	1,795	5,495
6,820	1,855	8,675	6,965	1,855	5,110

6-7A
7-8A
8-9A
9-10A

MD 337	
SB	NB
0	335
0	440
0	505
0	245

6-7A
7-8A
8-9A
9-10A

Exit 9		
Ramp 4	Ramp 5	Ramp 9
590	310	0
930	335	0
780	400	5
500	345	0

MD 337	
SB	NB
615	1,030
1,095	1,495
965	1,470
700	915

6-7A
7-8A
8-9A
9-10A

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	730	300	35	615
0	0	1,100	395	45	1,095
5	0	1,000	470	35	960
15	0	680	235	10	685

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
5,990	1,840	7,830	6,110	1,910	4,200
6,100	2,025	8,125	6,990	1,865	5,125
6,570	1,975	8,545	6,105	1,795	4,310
6,205	1,855	8,060	6,120	1,855	4,265

6-7A
7-8A
8-9A
9-10A

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
365	1,075	670	75
635	1,480	745	55
830	1,690	635	45
800	950	330	20

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
1,420	510	295	1,740	285	765	1,060	245	200
780	860	420	1,985	305	1,010	1,320	385	155
760	840	415	1,770	295	985	1,295	485	95
710	480	340	1,690	290	930	1,125	310	95

TR 2
275
415
410
290

TR 4	TR 5
1075	185
980	225
940	200
965	200

TR 7
675
940
775
800

MD 5	
SB	NB
3,280	8,010
4,110	7,710
3,890	6,145
3,600	5,150

6-7A
7-8A
8-9A
9-10A

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,160	1,840	8,000	6,855	1,910	4,945
6,280	2,025	8,305	7,790	1,865	5,925
6,790	1,975	8,765	6,785	1,795	4,990
6,420	1,855	8,275	6,470	1,855	4,615

6-7A
7-8A
8-9A
9-10A

MD 337	
SB	NB
440	1,075
690	1,480
875	1,690
820	950

6-7A
7-8A
8-9A
9-10A

I-495 South Side AM
Future Alternative 13B Peak Period Volumes

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,905	890	7,795	4,550	650	3,900
7-8A	5,570	670	6,240	5,490	660	4,830
8-9A	5,935	790	6,725	4,880	655	4,225
9-10A	5,655	765	6,420	4,440	690	3,750

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
600	225	480	550	240	185	395	540	70	45
475	240	535	670	370	200	445	550	190	70
470	245	595	630	335	185	525	440	200	85
345	305	435	560	310	175	500	305	120	105

MD 414		
WB	EB	
865	1,285	6-7A
1,190	1,800	7-8A
1,235	1,365	8-9A
1,190	1,215	9-10A

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
890	-	650	-
670	-	660	-
790	-	655	-
765	-	690	-

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,455	890	7,345	4,630	650	3,980
7-8A	5,420	670	6,090	5,725	660	5,065
8-9A	5,995	790	6,785	4,980	655	4,325
9-10A	5,930	765	6,695	4,595	690	3,905

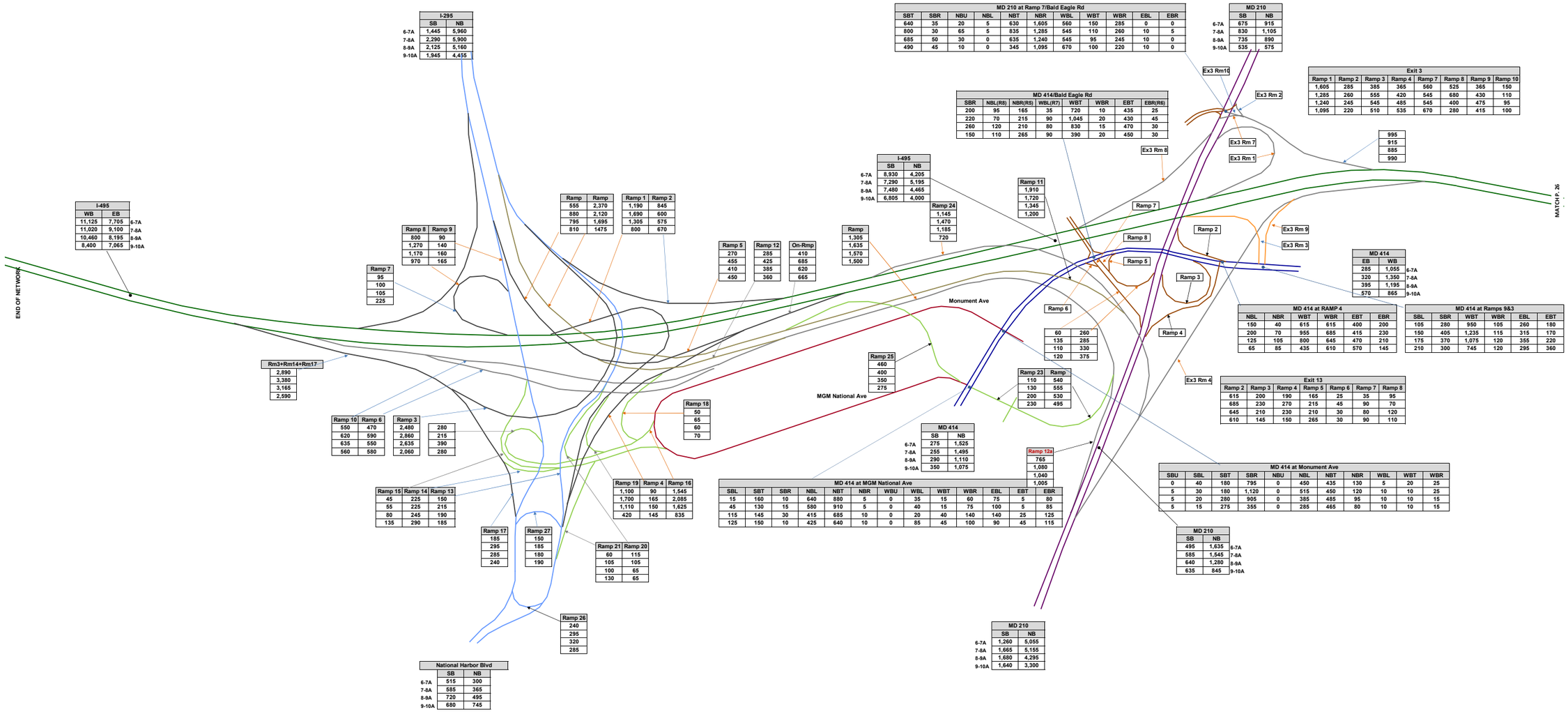
MD 414		
WB	EB	
705	340	6-7A
1,215	715	7-8A
1,225	480	8-9A
1,240	795	9-10A

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
85	140	65	5	225	840	25	35	975
155	150	185	5	240	1,135	55	35	1,405
95	110	150	50	245	1,185	50	40	1,025
50	80	70	50	305	1,160	30	55	860

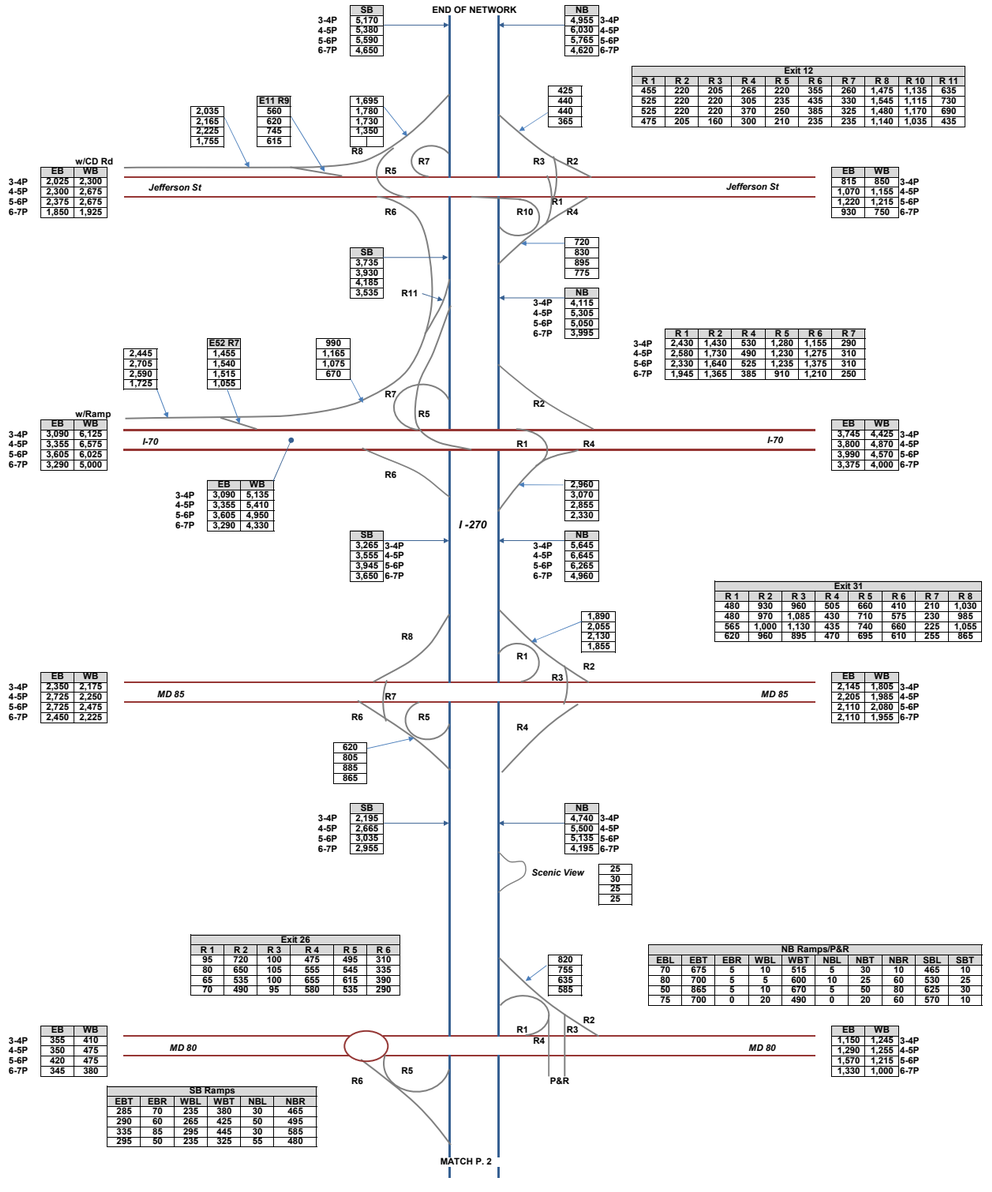
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
235	580	75	470	310	30
420	625	110	795	640	75
360	620	210	865	360	120
285	305	155	955	635	160

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
50	135	45	745	160	500	885	5
55	145	70	740	160	835	1,255	10
40	145	85	555	205	990	975	5
40	135	105	415	190	1,005	930	10

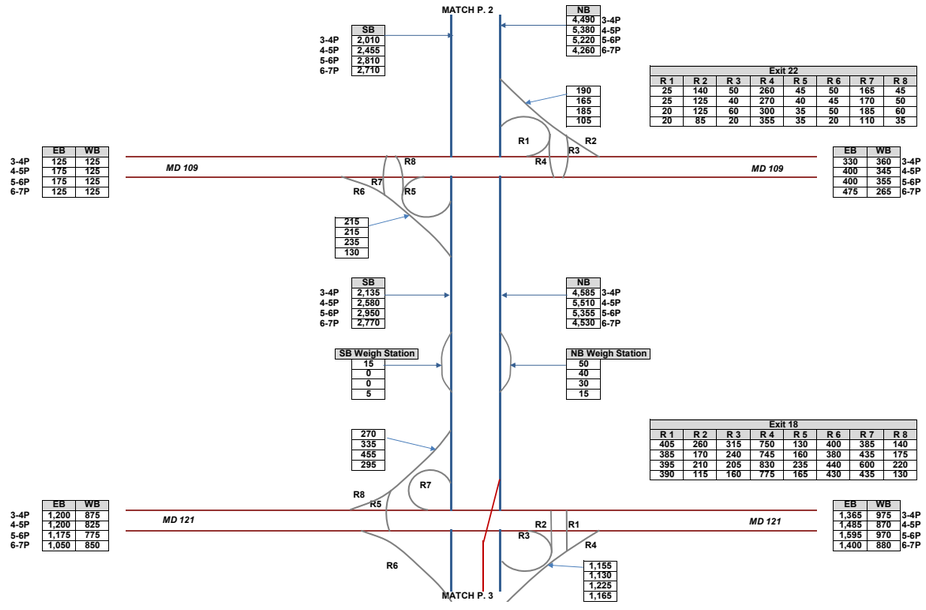
I-495 South Side AM
Future Alternative 13B Peak Period Volumes



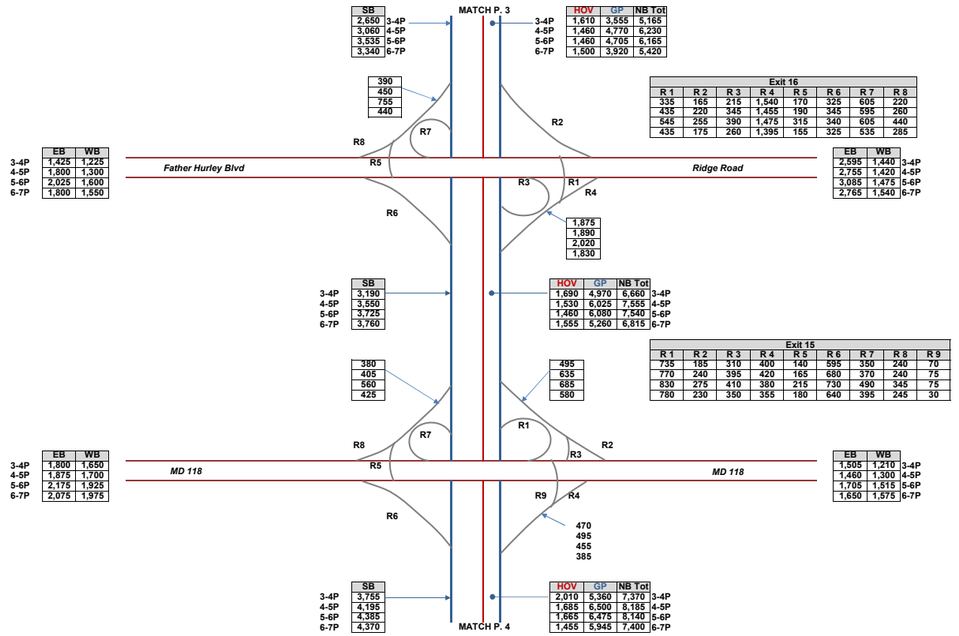
I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



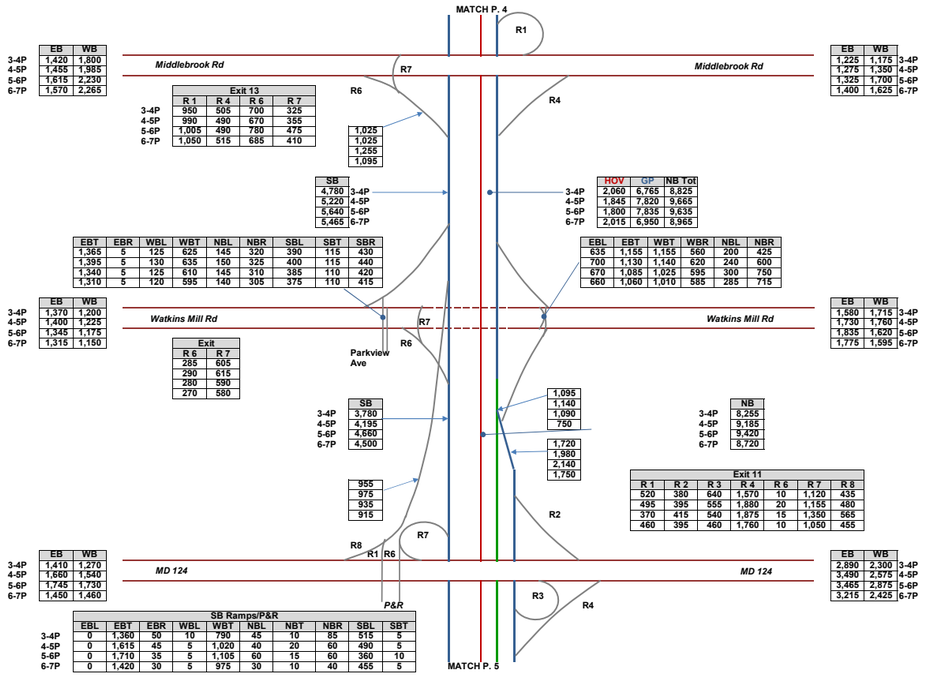
I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



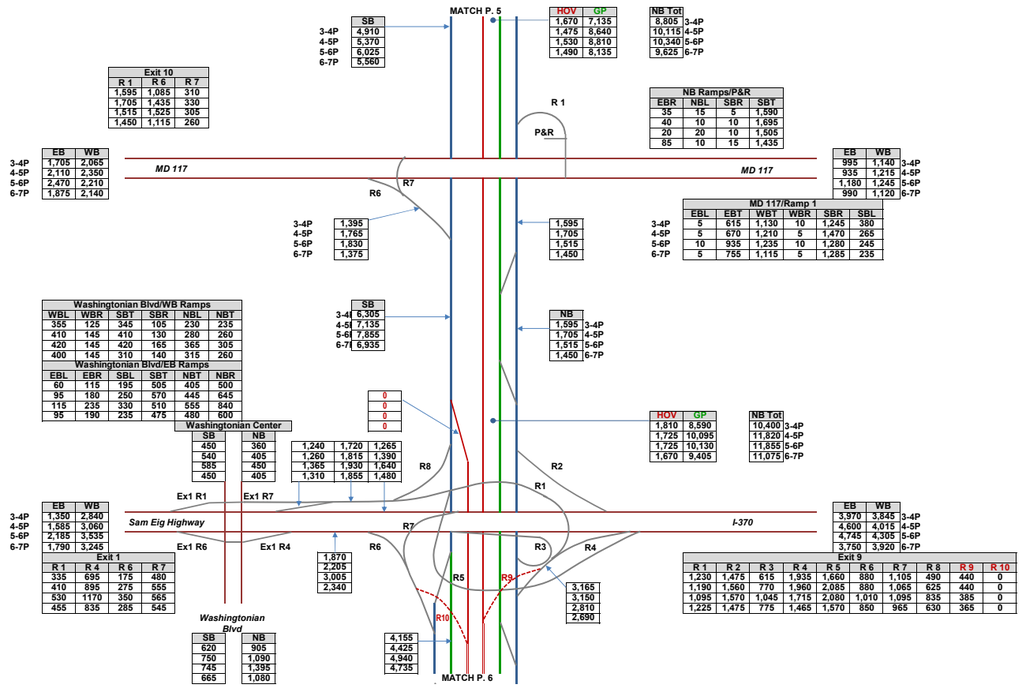
I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



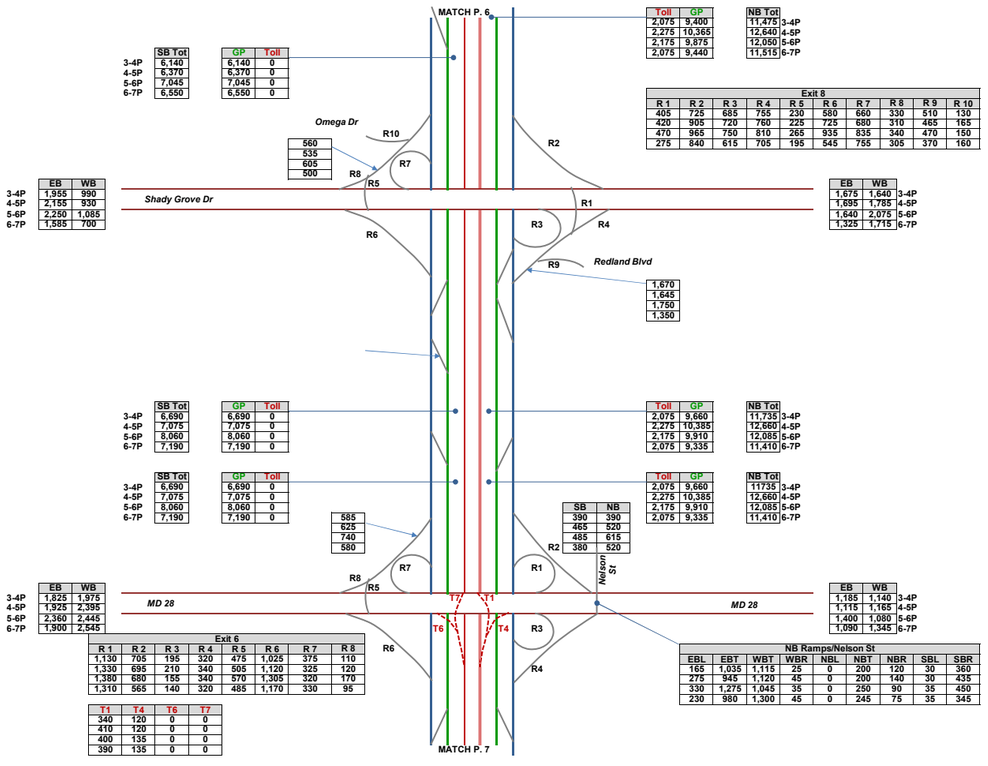
I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



	SB Tot
3-4P	6,140
4-5P	6,370
5-6P	7,045
6-7P	6,550

GP	Toll
6,140	0
6,370	0
7,045	0
6,550	0

Toll	GP
2,075	9,400
2,275	10,365
2,175	9,875
2,075	9,440

NB Tot	
11,475	3-4P
12,640	4-5P
12,050	5-6P
11,515	6-7P

Exit 8									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
405	725	685	755	230	580	660	330	510	130
420	905	720	760	225	725	680	310	465	165
470	965	750	810	265	935	835	340	470	150
275	840	615	705	195	545	755	305	370	160

	EB	WB
3-4P	1,955	990
4-5P	2,155	930
5-6P	2,250	1,085
6-7P	1,585	700

EB	WB	
1,675	1,640	3-4P
1,695	1,785	4-5P
1,640	2,075	5-6P
1,325	1,715	6-7P

560
535
605
500

1,670
1,645
1,750
1,350

	SB Tot
3-4P	6,690
4-5P	7,075
5-6P	8,060
6-7P	7,190

GP	Toll
6,690	0
7,075	0
8,060	0
7,190	0

Toll	GP
2,075	9,660
2,275	10,385
2,175	9,910
2,075	9,335

NB Tot	
11,735	3-4P
12,660	4-5P
12,085	5-6P
11,410	6-7P

	SB Tot
3-4P	6,690
4-5P	7,075
5-6P	8,060
6-7P	7,190

GP	Toll
6,690	0
7,075	0
8,060	0
7,190	0

Toll	GP
2,075	9,660
2,275	10,385
2,175	9,910
2,075	9,335

NB Tot	
11735	3-4P
12,660	4-5P
12,085	5-6P
11,410	6-7P

585
625
740
580

SB	NB
390	390
465	520
485	615
380	520

	EB	WB
3-4P	1,825	1,975
4-5P	1,925	2,395
5-6P	2,360	2,445
6-7P	1,900	2,545

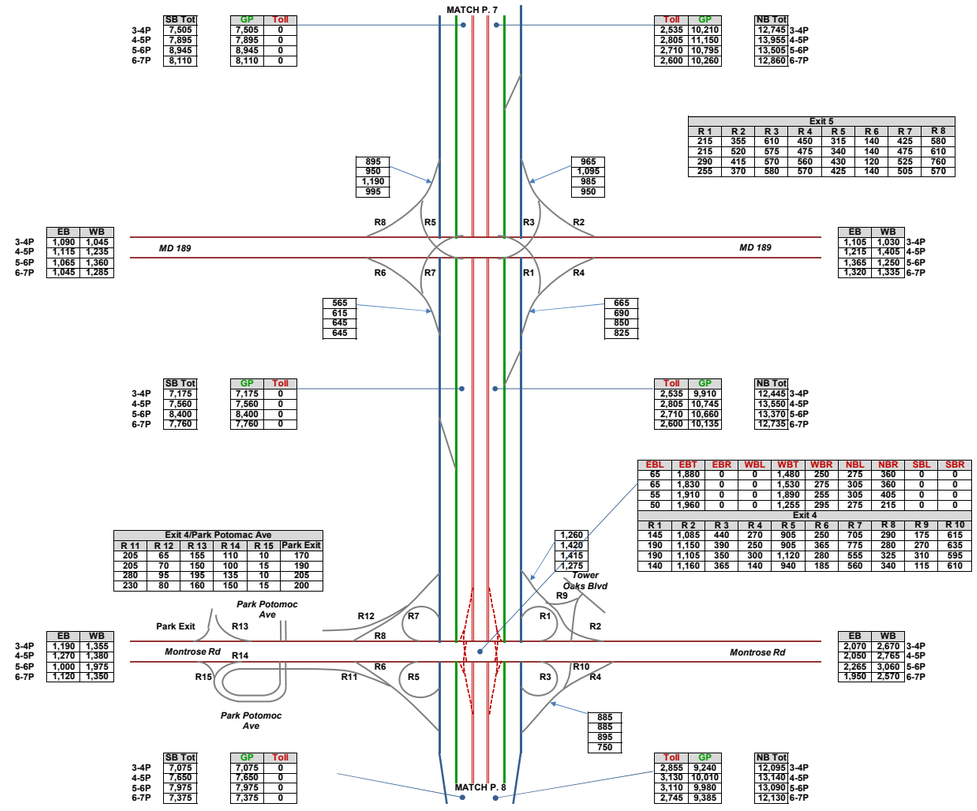
EB	WB	
1,185	1,140	3-4P
1,115	1,165	4-5P
1,400	1,080	5-6P
1,090	1,345	6-7P

Exit 6							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
1,130	705	195	320	475	1,025	375	110
1,330	695	210	340	505	1,120	325	120
1,380	680	155	340	570	1,305	320	170
1,310	565	140	320	485	1,170	330	95

NB Ramps/Nelson St								
EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBR
165	1,035	1,115	25	0	200	120	30	360
275	945	1,120	45	0	200	140	30	435
330	1,275	1,045	35	0	250	90	35	450
230	980	1,300	45	0	245	75	35	345

T1	T4	T6	T7
340	120	0	0
410	120	0	0
400	135	0	0
390	135	0	0

I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



	SB Tot	GP	Toll
3-4P	7,505	7,505	0
4-5P	7,895	7,895	0
5-6P	8,945	8,945	0
6-7P	8,110	8,110	0

Toll	GP	NB Tot	
2,535	10,210	12,745	3-4P
2,805	11,150	13,955	4-5P
2,710	10,795	13,505	5-6P
2,600	10,260	12,860	6-7P

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
215	355	610	450	315	140	425	580
215	520	575	475	340	140	475	610
290	415	570	560	430	120	525	760
255	370	580	570	425	140	505	570

	EB	WB
3-4P	1,090	1,045
4-5P	1,115	1,235
5-6P	1,065	1,360
6-7P	1,045	1,285

EB	WB	
1,105	1,030	3-4P
1,215	1,405	4-5P
1,365	1,250	5-6P
1,320	1,335	6-7P

	SB Tot	GP	Toll
3-4P	7,175	7,175	0
4-5P	7,560	7,560	0
5-6P	8,400	8,400	0
6-7P	7,760	7,760	0

Toll	GP	NB Tot	
2,535	9,910	12,445	3-4P
2,805	10,745	13,550	4-5P
2,710	10,660	13,370	5-6P
2,600	10,135	12,735	6-7P

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
65	1,880	0	0	1,480	250	275	360	0	0
65	1,830	0	0	1,530	275	305	360	0	0
55	1,910	0	0	1,890	255	305	405	0	0
50	1,960	0	0	1,255	295	275	215	0	0

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
145	1,085	440	270	905	250	705	290	175	615
190	1,150	390	250	905	365	775	280	270	635
190	1,105	350	300	1,120	280	555	325	310	595
140	1,160	365	140	940	185	560	340	115	610

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
205	65	155	110	10	170
205	70	150	100	15	190
280	95	195	135	10	205
230	80	160	150	15	200

	EB	WB
3-4P	1,190	1,355
4-5P	1,270	1,380
5-6P	1,000	1,975
6-7P	1,120	1,350

EB	WB	
2,070	2,670	3-4P
2,050	2,765	4-5P
2,265	3,060	5-6P
1,950	2,570	6-7P

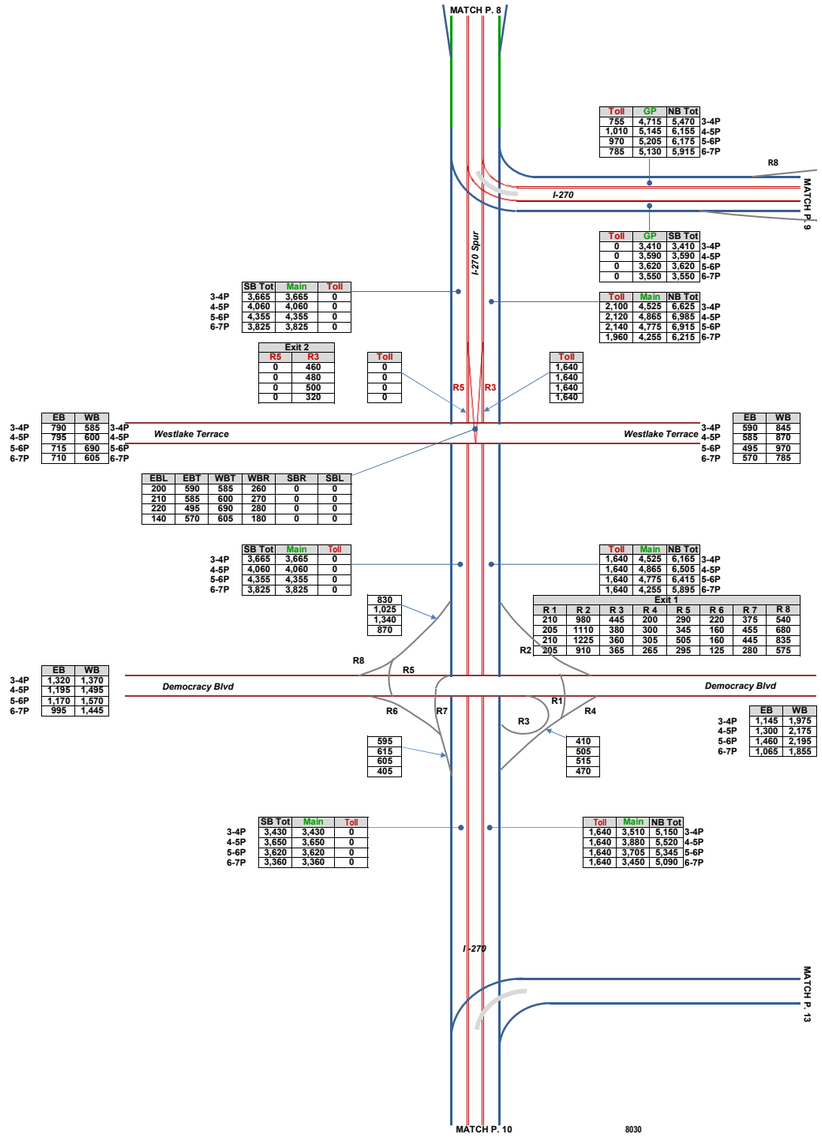
	SB Tot	GP	Toll
3-4P	7,075	7,075	0
4-5P	7,850	7,850	0
5-6P	7,975	7,975	0
6-7P	7,375	7,375	0

Toll	GP	NB Tot	
2,855	9,240	12,095	3-4P
3,130	10,010	13,140	4-5P
3,110	9,980	13,090	5-6P
2,745	9,385	12,130	6-7P

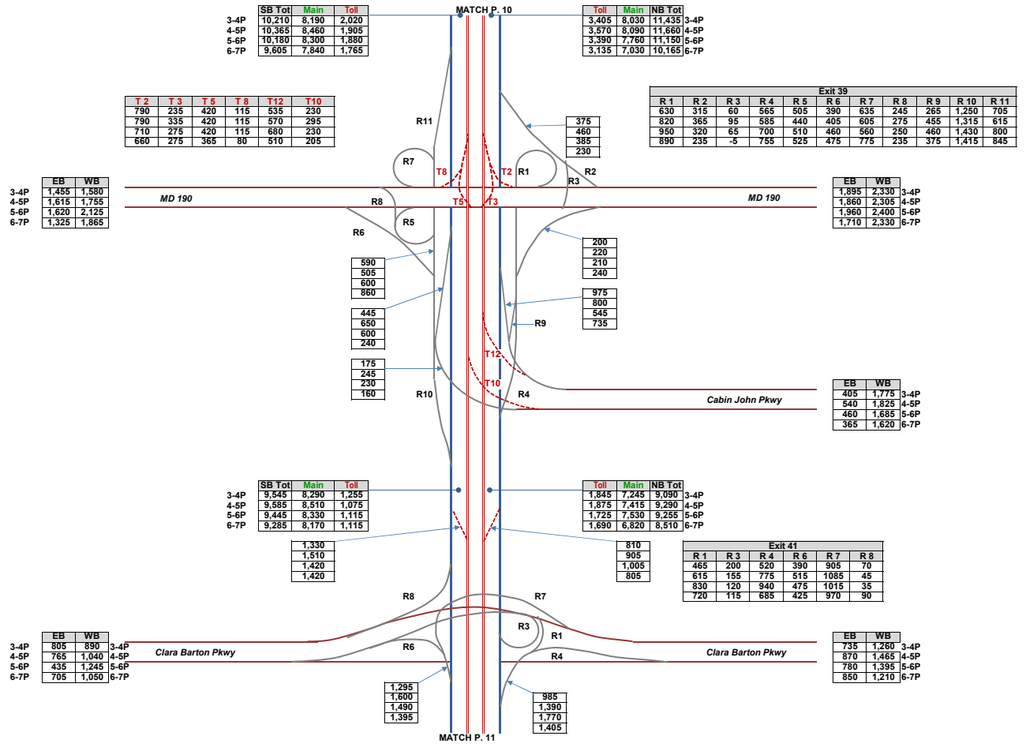
895	965	565	665
950	1,095	615	690
1,190	985	645	850
995	950	645	825

1,260	885		
1,420	885		
1,415	895		
1,275	750		

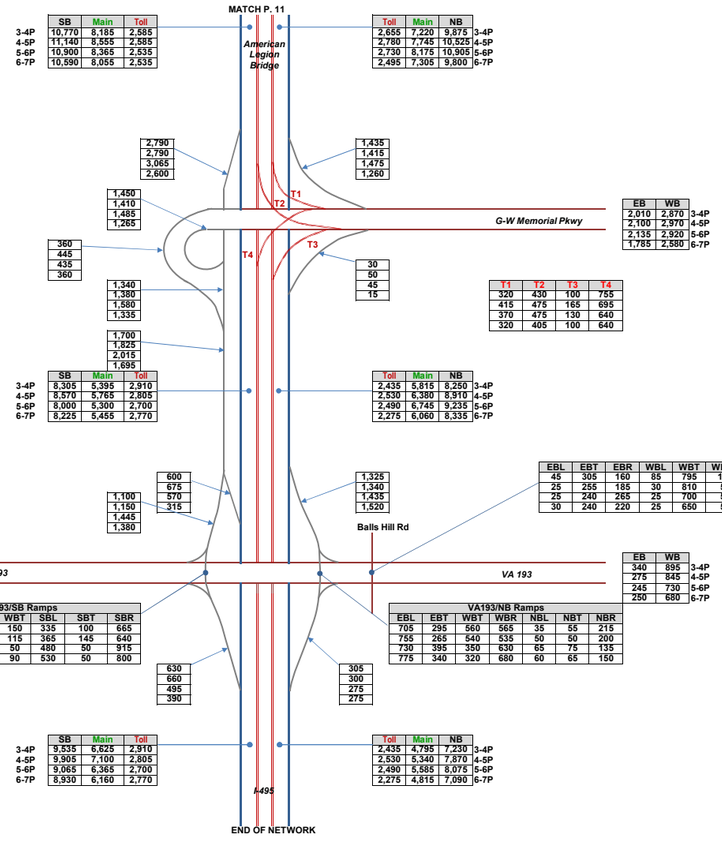
I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



	SB	Main	Toll
3-4P	10,770	8,185	2,585
4-5P	11,140	8,555	2,585
5-6P	10,900	8,365	2,535
6-7P	10,590	8,055	2,535

	Toll	Main	NB
3-4P	2,655	7,220	9,875
4-5P	2,780	7,745	10,525
5-6P	2,730	8,175	10,905
6-7P	2,495	7,305	9,800

	SB	Main	Toll
3-4P	8,305	5,395	2,910
4-5P	8,570	5,765	2,805
5-6P	8,000	5,300	2,700
6-7P	8,225	5,455	2,770

	Toll	Main	NB
3-4P	2,435	5,815	8,250
4-5P	2,530	6,380	8,910
5-6P	2,490	6,745	9,235
6-7P	2,275	6,060	8,335

	SB	Main	Toll
3-4P	9,535	6,625	2,910
4-5P	9,905	7,100	2,805
5-6P	9,065	6,365	2,700
6-7P	8,930	6,160	2,770

	Toll	Main	NB
3-4P	2,435	4,795	7,230
4-5P	2,530	5,340	7,870
5-6P	2,490	5,585	8,075
6-7P	2,275	4,815	7,090

	EB	WB
3-4P	2,010	2,870
4-5P	2,100	2,970
5-6P	2,135	2,920
6-7P	1,785	2,580

	EB	WB
3-4P	340	895
4-5P	275	845
5-6P	245	730
6-7P	200	680

	EB	WB
3-4P	750	815
4-5P	695	755
5-6P	725	965
6-7P	635	890

T1	T2	T3	T4
320	430	100	755
415	475	165	695
370	475	130	640
320	405	100	640

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
45	305	160	85	795	15	200	5	25	10	40	130
25	255	185	30	810	5	160	5	15	5	30	105
25	240	265	25	700	5	180	5	5	0	10	100
30	240	220	25	650	5	220	5	10	0	25	130

VA193/SB Ramps						
EBT	EBR	WBL	WBT	SBL	SBT	SBR
665	85	445	150	335	100	665
655	40	475	115	365	145	640
645	80	365	50	480	50	915
585	50	290	90	530	50	800

VA193/NB Ramps						
EBL	EBT	WBT	WBR	NBL	NBT	NBR
705	295	560	565	35	55	215
755	265	540	535	50	50	200
730	395	350	630	65	75	135
775	340	320	680	60	65	150

2,790
2,790
3,065
2,600

1,435
1,415
1,475
1,260

1,450
1,410
1,485
1,265

360
445
435
360

30
50
45
15

1,340
1,380
1,580
1,335

1,700
1,825
2,015
1,695

600
675
570
315

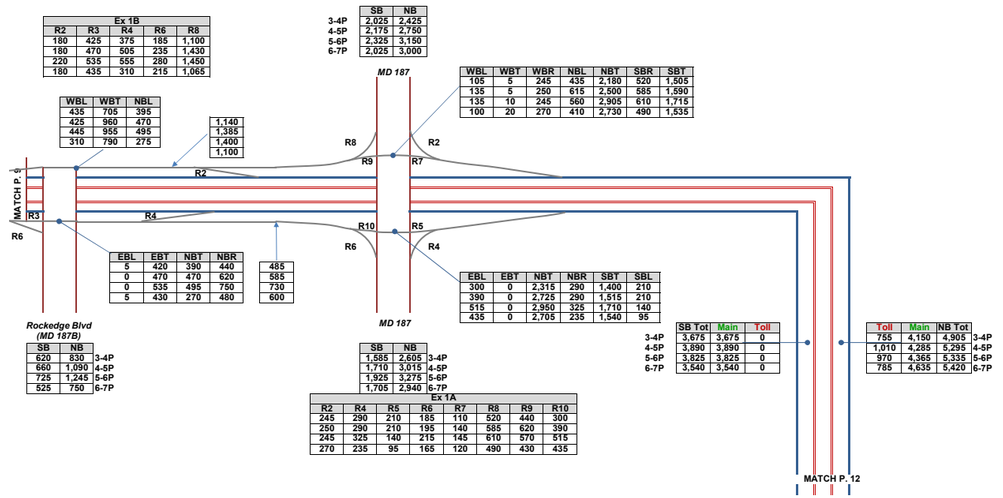
1,325
1,340
1,435
1,520

1,100
1,150
1,445
1,380

630
660
495
390

305
300
275
275

I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



Ex 1B				
R2	R3	R4	R6	R8
180	425	375	185	1,100
180	470	505	235	1,430
220	535	555	280	1,450
180	435	310	215	1,065

	SB	NB
3-4P	2,025	2,425
4-5P	2,175	2,760
5-6P	2,325	3,150
6-7P	2,025	3,000

WBL	WBT	WBR	NBL	NBT	SBR	SBT
105	5	245	435	2,180	520	1,505
135	5	250	615	2,500	585	1,590
135	10	245	560	2,905	610	1,715
100	20	270	410	2,730	490	1,535

WBL	WBT	NBL
435	705	395
425	960	470
445	955	495
310	790	275

1,140
1,385
1,400
1,100

EBL	EBT	NBT	NBR
5	420	390	440
0	470	470	620
0	535	495	750
5	430	270	480

485
585
730
600

EBL	EBT	NBT	NBR	SBT	SBL
300	0	2,315	290	1,400	210
390	0	2,725	290	1,515	210
515	0	2,950	325	1,710	140
435	0	2,705	235	1,540	95

	SB Tot	Main	Toll
3-4P	3,675	3,675	0
4-5P	3,890	3,890	0
5-6P	3,825	3,825	0
6-7P	3,540	3,540	0

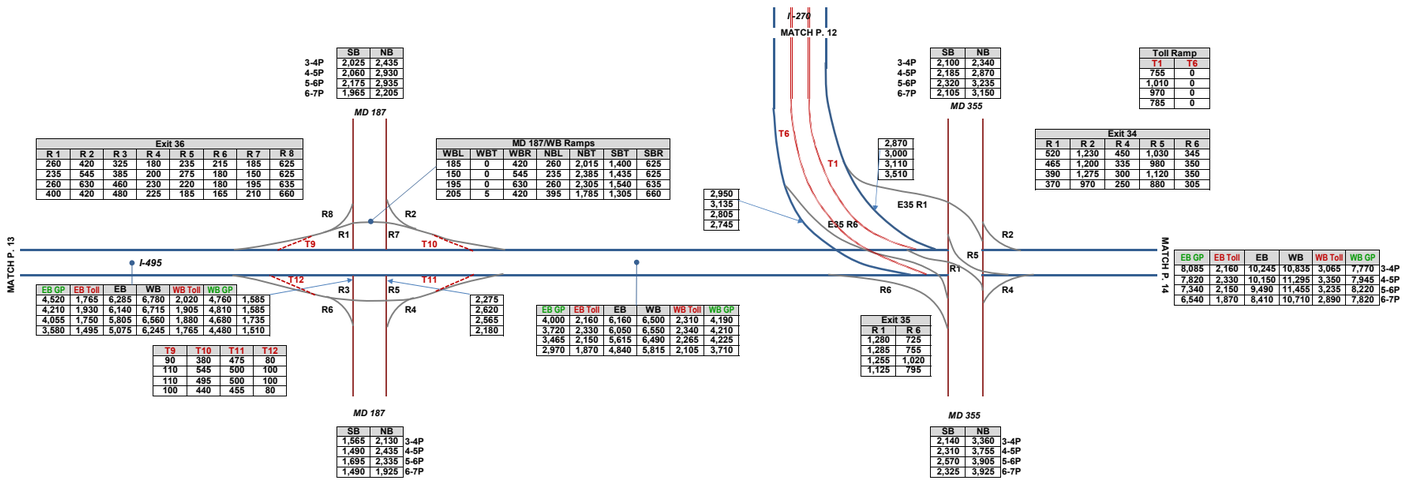
Toll	Main	NB Tot	
755	4,150	4,905	3-4P
1,010	4,285	5,295	4-5P
970	4,365	5,335	5-6P
785	4,635	5,420	6-7P

SB	NB	
620	830	3-4P
660	1,090	4-5P
725	1,245	5-6P
525	750	6-7P

SB	NB	
1,585	2,605	3-4P
1,710	3,015	4-5P
1,925	3,275	5-6P
1,705	2,940	6-7P

Ex 1A							
R2	R4	R5	R6	R7	R8	R9	R10
245	290	210	185	110	620	440	300
250	290	210	195	140	585	620	390
245	325	140	215	145	610	570	515
270	235	95	165	120	490	430	435

I-270 & I-495 West Side PM
Future Alternative 13B Peak Period Volumes



	SB	NB
3-4P	2,025	2,435
4-5P	2,060	2,930
5-6P	2,175	2,935
6-7P	1,965	2,205

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
260	420	325	180	235	215	185	625
235	545	385	200	275	180	150	625
260	630	460	230	220	180	195	635
400	420	480	225	185	165	210	660

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
185	0	420	260	2,015	1,400	625
150	0	545	235	2,385	1,435	625
195	0	630	260	2,305	1,540	635
205	5	420	395	1,785	1,305	660

	SB	NB
3-4P	2,100	2,340
4-5P	2,185	2,870
5-6P	2,320	3,235
6-7P	2,105	3,150

Toll Ramp	
T1	T6
755	0
1,010	0
970	0
785	0

Exit 34				
R 1	R 2	R 4	R 5	R 6
520	1,230	450	1,030	345
465	1,200	335	980	350
390	1,275	300	1,120	350
370	970	250	880	305

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,520	1,765	6,285	6,780	2,020	4,760	1,585	
4,210	1,930	6,140	6,715	1,905	4,810	1,585	
4,055	1,750	5,805	6,560	1,880	4,680	1,735	
3,580	1,495	5,075	6,245	1,765	4,480	1,510	

T9	T10	T11	T12
90	380	475	80
110	545	500	100
110	495	500	100
100	440	455	80

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
4,000	2,160	6,160	6,500	2,310	4,190	
3,720	2,330	6,050	6,550	2,340	4,210	
3,465	2,150	5,615	6,490	2,265	4,225	
2,970	1,870	4,840	5,815	2,105	3,710	

EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,085	2,160	10,245	10,835	3,065	7,770	3-4P
7,820	2,330	10,150	11,295	3,350	7,945	4-5P
7,340	2,150	9,490	11,455	3,235	8,220	5-6P
6,540	1,870	8,410	10,710	2,890	7,820	6-7P

	SB	NB	
3-4P	1,565	2,130	3-4P
4-5P	1,490	2,435	4-5P
5-6P	1,695	2,335	5-6P
6-7P	1,490	1,925	6-7P

	SB	NB	
3-4P	2,140	3,360	3-4P
4-5P	2,310	3,755	4-5P
5-6P	2,570	3,905	5-6P
6-7P	2,325	3,925	6-7P

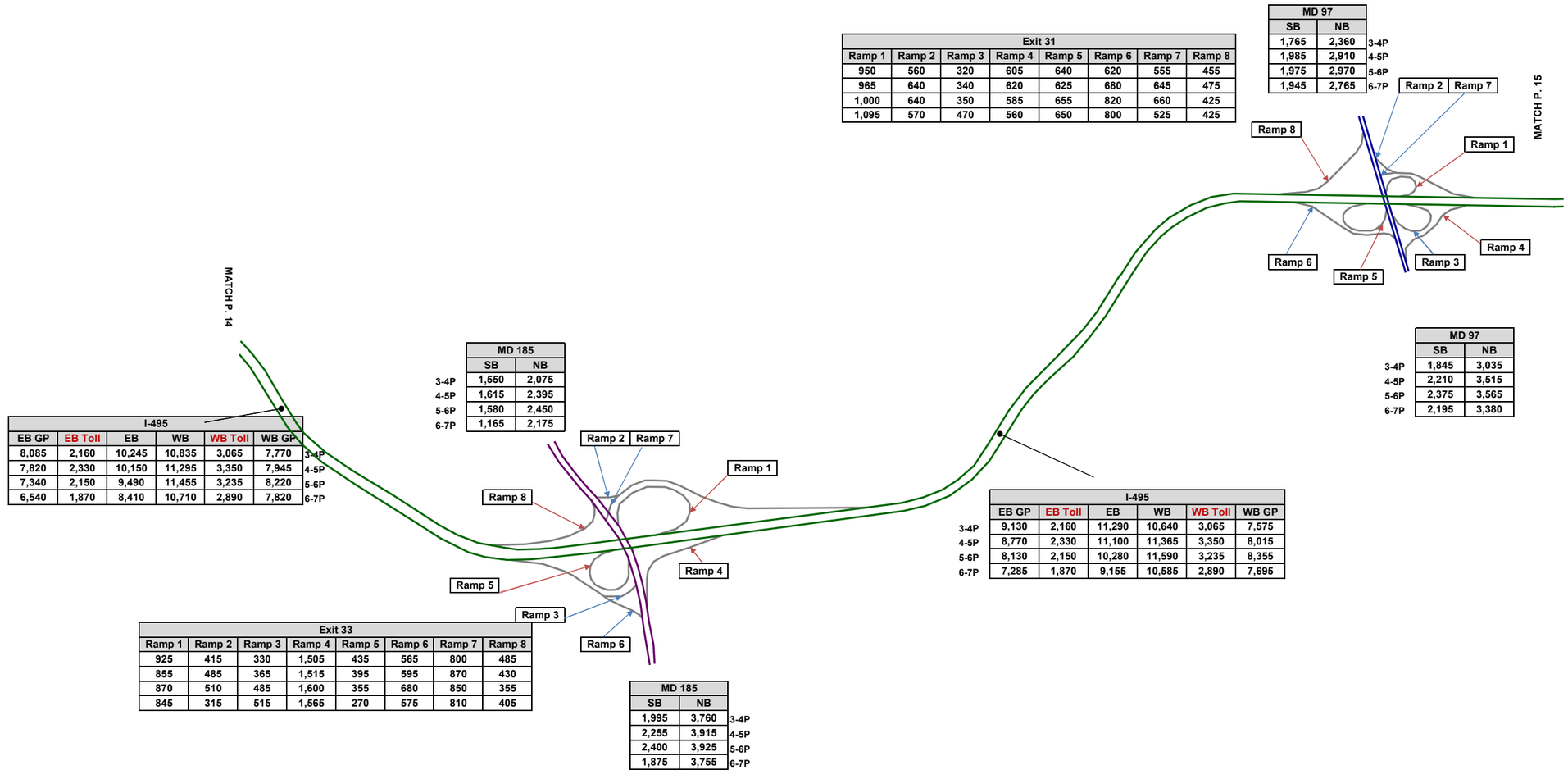
Exit 35	
R 1	R 6
1,280	725
1,285	755
1,255	1,020
1,125	795

2,950
3,135
2,805
2,745

2,870
3,000
3,110
3,510

2,275
2,620
2,565
2,180

I-495 North Side PM
Future Alternative 13B Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
950	560	320	605	640	620	555	455
965	640	340	620	625	680	645	475
1,000	640	350	585	655	820	660	425
1,095	570	470	560	650	800	525	425

	MD 97	
	SB	NB
3-4P	1,765	2,360
4-5P	1,985	2,910
5-6P	1,975	2,970
6-7P	1,945	2,765

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,085	2,160	10,245	10,835	3,065	7,770
4-5P	7,820	2,330	10,150	11,295	3,350	7,945
5-6P	7,340	2,150	9,490	11,455	3,235	8,220
6-7P	6,540	1,870	8,410	10,710	2,890	7,820

	MD 185	
	SB	NB
3-4P	1,550	2,075
4-5P	1,615	2,395
5-6P	1,580	2,450
6-7P	1,165	2,175

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
925	415	330	1,505	435	565	800	485
855	485	365	1,515	395	595	870	430
870	510	485	1,600	355	680	850	355
845	315	515	1,565	270	575	810	405

	MD 185	
	SB	NB
3-4P	1,995	3,760
4-5P	2,255	3,915
5-6P	2,400	3,925
6-7P	1,875	3,755

	MD 97	
	SB	NB
3-4P	1,845	3,035
4-5P	2,210	3,515
5-6P	2,375	3,565
6-7P	2,195	3,380

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,130	2,160	11,290	10,640	3,065	7,575
4-5P	8,770	2,330	11,100	11,365	3,350	8,015
5-6P	8,130	2,150	10,280	11,590	3,235	8,355
6-7P	7,285	1,870	9,155	10,585	2,890	7,695

I-495 North Side PM
Future Alternative 13B Peak Period Volumes

T1	T2	T3	T4	T5	T6	T7	T8
210	350	615	705	350	130	350	695
240	370	805	735	345	145	360	710
295	380	805	765	320	140	305	695
275	360	790	645	320	110	350	790

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
245	520	320	415	145	345
315	455	340	290	230	355
340	455	405	310	260	485
300	540	285	330	165	495

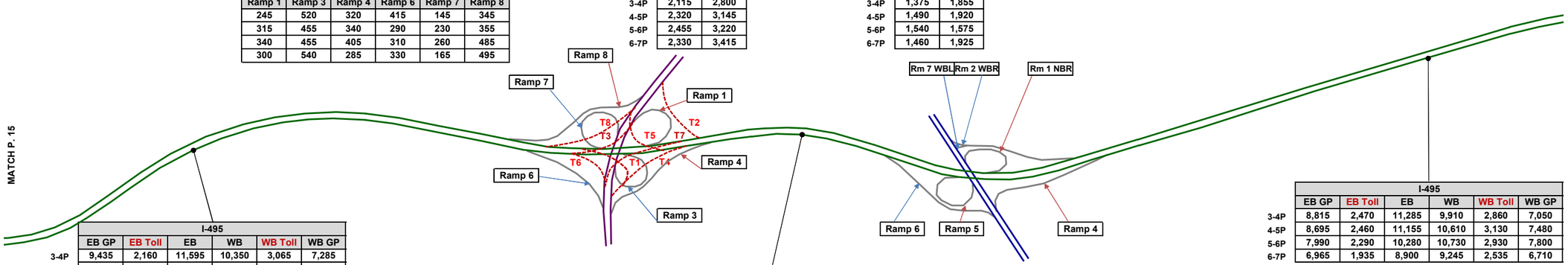
	US 29	
	SB	NB
3-4P	2,115	2,800
4-5P	2,320	3,145
5-6P	2,455	3,220
6-7P	2,330	3,415

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
575	470	490	420	915	315
810	540	530	450	875	330
860	585	505	460	815	410
820	535	430	465	570	355

	MD 193	
	SB	NB
3-4P	1,375	1,855
4-5P	1,490	1,920
5-6P	1,540	1,575
6-7P	1,460	1,925

MATCH P. 16

MATCH P. 15



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,435	2,160	11,595	10,350	3,065	7,285
4-5P	8,995	2,330	11,325	11,210	3,350	7,860
5-6P	8,200	2,150	10,350	11,465	3,235	8,230
6-7P	7,225	1,870	9,095	10,160	2,890	7,270

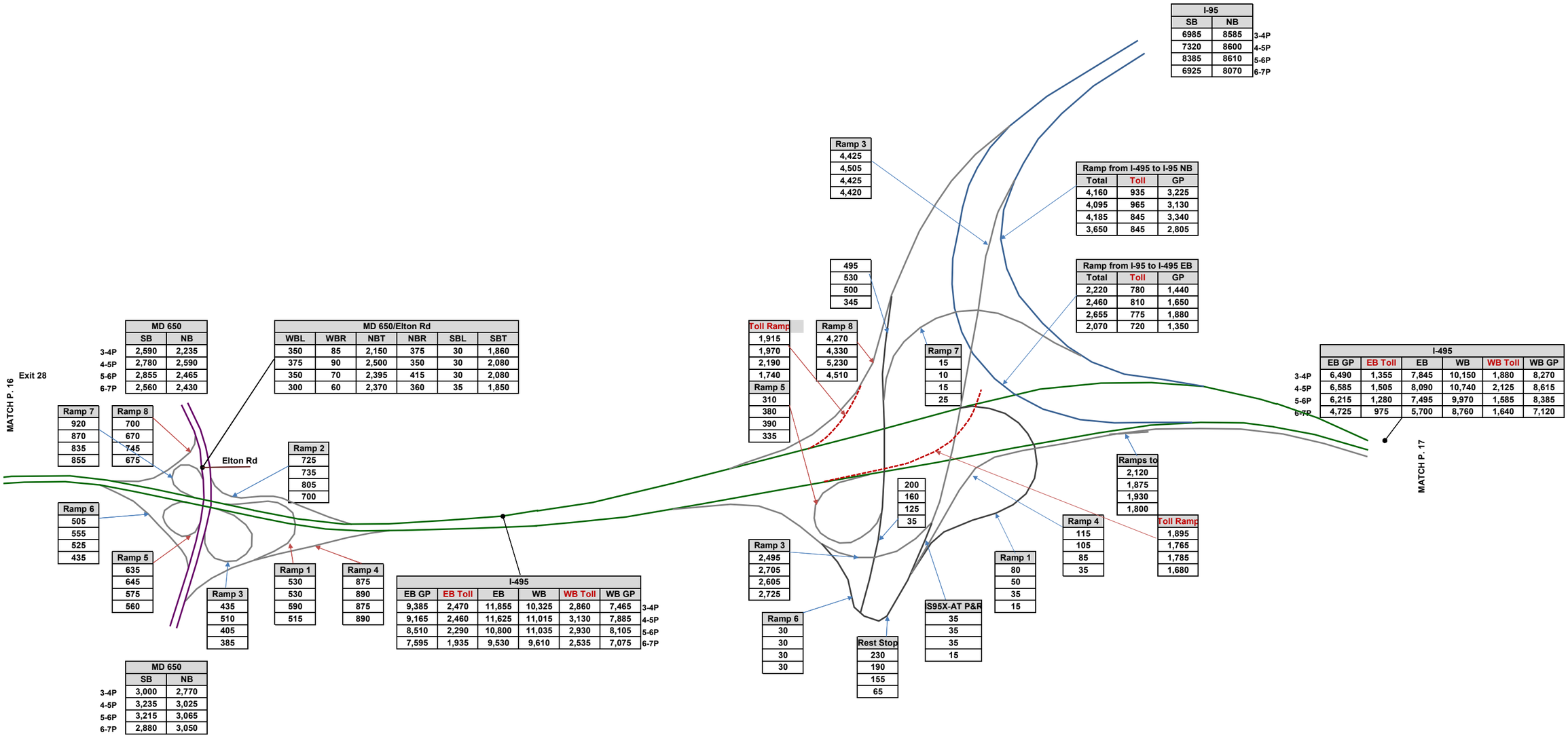
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,815	2,470	11,285	9,910	2,860	7,050
4-5P	8,695	2,460	11,155	10,610	3,130	7,480
5-6P	7,990	2,290	10,280	10,730	2,930	7,800
6-7P	6,965	1,935	8,900	9,245	2,535	6,710

	US 29	
	SB	NB
3-4P	1,765	2,795
4-5P	1,935	3,145
5-6P	1,970	3,385
6-7P	1,680	3,230

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,820	2,470	11,290	9,700	2,860	6,840	6-7A
8,590	2,460	11,050	10,550	3,130	7,420	7-8A
7,840	2,290	10,130	10,595	2,930	7,665	8-9A
6,640	1,935	8,575	9,175	2,535	6,640	9-10A

	MD 193	
	SB	NB
3-4P	2,185	2,450
4-5P	2,245	2,720
5-6P	2,305	2,355
6-7P	1,920	2,640

I-495 North Side PM
Future Alternative 13B Peak Period Volumes



MD 650		
	SB	NB
3-4P	2,590	2,235
4-5P	2,780	2,590
5-6P	2,855	2,465
6-7P	2,560	2,430

MD 650/Elton Rd					
WBL	WBR	NBT	NBR	SBL	SBT
350	85	2,150	375	30	1,860
375	90	2,500	350	30	2,080
350	70	2,395	415	30	2,080
300	60	2,370	360	35	1,850

Ramp 7
920
870
835
855

Ramp 8
700
670
745
675

Ramp 2
725
735
805
700

Ramp 6
505
555
525
435

Ramp 5
635
645
575
560

Ramp 3
435
510
405
385

Ramp 1
530
530
590
515

Ramp 4
875
890
875
890

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
9,385	2,470	11,855	10,325	2,860	7,465
9,165	2,460	11,625	11,015	3,130	7,885
8,510	2,290	10,800	11,035	2,930	8,105
7,595	1,935	9,530	9,610	2,535	7,075

3-4P
4-5P
5-6P
6-7P

MD 650		
	SB	NB
3-4P	3,000	2,770
4-5P	3,235	3,025
5-6P	3,215	3,065
6-7P	2,880	3,050

I-95	
SB	NB
6985	8585
7320	8600
8385	8610
6925	8070

3-4P
4-5P
5-6P
6-7P

Ramp 3
4,425
4,505
4,425
4,420

Ramp from I-495 to I-95 NB		
Total	Toll	GP
4,160	935	3,225
4,095	965	3,130
4,185	845	3,340
3,650	845	2,805

495
530
500
345

Ramp from I-95 to I-495 EB		
Total	Toll	GP
2,220	780	1,440
2,460	810	1,650
2,655	775	1,880
2,070	720	1,350

Toll Ramp
1,915
1,970
2,190
1,740

Ramp 8
4,270
4,330
5,230
4,510

Ramp 5
310
380
390
335

Ramp 7
15
10
15
25

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
6,490	1,355	7,845	10,150	1,880	8,270
6,585	1,505	8,090	10,740	2,125	8,615
6,215	1,280	7,495	9,970	1,585	8,385
4,725	975	5,700	8,760	1,640	7,120

3-4P
4-5P
5-6P
6-7P

200
160
125
35

Ramps to
2,120
1,875
1,930
1,800

Ramp 3
2,495
2,705
2,605
2,725

Ramp 4
115
105
85
35

Toll Ramp
1,895
1,765
1,785
1,680

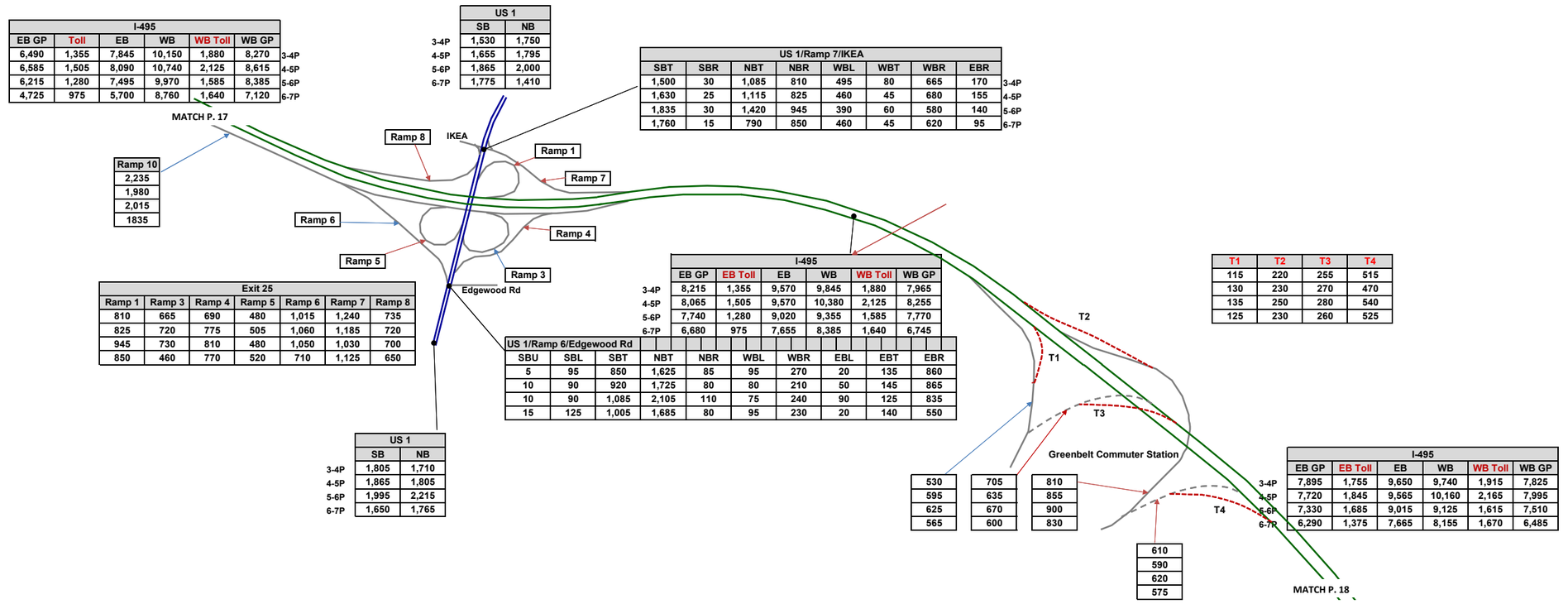
Ramp 1
80
50
35
15

Ramp 6
30
30
30
30

IS95X-AT P&R
35
35
35
15

Rest Stop
230
190
155
65

I-495 North East Side PM
Future Alternative 13B Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,490	1,355	7,845	10,150	1,880	8,270	3-4P
6,585	1,505	8,090	10,740	2,125	8,615	4-5P
6,215	1,280	7,495	9,970	1,585	8,385	5-6P
4,725	975	5,700	8,760	1,640	7,120	6-7P

US 1		
	SB	NB
3-4P	1,530	1,750
4-5P	1,655	1,795
5-6P	1,865	2,000
6-7P	1,775	1,410

US 1/Ramp 7/IKEA								
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR	
1,500	30	1,085	810	495	80	665	170	3-4P
1,630	25	1,115	825	460	45	680	155	4-5P
1,835	30	1,420	945	390	60	580	140	5-6P
1,760	15	790	850	460	45	620	95	6-7P

Ramp 10
2,235
1,980
2,015
1835

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
810	665	690	480	1,015	1,240	735
825	720	775	505	1,060	1,185	720
945	730	810	480	1,050	1,030	700
850	460	770	520	710	1,125	650

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
8,215	1,355	9,570	9,845	1,880	7,965	3-4P
8,065	1,505	9,570	10,380	2,125	8,255	4-5P
7,740	1,280	9,020	9,355	1,585	7,770	5-6P
6,680	975	7,655	8,385	1,640	6,745	6-7P

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	850	1,625	85	95	270	20	135	860
10	90	920	1,725	80	80	210	50	145	865
10	90	1,085	2,105	110	75	240	90	125	835
15	125	1,005	1,685	80	95	230	20	140	550

US 1		
	SB	NB
3-4P	1,805	1,710
4-5P	1,865	1,805
5-6P	1,995	2,215
6-7P	1,650	1,765

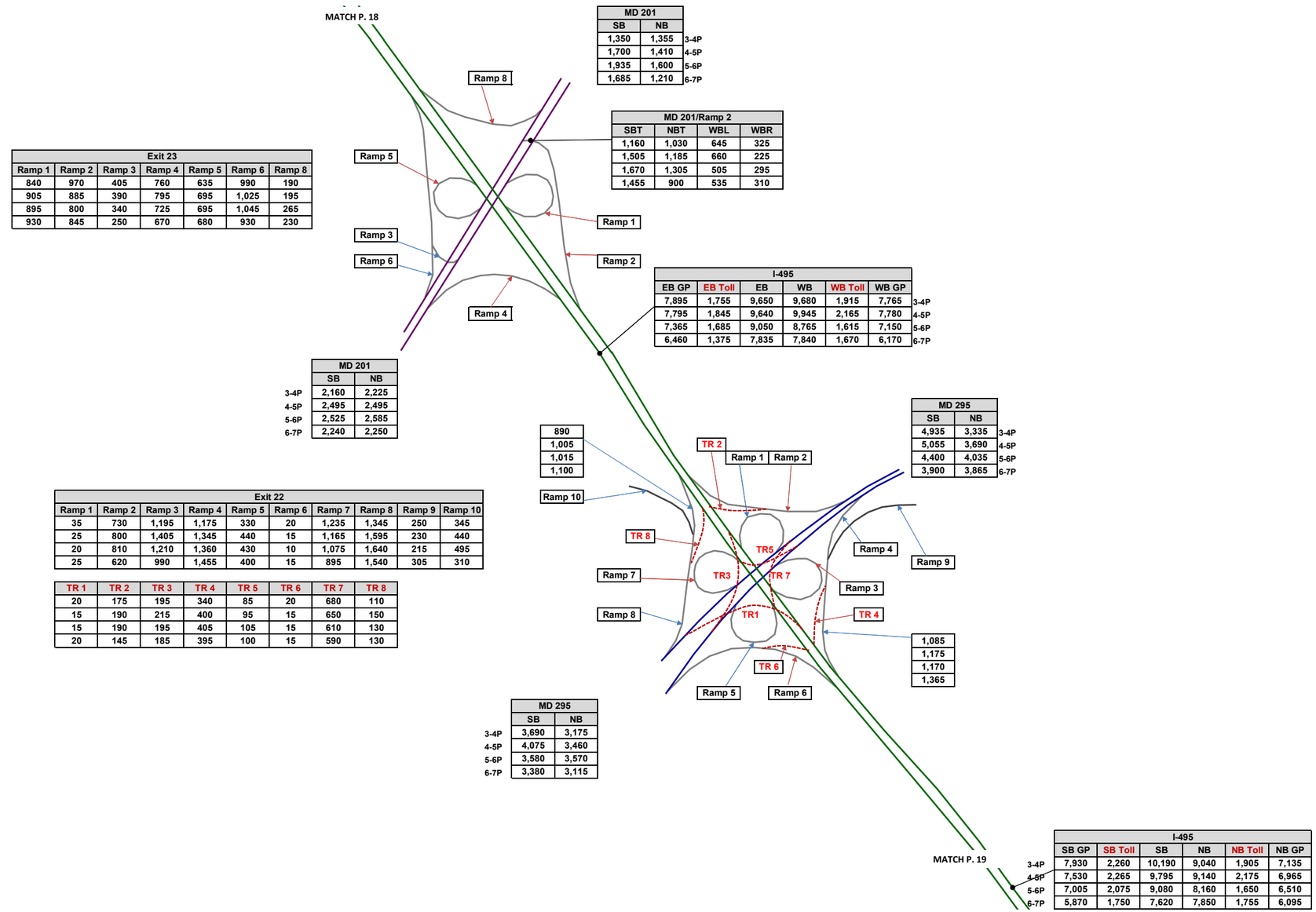
T1	T2	T3	T4
115	220	255	515
130	230	270	470
135	250	280	540
125	230	260	525

530	705	810
595	635	855
625	670	900
565	600	830

610
590
620
575

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,895	1,755	9,650	9,740	1,915	7,825	3-4P
7,720	1,845	9,565	10,160	2,165	7,995	4-5P
7,330	1,685	9,015	9,125	1,615	7,510	5-6P
6,290	1,375	7,665	8,155	1,670	6,485	6-7P

I-495 North East Side PM
Future Alternative 13B Peak Period Volumes



MD 201		
SB	NB	
1,350	1,355	3-4P
1,700	1,410	4-5P
1,935	1,600	5-6P
1,685	1,210	6-7P

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
1,160	1,030	645	325
1,505	1,185	660	225
1,670	1,305	505	295
1,455	900	535	310

Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
840	970	405	760	635	990	190
905	885	390	795	695	1,025	195
895	800	340	725	695	1,045	265
930	845	250	670	680	930	230

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,895	1,755	9,650	9,680	1,915	7,765	3-4P
7,795	1,845	9,640	9,945	2,165	7,780	4-5P
7,365	1,685	9,050	8,765	1,615	7,150	5-6P
6,460	1,375	7,835	7,840	1,670	6,170	6-7P

MD 201		
SB	NB	
2,160	2,225	3-4P
2,495	2,495	4-5P
2,525	2,585	5-6P
2,240	2,250	6-7P

MD 295		
SB	NB	
4,935	3,335	3-4P
5,055	3,690	4-5P
4,400	4,035	5-6P
3,900	3,865	6-7P

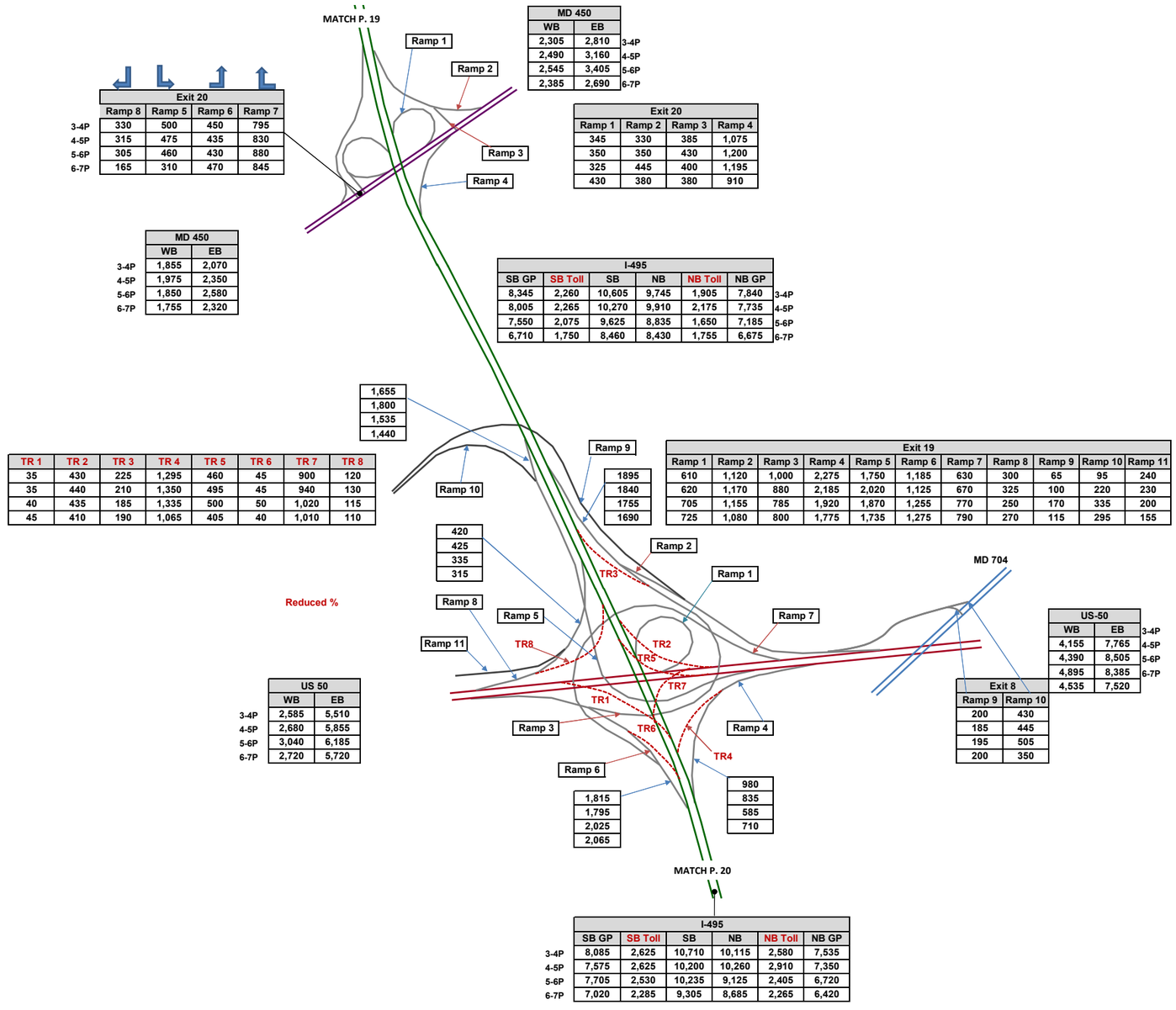
Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
35	730	1,195	1,175	330	20	1,235	1,345	250	345
25	800	1,405	1,345	440	15	1,165	1,595	230	440
20	810	1,210	1,360	430	10	1,075	1,640	215	495
25	620	990	1,455	400	15	895	1,540	305	310

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	175	195	340	85	20	680	110
15	190	215	400	95	15	650	150
15	190	195	405	105	15	610	130
20	145	185	395	100	15	590	130

MD 295		
SB	NB	
3,690	3,175	3-4P
4,075	3,460	4-5P
3,580	3,570	5-6P
3,380	3,115	6-7P

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,930	2,260	10,190	9,040	1,905	7,135	3-4P
7,530	2,265	9,795	9,140	2,175	6,965	4-5P
7,005	2,075	9,080	8,160	1,650	6,510	5-6P
5,870	1,750	7,620	7,850	1,755	6,095	6-7P

I-495 North East Side PM
Future Alternative 13B Peak Period Volumes



MD 450	
WB	EB
2,305	2,810
2,490	3,160
2,545	3,405
2,385	2,690

3-4P 4-5P 5-6P 6-7P

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
345	330	385	1,075
350	350	430	1,200
325	445	400	1,195
430	380	380	910

Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
330	500	450	795
315	475	435	830
305	460	430	880
165	310	470	845

3-4P 4-5P 5-6P 6-7P

MD 450	
WB	EB
1,855	2,070
1,975	2,350
1,850	2,580
1,755	2,320

3-4P 4-5P 5-6P 6-7P

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
8,345	2,260	10,605	9,745	1,905	7,840
8,005	2,265	10,270	9,910	2,175	7,735
7,550	2,075	9,625	8,835	1,650	7,185
6,710	1,750	8,460	8,430	1,755	6,675

3-4P 4-5P 5-6P 6-7P

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
610	1,120	1,000	2,275	1,750	1,185	630	300	65	95	240
620	1,170	880	2,185	2,020	1,125	670	325	100	220	230
705	1,155	785	1,920	1,870	1,255	770	250	170	335	200
725	1,080	800	1,775	1,735	1,275	790	270	115	295	155

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
35	430	225	1,295	460	45	900	120
35	440	210	1,350	495	45	940	130
40	435	185	1,335	500	50	1,020	115
45	410	190	1,065	405	40	1,010	110

US 50	
WB	EB
2,585	5,510
2,680	5,855
3,040	6,185
2,720	5,720

3-4P 4-5P 5-6P 6-7P

US-50	
WB	EB
4,155	7,765
4,390	8,505
4,895	8,385
4,535	7,520

3-4P 4-5P 5-6P 6-7P

Exit 8	
Ramp 9	Ramp 10
200	430
185	445
195	505
200	350

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
8,085	2,625	10,710	10,115	2,580	7,535
7,575	2,625	10,200	10,260	2,910	7,350
7,705	2,530	10,235	9,125	2,405	6,720
7,020	2,285	9,305	8,685	2,265	6,420

3-4P 4-5P 5-6P 6-7P

1,655
1,800
1,535
1,440

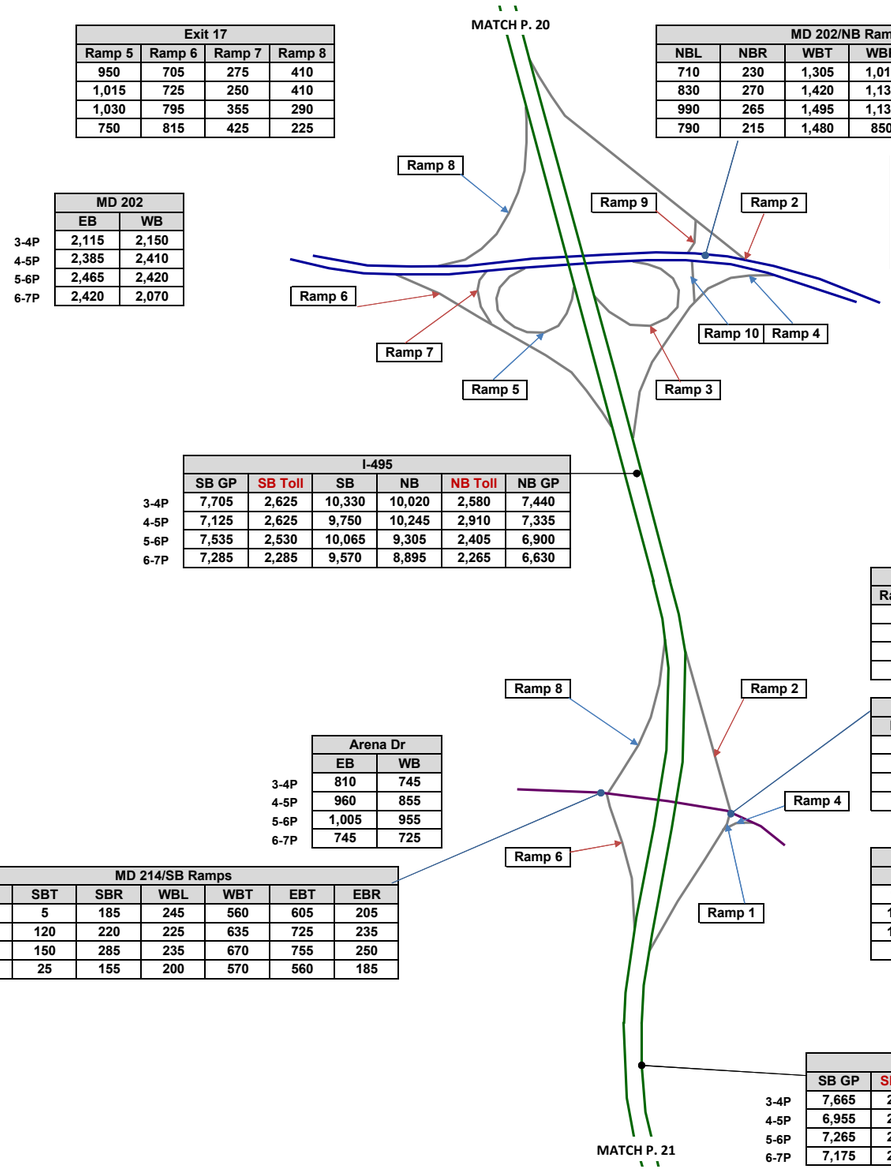
1895
1840
1755
1690

420
425
335
315

1,815
1,795
2,025
2,065

980
835
585
710

I-495 East Side PM
Future Alternative 13B Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
950	705	275	410
1,015	725	250	410
1,030	795	355	290
750	815	425	225

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
710	230	1,305	1,015	15	2,085
830	270	1,420	1,130	10	2,440
990	265	1,495	1,130	20	2,510
790	215	1,480	850	15	2,175

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,015	260	255	15	940
1,130	225	250	10	1,100
1,130	170	245	20	1,255
850	165	235	15	1,005

	MD 202	
	EB	WB
3-4P	2,115	2,150
4-5P	2,385	2,410
5-6P	2,465	2,420
6-7P	2,420	2,070

MD 202		
SB	NB	
2,570	2,320	3-4P
2,960	2,550	4-5P
3,020	2,625	5-6P
2,625	2,330	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,705	2,625	10,330	10,020	2,580	7,440
4-5P	7,125	2,625	9,750	10,245	2,910	7,335
5-6P	7,535	2,530	10,065	9,305	2,405	6,900
6-7P	7,285	2,285	9,570	8,895	2,265	6,630

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
150	455	255	455	495
165	475	260	580	750
170	445	295	635	905
170	405	235	410	520

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
150	0	255	655	230	225	685
165	0	260	695	225	250	885
160	10	295	745	205	230	995
165	5	235	605	165	235	665

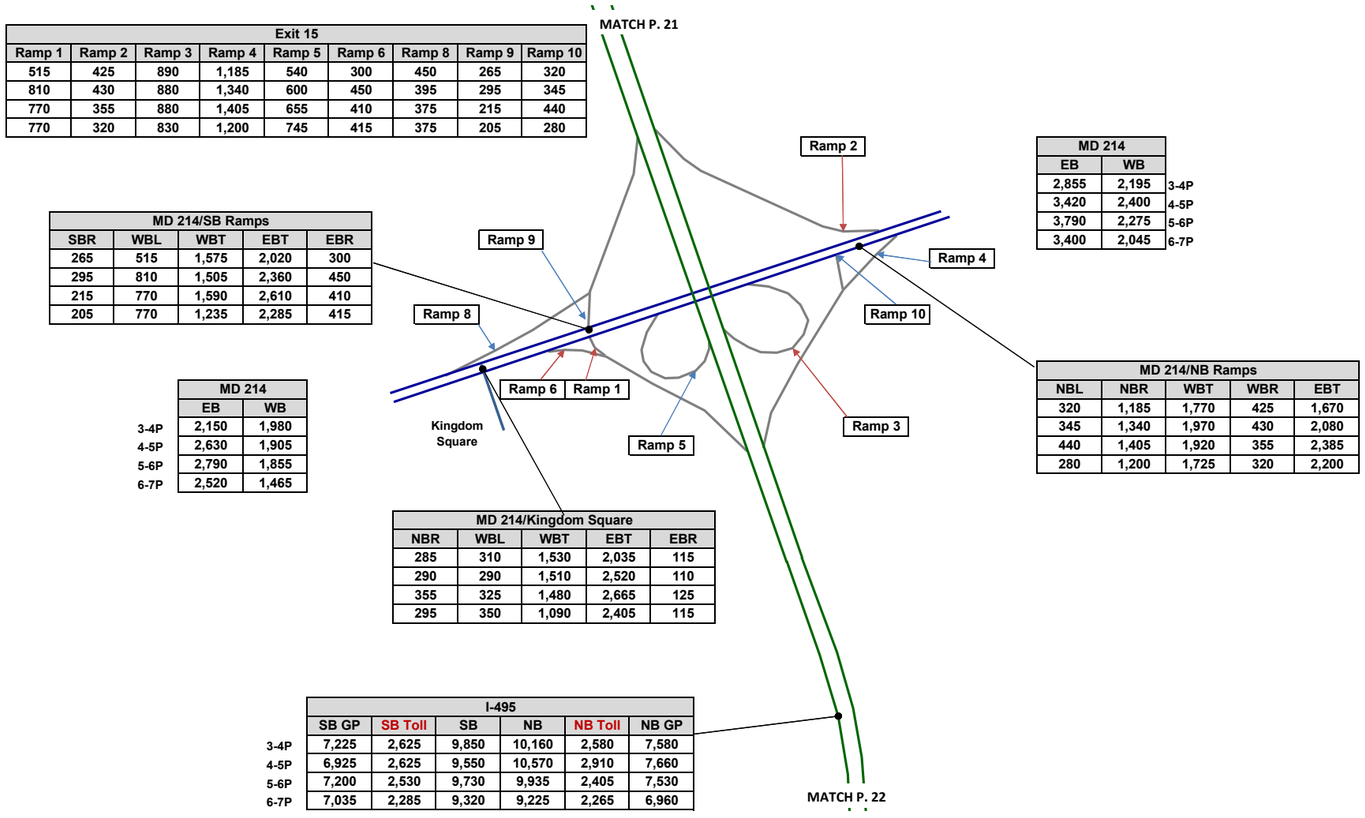
	Arena Dr	
	EB	WB
3-4P	810	745
4-5P	960	855
5-6P	1,005	955
6-7P	745	725

Arena Dr		
EB	WB	
940	885	3-4P
1,145	920	4-5P
1,290	950	5-6P
900	770	6-7P

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
305	5	185	245	560	605	205
410	120	220	225	635	725	235
470	150	285	235	670	755	250
340	25	155	200	570	560	185

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,665	2,625	10,290	9,970	2,580	7,390
4-5P	6,955	2,625	9,580	10,195	2,910	7,285
5-6P	7,265	2,530	9,795	9,325	2,405	6,920
6-7P	7,175	2,285	9,460	8,895	2,265	6,630

I-495 East Side PM
Future Alternative 13B Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	425	890	1,185	540	300	450	265	320
810	430	880	1,340	600	450	395	295	345
770	355	880	1,405	655	410	375	215	440
770	320	830	1,200	745	415	375	205	280

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
265	515	1,575	2,020	300
295	810	1,505	2,360	450
215	770	1,590	2,610	410
205	770	1,235	2,285	415

MD 214		
EB	WB	
2,855	2,195	3-4P
3,420	2,400	4-5P
3,790	2,275	5-6P
3,400	2,045	6-7P

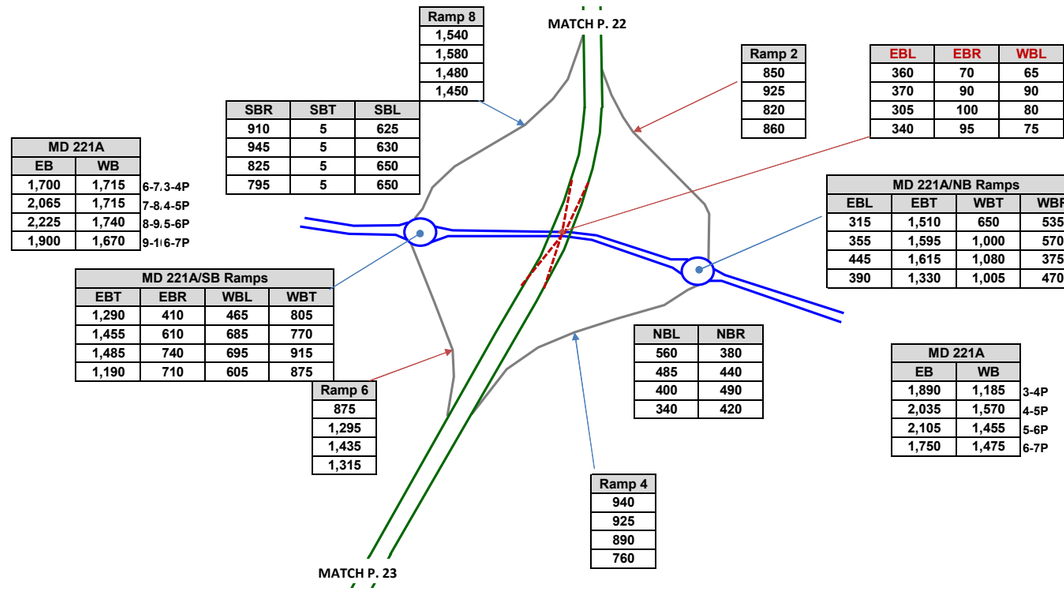
	MD 214	
	EB	WB
3-4P	2,150	1,980
4-5P	2,630	1,905
5-6P	2,790	1,855
6-7P	2,520	1,465

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
320	1,185	1,770	425	1,670
345	1,340	1,970	430	2,080
440	1,405	1,920	355	2,385
280	1,200	1,725	320	2,200

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
285	310	1,530	2,035	115
290	290	1,510	2,520	110
355	325	1,480	2,665	125
295	350	1,090	2,405	115

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,225	2,625	9,850	10,160	2,580	7,580
4-5P	6,925	2,625	9,550	10,570	2,910	7,660
5-6P	7,200	2,530	9,730	9,935	2,405	7,530
6-7P	7,035	2,285	9,320	9,225	2,265	6,960

I-495 East Side PM
Future Alternative 13B Peak Period Volumes



Ramp 8
1,540
1,580
1,480
1,450

Ramp 2
850
925
820
860

SBR	SBT	SBL
910	5	625
945	5	630
825	5	650
795	5	650

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
360	70	65	450	90	70	270	485
370	90	90	510	80	70	255	490
305	100	80	315	65	70	260	460
340	95	75	310	60	70	245	460

MD 221A		
EB	WB	
1,700	1,715	6-7.3-4P
2,065	1,715	7-8.4-5P
2,225	1,740	8-9.5-6P
1,900	1,670	9-10 6-7P

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
315	1,510	650	535
355	1,595	1,000	570
445	1,615	1,080	375
390	1,330	1,005	470

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,290	410	465	805
1,455	610	685	770
1,485	740	695	915
1,190	710	605	875

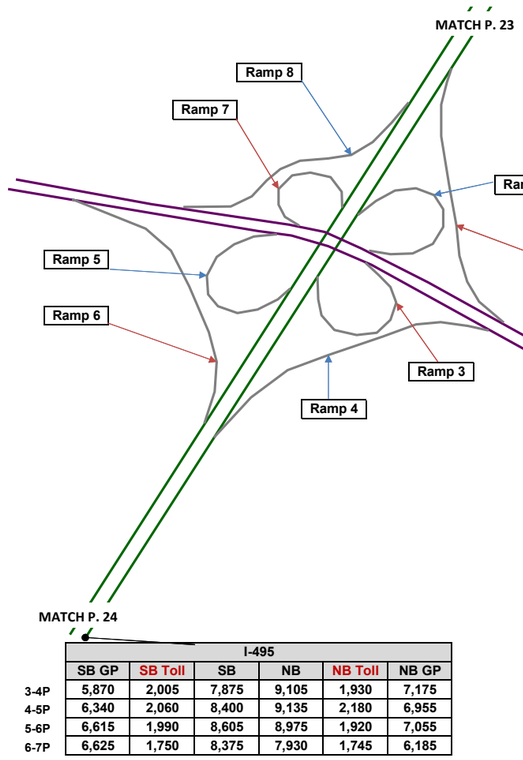
NBL	NBR
560	380
485	440
400	490
340	420

MD 221A		
EB	WB	
1,890	1,185	3-4P
2,035	1,570	4-5P
2,105	1,455	5-6P
1,750	1,475	6-7P

Ramp 6
875
1,295
1,435
1,315

Ramp 4
940
925
890
760

I-495 East Side PM
Future Alternative 13B Peak Period Volumes



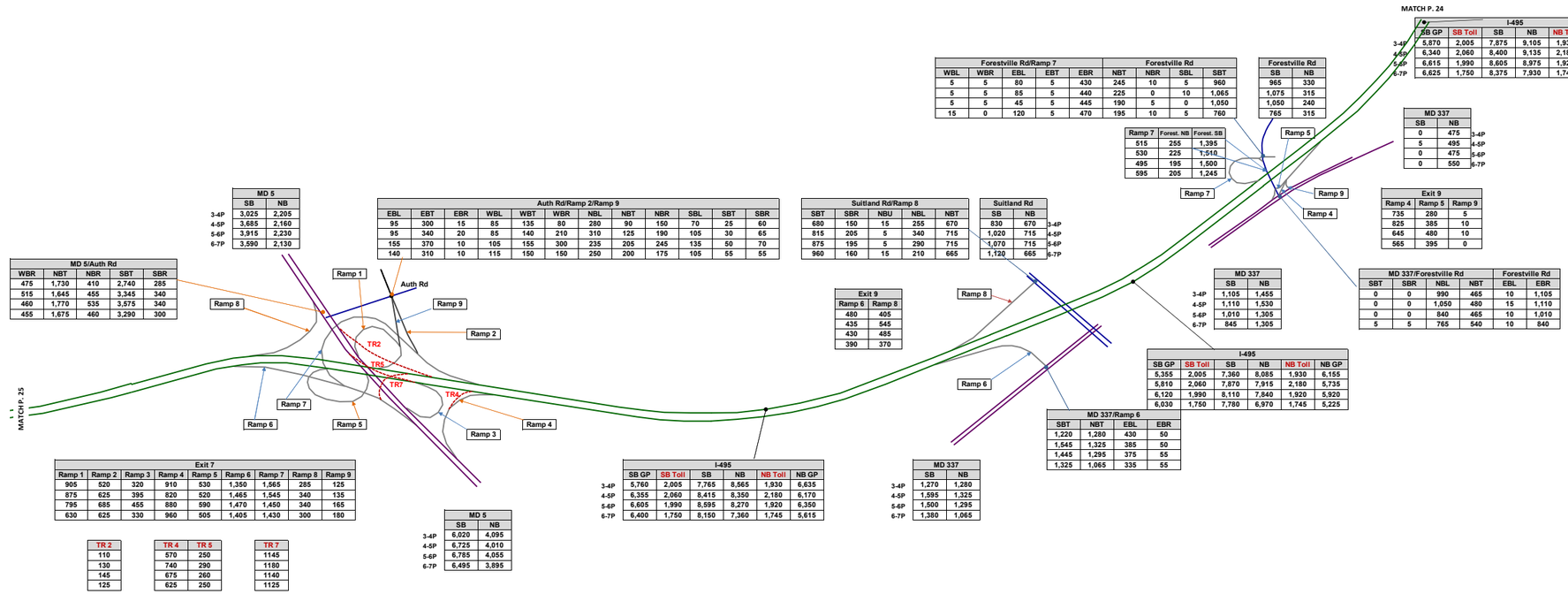
MD 4		
SB	NB	
2,325	1,745	3-4P
2,665	1,875	4-5P
2,715	1,850	5-6P
2,540	1,650	6-7P

Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
695	1,310	905	1,025	1,185	525	715	745
765	1,310	980	820	1,120	765	820	765
745	1,130	960	800	1,045	625	685	805
690	1,025	1,055	715	930	805	655	805

MD 4		
SB	NB	
3,105	2,330	3-4P
2,860	2,475	4-5P
2,975	2,115	5-6P
2,325	1,835	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,870	2,005	7,875	9,105	1,930	7,175
4-5P	6,340	2,060	8,400	9,135	2,180	6,955
5-6P	6,615	1,990	8,605	8,975	1,920	7,055
6-7P	6,625	1,750	8,375	7,930	1,745	6,185

I-495 South Side PM
Future Alternative 13B Peak Period Volumes



I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,870	2,005	7,875	9,105	1,930	7,175
4-5P	6,340	2,060	8,400	9,135	2,180	6,955
5-6P	6,615	1,990	8,605	8,975	1,920	7,055
6-7P	6,625	1,750	8,375	7,930	1,745	6,185

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
5	5	80	5	430	245	10	5	960
5	5	85	5	440	225	0	10	1,065
5	5	45	5	445	190	5	0	1,050
15	0	120	5	470	195	10	5	760

Forestville Rd	
SB	NB
965	330
1,075	315
1,050	240
765	315

Ramp 7	Forest. NB	Forest. SB
515	255	1,395
530	225	1,510
495	195	1,500
595	205	1,245

MD 337	
SB	NB
0	475
5	495
0	475
0	550

Exit 9		
Ramp 4	Ramp 5	Ramp 9
735	280	5
825	385	10
645	480	10
565	395	0

MD 5	
SB	NB
3,025	2,205
3,685	2,160
3,915	2,230
3,590	2,130

Auth Rd/Ramp 2/Ramp 9											
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
95	300	15	85	135	80	280	90	150	70	25	60
95	340	20	85	140	210	310	125	190	105	30	65
155	370	10	105	155	300	235	205	245	135	50	70
140	310	10	115	150	150	250	200	175	105	55	55

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
680	150	15	255	670
815	205	5	340	715
875	195	5	290	715
960	160	15	210	665

Suitland Rd		
SB	NB	
830	670	3-4P
1,020	715	4-5P
1,070	715	5-6P
1,120	665	6-7P

MD 337		
SB	NB	
1,105	1,455	3-4P
1,110	1,530	4-5P
1,010	1,305	5-6P
845	1,305	6-7P

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	990	465	10	1,105
0	0	1,050	480	15	1,110
0	0	840	465	10	1,010
5	5	765	540	10	840

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
475	1,730	410	2,740	285
515	1,645	455	3,345	340
460	1,770	535	3,575	340
455	1,675	460	3,290	300

Exit 9	
Ramp 6	Ramp 8
480	405
435	545
430	485
390	370

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,355	2,005	7,360	8,085	1,930	6,155
4-5P	5,810	2,060	7,870	7,915	2,180	5,735
5-6P	6,120	1,990	8,110	7,840	1,920	5,920
6-7P	6,030	1,750	7,780	6,970	1,745	5,225

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,280	430	50
1,545	1,325	385	50
1,445	1,295	375	55
1,325	1,065	335	55

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
905	520	320	910	530	1,350	1,565	285	125
875	625	395	820	520	1,465	1,545	340	135
795	685	455	880	590	1,470	1,450	340	165
630	625	330	960	505	1,405	1,430	300	180

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,760	2,005	7,765	8,565	1,930	6,635
4-5P	6,355	2,060	8,415	8,350	2,180	6,170
5-6P	6,605	1,990	8,595	8,270	1,920	6,350
6-7P	6,400	1,750	8,150	7,360	1,745	5,615

MD 337		
SB	NB	
1,270	1,280	3-4P
1,595	1,325	4-5P
1,500	1,295	5-6P
1,380	1,065	6-7P

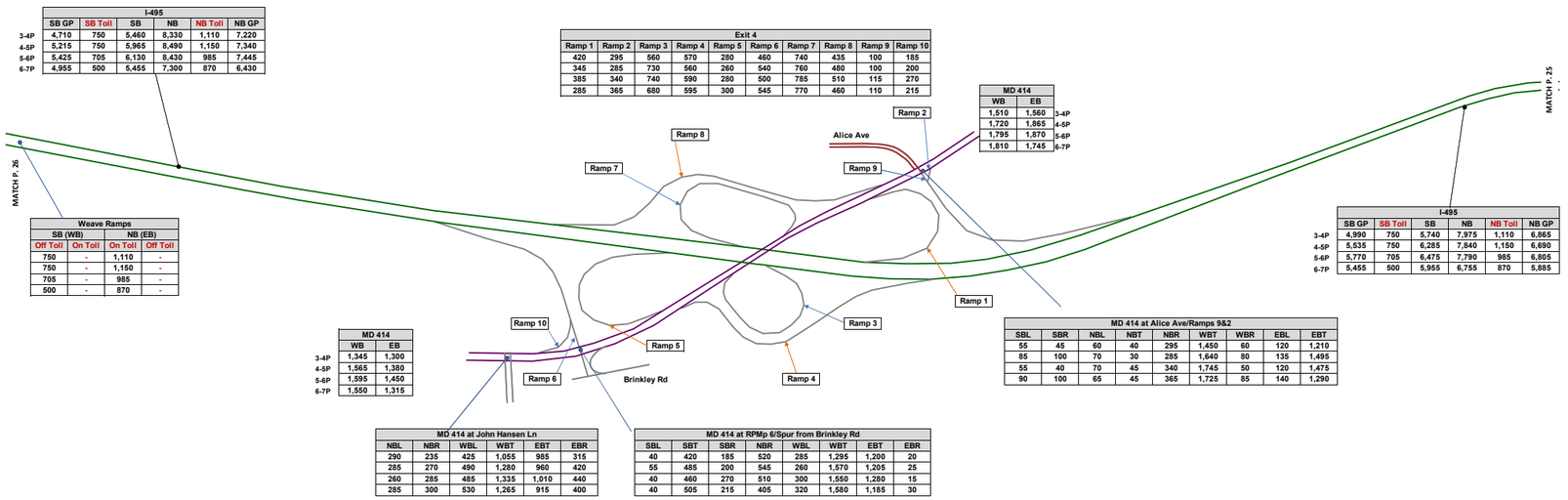
MD 5		
SB	NB	
6,020	4,095	3-4P
6,725	4,010	4-5P
6,785	4,055	5-6P
6,495	3,895	6-7P

TR 2
110
130
145
125

TR 4	TR 5
570	250
740	290
675	260
625	250

TR 7
1145
1180
1140
1125

I-495 South Side PM
Future Alternative 13B Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,710	750	5,460	8,330	1,110	7,220
4-5P	5,215	750	5,965	8,490	1,150	7,340
5-6P	5,425	705	6,130	8,430	985	7,445
6-7P	4,955	500	5,455	7,300	870	6,430

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
750	-	1,110	-
750	-	1,150	-
705	-	985	-
500	-	870	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
420	295	560	570	280	460	740	435	100	185
345	285	730	560	260	540	760	480	100	200
385	340	740	590	280	500	785	510	115	270
285	365	680	595	300	545	770	460	110	215

MD 414		
WB	EB	
1,510	1,560	3-4P
1,720	1,865	4-5P
1,795	1,870	5-6P
1,810	1,745	6-7P

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
4,990	750	5,740	7,975	1,110	6,865
5,535	750	6,285	7,840	1,150	6,690
5,770	705	6,475	7,790	985	6,805
5,455	500	5,955	6,755	870	5,885

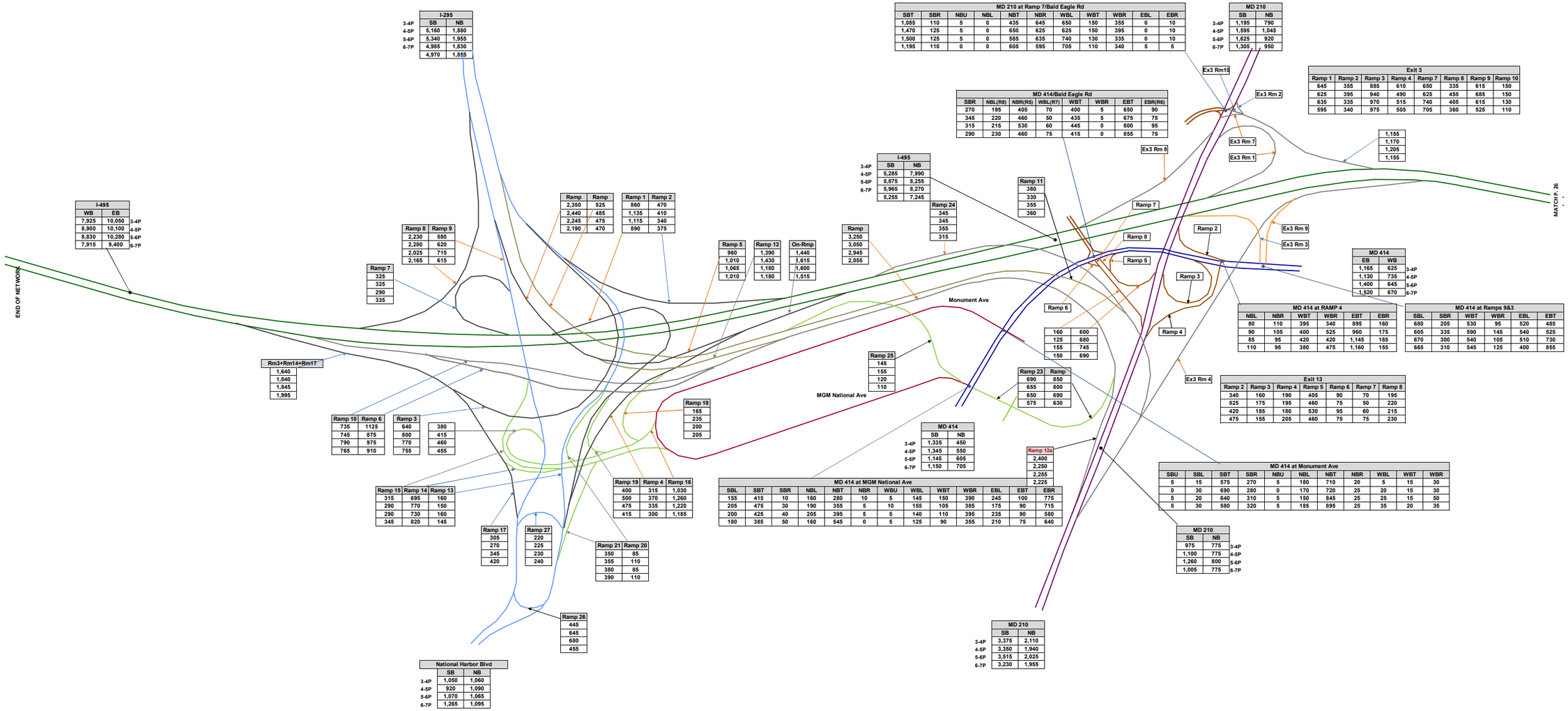
MD 414		
WB	EB	
1,345	1,300	3-4P
1,565	1,380	4-5P
1,595	1,450	5-6P
1,550	1,315	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
55	45	60	40	295	1,450	60	120	1,210
85	100	70	30	285	1,640	80	135	1,495
55	40	70	45	340	1,745	50	120	1,475
90	100	65	45	365	1,725	85	140	1,290

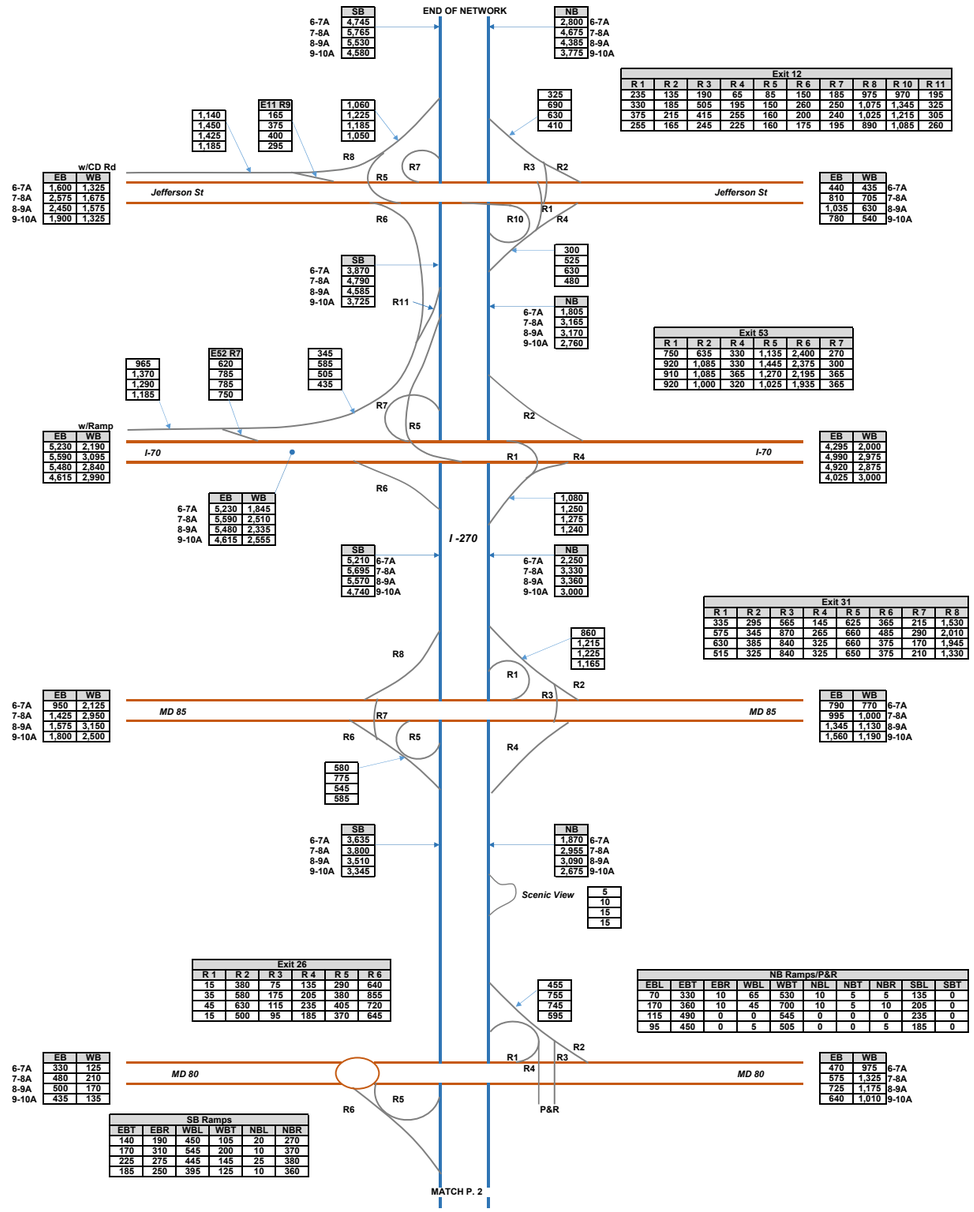
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
290	235	425	1,055	985	315
285	270	490	1,280	960	420
260	285	485	1,335	1,010	440
285	300	530	1,265	915	400

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
40	420	185	520	285	1,295	1,200	20
55	485	200	545	260	1,570	1,205	25
40	460	270	510	300	1,550	1,280	15
40	505	215	405	320	1,580	1,185	30

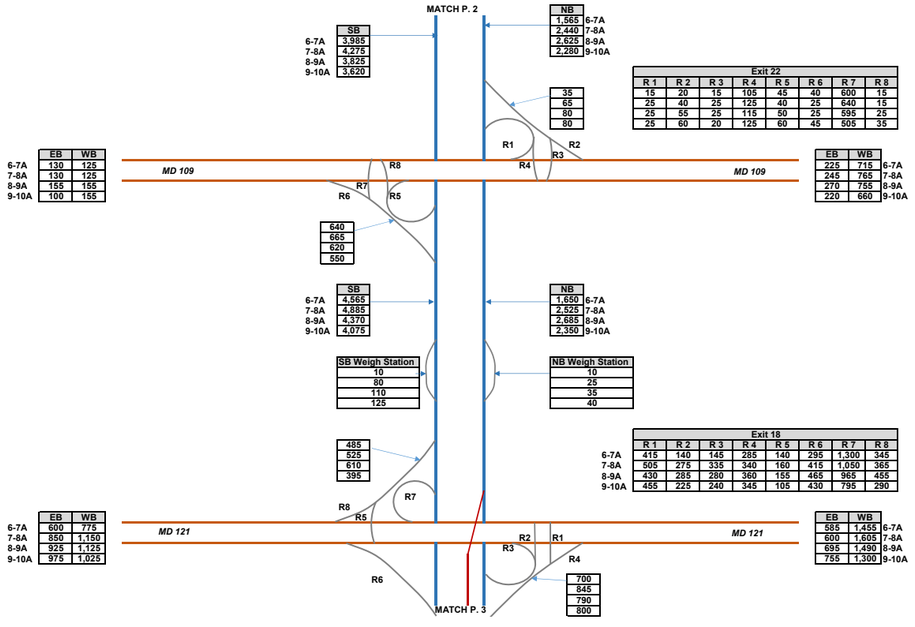
I-495 South Side PM
Future Alternative 13B Peak Period Volumes



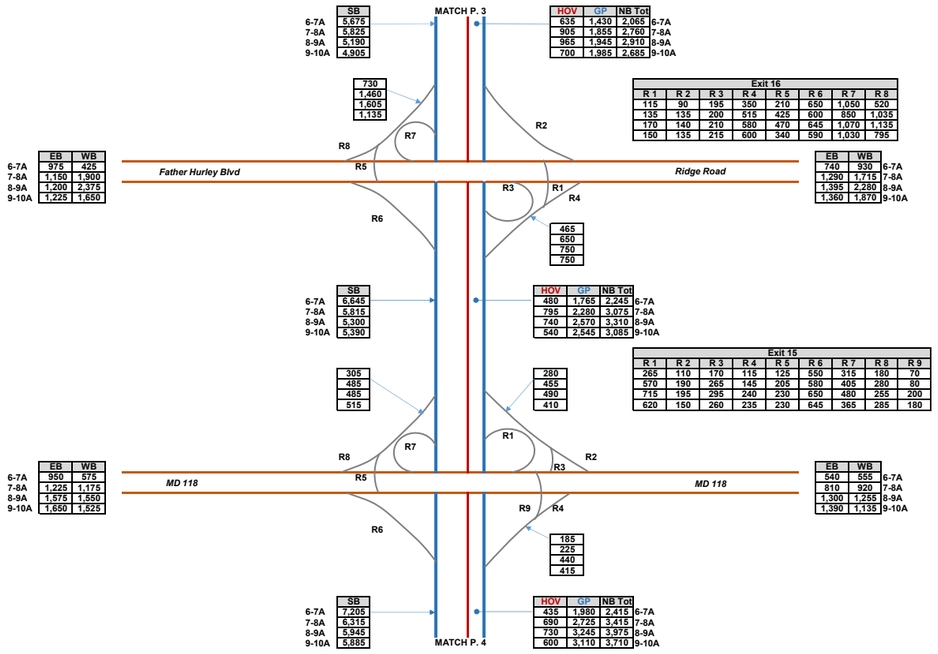
I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



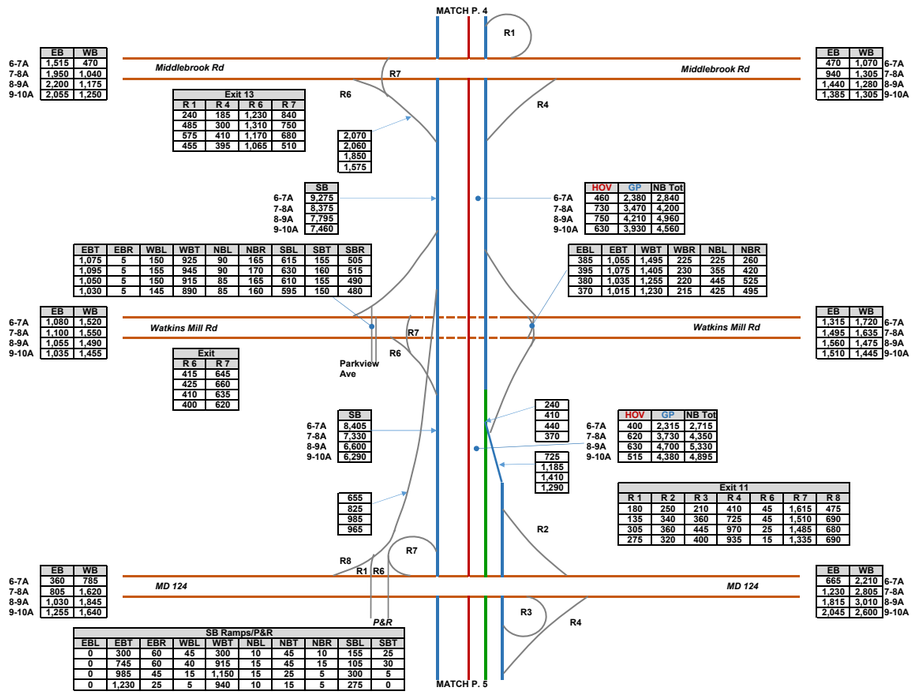
I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



	EB	WB
6-7A	1,515	470
7-8A	1,950	1,040
8-9A	2,200	1,175
9-10A	2,055	1,250

Exit 13			
R 1	R 4	R 6	R 7
240	185	1,230	840
485	300	1,310	750
575	410	1,170	680
455	395	1,065	510

2,070
2,060
1,850
1,575

	SB
6-7A	9,275
7-8A	8,375
8-9A	7,795
9-10A	7,460

EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
1,075	5	150	925	90	165	615	155	505
1,095	5	155	945	90	170	630	160	515
1,050	5	150	915	85	165	610	155	490
1,030	5	145	890	85	160	595	150	480

	EB	WB
6-7A	470	1,070
7-8A	940	1,305
8-9A	1,440	1,280
9-10A	1,385	1,305

	HOV	GP	NB Tot
6-7A	460	2,380	2,840
7-8A	730	3,470	4,200
8-9A	750	4,210	4,960
9-10A	630	3,930	4,560

EBL	EBT	WBT	WBR	NBL	NBR
385	1,055	1,495	225	225	260
395	1,075	1,405	230	355	420
380	1,035	1,255	220	445	525
370	1,015	1,230	215	425	495

	EB	WB
6-7A	1,080	1,520
7-8A	1,100	1,550
8-9A	1,055	1,490
9-10A	1,035	1,455

Exit	
R 6	R 7
415	645
425	660
410	635
400	620

	SB
6-7A	8,405
7-8A	7,330
8-9A	6,600
9-10A	6,290

655
825
985
965

240
410
440
370

725
1,185
1,410
1,290

	HOV	GP	NB Tot
6-7A	400	2,315	2,715
7-8A	620	3,730	4,350
8-9A	630	4,700	5,330
9-10A	515	4,380	4,895

Exit 11						
R 1	R 2	R 3	R 4	R 6	R 7	R 8
180	250	210	410	45	1,615	475
135	340	360	725	45	1,510	690
305	360	445	970	25	1,485	680
275	320	400	935	15	1,335	690

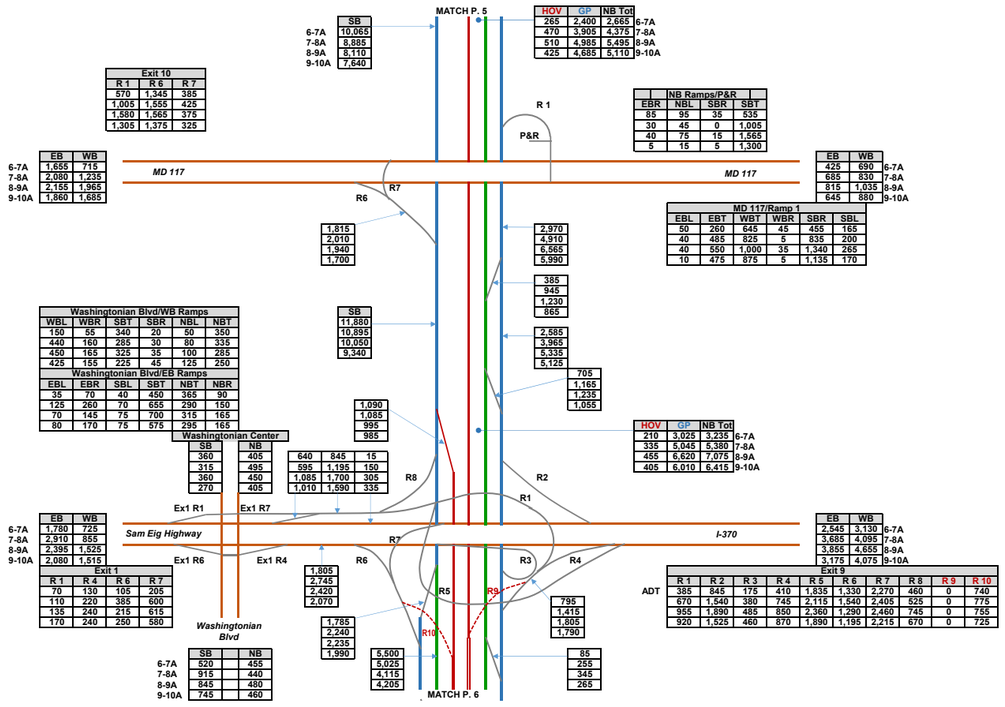
	EB	WB
6-7A	1,315	1,720
7-8A	1,495	1,635
8-9A	1,560	1,475
9-10A	1,510	1,445

	EB	WB
6-7A	360	785
7-8A	805	1,620
8-9A	1,030	1,845
9-10A	1,255	1,640

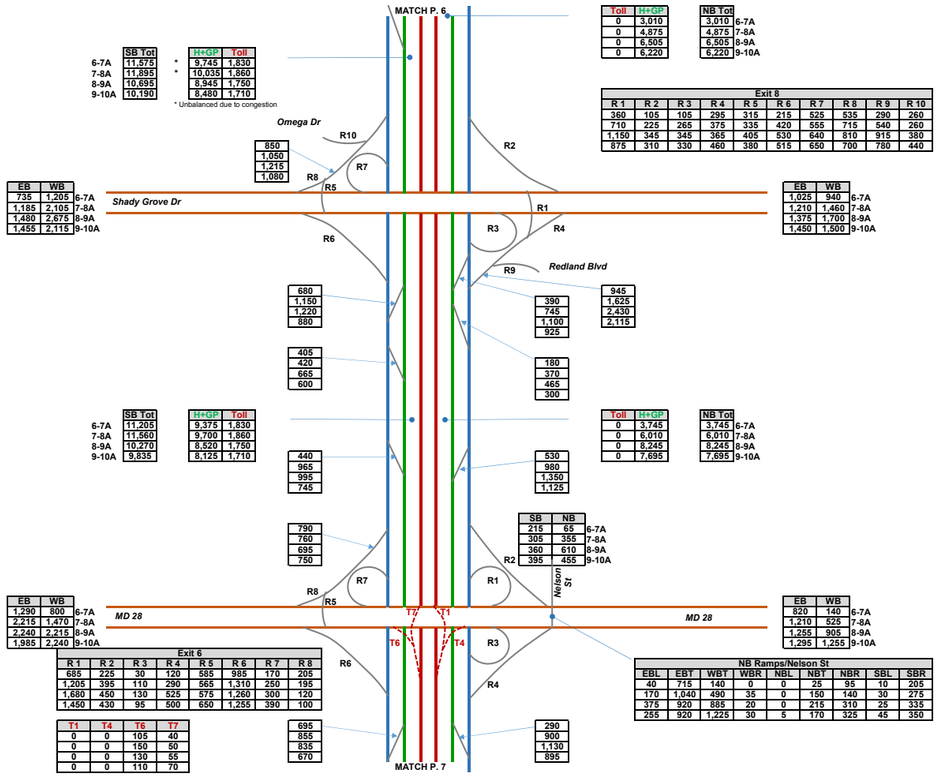
	EB	WB
6-7A	665	2,210
7-8A	1,230	2,805
8-9A	1,815	3,010
9-10A	2,045	2,600

SB Ramps/P&R									
EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
0	300	60	45	300	10	45	10	155	25
0	745	60	40	915	15	45	15	105	30
0	985	45	15	1,150	15	25	5	300	5
0	1,230	25	5	940	10	15	5	275	0

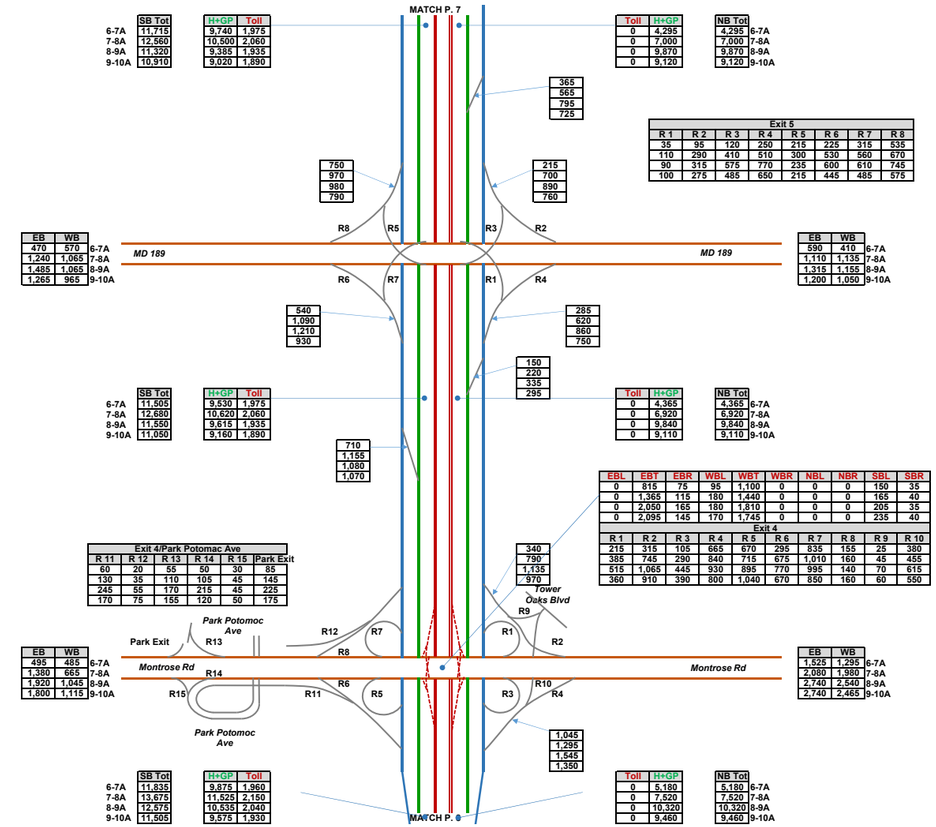
I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



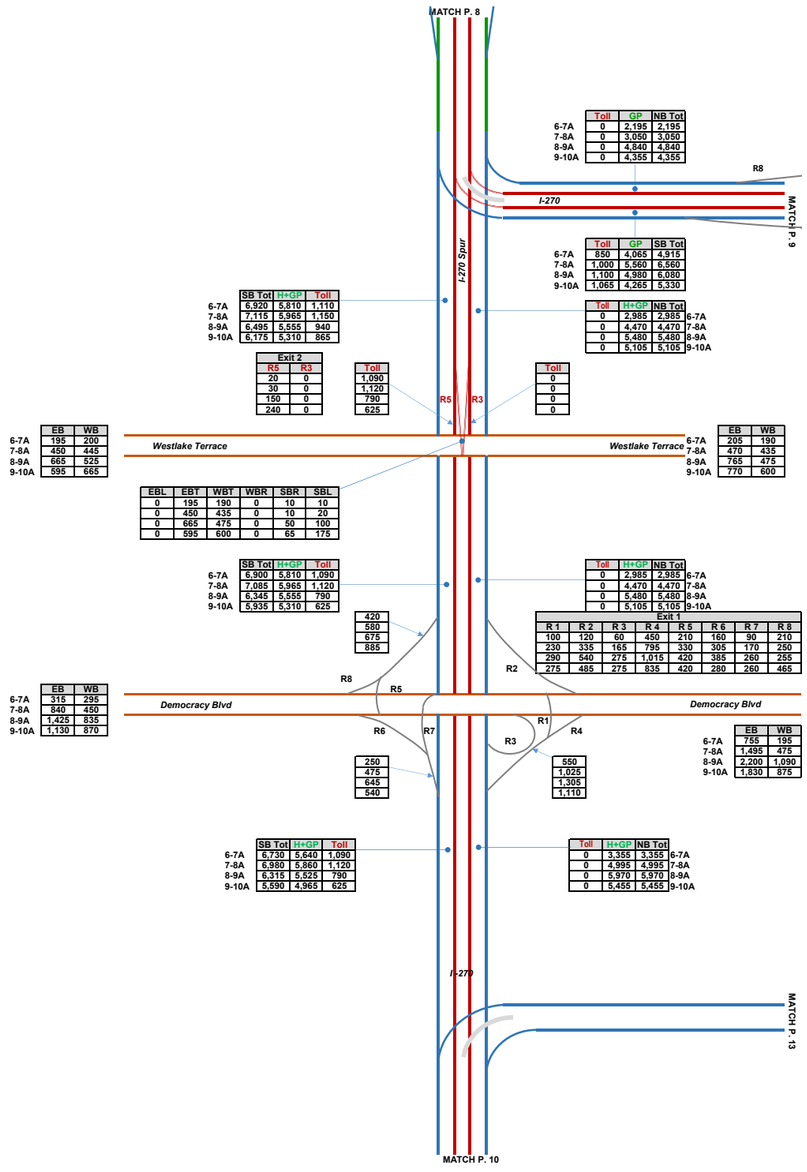
I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



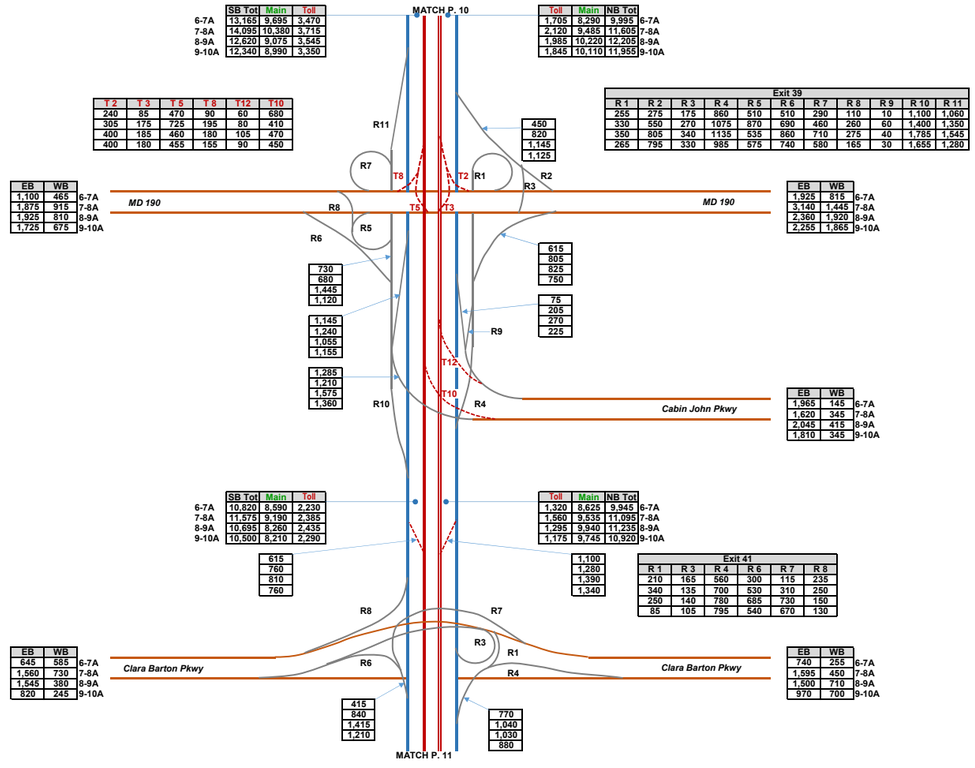
I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



	SB Tot	Main	Toll
6-7A	13,165	9,695	3,470
7-8A	14,095	10,380	3,715
8-9A	12,620	9,075	3,545
9-10A	12,340	8,990	3,350

Toll	Main	NB Tot	
1,705	8,290	9,995	6-7A
2,120	9,485	11,605	7-8A
1,985	10,220	12,205	8-9A
1,845	10,110	11,955	9-10A

T 2	T 3	T 5	T 8	T12	T10
240	85	470	90	60	680
305	175	725	195	80	410
400	185	460	180	105	470
400	180	455	155	90	450

Exit 39										
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11
255	275	175	860	510	510	290	110	10	1,100	1,060
330	550	270	1075	870	690	460	260	60	1,400	1,350
350	805	340	1135	535	860	710	275	40	1,785	1,545
265	795	330	985	575	740	580	165	30	1,655	1,280

EB	WB	
1,100	465	6-7A
1,975	915	7-8A
1,925	810	8-9A
1,725	675	9-10A

EB	WB	
1,925	815	6-7A
3,140	1,445	7-8A
2,360	1,920	8-9A
2,255	1,865	9-10A

EB	WB	
1,965	145	6-7A
1,620	345	7-8A
2,045	415	8-9A
1,810	345	9-10A

	SB Tot	Main	Toll
6-7A	10,820	8,590	2,230
7-8A	11,575	9,190	2,385
8-9A	10,695	8,260	2,435
9-10A	10,500	8,210	2,290

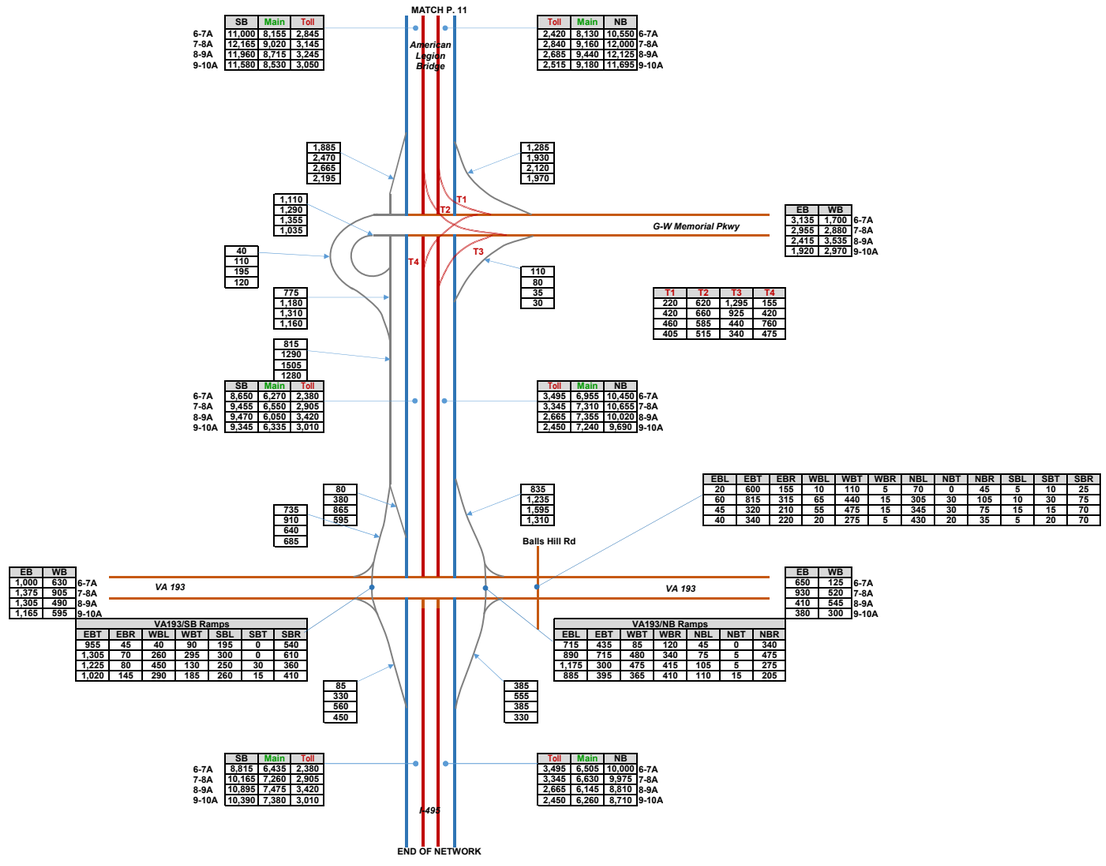
Toll	Main	NB Tot	
1,320	8,625	9,945	6-7A
1,560	9,535	11,095	7-8A
1,295	9,940	11,235	8-9A
1,175	9,745	10,920	9-10A

Exit 41					
R 1	R 3	R 4	R 6	R 7	R 8
210	165	560	300	115	235
340	135	700	530	310	250
250	140	780	685	730	150
85	105	795	540	670	130

EB	WB	
645	585	6-7A
1,560	730	7-8A
1,545	380	8-9A
820	245	9-10A

EB	WB	
740	255	6-7A
1,595	450	7-8A
1,500	710	8-9A
970	700	9-10A

I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



	SB Main	SB Toll
6-7A	11,000	2,845
7-8A	12,165	3,145
8-9A	11,960	3,245
9-10A	11,580	3,050

Toll	Main	NB	
2,420	8,130	10,550	6-7A
2,840	9,160	12,000	7-8A
2,685	9,440	12,125	8-9A
2,515	9,180	11,695	9-10A

1,885	1,110	40	775
2,470	1,290	110	1,180
2,665	1,355	195	1,310
2,195	1,035	120	1,160

1,285	110	815	80
1,930	80	1,290	380
2,120	35	1,505	865
1,970	30	1,280	595

EB	WB	
3,135	1,700	6-7A
2,955	2,880	7-8A
2,415	3,535	8-9A
1,920	2,970	9-10A

T1	T2	T3	T4
220	620	1,295	155
420	660	925	420
460	585	440	760
405	515	340	475

	SB Main	SB Toll
6-7A	8,650	2,380
7-8A	9,455	2,905
8-9A	9,470	3,420
9-10A	9,345	3,010

Toll	Main	NB	
3,495	6,955	10,450	6-7A
3,345	7,310	10,655	7-8A
2,665	7,355	10,020	8-9A
2,450	7,240	9,690	9-10A

735	80	835	80
910	380	1,235	380
640	865	1,595	865
685	595	1,310	595

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
20	600	155	10	110	5	70	0	45	5	10	25
60	815	315	65	440	15	305	30	105	10	30	75
45	320	210	55	475	15	345	30	75	15	15	70
40	340	220	20	275	5	430	20	35	5	20	70

EB	WB	
1,000	630	6-7A
1,375	905	7-8A
1,305	490	8-9A
1,165	595	9-10A

EB	WB	
650	125	6-7A
930	520	7-8A
410	545	8-9A
380	300	9-10A

VA193/SB Ramps

EBT	EBR	WBL	WBT	SBL	SBT	SBR
955	45	40	90	195	0	540
1,305	70	260	295	300	0	610
1,225	80	450	130	250	30	360
1,020	145	290	185	260	15	410

VA193/NB Ramps

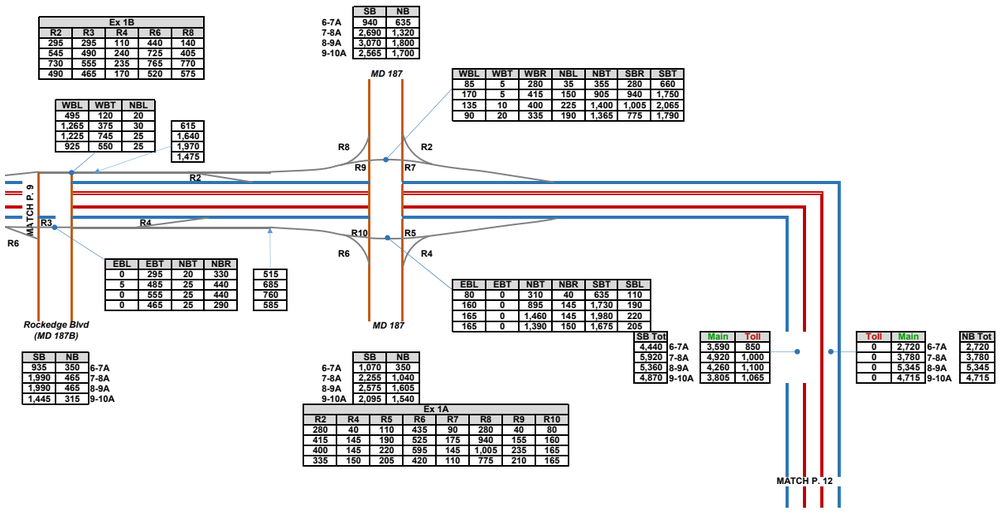
EBL	EBT	WBT	WBR	NBL	NBT	NBR
715	435	85	120	45	0	340
890	715	480	340	75	5	475
1,175	300	475	415	105	5	275
885	395	365	410	110	15	205

85	385	80	385
330	555	380	555
560	385	865	385
450	330	595	330

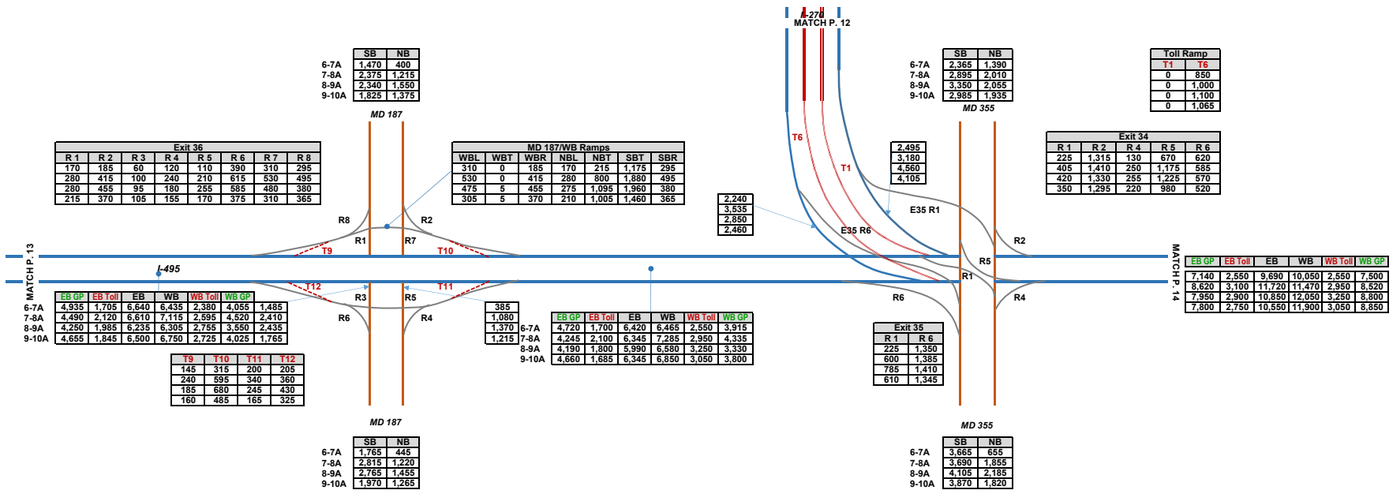
	SB Main	SB Toll
6-7A	8,815	2,380
7-8A	10,165	2,905
8-9A	10,895	3,420
9-10A	10,390	3,010

Toll	Main	NB	
3,495	6,505	10,000	6-7A
3,345	6,630	9,975	7-8A
2,665	6,145	8,810	8-9A
2,450	6,260	8,710	9-10A

I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side AM
Future Alternative 13C Peak Period Volumes



	SB	NB
6-7A	1,470	400
7-8A	2,375	1,215
8-9A	2,340	1,550
9-10A	1,825	1,375

	SB	NB
6-7A	2,365	1,390
7-8A	2,895	2,010
8-9A	3,350	2,055
9-10A	2,985	1,935

Toll Ramp	
T1	T6
0	850
0	1,000
0	1,100
0	1,065

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
170	185	60	120	110	390	310	295
280	415	100	240	210	615	530	495
280	455	95	180	255	585	480	380
215	370	105	155	170	375	310	365

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
310	0	185	170	215	1,175	295
530	0	415	280	800	1,880	495
475	5	455	275	1,095	1,960	380
305	5	370	210	1,005	1,460	365

Exit 34				
R 1	R 2	R 4	R 5	R 6
225	1,315	130	670	620
405	1,410	250	1,175	585
420	1,330	255	1,225	570
350	1,295	220	980	520

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	4,935	1,705	6,640	6,435	2,380	4,055	1,485
7-8A	4,490	2,120	6,610	7,115	2,595	4,520	2,410
8-9A	4,250	1,985	6,235	6,305	2,755	3,550	2,435
9-10A	4,655	1,845	6,500	6,750	2,725	4,025	1,765

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	4,720	1,700	6,420	6,465	2,550	3,915
7-8A	4,245	2,100	6,345	7,285	2,950	4,335
8-9A	4,190	1,800	5,990	6,580	3,250	3,330
9-10A	4,660	1,685	6,345	6,850	3,050	3,800

	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,140	2,550	9,690	10,050	2,550	7,500
7-8A	8,620	3,100	11,720	11,470	2,950	8,520
8-9A	7,950	2,900	10,850	12,050	3,250	8,800
9-10A	7,800	2,750	10,550	11,900	3,050	8,850

T9	T10	T11	T12
145	315	200	205
240	595	340	360
185	680	245	430
160	485	165	325

	SB	NB
6-7A	1,765	445
7-8A	2,815	1,220
8-9A	2,765	1,455
9-10A	1,970	1,265

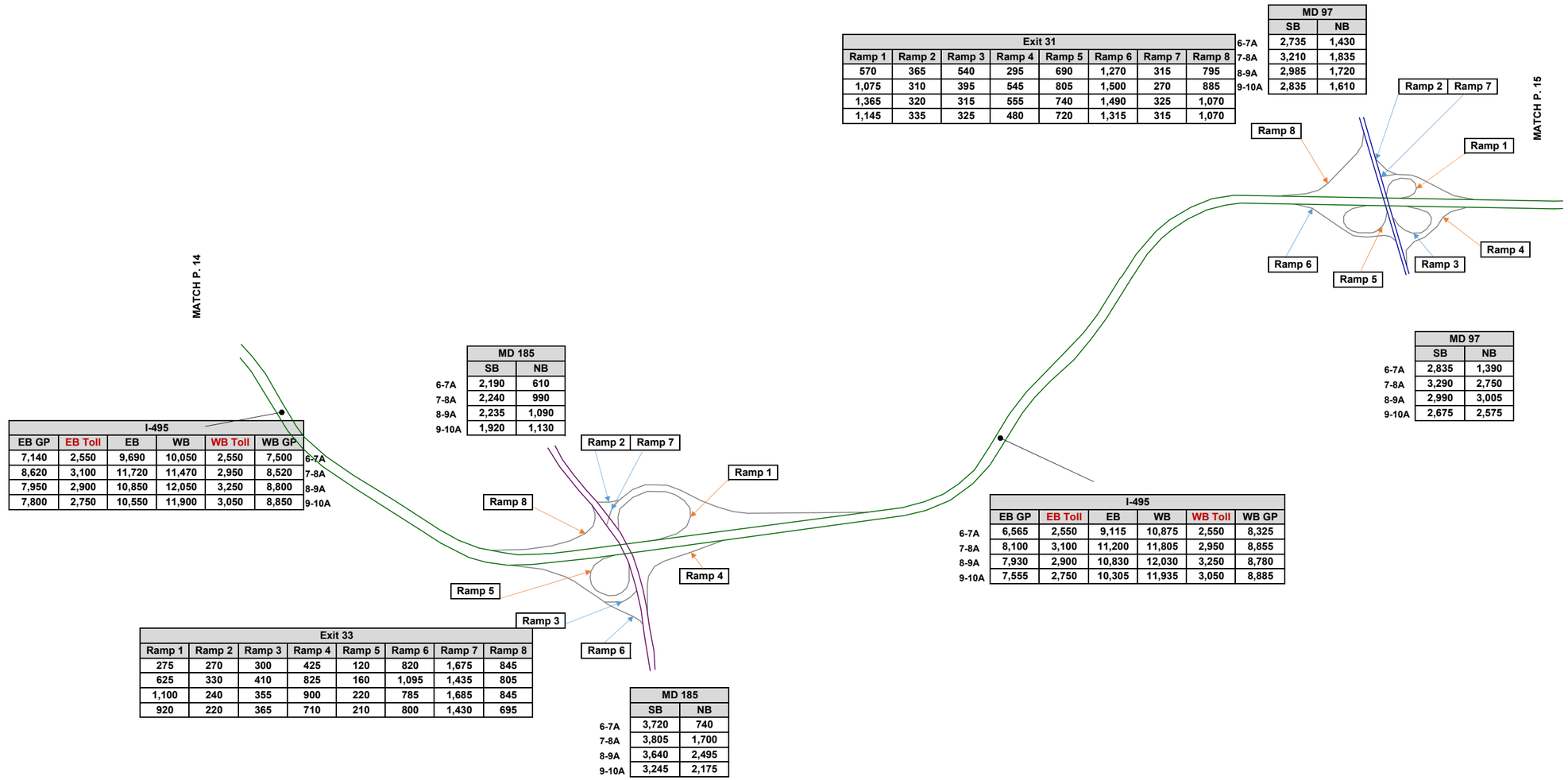
	SB	NB
6-7A	3,665	655
7-8A	3,690	1,855
8-9A	4,105	2,185
9-10A	3,870	1,820

Exit 35	
R 1	R 6
225	1,350
600	1,385
785	1,410
610	1,345

2,240	3,535	2,850
2,460	2,495	3,180
4,560	4,105	

385	1,080	1,370
1,215		

I-495 North Side AM
Future Alternative 13C Peak Period Volumes



Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
570	365	540	295	690	1,270	315	795
1,075	310	395	545	805	1,500	270	885
1,365	320	315	555	740	1,490	325	1,070
1,145	335	325	480	720	1,315	315	1,070

	MD 97	
	SB	NB
6-7A	2,735	1,430
7-8A	3,210	1,835
8-9A	2,985	1,720
9-10A	2,835	1,610

	MD 97	
	SB	NB
6-7A	2,835	1,390
7-8A	3,290	2,750
8-9A	2,990	3,005
9-10A	2,675	2,575

	MD 185	
	SB	NB
6-7A	2,190	610
7-8A	2,240	990
8-9A	2,235	1,090
9-10A	1,920	1,130

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	7,140	2,550	9,690	10,050	2,550	7,500
7-8A	8,620	3,100	11,720	11,470	2,950	8,520
8-9A	7,950	2,900	10,850	12,050	3,250	8,800
9-10A	7,800	2,750	10,550	11,900	3,050	8,850

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,565	2,550	9,115	10,875	2,550	8,325
7-8A	8,100	3,100	11,200	11,805	2,950	8,855
8-9A	7,930	2,900	10,830	12,030	3,250	8,780
9-10A	7,555	2,750	10,305	11,935	3,050	8,885

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
275	270	300	425	120	820	1,675	845
625	330	410	825	160	1,095	1,435	805
1,100	240	355	900	220	785	1,685	845
920	220	365	710	210	800	1,430	695

	MD 185	
	SB	NB
6-7A	3,720	740
7-8A	3,805	1,700
8-9A	3,640	2,495
9-10A	3,245	2,175

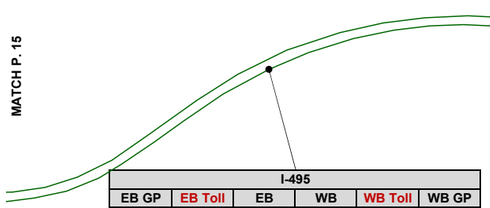
I-495 North Side AM
Future Alternative 13C Peak Period Volumes

T1	T2	T3	T4	T5	T6	T7	T8
55	260	315	235	445	120	600	940
155	270	535	345	460	165	495	1,055
200	280	580	455	465	180	395	1,140
270	260	505	400	360	200	395	1,020

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
135	220	220	160	215	890
240	480	290	190	90	830
320	500	385	180	150	795
405	460	275	240	210	775

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
990	525	280	485	540	95
1,085	430	410	580	765	110
1,010	435	440	600	695	115
880	420	350	465	715	165

MATCH P. 15



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,740	2,550	8,290	10,190	2,550	7,640
7-8A	7,555	3,100	10,655	10,425	2,950	7,475
8-9A	7,420	2,900	10,320	10,240	3,250	6,990
9-10A	7,115	2,750	9,865	10,370	3,050	7,320

	US 29	
	SB	NB
6-7A	3,565	815
7-8A	4,390	1,795
8-9A	5,200	1,885
9-10A	3,815	1,440

	MD 193	
	SB	NB
6-7A	1,325	940
7-8A	1,760	1,340
8-9A	1,620	1,315
9-10A	1,280	1,155

Ramp 8
Ramp 7
Ramp 1
T8
T3
T2
T5
T7
T6
T1
T4
Ramp 4
Ramp 6
Ramp 2
Ramp 3

Rm 7 WBL
Rm 2 WBR
Rm 1 NBR
Ramp 6
Ramp 5
Ramp 4

MATCH P. 16

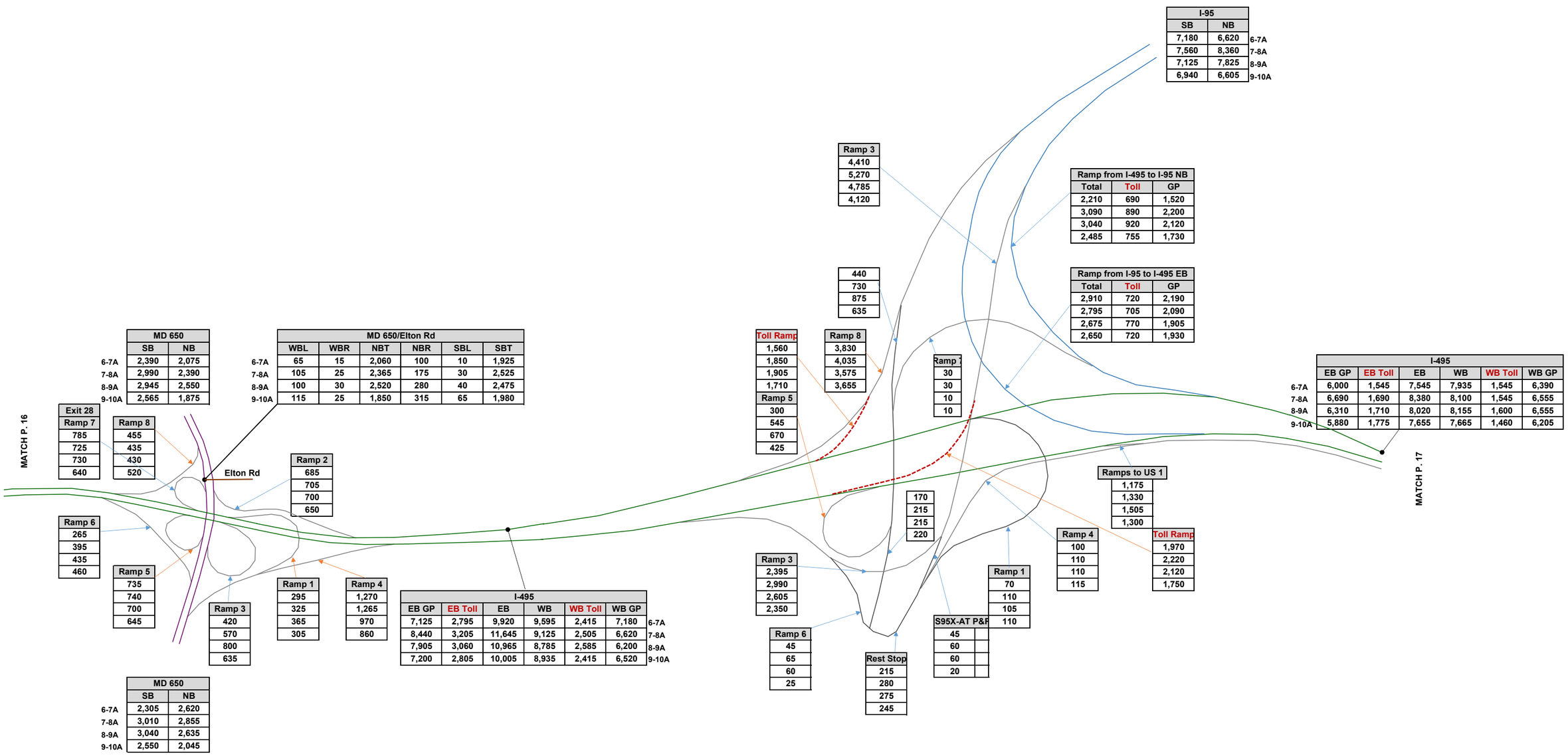
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,805	2,795	8,600	8,875	2,415	6,460
7-8A	7,400	3,205	10,605	8,455	2,505	5,950
8-9A	7,470	3,060	10,530	8,150	2,585	5,565
9-10A	6,790	2,805	9,595	8,470	2,415	6,055

	US 29	
	SB	NB
6-7A	2,385	665
7-8A	2,985	1,540
8-9A	3,705	1,885
9-10A	2,705	1,565

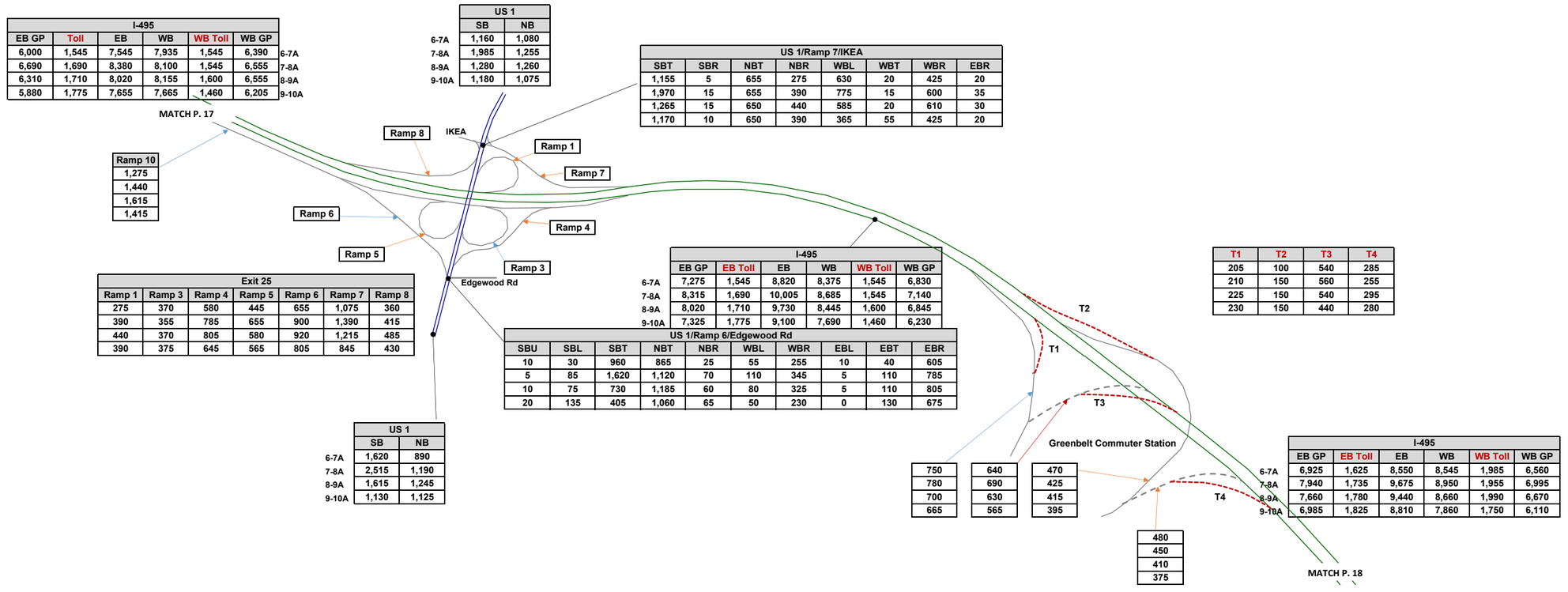
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	5,580	2,795	8,375	9,245	2,415	6,830
7-8A	7,175	3,205	10,380	9,000	2,505	6,495
8-9A	7,125	3,060	10,185	8,610	2,585	6,025
9-10A	6,690	2,805	9,495	8,765	2,415	6,350

	MD 193	
	SB	NB
6-7A	1,475	1,685
7-8A	2,055	2,405
8-9A	1,830	2,330
9-10A	1,695	1,965

I-495 North Side AM
Future Alternative 13C Peak Period Volumes



I-495 North East Side AM
Future Alternative 13C Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,000	1,545	7,545	7,935	1,545	6,390	6-7A
6,690	1,690	8,380	8,100	1,545	6,555	7-8A
6,310	1,710	8,020	8,155	1,600	6,555	8-9A
5,880	1,775	7,655	7,665	1,460	6,205	9-10A

Ramp 10
1,275
1,440
1,615
1,415

US 1		
	SB	NB
6-7A	1,160	1,080
7-8A	1,985	1,255
8-9A	1,280	1,260
9-10A	1,180	1,075

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,155	5	655	275	630	20	425	20
1,970	15	655	390	775	15	600	35
1,265	15	650	440	585	20	610	30
1,170	10	650	390	365	55	425	20

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
275	370	580	445	655	1,075	360
390	355	785	655	900	1,390	415
440	370	805	580	920	1,215	485
390	375	645	565	805	845	430

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
7,275	1,545	8,820	8,375	1,545	6,830	6-7A
8,315	1,690	10,005	8,685	1,545	7,140	7-8A
8,020	1,710	9,730	8,445	1,600	6,845	8-9A
7,325	1,775	9,100	7,690	1,460	6,230	9-10A

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
10	30	960	865	25	55	255	10	40	605
5	85	1,620	1,120	70	110	345	5	110	785
10	75	730	1,185	60	80	325	5	110	805
20	135	405	1,060	65	50	230	0	130	675

US 1		
	SB	NB
6-7A	1,620	890
7-8A	2,515	1,190
8-9A	1,615	1,245
9-10A	1,130	1,125

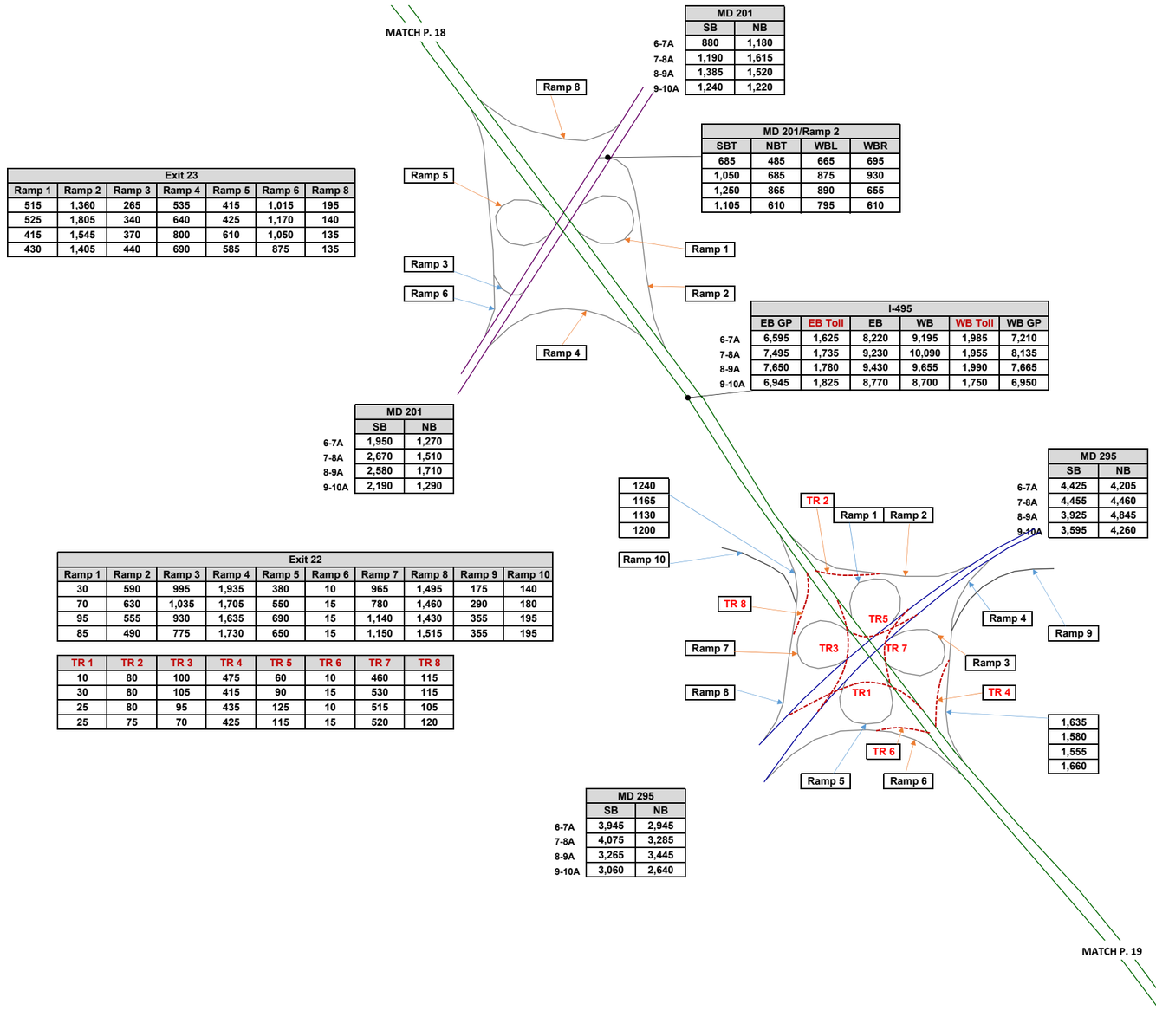
T1	T2	T3	T4
205	100	540	285
210	150	560	255
225	150	540	295
230	150	440	280

750	640	470
780	690	425
700	630	415
665	565	395

480
450
410
375

I-495						
EB GP	EB Toll	EB	WB	WB Toll	WB GP	
6,925	1,625	8,550	8,545	1,985	6,560	6-7A
7,940	1,735	9,675	8,950	1,955	6,995	7-8A
7,660	1,780	9,440	8,660	1,990	6,670	8-9A
6,985	1,825	8,810	7,860	1,750	6,110	9-10A

I-495 North East Side AM
Future Alternative 13C Peak Period Volumes



Exit 23						
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
515	1,360	265	535	415	1,015	195
525	1,805	340	640	425	1,170	140
415	1,545	370	800	610	1,050	135
430	1,405	440	690	585	875	135

	MD 201	
	SB	NB
6-7A	880	1,180
7-8A	1,190	1,615
8-9A	1,385	1,520
9-10A	1,240	1,220

MD 201/Ramp 2			
SBT	NBT	WBL	WBR
685	485	665	695
1,050	685	875	930
1,250	865	890	655
1,105	610	795	610

	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
6-7A	6,595	1,625	8,220	9,195	1,985	7,210
7-8A	7,495	1,735	9,230	10,090	1,955	8,135
8-9A	7,650	1,780	9,430	9,655	1,990	7,665
9-10A	6,945	1,825	8,770	8,700	1,750	6,950

	MD 201	
	SB	NB
6-7A	1,950	1,270
7-8A	2,670	1,510
8-9A	2,580	1,710
9-10A	2,190	1,290

	MD 295	
	SB	NB
6-7A	4,425	4,205
7-8A	4,455	4,460
8-9A	3,925	4,845
9-10A	3,595	4,260

Exit 22									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
30	590	995	1,935	380	10	965	1,495	175	140
70	630	1,035	1,705	550	15	780	1,460	290	180
95	555	930	1,635	690	15	1,140	1,430	355	195
85	490	775	1,730	650	15	1,150	1,515	355	195

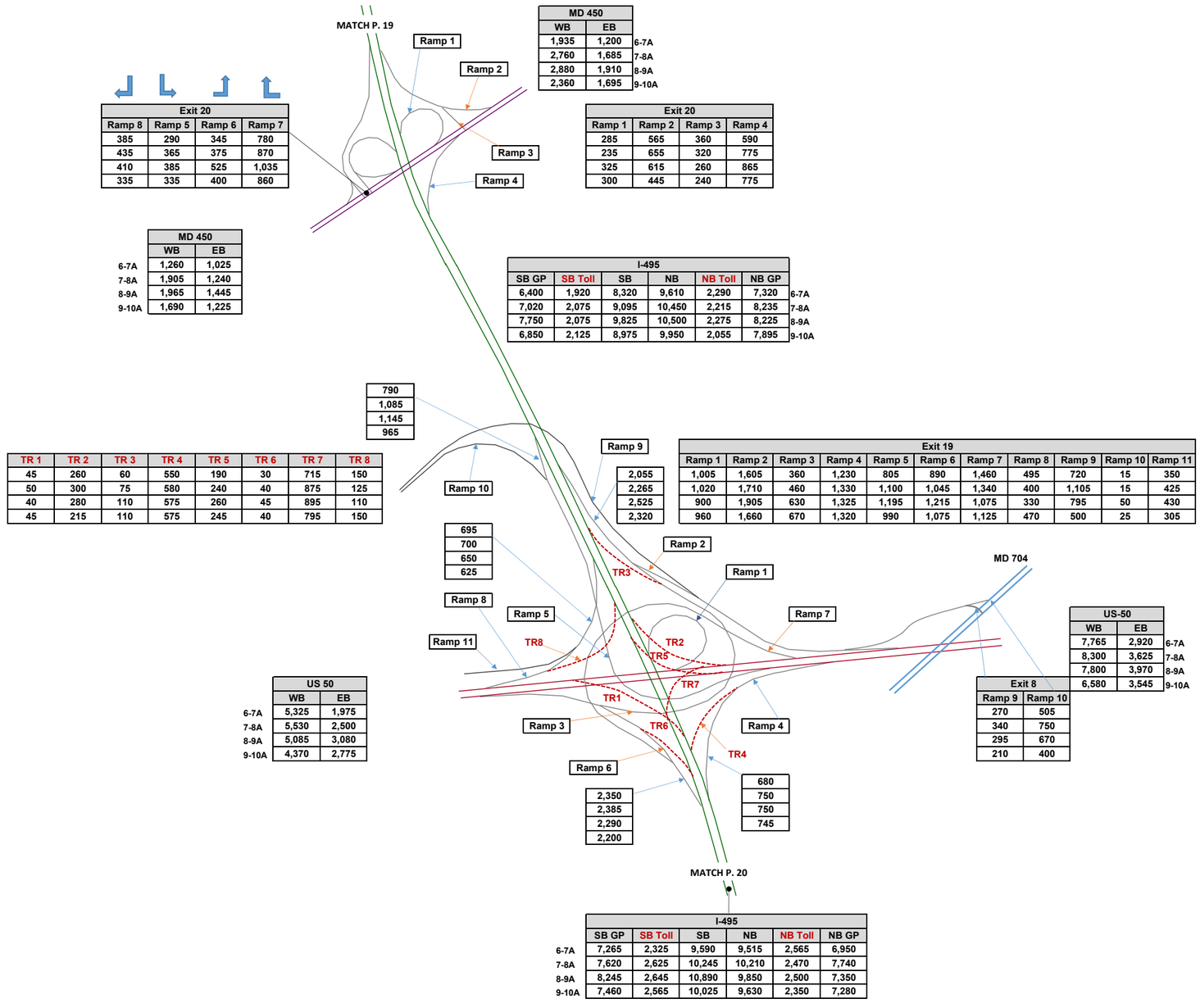
TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
10	80	100	475	60	10	460	115
30	80	105	415	90	15	530	115
25	80	95	435	125	10	515	105
25	75	70	425	115	15	520	120

	MD 295	
	SB	NB
6-7A	3,945	2,945
7-8A	4,075	3,285
8-9A	3,265	3,445
9-10A	3,060	2,640

1,635
1,580
1,555
1,660

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	5,950	1,920	7,870	9,660	2,290	7,370
7-8A	6,575	2,075	8,650	10,415	2,215	8,200
8-9A	6,985	2,075	9,060	10,185	2,275	7,910
9-10A	6,260	2,125	8,385	9,560	2,055	7,505

I-495 North East Side AM
Future Alternative 13C Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
385	290	345	780
435	365	375	870
410	385	525	1,035
335	335	400	860

MD 450		
	WB	EB
6-7A	1,935	1,200
7-8A	2,760	1,685
8-9A	2,880	1,910
9-10A	2,360	1,695

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
285	565	360	590
235	655	320	775
325	615	260	865
300	445	240	775

MD 450		
	WB	EB
6-7A	1,260	1,025
7-8A	1,905	1,240
8-9A	1,965	1,445
9-10A	1,690	1,225

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
6,400	1,920	8,320	9,610	2,290	7,320	6-7A
7,020	2,075	9,095	10,450	2,215	8,235	7-8A
7,750	2,075	9,825	10,500	2,275	8,225	8-9A
6,850	2,125	8,975	9,950	2,055	7,895	9-10A

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
45	260	60	550	190	30	715	150
50	300	75	580	240	40	875	125
40	280	110	575	260	45	895	110
45	215	110	575	245	40	795	150

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
1,005	1,605	360	1,230	805	890	1,460	495	720	15	350
1,020	1,710	460	1,330	1,100	1,045	1,340	400	1,105	15	425
900	1,905	630	1,325	1,195	1,215	1,075	330	795	50	430
960	1,660	670	1,320	990	1,075	1,125	470	500	25	305

790
1,085
1,145
965

2,055
2,265
2,525
2,320

695
700
650
625

US 50		
	WB	EB
6-7A	5,325	1,975
7-8A	5,530	2,500
8-9A	5,085	3,080
9-10A	4,370	2,775

US-50		
WB	EB	
7,765	2,920	6-7A
8,300	3,625	7-8A
7,800	3,970	8-9A
6,580	3,545	9-10A

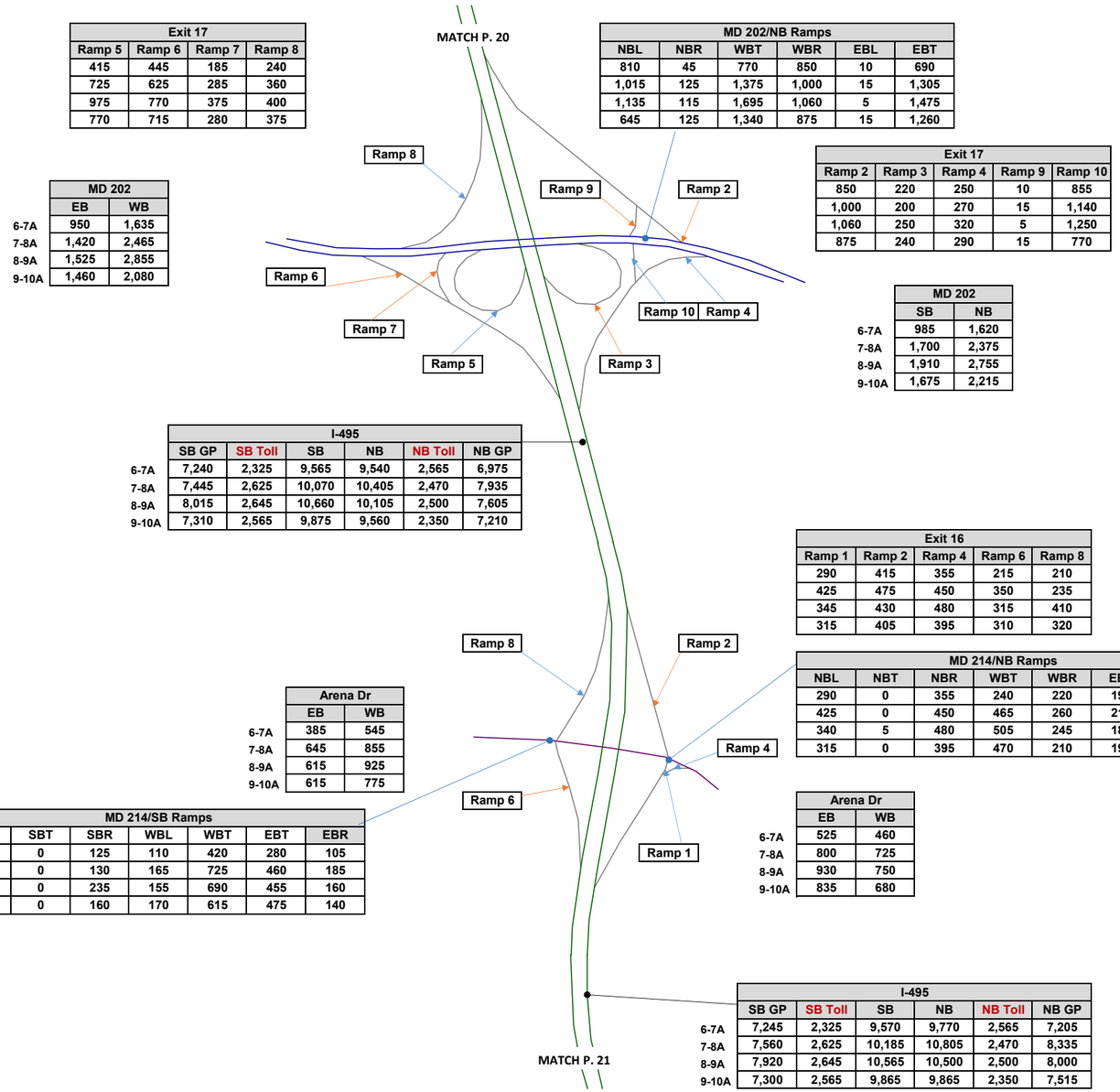
Exit 8	
Ramp 9	Ramp 10
270	505
340	750
295	670
210	400

2,350
2,385
2,290
2,200

680
750
750
745

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,265	2,325	9,590	9,515	2,565	6,950	6-7A
7,620	2,625	10,245	10,210	2,470	7,740	7-8A
8,245	2,645	10,890	9,850	2,500	7,350	8-9A
7,460	2,565	10,025	9,630	2,350	7,280	9-10A

I-495 East Side AM
Future Alternative 13C Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
415	445	185	240
725	625	285	360
975	770	375	400
770	715	280	375

MD 202		
	EB	WB
6-7A	950	1,635
7-8A	1,420	2,465
8-9A	1,525	2,855
9-10A	1,460	2,080

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,240	2,325	9,565	9,540	2,565	6,975
7,445	2,625	10,070	10,405	2,470	7,935
8,015	2,645	10,660	10,105	2,500	7,605
7,310	2,565	9,875	9,560	2,350	7,210

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
810	45	770	850	10	690
1,015	125	1,375	1,000	15	1,305
1,135	115	1,695	1,060	5	1,475
645	125	1,340	875	15	1,260

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
850	220	250	10	855
1,000	200	270	15	1,140
1,060	250	320	5	1,250
875	240	290	15	770

MD 202		
	SB	NB
6-7A	985	1,620
7-8A	1,700	2,375
8-9A	1,910	2,755
9-10A	1,675	2,215

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
290	415	355	215	210
425	475	450	350	235
345	430	480	315	410
315	405	395	310	320

Arena Dr		
	EB	WB
6-7A	385	545
7-8A	645	855
8-9A	615	925
9-10A	615	775

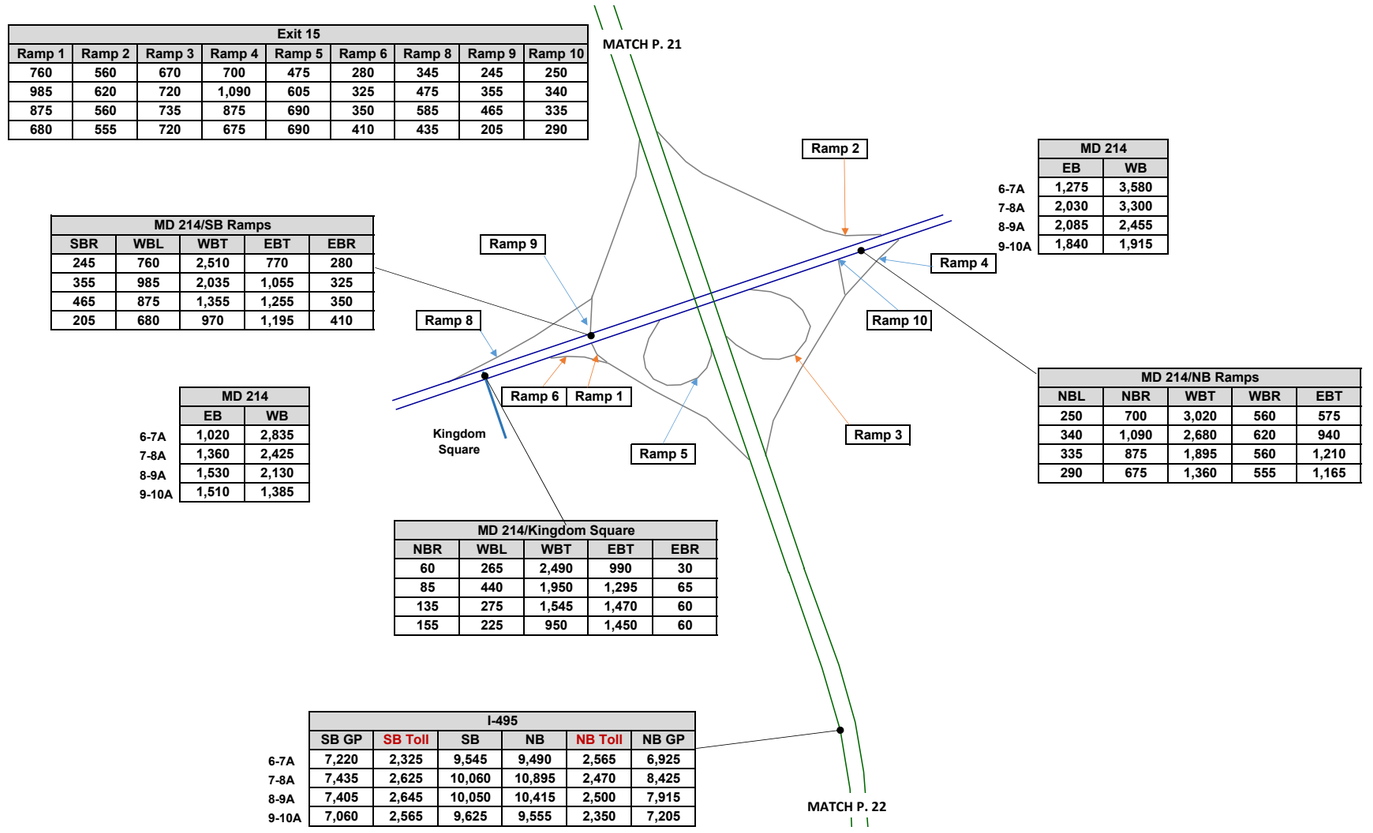
MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
290	0	355	240	220	195	170
425	0	450	465	260	215	350
340	5	480	505	245	180	450
315	0	395	470	210	195	440

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
85	0	125	110	420	280	105
105	0	130	165	725	460	185
175	0	235	155	690	455	160
160	0	160	170	615	475	140

Arena Dr		
	EB	WB
6-7A	525	460
7-8A	800	725
8-9A	930	750
9-10A	835	680

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,245	2,325	9,570	9,770	2,565	7,205
7,560	2,625	10,185	10,805	2,470	8,335
7,920	2,645	10,565	10,500	2,500	8,000
7,300	2,565	9,865	9,865	2,350	7,515

I-495 East Side AM
Future Alternative 13C Peak Period Volumes



Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
760	560	670	700	475	280	345	245	250
985	620	720	1,090	605	325	475	355	340
875	560	735	875	690	350	585	465	335
680	555	720	675	690	410	435	205	290

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
245	760	2,510	770	280
355	985	2,035	1,055	325
465	875	1,355	1,255	350
205	680	970	1,195	410

	MD 214	
	EB	WB
6-7A	1,020	2,835
7-8A	1,360	2,425
8-9A	1,530	2,130
9-10A	1,510	1,385

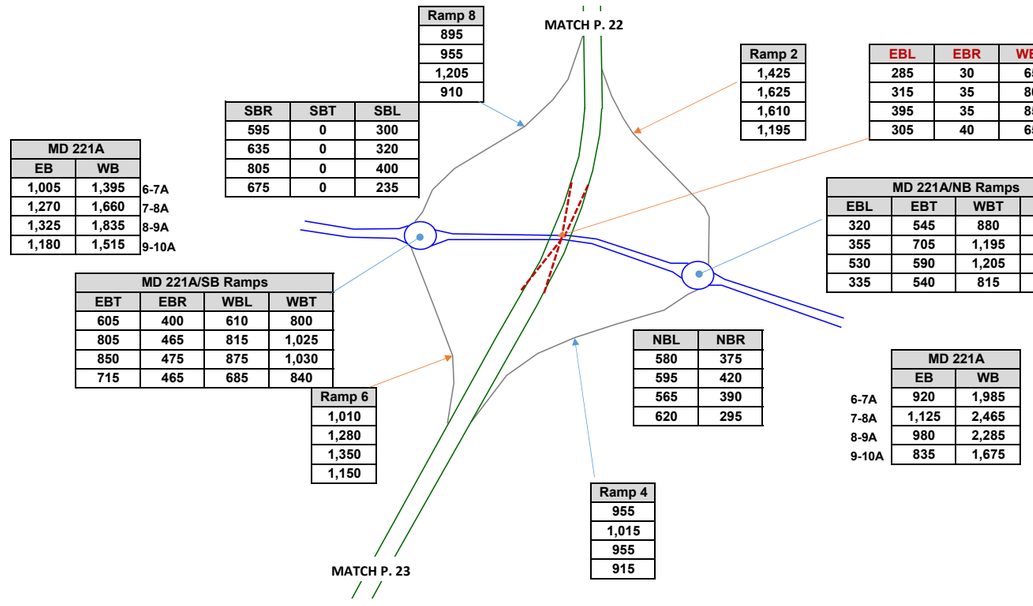
	MD 214	
	EB	WB
6-7A	1,275	3,580
7-8A	2,030	3,300
8-9A	2,085	2,455
9-10A	1,840	1,915

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
250	700	3,020	560	575
340	1,090	2,680	620	940
335	875	1,895	560	1,210
290	675	1,360	555	1,165

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
60	265	2,490	990	30
85	440	1,950	1,295	65
135	275	1,545	1,470	60
155	225	950	1,450	60

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	7,220	2,325	9,545	9,490	2,565	6,925
7-8A	7,435	2,625	10,060	10,895	2,470	8,425
8-9A	7,405	2,645	10,050	10,415	2,500	7,915
9-10A	7,060	2,565	9,625	9,555	2,350	7,205

I-495 East Side AM
Future Alternative 13C Peak Period Volumes



Ramp 8
895
955
1,205
910

SBR	SBT	SBL
595	0	300
635	0	320
805	0	400
675	0	235

MD 221A		
EB	WB	
1,005	1,395	6-7A
1,270	1,660	7-8A
1,325	1,835	8-9A
1,180	1,515	9-10A

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
605	400	610	800
805	465	815	1,025
850	475	875	1,030
715	465	685	840

Ramp 6
1,010
1,280
1,350
1,150

Ramp 2
1,425
1,625
1,610
1,195

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
285	30	65	490	100	50	225	405
315	35	80	500	100	50	235	530
395	35	85	415	90	45	255	545
305	40	65	405	100	40	230	460

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
320	545	880	1,105
355	705	1,195	1,270
530	590	1,205	1,080
335	540	815	860

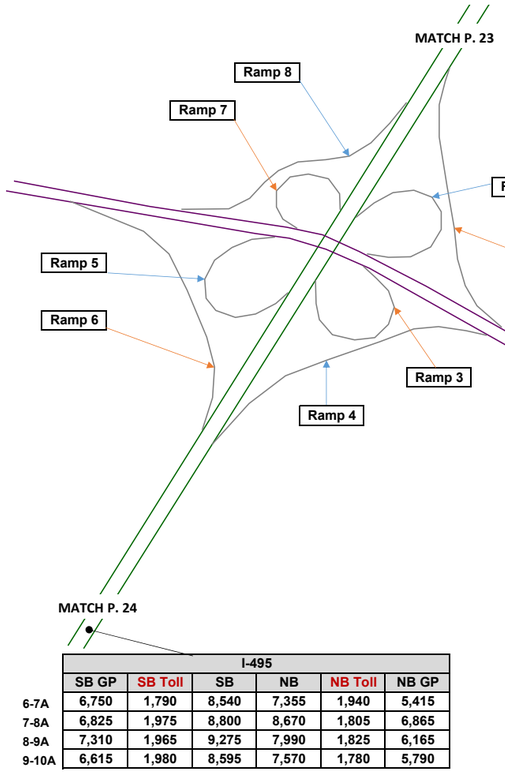
NBL	NBR
580	375
595	420
565	390
620	295

MD 221A		
	EB	WB
6-7A	920	1,985
7-8A	1,125	2,465
8-9A	980	2,285
9-10A	835	1,675

Ramp 4
955
1,015
955
915

I-495 East Side AM
Future Alternative 13C Peak Period Volumes

MD 4		
SB	NB	
1,335	2,325	6-7A
1,665	3,095	7-8A
1,580	2,105	8-9A
1,450	1,550	9-10A

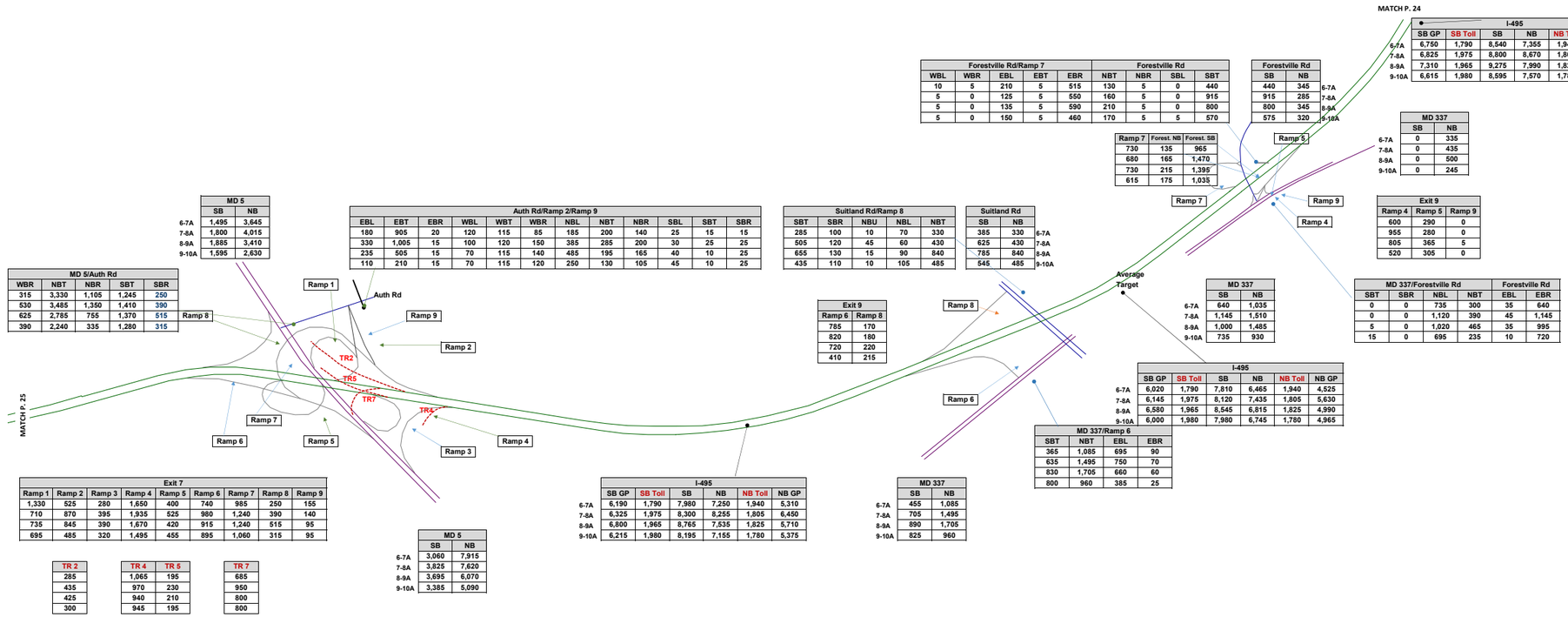


Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
650	1,655	605	570	890	470	1,125	1,290
800	1,580	700	530	800	420	920	1,475
730	1,680	695	550	660	460	835	875
540	1,515	645	485	750	385	605	925

	MD 4	
	SB	NB
6-7A	1,720	3,165
7-8A	1,875	3,320
8-9A	1,635	3,015
9-10A	1,655	2,205

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,750	1,790	8,540	7,355	1,940	5,415
7-8A	6,825	1,975	8,800	8,670	1,805	6,865
8-9A	7,310	1,965	9,275	7,990	1,825	6,165
9-10A	6,615	1,980	8,595	7,570	1,780	5,790

I-495 South Side AM
Future Alternative 13C Peak Period Volumes



	MD 5	
	SB	NB
6-7A	1,495	3,645
7-8A	1,800	4,015
8-9A	1,885	3,410
9-10A	1,595	2,630

MD 5/Auth Rd				
WBR	NBT	NBR	SBT	SBR
315	3,330	1,105	1,245	250
530	3,485	1,350	1,410	390
625	2,785	755	1,370	515
390	2,240	335	1,280	315

Auth Rd/Ramp 2/Ramp 9										
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
180	905	20	120	115	85	185	200	140	25	15	15
330	1,005	15	100	120	150	385	285	200	30	25	25
235	505	15	70	115	140	485	195	165	40	10	25
110	210	15	70	115	120	250	130	105	45	10	25

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
285	100	10	70	330
505	120	45	60	430
655	130	15	90	840
435	110	10	105	485

Suitland Rd		
SB	NB	
385	330	6-7A
625	430	7-8A
785	840	8-9A
545	485	9-10A

Exit 9	
Ramp 6	Ramp 8
785	170
820	180
720	220
410	215

Forestville Rd/Ramp 7					Forestville Rd			
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT
10	5	210	5	515	130	5	0	440
5	0	125	5	550	160	5	0	915
5	0	135	5	590	210	5	0	800
5	0	150	5	460	170	5	5	570

Forestville Rd		
SB	NB	
440	345	6-7A
915	285	7-8A
800	345	8-9A
575	320	9-10A

Ramp 7	Forest. NB	Forest. SB
730	135	965
680	165	1,470
730	215	1,395
615	175	1,033

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,750	1,790	8,540	7,355	1,940	5,415
6,825	1,975	8,800	8,670	1,805	6,865
7,310	1,965	9,275	7,990	1,825	6,165
6,615	1,980	8,595	7,570	1,780	5,790

MD 337	
SB	NB
0	335
0	435
0	500
0	245

Exit 9		
Ramp 4	Ramp 5	Ramp 9
600	290	0
955	280	0
805	365	5
520	305	0

MD 337	
SB	NB
640	1,035
1,145	1,510
1,000	1,485
735	930

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	735	300	35	640
0	0	1,120	390	45	1,145
5	0	1,020	465	35	995
15	0	695	235	10	720

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,020	1,790	7,810	6,465	1,940	4,525
6,145	1,975	8,120	7,435	1,805	5,630
6,580	1,965	8,545	6,815	1,825	4,990
6,000	1,980	7,980	6,745	1,780	4,965

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
365	1,085	695	90
635	1,495	750	70
830	1,705	660	60
800	960	385	25

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
1,330	525	280	1,650	400	740	985	250	155
710	870	395	1,935	525	980	1,240	390	140
735	845	390	1,670	420	915	1,240	515	95
695	485	320	1,495	455	895	1,060	315	95

TR 2
285
435
425
300

TR 4	TR 5
1,065	195
970	230
940	210
945	195

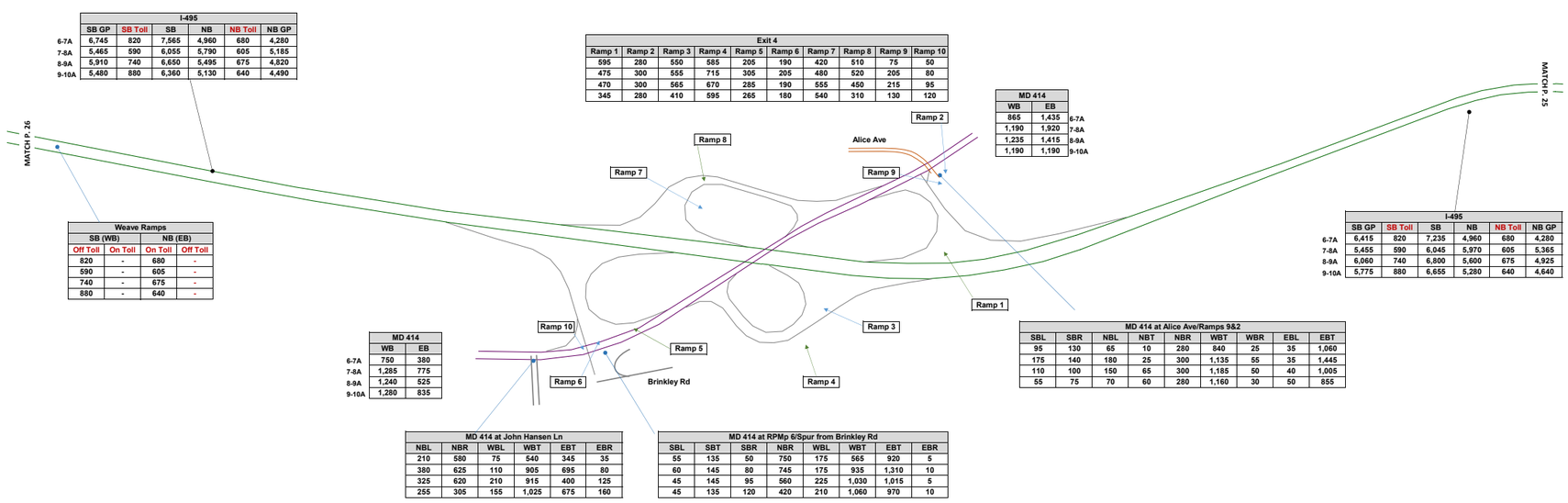
TR 7
685
950
800
800

MD 5	
SB	NB
3,060	7,915
3,825	7,620
3,695	6,070
3,385	5,090

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
6,190	1,790	7,980	7,250	1,940	5,310
6,325	1,975	8,300	8,255	1,805	6,450
6,800	1,965	8,765	7,535	1,825	5,710
6,215	1,980	8,195	7,155	1,780	5,375

MD 337	
SB	NB
455	1,085
705	1,495
890	1,705
825	960

I-495 South Side AM
Future Alternative 13C Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,745	820	7,565	4,960	680	4,280
7-8A	5,465	590	6,055	5,790	605	5,185
8-9A	5,910	740	6,650	5,495	675	4,820
9-10A	5,480	880	6,360	5,130	640	4,490

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
820	-	680	-
590	-	605	-
740	-	675	-
880	-	640	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
595	280	550	585	205	190	420	510	75	50
475	300	555	715	305	205	480	520	205	80
470	300	565	670	285	190	555	450	215	95
345	280	410	595	265	180	540	310	130	120

MD 414		
WB	EB	
865	1,435	6-7A
1,190	1,920	7-8A
1,235	1,415	8-9A
1,190	1,190	9-10A

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
6-7A	6,415	820	7,235	4,960	680	4,280
7-8A	5,455	590	6,045	5,970	605	5,365
8-9A	6,060	740	6,800	5,600	675	4,925
9-10A	5,775	880	6,655	5,280	640	4,640

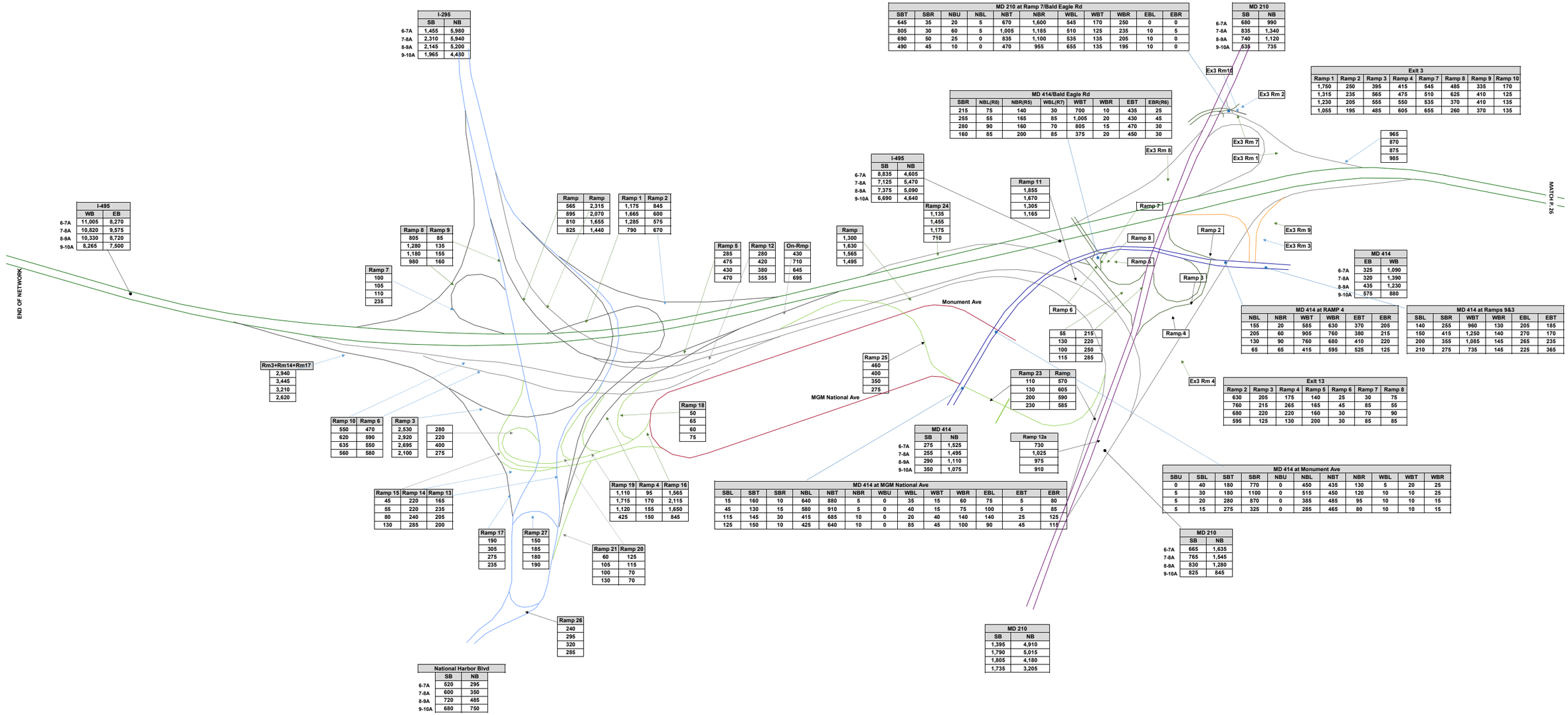
MD 414		
WB	EB	
750	380	6-7A
1,285	775	7-8A
1,240	525	8-9A
1,280	835	9-10A

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
95	130	65	10	280	840	25	35	1,060
175	140	180	25	300	1,135	55	35	1,445
110	100	150	65	300	1,185	50	40	1,005
55	75	70	60	280	1,160	30	50	855

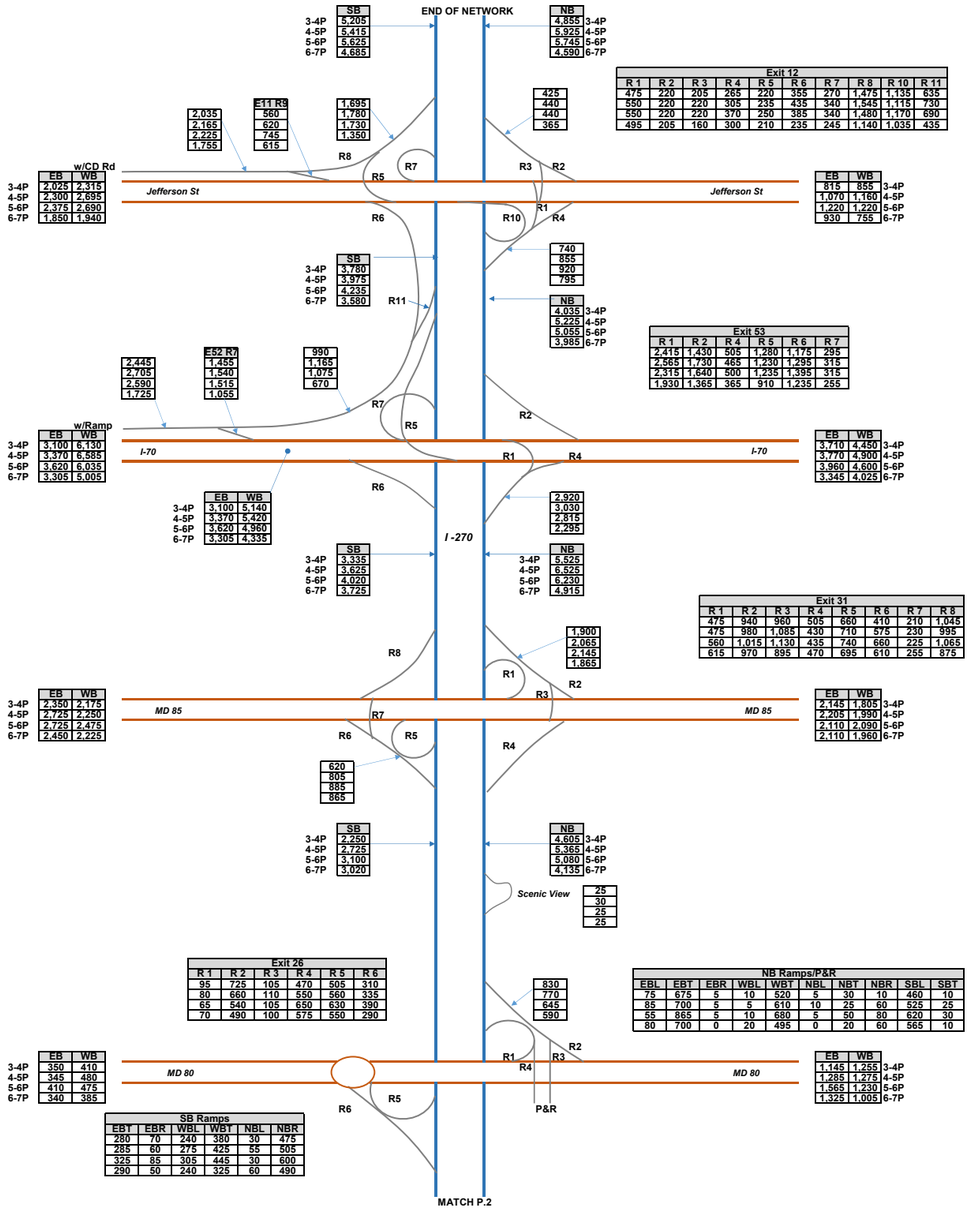
MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
210	580	75	540	345	35
380	625	110	905	695	80
325	620	210	915	400	125
255	305	155	1,025	675	160

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
55	135	50	750	175	565	920	5
60	145	80	745	175	935	1,310	10
45	145	95	560	225	1,030	1,015	5
45	135	120	420	210	1,060	970	10

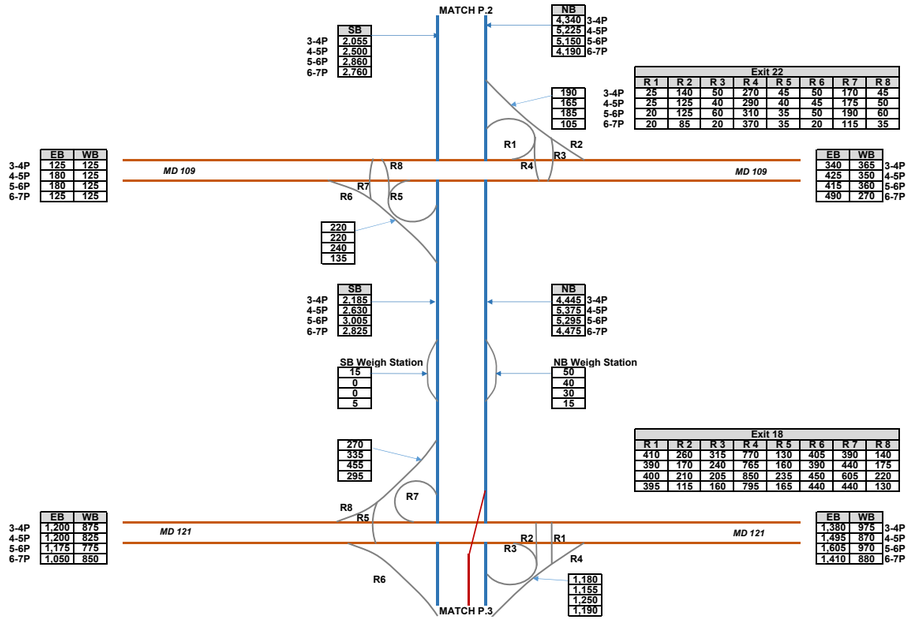
I-495 South Side AM
Future Alternative 13C Peak Period Volumes



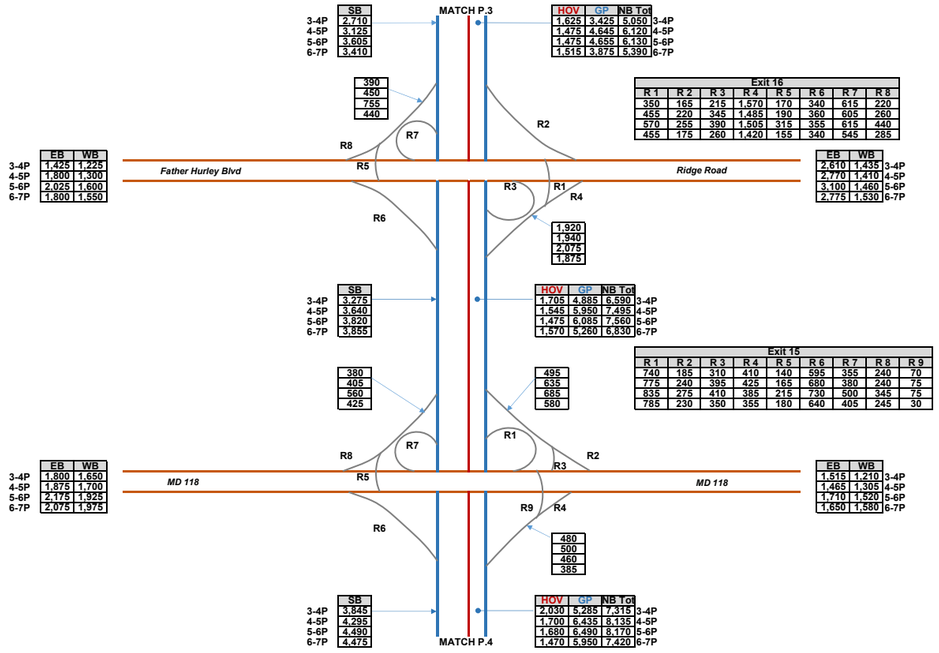
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



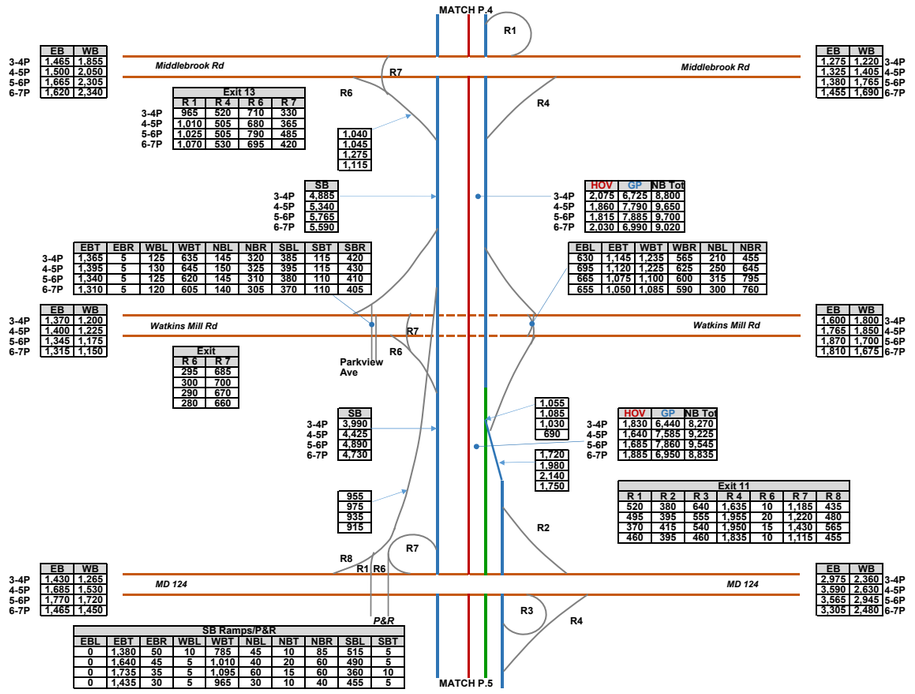
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



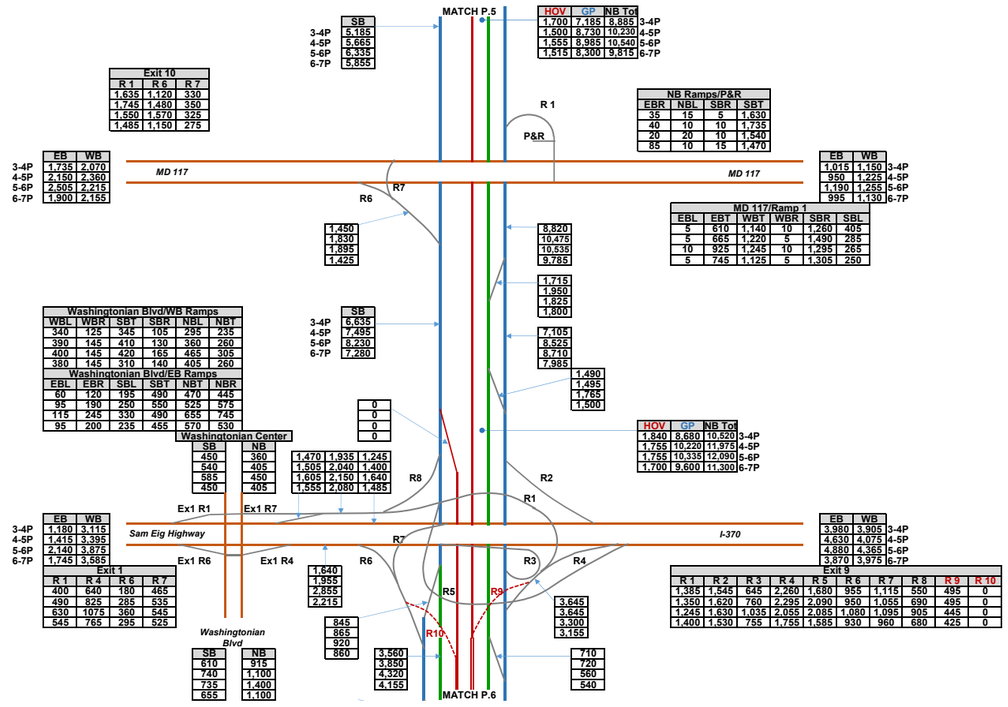
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



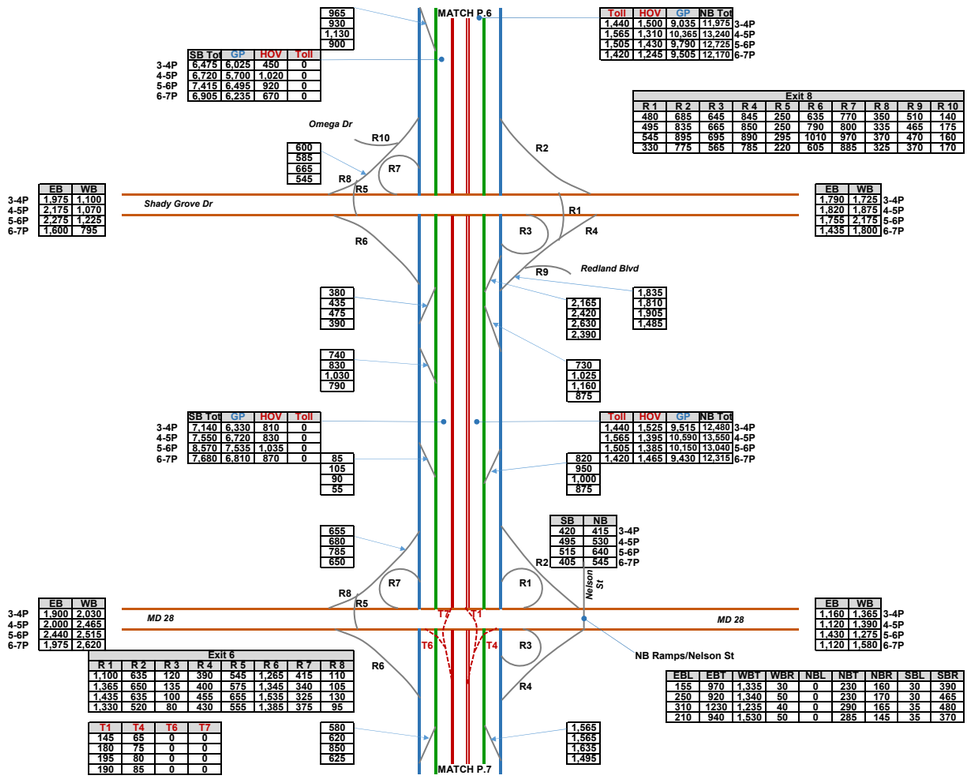
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



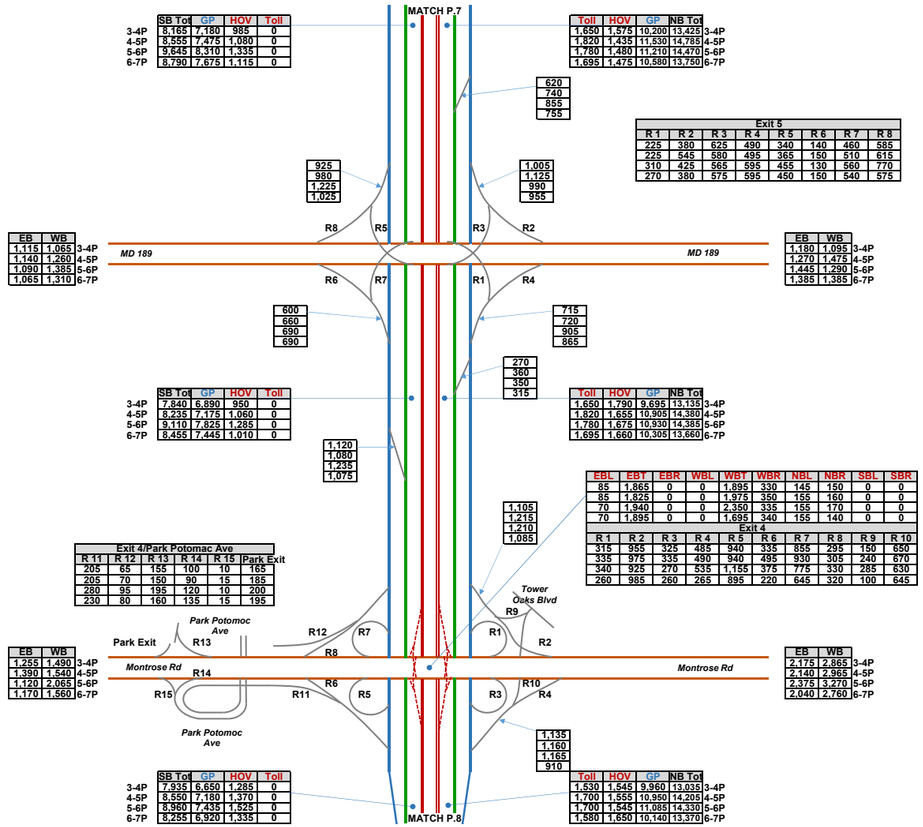
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



	SB Tot	GP	HOV	Toll
3-4P	8,165	7,180	985	0
4-5P	8,555	7,475	1,080	0
5-6P	9,645	8,310	1,335	0
6-7P	8,790	7,675	1,115	0

Toll	HOV	GP	NB Tot	
1,650	1,575	10,200	13,425	3-4P
1,820	1,435	11,530	14,785	4-5P
1,780	1,480	11,210	14,470	5-6P
1,695	1,475	10,580	13,750	6-7P

Exit 5							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
225	380	625	490	340	140	460	585
225	545	580	495	365	150	510	615
310	425	565	595	455	130	560	770
270	380	575	595	450	150	540	575

EB	WB	
1,115	1,065	3-4P
1,140	1,260	4-5P
1,090	1,385	5-6P
1,065	1,310	6-7P

EB	WB	
1,180	1,095	3-4P
1,270	1,475	4-5P
1,445	1,290	5-6P
1,385	1,385	6-7P

	SB Tot	GP	HOV	Toll
3-4P	7,840	6,890	950	0
4-5P	8,235	7,175	1,060	0
5-6P	9,110	7,825	1,285	0
6-7P	8,455	7,445	1,010	0

Toll	HOV	GP	NB Tot	
1,650	1,790	9,695	13,135	3-4P
1,820	1,655	10,905	14,380	4-5P
1,780	1,675	10,930	14,385	5-6P
1,695	1,660	10,305	13,660	6-7P

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
85	1,865	0	0	1,895	330	145	150	0	0
85	1,825	0	0	1,975	350	155	160	0	0
70	1,940	0	0	2,350	335	155	170	0	0
70	1,895	0	0	1,695	340	155	140	0	0

Exit 4									
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10
315	955	325	485	940	335	855	295	150	650
335	975	335	490	940	495	930	305	240	670
340	925	270	535	1,155	375	775	330	285	630
260	985	260	265	895	220	645	320	100	645

Exit 4/Park Potomac Ave					
R 11	R 12	R 13	R 14	R 15	Park Exit
205	65	155	100	10	165
205	70	150	90	15	185
280	95	195	120	10	200
230	80	160	135	15	195

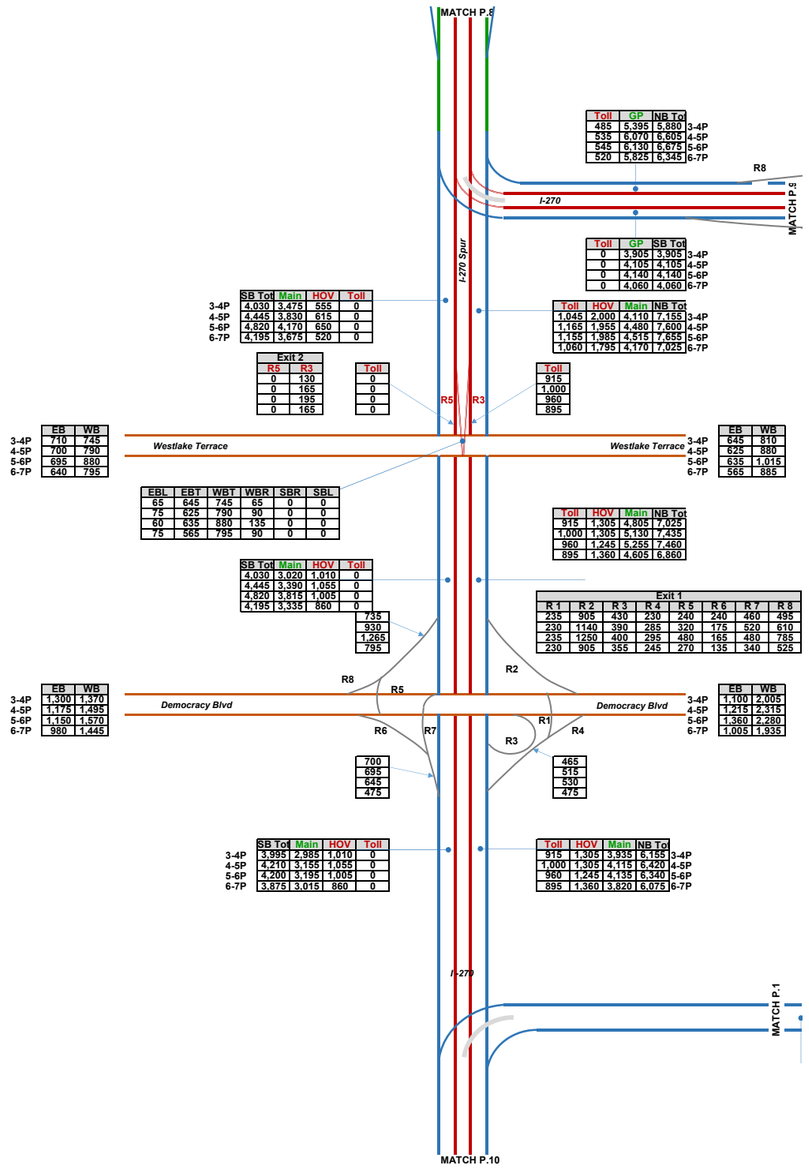
EB	WB	
1,255	1,490	3-4P
1,390	1,540	4-5P
1,120	2,065	5-6P
1,170	1,560	6-7P

EB	WB	
2,175	2,865	3-4P
2,140	2,965	4-5P
2,375	3,270	5-6P
2,040	2,760	6-7P

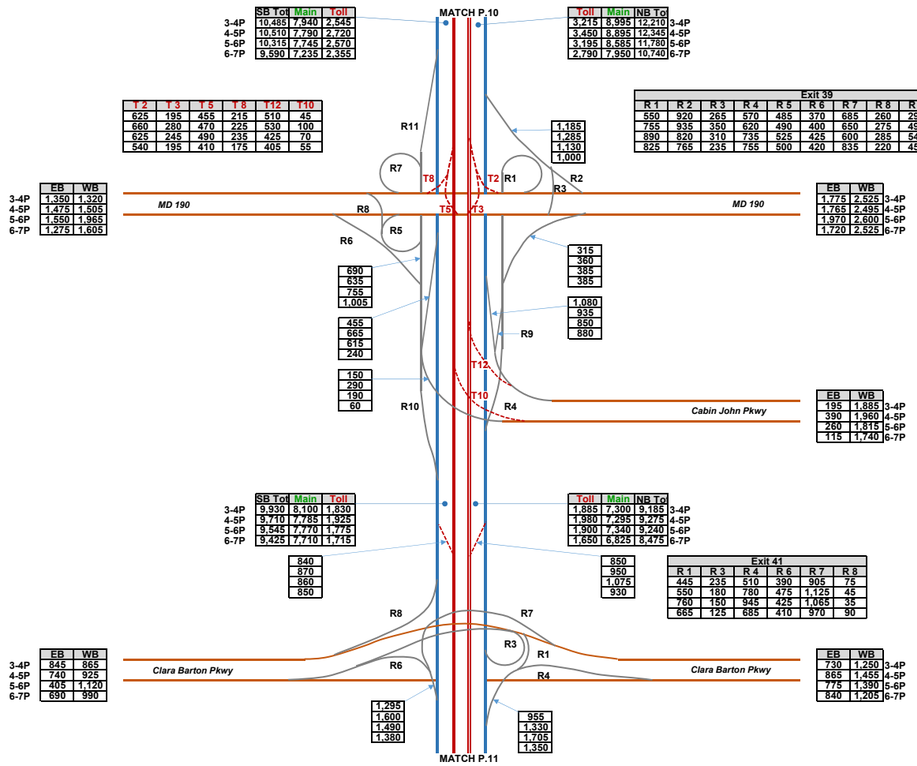
	SB Tot	GP	HOV	Toll
3-4P	7,935	6,650	1,285	0
4-5P	8,550	7,180	1,370	0
5-6P	8,960	7,435	1,525	0
6-7P	8,255	6,920	1,335	0

Toll	HOV	GP	NB Tot	
1,530	1,545	9,960	13,035	3-4P
1,700	1,555	10,950	14,205	4-5P
1,700	1,545	11,085	14,330	5-6P
1,580	1,650	10,140	13,370	6-7P

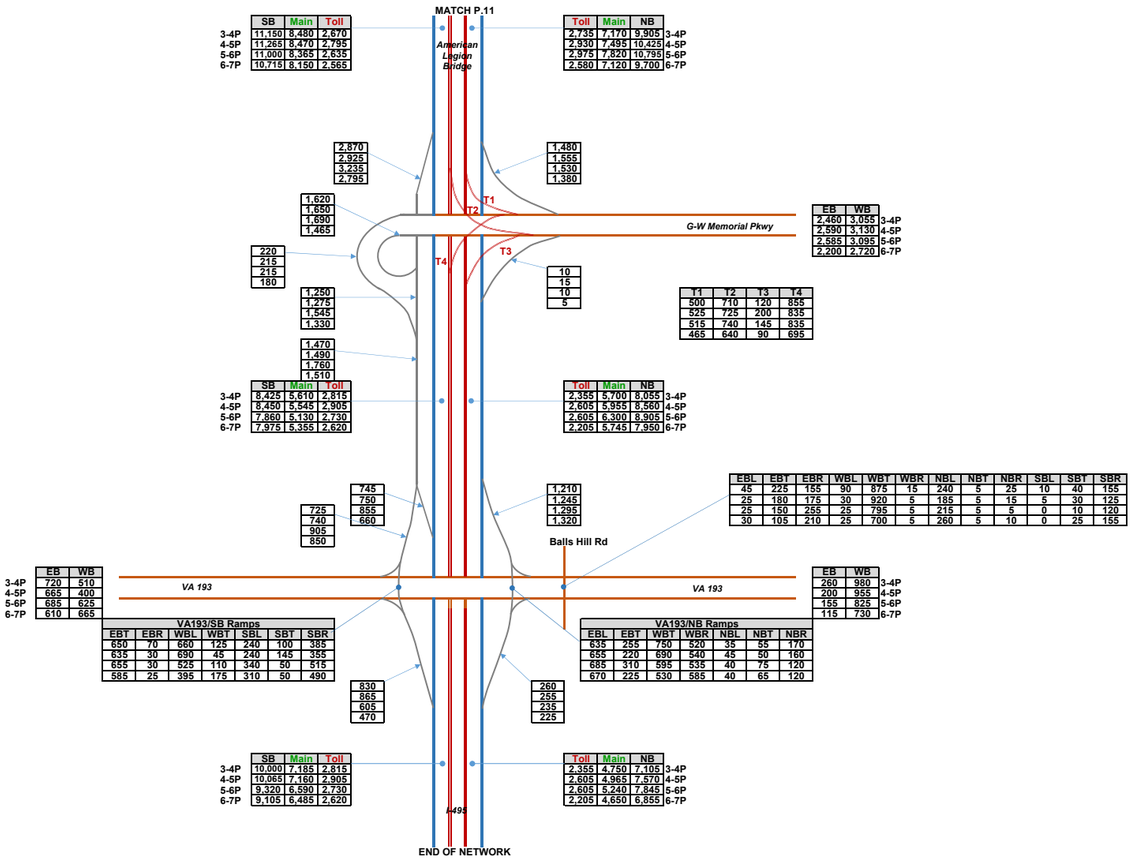
I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



	SB	Main	Toll
3-4P	11,150	8,480	2,670
4-5P	11,265	8,470	2,795
5-6P	11,000	8,365	2,635
6-7P	10,715	8,150	2,565

	Toll	Main	NB
3-4P	2,735	7,170	9,505
4-5P	2,930	7,495	10,425
5-6P	2,975	7,820	10,795
6-7P	2,580	7,120	9,700

	SB	Main	Toll
3-4P	8,425	5,610	2,815
4-5P	8,450	5,545	2,905
5-6P	7,860	5,130	2,730
6-7P	7,975	5,355	2,620

	Toll	Main	NB
3-4P	2,355	5,700	8,055
4-5P	2,605	5,955	8,560
5-6P	2,605	6,300	8,905
6-7P	2,205	5,745	7,950

	SB	Main	Toll
3-4P	10,000	7,185	2,815
4-5P	10,065	7,160	2,305
5-6P	9,320	6,590	2,730
6-7P	9,105	6,485	2,620

	Toll	Main	NB
3-4P	2,355	4,750	7,105
4-5P	2,605	4,965	7,870
5-6P	2,605	5,240	7,845
6-7P	2,205	4,650	6,855

	EB	WB
3-4P	2,460	3,055
4-5P	2,590	3,130
5-6P	2,585	3,095
6-7P	2,200	2,720

	EB	WB
3-4P	720	510
4-5P	665	400
5-6P	685	625
6-7P	610	665

	EB	WB
3-4P	260	980
4-5P	200	955
5-6P	155	825
6-7P	115	730

T1	T2	T3	T4
500	710	120	855
525	725	200	835
515	740	145	835
465	640	90	695

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
45	225	155	90	875	15	240	5	25	10	40	155
25	180	175	30	920	5	185	5	15	5	30	125
25	150	295	25	795	5	215	5	5	0	10	120
30	105	210	25	700	5	260	5	10	0	25	155

VA193/SB Ramps

EBT	EBR	WBL	WBT	SBL	SBT	SBR
650	70	660	125	240	100	385
635	30	690	45	240	145	355
655	30	525	110	340	50	515
585	25	395	175	310	50	490

VA193/NB Ramps

EBL	EBT	WBT	WBR	NBL	NBT	NBR
635	255	750	520	35	55	170
655	220	690	540	45	50	160
685	310	595	535	40	75	120
670	225	530	585	40	65	120

2,870 2,925 3,235 2,795

1,480 1,555 1,530 1,380

1,620 1,650 1,690 1,465

220 215 215 180

10 15 10 5

1,250 1,275 1,545 1,330

1,470 1,490 1,760 1,510

745 750 855 660

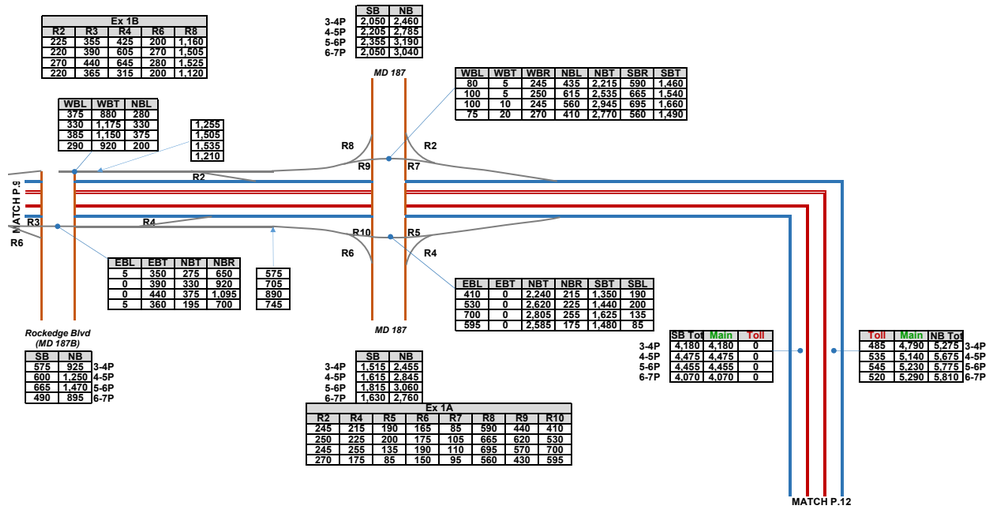
725 740 905 850

1,210 1,245 1,295 1,320

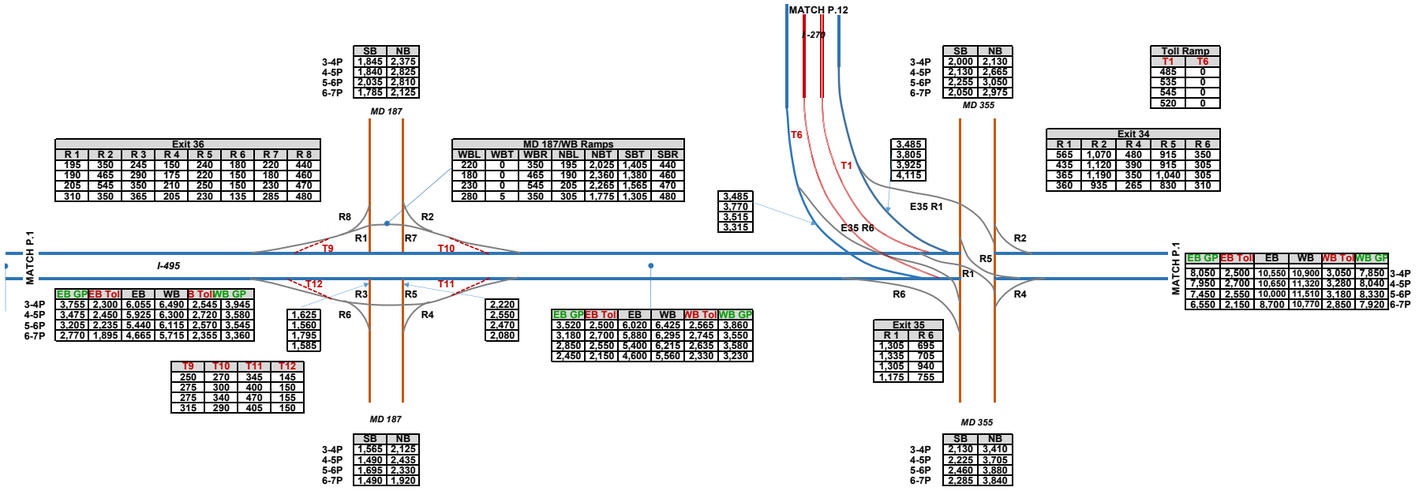
830 865 605 470

260 255 235 225

I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



I-270 & I-495 West Side PM
Future Alternative 13C Peak Period Volumes



	SB	NB
3-4P	1,845	2,375
4-5P	1,840	2,825
5-6P	2,035	2,810
6-7P	1,785	2,125

Exit 36							
R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8
195	350	245	150	240	180	220	440
190	465	290	175	220	150	180	460
205	545	350	210	250	150	230	470
310	350	365	205	230	135	285	480

MD 187/WB Ramps						
WBL	WBT	WBR	NBL	NBT	SBT	SBR
220	0	350	195	2,025	1,405	440
180	0	465	190	2,360	1,380	460
230	0	545	205	2,265	1,565	470
280	5	350	305	1,775	1,305	480

	SB	NB
3-4P	2,000	2,130
4-5P	2,130	2,665
5-6P	2,255	3,050
6-7P	2,050	2,975

Toll Ramp	
T1	T6
485	0
535	0
545	0
520	0

Exit 34				
R 1	R 2	R 4	R 5	R 6
565	1,070	480	915	350
435	1,120	390	915	305
365	1,190	350	1,040	305
360	935	265	830	310

	EB GP	EB Tol	EB	WB	B Tol	WB GP
3-4P	3,755	2,300	6,055	6,490	2,545	3,945
4-5P	3,475	2,450	5,925	6,300	2,720	3,580
5-6P	3,205	2,235	5,440	6,115	2,570	3,545
6-7P	2,770	1,895	4,665	5,715	2,355	3,360

T9	T10	T11	T12
250	270	345	145
275	300	400	150
275	340	470	155
315	290	405	150

	EB GP	EB Tol	EB	WB	WB Tol	WB GP
3-4P	3,520	2,500	6,020	6,425	2,565	3,860
4-5P	3,180	2,700	5,880	6,295	2,745	3,550
5-6P	2,850	2,550	5,400	6,215	2,635	3,580
6-7P	2,450	2,150	4,600	5,560	2,330	3,230

	EB GP	EB Tol	EB	WB	WB Tol	WB GP	
	8,050	2,500	10,550	10,900	3,050	7,850	3-4P
	7,950	2,700	10,650	11,320	3,280	8,040	4-5P
	7,450	2,550	10,000	11,510	3,180	8,330	5-6P
	6,550	2,150	8,700	10,770	2,850	7,920	6-7P

Exit 35	
R 1	R 6
1,305	695
1,335	705
1,305	940
1,175	755

	SB	NB
3-4P	1,565	2,125
4-5P	1,490	2,435
5-6P	1,695	2,330
6-7P	1,490	1,920

	SB	NB
3-4P	2,130	3,410
4-5P	2,225	3,705
5-6P	2,460	3,880
6-7P	2,285	3,840

3,485
3,770
3,515
3,315

3,485
3,805
3,925
4,115

1,625
1,560
1,795
1,585

2,220
2,550
2,470
2,080

I-495 North Side PM
Future Alternative 13C Peak Period Volumes

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
8,050	2,500	10,550	10,900	3,050	7,850
7,950	2,700	10,650	11,320	3,280	8,040
7,450	2,550	10,000	11,510	3,180	8,330
6,550	2,150	8,700	10,770	2,850	7,920

3-4P
4-5P
5-6P
6-7P

MATCH P.12

MATCH P. 14

MD 185		
	SB	NB
3-4P	1,510	2,025
4-5P	1,575	2,330
5-6P	1,540	2,380
6-7P	1,135	2,130

Exit 33							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
960	380	325	1,520	360	575	775	455
885	440	360	1,540	315	605	845	405
905	460	475	1,615	280	695	825	335
870	290	505	1,590	215	585	785	380

Ramp 2 | Ramp 7
Ramp 1
Ramp 8
Ramp 4
Ramp 5
Ramp 3
Ramp 6

MD 185		
	SB	NB
3-4P	2,045	3,800
4-5P	2,305	3,955
5-6P	2,445	3,965
6-7P	1,910	3,795

Exit 31							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
980	560	295	620	640	630	555	415
1,005	640	300	635	645	690	645	435
1,045	640	310	600	655	830	660	380
1,120	570	435	575	650	810	525	385

MD 97		
SB	NB	
1,750	2,355	3-4P
1,970	2,895	4-5P
1,960	2,950	5-6P
1,930	2,750	6-7P

Ramp 2 | Ramp 7
Ramp 8
Ramp 1
Ramp 6
Ramp 5
Ramp 3
Ramp 4

MATCH P.15

MD 97		
	SB	NB
3-4P	1,880	3,100
4-5P	2,225	3,595
5-6P	2,415	3,645
6-7P	2,230	3,440

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
9,030	2,500	11,530	10,640	3,050	7,590
8,840	2,700	11,540	11,315	3,280	8,035
8,175	2,550	10,725	11,555	3,180	8,375
7,265	2,150	9,415	10,595	2,850	7,745

3-4P
4-5P
5-6P
6-7P

I-495 North Side PM
Future Alternative 13C Peak Period Volumes

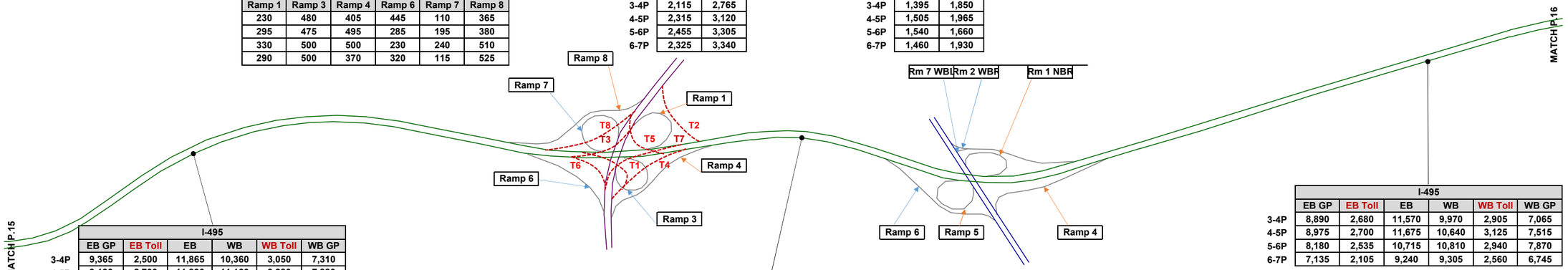
T1	T2	T3	T4	T5	T6	T7	T8
190	330	740	735	325	140	395	680
220	350	880	720	315	155	405	690
260	355	880	730	290	155	345	680
250	340	870	670	285	130	390	770

Exit 30					
Ramp 1	Ramp 3	Ramp 4	Ramp 6	Ramp 7	Ramp 8
230	480	405	445	110	365
295	475	495	285	195	380
330	500	500	230	240	510
290	500	370	320	115	525

	US 29	
	SB	NB
3-4P	2,115	2,765
4-5P	2,315	3,120
5-6P	2,455	3,305
6-7P	2,325	3,340

Exit 29					
Ramp 1	Ramp 2	Ramp 4	Ramp 5	Ramp 6	Ramp 7
575	505	530	495	980	310
810	605	550	500	940	320
860	650	485	490	855	430
820	555	445	510	615	375

	MD 193	
	SB	NB
3-4P	1,395	1,850
4-5P	1,505	1,965
5-6P	1,540	1,660
6-7P	1,460	1,930



	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	9,365	2,500	11,865	10,360	3,050	7,310
4-5P	9,130	2,700	11,830	11,160	3,280	7,880
5-6P	8,290	2,550	10,840	11,430	3,180	8,250
6-7P	7,245	2,150	9,395	10,185	2,850	7,335

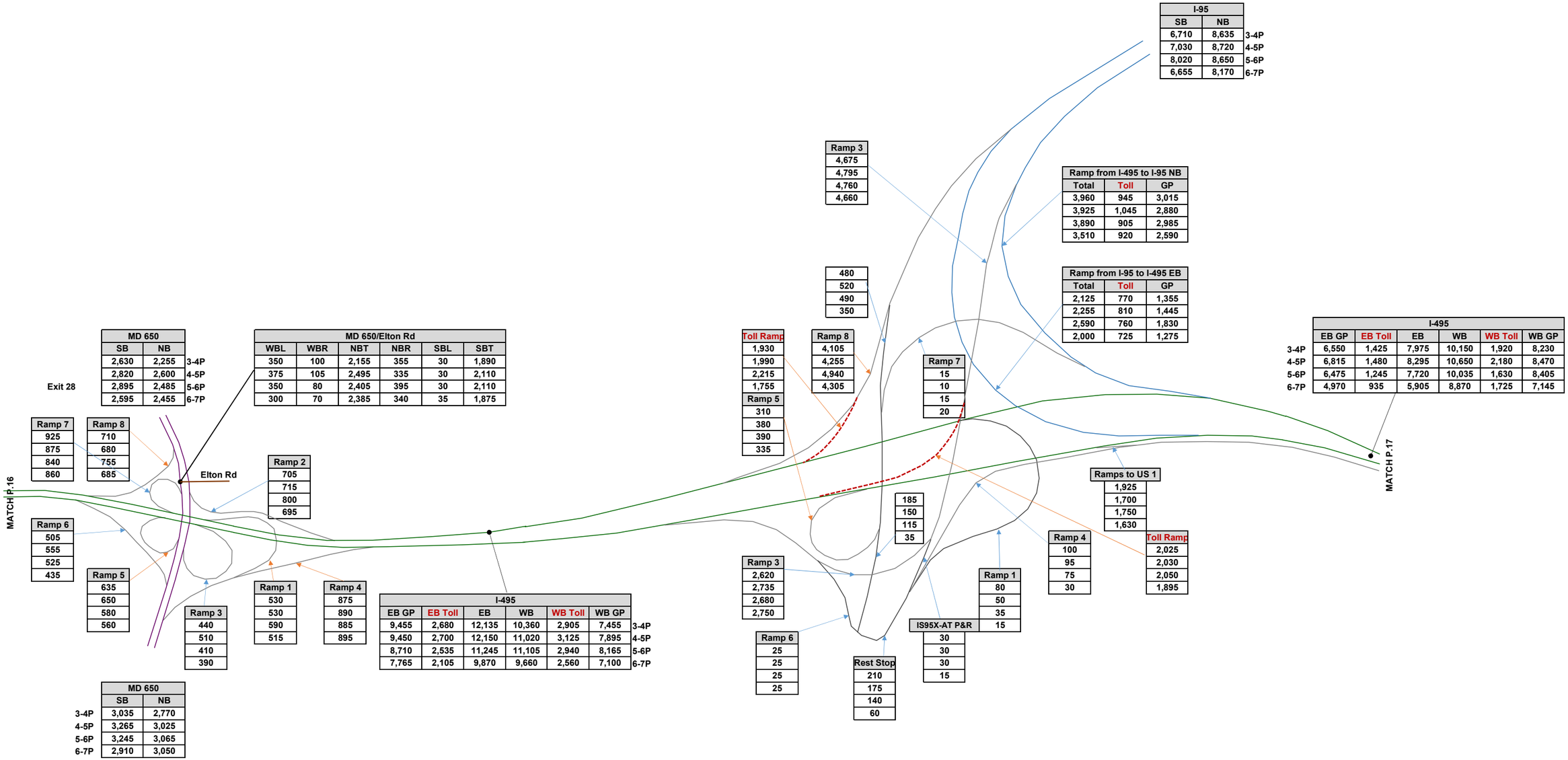
	I-495					
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	8,890	2,680	11,570	9,970	2,905	7,065
4-5P	8,975	2,700	11,675	10,640	3,125	7,515
5-6P	8,180	2,535	10,715	10,810	2,940	7,870
6-7P	7,135	2,105	9,240	9,305	2,560	6,745

	US 29		
	SB	NB	
3-4P	1,835	2,775	3-4P
4-5P	1,970	3,145	4-5P
5-6P	1,945	3,390	5-6P
6-7P	1,700	3,210	6-7P

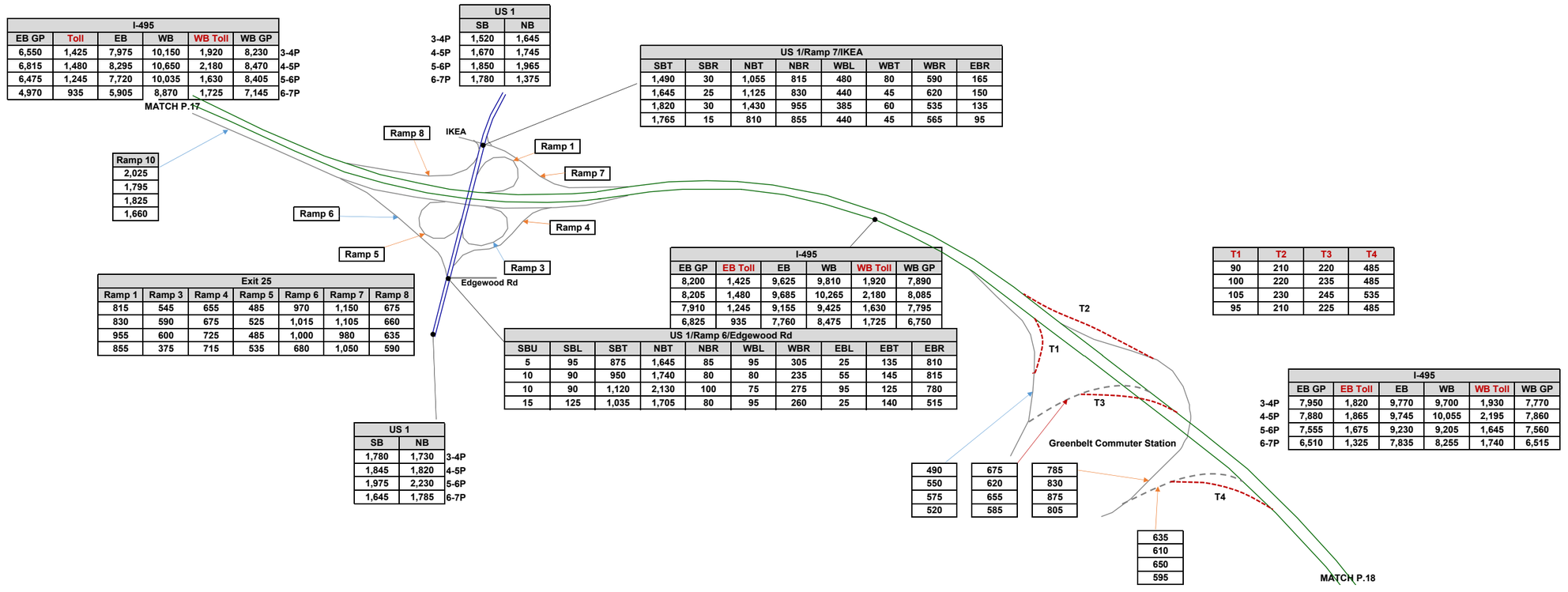
	I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP	
3-4P	8,845	2,680	11,525	9,730	2,905	6,825	3-4P
4-5P	8,865	2,700	11,565	10,525	3,125	7,400	4-5P
5-6P	8,060	2,535	10,595	10,590	2,940	7,650	5-6P
6-7P	6,795	2,105	8,900	9,195	2,560	6,635	6-7P

	MD 193		
	SB	NB	
3-4P	2,190	2,450	3-4P
4-5P	2,265	2,720	4-5P
5-6P	2,335	2,355	5-6P
6-7P	1,940	2,640	6-7P

I-495 North Side PM
Future Alternative 13C Peak Period Volumes



I-495 North East Side PM
Future Alternative 13C Peak Period Volumes



I-495						
EB GP	Toll	EB	WB	WB Toll	WB GP	
6,550	1,425	7,975	10,150	1,920	8,230	3-4P
6,815	1,480	8,295	10,650	2,180	8,470	4-5P
6,475	1,245	7,720	10,035	1,630	8,405	5-6P
4,970	935	5,905	8,870	1,725	7,145	6-7P

US 1		
	SB	NB
3-4P	1,520	1,645
4-5P	1,670	1,745
5-6P	1,850	1,965
6-7P	1,780	1,375

US 1/Ramp 7/IKEA							
SBT	SBR	NBT	NBR	WBL	WBT	WBR	EBR
1,490	30	1,055	815	480	80	590	165
1,645	25	1,125	830	440	45	620	150
1,820	30	1,430	955	385	60	535	135
1,765	15	810	855	440	45	565	95

Ramp 10
2,025
1,795
1,825
1,660

Exit 25						
Ramp 1	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
815	545	655	485	970	1,150	675
830	590	675	525	1,015	1,105	660
955	600	725	485	1,000	980	635
855	375	715	535	680	1,050	590

I-495					
EB GP	EB Toll	EB	WB	WB Toll	WB GP
8,200	1,425	9,625	9,810	1,920	7,890
8,205	1,480	9,685	10,265	2,180	8,085
7,910	1,245	9,155	9,425	1,630	7,795
6,825	935	7,760	8,475	1,725	6,750

US 1/Ramp 6/Edgewood Rd									
SBU	SBL	SBT	NBT	NBR	WBL	WBR	EBL	EBT	EBR
5	95	875	1,645	85	95	305	25	135	810
10	90	950	1,740	80	80	235	55	145	815
10	90	1,120	2,130	100	75	275	95	125	780
15	125	1,035	1,705	80	95	260	25	140	515

US 1		
SB	NB	
1,780	1,730	3-4P
1,845	1,820	4-5P
1,975	2,230	5-6P
1,645	1,785	6-7P

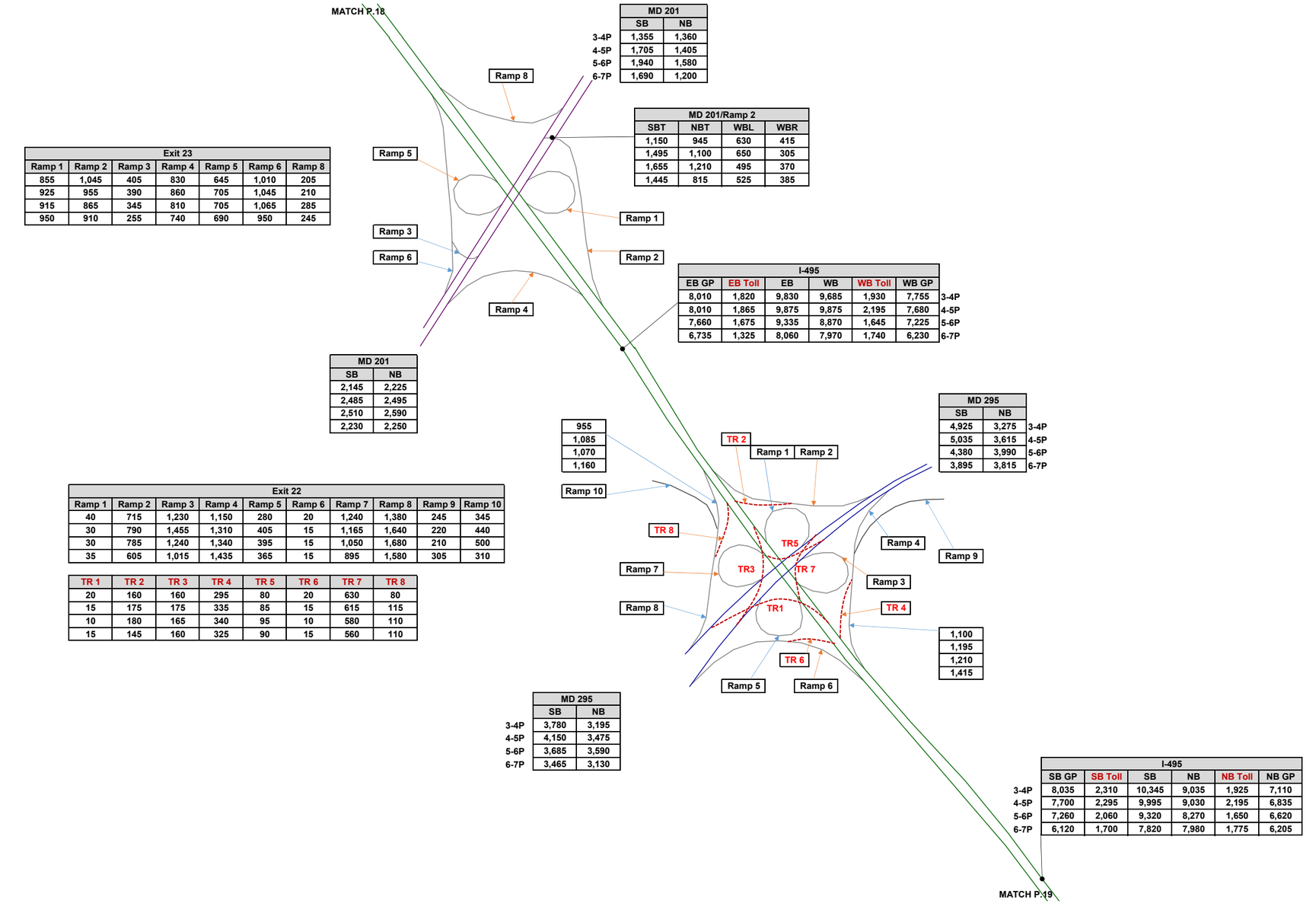
T1	T2	T3	T4
90	210	220	485
100	220	235	485
105	230	245	535
95	210	225	485

I-495						
	EB GP	EB Toll	EB	WB	WB Toll	WB GP
3-4P	7,950	1,820	9,770	9,700	1,930	7,770
4-5P	7,880	1,865	9,745	10,055	2,195	7,860
5-6P	7,555	1,675	9,230	9,205	1,645	7,560
6-7P	6,510	1,325	7,835	8,255	1,740	6,515

490	675	785
550	620	830
575	655	875
520	585	805

635
610
650
595

I-495 North East Side PM
Future Alternative 13C Peak Period Volumes



Exit 23

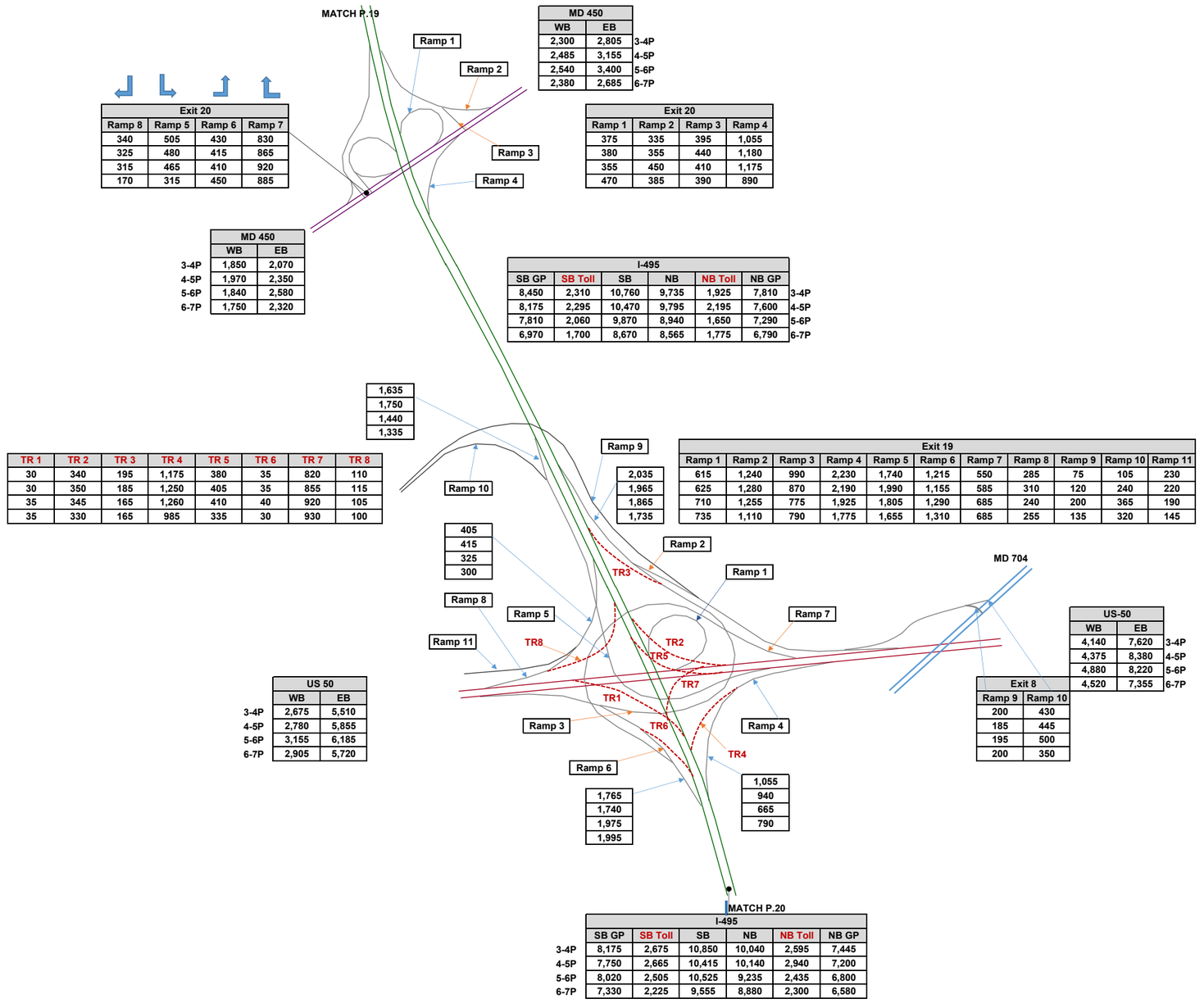
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8
855	1,045	405	830	645	1,010	205
925	955	390	860	705	1,045	210
915	865	345	810	705	1,065	285
950	910	255	740	690	950	245

Exit 22

Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
40	715	1,230	1,150	280	20	1,240	1,380	245	345
30	790	1,455	1,310	405	15	1,165	1,640	220	440
30	785	1,240	1,340	395	15	1,050	1,680	210	500
35	605	1,015	1,435	365	15	895	1,580	305	310

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
20	160	160	295	80	20	630	80
15	175	175	335	85	15	615	115
10	180	165	340	95	10	580	110
15	145	160	325	90	15	560	110

I-495 North East Side PM
Future Alternative 13C Peak Period Volumes



Exit 20			
Ramp 8	Ramp 5	Ramp 6	Ramp 7
340	505	430	830
325	480	415	865
315	465	410	920
170	315	450	885

MD 450		
WB	EB	
2,300	2,805	3-4P
2,485	3,155	4-5P
2,540	3,400	5-6P
2,380	2,685	6-7P

Exit 20			
Ramp 1	Ramp 2	Ramp 3	Ramp 4
375	335	395	1,055
380	355	440	1,180
355	450	410	1,175
470	385	390	890

MD 450		
WB	EB	
1,850	2,070	3-4P
1,970	2,350	4-5P
1,840	2,580	5-6P
1,750	2,320	6-7P

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,450	2,310	10,760	9,735	1,925	7,810	3-4P
8,175	2,295	10,470	9,795	2,195	7,600	4-5P
7,810	2,060	9,870	8,940	1,650	7,290	5-6P
6,970	1,700	8,670	8,565	1,775	6,790	6-7P

1,635
1,750
1,440
1,335

TR 1	TR 2	TR 3	TR 4	TR 5	TR 6	TR 7	TR 8
30	340	195	1,175	380	35	820	110
30	350	185	1,250	405	35	855	115
35	345	165	1,260	410	40	920	105
35	330	165	985	335	30	930	100

2,035
1,965
1,865
1,735

Exit 19										
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10	Ramp 11
615	1,240	990	2,230	1,740	1,215	550	285	75	105	230
625	1,280	870	2,190	1,990	1,155	585	310	120	240	220
710	1,255	775	1,925	1,805	1,290	685	240	200	365	190
735	1,110	790	1,775	1,655	1,310	685	255	135	320	145

405
415
325
300

US 50		
WB	EB	
2,675	5,510	3-4P
2,780	5,855	4-5P
3,155	6,185	5-6P
2,905	5,720	6-7P

US-50		
WB	EB	
4,140	7,620	3-4P
4,375	8,380	4-5P
4,880	8,220	5-6P
4,520	7,355	6-7P

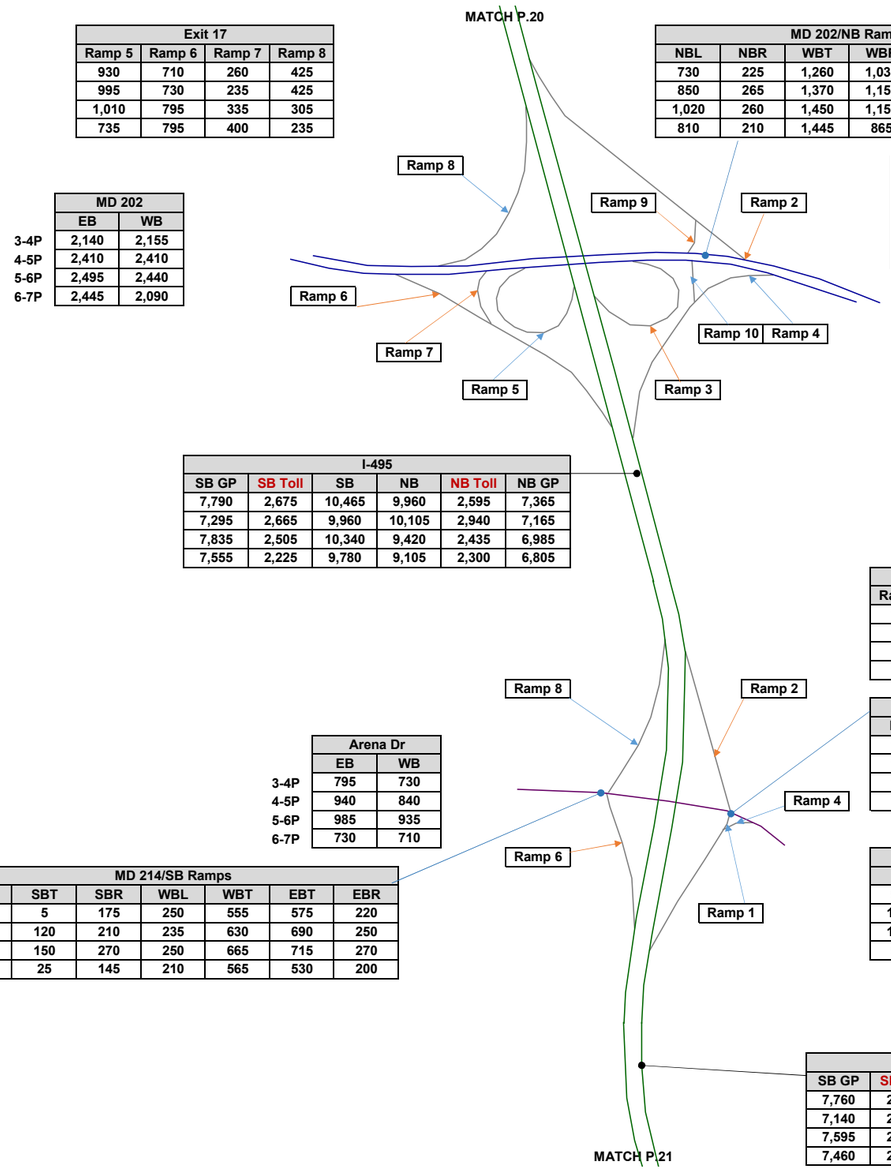
Exit 8	
Ramp 9	Ramp 10
200	430
185	445
195	500
200	350

1,765
1,740
1,975
1,995

1,055
940
665
790

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
8,175	2,675	10,850	10,040	2,595	7,445	3-4P
7,750	2,665	10,415	10,140	2,940	7,200	4-5P
8,020	2,505	10,525	9,235	2,435	6,800	5-6P
7,330	2,225	9,555	8,880	2,300	6,580	6-7P

I-495 East Side PM
Future Alternative 13C Peak Period Volumes



Exit 17			
Ramp 5	Ramp 6	Ramp 7	Ramp 8
930	710	260	425
995	730	235	425
1,010	795	335	305
735	795	400	235

	MD 202	
	EB	WB
3-4P	2,140	2,155
4-5P	2,410	2,410
5-6P	2,495	2,440
6-7P	2,445	2,090

I-495					
SB GP	SB Toll	SB	NB	NB Toll	NB GP
7,790	2,675	10,465	9,960	2,595	7,365
7,295	2,665	9,960	10,105	2,940	7,165
7,835	2,505	10,340	9,420	2,435	6,985
7,555	2,225	9,780	9,105	2,300	6,805

MD 202/NB Ramps					
NBL	NBR	WBT	WBR	EBL	EBT
730	225	1,260	1,035	15	2,085
850	265	1,370	1,150	10	2,440
1,020	260	1,450	1,150	20	2,520
810	210	1,445	865	15	2,205

Exit 17				
Ramp 2	Ramp 3	Ramp 4	Ramp 9	Ramp 10
1,035	260	275	15	955
1,150	225	235	10	1,115
1,150	170	245	20	1,280
865	165	250	15	1,020

MD 202		
SB	NB	
2,585	2,295	3-4P
2,940	2,520	4-5P
3,025	2,600	5-6P
2,665	2,310	6-7P

Exit 16				
Ramp 1	Ramp 2	Ramp 4	Ramp 6	Ramp 8
140	470	270	475	505
155	490	285	605	760
160	455	325	670	910
165	415	250	435	530

MD 214/NB Ramps						
NBL	NBT	NBR	WBT	WBR	EBL	EBT
140	0	270	665	255	215	685
155	0	285	710	250	240	880
150	10	325	765	225	220	985
160	5	250	615	185	225	665

Arena Dr		
EB	WB	
955	920	3-4P
1,165	960	4-5P
1,310	990	5-6P
915	800	6-7P

	Arena Dr	
	EB	WB
3-4P	795	730
4-5P	940	840
5-6P	985	935
6-7P	730	710

MD 214/SB Ramps						
SBL	SBT	SBR	WBL	WBT	EBT	EBR
325	5	175	250	555	575	220
430	120	210	235	630	690	250
490	150	270	250	665	715	270
360	25	145	210	565	530	200

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
7,760	2,675	10,435	9,900	2,595	7,305	3-4P
7,140	2,665	9,805	10,055	2,940	7,115	4-5P
7,595	2,505	10,100	9,450	2,435	7,015	5-6P
7,460	2,225	9,685	9,105	2,300	6,805	6-7P

I-495 East Side PM
Future Alternative 13C Peak Period Volumes

Exit 15								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 8	Ramp 9	Ramp 10
515	445	880	1,195	560	305	440	280	315
810	450	875	1,345	620	460	390	310	340
770	370	880	1,410	680	420	380	225	430
770	335	830	1,205	770	425	370	220	275

MD 214/SB Ramps				
SBR	WBL	WBT	EBT	EBR
280	515	1,550	2,015	305
310	810	1,480	2,350	460
225	770	1,565	2,600	420
220	770	1,215	2,275	425

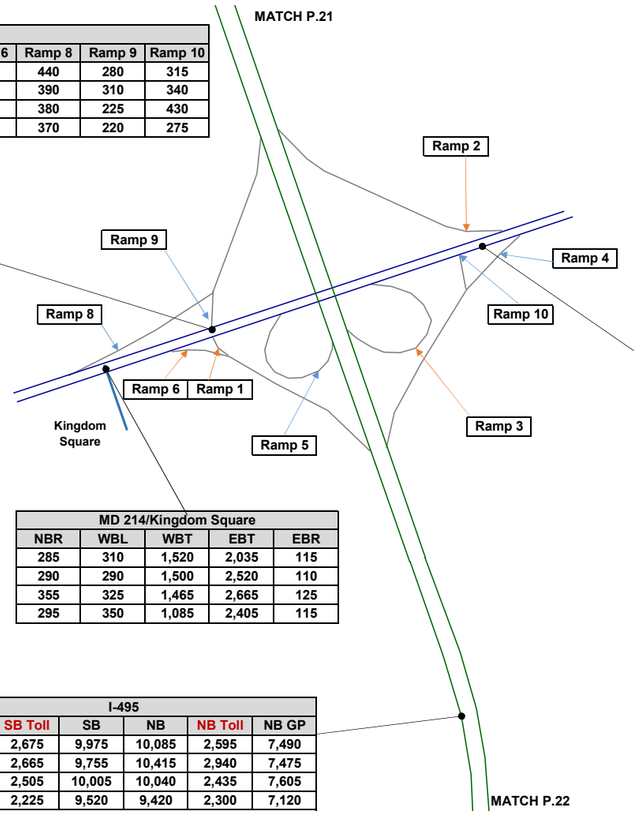
	MD 214	
	EB	WB
3-4P	2150	1960
4-5P	2,630	1,890
5-6P	2,790	1,845
6-7P	2,520	1,455

MD 214/Kingdom Square				
NBR	WBL	WBT	EBT	EBR
285	310	1,520	2,035	115
290	290	1,500	2,520	110
355	325	1,465	2,665	125
295	350	1,085	2,405	115

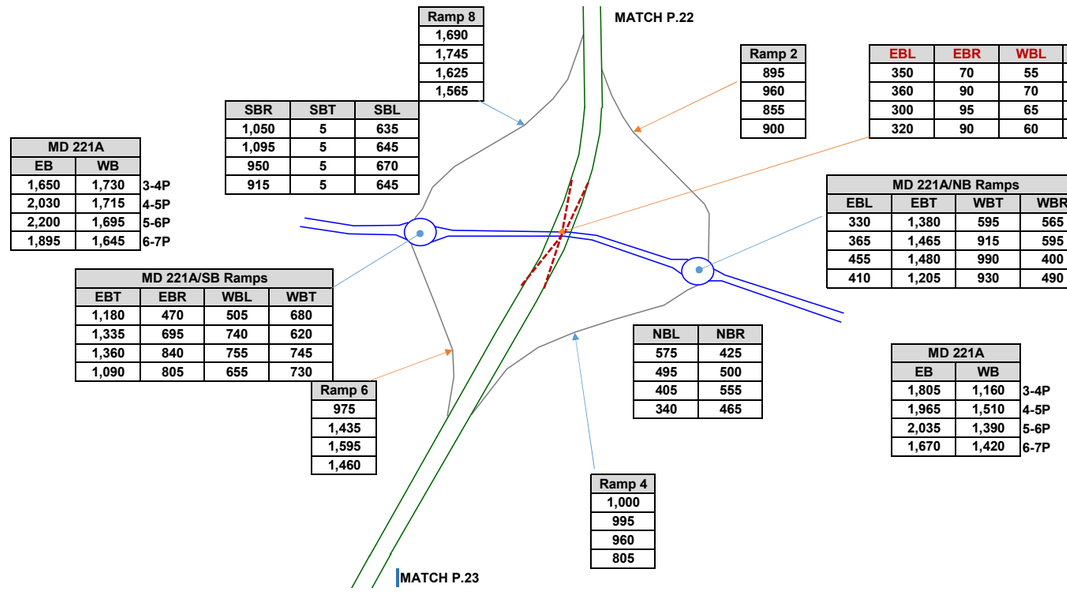
	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	7,300	2,675	9,975	10,085	2,595	7,490
4-5P	7,090	2,665	9,755	10,415	2,940	7,475
5-6P	7,500	2,505	10,005	10,040	2,435	7,605
6-7P	7,295	2,225	9,520	9,420	2,300	7,120

	MD 214	
EB	WB	
2,890	2,195	3-4P
3,440	2,400	4-5P
3,810	2,275	5-6P
3,420	2,045	6-7P

MD 214/NB Ramps				
NBL	NBR	WBT	WBR	EBT
315	1,195	1,750	445	1,695
340	1,345	1,950	450	2,095
430	1,410	1,905	370	2,400
275	1,205	1,710	335	2,215



I-495 East Side PM
Future Alternative 13C Peak Period Volumes



Ramp 8
1,690
1,745
1,625
1,565

SBR	SBT	SBL
1,050	5	635
1,095	5	645
950	5	670
915	5	645

Ramp 2
895
960
855
900

EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
350	70	55	445	80	55	260	435
360	90	70	505	75	55	245	450
300	95	65	325	60	55	245	435
320	90	60	305	55	50	240	425

MD 221A		
EB	WB	
1,650	1,730	3-4P
2,030	1,715	4-5P
2,200	1,695	5-6P
1,895	1,645	6-7P

MD 221A/NB Ramps			
EBL	EBT	WBT	WBR
330	1,380	595	565
365	1,465	915	595
455	1,480	990	400
410	1,205	930	490

MD 221A/SB Ramps			
EBT	EBR	WBL	WBT
1,180	470	505	680
1,335	695	740	620
1,360	840	755	745
1,090	805	655	730

Ramp 6
975
1,435
1,595
1,460

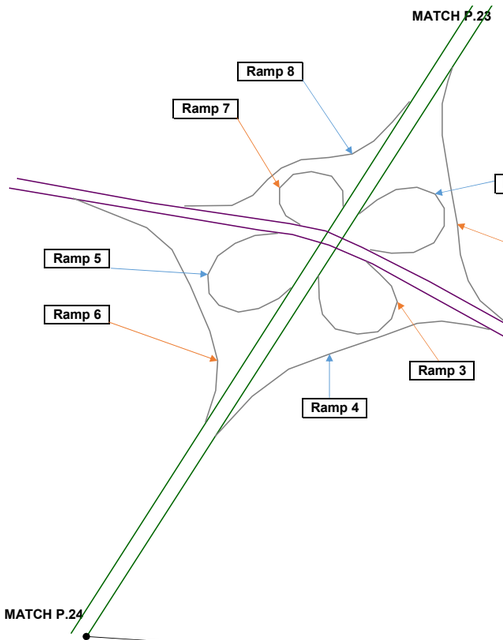
NBL	NBR
575	425
495	500
405	555
340	465

Ramp 4
1,000
995
960
805

MD 221A		
EB	WB	
1,805	1,160	3-4P
1,965	1,510	4-5P
2,035	1,390	5-6P
1,670	1,420	6-7P

I-495 East Side PM
Future Alternative 13C Peak Period Volumes

MD 4		
SB	NB	
2,325	1,760	3-4P
2,665	1,885	4-5P
2,715	1,865	5-6P
2,540	1,660	6-7P

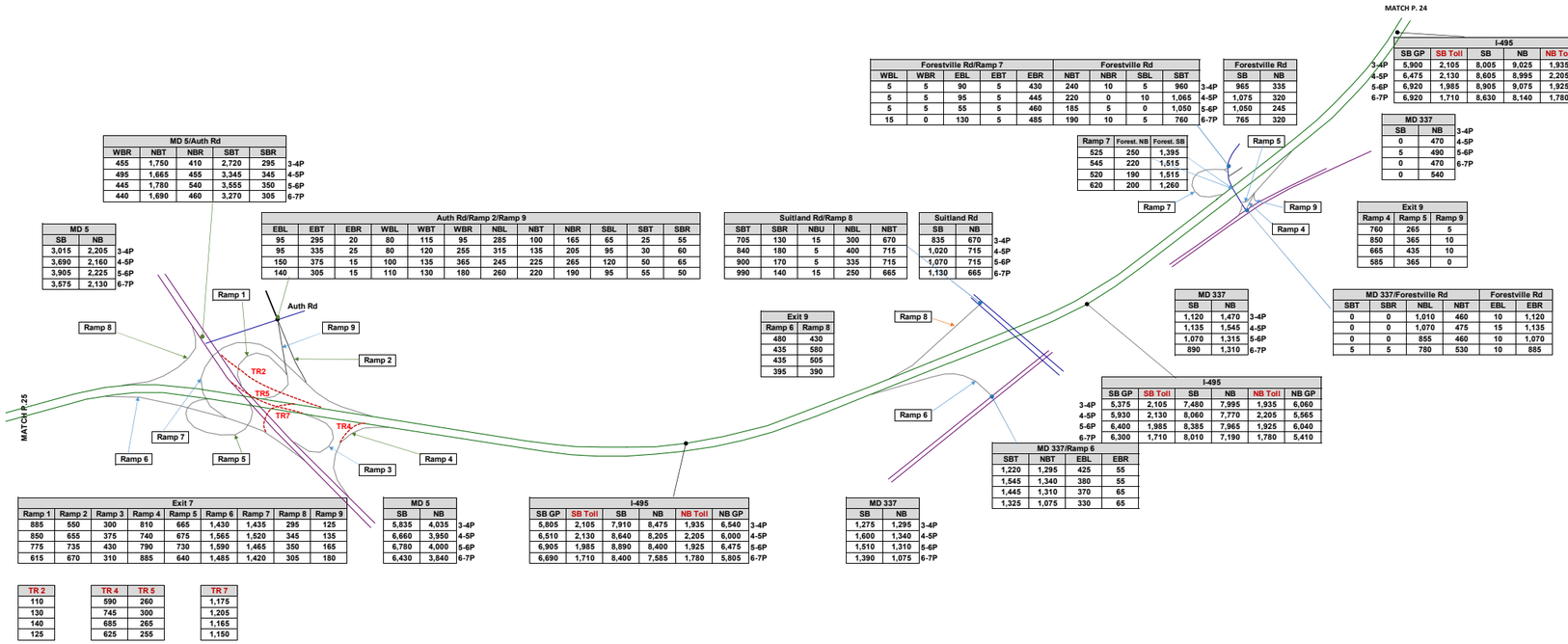


Exit 11							
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8
710	1,355	885	1,025	1,145	540	685	765
780	1,355	965	820	1,095	780	800	790
760	1,170	950	800	1,025	640	665	830
705	1,060	1,025	715	905	820	645	830

MD 4		
SB	NB	
3,070	2,325	3-4P
2,835	2,470	4-5P
2,950	2,110	5-6P
2,315	1,830	6-7P

	I-495					
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,900	2,105	8,005	9,025	1,935	7,090
4-5P	6,475	2,130	8,605	8,995	2,205	6,790
5-6P	6,920	1,985	8,905	9,075	1,925	7,150
6-7P	6,920	1,710	8,630	8,140	1,780	6,360

I-495 South Side PM
Future Alternative 13C Peak Period Volumes



MD 5/Auth Rd					
WBR	NBT	NBR	SBT	SBR	
455	1,750	410	2,720	295	3-4P
495	1,665	455	3,345	345	4-5P
445	1,780	540	3,555	350	5-6P
440	1,690	460	3,270	305	6-7P

MD 5		
SB	NB	
3,015	2,205	3-4P
3,690	2,160	4-5P
3,905	2,225	5-6P
3,575	2,130	6-7P

Auth Rd/Ramp 2/Ramp 9												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
95	295	20	80	115	95	285	100	165	65	25	55	3-4P
95	335	25	80	120	255	315	135	205	95	30	60	4-5P
150	375	15	100	135	365	245	225	265	120	50	65	5-6P
140	305	15	110	130	180	260	220	190	95	55	50	6-7P

Suitland Rd/Ramp 8				
SBT	SBR	NBU	NBL	NBT
705	130	15	300	670
840	180	5	400	715
900	170	5	335	715
990	140	15	250	665

Suitland Rd		
SB	NB	
835	670	3-4P
1,020	715	4-5P
1,070	715	5-6P
1,130	665	6-7P

Forestville Rd/Ramp 7									
WBL	WBR	EBL	EBT	EBR	NBT	NBR	SBL	SBT	
5	5	90	5	430	240	10	5	960	3-4P
5	5	95	5	445	220	0	10	1,065	4-5P
5	5	55	5	460	185	5	0	1,050	5-6P
15	0	130	5	485	190	10	5	760	6-7P

Forestville Rd		
SB	NB	
965	335	3-4P
1,075	320	4-5P
1,050	245	5-6P
765	320	6-7P

Ramp 7	Forest. NB	Forest. SB
525	250	1,395
545	220	1,515
520	190	1,515
620	200	1,260

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,900	2,105	8,005	9,025	1,935	7,090	3-4P
6,475	2,130	8,605	8,995	2,205	6,790	4-5P
6,920	1,985	8,905	9,075	1,925	7,150	5-6P
6,920	1,710	8,630	8,140	1,780	6,360	6-7P

MD 337		
SB	NB	
0	470	3-4P
5	490	4-5P
0	470	5-6P
0	540	6-7P

Exit 9		
Ramp 4	Ramp 5	Ramp 9
760	265	5
850	365	10
665	435	10
585	365	0

MD 337		
SB	NB	
1,120	1,470	3-4P
1,135	1,545	4-5P
1,070	1,315	5-6P
890	1,310	6-7P

MD 337/Forestville Rd				Forestville Rd	
SBT	SBR	NBL	NBT	EBL	EBR
0	0	1,010	460	10	1,120
0	0	1,070	475	15	1,135
0	0	855	460	10	1,070
5	5	780	530	10	885

Exit 9	
Ramp 6	Ramp 8
480	430
435	580
435	505
395	390

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,375	2,105	7,480	7,995	1,935	6,060	3-4P
5,930	2,130	8,060	7,770	2,205	5,565	4-5P
6,400	1,985	8,385	7,965	1,925	6,040	5-6P
6,300	1,710	8,010	7,190	1,780	5,410	6-7P

MD 337/Ramp 6			
SBT	NBT	EBL	EBR
1,220	1,295	425	55
1,545	1,340	380	55
1,445	1,310	370	65
1,325	1,075	330	65

Exit 7								
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9
885	550	300	810	665	1,430	1,435	295	125
850	655	375	740	675	1,565	1,520	345	135
775	735	430	790	730	1,590	1,465	350	165
615	670	310	885	640	1,485	1,420	305	180

MD 5		
SB	NB	
5,835	4,035	3-4P
6,660	3,950	4-5P
6,780	4,000	5-6P
6,430	3,840	6-7P

I-495						
SB GP	SB Toll	SB	NB	NB Toll	NB GP	
5,805	2,105	7,910	8,475	1,935	6,540	3-4P
6,510	2,130	8,640	8,205	2,205	6,000	4-5P
6,905	1,985	8,890	8,400	1,925	6,475	5-6P
6,690	1,710	8,400	7,585	1,780	5,805	6-7P

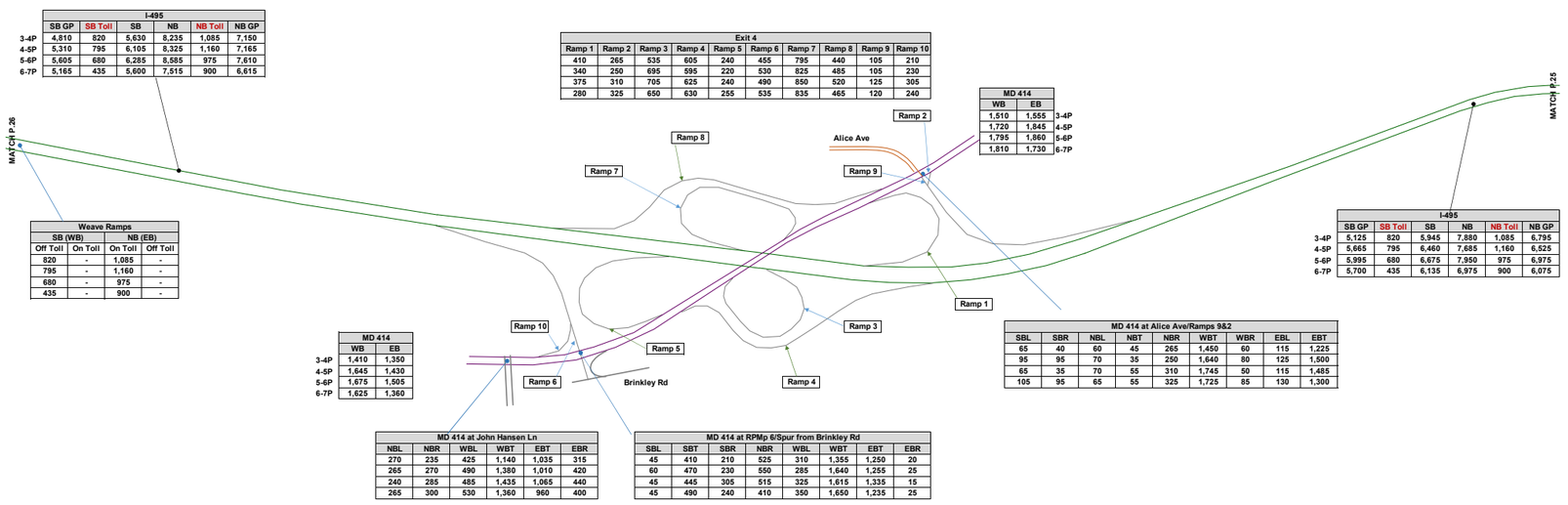
MD 337		
SB	NB	
1,275	1,295	3-4P
1,600	1,340	4-5P
1,510	1,310	5-6P
1,390	1,075	6-7P

TR 2
110
130
140
125

TR 4	TR 5
590	260
745	300
685	265
625	255

TR 7
1,175
1,205
1,165
1,150

I-495 South Side PM
Future Alternative 13C Peak Period Volumes



I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	4,810	820	5,630	8,235	1,085	7,150
4-5P	5,310	795	6,105	8,325	1,160	7,165
5-6P	5,605	680	6,285	8,585	975	7,610
6-7P	5,165	435	5,600	7,515	900	6,615

Weave Ramps			
SB (WB)		NB (EB)	
Off Toll	On Toll	On Toll	Off Toll
820	-	1,085	-
795	-	1,160	-
680	-	975	-
435	-	900	-

Exit 4									
Ramp 1	Ramp 2	Ramp 3	Ramp 4	Ramp 5	Ramp 6	Ramp 7	Ramp 8	Ramp 9	Ramp 10
410	265	535	605	240	455	795	440	105	210
340	250	695	595	220	530	825	485	105	230
375	310	705	625	240	490	850	520	125	305
280	325	650	630	255	535	835	465	120	240

MD 414		
WB	EB	
1,510	1,555	3-4P
1,720	1,845	4-5P
1,795	1,860	5-6P
1,810	1,730	6-7P

I-495						
	SB GP	SB Toll	SB	NB	NB Toll	NB GP
3-4P	5,125	820	5,945	7,880	1,085	6,795
4-5P	5,665	795	6,460	7,685	1,160	6,525
5-6P	5,995	680	6,675	7,950	975	6,975
6-7P	5,700	435	6,135	6,975	900	6,075

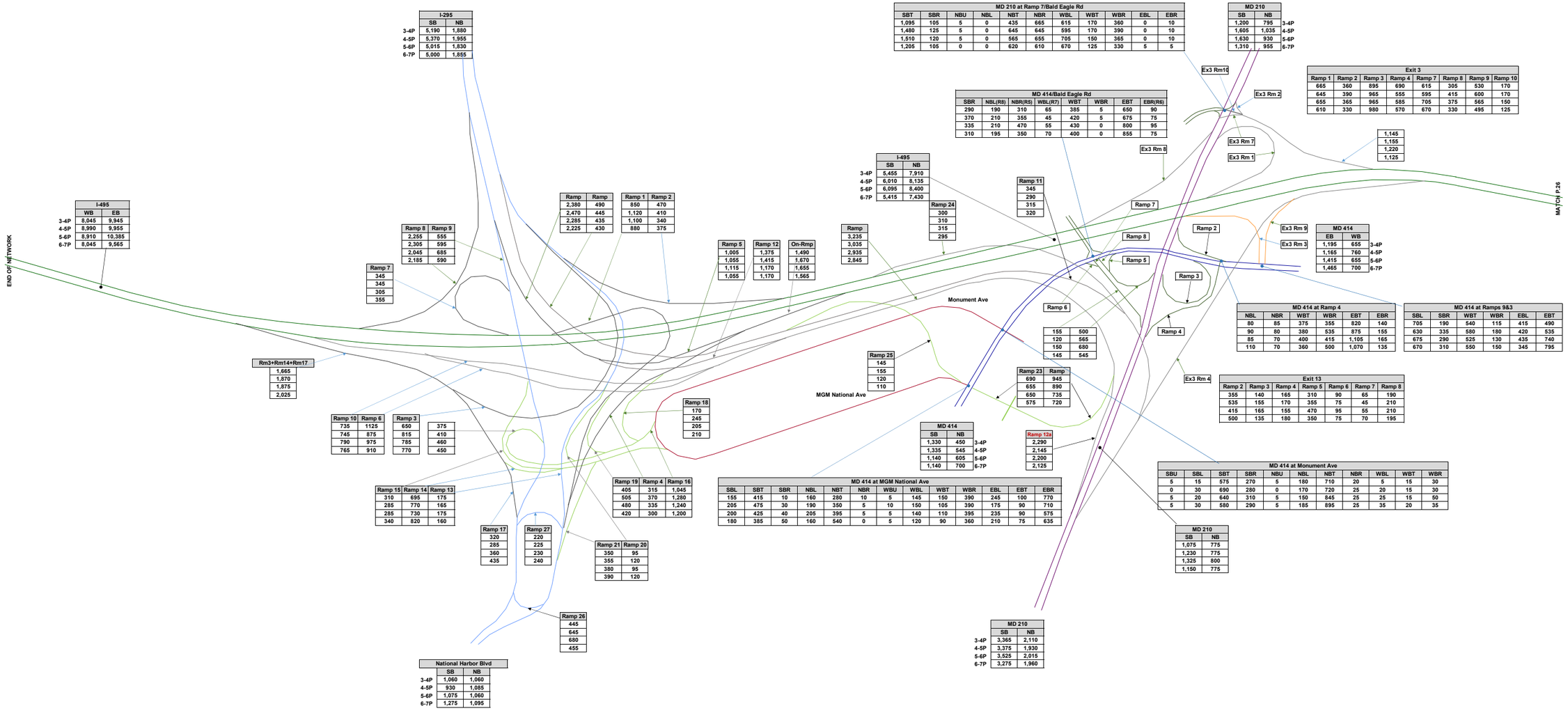
MD 414		
WB	EB	
1,410	1,350	3-4P
1,645	1,430	4-5P
1,675	1,505	5-6P
1,625	1,360	6-7P

MD 414 at Alice Ave/Ramps 9&2								
SBL	SBR	NBL	NBT	NBR	WBT	WBR	EBL	EBT
65	40	60	45	265	1,450	60	115	1,225
95	95	70	35	250	1,640	80	125	1,500
65	35	70	55	310	1,745	50	115	1,485
105	95	65	55	325	1,725	85	130	1,300

MD 414 at John Hansen Ln					
NBL	NBR	WBL	WBT	EBT	EBR
270	235	425	1,140	1,035	315
265	270	490	1,380	1,010	420
240	285	485	1,435	1,065	440
265	300	530	1,360	960	400

MD 414 at RPMp 6/Spur from Brinkley Rd							
SBL	SBT	SBR	NBR	WBL	WBT	EBT	EBR
45	410	210	525	310	1,355	1,250	20
60	470	230	550	285	1,640	1,255	25
45	445	305	515	325	1,615	1,335	15
45	490	240	410	350	1,650	1,235	25

I-495 South Side PM
Future Alternative 13C Peak Period Volumes



Appendix B:

MWCOG User Guide

National Capital Region
Transportation Planning Board

Metropolitan Washington Council of Governments (COG)
National Capital Region Transportation Planning Board (TPB)

User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.75

Volume 1 of 2: Main Report and Appendix A (Flowcharts)

December 5, 2018

777 NORTH CAPITOL STREET NE, SUITE 300, WASHINGTON, DC 20002
MWCOG.ORG/TPB (202) 962-3200

User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.75: Volume 1 of 2

December 5, 2018

About the TPB

The National Capital Region Transportation Planning Board (TPB) is the federally designated metropolitan planning organization (MPO) for metropolitan Washington. It is responsible for developing and carrying out a continuing, cooperative, and comprehensive transportation planning process in the metropolitan area. Members of the TPB include representatives of the transportation agencies of the states of Maryland and Virginia and the District of Columbia, 23 local governments, the Washington Metropolitan Area Transit Authority, the Maryland and Virginia General Assemblies, and nonvoting members from the Metropolitan Washington Airports Authority and federal agencies. The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG).

About COG

The Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association that brings area leaders together to address major regional issues in the District of Columbia, suburban Maryland, and Northern Virginia. COG's membership is comprised of 300 elected officials from 23 local governments, the Maryland and Virginia state legislatures, and U.S. Congress.

Credits

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Oversight: COG/TPB Travel Forecasting Subcommittee

Acknowledgements

This publication was funded, in part, by grants from the District of Columbia Department of Transportation, the Maryland Department of Transportation, the Virginia Department of Transportation, the Federal Highway Administration and the Federal Transit Administration. The material herein does not necessarily reflect the views of the sponsoring agencies.

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Appendices

A. Flowcharts
B. Batch Files (See Volume 2)
C. Cube Voyager Scripts (See Volume 2)
D. AEMS and LineSum Control Files (See Volume 2)

Colophon

This report was created using Microsoft Word 2016 and Visio 2016, and was converted to a PDF file using Adobe Acrobat DC. This report consists of two sections: the main report and the appendices. The files for these two sections can be found in a folder on COG's internal file server (I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide).

1 Introduction

The National Capital Region Transportation Planning Board (NCRTPB or simply TPB) is the federally designated Metropolitan Planning Organization (MPO) for the Washington, D.C. metropolitan area and is also one of several policy boards that operate at the Metropolitan Washington Council of Governments (MWCOG or simply COG). The TPB is staffed by COG's Department of Transportation Planning (DTP). The COG/TPB staff develops and maintains, with consultant assistance, a series of regional travel demand forecasting models that are used for the regional transportation planning process in the Washington, D.C. area. These regional travel demand models are developed under the guidance of the Travel Forecasting Subcommittee (TFS), a subcommittee of TPB's Technical Committee. At any given time, the COG/TPB staff maintains at least two regional travel demand models: an adopted, production-use model and a developmental model. The production-use model is the one that is used in planning studies conducted by COG/TPB and is made available to outside parties.[1] The developmental model is the one that is currently under development by COG/TPB staff, and is generally not made available to outside parties, since it is not yet considered a finished product.

This report explains how to setup and run the TPB Travel Demand Forecasting Model, **Version 2.3.75, which is the latest in a series of adopted, regional, production-use travel demand models, within the "Version 2.3" model family**, developed by the COG/TPB staff for regional transportation planning work in the Washington, D.C. metropolitan area. The previous adopted, regional, production-use travel demand model was the Ver. 2.3.70 model. All the model versions in the Version 2.3 model family are aggregate, trip-based, four-step travel demand models.

Between 2008 and 2011, the TPB Version 2.3 travel model was **calibrated to year-2007 conditions** and this work was documented in a calibration report dated January 20, 2012.[2] In 2013, the Version 2.3 Travel Model was **validated to year-2010 conditions**,[3] with an emphasis on validating the model's highway assignment results. Updates to the model resulting from this validation work were part of Build 52 of the Version 2.3 Travel Model (a.k.a., Ver. 2.3.52). Although the model was validated to year-2010 conditions, it was not recalibrated, so the January 20, 2012 calibration report remains the latest documentation for calibration work. The previous model version, Ver. 2.3.70, is documented in a two-volume user's guide.[4] This current user's guide is derived from the previous user's guide.

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[1] The procedures for requesting the model can be found on the "Data Requests" webpage (https://www.mwcog.org/transportation/data-and-tools/modeling/data-requests/).

[2] Ronald Milone et al., "Calibration Report for the TPB Travel Forecasting Model, Version 2.3, on the 3,722-Zone Area System," Final Report (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, January 20, 2012), https://www.mwcog.org/transportation/data-and-tools/modeling/model-documentation/.

[3] Ronald Milone to Files, "2010 Validation of the Version 2.3 Travel Demand Model," Memorandum, June 30, 2013.

[4] Mark Moran, Ron Milone, and Meseret Seifu, "User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.70. Volume 1 of 2: Main Report and Appendix A (Flowcharts)" (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, November 28, 2017), https://www.mwcog.org/transportation/data-and-tools/modeling/model-documentation/; Mark

1.1 Adoption of the regional travel demand forecasting model by the TPB

The TPB does not *explicitly* adopt a specific version of the regional travel demand model. Instead, the adoption is made *implicitly* when the TPB adopts both 1) a given version of its Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP); and 2) the findings from an air quality conformity (AQC) analysis of the financially constrained element of the LRTP and the associated TIP. The latest version of the LRTP is known as Visualize 2045, which was finalized in 2018 and has an out year of 2045. Visualize 2045 has both a financially constrained element and an aspirational element. The constrained element is what used to be called the Constrained Long-Range Plan (CLRP). The purpose of the AQC analysis is to determine whether the air pollution created by motor vehicles ("mobile emissions") traveling on the transportation network represented in the constrained element of the LRTP (in this case, Visualize 2045) is consistent with (conforms to) the state air quality implementation plans (SIPs). The *implicit adoption* of a specific model version occurs by virtue of the fact that that model version was the one used for the analysis presented to the TPB. Consequently, the Ver. 2.3.75 TPB Travel Demand Forecasting Model (TDFM) became the adopted, production-use model on Oct. 17, 2018, when the TPB adopted the following three resolutions:

- R4-2019: Resolution finding that the Constrained Element of the Long-Range Transportation Plan (Visualize 2045) and the FY 2019-2024 TIP conform with the requirements of the Clean Air Act Amendments of 1990
- R5-2019: Resolution approving the Visualize 2045 Long-Range Transportation Plan for the National Capital Region
- R6-2019: Resolution approving the FY 2019-2024 TIP

1.2 History of the Version 2.3 Travel Model

The Version 2.3 travel model is a series or family of model versions. The first iteration of the Version 2.3 model became the adopted regional travel model for the Washington, D.C. metropolitan area on November 16, 2011. In 2012, a newer version of the model, known as Build 39 of the Version 2.3 Travel Model, or Ver. 2.3.39, was used for the air quality conformity analysis of the 2012 Constrained Long-Range Plan and the FY 2013-2018 Transportation Improvement Plan. In 2013, Build 52 of the model was used for the air quality conformity analysis of the 2013 CLRP and FY 2013-2018 TIP. In 2015, Build 57a of the Version 2.3 model (Ver. 2.3.57a) became the production-use model. In 2016, the Ver. 2.3.66 model became the production-use model. In 2017, the Ver. 2.3.70 model became the adopted model. Most recently, in 2018, the Ver 2.3.75 model became the adopted, production-use regional travel demand model. Below is a list of milestones in the development of the TPB regional travel demand model from 2008 to the present:

Moran, Ron Milone, and Meseret Seifu, "User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.70: Volume 2 of 2: Appendices B (Batch Files), C (Cube Voyager Scripts), and D (AEMS Fortran Control Files)" (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, November 28, 2017).

- March 1, 2008: TPB Version 2.2 Travel Model was released.[5]
    - The Version 2.2 travel model was developed on the 2,191-TAZ area system and most of its component models were estimated and calibrated with data from the COG/TPB 1994 Household Travel Survey (HTS), which included about 4,800 households.
- June 30, 2008: Draft TPB Version 2.3 Travel Model was released.[6]
    - At the time when the Version 2.2 Travel Model was released, a parallel effort was also underway to combine a nested-logit mode choice (NL MC) model and revised truck models into the Version 2.2 framework. This development effort proved to be viable and resulted in a release of what was then called the "draft Version 2.3 travel model" in June of 2008. The draft Version 2.3 model, like Version 2.2, was developed on the 2,191-TAZ area system.
    - The draft Version 2.3 model was not brought into production given that two related events were in motion during 2008. First, a new round of travel data collection was underway, including a major regional household travel survey (the COG/TPB 2007/2008 Household Travel Survey, which included about 11,000 households) and two transit on-board surveys (a bus on-board survey and a Metrorail passenger survey). Second, a new TAZ system was in development. The new zone system was envisioned to be developed over the same geographic area as the 2,191-TAZ system (6,800 square miles), but with smaller average zone sizes. TPB staff ultimately decided that the draft Version 2.3 Travel Model should not become the approved regional travel model until it incorporated the new zone system and the new data from the 2007/2008 Household Travel Survey (HTS) and the on-board transit surveys.
- February 28, 2011: TPB Version 2.3 Travel Model, Build 9, was released.[7]
    - From 2008 to 2012, TPB staff conducted the following activities:
        - Compiling and cleaning new survey data.
        - Preparing calibration files based on the new 3,722 TAZ system
        - Estimating and calibrating various sub-models in the regional travel model.
- November 11, 2011: TPB Version 2.3 Travel Model, Build 36, was released.[8] This is the model that became the adopted regional travel model for the for the Washington, D.C. metropolitan area on November 16, 2011.

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[5] Ronald Milone et al., *TPB Travel Forecasting Model, Version 2.2: Specification, Validation, and User's Guide* (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, March 1, 2008), http://www.mwcog.org/transportation/activities/models/documentation.asp.

[6] Ronald Milone et al., "TPB Travel Forecasting Model, Version 2.3: Specification, Validation, and User's Guide," Draft Report (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, June 30, 2008).

[7] Ronald Milone et al., "TPB Version 2.3 Travel Forecasting Model for the 3,722-Zone Area System: Calibration Report," Draft report (Washington, D.C.: National Capital Region Transportation Planning Board, February 28, 2011).

[8] Ronald Milone et al., "Calibration Report for the TPB Travel Forecasting Model, Version 2.3.36, on the 3,722-Zone Area System," Draft report (Washington, D.C.: National Capital Region Transportation Planning Board, November 18, 2011), http://www.mwcog.org/uploads/committee-documents/aF1fV1xW20111118131827.pdf.

- December 21, 2011: TPB Version 2.3 Travel Model, Build 38, was released. This model was documented in January 2012.[9]
- July 17, 2013: TPB Version 2.3 Travel Model, Build 52 became the production-use travel model.
- October 15, 2014: The TPB Version 2.3.57 model became the production-use travel model.
- October 21, 2015: The TPB Version 2.3.57a model became the production-use travel model.
- November 16, 2016: The TPB Version 2.3.66 model became the production-use travel model.
- October 18, 2017: The TPB Version 2.3.70 model became the production-use travel model.
- October 17, 2018: The TPB Version 2.3.75 model became the production-use travel model.

1.3 Recent changes to the model: From Ver. 2.3.70 to Ver. 2.3.75

There have been only four updates to the regional travel demand model since the previously adopted model (Ver. 2.3.70). The updates are listed Table 1 and are described in more detail later in this report. The four model updates cover three types of updates:

- Bug fixes (1 update)
- New/enhanced features (3 updates)

Bug fixes are the most important type of update and have the highest priority. Software bugs can be found by either internal or external users of the travel demand model code. New/enhanced features bring improvement to the model or make it easier to use. Documentation relates to comments or annotations within scripts or batch files that explain what is occurring in the software code. As explained later, the bug fix did not cause a change in the modeled results, and only two among three updates caused a change in the modeled results.

Three of four updates can also be found in a recent internal memo.[10] It should be noted that the memo was written before the TPB's decision to modify the model so that it no longer implemented the Metrorail constraint to and through the regional core.

[9] Ronald Milone et al., "User's Guide for the TPB Travel Forecasting Model, Version 2.3, Build 38, on the 3,722-Zone Area System," Final Report (Washington, D.C.: National Capital Region Transportation Planning Board, January 20, 2012), http://www.mwcog.org/transportation/activities/models/documentation.asp.
[10] Ray Ngo to Mark Moran, Ronald Milone, and Dusan Vuksan, "Updates to the TPB Travel Demand Forecasting Model, Generation 2, Version 2.3.70 for Visualize 2045," Memorandum, March 30, 2018.

Table 1 Updates made to the TPB travel demand model Version 2.3.75 (compared to Ver. 2.3.70)

#	Description	Type of update	Further details and benefit(s)	Effect on model results?
1	Streamlined the way that HOT-lane facilities are modeled by removing the High-Occupancy Vehicle (HOV) Highway Skim Replacement (HSR) procedure from the model	New/improved feature	Due to the low benefits and drawbacks associated with the HSR procedure, the process was eliminated. The elimination helps reduce model run times. For example, in model application (after toll setting has already been accomplished), the model no longer needs two runs per alternative/year (i.e., "base" and "final"). Now, only one run per alternative/year is needed (i.e., "final").	Yes
2	Added a check to report the active transit stations with "zero" drive-access skim values	New/improved feature	This feature reports the inaccessible stations whose drive-access skims are all zeros, typically due to a network coding issue.	No
3	Updated *unbuild_net.s* with the latest version of the travel model and its associated networks	Bug fix	This tool to unbuild a highway network was updated to work with the latest model network inputs.	No
4	Removed the Metrorail constraint to and through the regional core, as per a policy change by the Washington Metropolitan Area Transit Authority (WMATA), resulting from new dedicated funding for transit	New/improved feature	TPB approved the removal of Metrorail constraint from the model on May 16, 2018. Therefore, the model runs for the scenarios after 2020 will no longer require the transit constraint information from the 2020 model run. More details about the history and rationale behind the Metrorail constraint can be found in this report.	Yes

1.3.1 Update 1: Removed the HOV Highway Skim Replacement (HSR) procedure

1.3.1.1 Update type

New/improved feature

1.3.1.2 Effects on the model results?

This update had a small impact on the model output at the regional level. A sensitivity test was conducted for year-2040 conditions using the Ver. 2.3.70 Travel Model with network inputs from the Off-Cycle Update of the 2016 CLRP and land use inputs from the Cooperative Forecasts, Round 9.0. After the update, at the regional level, the total number of vehicles assigned increased by 1,505 (less than one-tenth a percent relative to the baseline), total Vehicle Miles of Traveled (VMT) decreased by only 105,796 or 0.1%, and total transit increased by 3,679 or 0.3%. Those changes at regional level were considered negligible. At the jurisdictional level and link level, the changes were more noticeable, discussed below, as documented in an internal memo, entitled "Evaluating the Modeling Effects of Eliminating the 'HOV Skim Replacement' Process": [11]

> *At the jurisdictional level, moderate shifts away from HOV3+ travel are observed in the Northern Virginia jurisdictions with HOT-lane operations in 2040, but this impact is very confined. At the link level, changes to HOV3+ traffic volume are marginal across the regional roadway network. Noticeable increases in AM speeds are observed on some of the I-66 and I-95 HOT-lane segments in peak direction, mainly due to higher tolls and lower volumes resulting from the toll setting process, but these changes are in the favorable direction in terms of accommodating VDOT's policy to maintain HOV3+ traffic conditions on HOT lanes. (p. 10)*

More details on the effects of the update to the model results can be found in the cited memo.

1.3.1.3 Description

With the implementation of High-Occupancy Toll (HOT) facilities in Northern Virginia, the Virginia Department of Transportation (VDOT) required that the toll paying traffic in the HOT lanes should not cause the operating characteristics of the facilities to become degraded, as per federal guidance.[12] To accommodate the VDOT/federal guidance, starting from the Ver. 2.1D#50 model (through the Ver 2.3.70 model), COG/TPB staff developed a modeling procedure often called **HOV3+ Skim Replacement (HSR).** The procedure required two model runs, a "base run" and a "final run", for one modeled scenario, application mode (which is used by most external users), given the estimated toll as a model input. The "**base run**" captured the unimpeded flow of HOV traffic on HOT lanes. The "**final run**" of the travel model allowed all HOT facilities to function as true HOT lanes by using the HOV skims from the

[11] Feng Xie and Dusan Vuksan to Files, "Evaluating the Modeling Effects of Eliminating the 'HOV Skim Replacement' Process," Memorandum, March 7, 2018.
[12] "Federal-Aid Highway Program Guidance on High Occupancy Vehicle (HOV) Lanes," U.S. Department of Transportation, Federal Highway Administration, November 2012, http://ops.fhwa.dot.gov/freewaymgmt/hovguidance/chapter3.htm.

"base run" and all other (non-HOV) skims from the "final run". Section 2.4.1 provides a further detailed description of the process from the Version 2.2 Travel Model documentation.[13]

In the Ver. 2.3.75 model, COG staff decided to eliminate the HSR procedure based on the following motivations: [14]

> *While TPB's travel demand model has transformed itself with two major upgrades (i.e., Version 2.2 and Version 2.3) in the past decade, the HSR procedure developed based on the now outdated Version 2.1D#50 model remains unchanged. In recent years, both internal and external model users have suggested that this ad hoc process may have become less pertinent, as TPB's newer generations of travel demand models may have already addressed VDOT's policy requirements related to HOT lanes in an inherent way with new modeling capabilities that were not available when HSR was initially developed.*
>
> *Another major challenge to the HSR process comes from the Maryland side of this region. The Maryland Department of Transportation has announced the Traffic Relief Plan (TRP) in September 2017, which, in the current draft form, entails the addition of two express / toll lanes per direction to I-495, MD-295 and I-270. Different from the HOT lanes in Virginia, the proposed toll lanes in Maryland will not need to comply with the federal requirements regarding HOV facilities, as they will likely operate as Express Toll Lanes (ETLs), which do not exempt HOV vehicles from paying tolls. As TPB is looking to incorporate parts of Maryland's TRP into its upcoming long-range plan "Visualize 2045", the modeling staff has made an assessment that it would be extremely challenging to model two different types of dynamically priced toll lanes with the current HSR process that is only applicable to the Virginia HOT lanes.*
>
> *Furthermore, as TPB's travel demand model will soon undergo a major upgrade to Version 2.5, TPB staff is facing the challenge of tackling significantly increased model run times due to increased model complexity. It thus becomes especially appealing to revisit the multi-run HSR process, which is both complex and long, and to look for ways to improve it or eliminate it. (pp. 2-3)*
>
> *…*
>
> *The application of HSR requires a multi-run process, which is both complex and time-consuming (a complete three-run process can take over a week).*

[13] Ronald Milone et al., "TPB Travel Forecasting Model, Version 2.2: Specification, Validation, and User's Guide" (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, March 1, 2008), 1–10 to 1–12.
[14] Feng Xie and Dusan Vuksan to Files, "Evaluating the Modeling Effects of Eliminating the 'HOV Skim Replacement' Process."

> *Importing skims from different base runs could introduce a bias ("noise") to "alternatives analysis", which involves comparing final run results between different alternatives for scenario planning and project planning activities.*
>
> *Since the HSR procedure was designed with a "HOT-Lane-Only" world in mind, the application of this procedure would become extremely challenging when other types of dynamically priced toll lanes (such as ETLs) are modeled along with HOT lanes. (pp. 4-5)*

The HSR procedure elimination resulted in the following changes to the model's components:

Table 2 Affected model's components due to Update 1

File name	Changes
run_Model_[year]_base.bat run_ModelSteps_[year]_base.bat	Removed
run_ModelSteps_[year].bat	Revised
HSR_Highway_Skims_2017HOV2.bat HSR_Highway_Skims.bat	Removed
Joinskims.s	Revised

where [year] is the modeling year/scenario, for example 2019 or 2045.

Changes made to run_ModelSteps_[year].bat

Figure 1 to Figure 2 below show the changes made to the *run_ModelSteps_2019.bat*, an example of *run_ModelSteps_[year].bat*. The red and green lines indicate the lines before and after changes. The far-left column shows the line numbers of the scripts before the change and the next column shows the line numbers of the scripts after the change. If a green line is blank, the line is deleted from the batch file. For example, the original lines 20 and 21:

```
:: Location of substitute HOV3+ skims
set _HOV3PATH_=..\2019_base
```

are removed and become blank in line 19 in the updated batch file.

```
:: Version 2.3 TPB Travel Model on 3722 TAZ System

set _year_=2019
set _alt_=Ver2.3.70_2019_Final
set _alt_=Ver2.3.75_2019_Final
:: Maximum number of user equilibrium iterations used in traffic assignment
:: User should not need to change this.  Instead, change _relGap_ (below)
set _maxUeIter_=1000

:: Set transit constraint path and files
:: Current year used to set the constraint = 2020
:: For years before constraint year:  set _tcpath_=<blank>
:: For years after  constraint year:  set _tcpath_=..\2020_final

set _tcpath_=

:: Location of substitute HOV3+ skims
set _HOV3PATH_=..\2019_base

:: UE relative gap threshold: Progressive (10^-2 for pp-i2, 10^-3 for i3, & 10^-4 for i4)
:: Set the value below


call PP_Auto_Drivers.bat        %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
REM rem  call Highway_Skims.bat          %1
call HSR_Highway_Skims_2017HOV2.bat    %1
call Highway_Skims.bat          %1
```

Figure 1 Changes made to *run_ModelSteps_[year].bat* after the elimination of the HSR procedure

```
:: rem ====== Iteration 1 ==================================================

call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
rem  call Highway_Skims.bat          %1
call HSR_Highway_Skims_2017HOV2.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 2 ==================================================

call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
rem  call Highway_Skims.bat          %1
call HSR_Highway_Skims_2017HOV2.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 3 ==================================================

call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
rem  call Highway_Skims.bat          %1
call HSR_Highway_Skims_2017HOV2.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 4 ==================================================

call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
rem  call Highway_Skims.bat          %1
call HSR_Highway_Skims_2017HOV2.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Transit assignment ============================================
@echo Starting Transit Assignment Step
```

Figure 2 Changes made to *run_ModelSteps_[year].bat* after the elimination of the HSR procedure

As shown above, the HSR procedure elimination replaced the *HSR_Highway_Skim.bat* (or *HSR_Highway_Skim_2017HOV2.bat*) with the Highway_Skim.bat process.

Changes made to *joinskims.s*

The comment regarding the environment variable *_HOV3Path_* in the script *joinskims.s* is removed, as shown in Figure 3, to reflect the HSR procedure elimination. Obviously, a change in code comments has no effect on the model output.

```
;      distance (1/10s of mi),
;      tolls (2007 cts) of any FIXED price facility, such as Dulles toll road.
;
; _HOV3Path_  environment variable is used to override HOV3 Skims from another Subdirectory
;

pageheight=32767  ; Preclude header breaks
```

Figure 3 Changes made to *Joinskims.s* after the elimination of the HSR procedure

1.3.2 Update 2: Reported active transit stations with zero skim values

1.3.2.1 Update type

New/improved feature

1.3.2.2 Effect on model results?

No

1.3.2.3 Description

This update was to address an issue reported by a consultant that travel matrices ("skims") associated with the West Falls Church Station's centroid (5054) were all zeroes. He suspected that it was because the link connecting this node to the network (34939-34938) was marked with a limit code of "9" (which does not get processed in the *Autoacc5.s* step). The limit codes of "9" resulted in default values (dist = 50, speed = 25) when processing this station's drive-access connectors – without qualifying the actual distances and speeds from TAZs.[15]

COG staff proposed a simple check in the travel model to stop the model run and report the issue if the model encounters an active station in the station file which has "zero" skim values.

The proposed update resulted in two changes of the model's components:

Table 3 Affected model's components due to Update 2

File name	Changes
CheckStationAccess.s	Added
PP_Highway_Skims.bat	Revised

[15] Mark S. Moran to Ronald Milone, "Possible Updates to the TPB Travel Demand Forecasting Model, Generation 2, Version 2.3.70," Memorandum, February 8, 2018.

Added *CheckStationAccess.s*

The new script, *CheckStationAccess.s*, shown in Figure 4, is added to the model.

```
*del voya*.prn
;=================================================================
;   CheckStationAccess.s
;   Purpose: To check whether transit stations are accessible

; RM, RN
; Date:      2018-03-30
;
;=================================================================


RUN PGM=MATRIX

ZONES=8000
FILEI LOOKUPI[1] = 'inputs\node.dbf'
FILEI MATI[1] = '%_iter_%_am_sov_mod.skm'

LOOKUP LOOKUPI = 1, NAME = NODES, LOOKUP[1] = N, RESULT = N, INTERPOLATE = N, FAIL = 0,0,0, LIST = Y

MW[1] = MI.1.1
TIMESUM = ROWSUM(1)
IF (I = 5000 - 8000)
    NODEVAL = NODES(1, I)
    IF (NODEVAL>0 && TIMESUM = 0)
    PRINT LIST = 'STATION NUMBER ', NODEVAL(5), ' HAS NO SKIM BUILT TO IT'
        ABORT MSG = STATION CENTROIDS WITHOUT SKIMS. PLEASE CHECK THE NETWORK.
    ENDIF
ENDIF

ENDRUN
```

Figure 4 *CheckStationAccess.s*, new script to report the active transit stations with zero skim values

The script searches the node.dbf file for cases where there are no drive-access skim values for nodes 5000 to 8000, which corresponds to the Metrorail PNR centroids (5000-5999), commuter rail PNR centroids (6000-6999), and light rail/BRT PNR centroids (7000-7999). If the program files a station that is disconnected from the highway network, it creates a listing file with the station number and a note that the station "has no skim built to it." The model results were not affected by the new script.

Changes made to *PP_Highway_Skims.bat*

Figure 5 shows the changes made to *PP_Highway_Skims.bat*. The green lines are newly added to the batch file. There are no changes to the model's outputs.

```
      1  :: 2018-03-30 RN Add lines to execute a check on whether transit stations are accessible
      2
 1    3  CD %1
 2    4  set _iterOrder_=initial
 3    5
 ...
39   41  if errorlevel 1 goto error
40   42  if exist voya*.prn  copy voya*.prn %_iter_%_%_iterOrder_%_Highway_Skims_Mod_am.rpt /y
41   43
      44  :: Check whether transit stations are accessible
      45  if exist voya*.*  del voya*.*
      46  if exist %_iter_%_%_iterOrder_%_CheckStationAccess.rpt  del %_iter_%_%_iterOrder_%_CheckStationAccess.rpt
      47  start /w Voyager.exe  ..\scripts\CheckStationAccess.s /start -Pvoya -S..\%1
      48  if errorlevel 2 (echo STATION CENTROIDS WITHOUT SKIMS. PLEASE CHECK THE NETWORK && goto stationerr)
      49  if errorlevel 3 (echo STATION CENTROIDS WITHOUT SKIMS. PLEASE CHECK THE NETWORK && goto stationerr)
      50  if exist voya*.prn  copy voya*.prn CheckStationAccess.rpt /y
      51
      52
42    53  if exist voya*.*  del voya*.*
43    54  if exist %_iter_%_%_iterOrder_%_Highway_Skims_mod_md.rpt  del %_iter_%_%_iterOrder_%_Highway_Skims_mod_md.rpt
44    55  start /w Voyager.exe  ..\scripts\Highway_Skims_mod_md.s /start -Pvoya -S..\%1
 ...
86    97
87    98
88    99  goto end
     100
     101  :stationerr
     102  PAUSE&EXIT
     103
89   104  :error
90   105  REM  Processing Error....
91   106  PAUSE
```

Figure 5 Changes made to *PP_Highway_Skims.bat* to report the active transit stations with zero skim values

1.3.3 Update 3: Updated *unbuild_net.s* to work with the latest version of the travel model

1.3.3.1 Update type

Bug fix

1.3.3.2 Effect on model results?

No

1.3.3.3 Description

Unbuild_net.s is a utility script, which is used to unbuild a highway network file from a Citilabs *NET* format to a link and a node file in *dbf* format. The script needed to be updated so that it would be in sync with recent changes that had been made to network attributes. This update did not change the modeled outputs. As one example of the changes, "spdc(7)" was changed to "spdclass(7)".

Changes made to *unbuild_net.s*

```
21  21
22  22 linko= @basepath@\@out_link@,
23  23   format=DBF,
24       include=a(5),b(5),distance(7.2),spdc(7),capc(7),jur(7),Screen(5),ftype(7),toll(9),tollgroup(5),
25                amlane(3),amlimit(3),pmlane(3),pmlimit(3),oplane(3),oplimit(3),edgeid(10),linkid(10),Networkyear(8),Shape_Length(7.2),
    24   include=a(5),b(5),distance(7.2),spdclass(7),capclass(7),jur(7),Screen(5),ftype(7),toll(9),tollgrp(5),
    25            amlane(3),amlimit(3),pmlane(3),pmlimit(3),oplane(3),oplimit(3),edgeid(10),linkid(10),netyear(8),Shape_Leng(7.2),
26  26            projectid(10)
27  27
28  28 /* Write out node file */
```

Figure 6 Changes made to *Unbuild_net.s* to work with the latest version

1.3.4 Update 4: Removed Metrorail constraint procedure

1.3.4.1 Update type

New/improved feature (in response to recent changes in WMATA policy)

1.3.4.2 Effect on model results?

Removing the modeling procedure that implements the Metrorail constraint to/through the regional core did not affect model results for the years up through 2020. However, the update did change model results for the forecast scenarios after 2020. A sensitivity test of the update to the Ver. 2.3.70 Travel Model was made for a network representing year-2040 conditions (i.e., 2040_base and 2040_final). At the regional level, the changes in modeled results were considerable. For example, after the update, the 2040_final scenario saw an increase of the total number of regional transit person trips by 3%, a drop in auto person trips by 0.2%, and a decrease in total vehicle-miles of travel (VMT) by 0.1%. The removal of the Metrorail constraint resulted in increases of more than 5% for both regional Metrorail and Metrobus trips, which were mainly shifted from auto trips and commuter rail trips. The walk trips to Metrorail and Metrobus both gained about 5% after the update. At the sub-regional level, the update caused a similar impact. Specifically, the Metrorail trips coming from the regional non-core area destined to the regional core jumped 7%, which makes sense, since the Metrorail system has more capacity after the constraint removal. Since Metrorail is more attractive, the trips of commuter rail, a competitive mode, coming from the regional non-core area destined to core area fell 3%.

1.3.4.3 Description

The Metrorail constraint through the regional core (sometimes referred to as the "transit constraint through the regional core") is a technical adjustment to the trip tables coming out of the mode choice process designed to reflect a WMATA policy assumption that, during peak periods, the Metrorail system may have insufficient capacity to serve all the demand traveling to and through the regional core. Typically, it is assumed that the Metrorail system will be able to handle all of the peak-period demand to and through the regional core in the near term, but, since demand has historically grown over the long

run,[16] the system might not be able to handle all the peak-period demand at some future time, depending on the amount of growth in demand and the number of rail cars available in a given year. The assumed year at which the Metrorail system will be at its peak capacity during the peak periods to and through the regional core is known as the "binding year." For years beyond the binding year, it is assumed that any growth in peak-period Metrorail demand to and through the regional core will be forced to switch to other travel modes (specifically, auto person trips). The Metrorail constraint was initiated by WMATA in 2000 to address funding shortfalls restricting the expansion of the rail fleet.[17] WMATA policy sets the binding year, which was set at 2020 in previous versions of COG/TPB Travel Model. This means that, for any forecast year past 2020, the Metrorail constraint was applied, i.e., any forecasted peak-period Metrorail trips that exceeded the 2020 demand to and through the regional core were shifted to other travel modes (specifically, auto person trips). Details about the Metrorail constraint through the regional core, including a definition of the extent of the regional core can be found in section 21.2 on page 159, which is part of the "mode choice" section of this report.

The recent legislation establishing stable long-term funding of $500 million a year for Metro will now support WMATA's plans to implement all 8-car trains during peak periods in the Visualize 2045 Plan.[18] Consequently, TPB approved the removal of the Metrorail constraint from the travel model process at the TPB meeting on May 16, 2018.

The transit constraint removal update changed the following components of the model:

Table 4 Affected model's components due to Update 4

File name	Changes
run_ModelSteps_[year]_Final.bat	Revised
Mode_Choice_TC_V23_Parallel.bat	Removed

[16] In the shorter term, Metrorail ridership has decreased slightly between 2009 and 2017.
[17] Ronald Milone, "TPB Version 2.3 Travel Model on the 3,722-TAZ area system: Status report" (presented at the September 23, 2011 meeting of the Travel Forecasting Subcommittee of the Technical Committee of the National Capital Region Transportation Planning Board, held at the Metropolitan Washington Council of Governments, Washington, D.C., September 23, 2011).
[18] Jane Posey, "Amendments to the Visualize 2045 Air Quality Conformity Scope of Work," Memorandum, May 16, 2018.

Updates to *run_ModelSteps_[year]_Final.bat*

```
14      :: Set transit constraint path and files
15      :: Current year used to set the constraint = 2020
16      :: For years before constraint year:  set _tcpath_=<blank>
17      :: For years after  constraint year:  set _tcpath_=..\2020_final
18      set _tcpath_=..\2020_final
    14  :: Not set transit constraint path and files
    15
    16  set _tcpath_=
19  17
20  18
21  19


49  47  call Transit_Fare.bat           %1
50  48  call Trip_Generation.bat        %1
51  49  call Trip_Distribution.bat      %1
52      call Mode_Choice_TC_V23_Parallel.bat       %1
    50  call Mode_Choice_Parallel.bat      %1
53  51  call Auto_Driver.bat            %1
54  52  call Time-of-Day.bat            %1
55  53  call Highway_Assignment_Parallel.bat     %1


64  62  call Transit_Fare.bat           %1
65  63  call Trip_Generation.bat        %1
66  64  call Trip_Distribution.bat      %1
67      call Mode_Choice_TC_V23_Parallel.bat       %1
    65  call Mode_Choice_Parallel.bat      %1
68  66  call Auto_Driver.bat            %1
69  67  call Time-of-Day.bat            %1
70  68  call Highway_Assignment_Parallel.bat     %1


81  79  call Transit_Fare.bat           %1
82  80  call Trip_Generation.bat        %1
83  81  call Trip_Distribution.bat      %1
84      call Mode_Choice_TC_V23_Parallel.bat       %1
    82  call Mode_Choice_Parallel.bat      %1
85  83  call Auto_Driver.bat            %1
86  84  call Time-of-Day.bat            %1
87  85  call Highway_Assignment_Parallel.bat     %1


98  96  call Transit_Fare.bat           %1
99  97  call Trip_Generation.bat        %1
100 98  call Trip_Distribution.bat      %1
101     call Mode_Choice_TC_V23_Parallel.bat       %1
    99  call Mode_Choice_Parallel.bat      %1
102 100 call Auto_Driver.bat            %1
103 101 call Time-of-Day.bat            %1
```

Figure 7 Changes made to *run_ModelSteps_[year]_Final.bat* to remove Metrorail Constraint procedure

2 Overview of the model

The TPB Version 2.3 family of travel models is a classic, aggregate, "four-step," trip-based, regional travel demand model. The four steps in a classic travel demand model are

- Trip generation
- Trip distribution
- Mode choice
- Traffic assignment[19]

The first three steps deal with estimating current-year or future-year demand for travel. The last step, traffic assignment, is where the demand for travel is assigned to a transportation network. This final step represents an equilibration between the transportation demand and the transportation supply. In many models, traffic assignment includes only a highway assignment, where private-use motor vehicles are assigned to a roadway network. In larger urban areas with extensive transit systems, there is often also a transit assignment, in addition to the highway assignment. The TPB travel model includes both a highway assignment and a transit assignment. So-called "four-step" models are trip based, meaning that trips are the basic unit of analysis, and are also "aggregate," meaning that the model represents aggregate person flows and aggregate vehicle flows between transportation analysis zones (TAZs). In other words, these models do not model trips that happen within an individual TAZ (intra-zonal trips) and they do not simulate the movement of individual people or individual vehicles.

A highway assignment can be conducted at one of three different scales: microscopic, mesoscopic, or macroscopic. The TPB Version 2.3 Travel Model highway assignment is a **macro**scopic, static traffic assignment. This is the standard practice for almost every four-step model used in the United States. To better understand the meaning of a **macro**scopic traffic assignment, it is useful to understand the two other scales of assignment: microscopic and mesoscopic. In a **micro**scopic traffic assignment, individual vehicles are modeled, using a small time-step, such as every second. In a **meso**scopic traffic assignment, platoons of vehicles are modeled, with a demand that varies though the assignment period (e.g., the AM peak hour demand is higher than the demand found in the shoulder hours of the AM peak period). By contrast, in a **macro**scopic traffic assignment, all traffic moving from one zone to another zone is modeled, but demand does not vary within the assignment period (e.g., a constant demand is assumed for all three hours in the AM peak period). Although it would seem appealing to use a microscopic or mesoscopic assignment in a regional travel demand model, these fine-grained assignments are almost never used in regional travel demand models since they would take too long to run and would require, at the regional level, too much input data (e.g., information about the traffic control devices and signal timings at every intersection). Thus, a macroscopic traffic assignment is usually the norm for regional travel demand models. As noted in a recent TRB report, "While there is much ongoing research into the

[19] The Version 2.3 family of travel models actually has six major steps. The two additional steps are "demographic sub-models" and the "time-of-day model." All six of these steps are described in section 2.3 of this report, beginning on page 6.

use of dynamic assignment and traffic simulation procedures, the state of the practice for regional travel models remains static equilibrium assignment."[20]

2.1 Model inputs

The major inputs and outputs of the regional travel demand model are shown in Figure 8.The travel model requires three major inputs:

- Zone-level land activity forecasts for year/scenario X;
- Transportation networks (both highway and transit) for year/scenario X; and
- Transportation policy assumptions for year/scenario X.

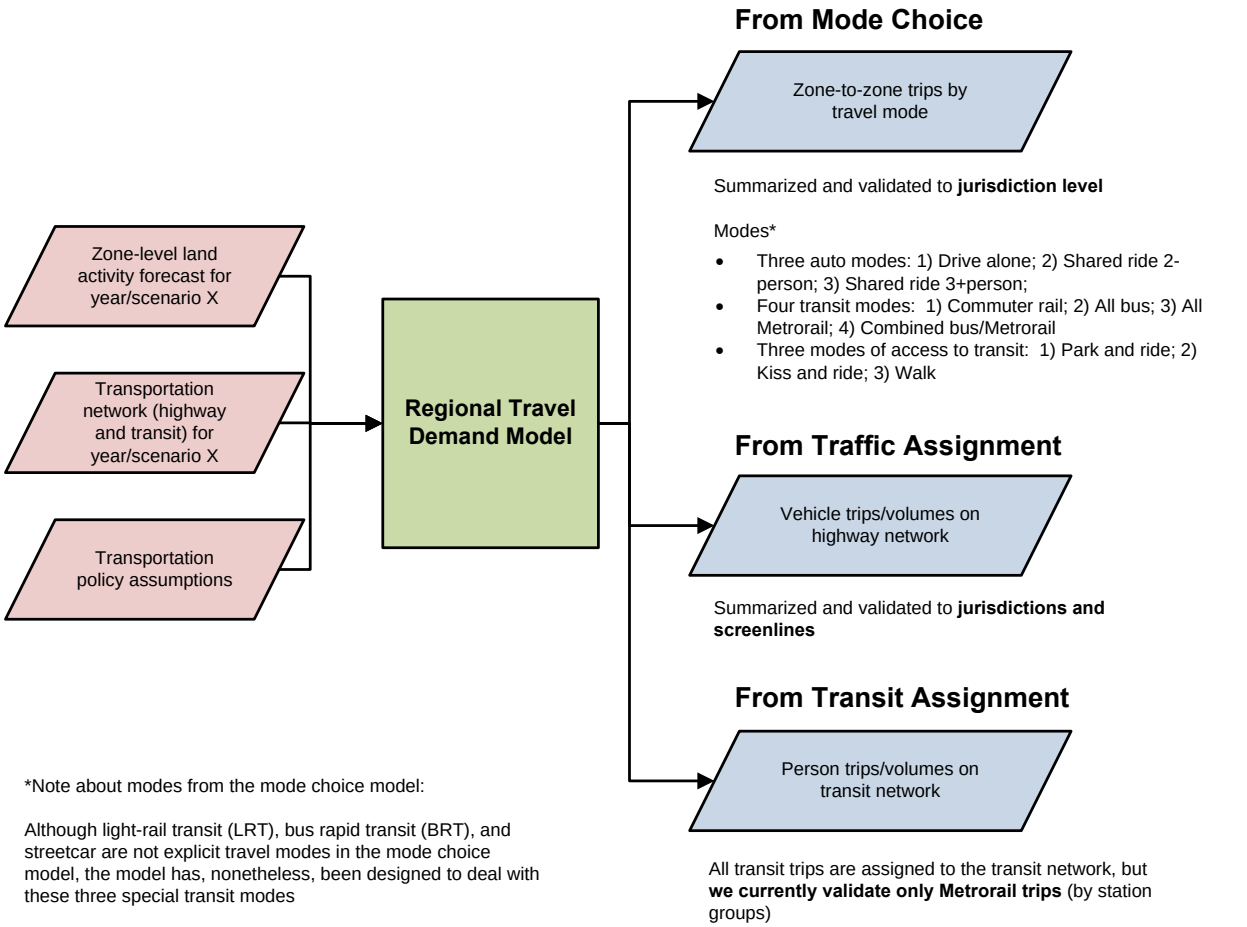


Figure 8 Major inputs and outputs of the TPB Version 2.3 Travel Model

Ref: travel_model_flowchart_overview_v3.vsd

[20] Cambridge Systematics, Inc. et al., *NCHRP Report 716: Travel Demand Forecasting: Parameters and Techniques*, National Cooperative Highway Research Program (Washington, D.C.: Transportation Research Board of the National Academies, 2012), 74, http://www.trb.org/Main/Blurbs/167055.aspx.

The zone-level land activity forecasts are developed by COG's Cooperative Forecasting Program, working through its Cooperative Forecasting and Data Subcommittee.[21] COG does not use a formal land use model. In the early 1970s, COG tried using a land use model called EMPIRIC,[22] but COG staff was not satisfied with its performance, and later abandoned its use.[23] Instead of a land use model, like many MPOs and regional planning agencies, COG uses a process, often known as a "modified Delphi process," which involves reconciling top-down and bottom-up land activity forecasts.[24] The top-down forecasts are regional econometric projections of employment, population, and households. The bottom-up forecasts are also projections of employment, population, and households, but made at the zone level and are based on information from the local governments. These bottom-up forecasts are derived from both building permits (providing short-term information) and comprehensive land use plans (providing long-term information). Each update of the zone-level, land activity forecasts in the Cooperative Forecasting program is called a "round" and the latest update is Round 9.1.

Before the zone-level land activity data can be used as an input to the travel model, it must undergo an adjustment process, known as the CTPP-based employment adjustment, which ensures that a consistent employment definition is used by all counties and jurisdictions in the modeled area. The reason for this adjustment is that different jurisdictions in the modeled area, which covers DC, Maryland, Virginia, and one county in West Virginia, use different definitions of employment. For example, jurisdictions in the Baltimore region and several other Maryland jurisdictions develop their base-year employment estimates using data from Bureau of Economic Analysis (BEA). By contrast, most of the jurisdictions in the Washington region develop their base-year employment estimates using data from the Quarterly Census of Employment and Wages (QCEW) collected by the Bureau of Labor Statistics (BLS).[25] The QCEW is a joint federal/state cooperative arrangement between the BLS and state employment security agencies (ESAs). According to Spear, "In lieu of using the publicly available QCEW database, some state DOTs (and even some MPOs) have entered into formal agreements with their state ESAs to obtain access to the enhanced QCEW microdata files that are used by BLS to develop the QCEW… [The QCEW files] are more commonly known in the transportation community as ES-202 data, but this terminology

[21] "Cooperative Forecasting and Data Subcommittee," Metropolitan Washington Council of Governments, 2018, https://www.mwcog.org/committees/cooperative-forecasting-and-data-subcommittee/.
[22] Peat, Marwick, Mitchell and Company, "EMPIRIC Activity Allocation Model: Application to the Washington Metropolitan Region" (Metropolitan Washington Council of Governments, 1972).
[23] Reid Ewing and Keith Bartholomew, "Comparing Land Use Forecasting Methods: Expert Panel Versus Spatial Interaction Model," *Journal of the American Planning Association* 75, no. 3 (2009): 347.
[24] Paul DesJardin, "Round 8.4 Cooperative Forecasts" (March 18, 2015), https://www.mwcog.org/file.aspx?&A=OtImE2QWj1BO0DeQmbp6QUDb5wY6PX%2fzbRb%2bkgWDGhw%3d.
[25] Robert E. Griffiths to Ronald Milone, "Travel Model Employment Data Adjustment Factors for Round 7.0," Memorandum, August 10, 2005, 1.

is no longer used by BLS."[26] The most recent CTPP-based employment adjustment was conducted on Round 9.1 land activity data.[27]

As for the transportation networks, COG/TPB staff develops a series of highway and transit networks for the air quality conformity analysis, and these networks are often used as the starting point for other planning studies. The highway network consists of all freeways, expressways, and major arterials in the modeled area. It also includes many minor arterials and some collectors, but almost no local roads (centroid connectors represent local roads, but one centroid connector may represent many local roads, so there is not a one-to-one representation like one finds for other link types in the highway network). The highway network forms the base layer for the transit network, since buses mostly make use of the highway network. In addition to the highway network, the transit network includes the following elements:

- Transit infrastructure: Transit-only links
- Transfer links
- Transit service
- Transit fares

The latest full-scale documentation of the transportation networks was done in 2018.[28]

Transportation policy assumptions include the following:

- Assumptions about how transportation costs will increase over time, e.g.,
    - Will transit fares rise at the same rate as inflation or a different rate?
    - How will auto operating costs change over time?
- Cost of parking;
    - For drive-access transit trips, the cost of parking is stored in the station file. For park-and-ride (PNR)-to-station transfer links, the walk time is a function of parking capacity and parking cost,[29] but parking cost is not used as part of the transit path-building.
    - For driving trips not involving transit, a parking cost model is used, where parking cost is a function of employment density (see section 21.7.1 "Non-transit-related parking costs").

[26] Bruce D. Spear, "NCHRP 08-36, Task 098: Improving Employment Data for Transportation Planning" (Washington, D.C.: American Association of State Highway and Transportation Officials (AASHTO), Standing Committee on Planning, September 2011), ES-7, http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36(98)_FR.pdf.
[27] Hamid Humeida and Ray Ngo to Mark Moran et al., "Developing Land Use Input Files for the Version 2.3 Travel Model Using Round 9.1 Cooperative Forecasts and the CTPP-Based Employment Adjustment Factors," Memorandum, October 25, 2018.
[28] Meseret Seifu, Ron Milone, and Mark Moran, "Highway and Transit Networks from the VDOT and MDOT Off-Cycle Amendment to the 2016 CLRP (TPB Version 2.3.70 Travel Model)," Draft report, June 15, 2018.
[29] Manish Jain to Ronald Milone and Mark Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," Memorandum, October 2010, 6.

- Amount of in-commuting from areas outside the modeled cordon.

2.2 Model outputs

The travel model produces a large number of outputs. **Each model run produces about 25 GB of output files**. Since many of these are intermediate files, a clean-up process has been added to the model that moves these intermediate/temporary files to a folder where they can be easily deleted. **Once these are deleted, the amount of output files per model run is about 10 GB**. As stated earlier, the travel model is an "aggregate" model meaning that the model represents aggregate person flows and aggregate vehicle flows between transportation analysis zones (TAZs). Nonetheless, the model produces many fine-grained outputs. These include link-level outputs, such as the number of vehicles traveling on a particular link in the AM peak period, and zone-interchange-level outputs, such as the number of bus person trips traveling from TAZ X to TAZ Y. However, although the model *produces* these fine-grained outputs, **the model has not been validated to these fine-grained levels, so it is not recommended that one use these fine-grained outputs from the travel model**. A general rule is that, before using or reporting any model outputs, they should be summarized or aggregated to the same, or a higher, level as was used in model validation. For example, although the model produces link-level traffic volumes, this information should be aggregated to the screenline level, jurisdiction level, or regional level, before it is used or reported. Despite this rule, these fine-grained outputs are sometimes used in corridor-level or project-level planning studies, but typically only after the outputs have undergone post-processing (see, for example the classic report NCHRP 255,[30] or its recent update, NCHRP 765[31]). Given the regional nature of most of the transportation planning studies conducted for the TPB, the COG/TPB staff rarely conducts this type of post-processing work (it is more commonly conducted by consultants working for local governments or state DOTs). In conclusion, when using outputs of the regional travel demand model, one should generally use outputs that have been aggregated or summarized to the following levels:

- Region level, e.g.,
  - The modeled area,
  - The TPB planning area,
  - The metropolitan statistical area (MSA), or
  - One of the air quality non-attainment areas, which can vary by pollutant.[32]
- Jurisdiction level
- Jurisdiction-to-jurisdiction level
- For highway assignments: Regional screenlines

[30] Neil J. Pedersen and D. R. Samdahl, *NCHRP Report 255: Highway Traffic Data for Urbanized Area Project Planning and Design*, National Cooperative Highway Research Program (NCHRP) (Transportation Research Board, National Research Council, 1982), http://trid.trb.org/view/1982/M/188432.
[31] CDM Smith et al., *NCHRP Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*, National Cooperative Highway Research Program (NCHRP) (Transportation Research Board of the National Academies, 2014).
[32] The modeled area is the largest of these regional areas.

- For transit assignments: Metrorail station groups

Figure 8 shows the three major outputs of the travel model, listing both the disaggregate-level output and the more aggregate-level output that is recommended for use. Table 5 adds some detail to the information found in Figure 8.

Table 5 Outputs of the travel model: Disaggregate-level output that is not validated versus aggregate-level output that is validated

Model producing the output	Disaggregate-level output (Produced by the model, but not recommended for use)	Aggregate-level output (recommended for use)
Mode choice	Zone-to-zone trips by travel mode	• Jurisdiction-to-jurisdiction flows • Jurisdiction-level mode spits • Region-level mode splits
Traffic assignment	Vehicle trips/volumes on the road links	• Jurisdiction-level metrics, such as VMT by jurisdiction • Screenline-level metrics, such as total number of vehicles crossing screenline
Transit assignment	Transit person trips/volumes on transit links	Although all transit person trips are assigned to the transit network, we currently validate only Metrorail trips, and these are validated only by station groups (generally three to four stations per group).

2.3 Modeling steps and the speed feedback loop

The major steps of the Version 2.3 Travel Model, including major inputs and outputs, can be found in Figure 9. As mentioned earlier, the major inputs are the transportation networks, the zonal land use data, and the transportation policy assumptions. The model itself, which is delineated in Figure 9 by a gray, dashed-line forming a box, begins with demographic models and ends with traffic assignment and transit assignment. Each of the steps of the travel model is discussed in subsequent chapters of the user's guide.

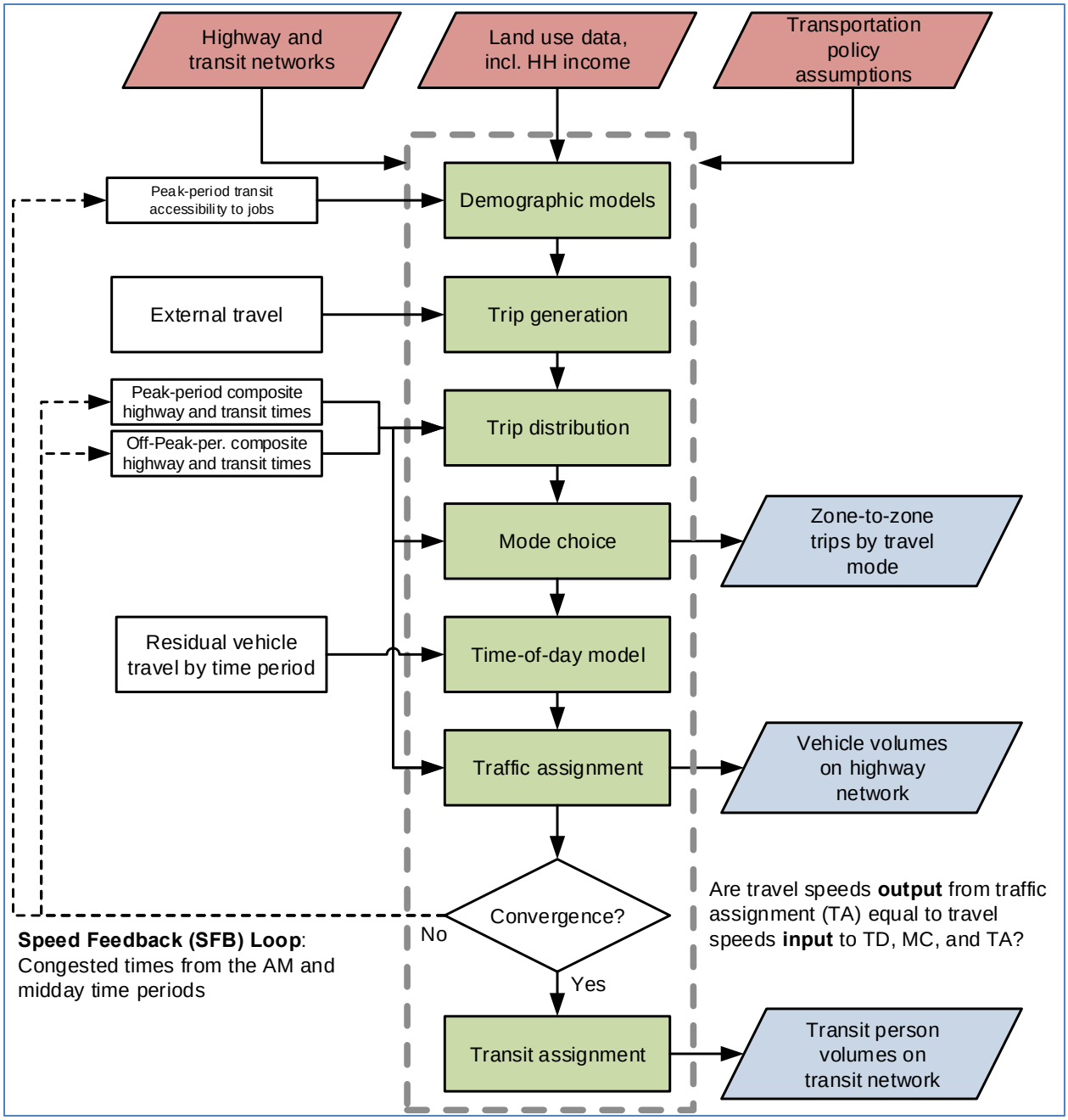


Figure 9 Major steps of the Version 2.3 Travel Model

Ref: six_step_model_ver2.3_v3.vsd

As can be seen in Figure 9, the Version 2.3 Travel Model uses a speed feedback (SFB) loop to ensure that the travel times (and hence speeds) coming out of traffic assignment are consistent with those used as inputs to trip distribution and mode choice. In theory, at the end of each SFB loop, the model would have a test to determine whether convergence has been met. In other words, one could continue running iterations of the speed feedback loop until a convergence stopping criterion has been met.

Currently, however, we do not use a convergence-based stopping criterion. Instead, based on past tests with the regional model, we have determined that the model is sufficiently converged after four SFB iterations,[33] so we simply use a fixed number of SFB loop iterations (five iterations, including the initialization iteration, known as the "pump prime" iteration). In the future, we may use a more formal convergence-based stopping criterion for the SFB loop, such as the percent root-mean-square error (%RMSE) of the travel skims.[34] Nonetheless, in 2011, Cambridge Systematics was unable to find any MPOs that used a formal stopping criterion for the SFB loop.[35] The SFB loop and the volume averaging method used in the SFB loop are discussed in more detail later in this section.

Traffic assignment is discussed both here and in its own chapter (Chapter 23). Like most travel models in the U.S., the Version 2.3 Travel Model uses a user-equilibrium (UE) traffic assignment, which is the generally accepted method for static traffic assignments. Furthermore, the assignment process is a multi-class UE assignment, meaning that separate user classes can be assigned at the same time. The Version 2.3 model includes six user classes:

1. Single-occupant vehicle (SOV)
2. High-occupant vehicle with two persons (HOV2)
3. High-occupant vehicle with three+ persons (HOV3+)
4. Medium and heavy trucks
5. Commercial vehicles
6. Airport passengers traveling to/from the three commercial airports

Additionally, the Version 2.3 model includes four time-of-day periods for traffic assignment:

- AM peak period (3 hours: 6:00 AM to 9:00 AM)
- Midday period (6 hours: 9:00 AM to 3:00 PM)
- PM peak period (4 hours: 3:00 PM to 7:00 PM)
- Night/early morning period (11 hours: 7:00 PM to 6:00 AM)

Most MPOs use a UE traffic assignment that relies on an optimization algorithm known as the Frank-Wolfe (FW) algorithm.[36] The FW algorithm is essentially a series of all-or-nothing traffic assignments where flows are combined using weights from an optimization process whose goal is to minimize an objective function. The process stops when a stopping criterion is met. Previously, the Version 2.3 Travel

[33] Ron Milone, "TPB Models Development Status Report," (January 23, 2009), https://www.mwcog.org/file.aspx?&A=%2fTnLbhiKP7J4dc5BCvLqxHQzO%2bq9WHN4K%2bDGCm64j8s%3d.
[34] See, for example, Caliper Corporation, "Traffic Assignment and Feedback Research to Support Improved Travel Forecasting," Final Report (Washington, D.C.: Federal Transit Administration, Office of Planning and Environment, July 31, 2015), pages 3-2 and 3–4, http://www.fta.dot.gov/documents/traffic-assignment-and-feedback-research-to-support-improved-travel-forecasting.pdf.
[35] Cambridge Systematics, Inc., "Fiscal Year 2010 Task Reports," Final Report (Washington, D.C.: National Capital Region Transportation Planning Board, November 16, 2010), 1–20 to 1–21, http://www.mwcog.org/transportation/activities/models/review.asp.
[36] Marguerite Frank and Philip Wolfe, "An Algorithm for Quadratic Programming," *Naval Research Logistics Quarterly* 3, no. 1–2 (1956): 95–110, https://doi.org/10.1002/nav.3800030109.

Model used the following UE stopping criterion: When the relative gap ≤ 10^{-3} OR the number of UE iterations ≥ 300. The relative gap threshold was always intended to be the primary stopping criterion, with the number of UE iterations functioning as a backup criterion. Now, however, we have moved to what we call a "progressive" relative gap stopping criterion. The idea is that, in the early SFB iterations, the UE closure criterion will be relatively loose, but, in the later SFB iterations, the UE closure criterion will tighten, as shown in Table 6.

Table 6 User equilibrium closure criterion (relative gap) varies by speed feedback iteration

Speed feedback iteration	Primary closure criterion for UE traffic assignment	Secondary closure criteria for UE traffic assignment
Pump prime	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
1	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
2	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
3	Relative gap ≤ 10^{-3} (i.e., 0.001)	Number of UE iterations ≥ 1000
4	Relative gap ≤ 10^{-4} (i.e., 0.0001)	Number of UE iterations ≥ 1000

By using the higher value for UE iterations (1000 vs. 300), we were able to ensure that this secondary criterion is unlikely to be used as the stopping criterion. Based on a series of sensitivity tests,[37] we found that the new progressive relative gap scheme results in a relatively converged traffic assignment, without the extremely lengthy model run times that would be needed if one were to use a high threshold (e.g., 10^{-4} relative gap) for each of the five SFB iterations. The Version 2.3 Travel Model uses a slight variation of the FW algorithm, called the *bi-conjugate* Frank-Wolfe algorithm, which converges marginally faster than the classic FW algorithm.

Regarding data inputs, the zonal land use data that is input to the travel model (Figure 9) includes information about average household wealth, in the form of an average household income index. This index is the ratio of the zonal median household income to the regional median household income, in year-2007 dollars. So-called "residual vehicle" or exogenous trips are added to the modeling stream at the time-of-day model stage. These trips include

- Through trips (auto and truck);
- Taxi trips;
- School trips;
- Visitor/tourist trips;
- Airport passenger trips (i.e., trips by air passengers destined to the three commercial airports in the region).

Figure 10 is another view of the Version 2.3 Travel Model, but with an emphasis on which steps occur *before* the speed feedback (SFB) loop and which steps occur *within* the SFB loop. Before the loop is

[37] Mark S. Moran and Ronald Milone, "Status Report on the Version 2.3 Travel Model: Updates to the Model and Year-2010 Validation" (March 22, 2013), 7–11.

begun, there is an initialization phase, known as the "pump-prime" iteration. In the pump prime iteration, a first pass of the travel model is performed using *initial* AM and off-peak highway speeds, and *initial* mode choice percentages (i.e., the mode choice model is not executed in the pump prime iteration). The "skimmed" highway times are used to develop drive-access-to-transit (zone-to-PNR-lot) links as part of the transit network. After the transit network is built and skimmed, trip generation and trip distribution are executed. The resulting person trips are converted to vehicle trips on the basis of default zone-level mode choice and car occupancy percentages, and these are assigned to the highway network.

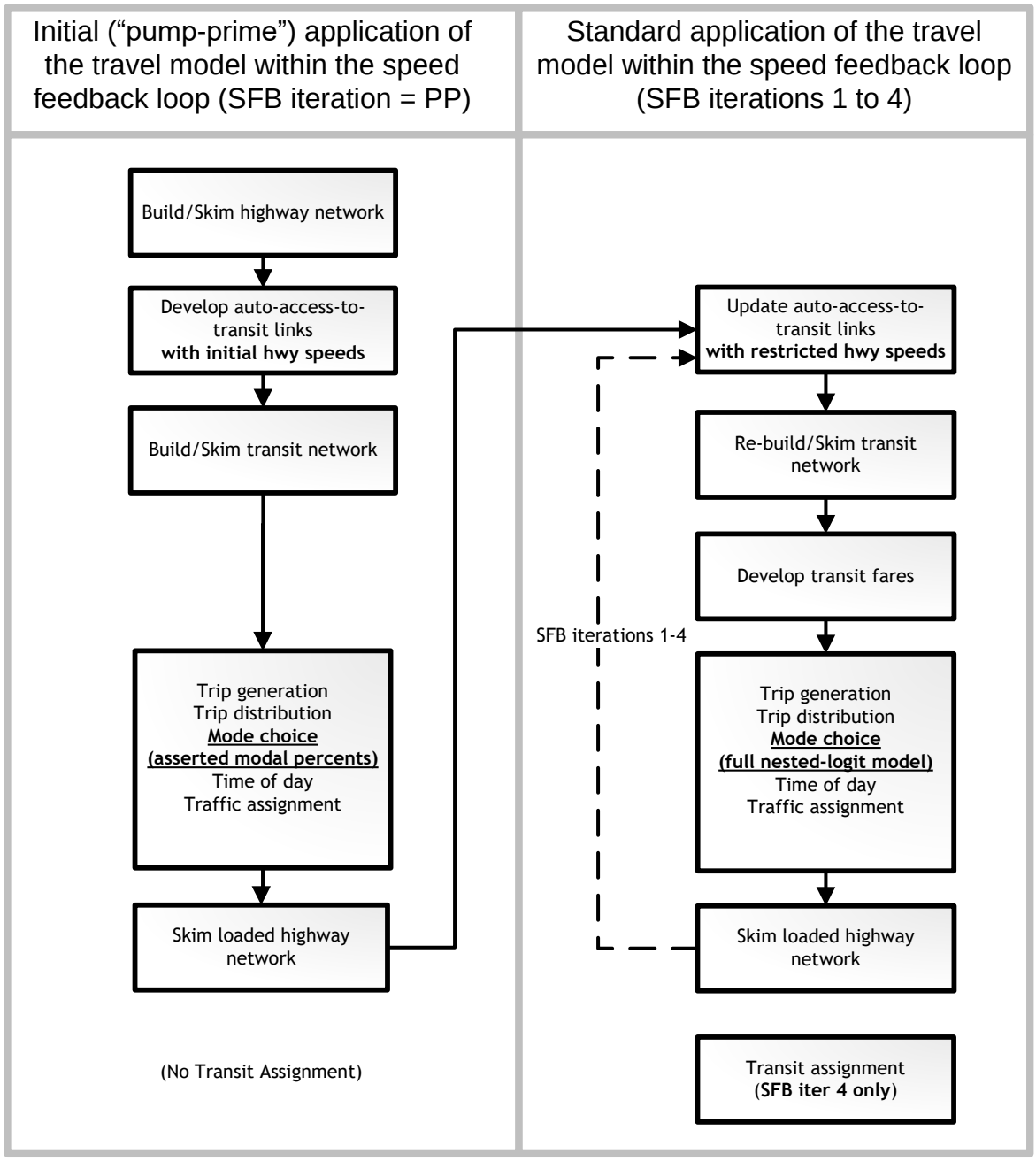


Figure 10 Application process of the Version 2.3 Travel Model

Ref: pumpPrime_vs_other_sfb_iter_v5.vsd

The next series of "standard" SFB iterations (1 through 4) involve the execution of the complete travel model which includes: 1) a mode choice model execution and 2) the use of recycled traffic assignment-based speeds as input. The AM peak and off-peak restrained highway times are used to update the zone-to-PNR link speeds, and the transit network is re-built and skimmed. The highway and transit time skims are used as inputs to the mode choice model. The auto driver trips produced from the mode choice model are processed through the time-of-day model, which apportions the auto drivers among

four time-of-day periods: the AM peak period (6 - 9 AM), the midday period (9 AM - 3 PM), the PM peak period (3 - 7 PM), and the night/early morning period (7 PM - 6 AM). The four time-of-day trip tables are subsequently loaded onto the highway network in separate traffic assignment procedures. The loaded-link volumes are successively averaged using the method of successive averages (MSA) to facilitate the convergence of the final link speeds. The averaging occurs individually for each of the four time-of-day periods at the link level, as follows:

- The "final" first iteration link volumes are equal to the "raw" assigned link volumes from the pump-prime iteration.
- The "final" second iteration link volume equals one half of the first iteration link volume plus one half of the second iteration assigned link volume.
- The "final" third iteration link volume equals 2/3 of the "final" second iteration link volume plus 1/3 of the third iteration assigned volume.
- The "final" fourth iteration volume is not averaged -- it is the direct assignment output.

In both the Version 2.2 and 2.3 travel models, a fixed number of speed-feedback (SFB) iterations is used. The Version 2.2 model used six speed feedback iterations (in addition to the pump prime iteration). By contrast, the Version 2.3 model uses four speed feedback iterations (in addition to the pump prime iteration). The Version 2.3 model produces **two final loaded network files** called **i4_Assign_Output.net** and **i4_HWY.NET** (not i6hwy.net, as was the case with the Version 2.2 Travel Model). The first file (**i4_Assign_Output.net**) is based on the direct trip table output, while **i4_HWY.NET** is based on volume averaging. TPB staff use **i4_Assign_Output.net** to compute the emissions as a part of air quality conformity and work for the state air quality implementation plans (SIPs).

As shown in both Figure 9 and Figure 10, transit assignment is not conducted within each speed feedback loop, but is instead conducted once, after the final feedback iteration is complete. Transit assignment is conducted for two time-of-day periods (peak and off-peak) using trip tables in production/attraction (P/A) format (not origin/destination format, as is the case for highway assignment) and, unlike highway assignment, transit assignment is not capacity constrained. Although both these aspects of transit assignment may seem like shortcomings, the state of the practice for regional transit assignments is P/A assignment without capacity constraint.[38]

2.4 Special modeling procedures used in earlier versions of the travel model

Historically, there have been two transportation phenomena that have required specialized modeling procedures. The two phenomena were 1) Limited capacity on the Metrorail system to handle the demand for travel to and through the regional core and 2) High Occupancy/Toll (HOT) lanes.

The first phenomenon, a limit on Metrorail's peak-period capacity, was modeled using a procedure called the Metrorail constraint to and through the regional core. This modeling technique was used from about 2001 to 2018. In 2018, however, WMATA received new dedicated funding from the District, Northern Virginia, and suburban Maryland, which meant that the transit authority would likely have the

[38] See, for example, Cambridge Systematics, Inc. et al., *NCHRP 716*, 77.

funds to handle its peak volumes to/through the regional core. Thus, in 2018, WMATA requested that this procedure stop being used. The last model to use this procedure was the Ver. 2.3.70 Model.

The second phenomenon, HOT-lanes, is still in effect and will be for the foreseeable future, but the technique for modeling it has been changed in the Ver. 2.3.75 Model. In the Ver. 2.3.70 Model, and older model versions, a special procedure was used, known as the HOV3+ highway skim replacement (HSR) procedure or the multi-run traffic assignment procedure.

As discussed in Section 1.3, starting with the Ver 2.3.75 Model, both the Metrorail constraint and the HSR procedure have been eliminated. Nonetheless, the Ver. 2.3.75 model still includes two special modeling procedures, which are not used for general application of the model, but can be used when the need arises. One is estimating toll values on HOT-lane facilities. The other is for performing select-link analyses. Both special procedures are described below.

2.4.1 Toll estimation for high occupancy/toll (HOT) lanes

According to a recent FHWA report, " 'Managed lanes' are defined as highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions….Examples of operating managed lane projects include high-occupancy vehicle (HOV) lanes, value priced lanes, high-occupancy toll (HOT) lanes, or exclusive or special use lanes."[39] Most HOT lane facilities exist on freeways which include one or more adjacent general purpose (GP) lanes that are not managed.

2.4.1.1 HOT lanes which allow free use with 3+ occupants per vehicle

On Nov. 17, 2012, HOT lanes, known as the I-495 Express Lanes, opened on I-495 in Virginia. On this facility, vehicles with three or more occupants (HOV3+) may use the facility for free, but single-occupant vehicles (SOVs) and two-occupant vehicles (HOV2) must pay a toll to use the facility. The toll is dynamically set, every six minutes or so, based on congestion levels. The toll is set such that the HOT lanes will remain free flowing. In December 2014, HOT lanes, known as the I-95 Express Lanes, opened on I-95. This second facility also had the same HOV restriction (HOV3+), so both facilities are HOT3+.

Given the advantageous treatments in favor of HOV3+ traffic, such as the fact that HOV3+ vehicles are not charged tolls like non-HOV3+ (in both mode choice and traffic assignment), staff decided to eliminated the HSR procedure.[40] Obviously, a central modeling objective in representing HOT lanes is to specify detailed toll rates that will result in demand levels that do not degrade the prevailing speed on the HOT facility. To achieve this objective, the following three steps (reduced from four steps in previous model versions when HSR procedure was used) are implemented in the Ver. 2.3.75 model on a year-by-year basis to perform toll setting (i.e., estimate toll values) on HOT lanes. Note that the toll-setting

[39] FHWA, "Managed Lanes: A Primer" (Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, 2008), 5, http://www.ops.fhwa.dot.gov/publications/managelanes_primer/managed_lanes_primer.pdf.
[40] Feng Xie and Dusan Vuksan to Files, "Evaluating the Modeling Effects of Eliminating the 'HOV Skim Replacement' Process."

procedure is conducted by TPB staff. Thus, many users of the TPB model never perform this step (since the estimated toll values for future-year networks are provided as part of the model transmittal package). For those with an interest in the current toll-setting procedure, please consult the 2018 memo cited here and earlier.[41]

2.4.1.2 HOT lanes which allow free use with 2+ occupants per vehicle

VDOT is recommending managing the I-66 HOT lanes inside the Beltway as a HOT2+ facility beginning in 2017 and continuing through 2020. Before this point, the only HOT lane facilities in the region were HOT3+. The Air Quality Conformity Analysis for Visualize 2045 includes six analysis years: 2019, 2021, 2025, 2030, 2040, and 2045. Among those years, only 2019 contains the HOT2+ facility of I-66 HOT lanes inside the Beltway. Since the HSR procedure has been removed, the similar three steps discussed in section 2.4.1.1 are implemented in Ver 2.3.75 for year-2019 to simulate HOT lanes. The only difference is that HOV2+ traffic is free to operate on HOT2+ facility, thus HOV2+ skims developed in Step 2 will be used in Step 3.

Please also see the discussion of the treatment of airport passenger auto driver trips on HOV- and HOT-lane facilities in section 23.3.8 (p. 204).

2.4.2 Select-link analyses

A select-link analysis (SLA) and a select-link assignment are common procedures in travel demand modeling, but these are not part of our standard modeling procedures. There are theoretical reasons why SLAs should not be performed,[42] but we often get requests for help with running SLAs. COG/TPB staff has developed some SLA procedures[43] for the Ver. 2.3 travel model, which may be requested by outside parties in the normal fashion (see https://www.mwcog.org/transportation/data-and-tools/modeling/data-requests/).

[41] Feng Xie and Dusan Vuksan to Files, "Evaluating the Modeling Effects of Eliminating the 'HOV Skim Replacement' Process," Memorandum, March 7, 2018.
[42] See, for example, Hillel Bar-Gera and Amos Luzon, "Non-Unique Solutions of User-Equilibrium Assignments and Their Practical Implications," in *Compendium of Papers CD-ROM* (Transportation Research Board 86th Annual Meeting, held January 21-25, 2007, Washington, D.C., 2007).
[43] Feng Xie to Files, "Select Link Analysis for TPB's Version 2.3.70 Travel Demand Model," Memorandum, September 14, 2018.

3 Hardware and software requirements

This section of the report describes the hardware and software requirements for running the Version 2.3 family of travel models, with an emphasis on the Ver. 2.3.75 model. It also includes a section discussing the hardware used for modeling at COG. In addition to requirements, this section of the report also discusses any recommendations regarding hardware and software.

3.1 Hardware

- Processor/central processing unit (CPU)/chip:
    - Intel or Intel-like processor, e.g., Intel, AMD, with 64-bit architecture ("x64").
    - Number of cores: The Version 2.3.75 Travel Model has been designed to run some steps in parallel, using Cube Cluster.
        - During the highway assignment step, there can be up to 8 concurrent program threads running at once, which means that it is recommended that you have a computer with 8 or more cores. Nonetheless, you can run the regional travel model on a computer with only 4 or 2 cores (see instructions found in Table 19 on p. 84), however, due to rounding issues in Cube Cluster, running with fewer than the recommended 8 cores may result in slight differences in modeled results.
        - The two biggest chip manufacturers are Intel and AMD. Some Intel chips feature a technology known as Hyper-Threading. When Hyper-Threading technology is enabled on the chip, the operating system sees double the number of cores. So, if your computer has four cores and Hyper-Threading is enabled, the operating system will see eight virtual cores, thus doubling your CPU capacity. See the section 8.2.1 for more details. COG/TPB staff has executed the Version 2.3 family of travel models on only computers running Intel chips, but the model should run equally well on computers running AMD chips.
    - Chip/CPU speed: While there is no minimum chip speed, we have found that model run time scales inversely with chip speed, so a faster chip/CPU is always preferred. We recommend a chip speed of around 3 GHz.
- Memory: 64-bit versions of Windows can a large amount of memory (e.g., from 128 GB on Windows 10 Home to 2 TB on Windows 10 Pro). However, based on experience, running the Ver. 2.3 model runs is not memory intensive, so 3 to 4 GB of RAM should suffice. Some of our current travel mode servers have 32 GB of RAM, but, again, this does not seem to be needed for the current, trip-based model.
- Storage space: We recommend you have at least 500 GB of free space on your computer storage -- hard disk drive (HDD) or solid-state drive (SSD). One modeling scenario/year generates about 25 GB of files (1,600 files) before the clean-up procedure is run, and about 10 GB of files after the clean-up procedure is run. A solid-state drive (SSD) could provide shorter model run times, but in one test we performed on a new travel model server, the SSD

performed no better than the hard drive.[44] This result was unexpected, since one would generally expect an SSD to out-perform an HDD. In this test, the data drive was an SSD and the operating system (O/S) drive was a HDD. We did not, however, have time to test the case where both the data drive and the O/S drive were SSDs.

3.2 Software

- Operating system: Microsoft Windows (64-bit version), such as Windows 10, Windows Server 2008, or Windows Server 2012. To our knowledge, the Ver. 2.3.75 model has not been tested at COG using Windows 10, but it should work.
- The Version 2.3.75 Travel Model: This is provided for free to those who request it. The procedures for requesting the model can be found on the "Data Requests" webpage (https://www.mwcog.org/transportation/data-and-tools/modeling/data-requests/). In short, one needs to send an e-mail or a signed letter to Ronald Milone, Director of Travel Forecasting and Emissions Analysis, in COG's Department of Transportation Planning. The e-mail/letter should indicate how you intend to use the model, naming the specific study or research project, if applicable. When someone is given the TPB travel model, this includes the model inputs (principally transportation networks and land use data), batch files, Cube Voyager scripts, and the Fortran program used to run the mode choice model. Although Cube Voyager scripts are part of the model transmittal package, you cannot run these scripts without having a copy of Cube Voyager software (see below). Please note that the COG/TPB staff does not have the resources to staff a "help desk" for the regional travel model, so it is expected that individuals who request the travel model will have the knowledge and skills to use the model with minimal assistance from COG/TPB staff.
- Citilabs Cube software: The TPB Version 2.3.75 Travel Model is implemented using Citilabs Cube software, a proprietary software package, which is produced, licensed, and marketed by Citilabs, Inc. Thus, to run the regional travel model, you will need to purchase the Cube software from Citilabs (www.citilabs.com). COG/TPB staff cannot provide copies of the Citilabs Cube software.
    - Cube Base: Cube Base is the graphical user interface (GUI) for editing transportation networks, matrices, and scripts. In theory, Cube Base can also be used for managing network scenarios (Scenario Manager) and running travel models (Application Manager), but that is not how the Version 2.3 family of travel model have been implemented. Instead, the Version 2.3 model is implemented using a command-line interface (CLI), as described later in this report. **Note that Cube Base is 32-bit software (Cube Voyager is 64 bit)**.
    - Cube Voyager: Cube Voyager is the numerical engine that powers the Cube suite of software and includes its own proprietary scripting language. The Version 2.3.75 Travel Model has been developed and applied by COG/TPB staff using **Cube versions 6.4.1, so it is recommended you use Cube 6.4.1 with the Ver. 2.3.75 Model**. As noted above,

[44] Dzung Ngo and Mark S. Moran to Ronald Milone et al., "Benchmark Tests on Travel Model Server #7 (Tms7) to Determine the Configuration for the Server's Hard Drives and the Potential Use of Cube's 64-Bit Version," Memorandum, February 2, 2016, 8.

Cube Voyager is 64-bit software. In the past, we noted that Cube Voyager 6.4.2 was less stable when running the ArcPy transit walkshed process. [45] For the transmittal version of the Ver. 2.3.75 model, we plan to "comment out" the automated ArcPy transit walkshed process as we did in Ver. 2.3.70,[46] since most users do not need to re-run this step (the output file from this process, areawalk.txt, is delivered with the model transmittal package). From our past experience, the automated ArcPy transit walkshed process is the modeling step that is most likely to result in the model run stopping prematurely. If a model user wants to make changes to the transit network, then they are recommended to uncomment the statement that calls this procedure, allowing the procedure to run as one of the first steps of the model.

  - Cube Cluster: Cube Cluster is Citilabs' implementation of distributed processing, which is a technique for distributing computing jobs across multiple computers or processors, thus reducing model run times by allowing two or more processes to run in parallel. Strictly speaking, Cube Cluster is not required to run the Version 2.3 Travel Model. But it is strongly recommended, in order to keep model run times to a minimum, and, if you choose not to use it, you will have to modify the model setups that are supplied by COG/TPB staff (this is described later in this report).

- ArcGIS Engine Runtime 10.1 or 10.3.1 or ArcGIS 10.1. ArcGIS Engine Runtime 10.3.1 comes with Cube 6.4.1. When installing Cube, the software installation process will check to see if ArcGIS has already been installed on your computer. See Table 20 on p. 98 for more information. The easiest setup would be to install Cube on a computer that does not have ArcGIS.
- A text editor (optional but recommended): The choice of which text editor to use is a personal one. Cube Base includes its own text editor, optimized, obviously, for editing Cube Voyager scripts. In addition to the Cube Base built-in text editor, COG staff uses one or more of the of the following: Notepad++ (free and open source), PSPad (free, but not open source), KEDIT (for purchase, though the software may no longer be supported by the vendor).
- Software for comparing or diffing text files (not required but recommended). COG staff uses both WinDiff, which is older, and WinMerge, which is newer and has more functionality. Both are available for free.
- Cygwin (optional, http://www.cygwin.com/) is a Linux-like environment for Windows that provides a series of Unix-like command-line tools, such as head, tail, and which. This free and open source software **is no longer part of the model stream, so users no longer need to install this** (though some users may still choose to install this software to get access to its suite of Unix-like utility commands).

[45] Mark Moran, Ron Milone, and Meseret Seifu, "User's Guide for the COG/ TPB Travel Demand Forecasting Model, Version 2.3.70. Volume 1 of 2: Main Report and Appendix A (Flowcharts)," November 28, 2017, https://www.mwcog.org/assets/1/6/mwcog_tpb_travel_model_v2.3.70_user_guide_v7_appA_flowch.pdf.
[46] In the run_ModelSteps_*.bat batch file, the line "call ArcPy_Walkshed_Process.bat %1" should have "REM" at the beginning of the line to comment out this step.

3.3 Examples of computer hardware used at COG for modeling

COG/TPB staff performs most modeling runs on computer servers that are dedicated for this task, though one can also run the travel model on a standard, desktop computer. COG/TPB staff typically accesses a travel model server (TMS) using a Remote Desktop Connection. We currently have five travel model servers, named tms4, tms5, tms6, tms7, and tms8. Tms8 is the most recent travel model server at COG. Currently, COG's Models Applications Group makes use of tms4, tms6, and tms7 and COG's Models Development Group makes use of tms5 and tms8.

Table 7 compares the computer specifications ("specs") of the latest travel model servers used by the Models Development Group (tms8) and the Models Applications Group (tms7). Both computers are running 64-bit versions of Windows Server 2012 R2 Standard.

Table 7 Comparison of computer specs between tms7 and tms8

Host Name:	**Tms7**	**Tms8**
OS Name:	MS Windows Server 2012 R2 Standard	MS Windows Server 2012 R2 Standard
OS Version:	6.3.9600 Build 9600	6.3.9600 Build 9600
System Manufacturer:	HP	HP
System Model:	ProLiant DL380 Gen9	ProLiant DL380 Gen10
System Type:	64-bit	64-bit
Number of processors:	2	2
Processor name(s):	Intel Xeon E5-2687W V3	Intel Xeon Gold 6146
Clock speed of processor (GHz):	3.10	3.20
No. of cores/processor:	10	12
No. of threads/processor:	20	24
Total number of cores:	20	24
Total number of threads:	40	48
Hyper-Threading Technology:	Yes	Yes
Total Physical Memory (MB):	32,640 MB	65,196 MB
Hard drives for data storage:		Total 6 disks for drives C & F
	Local Disk (C:), 1 TB, RAID 1 (2 disks)	Local Disk (C:), 325 GB, RAID 10
	Data (E:), 3.27 TB, RAID 5 (4 disks)	**Data (F:), 4.04 TB, RAID 10**
	SSD (F:), 186 GB, RAID 0 (for testing)	

Ref: " I:\ateam\docum\fy19\memos\travel_model_server_tms_specs_2018.xlsx"

On a 64-bit computer with a 64-bit version of windows, some applications are 32-bit applications whereas others are native 64-bit applications, and each type of application has its own installation folder, as shown below:

- Installation location for 64-bit applications: "C:\Program Files"
    - Example: Cube Voyager

- Installation location for 32-bit applications: "C:\Program Files (x86)"
    - Examples: Cube Base, WinMerge

Although both tms7 and tms8 have two processors, tms7 has 10 cores per processor, resulting in a total of 20 physical cores. By contrast, tms8 has 12 cores per processor, resulting in a total of 24 physical cores. Because of Intel's Hyper Threading Technology, each server appears (to the operating system) to have double the number of cores. Thus, tms7 appears to the operating system as 40 virtual cores (which can handle 40 threads of instruction) and tms8 appears to the operating system as 48 virtual cores (which can handle 48 threads of instruction). The processor clock speeds for tms7 and tms8 are 3.1 GHz and 3.2 GHz, respectively. Regarding total physical memory, tms8 has 64 GB of RAM, double the size of tms7's RAM.

One can use the total number of cores in a computer to determine the maximum number of concurrent model runs that can be conducted. Since the Version 2.3.75 model is set up to use a maximum of 8 threads/cores, three concurrent model runs require the simultaneous use of 24 (= 3 x 8) cores. Four concurrent model runs could require up to 32 (= 4 x 8) cores. In tests conducted on tms6, which has 32 virtual cores ("threads"), TPB staff found that we could run four concurrent model runs of the Ver. 2.3.57 model (the results should apply to the Ver. 2.3.75 model as well). However, In the past, using Cube 6.1 SP1, we had found that, if two or more users tried to launch concurrent model runs, even if there were only two users, each with one model run, then one of the two model runs would often crash.[47] However, **under Cube 6.4.1, we found that two or three users can submit concurrent model runs**.[48] This is one improvement of Cube 6.4.1. For users who are running the automated ArcPy transit walkshed process, it is still necessary to use a 45-minute offset for launching model runs, so that only one instance of ArcGIS is running at a time. Also, based on recent communications with Citilabs (personal communication, 2/6/17), it is better not to overload the processor, so, although a 32-core computer should be able to run 4 concurrent model runs (4 x 8 = 32), it would be better to limit this computer to 3 concurrent model runs. It is hoped that further information about this issue will be added to future Cube documentation.

Travel model servers often have two logical disk drives: one containing the software, usually called "C:", and one used to store data, such as the model runs. Each one of these logical disks could actually be one or more disks, storage arrays, or, conceivably, solid state drives. The data drives associated with the travel model servers at COG are shown in Table 8.

[47] Mark S. Moran and Dzung Ngo to Ronald Milone et al., "Stress Tests of Travel Model Server #6 (Tms6) to Determine the Maximum Number of Model Runs That Can Run Concurrently," Memorandum, October 29, 2014.
[48] Dzung Ngo to Mark S. Moran et al., "Testing the COG/TPB Travel Model Servers: 1) Need for Admin Privileges; 2) Ability to Run Two or More Concurrent Model Runs by Two or More Users; 3) Experience with Malware," Memorandum, June 6, 2017, 5.

Table 8 Computer storage drives used for travel demand modeling

Server	UNC Path	Mapped Drive Letter	Size	Drive Setup
nas	\\nas\TMSARCHIVE\MODELAPP	N:	13.9 TB	RAID 5
nas	\\nas\TMSARCHIVE\MODELDEV	O:	13.9 TB	RAID 5
sas	\\sas\dtp_sas$	S:	649 GB	VM. Gets storage from the SAN.
tms4	\\tms4\D	Y:	2.4 TB	RAID 5
tms5	\\tms5\E	X:	4.5 TB	RAID 5
tms6	\\tms6\ateam	L:	2 TB	RAID 0
tms6	\\tms6\bteam	P:	2 TB	RAID 0
tms6	\\tms6\ateamarray	T:	10 TB	RAID 5 DAS
tms6	\\tms6\bteamarray	V:	10 TB	RAID 5 DAS
tms7	\\tms7\Data	M:	3.3 TB	RAID 5 (4 disks)
tms8	\\tms8\F	Z:	4 TB	RAID 10

Ref: " I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide\mapped_drives_cog_2018.xlsx"

For example, tms4 has one data drive with a capacity of 2.4 TB. This drive is mapped as the D drive when logged on to tms4 and is mapped to the Y drive when not logged on to the server. By contrast, tms6 has four data drives. The UNC path for each data drive indicates both the server name (e.g., tms6) and the share name (e.g., ateam). Logical drives that are made of storage arrays consist of multiple physical disk drives, which can be configured in different ways to allow redundancy (using RAID, which stands for Redundant Array of Inexpensive Disks or Redundant Array of Independent Disks). RAID 0 provides no redundancy, but it can often be the fastest configuration. For example, ateamarray and bteamarray have been set up with RAID 5, so they have redundancy in the case of a hard drive crash.

4 Mechanics of the model application process

The Version 2.3 family of travel models, including Ver. 2.3.75, is applied using a command-line interface (CLI), not a graphical user interface (GUI). The model is launched via a single command that is typed or pasted in a single command window (this is covered in the section about running the model). The Version 2.3 Travel Model makes use of the following:

- A series of pre-established batch files, which are used to call a series of Cube Voyager scripts (*.s) and Fortran programs (*.exe);
- A standardized subdirectory system, in which input files, output files, Cube Voyager scripts, and other files are organized; and
- The use of generically named input and output files, which are stored in designated locations in the subdirectory system.

An example subdirectory structure for applying the Version 2.3 model is shown in Figure 11. The "root" subdirectory appears at the top of the structure. The root subdirectory may exist anywhere on the computer hard drive and may be arbitrarily named by the analyst, but **it is recommended that the name of the root subdirectory include information about both the travel model being used (e.g. Ver2.3.75) and the modeling project being undertaken**. For example, an analyst performing model runs to support the Air Quality Conformity (AQC) analysis of the Constrained Element of Visualize 2045, the TPB's Long-Range Transportation Plan (CE LRTP) might name the root subdirectory as follows:

`C:\modelRuns\fy18\`**`Ver2.3.75_aqc_Vis2045`**

Note that the root subdirectory need not be located directly off the root of the C drive (or D drive, etc.). In the example above, the root subdirectory is below the "fy18" subdirectory. On the left side of Figure 11, there are five specially designated subdirectories under the root that are established:

- SOFTWARE: Fortran executable files and dynamic-link library (DLL) files
- CONTROLS: Control files that are required by the Fortran programs
- SCRIPTS: Cube Voyager scripts
- SUPPORT: General parameter files used by the scripts or other programs, such as AEMS (Fortran) and LineSum (C++)
- SUMMARY: Summary scripts, which are used to summarize the model run

The first four subdirectories are required, but the fifth subdirectory is optional. The SUPPORT subdirectory is reserved for parameter files that generally do not change by modeled scenario such as K-factors, F-factors, and the like. The four required subdirectories must exist under the root, and must be named as shown, although the names are not case sensitive. The optional summary subdirectory may be given any name. Furthermore, the files residing in these four required subdirectories should generally not be altered or renamed.

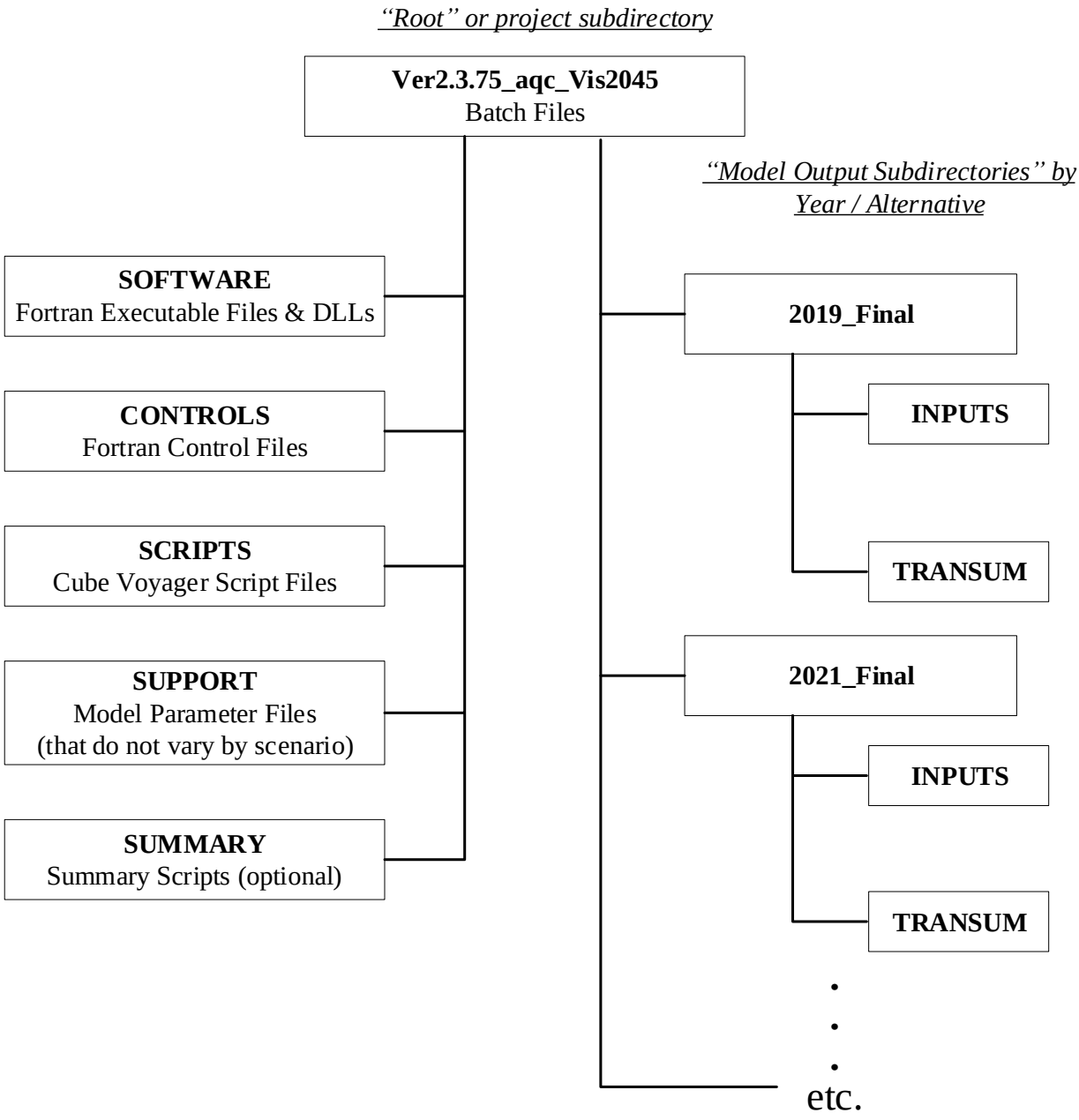


Figure 11 Subdirectory structure for executing the Version 2.3 Travel Model

Ref: "I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide\directoryStruct_v2.3.75_model_v2.vsd"

The right side of Figure 11 shows two subdirectories, named "2019_Final" and "2021_Final."[49] These two subdirectories are the output subdirectories (a.k.a. the scenario subdirectories). The user is free to choose any name for output subdirectories. Since travel demand models are best used in a comparative

[49] As of the Ver. 2.3.75 Model, we no longer require two runs of the travel model ("base" and "final") for each scenario modeled. However, some modelers continue to use the name "final" (e.g., 2021_final), even though there is only one run per scenario.

manner, a travel demand modeling project would typically have two or more scenarios or alternatives. Each alternative would get its own output subdirectory for scenario-specific outputs from the travel model.

Under each scenario-specific subdirectory that exists, there need to be two subdirectories, one named "inputs" and the other named "transum." These exact names must be used, but, as stated previously, names are case insensitive. The "transum" subdirectory is for storing summary information about the transit assignment summary. At the beginning of the model run, the "transum" subdirectory will be completely empty, but, at the end of the run, the subdirectory will contain reports from the process (LineSum) that summarizes the transit assignment. The "inputs" subdirectory is where one stores all necessary model inputs that area specific to a modeled scenario (see Table 9). Note that some "inputs" that are common to all modeled scenarios are stored in the "support" subdirectory (see Table 9, which also includes input files stored in the CONTROLS subdirectory). Input files in the "inputs" folder are named generically (e.g., land use data is stored in a file named zone.dbf; network link data is stored in a file named link.dbf, etc.). The user may establish an unlimited number of output subdirectories, as long as each one contains one "inputs" subdirectory and one "transum" subdirectory. Neither the inputs nor transum subdirectories can be shared among more than one alternative. After a model has been run, if the automated transit walkshed process was run with the model, then the "inputs" folder will contain a new subfolder called "Transit_Walksheds_GIS." In the default setup found with the model transmittal package, the automated transit walkshed process is not run (it is commented out). Note that the primary output file from the automated transit walkshed process (areawalk.txt) is now supplied in the inputs folder as part of the model transmittal package, so users need not re-run the process (it is commented out by default) unless users plan to make changes to the transit network, in which case it is recommended that the process be run.

The actual structure of the folders/subdirectories storing the travel model, its input files, and output folders, will be a function of the years/scenarios analyzed, but the list below is representative:

```
+---2019_final
|   +---Inputs
|   \---transum
+---2021_final
|   +---Inputs
|   \---transum
+---Controls
+---Docs
+---Scripts
+---Software
+---Summary
+---Support
```

If one is running multiple scenarios, **it is recommended that the analyst set up an electronic spreadsheet to keep track of metadata associated with each model run**. The metadata of importance will vary from study to study, but might contain items such as:

- Run number/ID (a unique sequence number to quickly name a model run)

- Parent run number/ID (indicates the run number of the run that formed the basis for the current run). Useful in figuring which run was derived from which other runs.
- Subdirectory name (i.e., the name of the root folder/subdirectory)
- Key modeling assumption parameters, such as the network year, land use year, land use round (e.g., Round 9.1), WMATA tariff number, etc.
- Key modeling output parameters, such as model run time, regional VMT, total transit, etc.

Table 9 Input files needed to run the Version 2.3 Travel Model, stored in the CONTROLS, INPUTS, and SUPPORT folders

No.	Folder	Filename	Description	File Type	Category	Modeling step where file is used	Transit/ Non-Transit Mode(s)
1	controls	HBO_NL_MC.ctl	HBO nested-logit mode choice mode control file	Text	Model	Mode choice (MC_Purp.bat & AEMS.EXE)	
2	controls	HBS_NL_MC.ctl	HBS nested-logit mode choice mode control file	Text	Model	Mode choice (MC_Purp.bat & AEMS.EXE)	
3	controls	HBW_NL_MC.ctl	HBW nested-logit mode choice mode control file	Text	Model	Mode choice (MC_Purp.bat & AEMS.EXE)	
4	controls	lineSum_MR_access.ctl	Summary of Metrorail riders by access mode	Text	Summary	LineSum.exe	
5	controls	lineSum_MR_line.ctl	Summary of Metrorail boardings, alightings, and ridership	Text	Summary	LineSum.exe	
6	controls	LineSum_Volume.ctl	Consolidate peak & off-peak vols from transit assignment	Text	Summary	LineSum.exe	
7	controls	NHO_NL_MC.ctl	NHO nested-logit mode choice mode control file	Text	Model	Mode choice (MC_Purp.bat & AEMS.EXE)	
8	controls	NHW_NL_MC.ctl	NHW nested-logit mode choice mode control file	Text	Model	Mode choice (MC_Purp.bat & AEMS.EXE)	
9	controls	station_names.dbf	Contains rail station names (derived from station.dbf)	DBF	Metadata	Created by set_factors.s; Used by LineSum	
1	inputs	airpax.adr	Air Passenger Auto Driver Trips	Binary	Assumptions	Miscellaneous time of day	
2	inputs	AM_Tfac.dbf	AM Toll Factors by Vehicle Type	DBF	Assumptions	Highway skimming and assignment	
3	inputs	areadef3722.prn	Input TAZ-Mode choice district equivalence	Text	Assumptions	Transit fare development (prefarv23.s)	
4	inputs	AreaWalk.txt	Optional. This file is now generated/re-generated by model	Text	Transit network	Generated by automated ArcPy process	
5	inputs	AT_override.TXT	Cases where zones have area-type override values	Text	Assumptions	AreaType_File.s	
6	inputs	Bus_Factor_File.dbf	Local Bus Time Degradation Factors	DBF	Assumptions	transit_skims_??.s	
7	inputs	bus_pnrn.tb	Bus PNR lots	Text	Transit network	transit_skims_??.s	1,2,6-9
8	inputs	BUSFARAM.ASC	AM Bus Fare matrix (Bus fares zones '1' to '21')	Text	Assumptions	mfare2.s	
9	inputs	BUSFAROP.ASC	OP Bus Fare matrix (Bus fares zones '1' to '21')	Text	Assumptions	mfare2.s	
10	inputs	com_bus.tb	Transfer link (walk) between commuter rail station and bus & LRT stop	Text	Transit network	transit_skims_??.s	12
11	inputs	com_link.tb	Commuter rail links	Text	Transit network	transit_skims_??.s	4
12	inputs	com_node.tb	Commuter rail stations	Text	Transit network	transit_skims_??.s	4
13	inputs	com_pnrn.tb	Commuter rail PNR lots	Text	Transit network	transit_skims_??.s	4
14	inputs	CPI_File.txt	Assumed rate of inflation, based on historical CPI	Text	Assumptions	Set_CPI.s	
15	inputs	Ext_PsAs.dbf	External Productions and Attractions	DBF	Observed data	trip_generation.s	
16	inputs	GIS_Variables.dbf	GIS variables used to calculate non-motorized trips	DBF	Observed data	trip_generation.s	
17	inputs	HBO_NL_MC.MTT	Pre-existing mode choice model output	Binary	Assumptions	pp_auto_drivers.s	
18	inputs	HBS_NL_MC.MTT	Pre-existing mode choice model output	Binary	Assumptions	pp_auto_drivers.s	
19	inputs	HBW_NL_MC.MTT	Pre-existing mode choice model output	Binary	Assumptions	pp_auto_drivers.s	
20	inputs	Jur.dbf	Equiv. between juris and river superdistricts: Disallows river crossings for PNR	DBF	Land use	Autoacc5.s	
21	inputs	Link.dbf	Highway network links	DBF	Highway network	V2.3_Highway_Build.s	
22	inputs	lrt_bus.tb	Transfer link (walk) between LRT station and bus stop	Text	Transit network	transit_skims_??.s	12
23	inputs	lrt_link.tb	LRT links	Text	Transit network	transit_skims_??.s	5
24	inputs	lrt_node.tb	LRT stations/stops	Text	Transit network	transit_skims_??.s	5
25	inputs	lrt_pnrn.tb	LRT PNR lots	Text	Transit network	transit_skims_??.s	5
26	inputs	MD_Tfac.dbf	MD Toll Factors by Vehicle Type	DBF	Assumptions	Highway skimming and assignment	
27	inputs	met_bus.tb	Transfer link (walk) between Metrorail station and bus stop	Text	Transit network	transit_skims_??.s	12
28	inputs	met_link.tb	Metrorail links	Text	Transit network	transit_skims_??.s	3
29	inputs	met_node.tb	Metrorail stations	Text	Transit network	transit_skims_??.s	3
30	inputs	met_pnrn.tb	Metrorail PNR lots	Text	Transit network	transit_skims_??.s	3
31	inputs	metlnkm1.tb	Metrorail Links	Text	Transit network	metrorail_skims.s	
32	inputs	metnodm1.tb	Metrorail Nodes	Text	Transit network	metrorail_skims.s	
33	inputs	mfare1.a1	Metrorail Sta XYs scaled to 1/100ths of miles	Text	Transit network	mfare1.s	
34	inputs	mfare1_Sta_Disc.ASC	Metrorail Sta fare discount array in cents	Text	Assumptions	mfare1.s	
35	inputs	MODE1AM,… MODE10AM.tb	AM Transit Line Files	Text	Transit network	transit_skims_??.s	
36	inputs	MODE1OP,… MODE10OP.tb	OP Transit Line Files	Text	Transit network	transit_skims_??.s	
37	inputs	new_bus.tb	Transfer link (walk) between BRT/streetcar stop and bus stop	Text	Transit network	transit_skims_??.s	12
38	inputs	new_link.tb	BRT/streetcar links	Text	Transit network	transit_skims_??.s	10
39	inputs	new_node.tb	BRT/streetcar stations/stops	Text	Transit network	transit_skims_??.s	10
40	inputs	new_pnrn.tb	BRT/streetcar PNR lots	Text	Transit network	transit_skims_??.s	10
41	inputs	NHO_NL_MC.MTT	Pre-existing mode choice model output	Binary	Assumptions	pp_auto_drivers.s	
42	inputs	NHW_NL_MC.MTT	Pre-existing mode choice model output	Binary	Assumptions	pp_auto_drivers.s	
43	inputs	Node.dbf	XY coordinates of nodes in highway network	DBF	Highway network	AreaType_File.s	
44	inputs	NT_Tfac.dbf	NT Toll Factors by Vehicle Type	DBF	Assumptions	Highway skimming and assignment	
45	inputs	Pen.dbf	List of TAZs considered to be in the "slugging" shed of the Pentagon	DBF	Assumptions	Autoacc5.s	
46	inputs	PM_Tfac.dbf	PM Toll Factors by Vehicle Type	DBF	Assumptions	highway_assignment.s	
47	inputs	schl.adr	School Auto Driver Trips	Binary	Assumptions	misc_time-of-day.s	

No.	Folder	Filename	Description	File Type	Category	Modeling step where file is used	Transit/ Non-Transit Mode(s)
48	inputs	StaAcc.dbf	Lookup table: Maximum drive-access-to-transit distances	DBF	Assumptions	Autoacc5.s	
49	inputs	station.dbf	Station file: Metrorail, commuter rail, LRT stations/PNR lots and bus PNR lots	DBF	Transit network	parker.s	
50	inputs	tariff.txt	WMATA tariff policy	Text	Assumptions	mfare1.s	
51	inputs	taxi.adr	Taxi Auto Driver Trips	Binary	Assumptions	misc_time-of-day.s	
52	inputs	tazfrzn.asc	Fare Zone File	Text	Assumptions	prefarv23.s	
53	inputs	Toll_Esc.dbf	Toll escalation assumptions: Highway tolls & deflators	DBF	Assumptions	V2.3_Highway_Build.s	
54	inputs	trnpen.dat	Turn Penalty file to ensure correct Metrorail fares	Text	Assumptions	metrorail_skims.s	
55	inputs	visi.adr	Visitor Auto Driver Trips	Binary	Assumptions	misc_time-of-day.s	
56	inputs	xtrawalk.dbf	Extra walk links that the analyst wishes to include	DBF	Transit network	walkacc.s	13
57	inputs	xxaut.vtt	Auto Driver Through Trips	Binary	Assumptions	misc_time-of-day.s	
58	inputs	XXCVT.vtt	Com/Mtk/Htk through Trips	Binary	Calculated data	misc_time-of-day.s	
59	inputs	Zone.dbf	Land use/land activity data at zonal level, 3722 TAZ	DBF	Land use	AreaType_File.s	
1	support	AM_SPD_LKP.txt	Initial lookup speeds used for highway links, AM period	Text	Highway network	V2.3_Highway_Build.s	
2	support	AttrRates.dbf	Trip Attractions	DBF	Calculated data	trip_generation.s	
3	support	cvdelta_3722.trp	Calibration matrix, or "delta table" for commercial vehicles	Binary	Assumptions	misc_time-of-day.s	
4	support	equiv_toll_min_by_inc.s	Equivalent minutes (min/'07$) by period & income level	Text	Assumptions	trip_distribution.s	
5	support	HBincRat.dbf	HB Income Shares	DBF	Calculated data	trip_generation.s	
6	support	hwy_assign_capSpeedLookup.s	FT x AT Speed & Capacity lookup	Text	Highway network	highway_assignment.s	
7	support	hwy_assign_Conical_VDF.s	Volume Delay Functions file	Text	Highway network	highway_assignment.s	
8	support	MD_SPD_LKP.txt	Initial lookup speeds used for highway links, midday	Text	Highway network	V2.3_Highway_Build.s	
9	support	NMArates.dbf	Non-motorized Trip Attractions	DBF	Calculated data	trip_generation.s	
10	support	NMPrates.dbf	Non-motorized Trip Productions	DBF	Calculated data	trip_generation.s	
11	support	TAZ3722_to_7Mrkts.txt	Equivalency between TAZs and mode choice superdistricts	Text	Assumptions	PP_Auto_Drivers.s	
12	support	tkdelta_3722.trp	Calibration matrix, or "delta table" for med and hvy truck	Binary	Assumptions	misc_time-of-day.s	
13	support	todcomp_2008HTS.dbf	Time of day model/factors	Binary	Assumptions	time-of-day.s	
14	support	toll_minutes.txt	Toll minutes equivalence file by Vehicle Type	Text	Assumptions	Highway_skims.s	
15	support	TPBMod_Jur_Boundary.shp	Jurisdictional boundaries	SHP	Network	Network editing with Cube Base	
16	support	Truck_Com_Trip_Rates.dbf	Truck and Commercial Vehicle Trip Rates	DBF	Calculated data	truck_com_trip_generation.s	
17	support	True_Shape_2040_Nov20.shp	Used to display highway network with True Shape	SHP	Highway network	Network editing with Cube Base	
18	support	Ver23_f_factors.dbf	F-factors for trip distribution	DBF	Calculated data	trip_distribution.s	
19	support	weighted_trip_rates.dbf	Trip Productions	DBF	Calculated data	trip_generation.s	

* This file is created automatically by set_factors.s from the station.dbf file.

Ref: v2.3.75_inputs_v1.xlsx

Pre-established "parent" and "child" batch files for executing the model reside in the root subdirectory. Typically, "parent" batch files are edited to correspond to each modeled scenario, while "child" batch files remain unaltered. The parent batch files can be named as the user likes. The two main parent batch files are the "wrapper" batch file and the "run model steps" batch file (the latter file used to be called the "run all" batch file). Details about these two files can be found in section 6.2 ("Parent batch files") on page 57. The child batch files are the ones that actually execute individual modeling steps, such as the trip generation step (e.g., Trip_Generation.bat) or the traffic assignment step (e.g., Highway_Assignment_Parallel.bat). Child batch files generally call the Cube Voyager scripts and/or Fortran programs. The child batch files also assign names to report files that result from each model step. Listing files are typically assigned file extensions of RPT or TAB. The former refers to Cube Voyager report or listing files, while the latter refers to a subset tabulation of the report file containing only trip table totals or jurisdictional summaries. Parent batch files are used to string child batch files together so that the entire model execution can be initiated with a single command or batch file. The parent batch files also establish Windows environment variables that are used in the child batch files and Cube Voyager scripts, such as the iteration number, the model year, and the model description.

As stated earlier, all the input files located in the "inputs," "controls," and "support" folders are listed in Table 9. It is the user's responsibility to make sure that the generically named files are appropriate for the modeled scenario and are in the prescribed format (described later). Additionally, almost all the files shown in Table 9 must exist for the model run to complete successfully, with the exception of some files such as the shapefiles used for displaying a highway network in True Shape mode (True_Shape_2040_Nov20.shp). The advantage of using generic filenames is that the input and output filenames referenced in each Cube Voyager script and control file do not need to be tailored to match the different scenarios that are run. The disadvantage of using generic filenames is that, when moving or sharing files, two files with the same name could be quite different (e.g., zone.dbf for the year 2019 has the same name as zone.dbf for the year 2045). Thus, the metadata that describes the scenario name is stored in the name of the output subdirectory (e.g., "2019_Final"), not in the filenames themselves.

The SOFTWARE folder contains two Fortran executable programs (AEMS.exe and extrtab.exe), one C++ executable program (LineSum.exe),[50] and several dynamic-link library (DLL) files, as shown in Table 10.

[50] In the future, if we replace AEMS with TRANSIMS ModeChoice, this folder will also include the C++ mode choice application program ModeChoice.exe.

Table 10 Fortran and C++ executable files and dynamic-link library files required for running the Version 2.3 travel model

Executable Name	Ver	Date	Size (bytes)	Program Function	Requires a control file?
AEMS.exe		2/13/2012	195,900	Mode choice application program (Fortran, 32-bit)	yes
cw3240.dll		2/13/2012	827,392	Dynamic-link library file associated w/ AEMS.exe	no
DFORMD.dll		2/13/2012	425,984	Dynamic-link library file associated w/ AEMS.exe	no
extrtab.exe		2/13/2012	464,559	Extracts sections from Cube Voyager report files (Fortran, 32-bit)	no
Linesum.exe	6.0.2	3/26/2014	697,344	Creates reports summarizing transit loaded link files (C++, 32-bit)	yes

Note: There are two Cube DLL files needed for running AEMS.exe: Tppdlibx.dll and Tputlibc.dll.[51] These two files come with Cube. **These are not stored in the software folder**, but when AEMS runs, it needs to "see" these two files. This can be accomplished by either 1) placing a copy of these two files in the folder where AEMS runs (the SOFTWARE folder under the root folder of the model run); OR 2) **setting the Windows PATH environment variable to point to the location where these DLL files exist**. **It has been found that the second option is generally the best one**. One complicating factor is the fact that Cube Base is 32-bit and Cube Voyager is 64-bit, and each comes with a version of these two files (see Table 11). **AEMS needs the 32-bit version** (which is stored here: C:\Program Files (x86)\Citilabs\CubeVoyager). For more information about setting the Windows PATH environment variable, see section 5.1 ("Software installation").

Table 11 Location for Cube DLL files

Cube DLL File	Location for 32-bit version	Location for 64-bit version
TPPDLIBX.DLL	C:\Program Files (x86)\Citilabs\Cube\ C:\Program Files (x86)\Citilabs\CubeVoyager\	none C:\Program Files\Citilabs\CubeVoyager\
TPUTLIBC.DLL	C:\Program Files (x86)\Citilabs\Cube\ C:\Program Files (x86)\Citilabs\CubeVoyager\	none C:\Program Files\Citilabs\CubeVoyager\

A listing of child batch files is provided in Table 12. The table also indicates the programs and/or Cube Voyager scripts that are invoked and the purpose of each batch file. Given the iterative application process of the model, most of the batch files are called multiple times during a model run. The sequence of batch file applications, by iteration, is shown in Table 13. The table indicates that there are 48 batch file steps called during a standard application of the model. Some of the batch files are called once, while others (e.g., *Trip_Generation.bat*) are called during the pump-prime and all four standard iterations. A parent batch file ("*run_ModelSteps*.bat*") is used to string each of the child batch files together during a typical model execution. The parent batch files, like child batch files, reside in the root subdirectory. Two parent batch files are typically prepared for each individual model run. The process for executing a model is addressed in the next section. The remaining chapters address the specific details of each modeling step.

[51] In earlier versions of Cube, the filename of the second file omitted the letter "c": Tputlib.dll

Table 12 Child batch files used to run the Version 2.3 Travel Model

Batch File	Scripts/Programs	Purpose
set_up_model_run_folders.bat	None	Not used in the running of the mode, but can be used to set up folders for a new model run.
ArcPy_Walkshed_Process.bat	MWCOG_Prepare_Inputs_to_Walkshed_Process_PT.s MWCOG_Prepare_Inputs_to_Walkshed_Process_TRNBUILD.s	Run the automated/integrated ArcPy/Python transit walkshed process
Set_CPI.bat	Set_CPI.s Set_Factors.s	Create highway and transit cost deflators. Create K factors and time penalties. Create station_names.dbf file from station.dbf file.
PP_Highway_Build.bat	AreaType_File.s V2.3_higway_build.s	Build highway networks.
PP_Highway_Skims.bat (see also Highway_Skims.bat)	Highway_skims_am.s Highway_skims_md.s Modnet.s CheckStationAccess.s Highway_skims_mod_am.s Highway_skims_mod_md.s Joinskims.s Remove_PP_Speed.s	Create AM/off-peak highway skims. Check whether stations are accessible
Transit_Skim_All_Modes_Parallel.bat	parker.s walkacc.s autoacc5.s transit_Accessibility.s Transit_Skim_LineHaul_Parallel.bat Transit_Skims_AB.s Transit_Skims_BM.s Transit_Skims_CR.s Transit_Skims_MR.s	Create the transit network: • Create transit access links • Create transit network • Skim the four transit submodes Also runs the transit accessibility process.
Transit_Fare.bat	prefarV23.s Metrorail_skims.s MFARE1.s MFARE2.s Assemble_Skims_MR.s Assemble_Skims_BM.s Assemble_Skims_AB.s Assemble_Skims_CR.s	Create transit fares for the current speed feedback iteration.
Trip_Generation.bat	Demo_Models.s Trip_Generation.s Trip_Generation_Summary.s Truck_Com_Trip_Generation.s	Execute daily trip generation.
Trip_Distribution.bat	Prepare_Ext_Auto_Ends.s Prepare_Ext_ComTruck_Ends.s Trip_Distribution_External.s Prepare_Internal_Ends.s Trip_Distribution_Internal.s	Execute daily trip distribution.
Mode_Choice_Parallel.bat	MC_purp.bat => AEMS.EXE mc_NL_summary.s	Execute the daily mode choice model (in P/A format).

Batch File	Scripts/Programs	Purpose
copyBaseMC_to_final_inputs.bat	None	Not currently called as part of a model run. Could potentially be used by modeler to copy pre-existing NL mode choice model output into the input folder for new run.
Auto_Driver.bat	mc_Auto_Drivers.s	Generate initial auto driver trips after mode choice.
PP_Auto_Drivers.bat	PP_Auto_Drivers.s	Generate initial auto driver trips without the use of the mode choice model.
Time-of-Day.bat	Time-of-Day.s Misc_Time-of-Day.s Prepare_Trip_Tables_for_Assignment.s	Convert daily modeled trips to AM, PM, midday, and night. Convert trip tables from P/A format to O/D format.
Highway_Assignment_Parallel.bat	Highway_Assignment_Parallel.s	Execute user equilibrium highway assignment for four time-of-day periods
Average_Link_Speeds.bat	Average_Link_Speeds.s	Compute average link speeds. Run for only speed feedback iterations 2-4
Highway_Skims.bat	Highway_Skims_am.s Highway_Skims_md.s modnet.s Highway_Skims_mod_am.s Highway_Skims_mod_md.s joinskims.s	Build zone-to-zone paths on the highway network and skim the times and costs on each path. Store the skimmed times and paths in matrix files.
Transit_Assignment_Parallel.bat	Combine_Tables_For_TrAssign_Parallel.s Transit_Assignment_LineHaul_Parallel.bat Transit_Assignment_AB.s Transit_Assignment_BM.s Transit_Assignment_CR.s Transit_Assignment_MR.s	Execute the transit assignment (P/A format) for peak and off-peak periods
TranSum.bat	LineSum_*.ctl (such as LineSum_Volume.ctl, or lineSum_MR_access.ctl)	Summarize the transit assignment
dateName.bat	None (used by searchForErrs.bat)	
searchForErrs.bat	None	Searches through log and print files for possible error codes
move_temp_files_v6.bat	None	Moves temporary files to a location where they can be later deleted manual by the modeler.
updating_tpp_dll_files.bat	None	Not used for a model run. In the past, this batch file could be used to put the TP+ DLL files in the correct location, but this file is no longer used.

Table 13 Sequence of the batch files used to run the Version 2.3 Travel Model

		Speed Feedback Iteration				
Batch File	**Scripts/Programs**	**PP**	**1**	**2**	**3**	**4**
ArcPy_Walkshed_Process.bat	MWCOG_Prepare_Inputs_to_Walkshed_Process_PT.s MWCOG_Prepare_Inputs_to_Walkshed_Process_TRNBUILD.s	1				
Set_CPI.bat	Set_CPI.s Set_Factors.s	2				
PP_Highway_Build.bat	AreaType_File.s V2.3_higway_build.s	3				
PP_Highway_Skims.bat (see also Highway_Skims.bat)	Highway_skims_am.s Highway_skims_md.s Modnet.s CheckStationAccess.s Highway_skims_mod_am.s Highway_skims_mod_md.s Joinskims.s Remove_PP_Speed.s	3				
Transit_Skim_All_Modes_Parallel.bat	parker.s walkacc.s autoacc5.s transit_Accessibility.s Transit_Skim_LineHaul_Parallel.bat Transit_Skims_AB.s Transit_Skims_BM.s Transit_Skims_CR.s Transit_Skims_MR.s	5	12	21	30	39
Transit_Fare.bat	prefarV23.s Metrorail_skims.s MFARE1.s MFARE2.s Assemble_Skims_MR.s Assemble_Skims_BM.s Assemble_Skims_AB.s Assemble_Skims_CR.s		13	22	31	39
Trip_Generation.bat	Demo_Models.s Trip_Generation.s Trip_Generation_Summary.s Truck_Com_Trip_Generation.s	6	14	23	32	41
Trip_Distribution.bat	Prepare_Ext_Auto_Ends.s Prepare_Ext_ComTruck_Ends.s Trip_Distribution_External.s Prepare_Internal_Ends.s Trip_Distribution_Internal.s	7	15	24	33	42
Mode_Choice_Parallel.bat	MC_purp.bat => AEMS.EXE mc_NL_summary.s		16	25	34	43
Auto_Driver.bat	mc_Auto_Drivers.s		17	26	35	44
PP_Auto_Drivers.bat	PP_Auto_Drivers.s	8				
Time-of-Day.bat	Time-of-Day.s Misc_Time-of-Day.s Prepare_Trip_Tables_for_Assignment.s	9	18	27	36	45
Highway_Assignment_Parallel.bat	Highway_Assignment_Parallel.s	10	19	28	37	46

		Speed Feedback Iteration				
Batch File	**Scripts/Programs**	**PP**	**1**	**2**	**3**	**4**
Highway_Skims.bat	Highway_Skims_am.s Highway_Skims_md.s modnet.s Highway_Skims_mod_am.s Highway_Skims_mod_md.s joinskims.s	11	20	29	38	47
Transit_Assignment_Parallel.bat	Combine_Tables_For_TrAssign_Parallel.s Transit_Assignment_LineHaul_Parallel.bat Transit_Assignment_AB.s Transit_Assignment_BM.s Transit_Assignment_CR.s Transit_Assignment_MR.s					48
TranSum.bat	LineSum_*.ctl (such as LineSum_Volume.ctl, or lineSum_MR_access.ctl)					49

5 Preparing to run the model

Before the travel model can be run, one must install the necessary software, as described in the next section.

5.1 Software installation and setting the Windows PATH environment variable

Step 1: Make sure you are logged on to your computer with administrator privileges, so you can install software (or ask your IT department to perform the installation).

At COG, you will need to be a member of these two groups: "Administrators" and "SophosAdministrator" (the second group is associated with antivirus software). In other agencies, there may be other requirements. Additionally, based on testing done at COG, the mode choice application program (AEMS.EXE) may not work if you are not part of the Administrators group.

Step 2: Verify that your computer is running a 64-bit version of Windows, since this is needed to install the 64-bit version of Cube Voyager (Cube Base is still 32-bit software).

<Windows key><Pause/Break> will bring up the System Properties window. The "System Type" should be listed as "64-bit Operating System." Alternatively, if you prefer using the command prompt, you can run the command "systeminfo | more":

- If you are running a 32-bit version of Windows, you will see "System Type: X86-based PC". This will not allow you to install the 64-bit version of Cube Voyager, so you will not be able to run the Ver. 2.3.75 model.
- If you are running a 64-bit version of Windows, you will see "System Type: x64-based PC".

On 64-bit versions of Windows

- 64-bit software, such as Cube Voyager, is stored here: "C:\Program Files".

- 32-bit software, such as Cube Base, is stored here: "C:\Program Files (x86)".

Step 3: Determine the number of cores on your computer.

Again, <Windows key><Pause/Break> will bring up the System Properties window. Here you can see the CPU type (e.g., "Intel Core i5-4590"). You can perform an internet search with this information to find the number of cores that are contained in your processor.

Also, if you open up the Task Manager (keyboard combination <CTRL><SHIFT><ESC>) and select the Performance tab, you can see the number of cores that the Windows operating system sees, as well as the number of logical processors (see Figure 12).

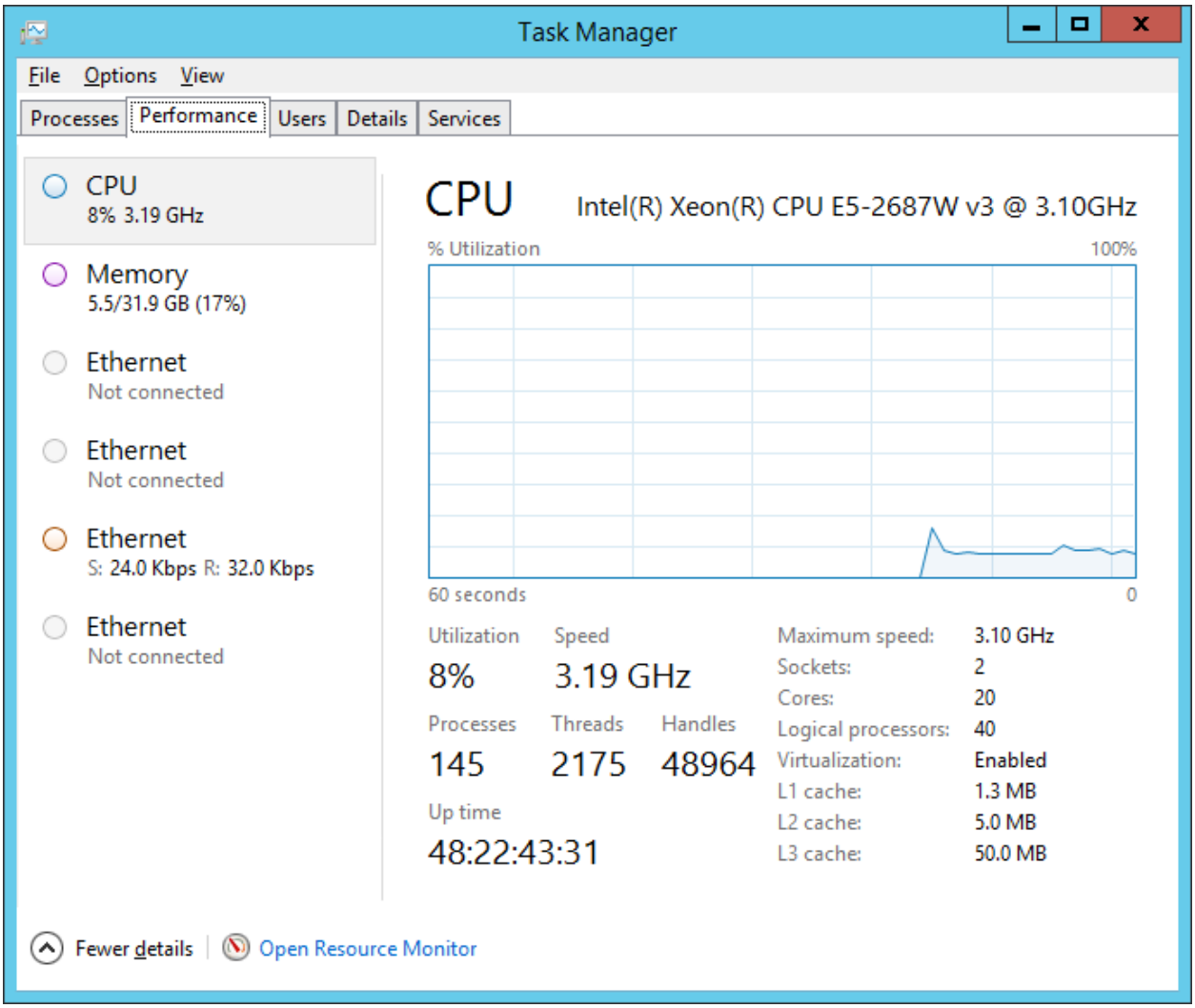


Figure 12 Number of cores and logical processors

In this example, Windows sees 20 cores and 40 logical processors. If the number of logical processors is double the number of cores, this means that Intel's Hyper-Threading Technology is turned on. Intel's

Hyper-Threading Technology allows each core to handle two threads, so the operating system (OS) will see twice as logical processors as the actual number of physical cores.

Step 4: Install Citilabs Cube Base and Cube Voyager software, according to the vendor's instructions. If you have purchased the license for Cube Cluster, this will also be installed at this point.

Once you have installed Cube Base, you can open it and click on help (" ") and "About…", which should bring up a window like the following:

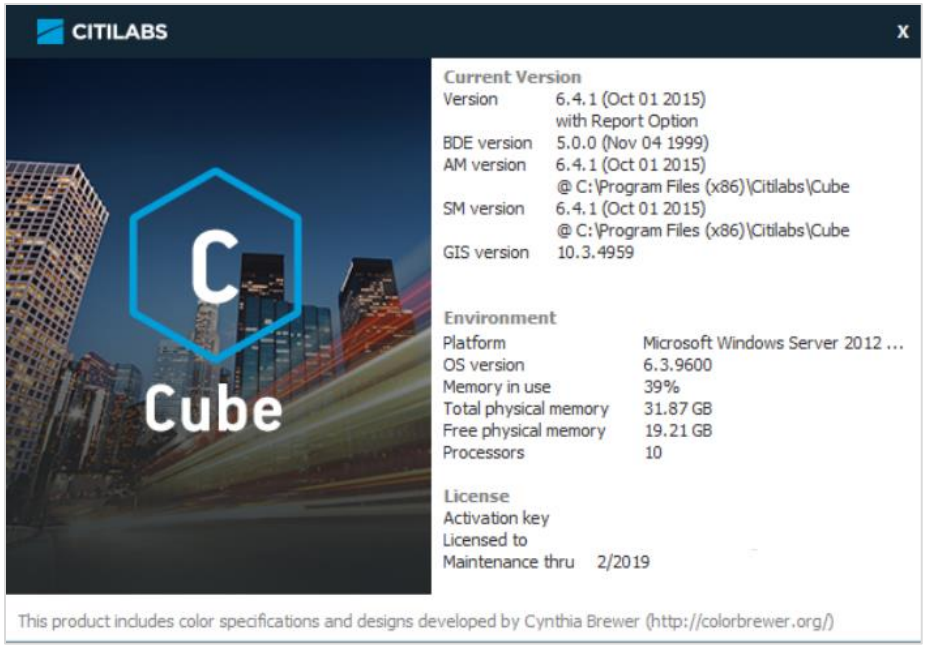


Figure 13 Citilabs Cube 6.4, "About" message window

From this window, we can see that we have installed Cube Base, version 6.4.1. The maintenance license expires in Feb. 2019. Cube sees 10 processors, even though this is on a computer with 20 cores and 40 logical processors.

If you are running the Ver. 2.3 Travel Model on a computer with fewer than 8 logical processors, you will need to follow the instructions in Table 19 (p. 84) before running the Ver. 2.3 Travel Model.

Determining if you have Cube Cluster: If you wish to determine whether a given computer includes a Cube Cluster license, open Cube Voyager and click the "About Voyager" button. If your computer has a Cube Cluster license, you should see "with Cluster License" (as shown in Figure 14).

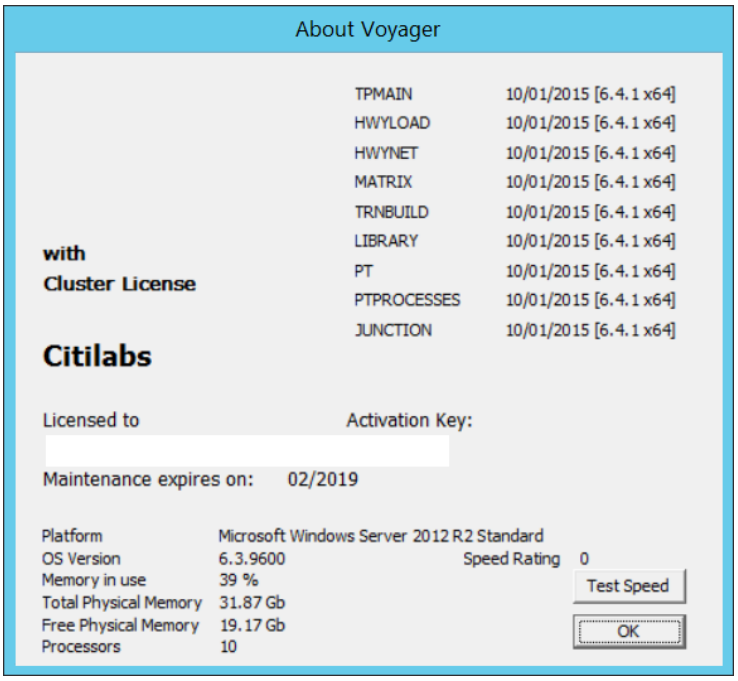


Figure 14 "About Voyager": Presence of Cube Cluster license

According to Citilabs, the "Test Speed" button is no longer active. This window also shows 10 processors, even though this computer has 20 cores and 40 logical processors.

Step 5: Make sure that the version of PowerShell is 3.0 or higher. One may check their PowerShell version by using $PSVersionTable command in Windows PowerShell.

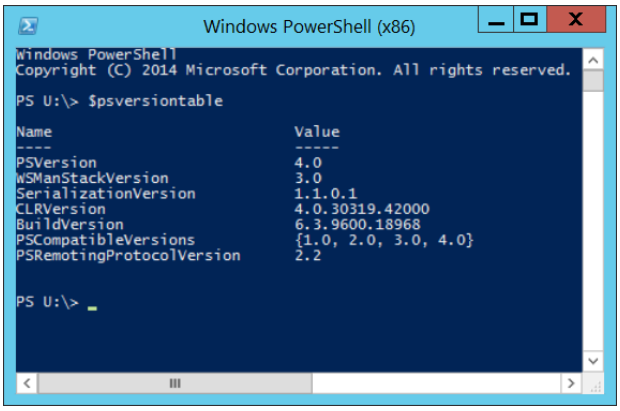


Figure 15 Windows PowerShell version

Most computers will likely be running Windows PowerShell 3.0 (or more recent), which comes preinstalled with Windows operating systems. If the version of PowerShell is 1.0 or 2.0, which may come with older versions of Windows, such as Windows XP or Windows Server 2008 SP1, the framework needs an upgrade to a more recent version. The steps to install a more recent Windows PowerShell version can be found in the Microsoft webpage "https://docs.microsoft.com/en-us/powershell/scripting/setup/installing-windows-powershell?view=powershell-6".

Step 6: If you do not already have one, install the text editor of your choice, such as Notepad++ or PSPad. Notepad++ is free and open source. PSPad is free but is not open source. Each of these text editors has it pluses and minuses, in terms of syntax highlighting, code folding, and other features, such as diffing two text files. Some non-open source text editors may include bloat-ware, which you may not want, so, when performing the installation, you need to be vigilant and de-select any options you do not want.

Step 7: (Optional) Install Cygwin (http://www.cygwin.com/). **Like Ver. 2.3.70, the Ver. 2.3.75 model does not need this software**. Nonetheless, some users may still choose to install this software, due to its ability to offer various Unix-like utility commands. This is a free, open source software package that provides a Linux-like environment for Windows. It provides a series of Unix-like command-line tools, such as head, tail, and which. Cygwin comes in two versions: a 32-bit version (setup-x86.exe) and a 64-bit version (setup-x86_64.exe). Normally, we would advise you to install the version that is appropriate for your computer. However, in the past, we have found that, in the 64-bit version of Cygwin, the head and tail commands did not seem to work correctly. **Consequently, if you choose to install Cygwin, we recommend that you install the 32-bit version of the software**.

1. Download the 32-bit version of Cygwin: setup-x86.exe.
2. Double click the setup file to run. It will install a default set of packages. You can always add more in the future by rerunning the setup file.

Do not forget where this file is, since you might need to run it in the future to add or remove components from Cygwin. The recommended location is to place the file is in a folder in your "downloads" folder (e.g., C:\Users\<username>\downloads\cygwin). Once you have done this, you should create a shortcut to the setup file on the Windows Desktop so that you can find this file easily in the future. As an alternative, you can also store the setup file directly on the Windows Desktop. The disadvantage with this second location is that, during the installation procedure, Cygwin will place a folder of downloaded files on the Desktop, and this folder may have an odd name, such as "ftp%3a%2f%2fftp.gtlib.gatech.edu%2fpub%2fcygwin%2f".

Step 8: Set the Windows PATH environment variable.

Among other files, the 32-bit software folder (C:\Program Files (x86)\Citilabs\CubeVoyager) contains the following files:

```
10/01/2015  07:11 AM         3,416,528 CLUSTER.EXE
10/01/2015  07:44 AM           111,056 RUNTPP.EXE
10/01/2015  07:44 AM           415,744 TPPDLIBX.DLL
10/01/2015  07:44 AM           152,576 TPUTLIBC.DLL
```

By contrast, the 64-bit software folder (C:\Program Files\Citilabs\CubeVoyager) contains the following files:

```
10/01/2015  07:11 AM         4,206,544 CLUSTER.EXE
10/01/2015  07:45 AM           150,480 RUNTPP.EXE
10/01/2015  07:45 AM           373,712 VOYAGER.EXE
```

```
10/01/2015  07:44 AM           511,488 TPPDLIBX.DLL
10/01/2015  07:44 AM           178,688 TPUTLIBC.DLL
```

AEMS.EXE requires the use of the two TP DLL files in the 32-bit folder (C:\Program Files (x86)\Citilabs\CubeVoyager), so the Windows PATH variable should point to that folder. However, the 32-bit folder contains the wrong version of Cluster and does not contain Voyager.exe at all. Luckily, when Voyager.exe is called using the "start /w" command, Windows knows how to find the correct version of Voyager (in this case, the only version of Voyager). Thus, as a minimum, you will want to add the following two paths to your Windows PATH environment variable:

64-bit version of Windows	**Reason**
C:\cygwin\bin	Needed to run Cygwin from the command line
C:\Program Files (x86)\Citilabs\CubeVoyager	Needed so that AEMS can find the two TP DLL files (Tppdlibx.dll and Tputlibc.dll)

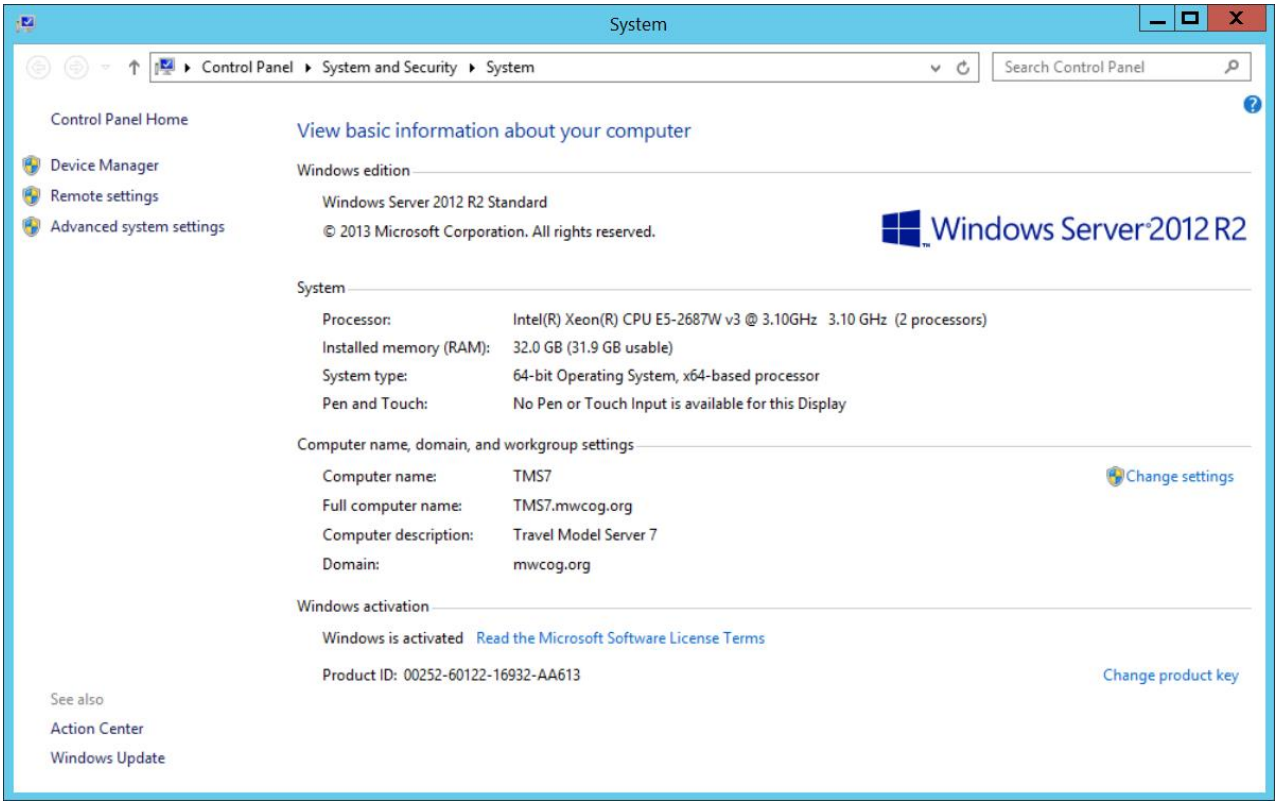
Additionally, the following paths might also be useful additions to your Windows PATH environment variable:

64-bit version of Windows	**Reason**
C:\Program Files (x86)\PSPad editor	To be able to open the PSPad text editor from the command line
C:\Program Files (x86)\WinMerge	To be able to open WinMerge from the command line

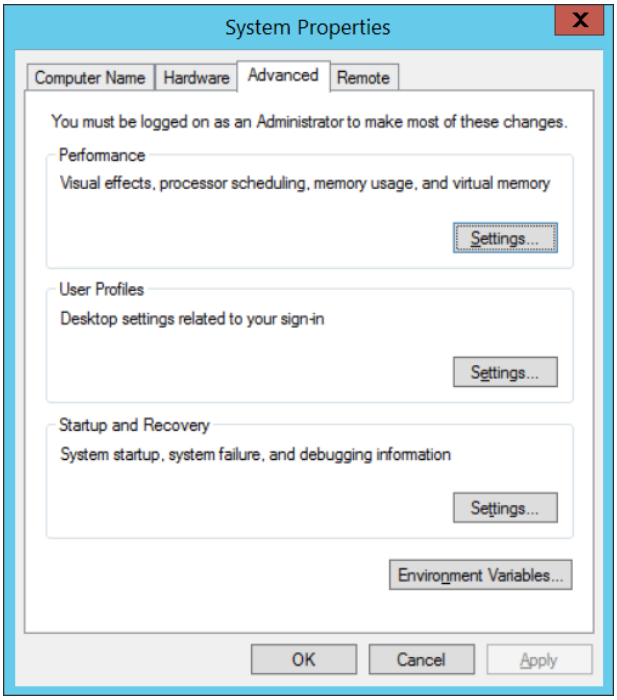
Here are instructions for updating the Windows PATH environment variable:

Hold down these two keys simultaneously to bring up the Windows System Properties window:

<Windows key><Pause/Break key>

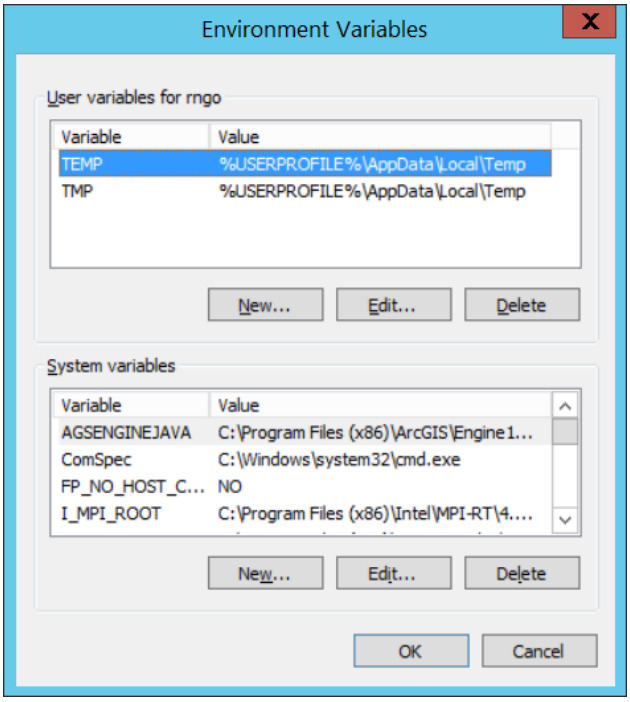


Click "Advanced system settings." Click the "Advanced" tab.

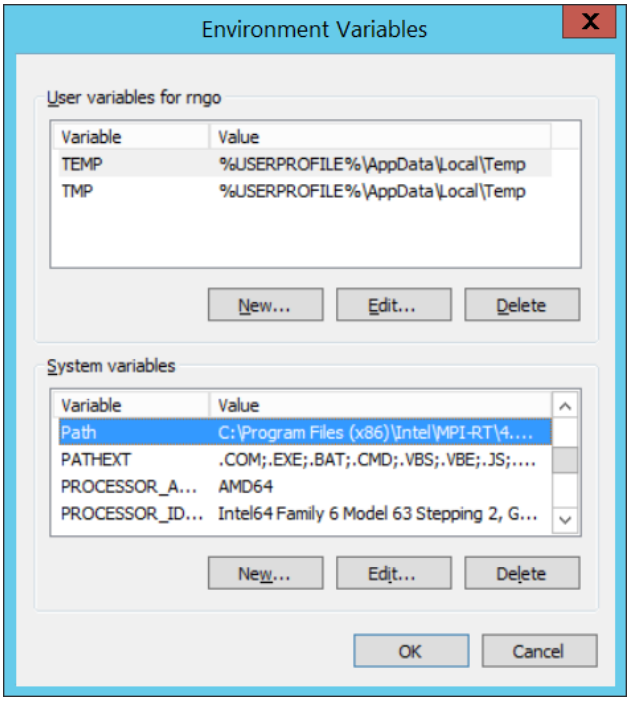


Click the "Environment Variables" button.

The lower half of this window contains "system variables."



Find the "Path" environment variable in the lower half of this window.



Click "Edit."

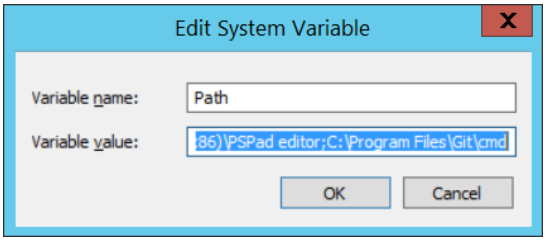
Add the Windows paths that you want. Add these to the end of the Path variable, using a semicolon (";") as the separator.

For example, this path:

```
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
```

Would become this path:

```
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\;C:\Program Files (x86)\Citilabs\CubeVoyager;C:\cygwin\bin
```



Click "OK" three times.

To test whether Cygwin is working correctly, open a command window and type a Cygwin command, such as

```
which ls
```

Or

```
tail --help
```

To test Cube Voyager, type:

```
start /w voyager
```

Or

```
cluster
```

Step 9: Useful, but not essential: Install Winmerge and update the PATH environment variable to include:

C:\Program Files\WinMerge

Step 10: You may want to associate *.net files with Cube.exe. This will allow the file i4_assign_output.net to be opened in Cube automatically at the completion of a model run. You may also want to associate *.txt and *.rpt files with your preferred text editor. At the completion of a model run, the "run model" batch file tries to open several of these files (such as i4_Highway_Assignment.rpt). By setting up the desired file association, these files will be opened at the end of the model run using the desired text editor (versus the default Windows text editor, which is Notepad).

5.2 Preparing input files and calculating zonal percent-walk-to-transit values

After a person has requested the COG/TPB travel model from COG/TPB staff (https://www.mwcog.org/transportation/data-and-tools/modeling/data-requests/), he or she will be sent a transmittal memo and the actual travel model, including its inputs. If the user wants to simply run the travel model for the years/scenarios that have been supplied by COG/TPB staff, then there is no need to make any changes to the model inputs (This also pre-supposes that the user has required hardware and software, as specified in this user's guide).

In the Ver. 2.3.66 travel model and earlier versions, one of the first steps in the run_modelSteps batch file was to run the automated transit walkshed process: "call *ArcPy_Walkshed_Process.bat* %1". Due to instabilities with ArcGIS and the ArcGIS runtime engine that is packaged with Cube, the automated transit walkshed process is one of the model steps that is most likely to fail (premature stop or crash). This is especially true with the ArcGIS runtime engine that comes with Cube 6.4.2. For this reason, when we transmit the model to end users, the automated transit walkshed process is turned off (commented out in the run_modelsteps batch file). This is not a problem for most users, since we provide in the inputs folder the primary output file (areawalk) from the automated transit walkshed process. If, however, a user wishes to make changes to the transit network, then we recommend uncommenting this step to allow the automated transit walkshed process to run. The new transit walkshed process is discussed in section 11 ("Building transit walksheds and calculating zonal walk percent") of this report, beginning on p. 95.

6 Running the model

As noted in the "Hardware and software " section, the Version 2.3 Travel Model is implemented using Citilabs Cube software. Cube Base is the graphical user interface (GUI) for the Cube suite of software. Cube base can be used for editing Cube Voyage scripts, editing transportation networks, viewing matrix files, managing network scenarios (Scenario Manager), and running travel models (Application Manager). However, the Version 2.3 Travel Model is not launched using Cube Base's Application Manager. Instead, the Version 2.3 Travel Model is implemented using a command-line interface (CLI) that is initiated from a Windows command window (also called a DOS command window by some, although DOS no longer exists).

6.1 Updating the Windows PATH environment variable

It is important to update the Windows PATH environment variable, as described in section 5.1 ("Software installation and setting the Windows PATH environment variable").

The next section describes a simple example of how to run the travel model. Following that are two sections that describe the wrapper batch file and the "run model steps" batch file in more detail.

6.2 Parent batch files

To run the Version 2.3 Travel Model (including Ver. 2.3.75), the user must edit two batch files and then run one of the batch files, which, in turn, will call the other file. These two batch files are known as the parent batch files, since they call a series of other batch files (known as the child batch files). The first

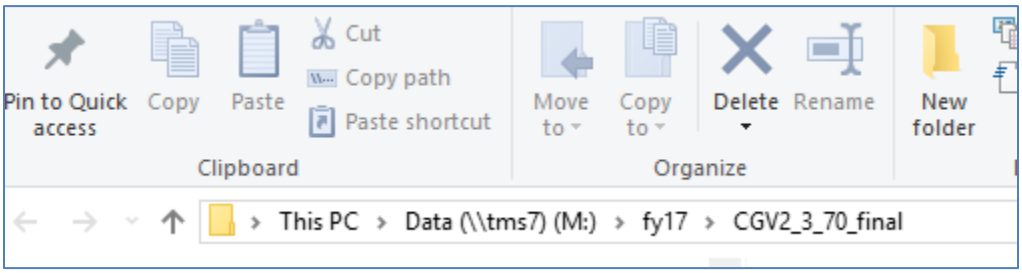
parent batch file is called the "wrapper" batch file or the "run model" batch file (an example can be seen in Figure 16). The second parent batch file is called the "run model steps" (formerly "run all") batch file (an example can be seen in Figure 17). In computer programming, the term "wrapper function" is used for a function whose main purpose is to call a second function and set up a computing environment for that second function. We are using this term in a similar vein, since the main purpose of our wrapper batch file is to call a second batch file (the "run model steps" batch file) and set up the running environment for the model run. Once the user has edited the two parent batch files with a text editor, the user launches the model run by launching the wrapper batch file either directly or within a command prompt window that is pointing to the root directory. For example, if the root directory is "C:\modelRuns\fy18\Ver2.3. 75_aqc_Vis2045", then **the user would open a command prompt window at this location and type the name of the "run model"/wrapper batch file and press Enter to execute it.** This process is described in more detail below, along with some preliminary information needed to make the model run correctly.

There is typically a "run model" batch file and a "run model steps" batch file for each scenario/year that is modeled, e.g.,:

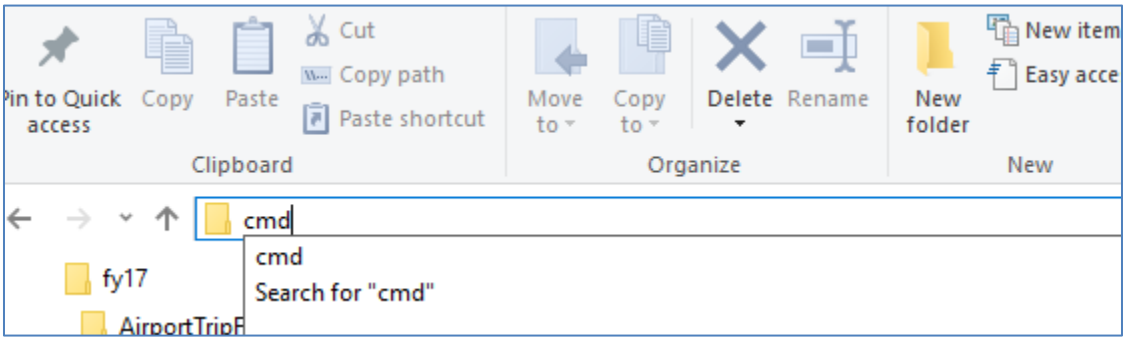
```
run_Model_2019_Final.bat
run_ModelSteps_2019_Final.bat

run_Model_2021_Final.bat
run_ModelSteps_2021_Final.bat

run_Model_2025_Final.bat
run_ModelSteps_2025_Final.bat

run_Model_2030_Final.bat
run_ModelSteps_2030_Final.bat

run_Model_2040_Final.bat
run_ModelSteps_2040_Final.bat

run_Model_2045_Final.bat
run_ModelSteps_2045_Final.bat
```

To launch a model run, one needs to open a Windows command window that points to the location where you have placed the parent batch files (the so-called "root" folder). One way to do this is to open Windows Explorer (File Explore in some versions of Windows) and navigate to the root folder, and then select the root folder by clicking it once. In earlier versions of Windows, one would select the folder in the left pane, and then, with nothing selected in the right pane, one would use the mouse to **shift-right-click** in the right pane, selecting "Open Command Window Here." However, in newer versions of Windows, this action results in the option to "Open PowerShell window here." Since the model is currently not run under Windows PowerShell, one should not select this option. Instead, one can do one of the following:

- Either, open a command window using the Windows Start button, and change the directory to the desired directory by using the change directory (CD) command. One can copy the desired path from the address bar of the file explorer:



- Or, one can put the cursor in the address bar and type "cmd". This will open a command window whose current path is the path that had been in the address bar of the Windows file explorer:



The main drawback to using the second approach is that after one types cmd in the address box, the address box seems to no longer contain the original path, even though the Windows File Explorer still seems to show this location and the files stored in this location. Thus, after one types "cmd" in the address box, when one clicks in the box a second time, one will see this:

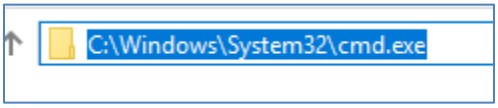


Figure 16 "Run model" batch file for 2019_Final

```
:: File location
:: Version 2.3.75
:: 2018-09-11 Tue 10:40 AM

set root=.
set scenar=2019_Final
set runbat=run_ModelSteps_2019_Final.bat
:: Environment variables for (multistep) distributed processing:
:: Environment variables for (intrastep) distributed processing:
::     use MDP = t/f (for true or false)
::     use IDP = t/f (for true or false)
::     Number of subnodes:  1-3 => 3 subnodes and one main node = 4 nodes in total
set useIdp=t
set useMdp=t
::  AMsubnode & MDsubnode are used in highway_assignment_parallel.bat/s
set AMsubnode=1-4
set MDsubnode=2-4
::  subnode used in transit fare and transit assignment
::  We no longer use IDP in transit skimming, since it would require 16 cores
set subnode=1-3
```

```
21
22      :: This command will
23      ::  1) time the model run (using timethis.exe and the double quotes)
24      ::  2) redirect standard output and standard error to a file
25      ::  3) Use the tee command so that stderr & stdout are sent both to the file and the screen
26
27      timethis "%runbat%  %scenar%" 2>&1 | tee %root%\%scenar%\%scenar%_fulloutput.txt
28
29      :: Open up the file containing the stderr and stdout
30      if exist %root%\%scenar%\%scenar%_fulloutput.txt     start %root%\%scenar%\%scenar%_fulloutput.txt
31
32      :: Look four errors in the reports and output files
33      call searchForErrs.bat  %scenar%
34      :: Open up the file containing any errors found
35      if exist %root%\%scenar%\%scenar%_searchForErrs.txt  start %root%\%scenar%\%scenar%_searchForErrs.txt
36
37      :: Open up other report files
38      if exist %root%\%scenar%\i4_Highway_Assignment.rpt   start %root%\%scenar%\i4_Highway_Assignment.rpt
39      if exist %root%\%scenar%\i4_mc_NL_summary.txt        start %root%\%scenar%\i4_mc_NL_summary.txt
40      if exist %root%\%scenar%\i4_Assign_Output.net        start %root%\%scenar%\i4_Assign_Output.net
41      cd %scenar%
42      start powershell.exe -noexit -Command get-content i4_ue*AM_nonHov*txt -tail 1; get-content i4_ue*AM_hov*txt -tail 1;
43      get-content i4_ue*PM_nonHov*txt -tail 1; get-content i4_ue*PM_hov*txt -tail 1; get-content i4_ue*MD*txt -tail 1;
44      get-content i4_ue*NT*txt -tail 1
45      cd ..
46      move_temp_files_v6.bat %scenar%
47
48      :: Cleanup
49      set root=
50      set scenar=
51      set runbat=
52      set useIdp=
53      set useMdp=
54      set AMsubnode=
55      set MDsubnode=
56      set subnode=
```

Figure 17 "Run model steps" batch file for 2019_Final

```
1       :: Version 2.3.75
2       :: 2018-09-11
3       :: Version 2.3 TPB Travel Model on 3722 TAZ System
4
5       set _year_=2019
6       set _alt_=Ver2.3.75_2019_Final
7       :: Maximum number of user equilibrium iterations used in traffic assignment
8       :: User should not need to change this.  Instead, change _relGap_ (below)
9       set _maxUeIter_=1000
10
11      :: Not set transit constraint path and files
12      :: Current year no longer used to set the constraint
13
14      set _tcpath_=
15
16
17
18      :: UE relative gap threshold: Progressive (10^-2 for pp-i2, 10^-3 for i3, & 10^-4 for i4)
19      :: Set the value below
20
21      rem ====== Pump Prime Iteration ========================================
22
23      set _iter_=pp
24      set _prev_=pp
25      set _relGap_=0.01
26
27  REM call ArcPy_Walkshed_Process.bat %1
28      call Set_CPI.bat               %1
```

```
call PP_Highway_Build.bat       %1
call PP_Highway_Skims.bat       %1
call Transit_Skim_All_Modes_Parallel.bat %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call PP_Auto_Drivers.bat        %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 1 ================================================

set _iter_=i1
set _prev_=pp

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 2 ================================================

set _iter_=i2
set _prev_=i1

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 3 ================================================

set _iter_=i3
set _prev_=i2
set _relGap_=0.001

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 4 ================================================

set _iter_=i4
set _prev_=i3
set _relGap_=0.0001

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
```

```
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Transit assignment ============================================
@echo Starting Transit Assignment Step
@date /t & time/t

call Transit_Assignment_Parallel.bat %1
call TranSum.bat %1

@echo End of batch file
@date /t & time/t
:: rem ====== End of batch file ================================================

REM cd %1
REM copy *.txt MDP_%useMDP%\*.txt
REM copy *.rpt MDP_%useMDP%\*.rpt
REM copy *.log MDP_%useMDP%\*.log
REM CD..

set _year_=
set _alt_=
set _iter_=
set _prev_=
set _maxUeIter_=
set _relGap_=
```

6.2.1 Description of the "run model"/wrapper batch file

The first three lines of the "run model" batch file shown in Figure 16 are simply comments. Comments in batch files can be indicated using either a double colon ("::") or the word REM at the start of the line.[52] In line #5, we define a Windows environment variable called "root" and set its value to ".", which simply means the current directory location (i.e., the current directory where one has opened a command prompt). In line #6, we define an environment variable called "scenar" (scenario) and set its value to the model scenario/year we want to run (in this case, 2019_Final, but any string may be used, such as "2030_lowGrowth"). In line #7, we define an environment variable named "runbat" which is used to store the name of the "run model steps" batch file that we will use for the year-2019 model run. Lines 13-20 is where one sets the environment variables that control distributed processing. Distributed processing is covered in more detail later in this report.

Line 27 is the actual line that runs the model. The "timethis" command is used to time how long the command takes to run. In this case, the command being timed is the entire model run. The "2>&1" and "tee" sections of line 27 are explained next. When a program is run in a command-line interface, such as the Windows command window, there are two streams of output information: standard output and standard error. Standard output is information that the program supplies to a user while the program is running, such as messages about finishing a step, or the current TAZ number that is being processed. Standard error is information about errors that occur while running a program, for example, "file not

[52] A single colon (":") before a word indicates a label, which is often the target of a GOTO statement.

found." Normally, both the standard output stream and the standard error stream are sent to the screen (in this case, the Windows command window). However, since model run last many hours, it is not practical for a model user to watch the screen to see what messages occur during the model run. One solution is to redirect these two information streams to a file, instead of the screen, which allows one to review the contents of the file after the model run is completed. The "2>&1" keyword redirects both standard error and standard output to one file (in this case, the file ending with "_fulloutput.txt"). However, the drawback to this approach is that the model user will not see any real-time information on the screen, since all the information is being sent to a file. An alternate approach is to combine the use of "2>&1" with the "tee" command, which splits any stream of information into two streams of identical information. The result of using these two keywords together is that the standard output and standard error streams are sent both to the screen and to a file at the same time. Line 30 simply opens, at the conclusion of the model run, the file containing the standard output and standard error information. The Tee.exe utility program is part of the Windows 2000 Resource Kit.

Line 33 calls a batch file that searches reports and output files for certain errors. Line 35 simply opens this file containing the listing of errors. It should be noted that this file was mainly used for model development, **so it contains little useful information for the average model user. For the average model users, the key file to review is the one that combines the standard output and error information ("_fulloutput.txt")**.

Lines 38 through 40 contain commands which opens other report files, after the model run has completed**. Line 42** (which is so long that it stretches over three lines in Figure 16) contains a PowerShell command that opens a window showing some summary convergence metrics for traffic assignment. **Lastly, line 46 runs the cleanup process**, which divides model output files into two sets: files to keep and temporary files that can be deleted. At the completion of a model run, there are about 26 GB of output files, many of which are temporary or non-final versions of files. The move_temp_files_v6.bat batch file creates the folder "temp_files" and moves about 16 GB of the 26 GB of files to the temp_files folder. **To save disk space, the user can then either delete the temp_files folder or the contents of the temp_files folder** (such as using Windows File Explorer). The advantage of deleting the *contents* of the temp_files folder, but not the folder itself, is that, in multi-user environments, it will be apparent to other model users that the cleanup process has already been run.

6.2.2 Description of the "run model steps" batch files

As stated earlier, there is a "run model steps" batch file for each model run scenario/year. In previous versions of the travel model, such as Ver 2.3.70, these "run model steps" batch files were structured to implement three special modeling procedures:

1. Metrorail constraint to and through the regional core.
2. HOT3+: HOT lanes with free access for HOV3+ (e.g., I-495 and I-95 Express Lanes).
3. HOT2+: HOT lanes with free access for HOV2+ (e.g., I-66 inside the Beltway for 2017-2020).

However, as explained in sections 1.3 and 2.4, starting with the Ver. 2.3.75 model, COG/TPB staff has eliminated the use of the Metrorail constraint to and through the regional core and also the HOV3+ skim

substitution technique for modeling HOT lanes. These changes simplify the development of the "run model steps" batch files, since we now use the same batch file structure for all scenarios of Ver 2.3.75. The setup now excludes HOV2 and HOV3+ skim replacement and the Metrorail constraint procedures (in the past, the Metrorail constraint procedure required extra attention for modeled years after 2020, which had been the constraint year in the past).

Table 14 shows the key changes in three scenario representatives of Ver. 2.3.70 and Ver 2.3.75. For example, the HOV3+ skim replacement procedure, which was invoked in Ver 2.3.70 in the model run representing year-2019 conditions (since HOT lanes existed in that scenario), is not called in Ver 2.3.75. Similarly, the Metrorail constraint and the HOV3+ skim replacement components are not invoked in the year-2040 model run from Ver 2.3.75. **Thus, a "base" scenario is not needed; only a "final" scenario is now needed to run any modeled year**. The final scenario can be called "2019_final" or simply "2019". In Ver 2.3.75, the environment variable "_tcpath_" (transit constraint path) is set to blank/null for all scenarios since the Metrorail constraint path is not needed. Also, the HOV3+ skim substitution/replacement technique is not used in the "run model steps" batch files of all scenarios, this means that the "_HOV3PATH_" environment variable is removed (see Figure 17). Although 2020 is not a conformity year in Visualize 2045, Table 14 still shows the differences between 2020_final scenario model-step batch files of these two versions.

Table 14 Summary of differences to the "run model steps" batch files for the years 2019, 2020, and 2045 in Ver 2.3.70 and Ver 2.3.75

	Year / Scenario model runs		**Metrorail constraint through regional core?**		**HOV2+ skim substitution technique for modeling HOT lanes?**		**HOV3+ skim substitution technique for modeling HOT lanes?**	
	V2.3.70	**V2.3.75**	**V2.3.70**	**V2.3.75**	**V2.3.70**	**V2.3.75**	**V2.3.70**	**V2.3.75**
2019	2019_base	**N/A**	Not used (2020 is constraining year) i.e., "set _tcpath_="	N/A	N/A	N/A	No (Base HOV3+ skims are estimated) i.e., "set _HOV3PATH_="	N/A
	2019_final	2019_final	Not used (2020 is constraining year) i.e., "set _tcpath_="	Not used "set _tcpath_="	N/A	N/A	**Yes** (Base HOV3+ skims are used from the "base" run) i.e., "set _HOV3PATH_=..\2019_base"	**Removed**
2020	2020_base	**N/A**	2020 is the year used to set the constraint, but no change is made to batch file i.e., "set _tcpath_="	N/A	No (Base HOV2&3+ skims are estimated) i.e., "set _HOV3PATH_="	N/A	No (Base HOV3+ skims are estimated) i.e., "set _HOV3PATH_="	N/A
	2020_final	2020_final	2020 is the year used to set the constraint, but no change is made to batch file i.e., "set _tcpath_="	Not used "set _tcpath_="	**Yes** (Base HOV2&3+ skims are used from the "base" run) i.e., "set _HOV3PATH_=..\2020_base"	**Removed**	**Yes** (Base HOV3+ skims are used from the "base" run) i.e., "set _HOV3PATH_=..\2020_base"	**Removed**
2040	2040_base	**N/A**	**Yes** e.g., "set _tcpath_=..\2020_final"	N/A	N/A	N/A	No (Base HOV3+ skims are estimated) i.e., "set _HOV3PATH_="	N/A
	2040_final	2045_final	**Yes** e.g., "set _tcpath_=..\2020_final"	**Removed** "set _tcpath_="	N/A	N/A	**Yes** (Base HOV3+ skims are used from the "base" run) i.e., "set _HOV3PATH_=..\2040_base"	**Removed**

Regarding the 2040_final scenario, whose "run model steps" batch file is shown in Figure 18, Table 14 shows that Ver. 2.3.75 is not using the Metrorail constraint process anymore. Thus, there are four changes to the batch file shown in Figure 18. These changes are highlighted in yellow. First, the "_tcpath_" environment variable is no longer set to the location containing the Metrorail trips for the constraint year, 2020 (see line 16 in Figure 18). Although we could have removed this command entirely from the batch file, we have chosen to leave it there, but with a blank argument, in case, in the future, there would be a need to re-apply the Metrorail constraint. Second, line 32 of Figure 18 is highlighted to indicate that *PP_Highway_Skims.bat* has been modified to adding a check to ensure that no rail stations are disconnected from the road network. Third, the lines that call the Metrorail constraint mode choice process ("call *Mode_Choice_TC_V23_Parallel.bat*") have been changed to apply the mode choice process without constraint ("call *Mode_Choice_Parallel.bat*"). These changes have been highlighted in lines 50, 65, 82, and 99 in Figure 18. Fourth, regarding the modeling of HOT lanes, Table 14 shows us that, a "final" scenario is no longer needed to apply the HOV3+ skim substitution/replacement technique, so we no longer need to designate the location of the HOV3+ baseline skims. Thus, the "_HOV3PATH_" environment variable is removed and the *Highway_Skims.bat* is used instead of *HSR_Highway_Skims.bat* (see lines 39, 54, 70, 87, and 104 in Figure 18).

Figure 18 "Run model steps" batch file for 2040_final

```
1   :: File location
2   :: Version 2.3.75
3   :: 2018-09-10 Mon 03:40 PM
4
5   :: Version 2.3 TPB Travel Model on 3722 TAZ System
6
7   set _year_=2040
8   set _alt_=Ver2.3.75_2040_Final
9   :: Maximum number of user equilibrium iterations used in traffic assignment
10  :: User should not need to change this.  Instead, change _relGap_ (below)
11  set _maxUeIter_=1000
12
13  :: Not set transit constraint path and files
14  :: Current year no longer used to set the constraint
15
16  set _tcpath_=
17
18
19
20  :: UE relative gap threshold: Progressive (10^-2 for pp-i2, 10^-3 for i3, & 10^-4 for i4)
21  :: Set the value below
22
23  rem ====== Pump Prime Iteration ========================================
24
25  set _iter_=pp
26  set _prev_=pp
27  set _relGap_=0.01
28
29  REM call ArcPy_Walkshed_Process.bat %1
30  call Set_CPI.bat                %1
31  call PP_Highway_Build.bat       %1
32  call PP_Highway_Skims.bat       %1
33  call Transit_Skim_All_Modes_Parallel.bat %1
34  call Trip_Generation.bat        %1
35  call Trip_Distribution.bat      %1
36  call PP_Auto_Drivers.bat        %1
37  call Time-of-Day.bat            %1
38  call Highway_Assignment_Parallel.bat     %1
```

```
call Highway_Skims.bat          %1

:: rem ====== Iteration 1 ================================================

set _iter_=i1
set _prev_=pp

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 2 ================================================

set _iter_=i2
set _prev_=i1

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 3 ================================================

set _iter_=i3
set _prev_=i2
set _relGap_=0.001

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Iteration 4 ================================================

set _iter_=i4
set _prev_=i3
set _relGap_=0.0001

call Transit_Skim_All_Modes_Parallel.bat %1
call Transit_Fare.bat           %1
call Trip_Generation.bat        %1
call Trip_Distribution.bat      %1
call Mode_Choice_Parallel.bat      %1
call Auto_Driver.bat            %1
call Time-of-Day.bat            %1
call Highway_Assignment_Parallel.bat     %1
call Average_Link_Speeds.bat    %1
call Highway_Skims.bat          %1

:: rem ====== Transit assignment ==========================================
```

```
@echo Starting Transit Assignment Step
@date /t & time/t

call Transit_Assignment_Parallel.bat %1
call TranSum.bat %1



@echo End of batch file
@date /t & time/t
:: rem ====== End of batch file ============================================

REM cd %1
REM copy *.txt MDP_%useMDP%\*.txt
REM copy *.rpt MDP_%useMDP%\*.rpt
REM copy *.log MDP_%useMDP%\*.log
REM CD..

set _year_=
set _alt_=
set _iter_=
set _prev_=
set _maxUeIter_=
set _relGap_=
```

All two of the "run model steps" batch files (Figure 17 and Figure 18) apply the progressive relative gap procedure by using the "_relGap_" environment variable. For example, the relGap variable starts at a value of 0.01 (10^-2) on line 27 in Figure 18, and then changes to 0.001 (10^-3) on lines 76, before attaining the final value of 0.0001 (10^-4) on line 93 in speed-feedback iteration 4. This is covered in more detail in the text surrounding both Table 6 and Table 86.

6.3 Running the model: An example

This section provides an example of how to run the travel model for the year 2019 (named "2019_final") using the travel model package that is typically transmitted to external users. It is assumed that the user has copied the transmitted model into the folder where it will be run and did not modify any input files or folder names. The top-level folder is referred to as the "root" folder and typically has a name referring to the travel model version and the specific modeling project (e.g. "Ver2.3. 75_aqc_Vis2045"). The root folder contains all the batch files and modeling folders (shown in Figure 11). The folder/subdirectory called "2019_final" is referred to as the "outputs" folder or the "scenario-specific" folder. It should also be noted that, to follow the steps below, one should have followed all the steps in Chapter 5 ("Preparing to run the model"). It is also assumed that you are not making any changes to the default parallel processing setup in the model, which requires a computer with eight cores. Otherwise, see instructions found in Table 19 on p. 84.

1. Ensure that the root folder has the two parent batch files:
    a. *run_Model_2019_final.bat*, which is known as the wrapper batch file or the "run model" batch file.
    b. *run_ModelSteps_2019_final.bat*, which is known as the "run model steps" batch file.
2. These two batch files are ready to go and should not need any editing for a normal model run. However, the general practice would be to open the wrapper file in a text editor (do not double click it, since this will launch the model run) and check the following:

   a. The "root" environment variable should be set equal to "." (which means the current working directory, i.e., the current folder in your command window)
   b. The "scenar" environment variable should be set equal to "2019_final"
   c. The "runbat" environment variable should be set equal to "*run_ModelSteps_2019_final.bat*" (which is the relevant "run model steps" batch file)
   d. Other environment variables, such as those used for distributed processing, are explained in the chapter on parallel processing.
3. Open a command window and navigate to the root folder OR

   Use Windows Explorer/File Explorer to navigate to the root folder using the method described in section 6.2 ("Parent batch files"), which begins on page 57).

4. Type "*run_Model_2019_final.bat*" (without the quotes) and hit Enter.

The model run should begin, and the user should see numerous commands scrolling in the command window.

7 Summarizing model output and other utilities

7.1 Summary Scripts

In addition to the model, the user is provided with a number of summary scripts, which may be helpful in analyzing the model output. These are listed in Table 15.

Table 15 Travel Model Summary Scripts

Summary script	Description	Folder
COMPARE_NL_MC.S	Compares **estimated** mode choice results between two different model runs.	summary
COMPARE_NL_MC_Cube61vsCube64.S	Compares **estimated** mode choice results between two different model runs.	summary
COMPARE_NL_MC_Expanded_Alt_V23_52_minus_Base_V23_39.S	Compares alternative developed with V2.3.52 and base developed with V.2.3.39. Such a script is needed because naming conventions for output files changed between Build 39 and Build 52.	summary
Compare_Trip_Distribution.s	Compares **estimated** trip distribution to **observed** trip distribution from HTS	summary
Diff_Plots_Rev2.s	Plots volume differences between two input networks	summary
Retrieve_Pros_SubAreas.s	Summarize estimated productions and attractions by purpose and mode.	summary
Screen_Analysis.s	Performs analysis of traffic assignment volumes by screenline	summary
Summarize_2007_2040_Screenlines.s	Compares estimated screenlines volumes in 2007 and 2040	summary
Summarize_Est_Obs_Volume_Daily.s	Compares **estimated** daily traffic volumes on select links to **observed** counts. Also compares **estimated** and **observed** daily screenline volumes.	summary
Summarize_Est_Obs_Volume_Period.s	Compares **estimated** AM, MD, PM, and NT volumes on select links to **observed** counts.	summary
view_from_space_v2.3.75.s	Creates global summary of demographic info, trips, and VMT.	summary
RMSE_Calc.s	Creates summaries of link counts and percent root mean squared error between estimated link volumes and observed counts.	assignment_summary
ScreenLine_Summary.s	Merges counts on to a network.	assignment_summary
TVOLDIF_Plot.s	Plots volume differences between two input networks	assignment_summary

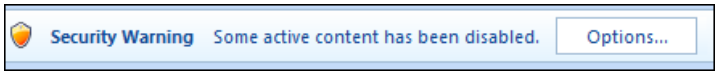
Additionally, the program LineSum.exe is used for summarizing the transit assignment (see Chapter 24 ("Transit Assignment, Including Summary Process (LineSum)").

7.2 Utilities

The Version 2.3 Travel Model requires many input files in various file formats. One of the file formats is dBase or DBF. Compared to space-delimited text files, DBF files have several advantages (e.g., fields do not mistakenly run together when values become large), but DBF files can also have some drawbacks, e.g., they can be difficult to create, and it can be difficult to compare two DBF files. On this second issue, there are several utilities for comparing or "diffing" text files (such as the Unix/Linux `diff` command, WinDiff, WinMerge, PSPad, and Notepad++), but it is more difficult to find programs that allow one to compare DBF files. To facilitate such comparison, a member of the TPB staff, Feng Xie, has developed a utility, known as the DBF Converter (DBF_Converter_v3.2.xls) that enables the user to convert DBF files to text files in comma-separated variable (CSV) format. This conversion can also be done within Cube (using File > Export). Once the files are converted to CSV format, it is easier to compare or "diff" them using other existing utilities. TPB staff is making this DBF converter available to users of the regional travel model to aid in checking/comparing input files.

Using the DBF converter, the user has the option of converting all DBF files in a directory or a select subset of the files. This utility requires Microsoft Office Excel software.

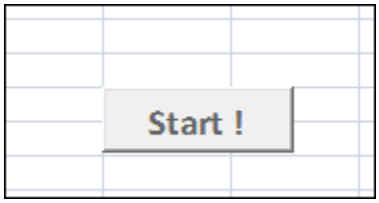
To begin the process, the user double clicks on the converter file/icon (DBF_Converter_v3.2.xls), which will open an Excel spreadsheet. In the center of the spreadsheet, there is a "Start" button. Before clicking on this button, the user has to enable the button by clicking on the "Options…" button:



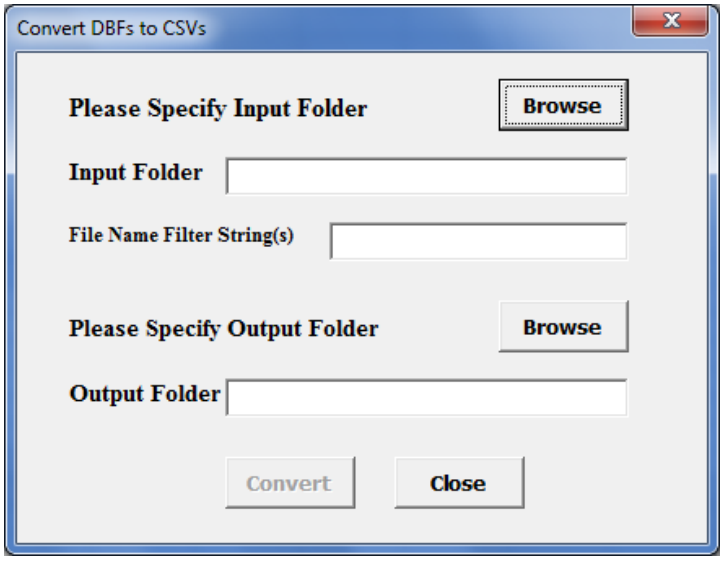
When prompted, the user will have to click "Enable this content" and "OK":



Now, the user can click on the "Start" button:

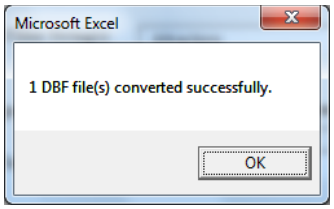


This will result in the following pop-up window prompting the user to enter the input folder, output folder, and the file name filter string(s):



The input folder must contain the DBF files that the user wishes to convert. The output folder is the folder where the newly created CSV files will be placed. The Input/Output folders can be specified by either by clicking the "Browse" button or by typing/pasting in the text boxes. Once the user has selected the input and output folders, he or she may wish to specify a file name filter string. The filter string textbox allows multiple filter strings, separated by spaces. If the user would like to convert all DBF files in the input folder, then the "File Name Filter String(s)" field should be left blank.[53] However, if the user wishes to convert only one DBF file or only a subset of DBF files in the input folder, he or she should specify either a full or partial file name. When the fields are filled, the user needs to press the "Convert" button. Once the conversion process is complete, the user will see a pop-up window stating that the DBF file(s) were converted successfully.

[53] Note, however, that this can take several minutes, since there are over 100 files.



Once the converter has run, the user can find the newly created CSV file(s) in the specified output folder.

8 Use of parallel processing to reduce model run times

8.1 Model run times

In the period from 2008 to 2011, when COG/TPB staff had first transitioned from the Version 2.2 Travel Model to the Version 2.3 Travel Model, we noticed that the Version 2.3 model required much longer run times. For example, using a server bought in 2009 (such as COG's travel model server 3, or tms3), a run of the Ver. 2.2 Travel Model took 15-20 hours, whereas a run of the Version 2.3 Travel Model required about 80-90 hours initially (a factor of 4.5 times or 350%), which was later reduced to about 30 hours in 2012 by using Cube Cluster, Citilabs' implementation of distributed processing. On a newer travel model server, such as tms8 or tms7, the model run time is about 13 - 17 hours.

There are several reasons why the Version 2.3 Travel Model, when it was first developed, had such long run times, compared to its predecessor, the Version 2.2 Travel Model. First, the number of transportation analysis zones (TAZs) increased from 2,191 to 3,722. This represents a 70% increase in the number of TAZs and a 189% increase in matrix sizes used to store trip tables and travel time skims ($3{,}722^2/2{,}191^2$). The other factors causing longer run times are associated mainly with refinements to the Version 2.2 traffic assignment process:

- The number of time-of-day periods went from three (AM, PM, and off peak) to four (AM, midday, PM, night/early morning)
- The number of user classes went from five to six (an explicit commercial-vehicle user class has been added);
- The number of traffic assignments has increased. The Version 2.2 Travel Model had originally used three traffic assignments, one for each time-of-day period (AM, PM, and off peak). Later versions of the Version 2.2 Travel Model split the peak assignments into two groups (HOV3+ and non-HOV3+, the so called "two step traffic assignment"), resulting in the five assignments shown in the left-hand column of Table 16. In the Version 2.3 Travel Model, the off-peak period has been further split into two parts: midday and night/early morning. So, the number of traffic assignments has increased from five in Version 2.2 to six in Version 2.3.
- Higher convergence thresholds
    - In the Version 2.2 model, all five traffic assignments were run with 60 user equilibrium (UE) iterations. This resulted in a range of relative gaps values, from a low value of 1.10×10^{-4} (0.0001) for the AM HOV3+ assignment to a high of 1.19×10^{-2} (0.0119) for the AM non-HOV3+ assignment.[54] [55]
    - In the Version 2.3 model, prior to Build 52, all six traffic assignments were run to either a relative gap of 0.001 (1×10^{-3}) or 300 user equilibrium iterations, whichever came first.

[54] From a model run representing year-2002 conditions from the air quality conformity determination of the 2009 CLRP/FY 2010-2015 TIP.

[55] The modeler can check the relative gap by consulting the highway assignment report file for the final speed feedback iteration (i.e., i4_Highway_Assignment.rpt). The variable is called RELGAP.

For travel model versions 2.3.52 through 2.3.75, we use a **progressively tightening relative gap** procedure, which is described in more detail later in this chapter.

Table 16 Five traffic assignments in the Version 2.2 travel model became six in the Version 2.3 travel model

Version 2.2 model: Five assignments	Version 2.3 model: Six assignments
AM Non-HOV3+	AM Non-HOV3+
AM HOV3+	AM HOV3+
PM Non-HOV3+	PM Non-HOV3+
PM HOV3+	PM HOV3+
Off peak	Midday
	Night and early morning

8.2 Use of parallel processing to reduce model run times

One way to reduce model run times is to buy quicker hardware. However, there are limits to this approach, given the recent trend of chip makers, such as Intel, to focus less on increasing clock speeds and focus more on increasing the number of cores (i.e., the capacity) of computer processors. As evidence of this trend, one of COG's travel model servers, tms6, has a processor whose clock speed is 16% *slower* than that of its predecessor (travel model server #5, or tms5). By contrast, the number of cores has gone from 12 physical cores (24 virtual cores with Hyper-Threading) in tms5 to 16 physical cores (32 virtual cores with Hyper-Threading) in tms6. Consequently, we have focused on achieving run time reductions via the software side of the equation. COG's newest travel model server, tms8, has a clock speed of 3.2 GHz, has two processors, each with 12 physical cores, which, with Hyper-Threading turnd on, appears to the operating system as 48 logical processors (virtual cores), as noted in Table 7.

We use the term "parallelization" to mean running two or more processes or threads in parallel. By running two or more steps in parallel, one can reduce model run time. A common way to achieve this parallelization is by using distributed processing, which essentially distributes the computing load across multiple computer processors or cores. These computer processors/cores could be in separate computers (linked by a local area network or LAN) or could be on one computer that has multiple cores. Citilabs has its own implementation of distributed processing called Cube Cluster, which is an add-on component of Cube Voyager. There are two forms of distributed processing available in Cube Cluster:

- "Intrastep distributed processing (IDP): This type of distributed processing works by breaking up zone based processing in a single step into zone groups that can be processed concurrently on multiple computing nodes. Currently only the Matrix and the Highway programs are available for IDP."[56]
- "Multistep distributed processing (MDP): This type of distributed processing works by breaking up blocks of one or more modeling steps and distributes them to multiple computing nodes to process. This can be used for any program in Cube Voyager as well as user-written programs

[56] Citilabs, Inc., "Cube Voyager Reference Guide, Version 6.4.1" (Citilabs, Inc., September 30, 2015), 1124–25.

> with the caveat that the distributed blocks and the mainline process must be logically independent of each other."[57]

The Version 2.3. Travel Model uses both IDP and MDP, and uses a third method of parallelization that is already part of the Windows operating system: Running programs in parallel using multiple concurrent command windows.

8.2.1 Background and terminology

A computer contains a central processing unit (CPU), which is also known as a chip or processor. Modern CPUs are often divided into two to ten. A core functions as a separate processor, so, to an operating system, a computer with two CPUs is the same as a computer with one CPU divided into two cores. The two biggest chip manufacturers for computers running the Microsoft Windows operating system are Intel and AMD. COG/TPB staff has run the Version 2.3 Travel Model on only computers with Intel chips, but the model should run on computers with any Intel-like chip, such as AMD. Some Intel chips feature a technology known as Hyper-Threading. When Hyper-Threading technology is enabled on the chip, the operating system sees double the number of cores. So, if your computer has four cores and Hyper-Threading is enabled, the operating system will see eight virtual cores (or "logical processors"), thus doubling your CPU capacity. **Thus, a computer with one CPU that contains four cores and has Hyper-Threading enabled, should be able to run the Version 2.3 Travel Model "out of the box" without making changes to the "run model"/wrapper batch file, since such a computer has eight virtual cores**.[58] When a computer executes a task, it uses a process or "thread." In general, one process or thread runs on one processor or core. The operating system (Microsoft Windows) chooses the actual physical core to use when running a process. If one opens the Resource Manager within Windows Task Manager, one can see that the operating system appears to randomly move the task from one core to the next until the process completes, but the user need not focus on this detail. Cube Base documentation does briefly discuss Hyper-Threading.[59]

In Cube Cluster parlance, a set of processors that can be used for a computing task, whether they exist in one computer or a network of computers is called a "cluster." Any individual processor or core is called a "computing node" or simply a "node." Cube Cluster, which is a part of Cube Voyager, allows the nodes in the cluster to communicate, so that they can work together, essentially running in parallel, to accomplish a computing task. Citilabs originally wrote Cube Cluster with the idea that users would want to harness the power of multiple, run-of-the-mill PCs that were networked together using a local area network (LAN). However, COG/TPB staff has not used Cube Cluster in that way. Instead, COG/TPB staff has harnessed the power of Cube Cluster by running on one computer (server) at a time, by virtue of the

[57] Citilabs, Inc., 1125.
[58] According to one external user who had a computer with only four cores (though it was not clear whether these were physical cores or virtual cores), the user found that the model crashed at the mode choice step. This was likely due to the fact that the default configuration of the model is designed to run five concurrent mode choice runs. However, this user was able to follow the procedures listed in Table 19 to get the model to run on the four-core computer.
[59] Citilabs, Inc., "Cube Base Reference Guide, Version 6.4.1" (Citilabs, Inc., September 30, 2015), 10–11.

fact that the computer contained multiple cores. If you are running Cube Cluster across multiple computers, you would have a main computer, known as the "main node," and one or more helper computers, known as "sub-nodes" (or "subnodes"). When running Cube Cluster in a single computer with multiple cores, the "main node" and "sub-nodes" would then exist within the same CPU. So, continuing with the single-computer scenario, the user can think of a model run as occurring on a "main node" (which is simply one of the cores on the CPU), and the main node can then call upon one or more sub-nodes (other cores on the CPU) to make use of IDP or MDP.

8.2.2 Effect of Cube Cluster on modeled results

It should be noted that **using Cube Cluster can result in numerical rounding which can affect model results**. For instance, COG/TPB staff found that the use of IDP resulted in a very small change in the estimated VMT coming out of the travel model.[60] As part of a series of test conducted in 2011, COG/TPB staff conducted two model runs: 1) a year-2007 traffic assignment with IDP using 4 cores; and 2) a year-2007 traffic assignment without IDP (i.e., one core). COG/TPB staff then calculated the VMT difference between the two runs at the regional level, the jurisdiction level, and the link level. At the regional level, the use of IDP had almost no effect on modeled results – it resulted in only a 1/100th to 3/100ths of a percent drop in estimated VMT (slide 25). At the jurisdiction level, the use of IDP also resulted in almost no difference in estimated VMT – the difference was as large as 9/100ths of a percent for some jurisdictions (slide 27). At the link level, however, the use of IDP resulted in several cases where the VMT difference was above 20% (slide 29). Fortunately, the links with the largest volume differences were the lower-class facilities (e.g., not freeways). Both runs were done as part of the full travel model and both were done using Cube Voyager/Cluster version 5.1.2. Newer versions of Cube Voyager/Cluster are now available (e.g., COG is now using 6.4.1), but COG/TPB staff have not re-tried the sensitivity test with the newer versions of Cube Voyager. COG/TPB staff shared these results with Citilabs and, in 2012, Citilabs updated its documentation to note this rounding phenomenon. For example, in the Cube 6.4.1 Cube Voyager Reference Guide from 2015: "Use of Cluster can have a very small effect on volumes generated by the HIGHWAY program. During the ADJUST phase, when iteration volumes are combined, the final assigned volumes might vary slightly over different numbers of cluster nodes."[61]

8.2.3 History of adding parallelization to the Version 2.3 Travel Model

In Build 16 of the Version 2.3 Travel Model (Ver. 2.3.16), COG/TPB staff added IDP to the highway assignment script. Staff set the travel model up to use four cores, and, based on the findings of various tests, staff recommended that users who wanted to replicate COG results also use four cores. In Builds 20 through 24 of the Version 2.3 Travel Model, COG/TPB staff added IDP to other modeling steps, such as *MFARE2.s*, *Time-of-Day.s*, and the transit skimming scripts. In 2012, COG asked for AECOM's assistance to further reduce model run times. AECOM suggested model changes that introduced MDP to

[60] See slides 25-32 of Ronald Milone and Mark S. Moran, "TPB Version 2.3 Travel Model on the 3,722-TAZ Area System: Status Report" (May 20, 2011).
[61] Citilabs, Inc., "Cube Voyager Reference Guide, Version 6.4.1," 1129.

the travel model.[62] Now, in addition to using four cores for IDP traffic assignment, the use of MDP allowed two traffic assignments to run in parallel (thus, 8 cores would be in use, but only 4 in each of the two IDP sessions). COG/TPB staff incorporated these AECOM recommendations into Build 40 of the Version 2.3 Travel Model (Ver. 2.3.40), and these same parallelization enhancements, such as the use of both IDP and MDP, also exist in the Version 2.3.52 Travel Model and later models.

8.2.4 Implementation of parallelization in the Version 2.3.52 through 2.3.75 travel models

The Version 2.3.52 Travel Model (and later models, including Ver. 2.3.75) has three types of parallelization to help minimize run times:

- Cube Cluster intra-step distributed processing (IDP)
- Cube Cluster multi-step distributed processing (MDP)
- Windows operating system: Running programs in parallel using multiple concurrent command windows

IDP is used in three modeling steps:

- Highway assignment (*Highway_Assignment_Parallel.s*)
- Transit fare development (*MFARE2.S*)
- Transit assignment (*Combine_Tables_For_TrAssign_Parallel.s*)

By contrast, MDP is used for only one step: Highway assignment (*Highway_Assignment_Parallel.s*). In other words, **highway assignment uses both IDP and MDP**. The model is set up to use four cores in IDP, and, using MDP, there are two concurrent IDP sessions: A main node, which uses four cores via IDP, and a sub-node, which also uses four cores via IDP. **This combination of IDP and MDP means that highway assignment uses 8 cores concurrently for processing**.

Lastly, running programs in parallel by using multiple concurrent command windows is used for three modeling steps:

- Transit skimming (command windows invoked by *Transit_Skim_All_Modes_Parallel.bat*)
- Mode choice (command windows invoked by *Mode_Choice_Parallel.bat*)
- Transit assignment (command windows invoked by *Transit_Assignment_Parallel.bat*)

IDP, which works only for the MATRIX or HIGHWAY modules of Cube Voyager, is implemented in a Cube Voyager script using **a single line of code**, such as this from the *Highway_Assignment_Parallel.s* script:

```
distributeIntrastep processId='AM', ProcessList=%AMsubnode%
```

[62] For more details, see AECOM and Stump/Hausman Partnership, "FY 2012 Draft Final Report, COG Contract 12-006: Assistance with Development and Application of the National Capital Region Transportation Planning Board Travel Demand Model" (National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, July 13, 2012), chap. 5, http://www.mwcog.org/uploads/committee-documents/aV1dWVhb20120720132722.pdf.

By contrast, **MDP** is implemented in a Cube Voyager script using **an MDP block of code**. The code block begins and ends with code such as the following (from the *Highway_Assignment_Parallel.s* script):

```
DistributeMULTISTEP ProcessID='AM', ProcessNum=1
       (various lines of code)
ENDDistributeMULTISTEP
```

The IDP statement above can be used on its own or within an MDP block. Examples of both of these cases can be found in the *Highway_Assignment_Parallel.s* script.

Table 17 shows the five modeling steps where parallelization is used, noting the method of parallelization (e.g., IDP, MDP, or batch file); the names of the batch files that call each step; the names of the tokens (variables) used to store the number of processing nodes/subnodes to use for IDP/MDP; and the maximum number of simultaneous threads/cores used by the step. For example, in the case of transit skimming, parallelization is achieved by calling multiple simultaneous batch files. The batch file that actually initiates the multiple Windows command windows is *Transit_Skim_All_Modes_Parallel.bat*, and, since this step uses neither IDP nor MDP, there are no associated IDP or MDP tokens. The transit skimming process uses 4 cores. In the highway assignment step, both MDP and IDP are used. The tokens used for IDP are AMsubnode and MDsubnode (more on this later in this chapter). Although MDP is used, no tokens are used for MDP. Instead, the subnode for MDP is labeled using a fixed name, "AM1". The highway assignment step can use up to 8 simultaneous nodes/cores, since IDP is implemented with four cores and there are two concurrent IDP sessions, run using MDP. As can be seen in Table 17, modeling steps with parallelization use 4, 5, or 8 cores. Modeling steps without parallelization use only one core at a time.

8.2.4.1 Parallel processing in the "Run model"/wrapper batch file

This section of the report describes how the code in the "run model"/wrapper batch files affects parallel processing implemented in the Version 2.3.52 Travel Model (and used in subsequent versions of the model, such as Ver. 2.3.75). This section uses the 2019_final "run model" batch file (Figure 16 on page 59) as an example. It also describes changes that can be made to the "run model"/wrapper batch files in order run the model on a computer with fewer than the standard 8 cores. The next section of the report, 8.2.4.3 on page 85, describes how parallel processing (specifically IDP and MDP) has been implemented in one script: *Highway_Assignment_Parallel.s*. As noted in Table 17 (p. 81), the number of cores used in each of the parallelized modeling steps varies from 4 to 8 cores. Those steps that do not contain parallelization use only one core at a time. **Thus, to run the Version 2.3.52 Travel Model "out of the box," without making any changes, one needs a computer with eight or more cores**, as was explained in the section 3.1 of the report.

Table 17 Modeling steps where parallelization is used, including the maximum number of threads/cores used

Modeling Step	**First-Level "Child" Batch File**	**Second-Level "Child" Batch File**	**Method of Parallelization** (batch file or script which calls parallel process)	**Tokens Used for IDP****	**Max. No. of Cores**
Transit skimming	Transit_Skim_All_Modes_Parallel.bat	TransitSkim_LineHaul_Parallel.bat	**Batch file** (Transit_Skim_All_Modes_Parallel.bat)		4
Highway assignment	Highway_Assignment_Parallel.bat	None	**MDP** & **IDP** (Highway_Assignment_Parallel.s)	AMsubnode MDsubnode	8
Transit fare development	Transit_Fare.bat	None	**IDP** (MFARE2.s)	subnode	4
Mode choice	Mode_Choice_Parallel.bat	MC_purp.bat	**Batch file** (Mode_Choice_Parallel.bat)		5
Transit assignment	Transit_Assignment_Parallel.bat	TransitAssignment_LineHaul_Parallel.bat	**Batch file** (Transit_Assignment_Parallel.bat) **IDP** (Combine_Tables_For_TrAssign_Parallel.s)	subnode	4

** MDP as implemented in *Highway_Assignment_Parallel.s* does not use a token. Instead, the subnode name designation is done using a hard-coded value in the script, i.e., "AM1", as is explained later in this chapter.

The "run model"/wrapper batch file makes use of several of user-defined Windows environment variables. Those environment variables that do not deal with distributed processing were discussed in section 6.2.1 ("Description of the "run model"/wrapper batch file") on page 62. By contrast, those environment variables that do deal with distributed processing are discussed in this chapter (Chapter 8).

It is possible to have IDP-related or MDP-related statements in a script, but not use them. Consequently, one of the first Cube Cluster statements in any script that uses Cube Cluster will be a statement that indicates whether Cube Cluster should be used or not. An example of such a statement is shown below:

```
distribute intrastep=t multistep=f
```

The above statement indicates that IDP will be used (since its flag has been set to a value of TRUE or T) and MDP will not be used (since its flag has been set to a value of FALSE or F). In this example, even if there is code for MDP in the Cube Voyager script, the MDP processing will not be executed, since it has been set to FALSE. In our scripts and batch files, we generally use user-defined, Windows environment variables to set these two values. Thus, the statement above appears like this, using two "tokens" or variables to hold the true/false flags:

```
distribute intrastep=%useIdp% multistep=%useMdp%
```

In lines 13 and 14 of the "run model"/wrapper batch file (shown in Figure 16), these two "set" statements simply set the IDP and MDP usage flags to a value of TRUE:

```
set useIdp=t
set useMdp=t
```

The statement "distribute intrastep=%useIdp% multistep=%useMdp%" is used in both *Combine_Tables_For_TrAssign_Parallel.s* and *Highway_Assignment_Parallel.s*.[63] By contrast, in MFARE2.s, which uses IDP, but not MDP, the MDP flag has been hard-coded to FALSE, instead of using the token value set in the wrapper batch file: "distribute intrastep=%useIdp% multistep=f".

The "useidp" environment variable is used in the three steps shown in Table 17 that make use of IDP. As one would expect, the "usemdp" environment variable is used in the highway assignment step, since this step makes used of MDP. However, the "usemdp" environment variable **is also used in *Mode_Choice_Parallel.bat***. Specifically, if the "usemdp" flag is set to TRUE, then parallel processing is used in the mode choice step (via concurrent batch files, not MDP), which means that the five mode choice models (HBW, HBS, HBO, NHW, and NHO) are run in parallel command windows. If the "usemdp" flag is set to FALSE, then the mode choice process assumes that there is only one core available and runs the five mode choice models in sequence.

[63] This same statement is also currently found in the four transit skimming scripts (Transit_Skims_AB|BM|CR|MR.s), but it is no longer being used, so it should eventually be removed. At one point, we had used IDP in transit skimming, but, for the Ver. 2.3.40 model, when parallelization via concurrent batch files was added, the parallelization via IDP was dropped, so that the model would not use more than 8 concurrent cores.

The next two environment variables dealing with distributed processing can be found on in lines 16 and 17 of the "run model"/wrapper batch file (Figure 16):

```
set AMsubnode=1-4
set MDsubnode=2-4
```

As shown in Table 17, the AMsubnode and MDsubnode are used for IDP in traffic assignment. The names AMsubnode and MDsubnode would seem to indicate a subnode for processing the AM peak period and one for processing the midday period. Originally, when AECOM first proposed adding MDP to various steps of the model, it was added to both highway skimming and highway assignment. In highway skimming, there is a peak period skim, represented by the AM peak period, and an off-peak period skim, represented by the midday (MD) period. So, for skimming, the processing of the AM skims was sent off to a subnode, using MDP, and the AMsubnode variable/token was used to define the number of subnodes to use in IDP for the processing of the AM skims. And for the processing of the midday (MD) skims, this work was retained on the main processing node, with the MDsubnode variable/token used to define the number of subnodes to use in IDP for the processing of the MD skims.[64] For reasons of expediency, the same variable names (AMsubnode and MDsubnode) were used for the MDP in the highway assignment step. This meant that the AM peak period highway assignment was transferred, via MDP, to a subnode called "AM1." But, in the case of the PM traffic assignment, it was processed on the main node, but it used the "MD" token for naming its IDP subnodes.[65] What's more, the MD period was processed on branch/sub-node delineated "AM" (from the AMsubnode, not "MD") and the NT period was processed by the main node, but was delineated "MD" (from MDsubnode, not "NT"). When COG/TPB staff chose which of the AECOM suggested parallelization enhancements to implement, it chose not to implement MDP in the highway skimming, just in highway assignment.[66] The end result was that the naming convention used in the highway assignment step is somewhat confusing, even though, strictly speaking, the code functions normally. This is explained in more detail in the next section of the report. Consequently, given the way that MDP is used in only the highway assignment step, one could come up with better names for the two variables that are currently called AMsubnode and MDsubnode, as shown in Table 18.

Table 18 Current and alternate names for the two Windows environment variables that store information about the number of subnodes to use in IDP in the highway assignment

Current name of environment variable	Usage	Alternate name for environment variable
AMsubnode	Number of IDP subnodes used within an MDP block	idp_for_mdp_branch
MDsubnode	Number of IDP subnodes used w/in main processing branch	idp_for_main_branch

[64] See, for example, AECOM and Stump/Hausman Partnership, "FY 2012 Report," figs. 5–2.
[65] See, for example, AECOM and Stump/Hausman Partnership, figs. 5–6.
[66] See Mary Martchouk and Mark S. Moran to Ronald Milone, "Reducing Model Run Times: Results from the TPB Staff Tests of AECOM's Proposed Parallelization Enhancements to the Travel Model," Memorandum, September 17, 2012, 6.

Given that we generally have decided upon using four cores for IDP processing in the model (to maintain constistency), one might expect that AMsubnode = MDsubnode = 1-4. In other words, one might expect that we would provide Cube Cluster with a list of four nodes (1-4) for both the main branch of IDP processing and the MDP branch of IDP. According to AECOM, the reason for delineating only three subnodes (i.e., "MDsubnode=2-4") and not four, is that "only three slave threads [sub-nodes] are launched since the master uses itself as one of the threads to process the PM highway assignment."[67] Thus, despite the appearance of 3 nodes for MD and 4 nodes for AM, both IDP sessions use 4 nodes. To further clarify this issue, the IDP and MDP processes running in *Highway_Assignment_Parallel.s* have been diagramed in Figure 19 and Figure 20 in section 8.2.4.3.

8.2.4.2 Changing the "run model"/wrapper batch file for computers with fewer than 8 cores

The Version 2.3 Travel Model (Ver. 2.3.52 and later) is designed to run on a computer that has 8 or more cores. Table 19 shows the changes that a user should make in order to run the Version 2.3 model on computers with fewer than 8 cores. See section 8.2.2 ("Effect of Cube Cluster on modeled results") on p. 78 for a discussion about how modeled results can change slightly with the number of cores used.

Table 19 Running the Version 2.3 Travel Model on computers with fewer than 8 cores: Changes that need to be made to the "run model"/wrapper batch file

Number of cores in your computer	Changes needed in the "run model"/wrapper batch file	Result
8 or more	• No changes need be made	The model will run using between 1 and 8 cores, depending on the modeling step. Eight cores are used in highway assignment, due to the use of both IDP and MDP.
4	• Change "useMdp=t" to "useMdp=f"	This change will mean that highway assignment no longer uses MDP, only four cores with IDP. Also, in the mode choice model, sequential processing will be done (i.e., the five models will no longer run in parallel).
2	• Change "useMdp=t" to "useMdp=f" • Change "set AMsubnode=1-4" to "set AMsubnode=1-2" • Change "set MDsubnode=2-4" to "set MDsubnode=2"	This should result in only 2 cores being used in IDP.
1	• Change "useMdp=t" to "useMdp=f" • Change "useIdp=t" to "useIdp=f"	This will disable IDP and MDP and will also result in disabling the parallel processing in the mode choice step.

Note that the information in Table 19 is based on testing done by COG/TPB staff using a virtual computer with Cube 6.0.2 installed.

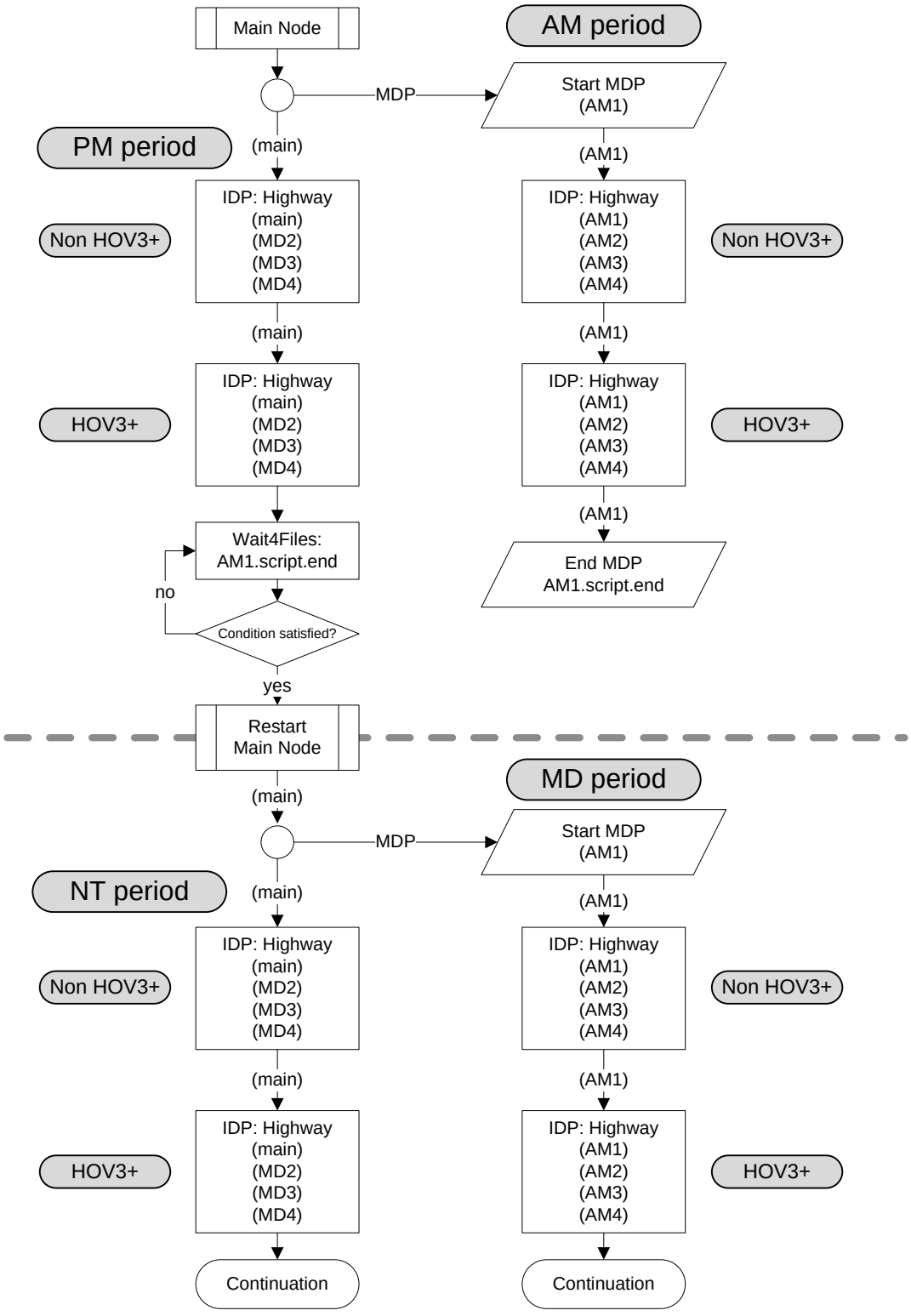
[67] AECOM and Stump/Hausman Partnership, "FY 2012 Report," 5–9 to 5–10.

8.2.4.3 Parallel processing in the highway assignment script

The previous section of the report, section 8.2.4.1, described how the code in the "run model"/wrapper batch files affects parallel processing implemented in the Version 2.3 Travel Model (Ver. 2.3.52 and later). This section of the report describes how parallel processing (specifically IDP and MDP) have been implemented in one script: *Highway_Assignment_Parallel.s*. Figure 19 shows a schematic of how IDP and MDP have been implemented in the highway assignment script. This figure shows the sub-node naming conventions that are used in the Version 2.3 Travel Model, keeping in mind some of the issues related to the naming of sub-nodes in section 8.2.4.1. Figure 20 is a revision of Figure 19, which shows a schematic of how IDP and MDP have been implanted in the highway assignment script, but with a proposal for more logical naming conventions (the changed sub-node names are indicated by using red font).

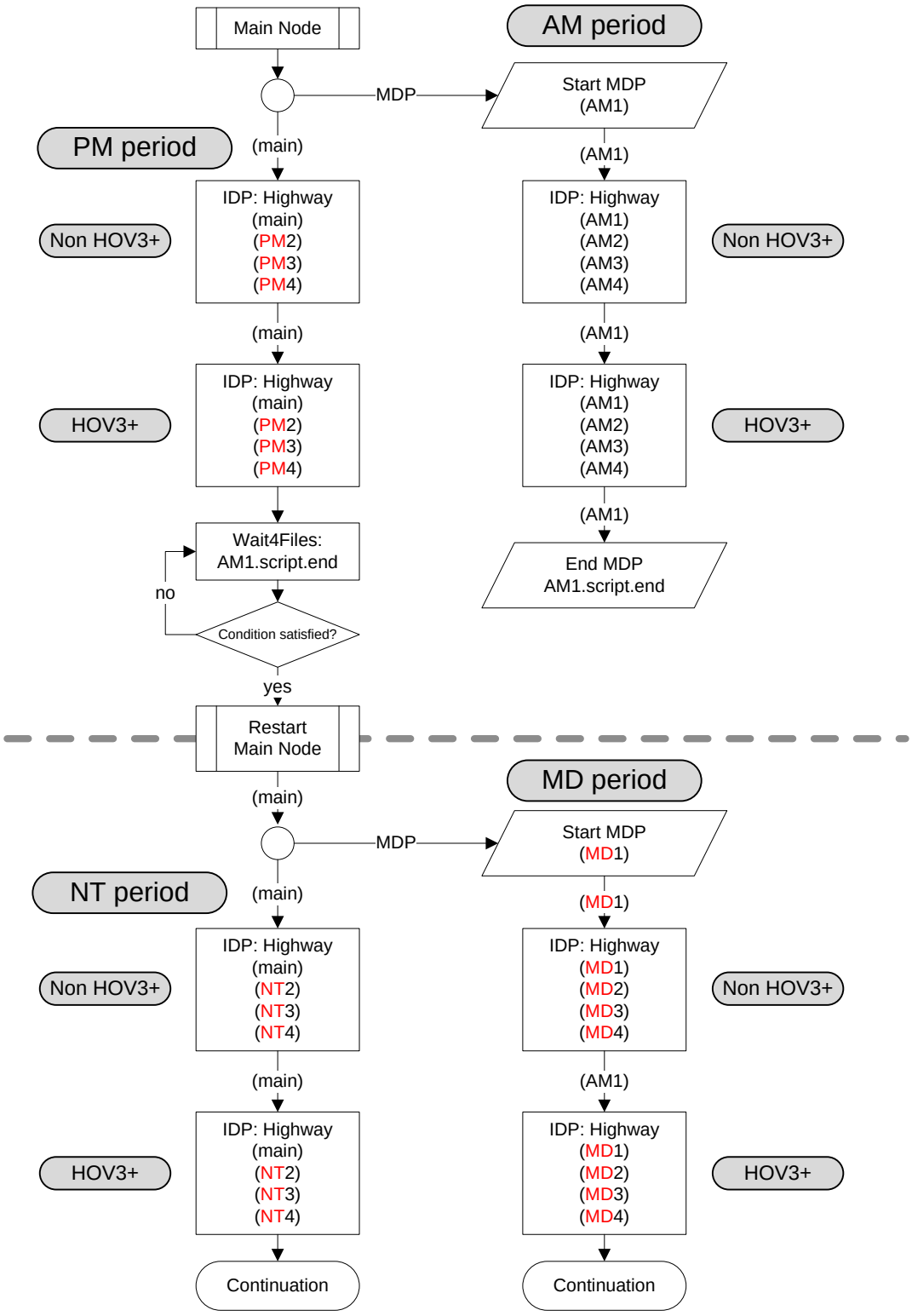
The actual highway assignment script relating to Figure 19 can be found in Appendix C (Volume 2). Since the script has over 2,000 lines of code, we have created an excerpt of the Highway_Assignment_Parallel.s script (about 150 lines), shown in Figure 21, that focuses on the lines that are most relevant to IDP and MDP. Locations where code has been removed are indicated in Figure 21 by a triple ampersand ("&&&"). On line 4 of Figure 21, the statement "distribute intrastep=%useIdp% multistep=%useMdp%" either turns IDP and MDP on or off, based on the value of the two tokens. The code in Figure 21 contains two MDP blocks. Each MDP block begins with the keyword "DistributeMULTISTEP" and ends with the keyword "ENDDistributeMULTISTEP." The beginning and ending of each of the two MDP blocks has been highlighted in green. IDP does not require a block of statements – it simply uses a single statement begun with the keyword "distributeIntrastep." Lines containing this keyword have been highlighted in yellow. For example, the first MDP block includes two IDP statements, but the next two IDP statements occur outside of an MDP block (in other words, they are run from the main node, not a sub-node). As shown in Figure 19, since we have two parallel streams of processes (e.g., one for the AM period and one for the PM period), we need to use a "Wait4Files" keyword, which ensures that the main line of processing stops until the MDP branch completes it work. The Wait4Files keywords have been highlighted in blue in Figure 21. So, as indicated in Figure 19, when the AM period processing is finished a file called AM1.script.end is generated. The Wait4Files tells the main line of processing to stop until it detects that the AM1.script.end file has been generated.

Figure 19 Schematic of IDP and MDP in the highway assignment process of the Ver. 2.3 Travel Model (*Highway_Assignment_Parallel.s*): Existing naming convention for nodes



Ref: ver2.3.52_hwy_assign_mdp_idp.vsd

Figure 20 Schematic of IDP and MDP in the highway assignment process of the Ver. 2.3 Travel Model (*Highway_Assignment_Parallel.s*): Proposed new naming convention for nodes (changes shown in red)



Ref: ver2.3.52_hwy_assign_mdp_idp.vsd

Figure 21 Excerpts from the *Highway_Assignment_Parallel.s* script (triple ampersand => code removed)

```
&&&
/*  **** Set up tokens in Voyager Pilot step ***** */
;  useIdp = t (true) or f (false);  this is set in the wrapper batch file
distribute intrastep=%useIdp% multistep=%useMdp%
&&&
;;;*************************************************************************
;;; Step 1: Execute peak-period traffic assignments (AM & PM)
;;;         AM nonHOV, HOV and PM nonHOV and HOV Assignemnts
;;;*************************************************************************

itr = '%_iter_%'   ;;
&&&
INPNET = 'ZONEHWY.NET'

DistributeMULTISTEP ProcessID='AM', ProcessNum=1

PRD    =  'AM'         ;
PCTADT =   41.7        ; %_AMPF_%  AM PHF (% of traffic in pk hr of period)
CAPFAC=1/(PCTADT/100)     ;  Capacity Factor = 1/(PCTADT/100)
&&&
in_capSpd = '..\support\hwy_assign_capSpeedLookup.s'         ;;     FT x AT Speed & Capacity lookup
VDF_File  = '..\support\hwy_assign_Conical_VDF.s'            ;;     Volume Delay Functions file

;;;*************************************************************************
;;; Step 1.1: Assign AM NonHOV3+ trip tables only
;;;           (SOV, HOV2, CV, TRUCK & AIRPORT PASSENGER TRIPS)
;;;*************************************************************************

  RUN PGM=HIGHWAY  ; NonHOV3+ traffic assignment
distributeIntrastep processId='AM', ProcessList=%AMsubnode%
  FILEI NETI     =  @INPNET@                          ; TP+ Network
&&&
ENDRUN
;;;*************************************************************************
;;; Step 1.2: Assign AM HOV3+ only
;;;*************************************************************************

  RUN PGM=HIGHWAY  ; HOV3+    traffic assignment
distributeIntrastep processId='AM', ProcessList=%AMsubnode%
  FILEI NETI     = TEMP1_@PRD@.NET                    ; TP+ Network
&&&
ENDRUN
ENDDistributeMULTISTEP

PRD    =  'PM'         ;
PCTADT =   29.4        ; %_AMPF_%  AM PHF (% of traffic in pk hr of period)

&&&
;;;*************************************************************************
;;; Step 1.3: Assign PM NonHOV3+ trip tables only
;;;           (SOV, HOV2, CV, TRUCK & AIRPORT PASSENGER TRIPS)
;;;*************************************************************************

  RUN PGM=HIGHWAY  ; NonHOV3+ traffic assignment
distributeIntrastep processId='MD', ProcessList=%MDsubnode%
  FILEI NETI     =  @INPNET@                          ; TP+ Network
&&&
ENDRUN
;;;*************************************************************************
;;; Step 1.4: Assign PM HOV3+ only
;;;*************************************************************************

  RUN PGM=HIGHWAY  ; HOV3+    traffic assignment
```

```
distributeIntrastep processId='MD', ProcessList=%MDsubnode%
  FILEI NETI     = TEMP1_@PRD@.NET                    ; TP+ Network
&&&
ENDRUN

Wait4Files Files=AM1.script.end, CheckReturnCode=T, PrintFiles=Merge, DelDistribFiles=T

;;;*****************************************************************************
;;; Step 2: Execute off-peak-period traffic assignments (midday/MD & night/NT)
;;;         All 6 trip tables are assigned together.
;;;*****************************************************************************

DistributeMULTISTEP ProcessID='AM', ProcessNum=1
            ; Off-Peak Period
PRD    =  'MD'          ;
PCTADT =   17.7         ; %_MDPF_%  Midday PHF (% of traffic in pk hr of period)
CAPFAC=1/(PCTADT/100)                   ; Capacity Factor = 1/(PCTADT/100)
; Turnpen  = 'inputs\turnpen.pen'         ; Turn penalty

  RUN PGM=HIGHWAY  ; Off-peak (midday & evening) traffic assignment
distributeIntrastep processId='AM', ProcessList=%AMsubnode%
FILEI NETI     = @INPNET@                           ; TP+ Network
&&&
ENDRUN

ENDDistributeMULTISTEP

PRD    =  'NT'          ;
PCTADT =   15.0         ; %_NTPF_%  NT PHF (% of traffic in pk hr of period)
CAPFAC=1/(PCTADT/100)                   ; Capacity Factor = 1/(PCTADT/100)

  RUN PGM=HIGHWAY  ; Off-peak (midday & evening) traffic assignment
distributeIntrastep processId='MD', ProcessList=%MDsubnode%
FILEI NETI     = @INPNET@                           ; TP+ Network
&&&
ENDRUN

Wait4Files Files=AM1.script.end, CheckReturnCode=T, PrintFiles=Merge, DelDistribFiles=T

; END OF MIDDAY and OFF PEAK ASSIGNMENT

;;;*****************************************************************************
;;; Step 3: Calculate restrained final Volumes, speeds, V/Cs (No MSA)
;;;*****************************************************************************
;;; Step 3.1: Loop thru 1 (AM) and 2 (PM)
;;;*****************************************************************************

LOOP PERIOD = 1,2  ; Loop thru 1 (AM) and 2 (PM);  Each pk per. includes NonHOV3+ and HOV3+

IF (PERIOD==1)
            PRD    =  'AM'          ;
            PCTADT =   41.7         ;
ELSE
            PRD    =  'PM'          ;
            PCTADT =   29.4         ;
ENDIF
CAPFAC=1/(PCTADT/100)      ; Capacity Factor = 1/(PCTADT/100)

  RUN PGM=HWYNET                 ; Calculate restrained speed/perform MSA volume averaging
&&&
ENDRUN
ENDLOOP            ; Loop thru 1 (AM) and 2 (PM);  Each pk per. includes NonHOV3+ and HOV3+

;;;*****************************************************************************
;;; Step 3.2: Loop thru 3 (MD) and 4 (OP)
;;;*****************************************************************************

LOOP PERIOD = 3,4  ; Loop thru 1 (midday, MD) and 2 (evening/off-peak, OP)
```

```
IF (PERIOD==3)
            PRD    =  'MD'         ;
            PCTADT =   17.7
ELSE
            PRD    =  'NT'         ;
            PCTADT =   15.0
ENDIF
CAPFAC=1/(PCTADT/100)      ; Capacity Factor = 1/(PCTADT/100)

  RUN PGM=HWYNET   ; Calculate restrained speed/perform MSA volume averaging
&&&
ENDRUN
ENDLOOP            ; Loop thru 1 (midday, MD) and 2 (evening/off-peak, OP)

;;;*************************************************************************
;;; Step 4: Summarize 24-hour VMT of current AM, PM, MD & NT assignments
;;;*************************************************************************

RUN PGM=HWYNET     ; Summarize 24-hour VMT of current AM, PM, MD & OP assignments
&&&
ENDRUN
```

Ref: Highway_Assignment_Parallel_excerpt2.s

To conclude the discussion of Figure 21, we note here some cases where process sub-nodes have somewhat misleading names. The four periods being processed are AM, PM, MD, and NT, and these are indicated in Figure 21 by pink/purple highlighting. For the AM assignment, there are no issues with misleading names for the sub-nodes. For example, we can see that on line 17, the AM processing starts, and the four IDP sub-nodes for the non-HOV3+ assignment are named AM1, AM2, AM3, and AM4 (line 30 of Figure 21), since %AMsubnode% equals "1-4". After the non-HOV3+ assignment is complete, then HOV3+ assignment occurs, and the four IDP sub-nodes for the HOV assignment are also named AM1, AM2, AM3, and AM4 (line 39 of Figure 21). The mislabeled naming of sub-nodes begins with the PM period assignment, which begins on line 45. For example, for the PM non-HOV3+ assignment, the sub-nodes are named MD2, MD3, and MD4 (line 55 of Figure 21), since %MDsubnode% equals "2-4". It would be less confusing if these sub-nodes had been named PM2, PM3, and PM4. The same misleading naming convention is used for the sub-node names in the PM HOV3+ assignment: MD2, MD3, and MD4 -- instead of PM2, PM3, and PM4 (line 64 of Figure 21). A similar issue occurs for the midday assignment (beginning on line 78 of Figure 21) and the nighttime assignment (beginning on line 91 of Figure 21). **At any rate, it should be noted that the code works correctly, despite the misleadingly named sub-nodes**. In a future version of the model, it is possible that we will clean up the sub-node naming.

9 Debugging cases where the model run stops prematurely or crashes

If a model run stops prematurely or crashes, one can use the "full output" text file to determine:

- The speed feedback iteration (e.g., pump prime, iteration 1, …, iteration 4) that was underway when the model stopped
- The modeling step, within a given speed feedback iteration, that was underway when the model stopped (e.g., network building, trip distribution, mode choice, traffic assignment).
- Possible error messages returned by any programs that crash.

An excerpt from one of the "full output" text files can be seen in Figure 22. Additionally, when debugging a model run crash, one should find the latest print file (*.prn) to see any relevant error or warning messages. One can search this file using regular expressions to find any warnings or errors.[68]

In some cases, it is sufficient to review the "full output" text file and the latest print file to determine why a model run stops. As an additional tool, however, one can also scan the "search for errors" text file (e.g. 2019_Final_searchForErrs.txt), which is created by the *searchForErrs.bat* batch file. An example of the "search for errors" text file can be found in Figure 23.

One of the most common causes for a model run crash is a sharing violation, which typically occurs when one launches two or more concurrent model runs in the same root directory at about the same time. **One way to protect against this happening is to ensure there is a time delay (ca. 1 hour) between the start of two model runs that share the same root directory**. Additionally, there is now a second reason to offset model runs by about an hour: As described in Chapter 11 ("Building transit walksheds and calculating zonal walk percent"), with the new process for generating transit walksheds and calculating the percent of each zone within walking distance to transit, it is imperative to use a 45- to 60-minute gap in the start times of two or more model runs on the same computer.

[68] For example, using the text editor PSPad, one can use this regular expression (regex) to find warnings or errors: F\([0-9]*\):|W\([0-9]*\):

Figure 22 An excerpt from an example of the "full output" text file that is created during a model run

```
F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _year_=2019

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _alt_=Ver2.3.75_2019_Final

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _maxUeIter_=1000

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _tcpath_=

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>rem ====== Pump Prime Iteration
========================================

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _iter_=pp

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _prev_=pp

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>set _relGap_=0.01

F:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal>call ArcPy_Walkshed_Process.bat 2019_Final
    Searching for Python in Path C:\Python27\ArcGIS10.5
    Searching for Python in Path C:\Python27\ArcGIS10.4
    Searching for Python in Path C:\Python27\ArcGIS10.3
    Found Python in Path C:\Python27\ArcGIS10.3

 Using Python from Directory = C:\Python27\ArcGIS10.3



1) Creating Subdirectories ...


2) Preparing Inputs ...

    using TRNBUILD line files

3) Launching ArcPy-based Walkshed Process ...
```

Ref: Z:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal\2019_Final\2019_Final_fulloutput.txt

Figure 23 An excerpt from the "search for errors" file that is created during a model run

```
********** Searching for errors and anomalies after a travel model run **********
Program name: searchForErrs.bat

***** Searching *fulloutput.txt

  *** Searching for cases where a file could not be found


***** Searching report files (*.rpt)
  *** Searching for evidence that TP+ (TPMAIN) is running, instead of Voyager (PILOT)
  *** Searching for evidence of LINKO nodes that do not have XY values
2019_Final\i1_TRANSIT_SKIMS_AB.RPT:W(693): The following LINKO nodes do not have XY values:
2019_Final\i1_TRANSIT_SKIMS_AB.RPT:W(693): The following LINKO nodes do not have XY values:
2019_Final\i1_TRANSIT_SKIMS_AB.RPT:W(693): The following LINKO nodes do not have XY values:
2019_Final\i1_TRANSIT_SKIMS_AB.RPT:W(693): The following LINKO nodes do not have XY values:
2019_Final\i1_TRANSIT_SKIMS_AB.RPT:W(693): The following LINKO nodes do not have XY values:
```

Ref: Z:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal\2019_Final\2019_Final_searchForErrs.txt

10 Known issues related to running the model

10.1 Cube Cluster differences

When using Cube Cluster, the estimated VMT coming from the model can change slightly, depending on how many cores/nodes are used. See section 8.2.2 ("Effect of Cube Cluster on modeled results") on page 78 for more details.

10.2 Model run stops before finishing

We have experienced some cases where a model run will prematurely stop (this is sometimes also referred to as a "crash") for no apparent reason. Sometimes the exact same model run will complete successfully if run on a different computer. While we are still trying to determine the cause of these stoppages, we do, however, have a pragmatic way for dealing with these events. Determine where the model run crashed. Re-launch the model run but comment out all the steps in the "run model steps" that have completed successfully, so that the model runs only the step that crashed and the steps that follow it. This procedure will typically result in a normal model run, even though it requires the analyst to intervene midstream. Please see Chapter 9 ("Debugging cases where the model run stops prematurely or crashes") on page 91.

10.3 Issues with traffic assignment convergence

In the past, we have identified some cases where the gap (but not relative gap) for a given user equilibrium iteration in traffic assignment is equal to exactly zero, as opposed to a small, but non-zero value. We have reported this issue to Citilabs, which began an investigation into the matter. However, since the Version 2.3.75 model (like its predecessors, e.g., 2.3.57 - 2.3.70) uses the *relative* gap and the number of user equilibrium iterations as stopping criteria, this issue should not affect the running of the model. Nonetheless, a model user could experience convergence issues if they change the model to use a tight stopping criterion. For example, in one test conducted by TPB staff, a stopping criterion of 10^{-6} was used, but the traffic assignment continued, going past 10^{-7}, even though 10^{-6} was specified. This happened for a for a future-year scenario that had variably-priced facilities. At this point, we do not have any definitive answers, but we contacted Citilabs, whose staff thought that the difficulty reaching convergence was due to large toll values that dominate the link-cost function. Again, this should not be an issue for standard runs of the travel model, which use progressively tightening relative gap tolerances of 10^{-2}, 10^{-3}, and 10^{-4}.

10.4 Running multiple concurrent model runs on one computer/server

A user may wish to run two or more travel model runs on one computer or server at the same time. To compute the maximum number of concurrent model runs that may be run on a given computer, divide the number of cores (real or virtual, whichever is greater) by the number of cores needed per model run (currently 8, in the traffic assignment step). For example, on a computer like COG's travel model server #6 (tms6), which has 16 physical cores or 32 virtual cores due to Intel's Hyper-Threading Technology, the calculation would be:

(32 virtual cores)/(8 cores needed per model run) = 4 concurrent model runs (maximum)

However, based on our experience at COG, the actual number of concurrent model runs that you can run on a given computer may be less than the maximum number, depending on factors such as the following:

- The number of users launching the model runs: **This no longer appears to be an issue**. In the past, using Cube 6.1 SP1, we had found that, if two or more users tried to launch concurrent model runs, even if it was only two users, each with one model run, one of the two model runs would often stop prematurely or crash. However, **under Cube 6.4.1, we found that two or three users can submit concurrent model runs**.[69]
- Whether one runs the automated ArcPy walkshed process: This is now turned off by default in the model transmittal package, but it can also be uncommented (turned on) by the user if the user is making changes to the transit network and wants to recompute the transit walksheds and their resultant walk percentages.
- Whether one introduces a time delay (lag time) between model runs: For example, **two model runs can be launched at the same time**, or the **modeler can choose to offset the two launch times by a certain amount of time**. Thus, "**concurrent**" can mean that all the runs were started at the same time or that there was some offset between the start times of the model runs.

Finally, as noted in Section 3.3, based on recent communications with Citilabs (personal communication, 2/6/17), it is better not to overload the processor, so, although a 32-core computer should be able to run 4 concurrent model runs (4 x 8 = 32), it would be better to limit this computer to 3 concurrent model runs. Citilabs alludes to this issue in recent documentation: "However, when comparing two processors from the same family, assuming the processors are otherwise identical, an 8-core processor without Hyper-Threading will outperform a 4-core processor with Hyper-Threading, even though both processors are making 8 threads available to the operating system."[70]

[69] Ngo to Moran et al., "Testing the COG/TPB Travel Model Servers: 1) Need for Admin Privileges; 2) Ability to Run Two or More Concurrent Model Runs by Two or More Users; 3) Experience with Malware," 5.
[70] Citilabs, Inc., "Cube Base Reference Guide, Version 6.4.1," 10–11.

11 Building transit walksheds and calculating zonal walk percentages

11.1 Overview

One of the inputs to the travel demand model is the percentage of each zone that is within walking distance to transit. Conceptually, one develops a series of transit walksheds, which are then combined geographically with zone boundaries to calculate the percentage of each zone that is within walking distance to transit. This procedure creates point buffers around transit stop nodes and then overlays these point buffers with TAZ boundaries. The process is made more complicated by the fact that two walking distances are differentiated: a short walk (0.5 miles) and a long walk (1.0 miles). See Section 21.4.3 ("Market segmentation by access to transit") beginning on p. 167 for more details.

The model assumes that the area of each TAZ that is within a short-walk or a long-walk to transit is stored in a text file (areawalk.txt). This file is used by the walk access script (*walkacc.s*) to calculate the zonal walk *percentages*, which are then stored in a second text file (NLWalkPCT.txt).[71] This second file is then an input to both the transit fare process (*prefarv23.s*) and the mode choice process.

Note: **For the associated Ver. 2.3.75 model transmittal package, the automated transit walkshed process has been turned off** (commented out in the run_modelSteps batch files). This is because:

1. If the user is not changing the transit network, there is no need to rerun this process, since we supply the needed areawalk.txt file with each network scenario;
2. Based on experience, this step is one of the most likely modeling steps to cause a premature stop or a crash, so for most users, it is better simply not to run it automatically. The reasons why the automated transit walkshed process causes a premature stop or a crash are varied, from incompatibilities between Cube Base and ArcGIS (see Table 20 on p. 98), to issues related to the way that the current ArcGIS engine runtime deals with slivers in the buffering process.

11.2 Application Details

The Ver. 2.3.57 travel model continues using an automated/integrated transit walkshed process, which was developed by AECOM. The process is automated in the sense that it is run using a Python/ArcPy script, so it does not require manual intervention from the user. The process is integrated in the sense that it is built into the travel model run: It is now the first step in the "run model steps" batch file ("call *ArcPy_Walkshed_Process.bat* %1"). The new process was developed by AECOM in FY 2014, and is discussed both in AECOM's FY 2014 report.[72] Although this process is turned off, by default, in the version of the model distributed with the model transmittal package, for users who would like to run the

[71] See the modeling flowchart in Appendix A.

[72] AECOM, "FY 2014 Final Report, COG Contract 12-006: Assistance with Development and Application of the National Capital Region Transportation Planning Board Travel Demand Model" (National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, August 18, 2014), chap. 3, http://www.mwcog.org/uploads/committee-documents/Y11YWFZd20140922110646.pdf.

process (perhaps because they have made a change to a transit network), the user can simply uncomment (remove the "REM") the following line in the run_modelSteps batch file:

```
call ArcPy_Walkshed_Process.bat %1
```

As noted by AECOM, "ArcPy was chosen as the basis for development because it provides convenient and powerful access to the GIS functionalities in a (Python) programming environment that is transparent and relatively easy to modify."[73] Another advantage of the new process is that it does not require one to have/purchase ArcGIS. One needs only to have purchased Cube, which comes with the ArcGIS engine runtime and which is already a requirement to run the model. To run the new integrated walkshed process, one must have the following:

- One of the following two ArcGIS software packages:
    - ArcGIS, version 10.1: Available for purchase from Esri. Some modelers may already have this software; some may not.
    - ArcGIS engine runtime, version 10.3: Available for free, if you have purchased Cube. All modelers will have purchased Cube, since it is needed to run the model. Cube version 6.4.1 comes with ArcGIS engine runtime 10.3.4959. If you do not have a full installation of ArcGIS 10.1, you will want to install Cube, including the ArcGIS engine runtime.
- Python: This is free, open-source software. One way to get it automatically is to install Cube "with ArcGIS engine runtime." It may also be included when one installs the full version of ArcGIS.

Notes:

1. As of Ver. 2.3.66, the areawalk.txt file created in the new automated walkshed process is sorted by TAZ.
2. In testing, if two model runs that incorporate the new transit walkshed process were started at the same time, one of the two runs will likely stop prematurely in the walkshed process. This is likely due to a license restriction with the ArcGIS runtime engine. Consequently, it is recommended that multiple model runs with enabled walkshed process on the same computer not be launched at the same time. Instead, **it is recommended that the start times be staggered/offset by 45 to 60 minutes**.[74] Based on a series of recent "stress tests" to see how many concurrent model runs could be completed on one server, it was also found that the 45-60-minute time offset is useful for minimizing the chance of a model run crash (irrespective of whether the new walkshed process is run, since a sharing violation can occur with other modeling steps).

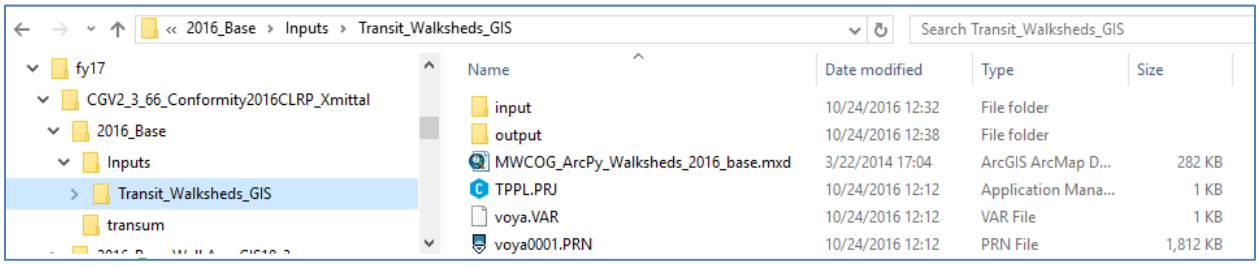
[73] AECOM, 3–2.
[74] AECOM, 3–8.

The new walkshed process appears to give identical results to the previous walkshed process, providing the inputs, such as the transit line files, are identical and correctly coded.[75]

In the model transmittal package, this line has been turned off (commented out), by placing "REM" at the beginning of the line (for the reasons explained earlier in this section).

If this automated transit walkshed process is run, this step occurs at the start of the pump-prime (PP) speed feedback loop. Once the walkshed process has been run, a new folder will be created in the "inputs" folder, named "Transit_Walkshed_GIS," as shown in Figure 24. Within this folder, one can find an ArcGIS map document file (MWCOG_ArcPy_Walksheds_*.mxd) which can be used to visualize the walkshed buffers, as shown in Figure 25.

Figure 24 Folder structure for the automated ArcPy walkshed process



Note that the Transit_Walkshed_GIS folder includes two subfolders, "input" and "output", which should not be confused with the "inputs" folder that is stored within the scenario-specific folder (which, in this case is called 2019_Final). The ArcPy walkshed process creates two files: areawalk.txt and PercentWalk.txt, but only the first file is used by the travel model. If a copy of areawalk.txt already exists in the "inputs" folder, the old copy will be renamed as AreaWalk_Old.txt, before the new areawalk.txt file is created.[76]

11.3 Known issues

Although the new automated transit walkshed generation process has been a benefit to most users of the regional travel model, it has also been the source of many technical assistance calls to the COG/TPB staff when the process crashes for one reason or another. To minimize the likelihood that the automated ArcPy transit walkshed process will crash, we recommend you use versions of Cube and ArcGIS that are compatible. Table 20 shows which versions of Cube Base are **compatible** with ArcGIS, **in terms of the ability to run the automated transit walkshed process**. We have tested four different versions of ArcGIS with Cube Base ver. 6.4.1. Two of these worked (ArcGIS Engine Runtime 10.3 and ArcGIS 10.1) and two of these did not (ArcGIS 10.3.1 and ArcGIS 10.4.1). According to recent Citilabs documentation covering Cube 6.4.2 and 6.4.1, "Cube 6.4.1 includes support for ArcGIS versions 9.3 to

[75] See page 2-3 of Mark S. Moran and Dzung Ngo to David Roden and Krishna Patnam, "Comments on Your Cube/ArcPy-Based Transit Walkshed Process and Its Associated Memo Dated March 25, 2013," Memorandum, May 15, 2014.
[76] AECOM, "FY 2014 Final Report, COG Contract 12-006: Assistance with Development and Application of the National Capital Region Transportation Planning Board Travel Demand Model," 9–2.

10.3.1."[77] However, in our test #3, we found that the "support" was not such that it would allow the automated ArcPy transit walkshed process to run to completion, which is why we have noted that Cube Base 6.4.1 and ArcGIS 10.3.1 are not compatible for running the ArcPy automated walkshed process.

The table also shows two other cases, both for Cube 6.4.2. In test #5, an external user tried using Cube 6.4.2 and ArcGIS 10.4, but the two software packages were incompatible. In test #6, COG/TPB staff tested Cube 6.4.2 with ArcGIS engine runtime 10.4. In this case, the two software packages seemed to be compatible, but, as noted in a footnote to the table below, Cube Voyager ver. 6.4.2 appears to be less stable than Cube 6.4.1 when running the automated ArcPy transit walkshed process. TPB staff experienced several crashes in the ArcPy walkshed process under Cube 6.4.2. When staff upgraded Cube 6.4.1 to Cube 6.4.2 but did not upgrade ArcGIS Engine Runtime from 10.3.4959 to 10.4.1636776 (test #7), the model runs did not crash. The success of test #7 indicates the instability of ArcGIS Engine Runtime 10.4.1636776 coming with Cube 6.4.2 when running the automated transit walkshed process.

Staff recommend using Cube 6.4.1 and its ArcGIS Engine Runtime, Version 10.3.4959, as is shown in **bold** in Table 20.

Table 20 Compatibility between Cube Base and ArcGIS, in terms of the ability to run the automated transit walkshed process

Version of Cube Base	Version of ArcGIS	Compatible? *	Test Conducted by	Test No.
6.4.1	**10.3.4959 (ArcGIS Engine Runtime**)**	**Yes**	**COG/TPB**	**1**
	10.1 (full version)	Yes	COG/TPB	2
	10.3.1 (full version)	No	COG/TPB	3
	10.4.1 (full version)	No	COG/TPB	4
6.4.2***	10.4 (full version)	No	No. Va. Transportation Commission	5
	10.4.1636776 (ArcGIS Engine Runtime**)	Unstable	COG/TPB	6
	10.3.4959 (ArcGIS Engine Runtime****)	Yes	COG/TPB	7

* "Compatible" means that the tester was able to run the automated ArcPy transit walkshed process using the noted version of Cube and ArcGIS.

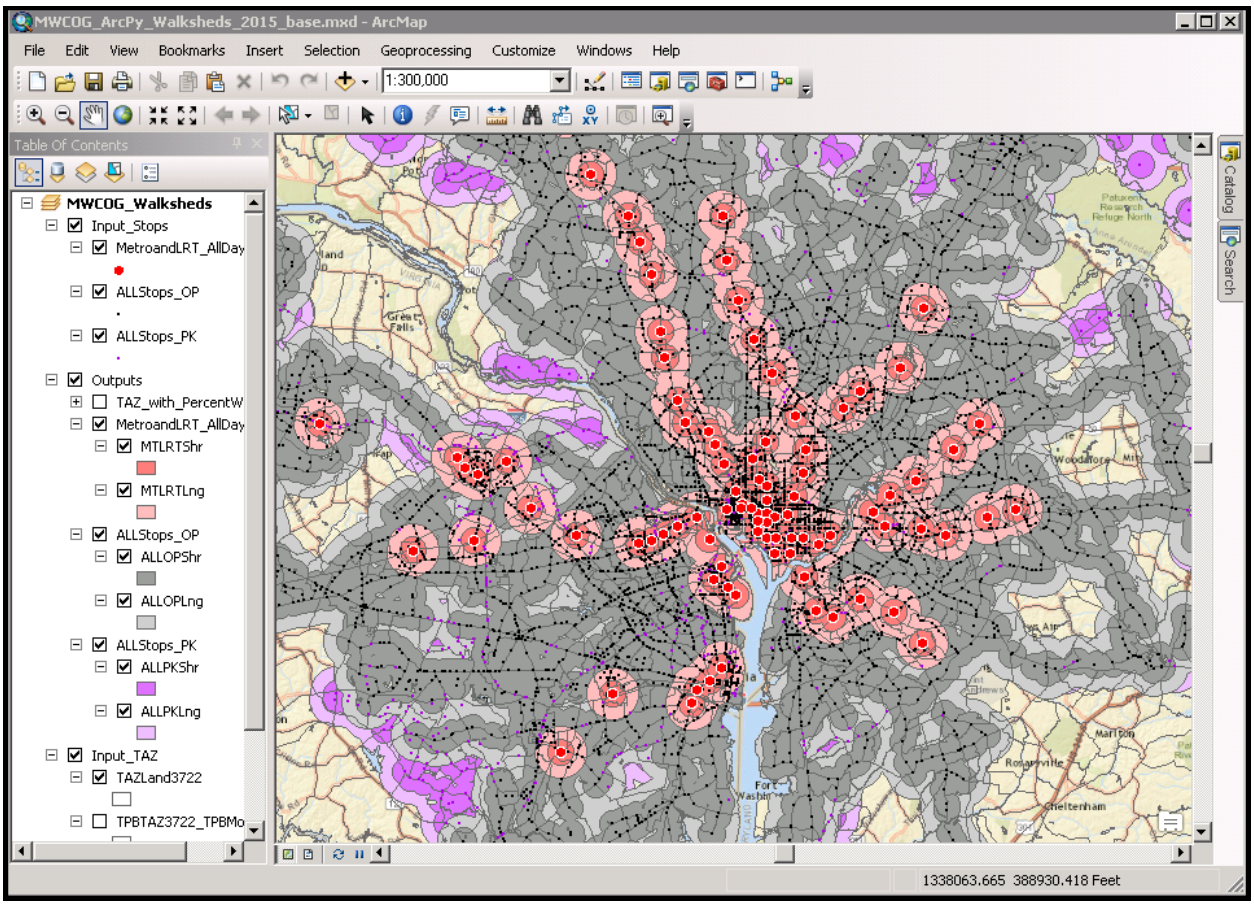
** ArcGIS Engine Runtime comes with Cube.

*** Compared to Cube Voyager ver. 6.4.1, Cube Voyager ver. 6.4.2 appears to be less stable when running the automated ArcPy transit walkshed process (TPB staff experienced several crashes in the ArcPy walkshed process under Cube 6.4.2).

**** ArcGIS Engine Runtime coming with Cube 6.4.1 is kept when updating to Cube 6.4.2.

[77] Citilabs, Inc., "Cube Base Release Summary, Version 6.4.2" (Tallahassee, Florida: Citilabs, Inc., September 22, 2016), 4, http://citilabs-website-resources.s3.amazonaws.com/resources/RS_CubeBase.pdf.

Figure 25 Walkshed buffers for a typical base-year scenario



12 Set-Up Programs and Highway Network Building

12.1 Overview

Following the generation of transit walksheds, the initial modeling steps of the Version 2.3 model are executed to establish basic modeling parameters to construct a binary (or "built") highway network. The steps are executed using two batch files:

- *Set_CPI.bat*: The batch file calls two Cube Voyager scripts, *Set_CPI.s* and *Set_Factors.s*
- *PP_Highway_Build.bat*: The batch file calls two Cube Voyager scripts, *AreaType_File.s* and *V2.3_Highway_Build.s*

The modeling steps included in these two batch files are shown on pages A-2 and A-3 of the flowchart in *Appendix A. Set_CPI.s* is used to establish deflation factors that are used in subsequent toll-related and transit fare-related steps. *Set_Factors.s* is used to establish K-Factors used in trip distribution and is also used to create the file *station_names.dbf* (used for the transit assignment summary process), which is developed using information pulled from station.dbf. The *Area_Type.s* step establishes zonal area type codes based on land activity densities (see Table 31). The resulting area type file is subsequently used in the highway building step, *V2.3_Highway_Build.s*. These steps are not implemented within the speed feedback loop of the travel model; they are executed only once, in the "pump prime" stage of the travel model. The principal inputs to above modeling steps are listed in Table 21 and detailed in Table 22 through Table 26. The principal outputs are listed in Table 27, and are detailed in Table 28 and Table 29.

Table 21 Inputs to the set-up and highway network building process

File description	File name and location	Format
CPI schedule and parameter file	\Inputs\CPI_File.txt	Text
Zonal land use file	\Inputs\ZONE.DBF	DBF
Node coordinate file	\Inputs\NODE.DBF	DBF
Zonal area type override file	\Inputs\AT_override.txt	Text
Link file	\Inputs\LINK.DBF	DBF
Initial AM and midday hwy. speed lookup files	\Support\AM_SPD_LKP.TXT, \Support\MD_SPD_LKP.TXT	Text
Toll parameter file	\Inputs\Toll_Esc.dbf	DBF

Table 22 Land Use File Format Description (zone.dbf)

Variable name	Description
TAZ	TAZ (1-3722)
HH	Households
HHPOP	Household population
GQPOP	Group quarters population
TOTPOP	Total population
TOTEMP	Total employment

Variable name	Description
INDEMP	Industrial employment
RETEMP	Retail employment
OFFEMP	Office employment
OTHEMP	Other employment
JURCODE	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
LANDAREA	Gross land area (square miles)
HHINCIDX	Ratio of zonal HH median income to regional median HH income in tenths (i.e., 10 = 1.0) per the 2007 ACS
ADISTTOX	Airline distance to the nearest external station (whole miles)
TAZXCRD	TAZ X-coordinate (NAD83, whole feet)
TAZYCRD	TAZ Y-coordinate (NAD83, whole feet)

Table 23 Node Coordinate File Format Description (node.dbf)

Variable name	Description
N	Highway node number
X	X-coordinate (NAD83, whole feet)
Y	Y-coordinate (NAD83, whole feet)

Table 24 Base Highway Link File Format Description (link.dbf)

File Name	Variable Name	Description
Link.dbf	A	A-Node
	B	B_Node
	DISTANCE	Link distance (in 1/100ths of miles)
	JUR	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
	SCREEN	Screenline Code
	FTYPE	Link Facility Type Code (0-6)
		0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/Collector, 5/Expressway, 6/Ramp
	TOLL	Toll Value in current year dollars
	TOLLGRP	Toll Group Code
	AMLANE	AM Peak No. of Lanes
	AMLIMIT	AM Peak Limit Code (0-9)
	PMLANE	PM Peak No. of Lanes

File Name	Variable Name	Description
	PMLIMIT	PM Peak Limit Code (0-9)
	OPLANE	Off-Peak No. of Lanes
	OPLIMIT	Off-Peak Limit Code (0-9)
	EDGEID	Geometric network link identifier
	LINKID	Logical network link identifier
	NETYEAR	Planning year of network link
	SHAPE_LENG	Geometric length of network link (in feet)
	PROJECTID	Project identifier
	TRANTIME	Unused place marker
	WKTIME	Unused place marker
	MODE	Unused place marker
	SPEED	Unused place marker

Notes:

- The mode choice model requires that all costs be in 2007 dollars, which was the calibration year.
- Link limit codes are shown in Table 25.

Table 25 Link limit codes

Limit Code	Description and Vehicles Allowed
0	All vehicles allowed
2	HOV 2+ occupant vehicles allowed
3	HOV 3+ occupant vehicles allowed
4	All vehicles allowed, except for trucks
5	Airport passenger auto driver trips allowed
9	Closed link or transit only link. Example use cases: a) Transit only: Link closed to all traffic other than transit vehicles. If no transit routes traverse the link, then it is essentially closed to all vehicle traffic. b) Directional coding of managed-lane facilities, such as HOV and HOT, where some links are effectively closed to vehicles in some directions, during some periods of the day. c) Change in link directionality through time, e.g., if a road is 2-directional in some network years, but changes to a one-way street in the future, then limit 9 is used on the direction that is closed in the future. d) Reversible lanes, e.g., Rock Creek Parkway has limit code 9 in the off-peak direction, since it is closed for travel in that direction. e) Roads that do not exist in early years of the plan but are built in later years. For example, I-270 has future-year improvements in 2030 north of I-370. In the early years, this links are coded as limit code 9, since they do not yet exist.

Table 26 Toll Parameter File (Toll_esc.dbf)

File Name	Variable Name	Description
Toll_Esc.dbf	Tollgrp	Toll group code 1 = Flat toll (pertains to most existing tolled facilities); 2 = Toll that varies by time of day (e.g. ICC), 3+= Tolls that change dynamically based on congestion level (e.g., VA HOT lanes/Express Lanes)
	Escfac	Deflation factor override. Can be used to group various toll policies.
	Dstfac	Distance (per mile) based toll factor in present year cents/dollar (optional)
	AM_Tftr	AM period Toll factor
	PM_Tftr	PM period toll factor
	OP_Tftr	Off-peak period toll factor
	AT_MIn	Area Type minimum override (optional)
	AT_Max	Area Type maximum override (optional)
	TollType	*Toll Type (1=operating in calibration year, 2= operating after calibration year)*

Table 27 Outputs of the set-up and highway network building process

Highway, transit deflator files	Trn_Deflator.txt, Hwy_Deflator.txt	Text
Summary text file of Fare CPI assumptions used	MFARE2_CPI.txt	Text
Zone centroid co-ordinates	TAZ_XYs.dbf	DBF
1-mile floating land use	Floating_LU.dbf	DBF
Area type file	AreaType_File.dbf	DBF
Unloaded/built highway network file	ZONEHWY.NET	Binary
Summary text file of Fare CPI assumptions used	MFARE2_CPI.txt	Text
Zonal K-factors	HBW_K.MAT, HBS_K.MAT, HBO_K.MAT, NHW_K.MAT, NHO_K.MAT	Binary

Table 28 Zonal Area Type File (AreaType_File.dbf)

Variable Name	Description
TAZ	TAZ Number (1-3,722)
POP_10	One-mile "floating" Population density
EMP_10	One-mile "floating" Employment density
AREA_10	One-mile "floating" Area
POPDEN	One-mile "floating" Population density
EMPDEN	One-mile "floating" Employment density
POPCODE	Population density code (1 -7)
EMPCODE	Employment density code (1 -7)
ATYPE	Area Type (1-6)

Ref: "I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide\AreaType_File.xlsx"

The one-mile floating density is calculated by using the TAZ centroids and a one-mile point buffer around these centroids.

Table 29 Unloaded binary highway network file (Zonehwy.net)

File Name	VariableName	Description
zonehwy.net	A	A Node
	B	B Node
	DISTANCE	Link Distance in miles (x.xx)
	SPDC	(Not used)
	CAPC	(Not used)
	JUR	Jurisdiction Code (0-23)
		0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef
	SCREEN	Screenline Code (1-38)
	FTYPE	Link Facility Type Code (0-6)
		0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/ Collector, 5/ Expressway, 6/ Ramp
	TOLL	Toll value in current year dollars
	TOLLGRP	Toll Group Code (1-9999)
	<Period>LANE	<Period> No. of Lanes
	<Period>LIMIT	<Period> Limit Code (0-9)
	EDGEID	Geometry network link identifier
	LINKID	Logical network link identifier
	NETWORKYEA	Planning year of network link
	SHAPE_LENG	Geometry length of network link (in feet)
	PROJECTID	Project identifier
	TAZ	TAZ (1-3,722)
	ATYPE	Area Type (1-6)
	SPDCLASS	Speed Class
	CAPCLASS	Capacity Class
	DEFLATIONFTR	Deflation factor for converting existing year costs to 2007 costs
	<Period>TOLL	<Period>Toll value in current year cents (if applicable)
	<Period>TOLL_VP	<Period>Toll of future, variably priced facility only
	<Period> HTIME	<Period> Highway Time (min)
Key		
<Period>=	AM	AM Peak Period (6:00-9:00 AM)
	MD	Mid Day (9:00 AM - 3:00 PM)
	PM	PM Peak Period (3:00 - 7:00 PM)
	NT	All remaining hours

12.2 Application Details

The *Set_CPI.S* script is used to produce deflation factor files (Trn_Deflator.txt and Hwy_Deflator.txt) which are used to convert present-year costs to constant-year (2007) costs. The deflation parameter files are inputs to the *V2.3_Highway_Build.s* and *MFARE2.S* scripts. This procedure has been established to ensure that cost deflation for highway tolls and transit fares are treated consistently.

The *Set_CPI.S* script reads a preexisting look-up table (\INPUTS\CPI_File.txt) containing historical annualized CPI figures published by the U.S. Bureau of Labor Statistics beginning with the model calibration year, 2007. The CPI figures are based on the U.S. city average of all urban consumers (100 = 1982-84). An example listing of the file appears in Figure 26.

Figure 26 Consumer price index file (CPI_File.txt)

```
;; - MWCOG V2.3 Travel Model - Cost deflation Table
;; - 1/30/2017 - RN
;; Data from BLS / All Urban Consumers (CPI-U) US City Avg.1982-84=100.0
;; http://www.usinflationcalculator.com/inflation/consumer-price-index-and-annual-percent-changes-from-1913-to-2008

InflationFTR         = 1.0    ; Inflation Assumption (DEFAULT IS 1.0)
Defl_OverRide        = 0.0    ; Deflation Override   (DEFAULT IS 0.0)  If Non-zero it is used as deflator
                              ; Used as deflator IF NON-ZERO
BaseCPIYear          = 2007   ; Base year of the CPI Table
CurrCPIYear          = 2017   ; Current year on  CPI table below (Year for which complete annual CPI data is available)
;
;============================================================
; Establish historic CPI table and Deflation Factor           =
;============================================================
;
      LOOKUP Name=CPI_Table,
             LOOKUP[1]   = 1,Result = 2,          ;;  CPI index (from US BLS)
             LOOKUP[2]   = 1,Result = 3,          ;;  Compounded Growth Rate From Base Year
             LOOKUP[3]   = 1,Result = 4,          ;;  Deflation Factor
             Interpolate = N, FAIL=0,0,0,list=Y,
          ;;
          ;;              (((YrCPI/BsCPI)^(1/n))-1.0)*100   BsCPI/YrCPI)
          ;;                    Annual_Avg.                 Historic Deflation
          ;; YEAR    CPI        Growth_Rate(%)              Factor
          ;; ----   -----       ----------------            -----------
        R=' 2007,  207.342,          0.00,                 1.0000 ', ; <--- BaseCPIYear
          ' 2008,  215.303,          3.84,                 0.9630 ', ;
          ' 2009,  214.537,          1.72,                 0.9665 ', ;
          ' 2010,  218.056,          1.69,                 0.9509 ', ;
          ' 2011,  224.939,          2.06,                 0.9218 ', ;
          ' 2012,  229.594,          2.06,                 0.9031 ', ;
          ' 2013,  232.957,          1.96,                 0.8900 ', ;
          ' 2014,  236.736,          1.91,                 0.8758 ', ;
          ' 2015,  237.017,          1.69,                 0.8748 ', ;
          ' 2016,  240.007,          1.64,                 0.8639 ', ;
          ' 2017,  245.120,          1.69,                 0.8459 '  ; <--- Curr(ent)CPI Year
; --- end of CPI File -----------
; ------------------------------
```

Ref: Z:\ModelRuns\fy19\CGV2_3_75_Visualize2045_CLRP_Xmittal\2019_Final\Inputs\CPI_File.txt

The script computes a cost deflation factor using the CPI table and the parameters *BaseCPIYear*, *CurrCPIYear, InflationFTR* (all specified in the above text file), and **the *_Year_* environment variable specified in the "Run_ModelSteps" batch file**. These parameters are defined as:

- **BaseCPIYear** = the base (or calibration) year of the travel model

- **CurrCPIYear** = the most recent year for which historical CPI data exists (as reflected in the CPI table)
- **_Year_** = the year of the modeled scenario (as defined in the Run_ModelSteps.bat file)
- **InflationFTR** = Factor reflecting special CPI growth assumptions beyond CurrCPIYear that might be considered in scenario testing. For example, a value of 1.0 indicates future cost escalation is assumed to remain constant with the historical rate of inflation; a value of 2.0 would indicate that the future cost escalation is assumed to be twice the historical rate of inflation; a value of 0.5 would indicate that the future cost escalation is assumed to be one half of the historical rate of inflation, etc. The default value is 1.0.

Under default conditions, if the modeled year (*_Year_*) is less than or equal to *CurrCPIYear*, the CPI factor will equal CPI_{2007}/ $CPI_{_Year_}$from values provided in the CPI table. If the modeled year (*_Year_*) is greater than *CurrCPIYear*, the CPI factor will equal (CPI_{2007}/ $CPI_{CurrCPIYear}$) from values provided in the CPI table. The user may optionally invoke the *InflationFTR* parameter to arrive at a deflation factor that reflects something other than the "historical inflation rate" assumption. In addition to the output deflation factor files mentioned above, the script also writes a text file (Mfare2_CPI.txt) that lists the input and output parameter values used.

The Set_Factors.s script is used to generate a family of K-factors by modeled trip purpose, to be used subsequently by the trip distribution process. The K-factors are jurisdiction-based and have been formulated during the calibration and validation phase of the model development process. Separate K-factor files are produced by purpose as Cube/Voyager binary matrix files (zone-to-zone). These files are currently stored in the Support folder, though there has been some thought of moving these into the inputs folder to prevent sharing violations when multiple model runs are launched concurrently. As of the Ver. 2.3.57a model, *Set_Factors.s* is also used to generate the station names file (station_names.dbf), which is stored in the INPUTS folder, used in the transit assignment summary process, and is derived from information found in the station file (station.dbf, see Table 38).

It is useful to understand the basic elements of the highway and transit networks that are reflected in the highway link input file (link.dbf) to the Version 2.3 model. The highway elements are shown in Table 30.

Table 30 Elements of the highway network

Highway Network Element	What It Represents	Node No. Ranges	Notes
Zone centroid	Center of activity for the TAZ; Start and end point for trips	1-3722	3676-3722 allocated as external stations. 3723-5000 reserved for TAZ expansion. Established ranges for each jurisdiction. Some TAZs are unused
Station PNR centroid	Location of the station's park-and-ride lot. Used to develop congested highway times between each TAZ and each PNR lot.	5001-7999*	5001-5999 for Metrorail. 6000-6999 for commuter rail. 7000-7999 for LRT, BRT, and streetcar.
Highway node	Highway intersections or junctions, including where zone centroids connect to the highway network	20000-60000	Established ranges for each jurisdiction.

Highway Network Element	What It Represents	Node No. Ranges	Notes
Zone centroid connectors	Connection from zone centroid to the highway network. One zone centroid connector can represent multiple local roads.		Facility type (FTYPE) = 0
PNR lot connectors	Connection from PNR lot to the highway network		Facility type (FTYPE) = 4
Highway links	Road segments		0 = centroid connectors; 1 = freeways; 2 = major arterials; 3 = minor arterials; 4 = collectors; 5 = expressways; 6 = ramps on freeways and arterials; 9 = transit only;

Notes: * Station PNR centroids (a.k.a. dummy station centroids) are not required for Mode 5 (LRT) or Mode 10 (BRT/streetcar).[78] For the sake of consistency, the current COG coding practice is to refrain from using station PNR centroids for LRT, BRT, and streetcar. In other words, in the station file, the STAC variable is coded with a value of zero.

The network includes two types of centroids: a zonal centroid, which represents the geographic center of land activity within a TAZ, and a park-and-ride (PNR) lot centroid (also known as a "station centroid," "dummy PNR centroid"), which represents PNR lot locations at Metrorail and commuter rail stations. The PNR centroid represents a kiss-and-ride (KNR) drop-off point if no PNR lot exists at a given station. Within the station file (station.dbf), the PNR centroid/station centroid is denoted with the variable name STAC. Each Metrorail station and commuter rail station should have its own unique STAC. The two centroid types are assigned specific numbering ranges. TAZ centroids are numbered 1-3722 and PNR centroids are numbered 5001-7999. The numbering gap between the TAZ and PNR ranges, 3723-5000, are reserved for future TAZ assignments.[79] The two centroid types are employed so that highway level-of-service (LOS) matrices may be built, not only between TAZs, but also between TAZs and PNR lots.

Highway nodes representing intersections or highway access points from TAZs or PNR lots are assigned a number from the following range: 20000 to 60000. Network links (i.e., centroid connectors and highway links) are assigned facility type ("Ftype") attributes ranging from 0 to 6.

The highway network building process -- i.e., the process for creating a binary highway network file which is used in subsequent modeling steps -- is undertaken with two scripts that are executed in sequence: *AreaType_File.s* and *V2.3_Highway_Build.s* (page A-3). The *AreaType_File.s* script, which reads a preexisting zonal land activity file (Zone.dbf) and a highway node coordinate file (Node.dbf), computes the area type code associated with each TAZ. Area type codes range from 1 to 6 and are based on population and employment density, as shown in Table 31.

[78] Jain to Milone and Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," 6 and 10.
[79] The existing Version 2.3 scripts, inputs, and support files would need to be modified if additional TAZs were added to the highway network.

Table 31 Area type codes, based on population and employment density

One-Mile "Floating" Population Density (Pop/Sq mi)	One- mile "Floating" Employment Density (Emp/Sq mi)						
	0-100	101-350	351-1,500	1,501-3,550	3,551-13,750	13,751-15,000	15,001+
0-750	6	6	5	3	3	3	2
751-1,500	6	5	5	3	3	3	2
1,501-3,500	6	5	5	3	3	2	2
3,501-6,000	6	4	4	3	2	2	1
6,001-10,000	4	4	4	2	2	2	1
10,000-15,000	4	4	4	2	2	2	1
15,001+	2	2	2	2	2	1	1

The *AreaType_File.s* script produces three files which are used as inputs to the v2.3_highway_build.s script:

- TAZ_Xys.dbf (zonal coordinates),
- Floating_LU.dbf (a zonal file containing the area, population, and employment within one mile),[80]
- Areatype_file.dbf (a zonal file containing the associated area type, in accordance with the land activity file)

The V2.3_Highway_Build.S script reads the zonal area type file, along with a node file, a link attribute file, a zone file, and four parameter files. The parameter files include initial speed and capacity lookup files (AMSpd.lkp, MDSpd.lkp), both arrayed by facility type and area type. The deflation file created by the SET_CPI.s script (Hwy_Deflator.txt) is also read into the highway building script. Finally, a toll parameter/escalation file (Toll_esc.dbf) is also used by the script. The file contains a number of toll-related parameters that are indexed by a tolled facility code (tollgrp) which is included as a link attribute.

The highway building process consists of the following steps:

1) Each highway link is evaluated against all TAZ centroids to determine its nearest zone (i.e., the TAZ centroid nearest to the airline mid-point of the link a-node and b-node). The nearest zone is then saved to a temporary link file containing the A-node, B-node, and nearest TAZ.

[80] TAZ-level floating density is calculated by using the TAZ centroids and creating a 1-mile point buffer around each centroid.

2) The link file, zonal area type file, and link-TAZ (from step 1) are merged to enable the zonal area type of the nearest TAZ to be assigned to each link. The link file contains basic link attributes, including distance, facility code, time-of-day-period-specific (AM, PM, OP) lanes and limit codes, coded tolls, toll group codes, jurisdiction, and screenline codes.
3) Toll parameters are merged to each link on the basis of the tollgrp code.
4) Speed and capacity classes are next defined as a two-digit integer, where the first digit is the facility type and the second digit is the area type.
5) Period-specific tolls (AM, PM, and OP) are computed. The general form of the toll computation is:

<prd>Toll = (Toll + ($DstFac_t$ * Distance * <prd>_$TFtr_t$)) * ($EscFac_t$ if > 0.0; Otherwise: Hdefl)

Where:

<prd>Toll	= period-specific toll coded on link in constant year dollars (e.g., Amtoll)
Toll	= link-coded "Toll" link attribute value
$DstFac_t$	= distance factor (cents/mi) for toll group "t", as specified in Toll_Esc.dbf
Distance	= link-coded distance (miles)
<prd>_$TFtr_t$	= period-specific factor for toll group "t" as specified in Toll_Esc.dbf
Hdefl	= Default highway deflation factor based on CPI assumptions (Set_CPI.s)
Esc_Fac_t	= Hwy. deflation factor *override* for toll group "t", as specified in Toll_Esc.dbf

6) A period-specific toll type code (<prd>Toll_VP) is established to distinguish whether the tolled link existed during the model calibration year or the tolled link is a future, variably priced facility. This information is relevant to subsequent toll skimming.
7) Initial AM and OP speeds are assigned, based on facility and area type codes.
8) Midday (MD) and Night (NT) attributes are set to off-peak (OP)-related attributes defined above

The binary network file resulting from the highway network building process is named Zonehwy.net. Variables that are included in the zonehwy.net file are described in Table 32.

Table 32 zonehwy.net file Variables description

Variable Name	Description
A	A-Node
B	B-Node
DISTANCE	Link Distance in miles (x.xx)
SPDC	Not used
CAPC	Not used
JUR	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
SCREEN	Screenline Code (1-38)
FTYPE	Link Facility Type Code (0-6) *0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/Collector, 5/Expressway, 6/Ramp*

Variable Name	Description
TOLL	Toll Value in current year dollars
TOLLGRP	Toll Group Code (1-9999)
<Period>LANE	<Period> No. of Lanes
<Period>LIMIT	<Period> Limit Code (0-9)
EDGEID	Geometry network link identifier
LINKID	Logical network link identifier
NETWORKYEA	Planning year of network link
SHAPE_LENG	Geometry length of network link (in feet)
PROJECTID	Project identifier
TAZ	TAZ (1-3722)
ATYPE	Area Type (1-6)
SPDCLASS	Speed Class
CAPCLASS	Capacity Class
DEFLATIONFTR	Factor for deflating current year tolls to constant year tolls
<Period>TOLL	<Period> Toll Value in current year dollars
<Period>TOLL_VP	<Period> Toll Value in current year dollars - Variably priced tolled facilities only
<Period> HTIME	<Period> Highway Time - based on initial highway lookup speeds
KEY	
<Period>= AM	AM Peak Period (6:00 AM - 9:00 AM)
MD	Midday (9:00 AM - 3:00 PM)
PM	PM Peak Period (3:00 PM - 7:00 PM)
NT	All remaining hours ("nighttime")

13 Highway Skim File Development

13.1 Overview

Highway skimming begins with path building, the process of building minimum-impedance paths from every TAZ to every other TAZ. After paths have been built, the paths can be "skimmed," i.e., the paths are traversed, and key variables are summed over the paths. The variables that are skimmed include travel times, distances, and tolls. The resultant zone-to-zone sums are saved in one or more skim matrices. The input to the skimming process is usually a loaded network with congested travel speeds, generated from a traffic assignment process. Although traffic assignment is conducted for four time-of-day periods (AM peak period, midday, PM peak period, and nighttime), the travel model is set up to use skims for only two time-of-day periods: a peak period (represented by the AM peak period) and an off-peak period (represented by the midday period). Highway skims in the Version 2.3 model are generated after each traffic assignment step.

Highway skims are generated by time period (AM and Midday), and by highway mode (SOV, HOV 2-occupant, HOV 3+occupant). In addition, truck skims are generated for the midday period only. Mode-specific paths are very important in the Washington, D.C. region, due to special operating restrictions, particularly during the AM peak period.

The TPB's highway skimming is done twice: once to develop zone-to-zone (3722 x 3722) skim matrices and then again to develop zone/PNR lot-to-zone/PNR lot (7999 x 7999) skim matrices. The latter set enables restrained highway speeds and distances to be calculated between zones and PNR lots, thus allowing transit auto-access links to be built. The entire highway skimming process is applied with the scripts named *Highway_Skims_am.s, Highway_Skims_md.s, modnet.s, Highway_Skims_mod_am.s, Highway_Skims_mod_md.s,*[81] *joinskims.s, and Remove_PP_Speed.s*. These are invoked with the *PP_Highway_Skims.bat* file in the initial or pump-prime iteration (see page A-4 of Appendix A) and the *Highway_Skims.bat* file (see page A-11) in the standard iterations. The *Remove_PP_Speed.s* script is executed in the pump-prime iteration only. The principal inputs and outputs are shown in Table 33 and Table 34 , respectively.

Table 33 Inputs to the highway skim file development

Built highway network file	<ITER>_HWY.NET	Binary
Toll minutes equivalent	support\toll_minutes.txt	Text
AM toll factors by vehicle type	Inputs\AM_Tfac.dbf	DBF
MD toll factors by vehicle type	Inputs\MD_Tfac.dbf	DBF

Note: <ITER> =PP, i1…i4 <Prd>= AM and MD

[81] Prior to build 37, there was one script (*Highway_Skims_mod.s*), which had a loop covering the two time periods, AM and midday. However, it was found that this script would crash on some hardware configurations, when running Voyager 5.1.3, resulting in the following errors: 1) Voyager.exe, APPCRASH, TPPDLIBX.DLL; and 2) Voyager, APPCRASH, MSVCR90.DLL. The script was then split into two files (*Highway_Skims_mod_am.s* and *Highway_Skims_mod_md.s*), which eliminated this problem.

Table 34 Outputs of the highway skim file development

Total highway skims	<ITER>_SKIMTOT.TXT	Text
Truck skims	<ITER>_MD_TRK.SKM	Binary
SOV skims	<ITER>_<Prd>_SOV.SKM	Binary
HOV2 skims	<ITER>_<Prd>_HOV2.SKM	Binary
HOV3+ skims	<ITER>_<Prd>_HOV3.SKM	Binary
SOV skims (used by mode choice model)	<ITER>_<Prd>_SOV_MC.SKM	Binary
HOV2 skims (used by mode choice model)	<ITER>_<Prd>_HOV2_MC.SKM	Binary
HOV3+ skims (used by mode choice model)	<ITER>_<Prd>_HOV3_MC.SKM	Binary
AM highway skims	<ITER>_HWY_AM.SKM	Binary
Off peak highway skims	<ITER>_HWY_OP.SKM	Binary
Network with added station centroid connectors	<ITER>_HWYMOD.NET	Binary
Walk access links	WalkAcc_Links.dbf	DBF
	<ITER>_<Prd>_SOV_MOD.SKM	Binary
	<ITER>_<Prd>_HOV2_MOD.SKM	Binary
	<ITER>_<Prd>_HOV3_MOD.SKM	Binary
Highway network with PP speeds removed	ZoneHWY.NET	Binary

Note: <ITER> =PP, i1…i4 <Prd>= AM and MD

13.2 Application Details

The highway skimming process is used to develop time, cost, and toll values between origin/destination (i/j) pairs of zones on a minimum-impedance path. The skimming process reads a highway network input file with preexisting restrained speeds. The restrained speeds used in the pump prime (PP) iteration initially are table look-up values based on time period (AM, Off-peak), facility type, and area type. After the PP iteration is completed (i.e., after the PP traffic assignment process is completed), the highway skimming is accomplished using traffic assignment-based link speeds. The generalized impedance for which paths are developed for highway skimming is defined as follows:

Equation 1 Converting tolls into time-equivalent minutes of impedance

$$(\text{Impedance})_v = (\text{Restrained over-the-network time})_v + (\text{Toll-related time})_v$$

or

$$(\text{Impedance})_v = (\text{Restrained over-the-network time})_v + ([\text{Toll cost}]_v \times [\text{Time rate}]_v \times [\text{Vehicle factor}]_{vf})$$

where

$(\text{Impedance})_v$ = Restrained over-the-network time$_V$ + Toll-related Time $_V$

$(\text{Restrained over-the-network time})_v$ = Congested/restrained network travel time (min) for vehicle class "V"

$[\text{Toll cost}]_v$ = Tolls (2007 dollars)paid by vehicle class "V", if a tolled facility was used

$[\text{Time rate}]_v$ = Time valuation (min/2007 dollar) of toll costs for vehicle class "V"
$[\text{Vehicle factor}]_{vf}$ = Vehicle class factor for tolled facility "F"

Note: Vehicle classes are: SOVs, HOV2-occs, HOV3+occs, Commercial Vehicles, Trucks, and airport passenger vehicles.

The assumed time rates are provided by vehicle class and time period in toll_minutes.txt (see below), which is located in the Support folder. The values shown are derived from average household income levels and information from the 2007/08 HTS. The values should not be altered.

```
;
;     ================================================================
;     = Equivalent Toll Minutes by Time Prd & Vehicle Type           =
;     = in minutes per 2007 dollar - rm 1/7/11                       =
;     ================================================================
;
;    AM Peak           Midday            PM Peak           Night
;---------------  ---------------    --------------     --------------
  SVAMEQM = 2.5     SVMDEQM = 3.0    SVPMEQM = 3.0     SVNTEQM = 3.0 ; <--- SOVs
  H2AMEQM = 1.5     H2MDEQM = 4.0    H2PMEQM = 2.0     H2NTEQM = 4.0 ; <--- HOVs-2 Occ
  H3AMEQM = 1.0     H3MDEQM = 4.0    H3PMEQM = 1.0     H3NTEQM = 4.0 ; <--- HOVs-3+Occ
  CVAMEQM = 2.0     CVMDEQM = 2.0    CVPMEQM = 2.0     CVNTEQM = 2.0 ; <--- Comm Veh
  TKAMEQM = 2.0     TKMDEQM = 2.0    TKPMEQM = 2.0     TKNTEQM = 2.0 ; <--- Trucks
  APAMEQM = 2.0     APMDEQM = 2.0    APPMEQM = 2.0     APNTEQM = 2.0 ; <--- Apaxs
```

The vehicle factors are provided by time period in the inputs files AM_Tfac.dbf and MD_Tfac.dbf. An example of the AM_Tfac.dbf file is shown below. The file is available to allow for the ability to reflect a facility-specific toll policy differential between vehicle classes. The table below specifies the default assumption that tolls do not vary between vehicle classes, except for trucks, which are assumed to pay 2.5 times the toll that an auto would pay.

TOLLGRP	AMSOVTFTR	AMHV2TFTR	AMHV3TFTR	AMCOMTFTR	AMTRKTFTR	AMAPXTFTR
1	1.0000	1.0000	1.0000	1.0000	2.5000	1.0000

Information about the "toll setting" process that is used to estimate reasonable toll values can be found in two technical memos.[82]

The standard zone-to-zone highway skims are developed by the scripts *Highway_Skims_am.s* and *Highway_Skims_md.s*. The scripts produce skim files pertaining to two time periods (AM and midday) and to four mode/path types (SOV, HOV2, HOV3+, and truck). The truck skim file contains one table

[82] Jinchul Park to Team B Modelers, "Processes Related to Toll Setting in Version 2.3 Model (Draft)," Memorandum, October 12, 2012; Jinchul Park to Files, "HOT Lane Modeling Process of MWCOG/TPB (Draft)," Memorandum, October 12, 2012.

pertaining to travel time. The SOV and HOV skim files **contain four tables**: 1) time (min), 2) distance in implied tenths of miles, 3) total toll (year-2007 cents), and 4) variably priced tolls (year-2007 cents).

Based on a past analysis of Version 2.2 model forecasts, TPB staff found substantial costs associated with planned variably priced highway facilities (e.g., the Northern Virginia HOT lanes and the ICC) caused counterintuitive mode choice model results. Essentially, the added person trips induced by the HOT lane's accessibility benefit tended to be allocated among non-SOV modes because of the substantial costs for paying SOVs to use the HOT lane costs. The result was not considered reasonable since the objective of the facility was to attract paying SOVs by selling a travel time benefit. Staff speculated that the result may be attributed to the specification of the mode choice model: the "SOV-pay" alternative was not included in the choice set when the model was calibrated (indeed, no such facility had ever operated in the region). It was decided that the potentially extreme costs associated with future-year, variably priced highway facilities should **not** be considered by the mode choice model **as monetary values** in application. **Instead, tolls on variably priced facilities are expressed as equivalent minutes that are added to the highway time**. This approach has been adopted for the Version 2.3 application. Consequently, two sets of SOV and HOV skim files are created, one in which all toll facility costs are skimmed (e.g., <ITER>_AM_SOV.SKM), and another set in which the toll skims reflect base-year toll facilities only **and the time skims reflect highway times and tolls converted to equivalent time** (<ITER>_AM_SOV_MC.SKM). The former is used as an input to the trip distribution model and the latter is used as an input to mode choice.

The *joinskims.s* script is use to merge the six skim files used by the mode choice model into two files, <iter>_HWY_AM.skm and <iter>_HWY_MD.skm, which are read directly into the mode choice model.

Modnet.s reads the built highway network file and creates another modified binary network that includes an expanded set of zone centroids, zone centroids (numbered 1 to 3722) and PNR lot centroids (numbered 5001 to 7999). The expanded network is named <iter>_HwyMod.net. *Modnet.s* also generates a list of highway links that are considered as "walk network links" in the development of sidewalk (mode 13) links for the transit network.

The *Highway_Skims_Mod_am.s* and *Highway_Skims_Mod_md.s* scripts read the expanded network and create an expanded set of highway skims dimensioned 7999 by 7999, which includes highway skims between zone centroids as well as between zone and PNR lot pairs. The latter will be used subsequently to create auto access link attributes. As explained in footnote 81, prior to build 37, there was one script (*Highway_Skims_mod.s*), which had a loop covering the two time periods, AM and midday. However, it was found that this script would crash on some hardware configurations, but not on others. The script was then split into two files (*Highway_Skims_mod_am.s* and *Highway_Skims_mod_md.s*), which eliminated this problem.

The *Remove_PP_Speed.s* script is used to remove the "PP" iteration speed attributes from the highway network. This is necessary in the initial (PP) iteration, when table lookup speeds are to be replaced by traffic assignment speeds in the PP iteration.

14 Auto Driver Trip Development

14.1 Overview

The "auto drivers" step is used to convert daily auto person trip tables by occupant group (1, 2, and 3+) into auto driver trips by occupant group. This step occurs in between the mode choice model and the time-of-day model steps (see pages A-8 and A-14 of Appendix A). The auto driver step uses daily auto person trips estimated by the mode choice model and computes auto driver trips by occupant groups using matrix division. Because the mode choice file output includes only internal-to-internal movements, total external auto person trips produced in the trip distribution step are also used as a basis for developing external auto driver trips by occupant groups. External auto person trips produced by the trip distribution process are not stratified by occupant groups. The auto driver step uses modeled occupant disaggregation curves to develop external auto drivers by occupant groups.

The scripts used are *PP_Auto_Drivers.s*, invoked by the *PP_AutoDrivers.bat* file (see page A-8 of Appendix A) and *MC_Auto_Drivers.s*, invoked by the *Auto_Drivers.bat* file (see page A-14 of Appendix A). The inputs to this step are shown in Table 35. The outputs are shown in Table 36. The outputs consist of five purpose-specific auto driver files, each containing three tables (one for each occupant group). The output files contain both internal and external auto driver movements.

Note that the *PP_Auto_Drivers.s* script uses a pre-existing mode choice model output file that resides in the \inputs subdirectory, while the *MC_Auto_Drivers.s* script reads mode choice model output that is generated within the model execution stream. A pre-existing file must be used in the pump prime iteration in order to provide initial zonal mode choice percentages. TPB staff uses a pre-existing file that is as current and as reasonable for the modeled scenario as possible.

Table 35 Inputs to auto driver trip development

Pre-existing final iteration AEMS mode choice model output modal trip tables	???_NL_MC.MTT	Binary
Pump Prime iteration person trip tables	<iter>_???.PTT	Binary
Current iteration AEMS mode choice model output modal trip tables	???_NL_MC.MTT	Binary

Note: ??? = HBW, HBS, HBO, NHW, and NHO <ITER> =PP, i1…i4

14.2 Application Details

Table 36 Outputs of auto driver trip development

Auto drivers trips by trip purpose (t1= 1-occ. auto drivers, t2= 2-occ. auto drivers, t3 =3+ occ. Auto drivers	<ITER>_???_ADR.MAT	Binary

Note: ??? = HBW, HBS, HBO, NHW, and NHO <ITER> =PP, i1…i4,

15 Pre-Transit Network Processing

15.1 Overview

Prior to transit network building (shown on page A-5), a series of Cube Voyager scripts is executed to generate special transit-access links that are subsequently folded into the transit network, along with highway links, transit links, and transit lines. The scripts include *Parker.s* (used to generate PNR-lot-to-rail-station links), *walkacc.s* (used to develop zonal walk access links), *Adjust_Runtime.s* (to update the RUNTIME values for local bus service to account for worsening congestion), and *Autoacc5.s* (used to generate TAZ-to-station links, a.k.a., auto access links). The automated approach for generating these links has greatly streamlined the transit network coding process. Three of these programs (*Parker.s*, *walkacc.s*, and *Autoacc5.s*) were originally developed as stand-alone Fortran programs developed by AECOM Consult. TPB staff converted these three Fortran programs to Cube Voyager scripts to facilitate the implementation of future enhancements.

The inputs used by the above programs are list in Table 37. Specific file descriptions are shown in Table 38 through Table 41. The output files are shown in Table 42.

Table 37 Inputs to pre-transit network processing

Zonal land use file	Zone.dbf	DBF
Station file	Station.dbf	DBF
Highway node file	node.dbf	DBF
Supplemental walk link file	xtrawalk.dbf	DBF
Sidewalk network links	WalkAcc_Links.dbf	DBF
TAZ area that is within walking distance from transit stops	Areawalk.txt**	Text
Factors used to determine the amount of speed degradation, due to congestion, for local bus routes	Bus_Factor_File.dbf	DBF
Station mode-station type-max access dist. Lookup	StaAcc.dbf	DBF
Jurisdiction code- jurisdiction group lookup	Jur.dbf	DBF
List of zones connected to the Pentagon Metrorail station for the purpose of creating long-distance kiss-and-ride (KNR) links, which represent "slugging" or informal, ad-hoc carpooling	Pen.dbf	DBF
TAZ XY co-ordinates	TAZ_xys.dbf	DBF
SOV AM/Off-peak highway time skims file	AM_SOV_MOD.SKM, MD_SOV_MOD.SKM	Binary

** Areawalk.txt contains information needed to calculate zonal percent-walk-to-transit (PWT) values.

Input File Descriptions and Formats

Table 38 Variables in the transit station file (Station.dbf)

Name	Type	Field Description
SEQNO	N	Sequence Number
MM	C	Mode Code (M=Metrorail, C=Commuter rail, B=Bus, L=Light rail, N= BRT/streetcar)
NCT	**N**	**Access distance code (1, 2, 3, 0, 9, 8)** (See Table 39)
STAPARK	C	Does the station have a park-and-ride lot? (Y=yes; blank=no)
STAUSE	C	Is the station in use for the given year? (Y=yes; blank=no)
SNAME	C	Station Name/PNR lot name
STAC	N	Station centroid number (5001-7999), also known as a park-and-ride (PNR) lot centroid or a dummy PNR centroid"
STAZ	N	For the purposes of path building, the TAZ (1-3722) that represents the location of the station PNR lot. Usually the closest TAZ to the PNR lot.
STAT	N	Station Node (8000-8999, 9000-9999, 10000-10999)
STAP	N	Station park-and-ride (PNR) node number (11000-13999)
STAN1	N	Station bus node #1 (used to generate a station-to-bus-node connector)
STAN2	N	Station bus node #2 (used to generate a station-to-bus-node connector)
STAN3	N	Station bus node #3 (used to generate a station-to-bus-node connector)
STAN4	N	Station bus node #4 (used to generate a station-to-bus-node connector)
STAPCAP	**N**	**Parking capacity (number of spaces at the PNR lot)**
STAX	N	X coordinate of station/PNR lot (MD State Plane, NAD83, feet)
STAY	N	Y coordinate of station/PNR lot (MD State Plane, NAD83, feet)
STAPKCOST	**N**	**Peak period parking cost (daily cost, cents)**
STAOPCOST	**N**	**Off-peak parking cost (hourly cost, cents)**
STAPKSHAD	**N**	**Peak-period shadow price (currently not used)**
STAOPSHAD	**N**	**Off-peak-period shadow price (currently not used)**
FIRSTYR	N	Year of Station/PNR lot Opening (unused by scripts, but used as metadata)
STA_CEND	N	Project ID (Metadata)
	C	Scenario name, or left blank (Metadata)
	C	Comments, if any, regarding the file, since file cannot accept comment lines preceding the data lines

Notes: New variables are shown with bold font. The SEQNO variable does not correspond to the station node (STAT), and, unlike the STAT, cannot be assumed to stay the same over time.

Source: Jain, M. (2010, October). MWCOG network coding guide for Nested Logit Model (First draft: September 20, 2007; Updated February 2008 and October 2010). Memorandum.

The station file (station.dbf) is created by the create-station-file function of COGTools using transit nodes and transfer links. The input files for this procedure[83] are pre-existing transit support files listed at the top of p. A-5. STAN1, STAN2, STAN3, STAN4 represent transit stop nodes, which are used to generate station-to-transit-node connectors. A node could be a bus bay, bus stop, a light rail stop, a light

[83] Meseret Seifu to Files, "Create a Station File," Memorandum, July 20, 2011.

rail station, or a commuter rail station, etc. The information of these nodes is used in four scripts: *Autoacc5.s, Parker.s, Set_Factors.s*, and *Refine_Station_File.s*. One transit station could have STAN1, or STAN1 and STAN2, or STAN1, STAN2, and STAN3. A station with four STANs could have other station connections beyond these four that exist in the network geodatabase, but these are not shown explicitly in the station file.

The "access distance code," known as NCT in the autoacc5.s script, is a newly added variable in the station file that controls the number, extent, and directionality of PNR/KNR access links generated for each parking lot (in the case of PNR) or each station (in the case of KNR). Table 39 describes the meaning of each of the six access distance codes.

Table 39 Interpretation of transit access distance codes (NCT): Metrorail, light rail, and bus PNR access distance codes and their meaning for the

Acc Dist Code	Interpretation
1	End-of-the-line station (e.g., Shady Grove Metro)
2	Intermediate station (e.g., Rockville Metro)
3	PNR close to a CBD (e.g., Rhode Island Ave. Metro, Fort Totten)
0	Only KNR-access links generated (e.g., Braddock Road, National Airport, Clarendon)
9	Metrorail sta. in use, but no PNR/KNR access (e.g., Dupont Circle, Farragut North, Metro Ctr.)
8	Pentagon Metro Sta., allows for very long KNR links, to represent "slugging" (informal carpool)

The access distance code, along with the transit mode, determines the maximum link distance for the drive-access-to-transit links generated by autoacc5.s for the TPB nested-logit mode choice model. The maximum link distances for PNR are shown in Table 81. Although not shown in the table, the maximum allowed link distance for KNR links is 3 miles. It is also important to note that the KNR links are generated to Metrorail stations, light rail stations, streetcar stops, and bus stops with parking lots, but not commuter rail stations.

Table 40 HBW zonal parking costs/terminal time file (HBWV2a1.dbf)

File Name	Variable Name	Description
HBWV2a1.dbf	TAZ	TAZ (1-3,722)
	PCTWKSH	Percent short walk to transit
	PCTWKLG	Percent long walk to transit
	AREA	in sq. mile

For more information about short walk and long walk to transit, see section 21.4 ("Market segmentation") on page 164.

Table 41 Walk Access Links (WalkAcc_Lnks.dbf)

File Name	Variable Name	Description
WalkAcc_Links.dbf	A	A-Node
	B	B_Node
	DISTANCE	Link distance (in 1/100ths of miles)
	FTYPE	Link Facility Type Code (0-6)
		0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/ Collector, 5/ Expressway, 6/ Ramp
	TAZ	TAZ (1-3,722)

Table 42 Outputs of pre-transit network processing

Transit support files in inputs subdirectory	met_link.tb, com_link.tb, lrt_link.tb, new_link.tb, met_node.tb, com_node.tb, lrt_node.tb, new_node.tb, bus_pnrn.tb, met_pnrn.tb, com_pnrn.tb, lrt_pnrn.tb, new_pnrn.tb, met_bus.tb, com_bus.tb, lrt_bus.tb, new_bus.tb	Text
Transit network walk link files	sidewalk.asc walkacc.asc support.asc	Text
Percent of TAZ within short/long walk from transit	HBWV2A1.dbf	DBF
	NLWalkPCT.txt	Text
PNR lot to station transfer links	metampnr.tb, comampnr.tb, busampnr.tb, newampnr.tb, lrtampnr.tb, metoppnr.tb, comoppnr.tb, busoppnr.tb, newoppnr.tb, lrtoppnr.tb	Text
Transit access link files	mrpram.asc, mrprop.asc, mrkram.asc, mrkrop.asc, cram.asc, crop.asc, buspram.asc, busprop.asc, buskram.asc, buskrop.asc, lrtam.asc, lrtop.asc, newam.asc, newop.asc, lrtkram.asc, lrtkrop.asc, newkram.asc, newkrop.asc, autoall.asc	Text

15.2 Application Details

It is important to understand the various elements of the Version 2.3 transit network system. The elements are listed in Table 43. The network consists of highway links, transit stops, PNR lots, rail stations, rail links, and transit lines (modes 1-10). The transit network also contains access links relating to zonal access connections including zone-to-transit-stop walking links (mode 16), and zone-to-KNR/PNR auto links (mode 11). The network also includes other walk-related connections such as sidewalk links used in transferring (mode 13), rail station-to-bus stop connections (mode 12), and PNR lot-to-station connections (mode 15). The above scripts are used to develop all of these types of "support" links, with the exception of station-to-bus transfer links which are addressed as part of pre-network development.

The Mode Choice Model chapter of this report addresses the how access links are developed by the *walkacc.s, Parker.s*, and the *Autoacc5.s* programs.

Table 43 Overview of Version 2.3 Transit Network Elements

Transit Network Element	Description	Numbering	Modes/Notes
Bus stop nodes	Highway nodes that reflect bus stops	20000 - 60000	boarding/alighting locations
PNR lots	Point location representing PNR lot	11001-13999	11001-11999 Metrorail
			12001-12999 Commuter rail
			13001-13999 LRT/BRT/Streetcar
Station	Point location representing rail stop	8001-10999	8001-8999 Metrorail
			9001-9999 Commuter rail
			10001-10999 LRT/BRT/New
Rail links	Fixed guideway segments connecting	-	Mode 3= Metrorail
	stations (non-highway transit links)		Mode 4 = Commuter rail
			Mode 5 = light rail
			Mode 10= BRT, Streetcar
Walk access links	TAZ -transit stop bike/ pedestrian connections	-	Mode 16= TAZ-to-transit stop node
			Mode 13= sidewalk links
Auto access links	TAZ-PNR lot driving connections	-	Mode 11
PNR lot-to station links	Walk transfer links from PNR lot to Station	-	Mode=15
Station-to-bus transfer link	Walk transfer links between stations & bus stops		Mode=12
Transit line files	Bus, Rail transit line data		Modes 1-10
	(line characteristics, node sequence of route)		

16 Transit Skim File Development

16.1 Overview

The transit skimming file process involves the development of 22 sets of level-of-service (LOS) skims corresponding to two time-of-day period (peak and off-peak)[84] by four sub-mode groups (Bus only, Metrorail only, Bus-Metrorail combination, and commuter rail) by three access mode (walk, PNR, KNR).[85] As shown on page A-5 of Appendix A, the transit network building and skimming scripts are named *Transit_Skims_CR.s, Transit_Skims_MR.s, Transit_Skims_AB.s, Transit_Skims_BM.s*. These four scripts are launched using two batch files:

- *Transit_Skim_All_Modes_Parallel.bat*
- *Transit_Skim_LineHaul_Parallel.bat*

Additionally, transit accessibility summaries are needed to support the vehicle ownership model. The *Transit_Accessibility.s* script is used for this purpose. The inputs out outputs to transit skimming are shown in Table 44 and Table 45, respectively.

Table 44 Inputs to transit skim file development

Local bus future time degradation factors	Bus_Factor_File.dbf	Binary
Transit line files	MODE1, MODE2AM, ... MODE10AM.TB MODE1, MODE2OP, ... MODE10OP.TB	Text
Transit path tracing selection criteria	PATHTRACE.S	Script block
Binary highway network	ZONEHWY.NET	Binary
Transit support files in inputs subdirectory	met_link.tb, com_link.tb, lrt_link.tb, new_link.tb, met_node.tb, com_node.tb, lrt_node.tb, new_node.tb, bus_pnrn.tb, met_pnrn.tb, com_pnrn.tb, lrt_pnrn.tb, new_pnrn.tb, met_bus.tb, com_bus.tb, lrt_bus.tb, new_bus.tb	Text
Transit network walk link files	sidewalk.asc walkacc.asc support.asc	Text
PNR lot to station transfer links	metampnr.tb, comampnr.tb, busampnr.tb, newampnr.tb, lrtampnr.tb, metoppnr.tb, comoppnr.tb, busoppnr.tb, newoppnr.tb, lrtoppnr.tb	Text
Transit access link files	mrpram.asc, mrprop.asc, mrkram.asc, mrkrop.asc, cram.asc, crop.asc, buspram.asc, busprop.asc, buskram.asc, buskrop.asc, lrtam.asc, lrtop.asc, newam.asc, newop.asc, lrtkram.asc, lrtkrop.asc, newkram.asc, newkrop.asc, autoall.asc	Text

[84] For the calculation of average headways and run times, the peak period is represented by the AM peak hour and the off-peak period is represented by the five-hour midday period.
[85] This should equal 24 (2x3x4), but KNR access to commuter rail mode is not considered by the mode choice model, and so the total number of required path sets equals 22.

Table 45 Outputs of transit skim file development

Commuter rail skim files	SUPL_<Prd>_<AA>_CR.ASC SUPN_<Prd>_<AA>_CR.DBF TRNL_<Prd>_<AA>_CR.DBF <ITER>_*<Prd>*_*<AA>*_CR.STA <ITER>_*<Prd>*_*<AA>*_CR.SKM <ITER>_*<Prd>*_*<AA>*_CR.TTT	Text DBF DBF Binary Binary Binary
Metrorail support skim files	SUPL_<Prd>_<AA>_MR.ASC SUPN_<Prd>_<AA>_MR.DBF TRNL_<Prd>_<AA>_MR.DBF <ITER>_*<Prd>*_*<AA>*_MR.STA <ITER>_*<Prd>*_*<AA>*_MR.SKM <ITER>_*<Prd>*_*<AA>*_MR.TTT	Text DBF DBF Binary Binary Binary
All Bus support skim files	SUPL_<Prd>_<AA>_AB.ASC SUPN_<Prd>_<AA>_AB.DBF TRNL_<Prd>_<AA>_AB.DBF <ITER>_*<Prd>*_*<AA>*_AB.STA <ITER>_*<Prd>*_*<AA>*_AB.SKM <ITER>_*<Prd>*_*<AA>*_AB.TTT	Text DBF DBF Binary Binary Binary
Bus/Metrorail support skim files	SUPL_<Prd>_<AA>_BM.ASC SUPN_<Prd>_<AA>_BM.DBF TRNL_<Prd>_<AA>_BM.DBF <ITER>_*<Prd>*_*<AA>*_BM.STA <ITER>_*<Prd>*_*<AA>*_BM.SKM <ITER>_*<Prd>*_*<AA>*_BM.TTT	Text DBF DBF Binary Binary Binary
Job accessibility by transit	<ITER>_<Prd>_<AA>_[BM|MR]_JobAcc.dbf	DBF

Note: <Prd>= AM and OP <AA>= WK, DR, KR <ITER> =PP, i1…i4

16.2 Application Details

16.2.1 Skim file names and list of transit skim tables in the skim files

The skim files developed by the transit skimming process in the Ver. 2.3 travel demand model are shown in Table 46. Each filename is preceded by the speed feedback iteration: pp (pump prime), i1, i2, i3, i4. Each skim file contains 16 tables of information, as shown in Table 47.

Table 46 Skim files developed by the transit skimming process

Submode	Time Period	
	AM Peak Skim Files	**Off-Peak Skim Files**
Commuter Rail	<iter>_AM_WK_CR.SKM <iter>_AM_DR_CR.SKM (no CR KNR file is created)	<iter>_OP_WK_CR.SKM <iter>_OP_DR_CR.SKM (no CR KNR file is created)
Metrorail Only	<iter>_AM_WK_MR.SKM <iter>_AM_DR_MR.SKM <iter>_AM_KR_MR.SKM	<iter>_OP_WK_MR.SKM <iter>_OP_DR_MR.SKM <iter>_OP_KR_MR.SKM
Bus Only	<iter>_AM_WK_AB.SKM <iter>_AM_DR_AB.SKM <iter>_AM_KR_AB.SKM	<iter>_OP_WK_AB.SKM <iter>_OP_DR_AB.SKM <iter>_OP_KR_AB.SKM
Metrorail and Bus	<iter>_AM_WK_BM.SKM <iter>_AM_DR_BM.SKM <iter>_AM_KR_BM.SKM	<iter>_OP_WK_BM.SKM <iter>_OP_DR_BM.SKM <iter>_OP_KR_BM.SKM

Table 47 Skim tables contained in each transit skim file

Table No.	Table Description
1	In-Vehicle Time-Local Bus (0.01 min)
2	In-Vehicle Time-Express Bus (0.01 min)
3	In-Vehicle Time-Metrorail (0.01 min)
4	In-Vehicle Time-commuter rail (0.01 min)
5	In-Vehicle Time-new rail mode (0.01 min)
6	In-Vehicle Time-new bus mode (0.01 min)
7	Initial wait time (0.01 min)
8	Transfer wait time (0.01 min)
9	Walk access time (0.01 min)
10	Other walk time (0.01 min)
11	Added Transfer time (0.01 min)
12	No. of transfers (0 to N)
13	Drive-access time (0.01 min)
14	Drive-access distance (0.01 mile)
15	PNR-to-Station time (0.01 min)
16	PNR Cost (2007 cents)

Ref: Transit_Skim_Specs_2.xlsx

16.2.2 Description of local bus, future time degradation factors

Transit service is represented in the transit network using a series of transit routes, which are stored in transit "line" or "mode" files. There is one set of transit routes for the peak period (represented by AM peak period service) and one set of transit routes for the off-peak period (represented by the midday period). For each of the two time-of-day periods, each transit route has the following:

- Name (such as "WM04AI," or WMATA bus 4A, inbound),
- Flag indicating whether the route is one-way or two-way,
- Mode code (e.g., 1 = local bus),
- Average headway (FREQ[1]= 30, which means the bus comes every 30 minutes), and
- Average run time (i.e., the number of minutes from the start of the route to the end of the route, e.g., RUNTIME= 42 min.).

When developing the transit networks for a base year (i.e., a year close to the current year, such as 2016), the average headways and average run times come directly from the published schedules from the transit providers. These schedules can be in paper format or electronic format, such as GTFS. For a future-year transit network (such as 2040), however, the average headway and run time are unknown, so we use information from the latest published schedule (e.g., 2016). However, simply using the published schedules would likely result in bus speeds that are too fast, since they don't account for the added roadway congestion that is likely to occur in the future, i.e., it is likely that worsening road congestion over time would result in slower bus speeds. In particular, **local** bus service, which travels on local roads, might be slowed more than express bus service, which makes use of freeways and expressways for all or part of its routes. Thus, it would be good to have a relationship that relates future-year, congested road/link speeds to bus speeds. Before 2004, the COG/TPB travel model had no such relationship. In 2004, AECOM recommended that COG develop a relationship between link speeds and bus speeds, but cautioned against developing overly sensitive relationships.[86] For example, if one develops a direct relationship between the link speed and the bus travel times over that link, and if one road link becomes hyper congested, due, say, to excessive traffic or a network coding error, then the bus speed will drop to near zero. Consequently, COG/TPB staff developed a proposed solution that followed what was proposed in the Bruggeman/Woodford memo. The solution was what is known as the local bus, future time degradation factors, which are used to represent the fact that, as the highway network becomes more congested, there will be a slight degradation in **local** bus speeds over time. This technique was first used in the Version 2.1/D Travel Model,[87] and has been retained in the Version 2.2 and 2.3 travel models. In 2015, the local bus speed degradation factors were re-estimated,[88] and those re-estimated factors were part of the Ver. 2.3.57a travel demand model.

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[86] Jeff Bruggeman and Bill Woodford to Ronald Milone, "Comments on MWCOG Modeling Procedures," Memorandum, June 30, 2004.
[87] Ronald Milone to Files, "Methodology for Linking Future Bus Speeds to Highway Congestion in the Version 2.1/D Model," Memorandum, July 14, 2004.
[88] Meseret Seifu and Ronald Milone, "Update of Local Bus Speed Degradation Model," Memorandum, March 19, 2015.

For the Ver. 2.3.66 model, the process was significantly updated, as was described in section 1.3.4 of the Ver. 2.3.66 user's guide[89] and a technical memo.[90] The major changes are as follows:

1. The text file Lbus_TimFTRS.asc has been replaced with the dBase file Bus_Factor_File.dbf.
2. A new script has been added (Adjust_Runtime.s). This script reads in the transit line files associated with the local bus routes (mode codes 1, 6, and 8), adjusts the RUNTIME values by the factors contained in Bus_Factor_File.dbf, and writes out revised mode 1, 6, and 8 files with the revised RUNTIME values. The script Adjust_Runtime.s is called from Transit_Skim_All_Modes_Parallel.bat.

An example of a local bus route **before** the adjustment of its RUNTIME variable is shown in Figure 27. An example of a local bus route **after** the adjustment of its RUNTIME variable is shown in Figure 28.

```
LINE NAME="ART43N",
OWNER="ART Bus;Crystal City Bay A, S Bell St, SB @ S Hayes St S;Crystal City Bay A, S Bell St, SB @ S Hayes St S;2014;base",
ONEWAY= Y,MODE= 01,FREQ[1]= 20,RUNTIME= 40,
          N=  30247  30666  30279 -30246 -30280 -30243 -30244 -30207  30206,
              30204 -30286 -30316 -30315 -30211  30115  30120 -30115  30116,
              30520  30117 -30122  30123
```

Figure 27 A local bus route before its RUNTIME value is updated

```
LINE NAME="ART43N",
OWNER="ART Bus;Crystal City Bay A, S Bell St, SB @ S Hayes St S;Crystal City Bay A, S Bell St, SB @ S Hayes St S;2014;base",
ONEWAY= Y,MODE= 01,FREQ[1]= 20,RUNTIME=43.9,                    ; Base RUNTIME=      40.00 Time Factor: 1.098 Year: 2040
          N=  30247  30666  30279 -30246 -30280 -30243 -30244 -30207  30206,
              30204 -30286 -30316 -30315 -30211  30115  30120 -30115  30116,
              30520  30117 -30122  30123
```

Figure 28 A local bus route after its RUNTIME value is updated to reflect road congestion predicted to occur in future years

Transit accessibility outputs are listed on Table 48.

[89] Ronald Milone, Mark Moran, and Meseret Seifu, "User's Guide for the COG/TPB Travel Demand Forecasting Model, Version 2.3.66: Volume 1 of 2: Main Report and Appendix A (Flowcharts)" (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, February 13, 2017), 7, https://www.mwcog.org/transportation/data-and-tools/modeling/model-documentation/.
[90] Ronald Milone to Feng Xie et al., "Update to the V2.3.57a Model's Treatment of Bus Speed Factors," Memorandum, March 17, 2016.

Table 48 Job accessibility by transit file format description (<ITER>_<Prd>_<AA>_[BM|MR]_JobAcc.dbf)

Variable Name	Description
TAZ	TAZ (1-3722)
EMP35	Number of jobs accessible, from a given zone, within 35 minutes' travel time
EMP40	Number of jobs accessible, from a given zone, within 40 minutes' travel time
EMP45**	Number of jobs accessible, from a given zone, within 45 minutes' travel time
EMP50	Number of jobs accessible, from a given zone, within 50 minutes' travel time
EMPTOT	Total number of jobs accessible, from a given zone

** Only EMP45 is used from this file.

17 Transit Fare Development

17.1 Overview

Zone-to-zone transit fares are developed for the 22 paths sets described in the transit skimming section (section 16). As shown on page A-12 of Appendix A, the fares are developed using the scripts named *Prefarv23.s, Metrorail_Skims.S, Mfare1.s*, and *Mfare2.s*. The inputs to the fare process are shown in Table 49 and the outputs are shown in Table 50. After the fare process is executed, four scripts are used to combine transit skims and fares into consolidated submode files: *Assemble_Skims_CR.s, Assemble_Skims_MR.s, Assemble_Skims_AB.s*, and *Assemble_Skims_BM.s*.

Table 49 Inputs to transit fare development

Zonal transit walk percent	Inputs\NLwalkPct.txt	Text
Zonal TAZ-to-bus fare zone equivalence	Inputs\TAZFRZN.ASC	Text
Zonal Area Type file	AreaType_File.dbf	DBF
Zonal land use file	zone.dbf	DBF
Zonal TAZ-Mode choice district equivalency	areadef3722.prn	Text
Metro Station Link File	METLNKM1.TB**	Text
Metro Station XY File	METNODM1.TB**	Text
Metrorail turn penalty file	Inputs\trnpen.dat	Text
MFARE1 A1 (Coordinate) File	MFARE1.A1	Text
Metrorail station discount file	Inputs\MFARE1_STA_DISC.ASC	Text
WMATA tariff parameters	Inputs\tarriff.txt	Text
Transit fare deflation factor file	Trn_deflator.txt	Text
	<ITER>_<*Prd*>_<*AA*>_CR.STA <ITER>_<*Prd*>_<*AA*>_CR.SKM <ITER>_<*Prd*>_<*AA*>_MR.STA <ITER>_<*Prd*>_<*AA*>_MR.SKM <ITER>_<*Prd*>_<*AA*>_AB.STA <ITER>_<*Prd*>_<*AA*>_AB.SKM <ITER>_<*Prd*>_<*AA*>_BM.STA <ITER>_<*Prd*>_<*AA*>_BM.SKM	Binary
	<ITER>_<*Prd*>_<*AA*>_CR.FAR <ITER>_<*Prd*>_<*AA*>_MR.FAR <ITER>_<*Prd*>_<*AA*>_AB.FAR <ITER>_<*Prd*>_<*AA*>_BM.FAR	
Peak / Off-Peak MFARE2 Bus Fare Matrix	Inputs\busfaram.asc Inputs\busfarop.asc	Text
Peak /Off-Peak MFARE2 A2 File	FARE_A2.ASC	Text

Notes: <Prd>= AM and OP <AA>= WK, DR, KR <ITER> =PP, i1…i4

** These two files are originally in the Inputs folder, and then are copied to the Output folder in Transit_Skim_All_Modes_Parallel.bat

Table 50 Outputs of transit fare development

Summary of walkshed area and walkshed percentage	Prepare_MC_Zfile.txt	Text
Output Zone file for the NL mode choice model	ZONEV2.A2F	Text
A "complete" A2 file for the MFARE2.S	Fare_a2.asc	
Metrorail distance skims	RLDIST.SKM	Binary
Metrorail station to station fares	AM_Metrorail_Fares.TXT OP_Metrorail_Fares.TXT	Text
Zonal fares	<ITER>_<*Prd*>_<*AA*>_CR.FAR <ITER>_<*Prd*>_<*AA*>_CR.FR5 <ITER>_<*Prd*>_<*AA*>_CR.TXT <ITER>_<*Prd*>_<*AA*>_MR.FAR <ITER>_<*Prd*>_<*AA*>_MR.FR5 <ITER>_<*Prd*>_<*AA*>_MR.TXT <ITER>_<*Prd*>_<*AA*>_AB.FAR <ITER>_<*Prd*>_<*AA*>_AB.FR5 <ITER>_<*Prd*>_<*AA*>_AB.TXT <ITER>_<*Prd*>_<*AA*>_BM.FAR <ITER>_<*Prd*>_<*AA*>_BM.FR5 <ITER>_<*Prd*>_<*AA*>_BM.TXT	
Combined time and fare commuter rail skims	<ITER>_TRNAM_CR.SKM <ITER>_TRNOP_CR.SKM	Binary
Combined time and fare Metrorail skims	<ITER>_TRNAM_MR.SKM <ITER>_TRNOP_MR.SKM	Binary
Combined time and fare all bus skims	<ITER>_TRNAM_AB.SKM <ITER>_TRNOP_AB.SKM	Binary
Combined time and fare bus/Metrorail skims	<ITER>_TRNAM_BM.SKM <ITER>_TRNOP_BM.SKM	Binary

Table 51 TAZ/Bus Fare Zone Equivalency File Format Description (TAZFRZN.ASC)

Columns	Format	Field Description
Zonal data (All lines in the file)		
1-8	I4	TAZ Number (1-3,675)
9-16	I4	1st Bus fare zone 1 (currently numbered 1 to 21)
17-24	I4	2nd Bus fare zone 2 (currently numbered 1 to 21)
57-64	I8	Jurisdiction code
65-72	I8	P discount
73-80	I8	A discount
Station data (first 150 lines of the file only)		
1-8	I4	Metrorail Station No. (1-150)
41-48	I4	1st Bus Fare Zone associated with Metro Station (currently numbered 1 to 21)
49-56	I4	2nd Bus Fare Zone associated with Metro Station (currently numbered 1 to 21)

As shown in Table 51 above, the TAZ/Bus Fare Zone Equivalency File (TAZFRZN.ASC) essentially contains two look-up tables: the zonal data table includes all lines in the file, while the station data table includes only the first 150 lines of the file. Both look-up tables use Columns 1-8 as the index column, which represents TAZ Number (1-3675) for the zonal data and represents Station Number (1-150) for the station data. Station information contained in Columns 41-48 and 49-56 are populated in only the first 150 lines of the file (zeros are used as placeholders for Lines 151-3675).

17.2 Application Details

The purpose of transit fare process is to develop a zonal matrix containing total transit costs as expressed in 2007 cents. The core components of the transit fare process are two scripts: *MFARE1.S* which develops Metrorail station-to-station fares and *MFARE2.S* which develops zone-to-zone transit fares using the *MFARE1.S* output. Twenty-two fare matrices are developed sub-mode, time period, and access type, specifically:

- Four sub-modes (Bus Only Metrorail only, Metrorail/ Bus, and Commuter Rail) by;
- Two time periods (AM, off-peak), by;
- Three access types (Walk, PNR, and KNR)

Since commuter rail access is distinguished by walk and auto access only, 22 matrices are developed (instead of 24 which is implied above).

The fare process is executed with a batch file named *Transit_Fare.bat*. The batch file calls four scripts that are used to formulate the zone-to-zone transit fares for each market:

- *PrefarV23.s*: This script reads a zonal transit walk area file (NLWalkPct.txt) which includes walk areas pertaining to Metrorail stations only. It also reads an equivalency file (TAZFRZN.ASC) that

equates TAZs to bus fare zones and Metrorail station numbers to bus fare zones. The program essentially merges the Metrorail walk percent information into the zonal equivalency file. The resulting file is named fare_a2.asc. This file is called by the MFARE2.S script and is needed for the zonal transit fare calculation. This script is also used to develop the zonal parking costs that are input into the mode choice model.

- *Metrorail_skims.s*: This script reads a Metrorail link and node file, and then develops Metrorail station-to-station distance skims. The file is need for the Metrorail station-to-station fare calculation.
- *MFARE1.S*: This script calculates the Metrorail station-to-station fares for AM and off-peak periods. The script reads in a fare parameter file that is consistent with WMATA's Metrorail fare policy (tariff.txt), station coordinates (MFARE1.A1), and a station discount file (MFARE1_STA_DISC.ASC). The script writes two text files containing Metrorail fares: AM_Metrorail_Fares.txt and OP_Metrorail_Fares.txt.
- *MFARE2.S*: This script calculates the total transit fare between TAZs for AM and off-peak periods. The script reads in several files:
    - The Metrorail station-to-station fares developed by MFARE1.s,
    - tarrif.txt (transit fare policy parameters contain rail-to-bus discounts)
    - TRN_Deflator.txt (the transit deflation factor)
    - Fare_a2.asc (file containing zonal walk percentages to Metrorail stations
    - BUSFAREAM/OP.ASC: AM and off-peak bus and commuter rail fares between bus fare policy zones. TPB currently uses 21 bus fare zones for the region. While most TAZs fall into a single bus policy zone, the fare calculation also accounts for the possibility that a single TAZ may be straddle 2 bus policy zones
    - Zonal skim files containing Metrorail on/off stations (*.STA) and in-vehicle travel times by transit mode (*.SKM). A set of transit skims must exist for each of the 22 transit paths.

The transit fare files are written to 22 binary file (*.FAR) each containing one table (total transit fare in 2007 cents). The batch file calls four additional scripts (*Assemble_Skims_??.S*) which are used to consolidate the 22 binary fare files into four files associated with each sub-mode. The consolidated files are subsequently used as inputs to the mode choice model.

The fare construction process between zonal pairs essentially consists of blending the Metrorail station-to-station fares with the bus-zone-to-bus-zone fares. The consideration of Metrorail fares is dependent upon individual path characteristics, i.e., whether or not the Metrorail in-vehicle time is greater than zero. If the path is not Metrorail-related, then the fare is developed from the bus fare matrix input. If the path is Metrorail-related, then the transit fare is based on the Metrorail station-to-station fare (from MFARE1), bus access and/or egress fares developed from the bus fare matrix, zonal Metrorail walk potential, and the Rail-to-Bus policy discount. The MFARE2 computation may be explained as a series of four discrete conditions.

Condition 1: Non-Metrorail related path / Single bus fare zone origin to Single bus fare destination zone

Transit fare = Bus Fare(bi1/bj1)

Condition 2: Non-Metrorail related path / Single bus fare zone origin to Double bus fare destination zone

Transit fare = [(Bus Fare(bi1/bj1) + Bus Fare(bi1/bj2)] / 2.0

Condition 3: Non-Metrorail related path / Double bus fare zone origin to Double bus fare destination zone

Transit fare = [(Bus Fare(bi1/bj1) + Bus Fare(b i1/bj2) + (Bus Fare(b i2/bj1) + Bus Fare(b i2/bj2)] / 4.0

Condition 4: Metrorail related paths

Transit Fare = (Bus Access fare * (1.0-Origin Metrorail walk Pct.)) + Metrorail fare(si/sj) +
(Bus Egress fare * (1.0-Destin. Metrorail walk Pct.))

Bus Access Fare **Single** bus fare zone to **Single** Metrorail bus fare zone =

Bus Fare(bi1/mi1) – 0.5 Rail-Bus Discount

Bus Access Fare **Single** bus fare zone to **Double** Metrorail bus fare zone =

Min[Bus Fare(bi1/mi1) , Bus Fare(bi1/mi2)] – 0.5 Rail-Bus Discount

Bus Access Fare **Double** bus fare zone to **Single** Metrorail bus fare zone =

[Bus Fare(bi1/mi1) + Bus Fare(bi2/mi1)]/2.0 – 0.5 Rail-Bus Discount

Bus Access Fare **Double** bus fare zone to **Double** Metrorail bus fare zone =

[Min[Bus Fare(bi1/mi1) , Bus Fare(bi1/mi2)] + Min[Bus Fare(bi2/mi1) , Bus Fare(bi2/mi2)]]/2.0 – 0.5 Rail-Bus Discount

Bus egress fares are calculated in the same way that bus access fares are calculated. A fare discount is applied to the fare calculation before it is written out to the binary output.

18 Demographic Submodels

Demographic submodels are applied within the *Trip_Generation.bat* batch file using the *Demo_Models.s* Cube Voyager script (see page A-6 of Appendix A). This script applies the three demographic submodels that are run prior to trip generation: household size, household income, and vehicle availability (see Chapter 3 of the calibration report for more details). The inputs to the model are zonal land use data (zone.dbf), data about area types (areaType_File.dbf), and information about the accessibility to jobs via transit. The zone.dbf file contains zonal households, population, jurisdiction code, and income index, as well as the household size and household income submodels (in the form of lookup tables). The households in each TAZ are then allocated to a household size group (1, 2, 3, or 4+) and an income group (<50K, 50K-100K, 100K-150K, or 150+K).

Next, the *Demo_Models.s* reads in the number of jobs accessible by AM Metrorail and Bus/Metrorail service within 45 minutes for each TAZ (see Table 48). This information along with household size, household income, area type, and the DC dummy variable are used to allocate households to the four vehicle ownership categories (0, 1, 2, or 3+).

Then, a file is produced, for each of the four income levels, which contains the number of households by household size and vehicle availability. These files are later used in trip generation. Lastly, the script accumulates the households by area type and prints out the following summaries located in the <ITER>_Demo_Models.txt:

- Regional Households by Size and Income Summary
- Jurisdictional Households by Size
- Jurisdictional Households by Income
- Regional Households by Vehicles Available and Size Summary
- Regional Households by Vehicles Available and Income Summary
- Jurisdictional Households by Vehicles Available
- Estimated Households by Size Level by Area Type
- Estimated Households by Income Level by Area Type
- Estimated Households by Vehicle Availability Level by Area Type

Process inputs and outputs are shown in Table 52 and Table 53.

Table 52 Inputs to the Demographic Models

Zonal Land Use File	Inputs\zone.dbf	DBF
Zonal Area Type File	AreaType_File.dbf	DBF
Transit Accessibility File (Metrorail only and Bus & Metrorail service)	<ITER>_AM_WK_MR_JOBACC.dbf <ITER>_AM_DR_MR_JOBACC.dbf <ITER>_AM_WK_BM_JOBACC.dbf <ITER>_AM_DR_BM_JOBACC.dbf	DBF

Note: <ITER> =PP, i1…i4

Table 53 Outputs of the Demographic Models

Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail.	HHI1_SV.txt	Text
Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail.	HHI2_SV.txt	Text
Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail.	HHI3_SV.txt	Text
Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail.	HHI4_SV.txt	Text
Interim Output: Zonal Households stratified by Income Level, household Size, and vehicle available (64 cross-classes)	<iter> _Demo_Models_HHbyISV.dbf	DBF

19 Trip Generation

19.1 Control/Support File(s):

Trip_Generation.s, Trip_Generation_Summary.s, Truck_Com_Trip_Generation.s

19.2 Application Details:

Trip generation is executed within the Trip_Generation.bat batch file using three Cube Voyager scripts: *Trip_Generation.s*, *Trip_Generation_Summary.s*, and *Truck_Com_Trip_Generation.s* (as shown on page A-6 of Appendix A). The inputs to the Trip_Generation.bat batch file are shown in Table 54.

Table 54 Inputs to trip generation

Zonal land use file	zone.dbf	DBF
Zonal Area Type File	AreaType_File.dbf	DBF
Zonal HHs stratified by income level, HH size, & vehs available	<iter>_Demo_Models_HHbyISV.dbf	DBF
Zonal GIS variable file	GIS_variables.dbf	DBF
Trip production rates	weighted_trip_rates.dbf	DBF
External Production and Attraction File	Ext_PsAs.dbf	DBF
Non-motorized trip production share model coefficients	NMPrates.dbf	DBF
Non-motorized trips Attraction share model coefficients	NMArates.dbf	DBF
Trip attraction rates	AttrRates.dbf	DBF
HB income shares	HBINCRAT.dbf	DBF
Consolidated zonal land use file	TripGen_LUFile.dbf	DBF
Truck and commercial vehicles trip rates	support\truck_com_trip_rates.dbf	DBF
Zonal access verification file	Skimtot<ITER>.txt	Text
	JurCore.dbf	DBF

The *Trip_Generation.s* script calculates zonal trip productions and attractions. The *Trip_Generation_Summary.s* summarizes the demographic information and the trip ends by jurisdiction. *The Truck_Com_Trip_Generation.s* produces trip ends for commercial vehicles and trucks.

The *Trip_Generation.s* script is very long (almost 1,500 lines). Figure 29 presents an outline or pseudo code of the steps in the trip generation script. The script has three phases, as indicated in the figure. There are a few points to note: **First**, the program is applied to compute zonal initial trip productions and (unscaled) zonal trip attractions. Attraction scaling is performed later, in the "*Prepare_Internal_Ends.s*" script. **Second**, the program makes sparing use of two sets of adjustments: jurisdiction level adjustments (end of phase 1) and area-type level adjustments (phases 1 and 2). The model does not make use of any "special generators" (other than the truck trip generation phase, where special generator TAZs are identified) and the model does not make use of zone-level adjustments,

which are used in some models and are usually referred to production modification factors ("p-mods") and attraction modification factors ("a-mods").[91]

[91] See, for example, William W. Mann, "TRIMS - Four Steps: One Execution," *ITE Journal* 52, no. 12 (December 1982): 16.

Phase 1: Read in input data and trip rates and establish parameters

1. *Read input files into arrays. The inputs include: zonal land activity, external Ps/As, zonal area types, zonal HHs stratified by Inc./Size/ VA., zonal GIS variables, trip production rates, trip attraction rates, and income attraction shares by HB purpose area type*
2. *Establish output files:*
    a. *Report file (%_iter_%_Trip_Generation.txt')*
    b. *Computed Zonal trip productions ('%_iter_%_Trip_Gen_Productions_Comp.dbf')*
    c. *Computed Zonal trip Attractions ('%_iter_%_Trip_Gen_Attractions_Comp.dbf')*
3. *Establish Area-Type trip end (motorized, non-motorized) factors by purpose and area type*
4. *Establish External trip parameters (Share of ext. NHB travel that is NHW and NHO, auto occupancies of external autos, by purpose)*
5. *Establish Jurisdictional trip end factors by purpose*

Phase 2: Compute Initial Trip Productions and Attractions

1. *Loop through each **internal** zone*
    a. *Apply trip production rates to stratified HHs by income, size, vehav. To arrive at total Ps*
    b. *Computed non-motorized production shares by purpose and area type*
    c. *Apply non-motorized shares and adjustment parameters to total Ps to arrive at final motorized & non-motorized Ps*
    d. *Summarize and write out internal computed trip Ps stratified by income*
    e. *Apply trip attraction rates to land activity*
    f. *Computed non-motorized attraction shares by purpose and area type*
    g. *Apply non-motorized shares and adjustment parameters to total As to arrive at final motorized & non-motorized As*
    h. *Disaggregate total final attractions to income strata, by purpose and area type*

    *End **internal** zone loop*

2. *Loop through each internal zone: Summarize and write out internal computed attractions by income*
3. *Loop through each **external** zone*
    a. *Read external auto driver trip Ps and As*
    b. *Convert external vehicle Ps and As to auto person trips based on car occ. parameters*
    c. *Disaggregate total external NHB auto persons among NHW and NHO based on parameters*
    d. *Write out external Ps and As*

    *End **external** zone loop*

Phase 3: Print out regional totals of computed trip productions/attractions

Figure 29 Outline/pseudo code for *trip_generation.s*

Trip_generation.s begins, in phase 1, by reading the zonal land use (Zone.dbf); the area type file (AreaType_File.dbf); external trip productions and attractions (EXT_PsAs.dbf, described in Table 55); zonal households stratified by income, size, and vehicles available (<iter>_Demo_Models_HHbyISV.dbf);

zonal walkability factors (GIS_variables.dbf); trip production rates (weighted_trip_rates.dbf); non-motorized production model coefficients (NMPrates.dbf); non-motorized attraction model coefficients (NMArates.dbf); trip attraction model coefficients (AttrRates.dbf); and income shares for home-based trips (HBINCRAT.dbf).

The zonal GIS variable file (GIS_variables.dbf) contains a number of built-environment variables that describe the walkability of an area, such as the number of 3-legged intersections per TAZ, the number of cul-de-sacs per TAZ, the number of street blocks per TAZ, and the number of Census blocks per TAZ. Although the GIS file contains a number of variables, the trip generation process uses only one: **the number of street blocks per TAZ ("BLOCKS")**.[92] Since these built-environment variables are intended to deal with issues of walkability, it is best to use a detailed street network when calculating these metrics (as opposed to simply using the highway network itself, which is quite coarse). In our case, we used NAVTEQ's NAVSTREETS Street Data[93] (for which COG pays a license fee) and the work was performed in 2010 by COG/TPB staff.[94] Note that NAVTEQ is now known as HERE. A block is defined as a 2-dimensional area (polygon) that is completely enclosed by a series of NAVTEQ street segments. Prior to forming blocks, the following segments were removed from the NAVTEQ street network:

- Street segments with no name (ST_NAME=blank), since these are not actually street segments;
- "Major highways" (NAVTEQ functional class [FUNC_CLASS] equal to 1 or 2).[95]
- Ramps (RAMP = Y)

Figure 30 shows an example of the seven blocks that are contained within TAZ 283 (Union Station), as defined by NAVTEQ street segments (omitting major highways and ramps, as discussed above).

[92] It has been found that areas with a higher density of street blocks are more walkable.
[93] NAVTEQ, "NAVTEQ's NAVSTREETS Street Data, Reference Manual v3.2," Proprietary and Confidential (Chicago, Illinois: NAVTEQ, April 1, 2009).
[94] Mary Martchouk to Mark S. Moran, "Developing GIS Walkability Measures," Memorandum, June 2, 2010, 6–7.
[95] NAVTEQ, "NAVTEQ's NAVSTREETS Street Data, Reference Manual v3.2", p. 4-5.

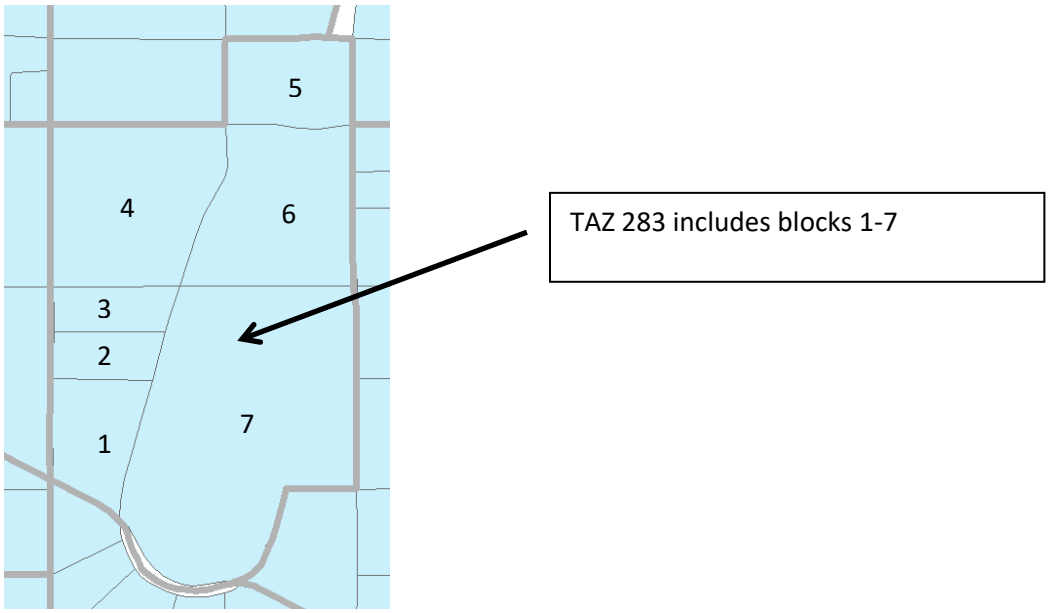


Figure 30 Example of seven NAVTEQ street blocks within TAZ 283 (Union Station)

In the trip generation script (*Trip_Generation.s*), the number of blocks per TAZ is then converted to a density measure, specifically the floating 0.5-mile block density for each TAZ (BLOCKS05, lines 180-215 of Trip_Generation.s). In the travel model, it is assumed that the block density has an effect on non-motorized trip productions and attractions **only for area types 1 and 2** (See, for example, Tables 27-29 of the calibration report for non-motorized productions and Tables 30-32 for non-motorized attractions, where the floating 0.5-mile block density is called BLKDEN05).[96]

It is assumed that the model user will rarely change the value of BLOCKS (or its derivative, BLKDEN05) when running the model (i.e., the modeler will freeze the base-year levels of block density). This is analogous to the way that household income distributions are generally frozen in the model. The exception to this rule is if the modeler believes that the street network in an area will become denser or sparser, then the modeler can make appropriate manual adjustments to the zonal BLOCK variable.

The trip generation process also reads external trip ends from a file (Ext_PsAs.dbf) that is developed exogenously. The data items are shown in Table 55. The *Trip_Generation.s* script writes out an intermediate dBase file containing land activity, one-mile "floating" land use density, one-half mile "floating" block density, and jurisdictional and area type codes. The file is a consolidation of input data from various zone files and derived variables.[97] The specific data elements are shown on Table 56. Note that, in the file Ext_PsAs.dbf (Table 55), the last two variables are medium truck external-internal (X-I) trip ends (MTK_XI) and heavy truck external-internal (X-I) trip ends (HTK_XI), but there are no

[96] Milone et al., "Calibration Report for the TPB Travel Forecasting Model, Version 2.3," 4–17 to 4–20.
[97] Floating densities are calculated using the centroids of the TAZs and street blocks, with a point buffer around the centroid with the given radius (0.5 mile or 1.0 mile).

corresponding variables for the internal-external movements (e.g., MTK_IX and HTK_IX). This is because it is assumed that the two movements (XI and IX) are the same.

Table 55 External Production and Attraction File (Ext_PsAs.dbf)

Variable	Description
TAZ	External station no. (3676-3722)
FACILITY	Facility route no./name
AAWT_CTL	Average annual weekday traffic count (observed or forecasted)
CNTFTR	(unused)
AUTO_XI	Auto driver external-internal (X-I) trip ends
AUTO_IX	Auto driver internal-external (I-X) trip ends
AUTO_XX	Auto driver through (X-X) trip ends
CV_XX	Commercial vehicle through (X-X) trip ends
HBW_XI	HBW external-internal (X-I) trip ends
HBS_XI	HBS external-internal (X-I) trip ends
HBO_XI	HBO external-internal (X-I) trip ends
NHB_XI	NHB external-internal (X-I) trip ends
CV_XI	Commercial vehicle external-internal (X-I) trip ends
HBW_IX	HBW internal-external (I-X) trip ends
HBS_IX	HBS internal-external (I-X) trip ends
HBO_IX	HBO internal-external (I-X) trip ends
NHB_IX	NHB internal-external (I-X) trip ends
CV_IX	Commercial vehicle internal-external (I-X) trip ends
TRCK_XX	Truck through (X-X) tip ends (medium and heavy truck)
TRCK_XI	Truck external-internal (X-I) trip ends (medium and heavy truck)
TRCK_IX	Truck internal-external (I-X) trip ends (medium and heavy truck)
MTK_XI	Medium truck external-internal (X-I) trip ends
HTK_XI	Heavy truck external-internal (X-I) trip ends

Source: Milone, R. (2011, July 1). Version 2.3 Exogenous Trip Files. Memorandum.

The one-mile floating density is then calculated for population and employment and a half-mile floating density is calculated for street blocks. These are saved in an intermediate file named TripGen_LUFile.dbf (Table 56). Then, the script calculates zonal trip productions based on demographic data and applies the non-motorized production model to the results. Motorized internal trips productions are then obtained by subtracting the estimated non-motorized trips. The output production file data items are shown on Table 57.

Table 56 Consolidated Zonal Land Use File

File Name	Variable Name	Description
TripGen_LUFile.dbf	TAZ	TAZ Number (1-3,722)
	HH	Number of house holds
	TOTPOP	Total Population
	TOTEMP	Total employment
	RETEMP	Retail employment
	NRETEMP	Non-retail employment
	OFFEMP	Office employment
	OTHEMP	Other employment
	INDEMP	Industrial employment
	HHPOP	House hold population
	GQPOP	Group quarter population
	LANDAREA	Land area (sq. mi.)
	POP_10	Number of population within one "floating" mile
	EMP_10	Number of employment within one "floating" mile
	AREA_10	Zonal Area within one "floating" mile
	POPDEN10	Population density within one "floating" mile
	EMPDEN10	Employment density within one "floating" mile
	ADISTTOX	Distance to the nearest external station
	BLOCKS05	Blocks within 0.5 mile "floating" blocks
	AREA05	Area within 0.5 mile "floating" blocks
	BLOCKDEN05	Block density within 0.5 mile "floating" blocks
	JURCODE	Jurisdiction code (0-23)
	ATYPE	Area Type (1-6)

Table 57 Computed zonal trip productions file (<iter>_Trip_Gen_Productions_Comp.dbf)

Variable Name	Description
TAZ	TAZ Number (1-3,722)
HBW_MTR_PS	Home-Based-Work motorized person trip productions
HBW_NMT_PS	Home-Based-Work non-motorized person trip productions
HBW_ALL_PS	Home-Based-Work motorized and non-motorized person trip productions
HBWMTRP_I1	Home-Based-Work Motorized person trip productions, Income level 1
HBWMTRP_I2	Home-Based-Work Motorized person trip productions, Income level 2
HBWMTRP_I3	Home-Based-Work Motorized person trip productions, Income level 3
HBWMTRP_I4	Home-Based-Work Motorized person trip productions, Income level 4
HBS_MTR_PS	Home-Based-Shop motorized person trip productions
HBS_NMT_PS	Home-Based-Shop non-motorized person trip productions
HBS_ALL_PS	Home-Based-Shop motorized and non-motorized person trip productions
HBSMTRP_I1	Home-Based-Shop Motorized person trip productions, Income level 1
HBSMTRP_I2	Home-Based-Shop Motorized person trip productions, Income level 2
HBSMTRP_I3	Home-Based-Shop Motorized person trip productions, Income level 3
HBSMTRP_I4	Home-Based-Shop Motorized person trip productions, Income level 4
HBO_MTR_PS	Home-Based-Other motorized person trip productions
HBO_NMT_PS	Home-Based-Other non-motorized person trip productions

HBO_ALL_PS	Home-Based-Other motorized and non-motorized person trip productions
HBOMTRP_I1	Home-Based-Other Motorized person trip productions, Income level 1
HBOMTRP_I2	Home-Based-Other Motorized person trip productions, Income level 2
HBOMTRP_I3	Home-Based-Other Motorized person trip productions, Income level 3
HBOMTRP_I4	Home-Based-Other Motorized person trip productions, Income level 4
NHW_MTR_PS	Non-Home-Based Work-Related motorized person trip productions
NHW_NMT_PS	Non-Home-Based Work-Related non-motorized person trip productions
NHW_ALL_PS	Non-Home-Based Work-Related motorized & non-motorized person trip productions
NHO_MTR_PS	Non-Home-Based Non-Work-Related motorized person trip productions
NHO_NMT_PS	Non-Home-Based Non-Work-Related non-motorized person trip productions
NHO_ALL_PS	Non-Home-Based Non-Work-Related motorized & non-motorized person trip productions

Next, the zonal trip attractions are calculated by applying the attraction trip models to the land use file. Non-motorized trip attractions are then determined and subtracted from the total trip attractions. Similar to productions, attractions are multiplied by an adjustment factor (Appendix A of the Calibration Report) and disaggregated by income level. The computed trip attractions are then written out to <ITER>_Trip_Gen_Attractions_Comp.dbf file. The final trip attractions are saved in the <ITER>_Trip_Gen_Attractions_Final.dbf described in Table 58.

Table 58 Computed zone trip attractions file (<iter>_Trip_Gen_Attractions_Comp.dbf)

Variable Name	Description
TAZ	TAZ Number (1-3,722)
HBW_MTR_AS	Home-Based-Work motorized person trip Attractions
HBW_NMT_AS	Home-Based-Work non-motorized person trip Attractions
HBW_ALL_AS	Home-Based-Work motorized and non-motorized person trip Attractions
HBWMTRA_I1	Home-Based-Work motorized person trip Attractions, Income level 1
HBWMTRA_I2	Home-Based-Work motorized person trip Attractions, Income level 2
HBWMTRA_I3	Home-Based-Work motorized person trip Attractions, Income level 3
HBWMTRA_I4	Home-Based-Work motorized person trip Attractions, Income level 4
HBS_MTR_AS	Home-Based-Shop motorized person trip Attractions
HBS_NMT_AS	Home-Based-Shop non-motorized person trip Attractions
HBS_ALL_AS	Home-Based-Shop motorized and non-motorized person trip Attractions
HBSMTRA_I1	Home-Based-Shop motorized person trip Attractions, Income level 1
HBSMTRA_I2	Home-Based-Shop motorized person trip Attractions, Income level 2
HBSMTRA_I3	Home-Based-Shop motorized person trip Attractions, Income level 3
HBSMTRA_I4	Home-Based-Shop motorized person trip Attractions, Income level 4
HBO_MTR_AS	Home-Based-Other motorized person trip Attractions
HBO_NMT_AS	Home-Based-Other non-motorized person trip Attractions
HBO_ALL_AS	Home-Based-Other motorized and non-motorized person trip Attractions

HBOMTRA_I1	Home-Based-Other motorized person trip Attractions, Income level 1
HBOMTRA_I2	Home-Based-Other motorized person trip Attractions, Income level 2
HBOMTRA_I3	Home-Based-Other motorized person trip Attractions, Income level 3
HBOMTRA_I4	Home-Based-Other motorized person trip Attractions, Income level 4
NHW_MTR_AS	Non-Home-Based Work-Related motorized person trip Attractions
NHW_NMT_AS	Non-Home-Based Work-Related non-motorized person trip Attractions
NHW_ALL_AS	Non-Home-Based Work-Related motorized & non-motorized person trip Attractions
NHO_MTR_AS	Non-Home-Based Non-Work-Related motorized person trip Attractions
NHO_NMT_AS	Non-Home-Based Non-Work-Related non-motorized person trip Attractions
NHO_ALL_AS	Non-Home-Based Non-Work-Related motorized & non-motorized person trip Attractions

The *Trip_Generation_Summary.s* creates a summary text file, <ITER>_Trip_Generation_Summary.txt, which includes the following tables:

- Land Activity by Jurisdiction
- Land Activity by Area Type
- Motorized Trip Productions by Purpose and Jurisdiction
- Motorized Trip Productions per Household by Purpose and Jurisdiction
- Motorized Trip Productions by Purpose and Area Type
- Non-Motorized Trip Productions by Purpose and Jurisdiction
- Non-Motorized Trip Productions by Purpose and Area Type
- Home-Based Motorized Trip Productions by Purpose, Income, and Jurisdiction
- Home-Based Motorized Trip Productions by Purpose, Income, and Area Type
- Motorized Trip Attractions by Purpose and Jurisdiction
- Motorized Trip Attractions per Job by Purpose and Jurisdiction
- Motorized Trip Attractions by Purpose and Area Type
- Non-Motorized Trip Attractions by Purpose and Jurisdiction
- Non-Motorized Trip Attractions by Purpose and Area Type
- Home-Based Motorized Trip Attractions by Purpose, Income, and Jurisdiction
- Home-Based Motorized Trip Attractions by Purpose, Income, and Area Type

The Truck_Com_Trip_Generation.s script reads in the zonal land use file (Zone.dbf), the area type file (AreaType_File.dbf), external trip productions and attractions (EXT_PsAs.dbf), demographic model outputs (%_iter_%_Demo_Models_HHbyISV.dbf), truck and commercial trip model coefficients (truck_com_trip_rates.dbf), and the zonal access verification file (Skimtot<ITER>.txt). For the list of inputs, see Table 54. The script then uses the truck and commercial trip model coefficients and the land use data to calculate medium and heavy truck and commercial vehicle zonal trips. After an adjustment factor is applied, these are written out to a ComVeh_Truck_Ends_<ITER>.dbf file described in Table 59.

Table 59 Truck and commercial vehicles trip ends (<iter>_ComVeh_Truck_Ends.dbf)

Variable Name	Description
TAZ	TAZ number (1-3722)
COMM_VEH	Commercial vehicle trip ends
MED_TRUCK	Medium truck trip ends
HVY_TRUCK	Heavy truck trip ends
ICOMM_VEH	Commercial vehicle trip ends (internal only)
IMED_TRUCK	Medium truck trip ends (internal only)
IHVY_TRUCK	Heavy truck trip ends (internal only)

The script also generates a summary text file- <ITER>_Truck_Com_Trip_Generation.txt, which includes the following tables:

- Regional Total Truck and Commercial Trip-Ends
- Truck and Commercial Vehicle Internal Trip Totals by Area Type
- Truck and Commercial Vehicle Internal Trip Totals by Jurisdiction

The trip generation process is currently applied to produce computed trip productions and computed (un-scaled) attractions by trip purpose. The computed productions and attractions are provided explicitly as motorized and non-motorized. The Home-Based motorized Ps and As are further stratified by income level. In prior trip generation versions, an Internal to External production share model was employed to extract the external travel component of total trip productions (of I-X trips). The extraction was necessary because external trip ends are prepared exogenously based on projected traffic counts. The potential problem with an I-X extraction model is that there is no guarantee that the model would yield I-X productions already developed exogenously at the external station level. It was ultimately decided that the approach for treating external trips in the generation and distribution process, and the approach for trip attraction scaling would be modified to ensure that I-X trips would be better preserved.

The modified process now involves the following Trip Generation and Trip distribution steps:

1. *Trip_Generation.s*: Computed trip productions and computed trip attractions are developed by purpose and mode (motorized and non-motorized). Trip attraction scaling is not undertaken.
2. *Prepare_Ext_Auto_Ends.s, Prepare_Ext_ComTruck_Ends.s*: External trip-ends (Ps and As) are prepared.
3. *Trip_Distribution_External.s*: External trip-ends are distributed, resulting in external trip tables, by purpose.
4. *Prepare_Internal_Ends.s*: Final internal trip-ends are computed as follows:
    - External trip ends (I-X) trips and (X-I) trips-ends are summarized by purpose from the external trip matrices developed in Step 3
    - The zonal I-X trip ends are subtracted from the motorized trip productions computed in Step 1. This results in final motorized productions. Non-motorized productions are unaffected.

- Scaling factors for internal trip attractions are computed by purpose. The factor is[98]

  IntAttrScaleFtr = ("Final" Intl P's + Extl. P's – Extl. A's) / (Intl. "Computed" A's)

  The above factor is applied to both motorized and non-motorized trip attractions

5. *Trip_Distribution_Internal.s*: The final internal P's and balanced A's are run through trip distribution. The resulting internal trips are combined with the external trips developed in step three.

While this process is slightly more complicated than the prior approach it better ensures that external trips developed exogenously are preserved through the trip distribution stage.

[98] This equation was developed by Bill Mann in the early 1990s.

20 Trip Distribution

20.1 Overview

The trip distribution process (shown on page A-7 of Appendix A) is invoked by the *Trip_Distribution.bat* file. The input and output files are listed in Table 60 and Table 61. As stated in the calibration report, the gravity model is doubly-constrained for all five trip purposes.

The trip distribution process entails five Cube Voyager steps that involve two separate trip distribution procedures: one to distribute external auto person trips by purpose, and another to distribute internal motorized person trips by purpose. As explained in the trip generation chapter, this dual distribution procedure enables external trips (I-X) trips to be more precisely preserved at the station level compared to the prior trip generation/distribution approach.

Table 60 Inputs to trip distribution

Item	Filename	Format
Computed zonal motorized trip productions	<iter>_Trip_Gen_Productions_Comp.dbf	dBase
Computed zonal motorized trip attractions (un-scaled)	<iter>_Trip_Gen_Attractions_Comp.dbf	dBase
Computed zonal commercial, truck trip ends (Ps, As)	<iter>_ComVeh_Truck_Ends.dbf	dBase
AM highway skims	<PreIter>_AM_SOV.SKM	Binary
OP highway skims	<PreIter>_OP_SOV.SKM	Binary
AM Walk Access Metrorail-only total travel time	<iter>_AM_WK_MR.ttt	Binary
AM Drive Access Metrorail-only total travel time	<iter>_AM_DR_MR.ttt	Binary
OP Walk Access Metrorail-only total travel time	<iter>_OP_WK_MR.ttt	Binary
OP Drive Access Metrorail-only total travel time	<iter>_OP_DR_MR.ttt	Binary
Toll-time equiv. file (by Income/purpose)	Equiv_Toll_Min_by_Inc.s	Text
K-Factor matrices	HBW_K.mat, HBS_k.mat, … ,NHO_k.mat	binary
Friction factors	Ver23_F_Factors.dbf	dBase

Note: <ITER> =PP, i1, …, i4

Table 61 Outputs of trip distribution

Item	Filename	Format
HBW Motorized Psn. Trips (internal & external)	<iter>_HBW.PTT	Binary
HBS Motorized Psn. Trips (internal & external)	<iter>_HBS.PTT	Binary
HBO Motorized Psn. Trips (internal & external)	<iter>_HBO.PTT	Binary
NHW Motorized Psn. Trips (internal & external)	<iter>_NHW.PTT	Binary
NHO Motorized Psn. Trips (internal & external)	<iter>_NHO.PTT	Binary
Commercial Vehicle Trips (internal & external)	<iter>_Commer.PTT	Binary

Medium Truck Trips (internal & external)	<iter>_MTruck.PTT	Binary
Heavy Truck Trips (internal & external)	<iter>_HTruck.PTT	Binary
HBW Motorized Psn. Trips (internal only)	<iter>_HBW_NL.PTT	Binary
HBS Motorized Psn. Trips (internal only)	<iter>_HBS_NL.PTT	Binary
HBO Motorized Psn. Trips (internal only)	<iter>_HBO_NL.PTT	Binary
NHW Motorized Psn. Trips (internal only)	<iter>_NHW_NL.PTT	Binary
NHO Motorized Psn. Trips (internal only)	<iter>_NHO_NL.PTT	Binary

20.2 Application Details

The Trip Distribution process is executed with the batch file named, *Trip_Distribution.bat*. Five Cube Voyager scripts are used to carry out the process.

The first two scripts, *Prepare_Ext_Auto_Ends.s* and *Prepare_Ext_ComTruck_Ends.s* read the computed zonal Productions and Attraction resulting trip generation and prepares trip ends that are suitable for applying trip distributing for external Ps and As only.

The *Trip_Distribution_External.s* script executes the distribution of external trip-ends, resulting in external trip tables, by purpose. The script also calculates zonal impedances that are used in both the distribution of external and internal trips.

The trip distribution process uses different LOS impedances measures, depending on trip purpose. Work (HBW) trips are distributed using AM peak travel impedances while midday (MD) impedances are used for all remaining purposes.

The script first prepares zonal highway terminal times, which are based on the zonal area type. The terminal times, which represent the time needed to park and un-park a vehicle, range from 1 minute in the least developed areas to 5 minutes for highly developed areas. The terminal times are then added to the over-the-network highway travel time skims. Next, composite impedance tables are developed combining transit time and highway times, based on the formula shown in Equation 2:

Equation 2 Composite time

$$CT_i = \frac{1}{\frac{1}{HT + TollT_i} + \frac{P_i}{TT}}$$

where

CT_i = Composite time for income level i
HT = Congested highway time (minutes), including terminal time
$TollT_i$ = Time equivalent (minutes)of tolls associated with the minimum-time path for income i
P_i = Regional transit share of income i for the trip purpose
TT = Metrorail-related transit time (min.), including in-vehicle and out-of-veh. time components

The basis of the $TollT_i$ term calculation is specified in Table 62. The table indicates the average time valuation, in minutes, per year-2007 dollar, that is assigned to a toll value by income level and trip type. The table indicates, for example, that a $1.00 toll equates to 8.7 minutes of travel time for a traveler in income level 1. More generally, the table indicates that travelers commuting to work are less sensitive to tolls than non-work-bound travelers because the time valuation of commuters is relatively high. The table also reflects the intuitive generalization that lower income travelers are more sensitive to tolls than the higher income travelers.

Table 62 Time Valuation (Minutes/2007$) by Purpose and Income Level

HH Income Quartile Range (1)	Assumed Mid-Point of HH Inc. Range	Hourly Rate per Worker (2)	2007 Time Valuation (Minutes per Dollar)	
			Work Trips (75% VOT)	Non-work (50% VOT)
$ 0 - $ 50,000	$25,000	$9.23	8.7	13.0
$ 50,000 - $ 100,000	$75,000	$27.70	2.9	4.3
$100,000 - $150,000	$125,000	$46.17	1.7	2.6
$150,000 +	$175,000	$64.64	1.2	1.9

Notes:
(1) Income groups based on 2007 ACS-based quartiles
(2) Hourly rate based on 1,920 annual hours/worker * 1.41 workers/HH = 2,707 hrs/HH
(3) Median 2007 annual HH income for the TPB modeled area is $84,280

Prepare_Internal_Ends.s reads the external trip tables created above, and summarizes the trip-ends from those trip tables. It also reads the internal trip-ends from the trip generation process. The script subtracts I-X trips from the total computed trip productions (by purpose), to arrive at "final" internal trip productions. An internal trip attraction trip scaling factor is next computed. The factor is computed by purpose as:

IntAttrScaleFtr = ("Final" Intl Ps + Extl. Ps – Extl. As)/ Intl. "Computed" As

The internal Ps and As in the above equation includes both motorized and non-motorized trips. A summary of the initial and final/scaled trip-ends is provided in a small text file named <iter>_Prepare_Internal_Ends.txt.

Trip_Distribution_Internal.s: The final internal Ps and scaled As are run through trip distribution. The resulting internal trips are combined with the external trips developed above. The trip distribution process produces complete (internal and external) trip tables by purpose and produces internal-to-internal (I-I) trip tables which will be inputs to the mode choice model later in the model stream. A

complete set of jurisdictional trip tables by purpose is reported in a text file named <iter>_Trip_Distribution_Internal.tab.

21 Mode Choice

21.1 Travel modes represented in the mode choice model

As shown in Figure 31, the mode choice model in the Version 2.3 Travel Model was designed to have 15 choices, made up of the following modes:

- Three auto modes: Drive alone, shared ride 2 person, and shared ride 3+ person.
- Three transit access modes:
  - Drive to transit and park in a park-and-ride (PNR) lot;
  - Drive to transit and drop off passenger(s) at the kiss and ride (KNR) lot or station; and
  - Walk to transit.
- Four transit modes: Commuter rail, all bus, all Metrorail, and combined bus/Metrorail.

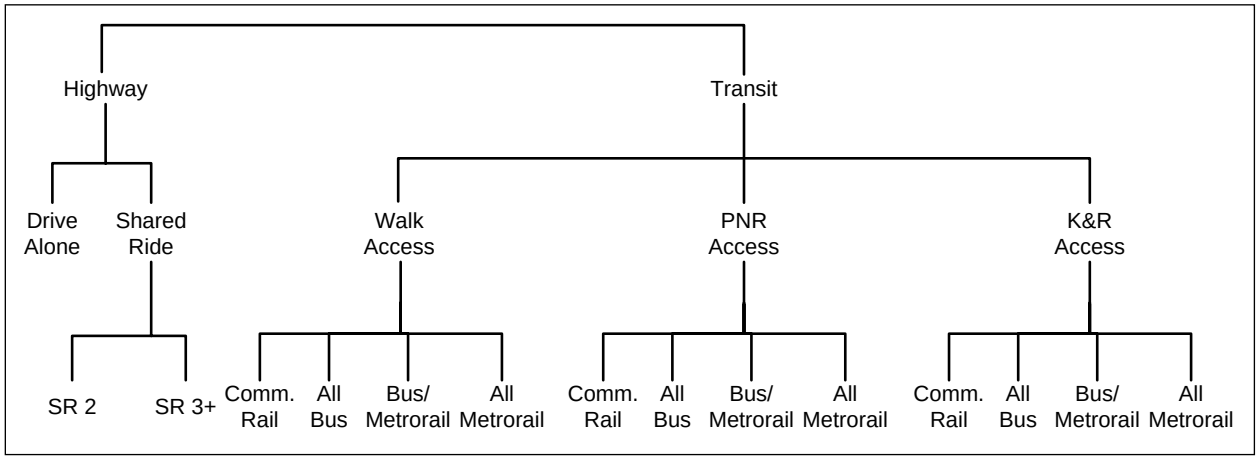


Figure 31 Designed nesting structure of the nested-logit mode choice model in the Version 2.3 travel model

* In model implementation, PNR and KNR access modes for commuter rail are combined into one choice, resulting in 14 choices, not 15.

Ref: "I:\ateam\nest_log\NestedChoice_Struct4.vsd"

Two important distinctions should be made. First, as per the design of AECOM, for the commuter rail mode, the model was implemented such that PNR and KNR commuter rail are combined as a single choice (in mode choice) or a single path (in path building), since, for commuter rail, the PNR- and KNR-access links are identical. Thus, instead of 12 access-mode/transit-mode choices, the model is implemented using 11 access-mode/transit-mode choices. Consequently, as implemented in the model, the mode choice model actually has 14 choices, not 15. This is difficult to portray in Figure 31, but is noted in a footnote on the figure. This combining of modes is also apparent in Table 67 ("Outputs from the AEMS mode choice application program").

Second, regarding the three auto modes: As discussed in the calibration report, the definition of high-occupancy vehicle (HOV) trips has changed, compared to the definition that was used in the Version 2.2 Travel Model. Previously, HOV trips coming out of the mode choice model referred to *only those that*

use HOV facilities for a substantial portion of their trip. Similarly, in previous models, the definition of low-occupancy vehicle (LOV) included both drive-alone and carpools (provided the carpools did not use a preferential HOV facility). By contrast, in the Version 2.3 NLMC model, the term LOV refers to only the drive-alone trips. Similarly, HOV refers to all shared-ride 2 (2-person carpools) and shared-ride 3 (3+ person carpools), irrespective of whether they use an HOV facility or not.

21.1.1 Treatment of LRT, BRT, and streetcar

Note that the nesting structure of the TPB Version 2.3 NLMC model does not include branches for specialized transit modes, such as light-rail transit (LRT), bus rapid transit (BRT), and streetcar. From this, one might conclude that the mode choice model is not designed to deal with these special transit modes. In fact, the model is designed to deal with these special transit modes. This section of the report discusses how these modes are treated in both the mode choice model and the transit path skimming process that feeds the mode choice model. This is the scheme that was developed by AECOM in 2004-2005 and has been retained by TPB staff. One of the underlying assumptions is that "premium" transit modes (e.g., Metrorail, commuter rail, LRT, BRT, and streetcar) will typically travel faster than buses, since they have one or more of these characteristics:

- A dedicated right-of-way, at least for part, if not all, of the route
- Traffic signal priority
- Superior acceleration/deceleration (compared to buses)

21.1.1.1 Network representation: LRT, BRT, and streetcar

In terms of network representation, LRT is typically coded as "mode 5." BRT and streetcar are coded as "mode 10," referred to in some parts of the model as the "new" mode. The thought is that LRT will travel mainly on its own grade-separated right-of-way (ROW), where it does not have to interact with road traffic. By contrast, it is assumed that streetcar will travel mostly in mixed traffic, i.e., it will share an at-grade right-of-way with road traffic. It is believed that AECOM chose to include BRT with streetcar, since although BRT will often include some grade-separated rights-of-way for the trunk-line portion of the route, the beginning and ending of the BRT route are likely to be in mixed traffic, making it more similar to the streetcar.

In cases where a travel demand modeler is coding a new transit line representing a "premium" transit mode,[99] the modeler must add "transit-only" links to the transit network to represent the new service, since the line requires a dedicated ROW which is not part of the highway network. In the past, one would have added these transit-only links to the rail link file (rail_link.bse). However, with the advent of TPB staff using an Esri geodatabase to manage the highway and transit networks, the rail_link.bse file no longer exists. For a modeler working at COG, one should add transit-only links directly into the highway/transit network geodatabase. For a modeler working external to COG (who will not have access

[99] Such as Metrorail (Mode 3), commuter rail (Mode 4), LRT (Mode 5), and BRT/streetcar (Mode 10).

to the COGTools ArcGIS add-in for managing the geodatabase), one should modify the text *.tb files that are output from the *create_support_files.s* Cube Voyager script.

The "station file" (station.dbf) contains information about transit stations in the modeled area. More formally, the station file contains information about Metrorail stations, commuter rail stations, light rail stations, bus rapid transit stations/stops, streetcar stations/stops, express-bus bus stops, and park-and-ride (PNR) lots that serve these stations/stops. One must add Mode 5 and Mode 10 station nodes to the station file using a mode code of "L" for LRT/Mode 5 and "N" for New/BRT/streetcar/Mode 10. Mode 5 and 10 stations do not require a station centroid number,[100] though recent network documentation has designated the node number range of 7000-7999 (light rail/BRT PNR centroids), even though this range is not currently in use in the geodatabase.[101] Cube Voyager cannot combine headways for routes unless they are part of the same mode code, so, in cases where Mode 10 routes share a street segment with local bus (Mode 1), these two routes will not be represented with a combined headway.

21.1.1.2 Transit path building and skimming, mode choice, and transit assignment: LRT, BRT, and streetcar

In transit path building and skimming, mode choice, and transit assignment, the following two rules apply:[102]

- LRT: Mode 5 is treated like Metrorail (Mode 3)
- BRT: Mode 10 is treated like local bus (Modes 1, 6, & 8)

21.1.1.3 Fares: LRT, BRT, and streetcar

Fares for Mode 5 and Mode 10 are computed like those for local bus (Modes 1, 6, & 8).

21.1.1.4 Inclusion of LRT, BRT, and streetcar trips in trip tables

Following the mode choice step, the output trip table files (*.MTT) each contain 14 tables, as shown in Table 67. Any table that lists "MR" (Metrorail) actually includes both Metrorail and LRT, since Mode 5 [LRT] is treated like Metrorail (Mode 3) in transit path building/skimming, mode choice and transit assignment. Similarly, any table that lists "BU" (Bus) actually includes both bus and BRT/streetcar. The only way to get the actual breakout of the estimated level of LRT or BRT/streetcar travel is to look at the transit assignment results (keeping in mind that, although we assign all transit trips, we validated only Metrorail trips, and, at the current time, these are validated only to station groups, not to individual stations). So, after transit assignment, one is able to see how many trips/boardings/alightings occurred

[100] Jain to Milone and Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," 6.
[101] Meseret Seifu, Ronald Milone, and Mark Moran, "Highway and Transit Networks for the Version 2.3.66 Travel Model, Based on the 2016 CLRP and FY 2017-2022 TIP," Final Report (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, March 17, 2017), 17, https://www.mwcog.org/transportation/data-and-tools/modeling/model-documentation/.
[102] Jain to Milone and Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," 10.

on a given LRT line, but, since we do not validate results at the LRT line level, model users are recommended to use caution when using these numbers.

21.1.2 Other issues relating to travel modes

Table 63 list the ten transit modes that are handled by the Version 2.3 mode choice model and lists the mode code used in the station file (station.dbf), which is an input to the *parker.s* script that is part of the transit_skim_all_modes.bat batch file (see Section 16, Transit Skim File Development). Note that the consolidated station file does not include bus stops, except for bus stops that have their own PNR lot (generally express bus service). Transit routes are represented in Cube Voyager's TRNBUILD module using the LINE command, which is usually placed in a *.LIN file or, using COG/TPB convention, in a MODE*.TB file (a "mode" file).

Table 63 Transit sub-modes represented in the Version 2.3 travel model

Mode #	Transit sub-mode	Mode code in station file
1	Local Metrobus	(not represented in the sta. file)
2	Express Metrobus	B
3	Metrorail	M
4	Commuter rail	C
5	Light rail transit (LRT)	L
6	Other local bus in the WMATA service area	(not represented in the sta. file)
7	Other express bus in the WMATA service area	B
8	Other local bus beyond the WMATA service area	(not represented in the sta. file)
9	Other express bus beyond the WMATA service area	B
10	Bus rapid transit (BRT) and street car	N (for "New" mode)

In addition, there are five non-transit modes that are used to access transit and make transfers to, from, and between transit services. These are detailed in Table 64.

Table 64 Transit Access and Transfer Links

Mode #	Link Type
11	Drive access, for both PNR and KNR (from the zone centroid to a transit stop node)
12	Walk transfer link (between transit services or to/from transit station)
13	Sidewalk link
14	Unused
15	Walk transfer link between PNR lot and transit station
16	Walk access (from the zone centroid to a transit stop node)

All the modes described in Table 63 and Table 64 can be used in the path-building process (see 16). If no prohibitions are imposed, path building assumes that transfers between all modes are possible. For example, a person could theoretically access Metrorail by driving (mode 11) to the station, use Metrorail (mode 3), and egress Metrorail by driving (mode 11) as well. When trips are in production-attraction format, as is the case for transit path-building and mode choice, a person cannot egress from a station

and take a car. To prevent the foregoing behavior in the model, some limitations with regard to transfers need to be imposed. These are described in Table 65. The mode interchanges where transfers are prohibited are denoted by "Y".

Table 65 Transfer Prohibitions (No Transfer or NOX)

From Mode	To Mode 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
2	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
3	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
4	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
5	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
6	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
7	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
8	n	n	n	n	n	n	n	n	n	n	Y	n	n	n	Y	n
9	n	n	n	n	n	n	n	n	n	n	Y	n	n	n	Y	n
10	n	n	n	n	n	n	n	Y	Y	n	Y	n	n	n	Y	n
11	n	n	n	n	n	n	n	n	n	n	Y	Y	n	Y	n	n
12	n	n	n	n	n	n	n	n	n	n	Y	Y	n	n	Y	n
13	n	n	n	n	n	n	n	n	n	n	Y	n	n	n	Y	n
14	n	n	n	n	n	n	n	n	n	n	Y	n	n	n	Y	n
15	n	n	n	n	n	n	n	n	n	n	Y	Y	Y	Y	Y	Y
16	n	n	n	n	n	n	n	n	n	n	Y	n	n	n	Y	Y

21.2 Elimination of Metrorail constraint to and through the regional core

As discussed in section 1.3.4 in page 14, the Metrorail constraint to and through the regional core has been removed from Ver 2.3.75. For the sake of documentation, below is a more detailed description of the constraint and its modeling-related aspects. This description came from previous model documentation.[103]

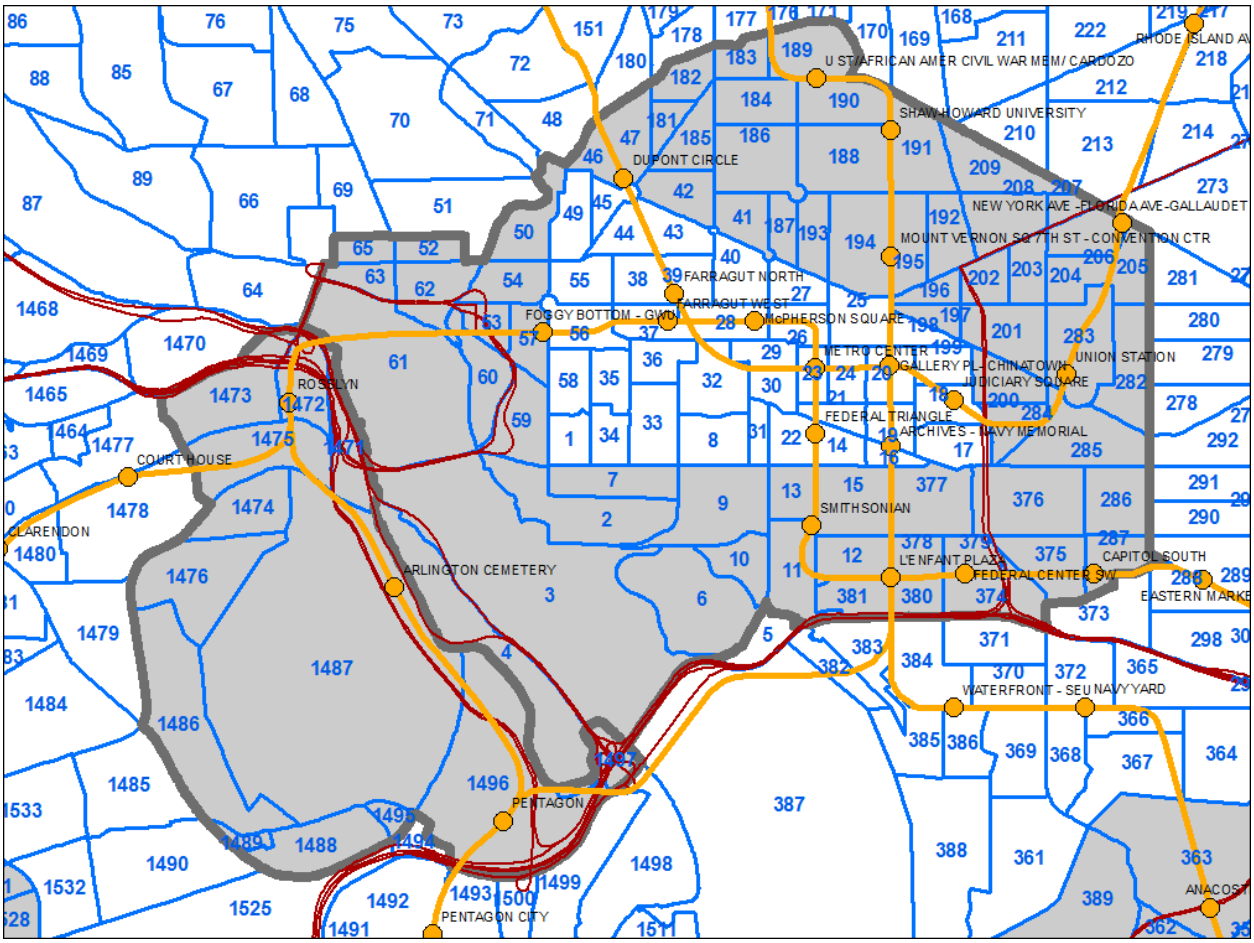
The Metrorail constraint through the regional core (sometimes referred to using the less precise term "transit constraint through the regional core") is a technical adjustment to the trip tables coming out of the mode choice process designed to reflect a WMATA policy assumption that, during peak periods, the Metrorail system may have insufficient capacity to handle all the demand traveling to and through the regional core. Typically, it is assumed that the Metrorail system will be able to handle all of the peak-period demand to and through the regional core in the near term, but, since demand is growing through time, the system might not be able to handle all the peak-period demand at some future time,

[103] Moran, Milone, and Seifu, "User's Guide for the COG/ TPB Travel Demand Forecasting Model, Version 2.3.70. Volume 1 of 2: Main Report and Appendix A (Flowcharts)."

depending on the amount of growth in demand and the number of rail cars available in a given year. The assumed year at which the Metrorail system will be at its peak capacity during the peak periods to and through the regional core is known as the "binding year." For years beyond the binding year, it is assumed that any growth in peak-period Metrorail demand to and through the regional core will be forced to switch to other travel modes (specifically, auto person trips). The Metrorail constraint was initiated by WMATA in 2000 to address funding shortfalls restricting the expansion of the rail fleet.[104] WMATA policy sets the binding year, which is currently set at 2020. This means that, for any forecast year past 2020, the Metrorail constraint is applied, i.e., forecasted peak-period Metrorail trips to and through the regional core are shifted to other travel modes (specifically, auto person trips). The regional core is defined as the set of Metrorail stations in the central employment area, i.e., the portion of the system bounded by Dupont Circle, U Street, New York Avenue (NOMA), Capital South, L'Enfant Plaza, Pentagon, Arlington Cemetery, and Rosslyn stations. This area is also sometimes referred to by technical audiences as "Ring 0" and "Ring 1." In Figure 32, Ring 0 is shown as the white area shaped like a trapezoid in the center of downtown Washington, D.C. Ring 1 is shown as the gray area surrounding Ring 0. The two areas together comprise the regional core. Note that non-Metrorail-related transit trips and off-peak Metrorail trips are not affected by the Metrorail constraint process.

[104] Ronald Milone, "TPB Version 2.3 Travel Model on the 3,722-TAZ area system: Status report" (presented at the September 23, 2011 meeting of the Travel Forecasting Subcommittee of the Technical Committee of the National Capital Region Transportation Planning Board, held at the Metropolitan Washington Council of Governments, Washington, D.C., September 23, 2011).

Figure 32 Ring 0 (white trapezoid) and Ring 1 (gray polygon), which form the "core" area used in the Metrorail constraint through the regional core



Ref: I:\ateam\gis\taz\taz_2191_3722.mxd

The Metrorail constraint is applied in the following way (assuming that 2020 is the binding year). Model runs representing the binding year and years prior to the binding year are conducted in the normal fashion, i.e., using the ***mode_choice.bat*** batch file (see page A-13 of Appendix A). Model runs representing any year following the binding year, e.g., 2030, are conducted using the ***mode_choice_tc_v23.bat*** batch file (see page A-13 of Appendix A), as follows:

- Peak 2020 Metrorail trips to and through the core are estimated using a time-of-day model.
- Peak 2030 Metrorail trips to and through the core are estimated using a time-of-day model.
- Peak 2030 Metrorail trips to and through the core are adjusted (downward) to match 2020 ridership levels.
- The "excess" 2030 Metrorail trips that cannot be accommodated are converted to auto person trips
- The constraint process occurs for each speed feedback iteration ("i1" through "i4).

Thus, the mode choice model is executed normally with the *mode_choice.bat* batch file, which invokes the following:

- Mode choice model application program (AEMS.EXE);
- Jurisdictional summary script (*MC_NL_Summary.s*);

By contrast, the mode choice model and Metrorail constraint process are executed using the *mode_choice_tc_v23.bat* batch file, which invokes the following:

- Mode choice model application program (AEMS.EXE);
- Jurisdictional summary script (*MC_NL_Summary.s*);
- Constraint adjustment script (*MC_Constraint_V23.s*);

21.3 Control/Support Files

The nested-logit mode choice (NLMC) model is applied using a Fortran program called AEMS.[105] AEMS.EXE is the compiled version of the source code AEMS.FOR. In order to run, AEMS.EXE needs to have several DLL files. The model is run one for each of the five trip purposes, as shown on page A-13 of the flowchart in Appendix A. Each run of the mode choice model requires a "control file," so there are five in total: HBW_NL_MC.CTL, HBS_NL_MC.CTL, HBS_NL_MC.CTL, NHW_NL_MC.CTL, and NHO_NL_MC.CTL. After the five mode choice models run, there is a Cube Voyager script, *MC_NL_Summary.s*, which is used to create jurisdiction-to-jurisdiction tabulations of the trip tables output from the mode choice model. The inputs to the AEMS mode choice application program are shown in Table 66. The outputs are shown in Table 67.

Table 66 Inputs to the AEMS mode choice application program

Daily person trips, stratified by income group (1, 2, 3, 4), in production/attraction format (INFILE 1)	hbw_income.ptt, hbs_income.ptt, hbo_income.ptt, nhw_income.ptt, nho_income.ptt	Binary
Highway skims, nine tables – SOV, HOV2, HOV3+ for time, distance, and tolls on non-variably-priced facilities (INFILE 2)	hwyam.skm, hwyop.skm	Binary
Commuter rail transit skims (INFILE 3)	trnam_cr.skm, trnop_cr.skm	Binary
All bus transit skims (INFILE 4)	trnam_ab.skm, trnop_ab.skm	Binary
Metrorail transit skims (INFILE 5)	trnam_mr.skm, trnop_mr.skm	Binary
Bus/Metrorail transit skims (INFILE 6)	trnam_bm.skm, trnop_bm.skm	Binary
Zonal data (INFILE 8)	zonev2.a2f	Text

[105] "AECOM Consult Mode Choice Computation Programs, AEMS, Users Guide," Draft report (Fairfax, Virginia: AECOM Consult, Inc., April 5, 2005).

Table 67 Outputs from the AEMS mode choice application program

Daily person trips, stratified by travel mode (14 tables): 1. DR ALONE 2. SR2 3. SR3+ 4. WK-CR 5. WK-BUS 6. WK-BU/MR 7. WK-MR 8. PNR-CR & KNR-CR 9. PNR-BUS 10. KNR-BUS 11. PNR-BU/MR 12. KNR-BU/MR 13. PNR-MR 14. KNR-MR	hbw_nl_mc.mtt, hbs_nl_mc.mtt, hbs_nl_mc.mtt, nhw_nl_mc.mtt, nho_nl_mc.mtt	Binary

21.4 Market segmentation

Most mode choice models used in large urban areas in the U.S. have historically been estimated at a disaggregate level but are applied at an aggregate level. Specifically, these models are typically estimated at the person-trip level but applied at the zone-to-zone interchange level. Furthermore, in application mode, within each zone-to-zone interchange, many models subdivide the travel market into homogeneous groups, known as market segments. The nested-logit mode choice model (NLMC) that is used in the Version 2.3 Travel Model uses three types of market segmentation:

- Household income
- Geography
- Access to transit

Note that there has been a recent trend away from disaggregate estimation, due, in part to guidance from the FTA.[106]

21.4.1 Market segmentation by household income

The income segmentation is the same that is used for the first two steps of the travel model (i.e., trip generation and trip distribution), namely households are segmented by the four household income quartiles, which are shown in Table 68.[107]

Table 68 Household income quartiles computed from the ACS

Quartile	Income range (2007 dollars)
First	Less than $50,000
Second	$50,000 to $99,999
Third	$100,000 to $149,999
Fourth	$150,000 or more

21.4.2 Market segmentation by geography

When AECOM Consult, Inc. first developed a mode choice model for the Washington, D.C. metropolitan area in 2004-2005, it divided the modeled area into seven superdistricts:[108]

1. DC core
2. VA core
3. DC urban

[106] See, for example, Federal Transit Administration, "Discussion Piece #16: Calibration and Validation of Travel Models for New Starts Forecasting" (Workshop on Travel Forecasting for New Starts Proposals, Minneapolis, Minnesota, 2006), http://www.fta.dot.gov/planning/newstarts/planning_environment_5402.html.
[107] Hamid Humeida to Files, "Analysis of Data from the American Community Survey (ACS): Households by Household Income, Household Size, and Vehicle Availability," Memorandum, March 19, 2010.
[108] Bill Woodford, "Development of Revised Transit Components of Washington Regional Demand Forecasting Model" (December 1, 2004), 30.

4. MD urban
5. VA urban
6. MD suburban
7. VA suburban

AECOM's mode choice model was applied as a post process to the COG/TPB travel model (the Version 2.1 Travel Model). COG/TPB staff used the AECOM post-process mode choice model as a starting point for its work on the Version 2.3 Travel Model in work done from 2008 to 2011. TPB staff integrated the mode choice model into the modeling chain (i.e., moved from a post process for the regional model to its normal position in the speed feedback loop, following trip distribution), and re-calibrated the model. **When COG/TPB staff retained and re-calibrated the NLMC model, it retained the same geographic market segmentation that had been developed by AECOM**.

These seven superdistricts are shown in Figure 33 and in Table 69. Table 69 shows the equivalency between the seven NLMC superdistricts and the new 3,722-TAZ area system.

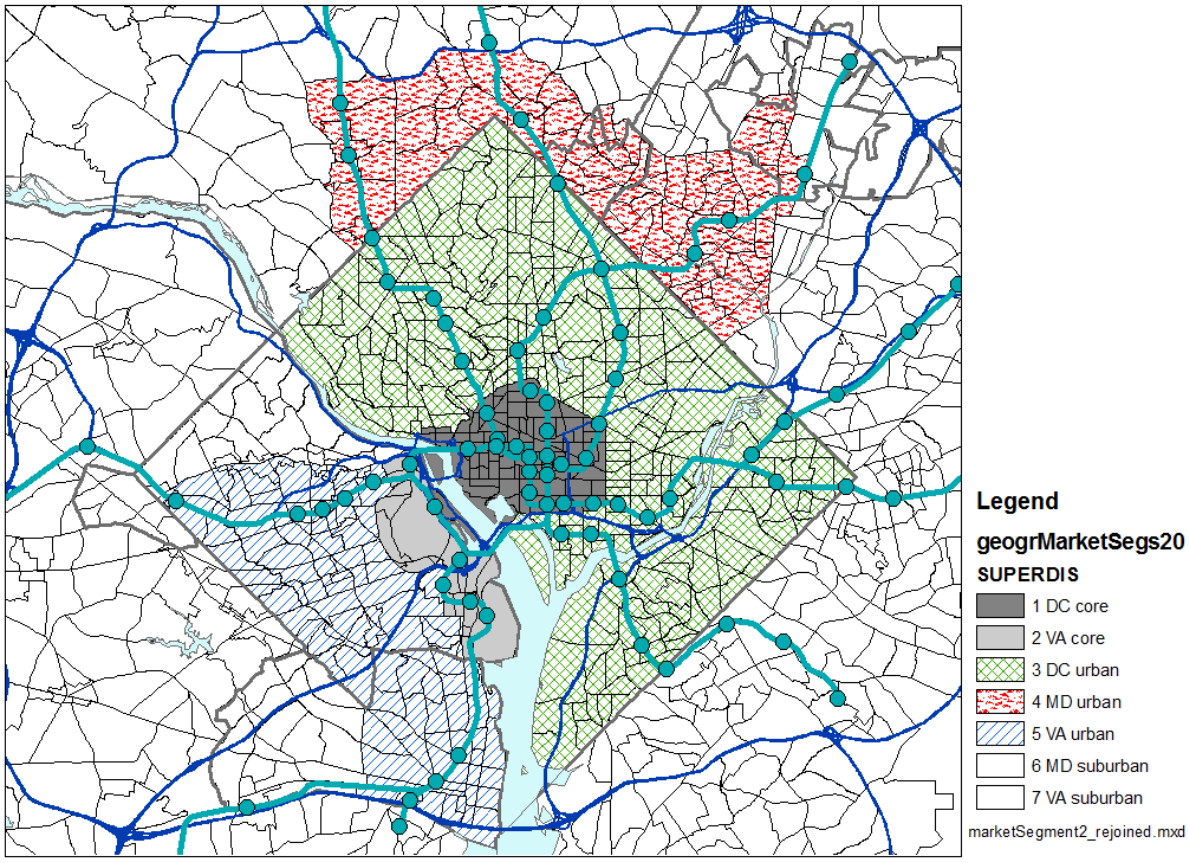


Figure 33 Seven superdistricts used in the Version 2.3 nested-logit mode choice model

Ref: "I:\ateam\nest_log\marketsegment2_rejoined.tif"

Table 69 Equivalency between nested-logit mode choice superdistricts and TPB TAZ 3,722

No.	Name	TAZs (TPB TAZ 3,722)
1	DC core	1-4,6-47,49-63,65,181-287,374-381
2	VA core	1471-1476,1486-1489,1493,1495-1504,1507,1508,1510,1511
3	DC urban	5,48,51,64,66-180,210-281,288-373,382-393
4	MD urban	603,606,612-628,630-640,662-664,669,670,913,916,917,939-957,959,961-982,985,
4	MD urban	986
5	VA urban	1405-1422,1427-1435,1448,1452,1454-1464,1477-1485,1490-1492,1494,1505,1506,
5	VA urban	1509,1512-1545,1569-1609
6	MD suburban	394-602,604,605,607-611,629,641-661,665-668,671-912,914,915,918-938,958,960,
6	MD suburban	983,984,987-1404,2820-3102,3104-3409
7	VA suburban	1423-1426,1436-1447,1449-1451,1453,1465-1470,1546-1568,1610-2554,2556-2628,
7	VA suburban	2630-2819,3410-3477,3479-3481,3483-3494,3496-3675

Ref: "I:\ateam\nest_log\equiv_tpbTaz3722_nlmc_superdistr.txt" and "I:\ateam\nest_log\Market_segment_NewTAZs_sorted.xlsx"

The TAZs in Table 69 are referred to as "TPB TAZ" to distinguish them from "COG TAZ." In 2008 and 2009, the COG GIS staff developed a new system of transportation analysis zones (TAZs), which had more zones, but did not increase the size of the modeled area. In other words, the new zones were, on average, smaller than the previous zone system, which is useful for better modeling of transit trips. The old zone system had 2,191 TAZs and the new system has 3,722 TAZs. After the COG GIS staff was finished with their work, the COG models development group reviewed the new zone system and found a few cases where the zone boundaries needed adjustment.[109] The final result was that there were now two sets of zones for the 3,722-TAZ area system:

- COG TAZs: For land activity forecasts (COGTAZ3722_TPBMOD)
- TPB TAZs: For transportation modeling (TPBTAZ3722_TPBMOD)[110]

Although seven market areas could lead to 49 (= 7 x 7) geographic interchanges, AECOM Consult, Inc. grouped them into the 20 paired production/attraction areas shown in Table 70 and Table 71. Another way to view the 20 geographic market segments is shown in Table 72.

Table 70 Production and attraction market segments used in the TPB Version 2.3 NLMC model

Production Areas	Attraction Areas
1. DC Core / Urban	1. DC Core
2. MD Urban	2. VA Core
3. VA Core / Urban	3. Urban
4. MD Suburban	4. Suburban
5. VA Suburban	

Ref: "I:\ateam\nest_log\marketSeg.xls"

[109] Meseret Seifu, "Review of New Zone System: 3722 Transportation Analysis Zones (TAZ)" (January 22, 2010), 4, http://www.mwcog.org/uploads/committee-documents/Zl5aV1dd20100122152445.pdf.
[110] Seifu, 23.

Table 71 20 geographic market segments used in the TPB nested-logit mode choice model

Market Seg No.	Prod Superdis	Attr Superdis	Production Area	Attraction Area
1	1,3	1	DC	DC core
2	1,3	2	DC	VA core
3	1,3	3,4,5	DC	Urban DC, MD, VA
4	1,3	6,7	DC	Suburban MD, VA
5	4	1	MD urban	DC core
6	4	2	MD urban	VA core
7	4	3,4,5	MD urban	Urban DC, MD, VA
8	4	6,7	MD urban	Suburban MD, VA
9	2,5	1	VA core/urban	DC core
10	2,5	2	VA core/urban	VA core
11	2,5	3,4,5	VA core/urban	Urban DC, MD, VA
12	2,5	6,7	VA core/urban	Suburban MD, VA
13	6	1	MD suburban	DC core
14	6	2	MD suburban	VA core
15	6	3,4,5	MD suburban	Urban DC, MD, VA
16	6	6,7	MD suburban	Suburban MD, VA
17	7	1	VA suburban	DC core
18	7	2	VA suburban	VA core
19	7	3,4,5	VA suburban	Urban DC, MD, VA
20	7	6,7	VA suburban	Suburban MD, VA

Ref: "I:\ateam\nest_log\marketSeg.xls"

Table 72 Equivalency between seven super-districts and the 20 geographic market segments

		1 DC core	2 VA core	3 DC urban	4 MD urban	5 VA urban	6 MD suburban	7 VA suburban
1	DC core	1	2	3	3	3	4	4
3	DC urban	1	2	3	3	3	4	4
4	MD urban	5	6	7	7	7	8	8
2	VA core	9	10	11	11	11	12	12
5	VA urban	9	10	11	11	11	12	12
6	MD suburban	13	14	15	15	15	16	16
7	VA suburban	17	18	19	19	19	20	20

Ref: "I:\ateam\nest_log\superDistr_marketSeg.xlsx"

21.4.3 Market segmentation by access to transit

The section of the report contains two subsections. The first includes a general discussion about how transit-access markets are developed in relatively simple mode choice models. It gives the example of the three transit access markets that are often used by the Federal Transit Administration (FTA): "can walk," "must drive," and "no transit."[111] The second subsection describes the more specific case of the

[111] See, for example, Federal Transit Administration, "Discussion Piece #11: Illustrative Mode-Choice and Summit Calculations for Travel by One Market Segment between a Pair of Zones for Base and Build Alternatives"

seven transit-access markets used in the mode choice model of the Version 2.3 Travel Model. In both the general discussion and the more specific case, zonal percent-walk-to-transit (PWT) values are used to develop the transit access markets. In the latter case, the mode choice model application program is AEMS.EXE, developed by AECOM.

21.4.3.1 General discussion

The purpose of a mode choice model is to predict the number and or share of trips that will be made by each major travel mode represented in a model. Transit, in one form or another, is usually one of the travel modes represented in most mode choice models. In order to use transit, one must be able to access it, either via non-motorized modes, such as walking and biking, or motorized modes, such as driving an automobile. Many mode choice models segment transit trips by walk access and drive access. A typical zonal metric for how easily one may walk to transit is the "percent walk to transit" (PWT) value, which is defined as the percent of a zone's area that is within walking distance to transit service. So, for example, a PWT value of 20% means that 20% of the zone's area lies within walking distance to transit service. If walking distance has been defined to be one mile, then this means that 20% of the zone lies within one mile of transit service. The walking distance threshold is set by the modelers in each urban area and should reflect the typical distance that people are likely to walk to reach transit. Typical values range from 0.5 miles to 1 mile. Some travel models, such as the TPB Version 2.3 Travel Model, make use of two walk-to-transit threshold distances, e.g., a short-walk distance (e.g., 0.5 miles) and a long-walk distance (e.g., 1 mile). The TPB travel model is discussed in the next section of the report. For this section of the report, it is assumed that there is only one walk-to-transit threshold distance (e.g., 1 mile).

A typical method for calculating the percent walk to transit for each zone in the modeled area is the following:

1. Determine a threshold distance for walking to transit (or two threshold distances may be used).
2. Determine point locations where transit service can be accessed (i.e., transit stop nodes and transit stations). In other words, create a geographic data set that includes all the points representing transit stop nodes and transit stations.
3. Determine transit walksheds, which are polygons composed of circular areas around transit stop nodes. In other words, create a geographic data set that represents point buffers (i.e., circles of radius X = the threshold walking distance) around each transit stop node and transit station.
4. Given that there is already a polygon layer of TAZ boundaries, perform a polygon-on-polygon overlay (TAZ boundaries and walkshed boundaries) to create a new geographic data set that can be used to calculate the percent walk to transit value for each zone.
5. Calculate the percent walk to transit values for each zone.[112]

(Workshop on Travel Forecasting for New Starts Proposals, Minneapolis, Minnesota, 2006), http://www.fta.dot.gov/planning/newstarts/planning_environment_5402.html.

[112] See, for example, Yew Yuan, "Transit Walkshed Generator: A GIS Application to Generate Transit Walksheds, Technical Report," Draft (Washington, D.C.: Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, November 15, 2012).

For a number of years, the Federal Transit Administration (FTA) has used a simple transit-access market segmentation system that has three segments known as "can walk," "must drive," and "no transit." These segments are defined at the zone-to-zone interchange level (the level used by most mode choice application programs) and can be determined using the percent-walk-to-transit (PWT) values in the production and attraction zones of the interchange. Before defining these three transit access markets, one must make a few assumptions:

1. Trips are in production/attraction format, not origin/destination format:
    a. A trip **production** is defined as the **home**-end of a home-based trip, or the **origin** of a non-home-based trip.
    b. A trip **attraction** is defined as the **non-home**-end of a home-based trip, or the **destination** of a non-home-based trip.
2. Travelers "access" transit at the production end of the trip and "egress from" transit at the attraction end of the trip.
3. At the production end of the trip, one may access the transit system by either walking or driving. Bike access is considered part of "walking."
4. At the attraction end of the trip, the only egress option is walking, since it is assumed that travelers do not have an automobile available at the non-home end of the trip.
5. The zonal PWT value functions as a probability value. Thus, if the PWT is 20%, this can be interpreted as meaning that, for trips that start (are produced in) or end (are attracted to) this zone, there is a 20% chance of that the trips will access or egress from the transit system via walking.

The "can walk" market is defined as the set of trips, within a given zone-to-zone interchange, where one can walk to transit at the production end of the trip (One can also walk from transit at the attraction end of the trip, but this is not a distinguishing feature, since "must drive" trips also walk from transit at the attraction end of the trip). Even though a trip may be included in the "can walk" segment, it is understood that drive access to transit is also a possibility for this market. In probability theory, if two events, A and B, are independent, the probability of the intersection of A and B equals the product of the probabilities of A and B, i.e.,

$$P(AB) = P(A) * P(B)$$

Since the PWT is considered a probability or likelihood of walking, and since the PWT for two given zones are considered to be independent, then, for a given zone-to-zone interchange, the probability of being in the "can walk" market -- P("can walk") or P(CW) -- is simply the product of the PWT of the production zone and the PWT of the attraction zone:

$$P("can\ walk"\ for\ interchange\ ij) = PWT(i) * PWT(j)$$

The "must drive" market includes trips that must access the transit market via driving since the trip begins outside of the transit walk-access threshold distance. The "no transit" market includes trips for which transit is not an option, since, at the attraction end of the trip, there is no transit available within walking distance. So, for a given interchange, the probability of being in the "must drive" market --

P("must drive") or P(MD) -- is simply the product of the non-walkable share of the production zone and the PWT of the attraction zone:

$$P(\text{"}must\ drive\text{"}\ for\ interchange\ ij) = \big(1 - PWT(i)\big) * PWT(j)$$

Similarly, for a given interchange, the probability of being in the "no transit" market -- P("no transit") or P(NT) -- is simply the non-walkable share of the attraction zone:

$$P(\text{"}no\ transit\text{"}\ for\ interchange\ ij) = \big(1 - PWT(j)\big)$$

So, whereas the P(CW) and P(MD) are a function of the PWT in both the production and attraction zones, the P(NT) is a function of only the PWT in the attraction zone. For a given interchange

$$P(CW) + P(MD) + P(NT) = 100\%$$

Table 73 presents 11 examples, or cases, of how various production and attraction PWT values are combined to get the probabilities of being in the "can walk," "must drive" and "no transit" zone-to-zone interchange market segments. For example, in the case #1, both the production zone and the attraction zone have percent-walk-to-transit (PWT) values of 0%, which results in the all the trips in the interchange being in the "no transit" market segment. By contrast, in case #2, PWT(i) = 0% and PWT(j) = 50%, which results in a 50%/50% split of trips in that interchange into the "must drive" and "no transit" markets. When, in case #3, PWT(i) = 0% and PWT(j) = 100%, this results in all trips being allocated to the "must drive" market.

In any of these cases, the number of trips in each of the three markets is equal to the total number of person trips in the zone-to-zone interchange times each of the three probabilities. **After trips have been assigned to the three markets, then the mode choice model is applied**, as described FTA's Discussion Piece #11 (Discussion_11_Summit_Calcs.doc) and shown in its associated spreadsheet (Discussion_11_Summit_Example_Calcs.xls).[113]

[113] Federal Transit Administration, "Discussion Piece #11: Illustrative Mode-Choice and Summit Calculations for Travel by One Market Segment between a Pair of Zones for Base and Build Alternatives."

Table 73 Eleven examples showing how zonal percent-walk-to-transit values translate into probabilities of being in three transit-access markets: can walk, must drive, and no transit

	Zonal Attributes		Zone-to-Zone Interchange Attributes			
	Percent Walk to Transit Prod. Zone	Percent Walk to Transit Attr. Zone	Proba-bility "Can Walk"	Proba-bility "Must Drive"	Proba-bility "No Transit"	Total Proba-bility
	PWT(i)	PWT(j)	P(CW,ij)	P(MD,ij)	P(NT,ij)	
Case	A	B	A*B	(1-A)*B	(1-B)	
1	0%	0%	0.0%	0.0%	100.0%	100.0%
2	0%	50%	0.0%	50.0%	50.0%	100.0%
3	0%	100%	0.0%	100.0%	0.0%	100.0%
4	50%	0%	0.0%	0.0%	100.0%	100.0%
5	50%	50%	25.0%	25.0%	50.0%	100.0%
6	50%	100%	50.0%	50.0%	0.0%	100.0%
7	100%	0%	0.0%	0.0%	100.0%	100.0%
8	100%	50%	50.0%	0.0%	50.0%	100.0%
9	100%	100%	100.0%	0.0%	0.0%	100.0%
10	75%	50%	37.5%	12.5%	50.0%	100.0%
11	100%	75%	75.0%	0.0%	25.0%	100.0%

Ref: "percent_walk_transit_can_walk.xlsx"

Table 74, Table 75, and Table 76 provide a more complete picture of how P(CW), P(MD), and P(NT) each vary with the production and attraction PWT values. For example, Table 74 shows the probability of being in the "can walk" market segment for a zone-to-zone interchange as a function of the production and attraction percent-walk-to-transit values. The probability of "can walk" is zero if either the production PWT or the attraction PWT equal zero. By contrast, the probability of "can walk" is 100% only if the production PWT and the attraction PWT equal 100%.

Table 74 Probability of being in the "can walk" market segment for a zone-to-zone interchange, based on the production and attraction percent-walk-to-transit values

		PWT(i)										
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
PWT(j)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10%	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	20%	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
	30%	0%	3%	6%	9%	12%	15%	18%	21%	24%	27%	30%
	40%	0%	4%	8%	12%	16%	20%	24%	28%	32%	36%	40%
	50%	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
	60%	0%	6%	12%	18%	24%	30%	36%	42%	48%	54%	60%
	70%	0%	7%	14%	21%	28%	35%	42%	49%	56%	63%	70%
	80%	0%	8%	16%	24%	32%	40%	48%	56%	64%	72%	80%
	90%	0%	9%	18%	27%	36%	45%	54%	63%	72%	81%	90%
	100%	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Ref: "percent_walk_transit_can_walk.xlsx"

Table 75 shows the probability of being in the "must drive" market segment for a zone-to-zone interchange as a function of the production and attraction percent-walk-to-transit values. The probability of "must drive" is zero if either the production PWT equals 100% or the attraction PWT equal zero. By contrast, the probability of "must drive" is 100% only if the production PWT equals zero and the attraction PWT equals 100%.

Table 75 Probability of being in the "must drive" market segment for a zone-to-zone interchange, based on the production and attraction percent-walk-to-transit values

		PWT(i)										
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
PWT(j)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	10%	10%	9%	8%	7%	6%	5%	4%	3%	2%	1%	0%
	20%	20%	18%	16%	14%	12%	10%	8%	6%	4%	2%	0%
	30%	30%	27%	24%	21%	18%	15%	12%	9%	6%	3%	0%
	40%	40%	36%	32%	28%	24%	20%	16%	12%	8%	4%	0%
	50%	50%	45%	40%	35%	30%	25%	20%	15%	10%	5%	0%
	60%	60%	54%	48%	42%	36%	30%	24%	18%	12%	6%	0%
	70%	70%	63%	56%	49%	42%	35%	28%	21%	14%	7%	0%
	80%	80%	72%	64%	56%	48%	40%	32%	24%	16%	8%	0%
	90%	90%	81%	72%	63%	54%	45%	36%	27%	18%	9%	0%
	100%	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%

Ref: "percent_walk_transit_can_walk.xlsx"

Table 76 shows the probability of being in the "no transit" market segment for a zone-to-zone interchange as a function of solely on the attraction percent-walk-to-transit values. The probability of "no transit" is zero only if the attraction PWT equals 100%. By contrast, the probability of "no transit" is 100% only if attraction PWT equals zero.

Table 76 Probability of being in the "no transit" market segment for a zone-to-zone interchange, based solely on the attraction percent-walk-to-transit values

		PWT(i)										
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
PWT(j)	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	10%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
	20%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
	30%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
	40%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
	60%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
	70%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
	80%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	90%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Ref: "percent_walk_transit_can_walk.xlsx"

21.4.3.2 Version 2.3 Travel Model and AEMS

Regarding the percent-walk-to-transit (PWT) values used by the mode choice model of the TPB Version 2.3 Travel Model, two distance thresholds are used:

- Short walk to transit: ≤ 0.5 mile
- Long walk to transit: > 0.5 mile and ≤ 1 mile

Furthermore, the mode choice model differentiates between peak period transit service and off-peak period transit service. When calculating average headways and run times for transit routes running during the peak and off-peak periods, the historical practice, which is continued to this day, has been to use a subset of the period to represent service during the entire period. Specifically, the one-hour time period from 7:00 AM to 7:59 AM is used to represent peak-period conditions, and the five-hour time period from 10:00 AM to 2:59 PM is used to represent off-peak-period conditions.[114] It is also assumed that home-based-work (HBW) trips occur in the peak periods, and thus make use of the peak-period transit skims and peak-period PWT values. Similarly, it is assumed that the other trip purposes (HBO, HBS, NHW, and NHO) occur in the off-peak periods, and thus make uses of the off-peak transit skims and off-peak PWT values.

The mode choice model in the TPB Version 2.3 Travel Model is a 15-choice, nested-logit mode choice (NLMC) model that includes

[114] Seifu, Milone, and Moran, "Highway and Transit Networks for the Version 2.3.66 Travel Model, Based on the 2016 CLRP and FY 2017-2022 TIP," 8.

- Three auto modes (drive alone [DA], shared ride 2-person [SR2], and shared ride 3+person [SR3]);
- Four transit modes (commuter rail [CR], all bus [AB], all Metrorail [MR], and combined bus/Metrorail[BM]); and
- Three modes of access to transit (park and ride [PNR], kiss and ride [KNR], and walk [WK])

These 10 modes are combined in nests, in such a way that there are 15 choices in the mode choice model, as shown in Figure 31 (p. 155). The NLMC model is applied using the AECOM mode choice application program (AEMS).

Although light-rail transit (LRT), bus rapid transit (BRT), and streetcar are not explicit transit modes in the mode choice model, the model has, nonetheless, been designed to deal with these three special transit modes. Mode 5 is reserved for modeling LRT. Mode 10 is reserved for modeling BRT and streetcar. It is assumed that Mode 5 (LRT) will travel mostly on its own, dedicated right of way. By contrast, it is assumed that Mode 10 (BRT and streetcar) will travel mostly in mixed traffic on a shared right of way. Full details of how these three transit modes are modeled can be found in either the calibration report[115] or in section 21.1.1 of this report, but one of the key assumptions is the following:

- For transit path building/skimming, mode choice, and transit assignment
    - Mode 5 (LRT) is treated like Mode 3 (Metrorail)
    - Mode 10 (BRT or streetcar) is treated like Mode 1 (local bus)

When AECOM first developed the nested-logit mode choice model that TPB staff later adopted and recalibrated, AECOM used six percent-walk-to-transit values:[116]

- Percent of the zone within a short walk to Metrorail (Mode 3): PSWMET
- Percent of the zone within a long walk to Metrorail (Mode 3): PLWMET
- Percent of the zone within a short walk to any transit in the AM peak period: PSWALLAM
- Percent of the zone within a long walk to any transit in the AM peak period: PLWALLAM
- Percent of the zone within a short walk to any transit in the off-peak period: PSWALLOP
- Percent of the zone within a long walk to any transit in the off-peak period: PLWALLOP

However, in 2012, thanks to work done by Dusan Vuksan and Feng Xie, it was discovered that **the first two PWT values should include both Metrorail and LRT, not simply Metrorail**. This oversight had not been noticed before, since 1) LRT was not part of the base-year (year-2007) calibration networks, and 2) when LRT was modeled in close-in areas that already had significant transit service, the omission of LRT PWT values from the Metrorail/LRT group was hard to detect. However, in the work conducted by Dusan and Feng, the LRT service was in suburban areas without significant surrounding transit service,

[115] Milone et al., "Calibration Report for the TPB Travel Forecasting Model, Version 2.3," 6–3 to 6–5.
[116] AECOM Consult, Inc., "Post MWCOG – AECOM Transit Component of Washington Regional Demand Forecasting Model: User's Guide" (AECOM Consult, Inc., March 2005), 11.

and it became apparent that the model was underestimating LRT ridership. The net effect is that the first two zonal PWT values now include both Metrorail and LRT together:

- Percent of the zone within a short walk to Metrorail (Mode 3) **or LRT (Mode 5)**: PSWMET
- Percent of the zone within a long walk to Metrorail (Mode 3) **or LRT (Mode 5)**: PLWMET
- Percent of the zone within a short walk to any transit in the AM peak period: PSWALLAM
- Percent of the zone within a long walk to any transit in the AM peak period: PLWALLAM
- Percent of the zone within a short walk to any transit in the off-peak period: PSWALLOP
- Percent of the zone within a long walk to any transit in the off-peak period: PLWALLOP

"Any transit" includes all transit, including Metrorail and LRT service.

As of the Ver. 2.3.57 model (and continued in subsequent models, including the Ver. 2.3.75 model), these new definitions have been incorporated in the automated ArcPy transit walkshed process.

There are two other assumptions governing the use of the six PWT values that need to be kept in mind. The first is definitional and the second relates to differentiating between peak-period and off-peak-period transit service. Regarding the definitional difference, when AECOM first developed the percent walk values, it defined them based on zonal areas:

$$Percent = \frac{walkshed\ area}{total\ zonal\ land\ area}$$

As an example, if a zone has half of its land area in the short-walk-to-Metrorail area and half of its land area in the long-walk-to-Metrorail area, one might expect that PSWMET = 50% and the PLWMET = 50%. However, the real PWT values for this scenario would be PSWMET = 50% and the PLWMET = 100%, since the short-walk area is always contained within the long-walk area. Consequently, if one wants the net area that is in the long walk area, one must subtract the two areas:

$$\text{Net Percent Long Walk} = (\text{Percent long walk}) - (\text{Percent short walk})$$

Evidence of this will be seen in later calculations discussed in this report.

The second assumption about PWT values relates to the coverage of transit service in the peak period versus in the off-peak period. It is assumed that transit service is accessed at the transit stop nodes (e.g., bus stops) and transit stations. In the case of Metrorail, there are no examples of stations that operate in the peak period, but do not operate in the off-peak period. Instead, all stations operate in all periods, even though the frequency of service changes (peak versus off-peak), and there are some segments that exist in the off-peak but not in the peak (e.g., in 2006, WMATA began running the Yellow Line from Gallery Place to Fort Totten, but only in the off-peak). However, since the transit walkshed buffers are drawn around points, and not segments, this does not affect Metrorail, meaning that the percent-walk-to-transit values need not be calculated separately for peak and off-peak Metrorail. Furthermore, now that we are including LRT with Metrorail for determining walksheds and calculating PWT values, it is also assumed that there is no difference between LRT stations operating in the peak periods and those in the off-peak.

Finally, transit access markets are determined within the mode choice application program (AEMS) by combining information from the six PWT values already discussed. AEMS is a compiled Fortran program, which requires a control file (*.CTL) for each mode choice model. The Version 2.3 Travel Model uses five mode choice models (one per trip purpose), and so it requires five control files (e.g., HBW_NL_MC.CTL, HBS_NL_MC.CTL, HBO_NL_MC.CTL, etc.). Percent-walk-to-transit values are stored in a zonal data file (ZONEV2.A2F) that is read into AEMS.

The remainder of this section of the report draws heavily from a 2012 memo from AECOM staff to COG/TPB staff.[117]

In each of the AEMS control files, the six PWT values are referenced using the following 4-character pattern:

<production or attraction indicator (1 char)><file number (1 char)><table number (2 char)>

The production or attraction zone status is indicated using the letter "i" (production") or "j" (attraction). In the current AEMS control files, the file number for the zonal data file is "8." Using current modeling conventions, the table numbers for the percent-walk-to-transit values go from 7 to 12 (and this information is noted in comment records in the AEMS control files). Thus, the following 3-digit codes refer to the six PWT values:

- 807: Percent of the zone within a short walk to Metrorail (Mode 3) or LRT (Mode 5): PSWMET
- 808: Percent of the zone within a long walk to Metrorail (Mode 3) or LRT (Mode 5): PLWMET
- 809: Percent of the zone within a short walk to any transit in the AM peak period: PSWALLAM
- 810: Percent of the zone within a long walk to any transit in the AM peak period: PLWALLAM
- 811: Percent of the zone within a short walk to any transit in the off-peak period: PSWALLOP
- 812: Percent of the zone within a long walk to any transit in the off-peak period: PLWALLOP

For example, if the control file refers to "i807", this means the percent of the zone within a short walk to Metrorail or LRT for production zone "i".

The aforementioned six percent-walk-to-transit values define the percentage of the zonal area that is within walking distance to transit, but they do not indicate the share of productions or attractions are assumed to walk. For example, not all transit trips that begin in a long-walk area will actually end up walking to transit (some will drive access). Consequently, the next step in the process is to calculate six values representing the likely walk-access markets. To do this, two assumptions are made:

1. 100% of the transit trips beginning or ending in the short-walk area will access transit via walking;

[117] David Roden to Mark S. Moran, "Memorandum for Task Order 7 (FY13 Task 1) of COG Contract 12-006, Interpreting AEMS Market Shares," Memorandum, September 24, 2012.

2. Only 25% of the transit trips beginning or ending in the long-walk area will access transit via walking (i.e., 75% are assumed to use drive access).

The six assumed walk markets are the following:

PCMI	Percent of trips assumed to access Metrorail/LRT via walking at the production zone
PCMJ	Percent of trips assumed to access Metrorail/LRT via walking at the attraction zone
PCTIAM	Percent of trips assumed to access all transit via walking at the production zone, AM peak per.
PCTJAM	Percent of trips assumed to access all transit via walking at the attraction zone, AM peak per.
PCTIOP	Percent of trips assumed to access all transit via walking at the production zone, off-peak per.
PCTJOP	Percent of trips assumed to access all transit via walking at the attraction zone, off-peak per.

Percent-walk-to-transit values are calculated using point buffers around transit stop nodes (i.e., stations, bus stops, etc.). As is the case with the original percent-walk-to-transit values, it is assumed that Metrorail and LRT service, in terms of stations in service, does not vary by time of day. By contrast, it is assumed that time-of-day variations in other transit modes, such as bus or commuter rail, will mean that the set of AM stop nodes will be different from the off-peak stop nodes. For this reason, there are two sets of percent-walk-to-transit values for all transit (one for AM and one for off peak), but only one for Metrorail and LRT.

For each of the five mode choice models (HBW, HBS, HBO, NHW, NHO), only four of these values are used at once (HBW gets AM and the other purposes get off-peak):

- PCMI: Percent of trips assumed to access Metrorail/LRT via walking at the production zone
- PCMJ: Percent of trips assumed to egress from Metrorail/LRT via walking at the attraction zone
- PCTI: Percent of trips assumed to access all transit via walking at the production zone
- PCTJ: Percent of trips assumed to egress from all transit via walking at the attraction zone

In all four cases, the following is assumed:

Percent of trips in the interchange assumed to be in one of the four categories =

(100% of the trips in the short-walk area) + (25% of the trips in the long-walk area)

In terms of equations in the mode choice control files, one finds:

- PCMI: Percent of trips assumed to access Metrorail/LRT via walking at the production zone
  - = (i807 + 0.25 * (i808 – i807)) / 100
- PCMJ: Percent of trips assumed to egress from Metrorail/LRT via walking at the attraction zone
  - = (j807 + 0.25 * (j808 – j807)) / 100
- PCTI: Percent of trips assumed to access "all transit" via walking at the production zone
  = (i809 + 0.25 * (i810 – i809)) / 100 for AM (used for HBW purpose)
  - = (i811 + 0.25 * (i812 – i811)) / 100 for off-peak (used for non-work purposes)
- PCTJ: Percent of trips assumed to egress from "all transit" via walking at the attraction zone
  - = (j809 + 0.25 * (j810 – j809)) / 100 for AM (used for HBW purpose)

- = (j811 + 0.25 * (j812 – j811)) / 100 for off-peak (used for non-work purposes)

A distinction is drawn between Metrorail/LRT and "other transit" (i.e., transit that is neither Metrorail nor LRT). In the "can walk" market, there are four sub-markets, as shown in Table 77. Similarly, in the "must drive" market, there are two sub-markets, as shown in Table 78. Lastly, there is the "no access to transit" market, which is not part of either table.

Table 77 Four "can walk" sub-markets

Sub-mkt	Transit Service Available		Description
	Production TAZ	Attraction TAZ	
WM	MR/LRT	MR/LRT	Share that can use MR/LRT at both ends of the trip
W1	Other transit	MR/LRT	Share that can use "other transit" at production end and MR/LRT at attraction end of the trip
W2	Other transit	Other transit	Share that can use "other transit" at both ends of the trip
W3	MR/LRT	Other transit	Share that can use MR/LRT at production end and "other transit" at attraction end of the trip

Table 78 Two "must drive" sub-markets

Sub-mkt	Transit Service Available		Description
	Production TAZ	Attraction TAZ	
M1	Any transit	MR/LRT	Share that must drive to any transit at the production end and can use MR/LRT at the attraction end of the trip
M2	Any transit	Other transit	Share that must drive to any transit at the production end and can use "other transit" at the attraction end of the trip

AEMS makes use of WALK SEG commands to allow the model users to specify subzone segmentation such as "can walk," "must drive," and "no transit,"[118] so **the six sub-markets above, along with the "no transit" segment, are represented with seven WALK SEG (WS) variables in the AEMS control files**, and these six variables are calculated as follows from the previously-defined walk percentages:

"Can walk" market

- WSWM – Share of the "walk segment" that can use Metrorail/LRT at both ends of the trip
  = PCMI * PCMJ
- WSW1 – Share of the "walk segment" that can use "other transit" at production end and MR/LRT at attraction end of the trip
  = (PCTI – PCMI) * PCMJ
- WSW2 – Share of the "walk segment" that cannot walk to Metrorail/LRT at either end of the trip (i.e., can use "other transit" at both ends of the trip)

[118] "AECOM Consult Mode Choice Computation Programs, AEMS, Users Guide," 29–31.

= (PCTI – PCMI) * (PCTJ – PCMJ)

- WSW3 – Share of the "walk segment" that can use MR/LRT at production end and "other transit" at attraction end of the trip
  = PCMI * (PCTJ – PCMJ)

"Must drive" market

- WSM1 – Share of the "walk segment" that must drive (to any transit) at the production, but can walk to Metrorail/LRT at the attraction
  = (1 – PCTI) * PCMJ
- WSM2 – Share of the "walk segment" that must drive (to any transit) at the production, but cannot walk to Metrorail/LRT at the attraction (i.e., must use "other transit" at the attraction)
  = (1 – PCTI) * (PCTJ – PCMJ)

"No transit" market

- WSNT – Share of the "walk segment" with no access to transit at the attraction end (thus, no access to transit for this zone-to-zone interchange)
  = (1 – WSWM – WSW1 – WSW2 – WSW3 – WSM1 – WSM2)

As was the case before with just three transit-access markets, the sum of the seven transit-access shares must equal 100% for any given interchange.

$$WSWM + WSW1 + WSW2 + WSW3 + WSM1 + WSM2 + WSNT = 100\%$$

Application of seven transit market segments to travel modes in the mode choice model

Given the aforementioned definitions of the transit-access market segments, the mode choice model must be applied to estimate the mode shares for each zone-to-zone interchange. In this case, the seven transit-access markets are applied in AEMS to the travel modes represented in the Ver. 2.3 nested-logit mode choice model as shown in Table 79.

Table 79 Application of the seven transit-access segments to travel modes represented in the Ver. 2.3 mode choice model

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			SOV	SR2	SR3+	WK-CR	WK-BUS	WK-BU/MR	WK-MR	PNR-CR	KNR-CR	PNR-BUS	KNR-BUS	PNR-BU/MR	KNR-BU/MR	PNR-MR	KNR-MR
1	WM	Can walk MR/LRT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	W1	Can walk 1	x	x	x	x	x	x		x	x	x	x	x	x	x	x
3	W2	Can walk 2	x	x	x	x	x	x		x	x	x	x	x	x		
4	W3	Can walk 3	x	x	x	x	x	x		x	x	x	x	x	x		
5	M1	Must drive 1	x	x	x					x	x	x	x	x	x	x	x
6	M2	Must drive 2	x	x	x					x	x	x	x	x	x		
7	NT	No transit	x	x	x												

Ref: "percent_walk_transit_can_walk.xlsx"

Where

- SOV = Drive Alone / single occupancy vehicle
- SR2 = Shared Ride with 2 persons

- SR3+ = Shared Ride with 3 or more persons
- WK-CR = walk to commuter rail
- WK-BUS = walk to bus
- WK-BU/MR = walk to/from bus and Metrorail/Light Rail
- WK-MR = walk to/from Metrorail/Light Rail only
- PNR-CR = park-n-ride to commuter rail
- KNR-CR = kiss-n-ride to commuter rail
- PNR-BUS = park-n-ride to bus
- KNR-BUS = kiss-n-ride to bus
- PNR-BU/MR = park-n-ride to bus and Metrorail/Light Rail
- KNR-BU/MR = kiss-n-ride to bus and Metrorail/Light Rail
- PNR-MR = park-n-ride to Metrorail/Light Rail

KNR-MR = kiss-n-ride to Metrorail/Light Rail

21.5 Transit access coding

In addition to the expanded set of transit submodes in the mode choice model, the Version 2.3 model includes new transit access coding enhancements which cover five areas:

1. The station file;
2. Sidewalk links and zonal walk links;
3. Zonal auto-access links;
4. Station transfer links; and
5. Zonal percent-walk-to-transit calculations.

21.5.1 Station file

The station file is a dBase file (station.dbf) that contains information about Metrorail stations, commuter rail stations, light rail stations, bus rapid transit stations/stops, street car stations/stops, express-bus bus stops, and park-and-ride lots that serve these stations/stops. Each station file is associated with one scenario, with the most typical scenarios being the "modeled year" (e.g., 2017, 2020, 2040). This file contains information such as:

- The mode code, a single-letter code indicating Metrorail (M), commuter rail (C), etc.
- A flag indicating whether the station is active in the given year/scenario (Y/N)
- A flag indicating whether the station PNR lot is active (Y/N)
- Station name

Six new columns/variables were added to the station file that were not present in earlier versions of the regional travel model (e.g., Ver. 2.2 and before). Only the first four of these six variables are currently used:

1. Access distance code (NCT)
2. Parking capacity
3. Peak-period parking cost

4. Off-peak-period parking cost
5. Peak-period shadow price (not used)
6. Off-peak-period shadow price (not used)

The full list of variables in the station file is described in Table 38 on page 120, with the new variables in bold font.

The "access distance code," known as NCT in the autoacc5.s script, is a newly added variable in the station file that controls the number, extent, and directionality of PNR/KNR access links generated for each parking lot (in the case of PNR) or each station (in the case of KNR). Table 39 describes the meaning of each of the six access distance codes.

The access distance code, along with the transit mode, determines the maximum link distance for the drive-access-to-transit links generated by autoacc5.s for the TPB nested-logit mode choice model. The maximum link distances for PNR are shown in Table 81. Although not shown in the table, the maximum allowed link distance for KNR links is 3 miles. It is also important to note that the KNR links are generated to Metrorail stations, light rail stations, streetcar stops, and bus stops with parking lots, but not commuter rail stations.

Table 80 shows the mode codes that are used in the station file. "Station centroids" are used to build minimum-impedance paths to all Metrorail and commuter rail stations. In the table below, even though modes 5 and 10 are shown as having a range of numbers designated for station centroids, only Metrorail and commuter rail actually require station centroids.

Table 80 Mode codes used in the consolidated station file/database (station.dbf)

Mode	Mode Code	Station Centroid Range	Station Node Range
Metrorail (Mode 3)	M	5000-5999	8000-8999
Commuter rail (Mode 4)	C	6000-6999	9000-9999
Light rail transit (Mode 5), Bus rapid transit/streetcar (Mode 10)	L, N	7000-7999*	10000-10999
Bus (Modes 1, 2, 6-9)	B	Not used	Not used

Notes: * Station PNR centroids (a.k.a. dummy station centroids) are not required for Mode 5 (LRT) or Mode 10 (BRT/streetcar).[119] For the sake of consistency, the current COG coding practice is to refrain from using station PNR centroids for LRT, BRT, and streetcar. In other words, in the station file, the STAC variable is coded with a value of zero.

21.5.2 Sidewalk links and zonal walk links

In the Version 2.2 travel model and earlier models, there was a walk network (sidewalk network), used for transferring from one transit line to another, in downtown DC and downtown Silver Spring, Maryland. In the Version 2.3 travel model, there is a sidewalk network in almost the entire modeled area. The regional sidewalk network is generated automatically using a script *walkacc.s* (see p. A-5 of

[119] Jain to Milone and Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," 6 and 10.

the flowchart in Appendix A). *walkacc.s* creates a sidewalk network by converting all suitable highway links into sidewalk links (Mode 13). Examples of highway links that are not converted into sidewalk links include freeways, parkways, and ramps (Facility Type = 1, 5, or 6). In order to limit the size of the sidewalk network to links that are likely used for walking, *walkacc.s* eliminates sidewalk links from zones where the "percent walk to transit" is zero. There is also a way to supply the program with a list of sidewalk links to be manually added or subtracted to the automated list of sidewalk links. For example, one can manually add a sidewalk link for Memorial Bridge, and one can manually remove sidewalk links that should not exist due to a physical barrier. See Jain's 2010 memo for more details.[120]

walkacc.s also generates zonal walk-access-to-transit links (Mode 16 links). It automatically sweeps each TAZ, generating walk-access links from the zone centroid to all highway network nodes within a maximum walk distance (See Equation 3).

Equation 3 Maximum walk distance formula, used for generating walk-access-to-transit links

$$(\text{maximum walk distance}) = \sqrt{(\text{zonal area})} * 0.75$$

So, for a small, downtown zone with an area of 0.1 square miles, the program would calculate a maximum walk distance of 0.237 miles and connect all highway network stop nodes that lie within that distance from the zone centroid. There is an absolute maximum of 1.0 mile, which would be obtained for zones with a size of 1.78 square miles or greater. The actual calculated (straight-line) distance and computed walk time are stored on each link. No walk-access links are generated for zones with a zero percent walk to transit. Figure 34 shows zonal walk access links and sidewalk links in downtown Washington, D.C., near Farragut Square (TAZ 37, which is in the center of the figure). The thickest gray lines are the TAZ boundaries, which are not part of the actual highway or transit network, but are shown for reference. The lines emanating from each TAZ centroid (dark-blue, when the figure is viewed in color) are the zonal walk access links (Mode 16). The rectilinear (green) lines over many, but not all roads, are the sidewalk links (Mode 13). Mode 13 and 16 links can be shown in Cube Base by adding the four files "support link" files associated with walk-access to transit

- supl??wkam.asc for AM: suplABWKAM.asc, suplBMWKAM.asc, suplCRWKAM.asc, suplMRWKAM.asc
- supl??wkop.asc for off peak: suplABWKOP.asc, suplBMWKOP.asc, suplCRWKOP.asc, suplMRWKOP.asc

If prompted to give a coordinate file for 8,000-series nodes (Metrorail), use the following "support node" file: supnmrwkam.dbf. If prompted to give a coordinate file for 9,000-series nodes (commuter rail), use the following "support node" file: supncrwkam.dbf.

[120] Manish Jain to Ronald Milone and Mark Moran, "MWCOG network coding guide for Nested Logit Model (First draft: September 20, 2007; Updated February 2008 and Oct. 2010)," Memorandum, October 2010, 7.

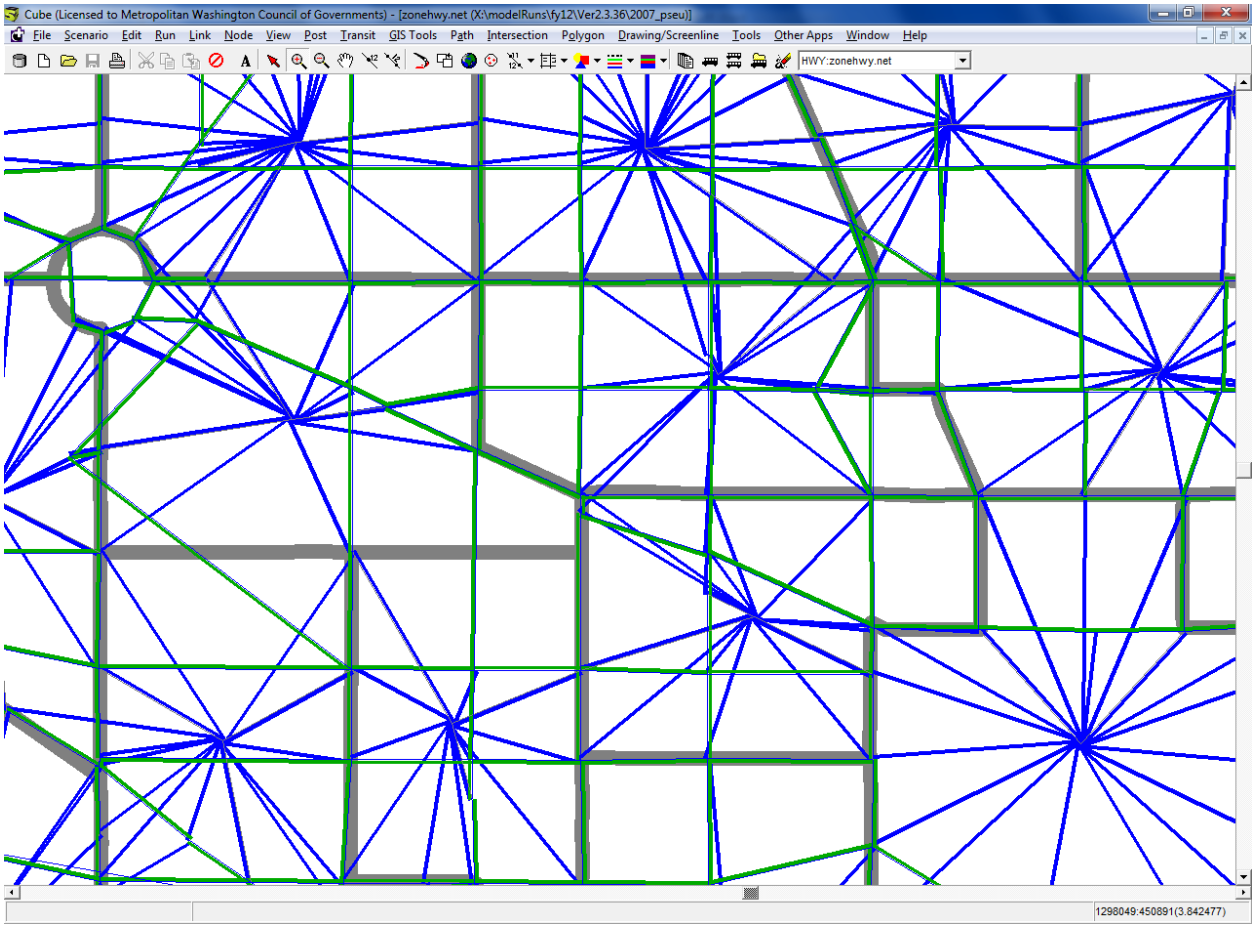


Figure 34 Zonal walk access links and sidewalk links in downtown DC near Farragut Square (Ver. 2.3 NL MC model)

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

21.5.3 Zonal auto-access links

The Cube Voyager script *Autoacc5.s*, originally created by AECOM Consult as a Fortran program and later transferred to Voyager script by TPB staff, is used to generate auto-access-to-transit links. Zonal auto access links are generated by transit mode (Metrorail, commuter rail, light rail, BRT, streetcar, and bus) for both the peak ("AM") and off-peak ("mid-day") time periods. Auto access links (Mode 11) are a function of multiple criteria:

- Orientation toward downtown (defined as TAZ 8, which corresponds to The Elllipse, just south of The White House)
- A backtracking penalty and a prohibition of crossing the Potomac River (except for trips from Loudoun County to MARC commuter rail);
- A maximum link distance, which is a function of station type (e.g., terminal vs. non-terminal) and transit mode;
- Manually specified overrides; and
- Distances based on the highway skims from the highway network that includes dummy centroids representing Metrorail and commuter rail stations.

Table 81 Maximum link distances for drive-access-to-transit links: Ver. 2.3 NL MC model

Mode	Access Dist. Code	Maximum Connect. Length (miles)
Metrorail station PNR	1	15
Metrorail station PNR	2	5
Metrorail station PNR	3	3
Metrorail station PNR	0	3
Commuter rail station PNR	1	15
Commuter rail station PNR	2	10
Commuter rail station PNR	0	5
Bus PNR	1	5
Bus PNR	0	3
BRT/Street car PNR	1	5
BRT/Street car PNR	0	3
LRT PNR	1	5
LRT PNR	0	3

Ref: I:\ateam\meetings_conf\transitModelingGroup\2007-11-07\maxDistForAutoAccConnect.xls

Figure 35 shows kiss-and-ride (KNR) auto-access-to-transit links for the AM period associated with Metrorail stations in Northern Virginia.

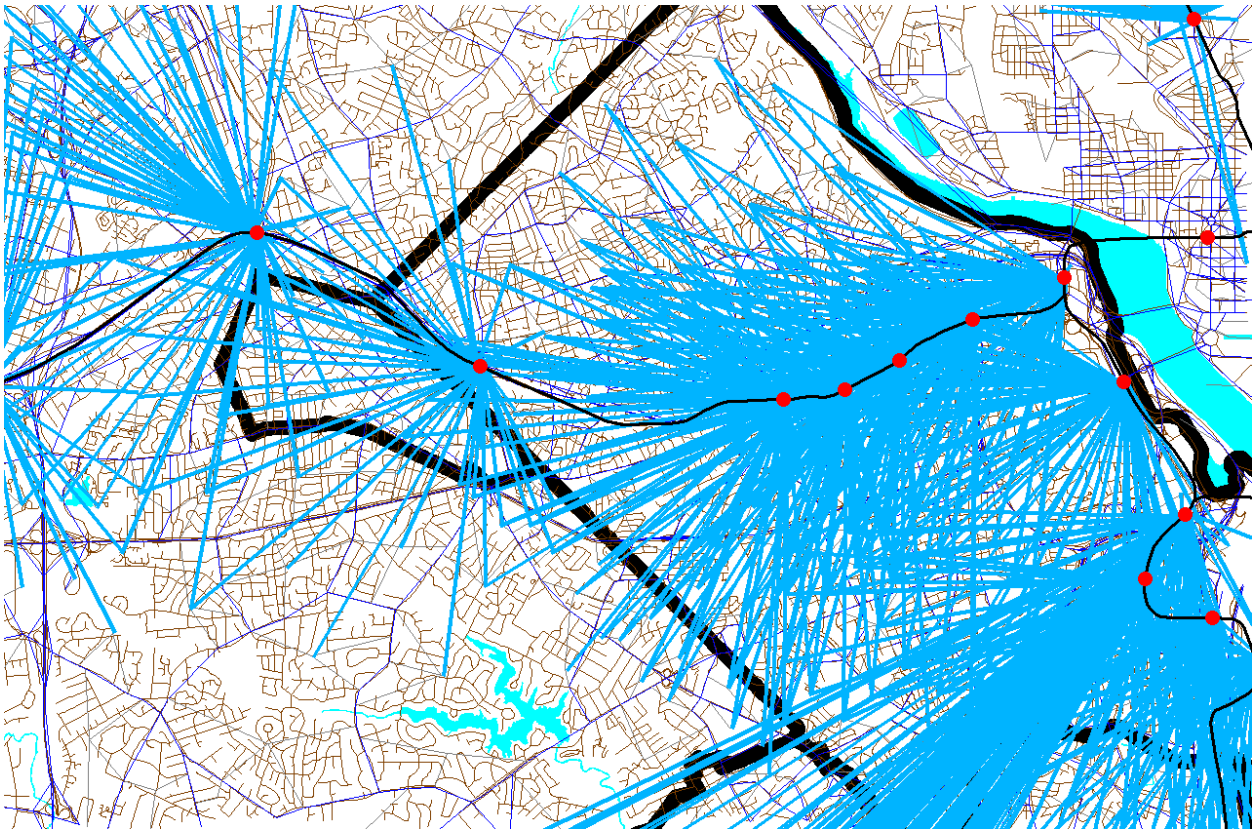


Figure 35 Kiss-and-ride (KNR) auto access links to Metrorail stations in Northern Virginia

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

Figure 36 shows park-and-ride (PNR) auto-access-to-transit links for the AM period associated with Metrorail stations in Northern Virginia. Notice that the Orange Line stations from Clarendon to Rosslyn do not have PNR-access links, since they do not have PNR lots. By contrast, these stations do have KNR-access links, since these stations can have KNR access. The Pentagon Metrorail station is another example of a station where the model does not allow travelers to have PNR access, but they may have KRN access. Notice that the KNR-access links and PNR-access links are not shaped like a circular "starburst," but are somewhat flattened, due to the backtracking penalty. This was done to mimic the behavior of travelers who tend not to want to backtrack when driving to park at or be dropped off at a Metrorail or commuter rail station.

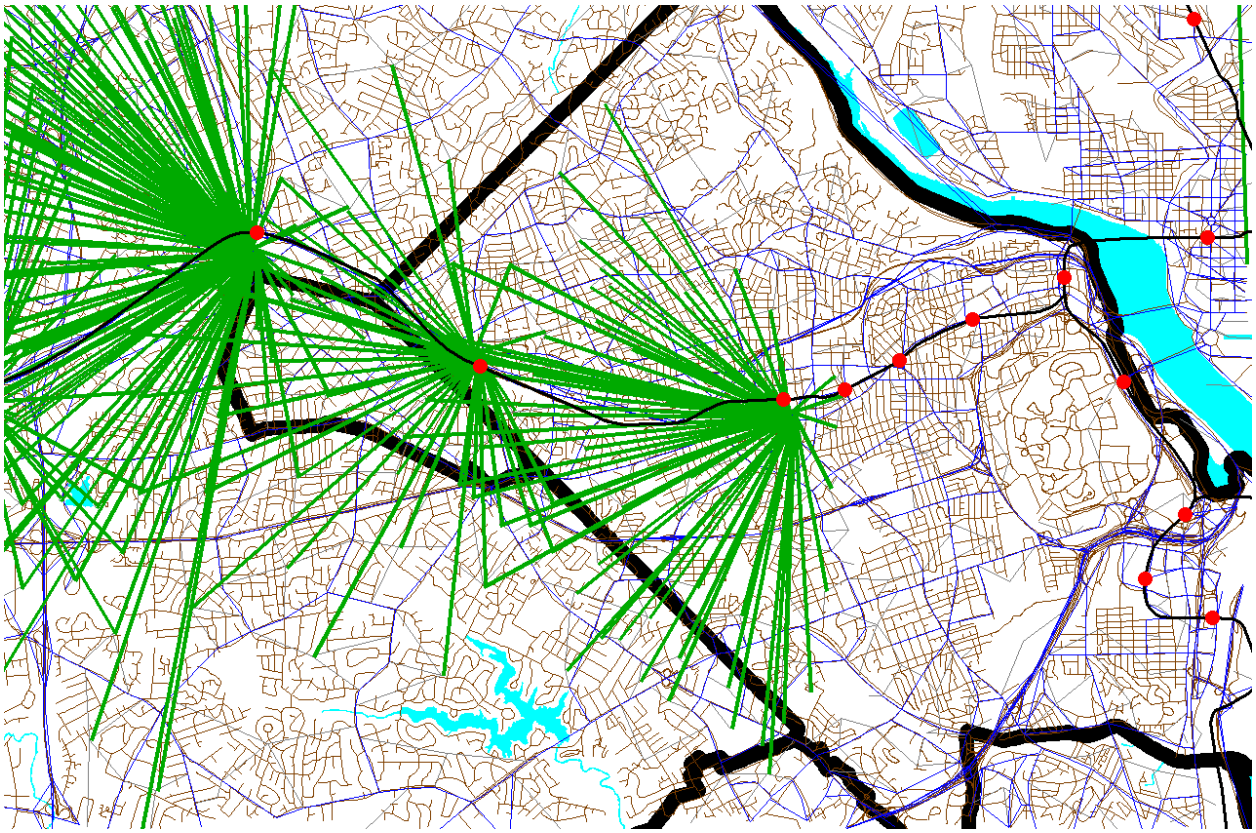


Figure 36 Park-and-ride (PNR) auto access links to Metrorail stations in Northern Virginia

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

21.5.4 Station transfer links

Station transfer links are walk links connecting:

Stations and sidewalks (Mode 12)
Stations and bus service (Mode 12)
Stations and PNR lots (Mode 15)

These links are generated automatically from data in the station file. **For PNR-station transfer links, the walk time is a function of parking capacity and parking cost, since it is reasoned that bigger parking lots and more expensive parking lots make them more burdensome to use**.[121]

The station file also includes shadow parking price variables (STAPKSHAD & STAOPSHAD, see Table 38) which are not currently used. However, the PNR capacity and parking costs are coded into the station file and are used by *Parker.s* to create PNR-to-station links read into TRNBUILD. The PNR-to-station time/impedance is computed as:[122]

[121] Jain to Milone and Moran, 6.
[122] Personal communication from Ron Milone, 9/25/13.

Equation 4 PNR-to-station time/impedance

$$(PNR\ time) = walk + SHAD + (MinPerDollar * park)$$

where

$(PNR\ time) = \text{PNR} - \text{to} - \text{station link time/impedance}$
$walk = (1\ to\ 5\ min)\text{Base time, which is a function of the number of PNR spaces}$
$SHAD = \text{Shadow cost (min.)}$
$MinPerDollar = \text{Equivalent minutes per dollar. Currently set to 6 (each dollar paid} = 6\ \text{min.)}$
$Park = Parking\ cost\ at\ station\ divided\ by\ two$

The Mode 15 links are generated by the script parker.s (see page A-5 of the flowchart in Appendix A). The following files contain the mode 15 links:

```
busampnr.tb
busoppnr.tb
comampnr.tb
comoppnr.tb
lrtampnr.tb
lrtoppnr.tb
metampnr.tb
metoppnr.tb
newampnr.tb
newoppnr.tb
```

The mode 12 links are developed manually using the COGTools geodatabase. These links can be found in the following files (see page A-5 of the flowchart in Appendix A):

```
Com_Bus.tb
LRT_bus.tb
Met_Bus.tb
NEW_bus.tb
```

21.5.5 Zonal percent walk to transit calculations

The zonal percent walk is the percent of a zone's area that lies within walking distance to transit service (i.e., a transit stop node, such as a bus stop or rail station). A short walk is defined as one that is less than or equal to 0.5 miles and a long walk is defined as one that is less than or equal to one mile. The following walk designations are used:

Short walk to Metrorail (<= 0.5 miles);
Long walk to Metrorail (>0.5 and <= 1.0 miles);
Short walk to AM transit;
Long walk to AM transit;
Short walk to off-peak transit;
Long walk to off-peak transit.

These walk-to-transit areas are sometimes called transit walksheds. Under contract with COG, AECOM has developed a new, automated/integrated Python/ArcPy walkshed process that is describe in Chapter 11 ("Building transit walksheds and calculating zonal walk percentages") on p. 95.

21.6 Transit path-building procedures

Given the segmentation in the model, 24 separate transit paths can be enumerated between each production zone and attraction zone:

Three modes of access to transit

1. Walk
2. Park and ride (PNR driver)
3. Ride to transit/KNR (drop-off/pick-up, or ride with a PNR driver)

Four transit modes/combinations

4. Commuter rail (alone and in combination with bus and/or Metrorail)
5. Bus-Metrorail (bus and Metrorail used in combination)
6. All bus (buses only)
7. All Metrorail (Metrorail only)

Two time-of-day periods

8. Peak (represented by transit service in the AM peak hour)
9. Off-peak (represented by transit service in the five-hour midday period)

However, at present, PNR and KNR to commuter rail are combined as a single path, since, for commuter rail, the PNR- and KNR-access links are identical. Consequently, the number of transit paths built between each production/attraction zone pair is 22. Table 82 summarizes the paths and available transit sub modes in each path. Again, in this figure, "drive to commuter rail" and "KNR to commuter rail" are combined into one category.

Run times for transit routes are controlled by the RUNTIME keyword (TRNBUILD).[123] As stated previously, path weights are consistent with the weights used in the mode choice model:

- Drive access time: Equal to 1.5 times the in-vehicle time
- Walk access time: Equal to 2.0 times the in-vehicle time
- Other out-of-vehicle time: Equal to 2.5 times the in-vehicle time

Headway combination between two or more transit routes is allowed to occur provided 1) the routes share the same transit mode code and 2) the difference between the run time and the minimum run time is less than a designated number of minutes (5 minutes for AM and 10 minutes for off peak). A maximum path time is set at 360 weighted minutes. There is no weighting of in-vehicle time by transit

[123] In Ver. 2.3.57a and earlier, bus IVT skims were adjusted to reflect the general level of road congestion using the factor table Lbus_TimFTRS.asc. In Ver. 2.3.66 and later models, this adjustment is now done directly to the mode 1, 6, and 8 local bus line files (*.TB) using the script Adjust_Runtime.s.

sub-modes (i.e., all transit modes have an IVT weight of 1.0). The maximum initial wait time for all ten transit modes is set at 60 perceived minutes. The minimum transfer wait time is 4.0 minutes for bus (Modes 1, 2, 6, 7, 8), 0 minutes for Metrorail (Mode 3), 4.0 minutes for commuter rail (Mode 4), 0 minutes for LRT (Mode 5), 10.0 minutes for express bus (Mode 9), and 4.0 minutes for Mode 10 (streetcar and/or BRT).

Table 82 Path-specific parameters used in transit path building

		Transit Submodes			
Path	**Path Parameter**	**Comm Rail**	**Express Bus**	**Local Bus**	**Metrorail**
Walk-to-Commuter Rail	Modes Available	X		X	X
	Weight	1.0		1.0	1.0
	Path Testing	must appear		can appear	can appear
Walk-to-Bus/Metrorail	Modes Available		X	X	X
	Weight		1.0	1.0	1.0
	Path Testing		either must appear		must appear
Walk-to-Bus	Modes Available		X	X	
	Weight		1.0	1.0	
	Path Testing		either must appear		
Walk-to-Metrorail	Modes Available				X
	Weight				1.0
	Path Testing				must appear
Drive-to-Commuter Rail	Modes Available	X		X	X
	Weight	1.0		1.0	1.0
	Auto access links to	CRsta. w/ parking		no	no
	Path Testing	must appear		can appear	can appear
K&R-to-Commuter Rail	Modes Available	X		X	X
	Weight	1.0		1.0	1.0
	Auto access links to	CRsta. w/ parking		no	no
	Path Testing	must appear		can appear	can appear
Drive-to-Bus/Metrorail	Modes Available		X	X	X
	Weight		1.0	1.0	1.0
	Auto access links to		all Bus park-ride lots		MRsta. w/ parking
	Path Testing		either must appear		must appear
K&R-to-Bus/Metrorail	Modes Available		X	X	X
	Weight		1.0	1.0	1.0
	Auto access links to		all Bus park-ride lots		all MRsta.
	Path Testing		either must appear		must appear
Drive-to-Bus	Modes Available		X	X	
	Weight		1.0	1.0	
	Auto access links to		all Bus park-ride lots		MRsta. w/ parking
	Path Testing		either must appear		
K&R-to-Bus	Modes Available		X	X	
	Weight		1.0	1.0	
	Auto access links to		all Bus park-ride lots		all MRsta.
	Path Testing		either must appear		
Drive-to-Metrorail	Modes Available				X
	Weight				1.0
	Auto access links				MRsta. w/ parking
	Path Testing				must appear
K&R-to-Metrorail	Modes Available				X
	Weight				1.0
	Auto access links				all MRsta.
	Path Testing				must appear

Source: AECOM Consult, Inc.[124]

21.7 Treatment of parking costs and terminal times for non-transit-related trips

Parking costs can be associated with either a transit trip (in the case of a drive-access transit trip) or a non-transit trip (an auto person trip, where no transit is involved). For drive-access transit trips, the cost of parking is stored in the station file. For park-and-ride (PNR)-to-station transfer links, the walk time is a function of parking capacity and parking cost,[125] but parking cost is not used as part of the transit path-building. For driving trips not involving transit, a parking cost model is used, where parking cost is a function of employment density. The next section of the report concerns parking costs that are not associated with a transit trip.

21.7.1 Non-transit-related parking costs

In applying the Version 2.3 model, prior to the execution of the mode choice model, a Voyager script (*prefarv23.s*) is used to generate zonal files containing zonal parking costs and highway terminal times (the time to park and "un-park" a vehicle). The files are, in turn, read into the mode choice model upon execution. The Version 2.3 model includes a new parking cost model estimated based on the 2007/2008 HTS.[126] HBW trip purpose utilizes the daily parking rate, while all other purposes use the hourly parking rate. Thus, two separate parking cost models were estimated, one for daily rates and one of hourly rates. For the daily rates model, the observed data indicated that it is rare for a traveler to incur parking costs in area types 4 and above, thus the model was estimated only for area types 1-3. A daily parking cost was estimated to be:

Equation 5 Daily non-transit-related parking cost for area types 1-3

$$\text{Non-transit-related parking cost} = 2.1724 * \ln(\text{floating employment density}) - 15.533$$

The resulting non-transit-related parking costs are also shown in Figure 37.

[124] AECOM Consult, Inc., *Post MWCOG – AECOM Transit Component of Washington Regional Demand Forecasting Model: User's Guide* (AECOM Consult, Inc., March 2005).
[125] Jain to Milone and Moran, "MWCOG Network Coding Guide for Nested Logit Model (First Draft: September 20, 2007; Updated February 2008 and October 2010)," 6.
[126] Mary Martchouk to Mark S. Moran, "Developing a Parking Cost Model for Automobile Modes in the Version 2.3 Travel Model," Memorandum, June 14, 2010.

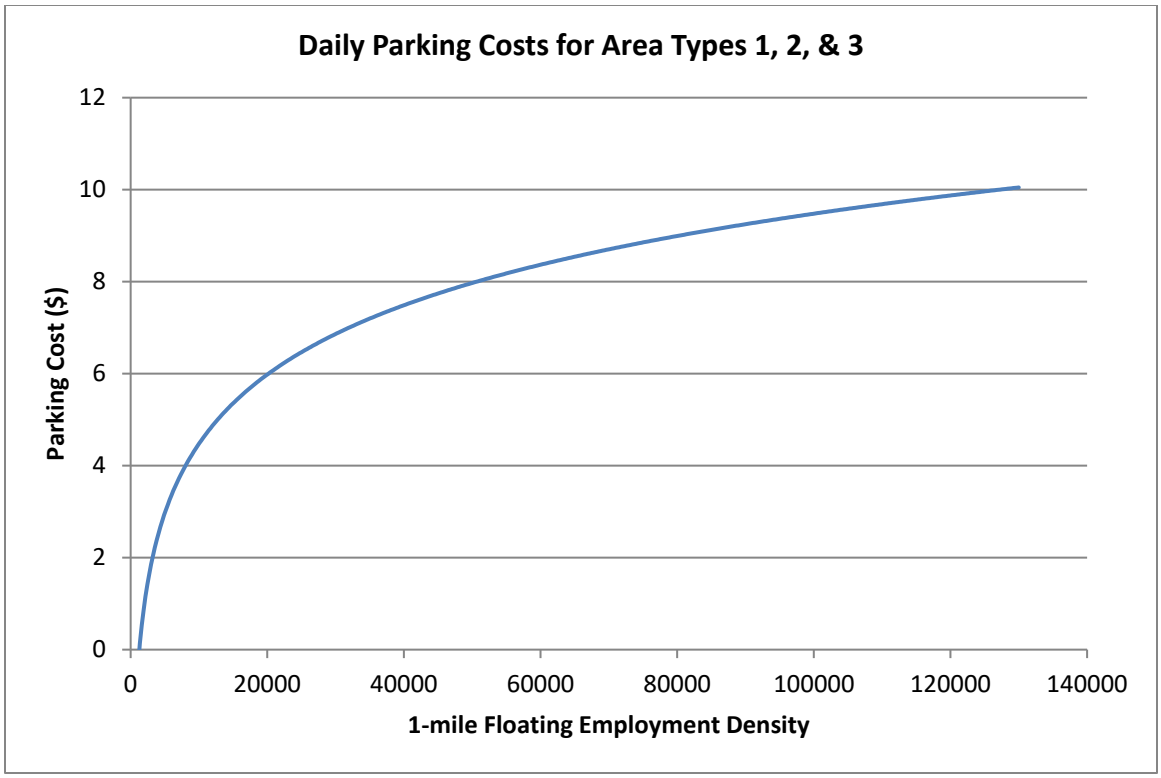


Figure 37 Non-transit-related, daily parking cost model used in the Version 2.3 Model

Ref: I:\ateam\docum\FY11\Ver2.3\modelDoc_v3\02_userGuide\parking_scatterplots.xlsx

For hourly rates, there was insufficient data to estimate a reliable model. Thus, a decision was made to assign a flat rate based on the prevalent metered rates for each area type. For area type 1, the most prevalent metered rate of parking was $2.00 and thus that value was selected. For area type 2, the average hourly parking cost was assumed to be $1.00. For area type 3, the value of $0.25 per hour was selected. For area types 4 and higher, no parking cost was anticipated.

21.7.2 Non-transit-related highway terminal time assumptions

Non-transit-related highway terminal time is typically associated with the average time spent parking or "un-parking" an automobile. The current mode choice model application program considers highway terminal time only at the attraction end. Highway time is calculated as a function of employment density, as shown in Table 83.

Table 83 Non-transit-related highway terminal time as a function of employment density

Employment density range (Emp/Sq. Mi.)	Highway terminal time (minutes)
0 - 4,617	1
4,618 - 6,631	2
6,632 - 11,562	4
11,563 - 32,985	6
32,986 +	8

21.8 Auto Operating Costs

The auto operating cost in the mode choice model relate to out-of-pocket expenditures directly associated with the requirements of an automobile trip, including fuel, oil, maintenance, tire wear, etc. (auto ownership costs including insurance, registration fees are not included). The mode choice model expresses operating costs as a per-mile rate (year-2007 cents) that is specified as a parameter in the nested-logit mode choice model control files. We are currently using 10 cents per mile and this rate is not varied over time (i.e., the auto operating cost for 2016 and 2030 are both assumed to be 10 cents per mile, in year-2007 cents).

22 Time-of-Day Processing

22.1 Overview

The time of day process (page A-9 of the flowchart in Appendix A) is applied to convert daily vehicle trips to time-of-day vehicle trips for the four modeled time periods, prior to being assigned to the network. The process is applied with the *Time-of-Day.s* and *Misc_Time-of-Day.s* scripts. The *Prepare_Trip_Tables_for_Assignment.s* script is used to combine the various trips by time period into combined trip tables for the traffic assignment process. The input and output files are listed in Table 84 and Table 85.

Table 84 Inputs to time-of-day process

Daily Auto Driver Trips, by Occupancy Levels	HBW<ITER>.ADR, HBS<ITER>.ADR, HBO<ITER>.ADR, NHW<ITER>.ADR, NHO<ITER>.ADR	Binary
Daily Miscellaneous and Truck Trips (From the \Inputs subdirectory)	VISI.ADR, TAXI.ADR, SCHL.ADR, AIRPAX.ADR, XXCVT.VTT, XXAUT.VTT,	Binary
Truck and commercial vehicle trip tables	MTK<ITER>.PTT, HTK<ITER>.PTT, COM<ITER>.PTT	Binary
Adjustment or 'delta' trip tables used for commercial and truck models	CVDelta_3722.trp TKDelta_3722.trp	Binary
Time of Day Percent File by Purpose, Mode, and Direction	todcomp_2008HTS.dbf	DBF

Note: <ITER> =PP, i1…i4

Table 85 Outputs of time-of-day process

Trip Tables by Time Period	AM<ITER>.ADR, MD<ITER>.ADR, PM<ITER>.ADR, NT<ITER>.ADR,	Binary
Miscellaneous Time-of-Day Files	MISCAM<ITER>.TT, MISCMD<ITER>.TT, MISCPM<ITER>.TT, MISCNT<ITER>.TT	Binary
Total Vehicle Trips by Six Markets T1 – SOVs T2 – 2 occ. vehicles T3 – 3+ occ. vehicles T4 – Commercial vehicles T5 – Medium + Heavy Trucks Combined T6 – Airport passenger auto-driver trips/vehs.	<ITER>AM.VTT, <ITER>MD.VTT, <ITER>PM.VTT, <ITER>NT.VTT	Binary

23 Traffic Assignment

23.1 Overview

As mentioned in section 2.3 ("Modeling steps and the speed feedback loop"), the Version 2.3 Travel Model uses a user-equilibrium (UE) traffic assignment, which is the generally accepted method for static traffic assignments. The user equilibrium condition was defined by Wardrop in 1952.[127] According to Wardrop's first principle, in the case where all trip makers perceive costs the same way (i.e., no stochastic effects):

> *Under equilibrium conditions, traffic arranges itself in congested networks such that all used routes between an O-D pair have equal and minimum costs, while all unused routes have greater or equal costs.*[128]

Furthermore, the assignment process is a multi-class UE assignment, meaning that separate user classes can be assigned at the same time. The Version 2.3 model includes six user classes:

1. Single-occupant vehicle (SOV)
2. High-occupant vehicle with two persons (HOV2)
3. High-occupant vehicle with three+ persons (HOV3+)
4. Medium and heavy trucks
5. Commercial vehicles
6. Airport passengers traveling to/from the three commercial airports

In Version 2.2, there were only five user classes, since the commercial vehicles category was grouped with medium/heavy truck. The primary reason for distinguishing truck markets is to allow for the option of using passenger car equivalents (PCEs) in the traffic assignment process. The use of PCEs has not yet been implemented, but they will be considered in future developmental work.

Additionally, the Version 2.3 model includes four time-of-day periods for traffic assignment:

- AM peak period (3 hours: 6:00 AM to 9:00 AM)
- Midday period (6 hours: 9:00 AM to 3:00 PM)
- PM peak period (4 hours: 3:00 PM to 7:00 PM)
- Night/early morning period (11 hours: 7:00 PM to 6:00 AM)

Most MPOs use a UE traffic assignment that relies on an optimization algorithm known as the Frank-Wolfe (FW) algorithm.[129] The FW algorithm is essentially a series of all-or-nothing traffic assignments where flows are combined using weights from an optimization process whose goal is to minimize an

[127] John Glen Wardrop, "Some Theoretical Aspects of Road Traffic Research," *Proceedings of the Institution of Civil Engineers* 1, no. 3 (January 1952): 325–62, https://doi.org/10.1680/ipeds.1952.11259.
[128] Juan de Dios Ortúzar and Luis G. Willumsen, *Modelling Transport*, 2nd ed. (John Wiley & Sons, 1994), 304.
[129] Frank and Wolfe, "An Algorithm for Quadratic Programming."

objective function. The process stops when a stopping criterion is met. Previously, the Version 2.3 Travel Model used the following UE stopping criterion: When the relative gap ≤ 10^{-3} OR the number of UE iterations ≥ 300. The relative gap threshold was always intended to be the primary stopping criterion, with the number of UE iterations functioning as a backup criterion. Now, however, we have moved to what we call a "progressive" relative gap stopping criterion. The idea is that, in the early SFB iterations, the UE closure criterion will be relatively loose, but, in the later SFB iterations, the UE closure criterion will tighten, as shown in Table 6.

Table 86 User equilibrium closure criterion (relative gap) varies by speed feedback iteration

Speed feedback iteration	Primary closure criterion for UE traffic assignment	Secondary closure criteria for UE traffic assignment
Pump prime	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
1	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
2	Relative gap ≤ 10^{-2} (i.e., 0.01)	Number of UE iterations ≥ 1000
3	Relative gap ≤ 10^{-3} (i.e., 0.001)	Number of UE iterations ≥ 1000
4	Relative gap ≤ 10^{-4} (i.e., 0.0001)	Number of UE iterations ≥ 1000

By using the higher value for UE iterations (1000 vs. 300), we were able to ensure that this secondary criterion is unlikely to be used as the stopping criterion. Based on a series of sensitivity tests,[130] we found that the new progressive relative gap scheme results in a relatively converged traffic assignment, without the extremely lengthy model run times that would be needed if one were to use a high threshold (e.g., 10^{-4} relative gap) for each of the five SFB iterations. The Version 2.3 Travel Model uses a slight variation of the FW algorithm, called the *bi-conjugate* Frank-Wolfe algorithm, which converges marginally faster than the classic FW algorithm.

23.2 Two-step assignment

23.2.1 Prior to 2008: 5 user classes

The Version 2.2 traffic assignment process prior to the fall of 2008 consisted of three separate assignment executions for each speed feedback (SFB) loop: AM peak period, PM peak period, and the off-peak period (see Table 87). To respect the various highway path options and prohibitions in the Washington region, five separate markets or "user classes" (trip tables) were loaded during each assignment execution:

1. Single-occupant vehicles, including commercial vehicles (SOV),
2. 2-occupant vehicles (HOV2),
3. 3+occupant vehicles (HOV3+),
4. Trucks (medium and heavy), and

[130] Moran and Milone, "Status Report on the Version 2.3 Travel Model: Updates to the Model and Year-2010 Validation," 7–11.

5. Airport passenger vehicles.

Table 87 Traffic assignment in the Version 2.2 Travel Model prior to fall 2008: Three multiclass assignments

For each SFB loop	Assignment period	Trip markets assigned
Assignment 1	AM peak	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Airport passengers
Assignment 2	PM peak	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Airport passengers
Assignment 3	Off-peak	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Airport passengers

In the fall of 2008, as part of air quality conformity work, the traffic assignment process was modified to improve the assignment of HOV/HOT traffic on the Capital Beltway in Virginia and the I-395 Shirley Highway.[131] In the revised process, shown in Table 88, the AM traffic assignment was split into two parts: non-HOV 3+ (i.e., SOV, HOV2, trucks, and airport passengers) and HOV 3+. Similarly, the PM traffic assignment was also split into two parts: non-HOV 3+ and HOV3+. This new traffic assignment process is sometimes referred to as the "two-step assignment," since it splits the AM and PM assignment each into two parts.[132]

[131] Ronald Milone and Mark S. Moran, "TPB Models Development Status Report" (November 21, 2008).
[132] Jinchul Park to Files, "Two Step Traffic Assignment for HOT Lane Modeling in 2008 CLRP," Memorandum, December 2, 2008.

Table 88 Traffic assignment in the Version 2.2 Travel Model prior to fall 2008: Five multiclass assignments

For each SFB loop	Assignment period	Trip markets assigned
Assignment 1	AM peak (non-HOV3+)	1. SOV 2. HOV2 3. Trucks 4. Airport passengers
Assignment 2	AM peak (HOV3+)	1. HOV3+
Assignment 3	PM peak (non-HOV3+)	1. SOV 2. HOV2 3. Trucks 4. Airport passengers
Assignment 4	PM peak (HOV3+)	1. HOV3+
Assignment 5	Off-peak	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Airport passengers

The result was five (not three) traffic assignments, with either four, one, or five user classes, depending on which assignment was being conducted. The fifth traffic assignment, representing the off-peak period, included all five trip markets (it was only the two peak-period assignments where the non-HOV 3+ and HOV 3+ were split out).

In the first step of the two-step assignment (assignments #1 and #3), non-HOV 3+ traffic (i.e., SOV, HOV 2, truck, and airport passenger trips) is assigned to all facilities (HOV and general purpose). In the second step, HOV 3+ traffic is assigned to HOT lanes and other facilities on the partially loaded network. The pre-assignment of non-HOV 3+ traffic results in congested link speeds for the general-purpose lanes. This means that HOV 3+ traffic has a greater incentive to use HOV facilities, which results in improved HOV 3+ loadings on priority-use and general-use facilities.

23.2.2 After 2008: 6 user classes

Recent versions of the regional travel demand model (e.g., 2.3.52, 2.3.57, 2.3.57a, 2.3.66, 2.3.70 and 2.3.75) continue to use the same two-step assignment, but there are now six assignments (not five) in each speed feedback loop, since the off-peak period has been split into midday and nighttime. Also, commercial vehicles are split out from trucks, as shown in Table 89. Note that four of the six traffic assignments are multi-class, but two of the assignments contain only one user class (HOV3+ vehicles in the AM peak and HOV3+ vehicles in the PM peak).

Table 89 Traffic assignment in the Version 2.3.52 and later travel model: Six traffic assignments per speed feedback loop

For each SFB loop	Assignment period	Trip markets assigned
Assignment 1	AM peak (non-HOV3+)	1. SOV 2. HOV2 3. Trucks 4. Commercial vehicles 5. Airport passengers
Assignment 2	AM peak (HOV3+)	1. HOV3+
Assignment 3	PM peak (non-HOV3+)	1. SOV 2. HOV2 3. Trucks 4. Commercial vehicles 5. Airport passengers
Assignment 4	PM peak (HOV3+)	1. HOV3+
Assignment 5	Off-peak, midday	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Commercial vehicles 6. Airport passengers
Assignment 6	Off-peak, nighttime	1. SOV 2. HOV2 3. HOV3+ 4. Trucks 5. Commercial vehicles 6. Airport passengers

23.3 Application details

The traffic assignment process is shown on page A-10 of the flowchart in Appendix A. The *Highway_Assignment_Parallel.bat* batch file calls the *Highway_Assignment_Parallel.s* script. As described in Chapter 8 ("Use of parallel processing to reduce model run times"), the highway assignment process has been "parallelized" by using Cube Cluster (both IDP and MDP), which is Cube's implementation of distributed processing. See section 8.2.1 for terminology related to distributed processing, and see section 8.2.4 for details about how Cube Cluster has been implanted in the Version 2.3.52 model (and later versions, such as 2.3.75), including the traffic assignment step.

23.3.1 Generalized cost

The highway assignment process uses a generalized cost or impedance, which is function of both travel time and cost. Cost is converted to travel time based on the vehicle class and time of day, as described in Table 90. These minutes/per-dollar factors are used for both variably-priced facilities, such as the I-495 HOT lanes in Virginia, and for fixed-price facilities, such as the Governor Nice Bridge.

Table 90 Time Valuation by Vehicle Type and Time Period (minutes/dollar, in year-2007 prices)

Mode	Equivalent Minutes per Dollar AM Peak	Midday	PM Peak	Night
SOV	2.5	3.0	3.0	3.0
HOV 2-occupant auto	1.5	4.0	2.0	4.0
HOV 3+occupant auto	1.0	4.0	1.0	4.0
Light duty commercial vehicle	2.0	2.0	2.0	2.0
Truck	2.0	2.0	2.0	2.0
Auto serving airport passenger	2.0	2.0	2.0	2.0

(Time_Valuation_V2.3.xls)

23.3.2 Inputs and outputs

The inputs and outputs of the *Highway_Assignment_Parallel.s* script are shown in Table 91 and Table 95, respectively.

Table 91 Inputs to traffic assignment process

Volume delay parameters and free-flow speed assumptions	support\hwy_assign_Conical_VDF.s support\hwy_assign_capSpeedLookup.s	Script block
Total vehicle trips by 4 time-of-day periods and 6 user classes	<ITER>_AM.VTT, <ITER>_MD.VTT, <ITER>_PM.VTT, <ITER>_NT.VTT	Binary
Toll minutes equivalence file	support\toll_minutes.txt	Text
AM Toll Factors by Vehicle Type	Inputs\AM_Tfac.dbf	DBF
Midday Toll Factors by Vehicle Type	Inputs\MD_Tfac.dbf	DBF
PM Toll Factors by Vehicle Type	Inputs\PM_Tfac.dbf	DBF
Night Toll Factors by Vehicle Type	Inputs\NT_Tfac.dbf	DBF
Network files	ZONEHWY.NET, <ITER>_HWY.NET	Binary

Note: <ITER> =PP, i1…i4

Table 92 is a lookup table showing highway link capacities in free-flow conditions (vehicles per hour per lane). Table 93 is a lookup table showing highway link speeds in free-flow conditions (mph).

Table 92 Lookup table: Highway link capacities in free-flow conditions (vehicles per hour per lane)

		Area Type 1	2	3	4	5	6
0	**Centroid Connectors**	3150	3150	3150	3150	3150	3150
1	**Freeways**	1900	1900	2000	2000	2000	2000
2	**Major Arterials**	600	800	960	960	1100	1100
3	**Minor Arterials**	500	600	700	840	900	900
4	**Collectors**	500	500	600	800	800	800
5	**Expressways**	1100	1200	1200	1400	1600	1600
6	**Ramps**	1000	1000	1000	1000	2000	2000

Ref: "I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide\ver2.3.75_highway_link_lookupTables_capacity_speed.xlsx"

Table 93 Lookup table: Highway link speeds in free-flow conditions (mph)

		Area Type					
		1	2	3	4	5	6
0	Centroid Connectors	15	15	20	25	30	35
1	Freeways	55	55	60	60	65	65
2	Major Arterials	35	35	45	45	50	50
3	Minor Arterials	35	35	40	40	40	45
4	Collectors	30	30	30	35	35	35
5	Expressways	45	45	50	50	50	55
6	Ramps	20	20	30	30	35	50

Ref: "I:\ateam\docum\fy19\tpb_tdfm_gen2\ver2.3\travel_model_user_guide\ver2.3.75_highway_link_lookupTables_capacity_speed.xlsx"

23.3.3 Multi-class assignment

As noted earlier, TPB travel forecasting model Ver. 2.3.52 (and later, including Ver. 2.3.75) perform six traffic assignments per speed feedback iteration (see Table 89). Four of these are multi-class assignments and two of them are single-class assignments. For the multi-user class assignments, two have five user classes (i.e., AM peak non-HOV3+ and PM peak non-HOV3+) and two have six user classes (i.e., midday and nighttime). The Cube Voyager PATHLOAD command is used to perform a traffic assignment, i.e., to load trips to a minimum-impedance path. For each of the traffic assignments, the number of PATHLOAD statements corresponds to the number of user classes (five or six, depending on the assignment). To perform a multi-user class assignment in Cube Voyager, a script must follow two steps:

1. First, in the LINKREAD phase, assign one or more links to a user group. To to this, one primarily uses the ADDTOGROUP (or ADDTOGRP) command, which sets group codes for a link.[133] Generally, one also makes use of link codes that indicate which vehicles are allowed or limited, such as our link LIMIT codes, whose values are shown in Table 94.
2. Second, when performing the traffic assignment with the PATHLOAD statement, one can then specify which groups are to be excluded from the particular traffic assignment.

Table 94 Link limit code, traffic assignment add group, and its meaning

Link Limit Code	Link Add Group	Definition
1	1	All vehicles accepted
2	2	Only HOV2 (or greater) vehicles accepted
3	3	Only HOV3 (or greater) vehicles accepted

[133] ADDTOGROUP is a subkey word of SETGROUP, although the key word SETGROUP does not need to appear in the script.

4	4	Medium and heavy trucks are not accepted, but all other traffic is accepted
5	5	Airport passenger vehicle trips
6-8	6	(Unused)
9	7	No vehicles are accepted

So, for example, links that should be restricted to HOV2+ traffic can be added to group 2:

```
PHASE=LINKREAD
       IF (LI.@PRD@LIMIT==2) ADDTOGROUP=2
```

Then, when performing the traffic assignment with the PATHLOAD statement for HOV2+ trips, one can use the EXCLUDEGROUP command like this:

```
PATHLOAD PATH=LW.HV2@PRD@IMP,  EXCLUDEGROUP=3,5,6,7,    VOL[2]=MI.1.2   ;  HOV 2
```

This means that HOV2 trips are excluded from using links that have been added to link groups 3 (HOV3+), 5 (airport passenger vehicles), 6 (unused), and 7 (unused).

23.3.4 Volume-delay functions

The Version 2.3 uses conical volume-delay functions (VDFs). More information about these VDFs can be found on pp. 8-13 to 8-17 of the calibration report dated 1/20/12.[134]

23.3.5 Convergence of user equilibrium traffic assignment

When the traffic assignment process is run, the script creates a series of user equilibrium convergence report files, as shown in Table 95. Each file contains the relative gap by user equilibrium iteration. By using these files with a spreadsheet, one can make plots of the rate of convergence of the traffic assignment.

[134] Milone et al., "Calibration Report for the TPB Travel Forecasting Model, Version 2.3."

Table 95 Outputs of traffic assignment process

Loaded-link files by time period	<ITER>_am_load_link.asc, <ITER>_md_load_link.asc, <ITER>_pm_load_link.asc, <ITER>_nt_load_link.asc,	Text
Loaded Highway Network	<ITER>_ Assign_output.net	Binary
UE convergence report files	<iter>_ue_iteration_report_AM_nonHov.txt <iter>_ue_iteration_report_AM_hov.txt <iter>_ue_iteration_report_PM_nonHov.txt <iter>_ue_iteration_report_PM_hov.txt <iter>_ue_iteration_report_MD.txt <iter>_ue_iteration_report_NT.txt	Text

Note: <ITER> =PP, i1…i4

23.3.6 Loaded link highway network

Table 96 provides further details regarding the attributes of the final loaded highway network.

Table 96 Variables included in the final iteration, loaded highway network (i4_Assign_output.net)

Variable Name	Description
A	A-Node
B	B-Node
DISTANCE	Link Distance in miles (x.xx)
SPDC	(Not used)
CAPC	(Not used)
JUR	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
SCREEN	Screenline Code (1-38)
FTYPE	Link Facility Type Code (0-6)
	0/Centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/Collector, 5/Expressway, 6/Ramp
TOLL	Toll Value in current year dollars
TOLLGRP	Toll Group Code (1-9999)
<Period> LANE	<Period> No. of Lanes
<Period>LIMIT	<Period> Limit Code (0-9)
EDGEID	Geometry network link identifier
LINKID	Logical network link identifier
NETWORKYEA	Planning year of network link
SHAPE_LENG	Geometry length of network link (in feet)
PROJECTID	Project identifier
TAZ	Nearest TAZ centroid to midpoint of link (1-3,722)
ATYPE	Area Type (1-6)
SPDCLASS	Speed Class

CAPCLASS	Capacity Class
DEFLATIONFTR	Factor for deflating current year tolls to constant year tolls
<Period>TOLL	<Period> Toll Value in current year dollars - all tolled facilities
<Period>TOLL_VP	<Period> Toll Value in current year dollars - Variably priced tolled facilities only
<Period> HTIME	<Period> Highway Time - based on initial highway lookup speeds
I4<Period>SOV	Iteration 4 <Period> assigned SOV Volume
I4<Period>HV2	Iteration 4 <Period> assigned HOV2 Volume
I4<Period>HV3	Iteration 4 <Period> assigned HOV3 Volume
I4<Period>CV	Iteration 4 <Period> assigned Commercial Vehicle Volume
I4<Period>TRK	Iteration 4 <Period> assigned Truck Volume
I4<Period>APX	Iteration 4 <Period> assigned Airport Passenger Volume
I4<Period> VOL	Iteration 4 <Period> assigned Volume
I4<Period>VMT	Iteration 4 <Period> Vehicle Miles Travelled (VMT)
I4<Period>FFSPD	Iteration 4 <Period> free flow speed (mph)
<Period>HRLKCAP	<Period> hourly link capacity
<Period>HRLNCAP	<Period> hourly lane capacity
I4<Period>VC	Iteration 4 <Period> Volume Capacity ratio
I4<Period>VDF	Iteration 4 <Period> Volume Delay function
I4<Period>SPD	Iteration 4 <Period> Speed (mph)
I424VOL	Iteration 4 Daily (24 hour) Volume

KEY <Period>= AM	AM Peak Period (6:00-9:00 AM)
MD	Mid Day (9:00 AM - 3:00 PM)
PM	PM Peak Period (3:00 - 7:00 PM)
NT	All remaining hours

23.3.7 Averaging of link volumes

Since the travel model includes speed feedback, in order to ensure that highway volumes and hence speeds are stabilizing with each successive speed feedback iteration, it is necessary to apply a link-level "method of successive averaging" (MSA) process. The MSA averaging is performed on the basis of total (non-segmented) link volumes, and is performed individually for each time period. This process is performed after each successive highway assignment process using the *Average_Link_Speeds.bat* file that includes the *Average_Link_Speeds.s* script. This script uses the current iteration and previous iteration loaded networks to develop a network with volume averaging named <ITER>_HWY.net.

23.3.8 Treatment of airport passenger auto driver trips on HOV and HOT lane facilities

Text for this section of the report come from or are derived from a recent memo on this subject.[135]

[135] Dusan Vuksan, Dzung Ngo, and Mark S. Moran, "Air Passenger Trips on HOV/HOT Lanes in the TPB Version 2.3 Travel Model: Discussion of Current Treatment and Recommendations for Modifications," Memorandum, April 24, 2017.

The terms "airport passenger trips" or "air passenger trips" refer to a motor vehicle carrying air passengers to or from one of the three commercial airports in the region: Reagan National (DCA), Dulles International (IAD), and Baltimore-Washington International (BWI). The focus is on highway assignment, not mode choice or transit assignment.

23.3.8.1 Real world conditions

Regarding the use of HOV and HOT-lane facilities by motor vehicles carrying air passengers, there are several real-world issues that increase the difficulty of reflecting these usage restrictions in the travel model. First, there are many different HOV and HOT facilities with different restrictions on their use, as shown in Table 97. The information in this table does not even address airport passenger trips.

Table 97 HOV and HOT-lane facilities in the Washington, D.C. area

Type of Facility	Use Restrictions	Examples
HOV2+	Vehicles must have two or more occupants (certain exemptions apply, including an airport-related exemption)	I-270, I-66, US 50 (MD)
HOV3+	Vehicles must have three or more occupants.	I-395, I-95 (VA)
HOT2+	Vehicles with two or more occupants can use the facility for free. Vehicles with one occupant may pay to use the facility. Users of the facility must have either an "E-Zpass" OR "E-ZPass Flex" tag/RFID transponder in vehicle. Users who want to gain free access to the facility due to meeting the occupancy requirement must have an "E-ZPass Flex" transponder.	I-66 Inside the Beltway after 2018
HOT3+	Vehicles with three or more occupants can use the facility for free. Vehicles with one or two occupants may pay to use the facility. Users of the facility must have either an "E-Zpass" OR "E-ZPass Flex" tag/RFID transponder in vehicle. Users who want to gain free access to the facility due to meeting the occupancy requirement must have an "E-ZPass Flex" transponder.	I-495 (VA), I-395 after 2019

Second, there is an important exception to the HOV occupancy rules regarding one HOV facility for air passenger auto trips to/from one of the three commercial airports:

> *Motorists traveling to and from Dulles International Airport to go to the airport to board a flight or to pick someone up at the airport are permitted to use I-66 inside the Beltway (I-495) during HOV hours. Motorists traveling to or from Dulles International Airport are not exempt from HOV restrictions on I-66 outside the Beltway (I-495). You are not permitted to use I-66 inside the beltway during HOV hours if you are going to the airport to eat, get coffee, get gas or any other reason other than boarding a plane or picking someone up at the airport.*[136]

[136] "High Occupancy Vehicle (HOV) Lanes - Rules and FAQs," Virginia Department of Transportation, February 1, 2017, http://www.virginiadot.org/travel/hov-rulesfaq.asp.

Third, the exemption for travelers to/from Dulles Airport will end when the I-66 Inside the Beltway HOT lanes open (ca. December 2017).[137]

23.3.8.2 Treatment in the Ver. 2.3 travel model

Before discussing how the model handles air passenger travel on HOV and HOT-lane facilities, this section of the report discusses the general way in which air passenger trips are handled in the travel demand model. Although air passenger travel on the road network is handled by the travel model, it is considered an exogenous input to the model. Other exogenous inputs to the travel model include taxi trips, visitor/tourist trips, school trips, through trips, and external trips. As noted in a recent memo:[138]

> *The airport passenger auto driver trip tables are prepared on the basis of base- and future-year trip tables that are developed as part of COG's Air System's Planning activities. The trip tables indicate local originations to the three major commercial airports in the modeled region by mode and purpose (Home-Based and Non-Home-Base). The trip tables are developed by year and are prepared at the Airport Analysis Zone (AAZ) level of geography. (p. 13).*

Airport passenger trips are stored in a binary trip-table file called airpax.adr. The current air passenger auto driver trip tables were developed using the COG 2011 Regional Air Passenger Survey, not the more recent 2013 survey, since TPB staff felt it would be inappropriate to use the 2013 survey since it was conducted during an unexpected federal shutdown known as the sequester.[139]

In terms of the treatment of air passenger trips on HOV and HOT-lane facilities, the Ver. 2.3.70 model (and earlier) allowed airport trips to use any HOV facility regardless of the vehicle occupancy. For the HOV2+ lanes on I-66 Inside the Beltway, **this makes sense**, given the current policy for I-66 mentioned earlier. For other HOV facilities in the region, however, the model's representation does not reflect the real transportation system. For these other HOV facilities, vehicles carrying air passengers should be allowed to use the other HOV facilities only if the vehicles meet the occupancy requirements for the facility.

Table 98 shows how airport passenger trips are treated with respect to HOV facilities in the real world, the Ver. 2.3.66 model, and the Ver. 2.3.75 model (the same as the Ver. 2.3.70). The three areas highlighted in yellow show where there was a mismatch between the real world and the Ver. 2.3.66 model.

[137] Robert Thomson, "As Virginia Sets up I-66 HOT Lanes, Drivers Again Ask: What about Me?," The Washington Post, August 16, 2016, https://www.washingtonpost.com/news/dr-gridlock/wp/2016/08/11/as-virginia-sets-up-i-66-hot-lanes-drivers-again-ask-what-about-me/.
[138] Ronald Milone to DTP Technical Staff, "Round 9.1-Based Exogenous Demand Inputs to the Travel Model," Memorandum, April 23, 2018.
[139] Milone to DTP Technical Staff.

Table 98 Use of HOV and HOT-lane facilities by autos serving airport passengers: Real world, Ver. 2.3.66 model, and Ver. 2.3.75 model

Auto Serving Airport Passenger (no. of occupants)	Case	HOV Facility			HOT-Lane Facility		
		2+	2+ I-66 Inside Beltway	3+	2+	2+ I-66 Inside Beltway	3+
1 occupant	**Real World**	**No**	**Yes, VDOT exemption (1)**	**No**	**Yes (pay toll)***	**Yes (pay toll)* (2)**	**Yes (pay toll)***
	V. 2.3.66 Model	Yes	Yes	Yes	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)
	V. 2.3.75 Model	Yes	Yes	No	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)
2 occupants	**Real World**	**Yes**	**Yes**	**No**	**Yes (free)****	**Yes (free)****	**Yes (pay toll)***
	V. 2.3.66 Model	Yes	Yes	Yes	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)
	V. 2.3.75 Model	Yes	Yes	No	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)
3+ occupants	**Real World**	**Yes**	**Yes**	**Yes**	**Yes (free)****	**Yes (free)****	**Yes (free)****
	V. 2.3.66 Model	Yes	Yes	Yes	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)
	V. 2.3.75 Model	Yes	Yes	No	Yes (pay toll)	Yes (pay toll)	Yes (pay toll)

(1): Per VDOT: "Motorists traveling to and from Dulles International Airport to go to the airport to board a flight or to pick someone up at the airport are permitted to use I-66 inside the Beltway (I-495) during HOV hours. Motorists traveling to or from Dulles International Airport are not exempt from HOV restrictions on I-66 outside the Beltway (I-495). You are not permitted to use I-66 inside the beltway during HOV hours if you are going to the airport to eat, get coffee, get gas or any other reason other than boarding a plane or picking someone up at the airport." (Source: "High Occupancy Vehicle (HOV) Lanes - Rules and FAQs." *Virginia Department of Transportation*, February 1, 2017. http://www.virginiadot.org/travel/hov-rulesfaq.asp).

(2): Exemption for travelers to/from Dulles Airport will end when the I-66 Inside the Beltway HOT lanes open (Source: Thomson, Robert. "As Virginia Sets up I-66 HOT Lanes, Drivers Again Ask: What about Me?" *The Washington Post*. August 16, 2016. https://www.washingtonpost.com/news/dr-gridlock/wp/2016/08/11/as-virginia-sets-up-i-66-hot-lanes-drivers-again-ask-what-about-me/)

* Must have an "E-Zpass" OR "E-ZPass Flex" tag/RFID transponder in vehicle.

** Must have an "E-ZPass Flex" tag/RFID transponder in vehicle.

The only change made to the travel model (Ver. 2.3.75) regarding modeling airport trips was to prohibit airport trips from using HOV3+ facilities, since observed car occupancy for these types of trips is approximately 1.6 persons per vehicle, which is calculated from the Average Weekday Air Passenger Ground Access trip data documented in the 2013 Washington – Baltimore Regional Air Passenger Survey. These three areas are highlighted in green in Table 98.

24 Transit Assignment, Including Summary Process (LineSum)

24.1 Transit assignment process

Transit assignment is a new feature of the Version 2.3 Travel Model that was not part of the Version 2.2 Travel Model. Transit assignment is where transit trips are loaded on to the transit network. Although highway and transit assignment have some similarities, it is useful to point out some of the differences between these two assignment procedures. First, whereas highway assignment is done with trip tables in origin/destination (O/D) format, transit assignment is done with trip tables in production/attraction (P/A) format. Second, whereas highway assignment is capacity constrained, transit assignment is not. Lastly, whereas highway assignment is done in each of the five speed feedback loops (i.e., pump prime, i1, i2, i3, and i4), transit assignment is conducted only at the conclusion of the i4 speed feedback loop (See Figure 9 and Figure 10).

Procedures for transit assignment are shown on pages A-15 through A-17 in the flowchart in Appendix A. The transit assignment is run using the *Transit_Assignment_Parallel.bat* and *Transit_Assignment_LineHaul_Parallel.bat* batch files, the first of which is called from the "run model steps" batch file. Prior to transit assignment, the five mode choice trip tables (HBW, HBS, HBO, NHW, and NHO) are combined into two trip tables (AM = HBW; and OP = HBS + HBO + NHW + NHO), using the *Combine_Tables_For_TrAssign_Parallel.s* script. After the transit assignment has been run, the transit assignment output files are summarized using the LineSum program. This is also called from the *Transit_Assignment_Parallel.bat* batch file via the *TranSum.bat* batch file. The transit assignment process is run in the standard scenario/output folder (e.g., 2016_Final), but the transit assignment summary files are stored in a sub-folder called "transum." The inputs to the *Transit_Assignment_Parallel.bat* batch file are shown in Table 99 and the outputs are shown in Table 100.

Table 99 Inputs to transit assignment process

Trip tables segmented by mode (coming from the mode choice model)	i4_HBW_NL_MC.MTT i4_HBS_NL_MC.MTT i4_HBO_NL_MC.MTT i4_NHW_NL_MC.MTT i4_NHO_NL_MC.MTT	Binary
Highway network	Zonehwy.net	Binary
AM peak transit lines	Inputs\MODE1AM…MODE10AM.TB	Text
Off peak transit lines	Inputs\MODE1OP…MODE10OP.TB	Text
Transit network files	met_node.tb, met_bus.tb, met_link.tb, com_node.tb, com_bus.tb, com_link.tb, lrt_node.tb, lrt_bus.tb, lrt_link.tb new_node.tb, new_bus.tb, new_link.tb met_pnrn.tb, com_pnrn.tb, bus_pnrn.tb, lrt_pnrn.tb, new_pnrn.tb met_[AM|OP] _pnr.tb, com_ [AM|OP] _pnr.tb, bus_ [AM|OP] _pnr.tb, lrt_ [AM|OP] _pnr.tb, new_ [AM|OP] _pnr.tb met_[AM|OP] _pnr.asc, com_ [AM|OP] _pnr.asc, bus_ [AM|OP] _pnr.asc, lrt_ [AM|OP] _pnr.asc, new_ [AM|OP] _pnr.asc met_[AM|OP] _knr.asc, bus_ [AM|OP] _knr.asc, lrt_ [AM|OP] _knr.asc, new_ [AM|OP] _knr.asc met_bus.tb, com_bus.tb, lrt_bus.tb, new_bus.tb	Text
Transit network walk links	walkacc.asc, sidewalk.asc	Text

Note: <ITER> =PP, i1…i4

Table 100 Outputs of transit assignment process

Combined transit trip file	<ITER>_<Prd>MS.TRP	Binary
Transit assignment node file	<ITER>_*<AA><??><Prd>*node.dbf	DBF
Transit assignment Link file	<ITER>_*<AA><??><Prd>*link.dbf	DBF
Support links	Supl_<??>_*<AA>*_*<Prd>*.asc	Text

Note: <ITER> =PP, i1…i4, <AA>= WK, DR, KR ??= CR, MR, AB, BM, Prd=AM, OP

The transit assignment is done for two time-of-day periods: the peak period and the off peak period. The peak period is represented by the three-hour AM peak period. The off-peak period is represented by the five-hour midday period. Thus, when calculating peak-period travel times on transit ("skims") the AM peak period is used to represent the level of service in both the AM and PM peak period. Similarly, when calculating the average headway and average run time for each transit route, these calculations are done for the peak period (represented by the AM peak) and the off-peak period (represented by the midday period). It is assumed that the majority of HBW trips will occur in the peak periods and that the majority of non-work trips will occur in the off-peak periods. Consequently, prior to the actual transit

assignment, the five trip tables coming out of mode choice are combined into two tables: one for the peak period and one for the off-peak period. The peak-period trip table ("AM") contains only one trip table (HBW). By contrast, the off-peak period trip table ("OP") contains the trip tables from the other four trip purposes (HBS, HBO, NHW, NHO) as shown in Table 101.

Table 101 Mapping/concatenation of trip tables by trip purposes into peak and off-peak period trip tables prior to transit assignment

Before combining trip tables	After combining trip tables
i4_HBW_NL_MC.MTT	i4_AMMS.TRP
i4_HBS_NL_MC.MTT i4_HBO_NL_MC.MTT i4_NHW_NL_MC.MTT i4_NHO_NL_MC.MTT	i4_OPMS.TRP

This is mapping/concatenation of trip tables done with the Cube Voyager script *Combine_Tables_For_TrAssign.s* script. There are 11 tables on the *.TRP files, not 12, since, for commuter rail, KNR and PNR are combined:

WK_CR, WK_BUS, WK_BUS_MR, WK_MR,

PNR_KNR_CR, PNR_BUS, KNR_BUS, PNR_BUS_MR, KNR_BUS_MR, PNR_MR, KNR_MR

There are four transit assignment scripts, one for each transit submode (commuter rail, Metrorail, all bus, and bus/Metrorail):

```
transit_assignment_CR.s
transit_assignment_MR.s
transit_assignment_AB.s
transit_assignment_BM.s
```

24.1.1 Inputs to the transit assignment

As can be seen on page A-15 of Appendix A, the specific list of inputs for transit assignment varies for each of the four transit submodes.

24.1.2 Outputs of the transit assignment

The output of the four transit assignment scripts are a series of transit link files and transit node files in dBase (DBF) format. These files are generated in Cube Voyager's TRNBUILD module using the LINKO and NODEO keywords. The transit node files (NODEO) simply contain the node number and its X and Y coordinates, as shown in Figure 38.

	A	B	C
1	N	X	Y
2	1	1298543	446898
3	2	1298807	445281
4	3	1297889	443318
5	4	1296811	441898
6	5	1303089	442174
7	6	1301409	443113
8	7	1299596	445914
9	8	1301916	446878
10	9	1302004	445336
11	10	1302622	443982
12	11	1303826	443797
13	12	1305207	444137
14	13	1303781	445659
15	14	1304865	446730

Figure 38 Excerpt from one of the transit node DBF files output from transit assignment (i4_WKMRAMnode.dbf)

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\i4_WKMRAMnode.dbf"

Transit link files (LINKO) files include the following attributes:[140]

- A: A-node of link
- B: B-node of link
- TIME: A-B time (hundredths of minutes)
- MODE: Mode of link (1-255)
- COLOR: User designated drawing color
- STOP_A: 1 = A is a stop node
- STOP_B: 1 = B is a stop node
- DIST: A-B distance (hundredths of miles)
- NAME: Name of line on this link
- FREQ: Service frequency (min)
- PLOT: Always = 0

The following additional attributes are included due to transit assignment:

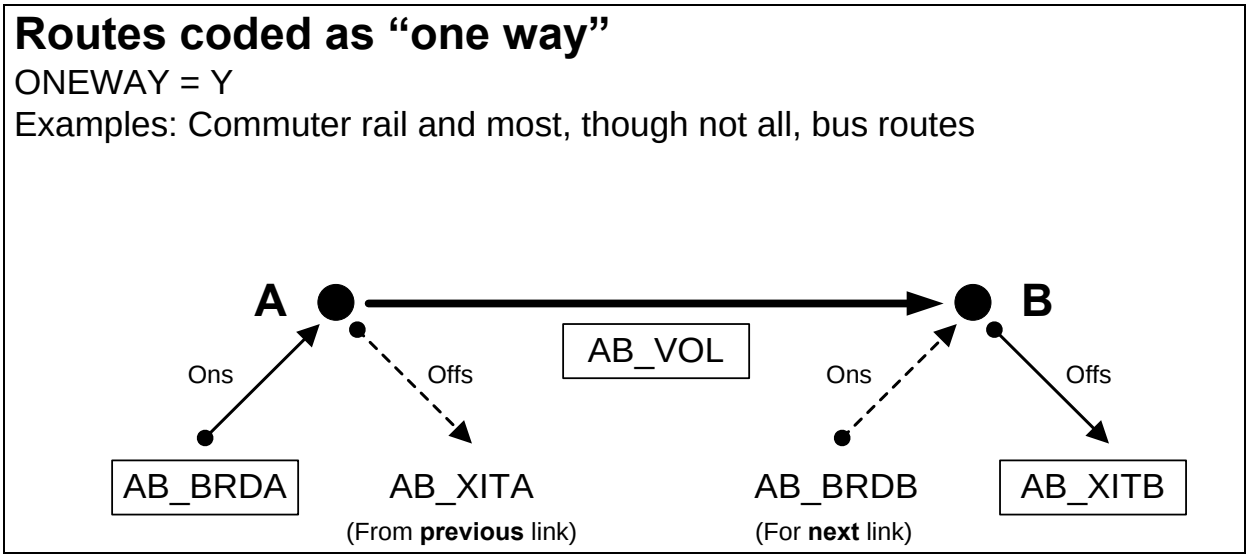
- SEQ: Link sequence in the line
- OWNER: Line owner (first ten characters)
- AB_VOL: Volume
- AB_BRDA: Number of trip boardings at A
- AB_XITA: Number of exits at A

[140] Citilabs, Inc., "Cube Voyager Reference Guide, Version 6.0.2" (Citilabs, Inc., July 26, 2012), 958.

- AB_BRDB: Number of boardings at B
- AB_XITB: Number of exits at B
- (last 5 variables are also repeated for B-A direction)

Figure 39 and Figure 40 show the naming conventions used for transit volumes from a TRNBUILD-based transit assignment. Both figures show the associated volumes ("ons," "throughs," and "offs") for a hypothetical transit link AB. Figure 39 is for the case of a one-way transit route, and Figure 40 is for the case of a two-way transit route. These figures can also be useful when interpreting reports from the LineSum transit assignment summary program (covered in the next section of the report).

Figure 39 Transit volumes from transit assignment using TRNBUILD: One-way route



Ref: transit_volumes_ab_ba_trnbuild_v2.vsd

Note: For a description of AB_VOL, AB_BRDA, AB_XITA, etc., see page 1020, Cube Voyager Reference Guide, Version 6.4.1 Citilabs, Inc., September 30, 2015.

The simplest case is the one-way route (Figure 39). In this case, the three important values for the link AB are:

- AB_VOL: Transit person trips on link AB ("throughs")
- AB_BRDA: Transit person boardings ("ons") at the "from" node (node A in the figure)
- AB_XITB: Transit person alightings ("offs") from the "to" node (node B in the figure)

All three of these variables are shown in rectangular boxes in Figure 39. The other two values shown in Figure 39 (AB_XITA and AB_BRDB) are associated with the **link prior to link AB** (AB_XITA) and the **link after link AB** (AB_BRDB).

For routes coded as two-way (Figure 40), the situation is similar, but a bit more complex. When traveling in the A-to-B direction, the three important variables for transit volumes are the same as before:

- AB_VOL: Transit person trips on link AB ("throughs")

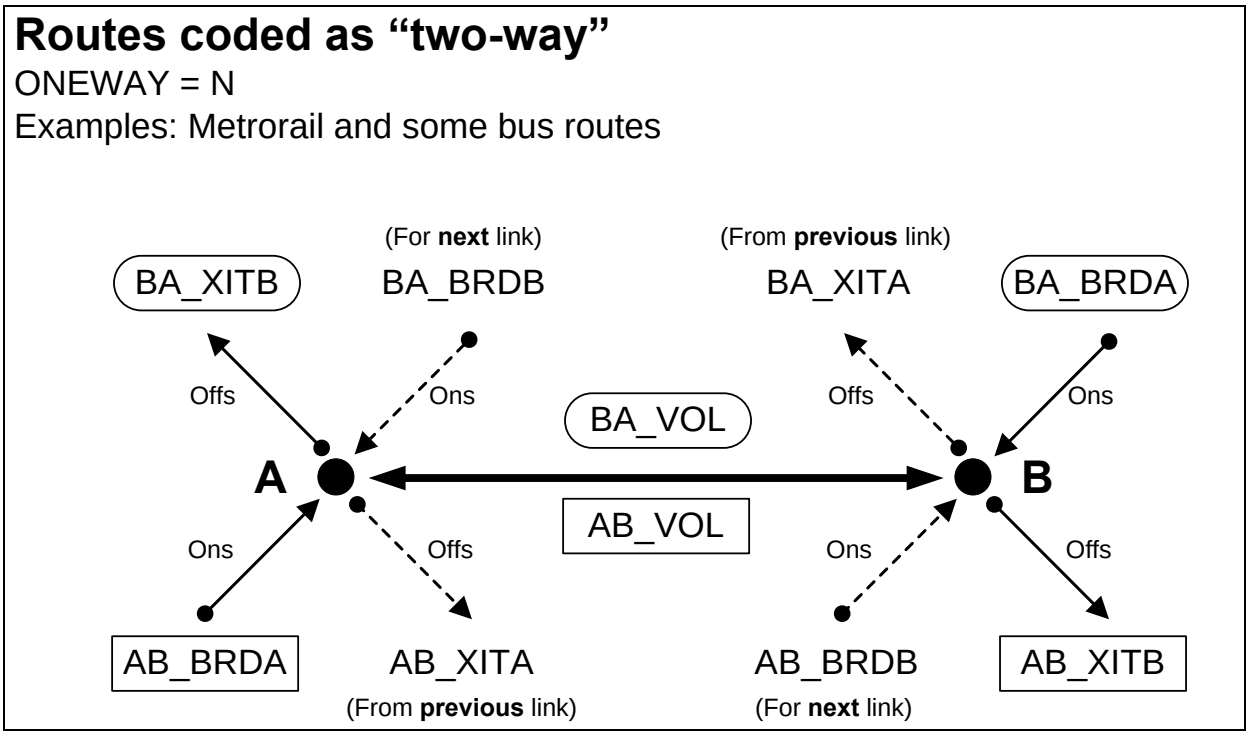
- AB_BRDA: Transit person boardings ("ons") at the "from" node (node A in the figure)
- AB_XITB: Transit person alightings ("offs") from the "to" node (node B in the figure)

However, when travelling in the B-to-A direction, the three relevant variables are:

- BA_VOL: Transit person trips on link AB in the B-to-A direction ("throughs")
- BA_BRDA: Transit person boardings ("ons") in the B-to-A direction at the "from" node (node B in the figure)[141]
- BA_XITB: Transit person alightings ("offs") in the B-to-A direction from the "to" node (node A in the figure)

These are indicated in Figure 40 with rectangular boxes that have rounded corners.

Figure 40 Transit volumes from transit assignment using TRNBUILD: Two-way route



Ref: transit_volumes_ab_ba_trnbuild_v2.vsd

Note: For a description of AB_VOL, AB_BRDA, AB_XITA, etc., see page 1020, Cube Voyager Reference Guide, Version 6.4.1 Citilabs, Inc., September 30, 2015.

Keep in mind that, since transit path-building and assignment are conducted in production/attraction (P/A) format, **all of the values on these tables are also in P/A format**. Conducting transit assignment in production/attraction format is state of the practice for transit assignments and has the benefit of

[141] Typically, the convention is that the "from" node is the A node and the "to" node is the B node. However, in Figure 40, for movement in the B-to-A direction, the "from" node is labeled B and the "to" node is labeled A, since those were the labels used for movement in the A-to-B direction.

showing the peak orientation of the transit line. **To estimate the boardings at a given station in origin/destination format, you need to add the "ons" and "offs" together and divide by two**.[142]

Some examples of the LINKO attribute values can be found in Figure 41 through Figure 43. For example, Figure 41 shows a portion of the AM walk-access to Metrorail LINKO file (i4_WKMRAMlink.dbf) that has mode-16 links (walk access to transit). Similarly, Figure 42 shows a portion of the AM walk-access to Metrorail LINKO file (i4_WKMRAMlink.dbf) that has mode-3 links (Metrorail line segments). Lastly, Figure 43 shows a portion of the AM walk-access to Metrorail LINKO file (i4_WKMRAMlink.dbf) that has mode-12 links (walk transfer links).

[142] AECOM, "LineSum (Version 5.0.17)" (Arlington, Virginia: AECOM, June 13, 2012), 14.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	A	B	TIME	MODE	FREQ	PLOT	COLOR	STOP_A	STOP_B	DIST	NAME	SEQ	OWNER	AB_VOL	AB_BRDA	AB_XITA	AB_BRDB	AB_XITB	BA_VOL	BA_BRDA	BA_XITA	BA_BRDB	BA_XITB
2	1	20263	280	16	0.00	0	6	0	0	14	*16	0		0	0	0	0	0	0	0	0	0	0
3	1	20266	200	16	0.00	0	6	0	0	10	*16	0		0	0	0	0	0	0	0	0	0	0
4	1	20269	180	16	0.00	0	6	0	0	9	*16	0		0	0	0	0	0	1344	0	0	0	0
5	1	20341	300	16	0.00	0	6	0	0	15	*16	0		0	0	0	0	0	0	0	0	0	0
6	1	20344	240	16	0.00	0	6	0	0	12	*16	0		0	0	0	0	0	0	0	0	0	0
7	1	20346	300	16	0.00	0	6	0	0	15	*16	0		0	0	0	0	0	0	0	0	0	0
8	1	20442	60	16	0.00	0	6	0	0	3	*16	0		0	0	0	0	0	0	0	0	0	0

Figure 41 Excerpt from one of the transit link DBF files output from transit assignment (i4_WKMRAMlink.dbf) showing mode-16 links

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\i4_WKMRAMlink.dbf"

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	A	B	TIME	MODE	FREQ	PLOT	COLOR	STOP_A	STOP_B	DIST	NAME	SEQ	OWNER	AB_VOL	AB_BRDA	AB_XITA	AB_BRDB	AB_XITB	BA_VOL	BA_BRDA	BA_XITA	BA_BRDB	BA_XITB
2	8001	8002	406	3	6.00	0	0	1	1	261	WMREDA	1	WMATA;SHAD	601	601	0	813	28	138	0	138	9	568
3	8002	8001	406	3	6.00	0	0	1	1	261	WMREDA-	26	WMATA;SHAD	138	9	568	0	138	601	813	28	601	0
4	8002	8003	329	3	6.00	0	0	1	1	213	WMREDA	2	WMATA;SHAD	1385	813	28	970	93	697	9	568	54	994
5	8003	8002	329	3	6.00	0	0	1	1	213	WMREDA-	25	WMATA;SHAD	697	54	994	9	568	1385	970	93	813	28
6	8003	8004	308	3	6.00	0	0	1	1	109	WMREDA	3	WMATA;SHAD	2263	970	93	593	89	1637	54	994	54	940
7	8004	8003	308	3	6.00	0	0	1	1	109	WMREDA-	24	WMATA;SHAD	1637	54	940	54	994	2263	593	89	970	93
8	8004	8005	203	3	6.00	0	0	1	1	135	WMREDA	4	WMATA;SHAD	2767	593	89	814	8	2523	54	940	143	47
9	8005	8004	203	3	6.00	0	0	1	1	135	WMREDA-	23	WMATA;SHAD	2523	143	47	54	940	2767	814	8	593	89
10	8005	8006	305	3	6.00	0	0	1	1	219	WMREDA	5	WMATA;SHAD	3573	814	8	344	213	2427	143	47	50	825
11	8005	8006	306	3	6.00	0	0	1	1	219	WMREDB	1	WMATA;GROS	801	801	0	337	63	44	0	44	1	697
12	8006	8005	305	3	6.00	0	0	1	1	219	WMREDA-	22	WMATA;SHAD	2427	50	825	143	47	3573	344	213	814	8
13	8006	8005	306	3	6.00	0	0	1	1	219	WMREDB-	19	WMATA;GROS	44	1	697	0	44	801	337	63	801	0
14	8006	8007	201	3	6.00	0	0	1	1	102	WMREDA	6	WMATA;SHAD	3704	344	213	1362	383	3202	50	825	266	1886
15	8006	8007	201	3	6.00	0	0	1	1	102	WMREDB	2	WMATA;GROS	1074	337	63	1329	117	740	1	697	62	1656
16	8007	8006	201	3	6.00	0	0	1	1	102	WMREDA-	21	WMATA;SHAD	3202	266	1886	50	825	3704	1362	383	344	213
17	8007	8006	201	3	6.00	0	0	1	1	102	WMREDB-	18	WMATA;GROS	740	62	1656	1	697	1074	1329	117	337	63
18	8007	8008	308	3	6.00	0	0	1	1	170	WMREDA	7	WMATA;SHAD	4683	1362	383	1739	169	4822	266	1886	401	845
19	8007	8008	309	3	6.00	0	0	1	1	170	WMREDB	3	WMATA;GROS	2286	1329	117	1706	97	2334	62	1656	254	771
20	8008	8007	308	3	6.00	0	0	1	1	170	WMREDA-	20	WMATA;SHAD	4822	401	845	266	1886	4683	1739	169	1362	383
21	8008	8007	309	3	6.00	0	0	1	1	170	WMREDB-	17	WMATA;GROS	2334	254	771	62	1656	2286	1706	97	1329	117

Figure 42 Excerpt from one of the transit link DBF files output from transit assignment (i4_WKMRAMlink.dbf) showing mode-3 links

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\i4_WKMRAMlink.dbf"

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	A	B	TIME	MODE	FREQ	PLOT	COLOR	STOP_A	STOP_B	DIST	NAME	SEQ	OWNER	AB_VOL	AB_BRDA	AB_XITA	AB_BRDB	AB_XITB	BA_VOL	BA_BRDA	BA_XITA	BA_BRDB	BA_XITB
256	8001	22395	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	138	0	0	0	0	601	0	0	0	0
257	8002	9005	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	0	0	0	0	0	0	0	0	0	0
258	8002	22351	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	160	0	0	0	0	236	0	0	0	0
259	8002	22370	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	436	0	0	0	0	586	0	0	0	0
260	8003	22344	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	542	0	0	0	0	776	0	0	0	0
261	8003	22672	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	545	0	0	0	0	248	0	0	0	0
262	8004	22332	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	830	0	0	0	0	613	0	0	0	0
263	8004	22670	20	12	0.00	0	2	0	0	1	*12	0	WMATA;SHAD	199	0	0	0	0	34	0	0	0	0
264	8005	22327	20	12	0.00	0	2	0	0	1	*12	0	WMATA;GROS	99	0	0	0	0	1757	0	0	0	0

Figure 43 Excerpt from one of the transit link DBF files output from transit assignment (i4_WKMRAMlink.dbf) showing mode-12 links

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\i4_WKMRAMlink.dbf"

24.2 Transit assignment summary process

The purpose of the transit assignment *summary* process is to summarize the output from the transit assignment process. The process is run with the *transum.bat* batch file, which, like the *Transit_Assignment_Parallel.bat* batch file, is called from the "run model steps" batch file (see page A-16 of Appendix A). Whereas the transit assignment process is run in the scenario/output folder (e.g., 2016_Final), the transit assignment summary process is run in the **transum** folder (e.g., 2016_Final**transum**), which is a subfolder of the scenario/output folder. In the past, such as the Version 2.3.36 model, there were two transit assignment summary programs (LineVol and LineSum). LineVol was used to merge transit assignment output files into peak and off-peak files. Now, there is only one of these (LineSum, ver. 6.0.2),[143] since LineSum performs all the functionality needed, including the merging of output files.

An excerpt from the *transum.bat* batch file is shown in Figure 44 and the complete batch file can be found in Appendix B. When the model run is begun, the "transum" folder must exist under the scenario folder (e.g., 2017_Final\transum), **but the folder is completely empty**. The control files needed to run LineSum are stored in the "controls" folder. Although the station names file (station_names.dbf) used to be stored in the "controls" folder, this file is now generated by *Set_Factors.s* and is stored in the "inputs" folder (this change occurred in the Ver. 2.3.57a). The station names file includes Metrorail stations, commuter rail station, and other "named" nodes, such as the following:

Metrorail		Commuter rail		Other named nodes	
8001	Shady Grove	9001	Union Station	45558	Bristol
8002	Rockville	9002	Silver Spring	44132	Broken Land Pkwy
8003	Twinbrook	9003	Kensington	22539	Burtonsville Crossi
8004	White Flint	9004	Garrett Park	26130	Capital Plaza
8005	Grosvenor	9005	Rockville	20811	Carter Barron
8006	Medical Center	9006	Washington Grove	49556	Charlotte Hall
8007	Bethesda	9007	Gaithersburg	27208	Clinton

Once the transit assignment summary process is finished, the folder will include both a copy of the control files that were used and the report files generated by LineSum.

The following control files, associated with LineSum, are stored in the "controls" folder and are called by the *transum.bat* batch file:

```
LineSum_Volume.ctl
lineSum_MR_access.ctl
lineSum_MR_line.ctl
```

These files are described below and the model user can always develop more control files to generate more reports.

[143] AECOM, *LineSum*, version 6.0.2 (Arlington, Virginia: AECOM, 2014).

At the beginning of the transum.bat batch file (line 8 in Figure 44), the change directory command is used to change the working directory to the "transum" folder. In line 11, a local copy of the LineSum control files is made in the transum folder. In line 14, we create a peak-period and off-peak period file containing the transit assignment. In line 18 of Figure 44, we generate a Metrorail station access report. This station access report does not include transfers from one Metrorail line to another, just the number of boardings at each station. Lastly, in line 22, we create line summaries for the Metrorail system.

Figure 44 An excerpt of *tranSum.bat* transit summary batch file

```
1  :: TranSum.bat
2  :: To be run from the root directory (e.g., E:\modelRuns\fy13\Ver2.3.46)
3
4
5  REM Change to the Transum folder, under the scenario-specific folder
6  REM Output report files will be stored in the Transum folder
7  REM The Transum folder starts out empty, since station_names.dbf is stored in Controls
8  CD %1\Transum
9
10 REM Copy the lineSum control files from the Controls folder to the Transum folder
11 copy ..\..\Controls\LineSum_*.ctl
12
13 REM Consolidate peak and off-peak volumes from transit assignment
14 ..\..\software\LineSum.exe  LineSum_Volume.ctl
15 if %ERRORLEVEL% == 1 goto error
16
17 REM Metrorail station access (does not include transfers)
18 ..\..\software\LineSum.exe  lineSum_MR_access.ctl
19 if %ERRORLEVEL% == 1 goto error
20
21 REM Metrorail line summaries
22 ..\..\software\LineSum.exe  lineSum_MR_line.ctl
23 if %ERRORLEVEL% == 1 goto error
24
25 (etc.)
```

Ref: M:\fy17\CGV2_3_66_Conformity2016CLRP_Xmittal\TranSum.bat

24.2.1 Consolidating transit assignment output and displaying results

As shown on page A-16 of Appendix A, the LineSum_Volume.ctl (Figure 45) control file is used to consolidate the transit assignment volume DBF files into two summary volume files, one for the peak period (PK_VOL.DBF, equal to the HBW transit volumes) and one for the off-peak period (OP_VOL.DBF, equal to the sum of the HBS, HBO, NHW, and NHO transit volume files).

Figure 45 Consolidating peak and off-peak transit assignment volumes (LineSum_Volume.ctl)

```
1  TITLE                          Merge the Transit Volumes
2
3  DEFAULT_FILE_FORMAT            DBASE
4
5  PEAK_RIDERSHIP_FILE_1          ..\i4_DRABAMlink.dbf                    //DRIVE ACCESS
6  PEAK_RIDERSHIP_FILE_2          ..\i4_DRBMAMlink.dbf
7  PEAK_RIDERSHIP_FILE_3          ..\i4_DRCRAMlink.dbf
8  PEAK_RIDERSHIP_FILE_4          ..\i4_DRMRAMlink.dbf
9  PEAK_RIDERSHIP_FILE_5          ..\i4_KRABAMlink.dbf                    //KISS AND RIDE ACCESS
10 PEAK_RIDERSHIP_FILE_6          ..\i4_KRBMAMlink.dbf
11 PEAK_RIDERSHIP_FILE_7          ..\i4_KRMRAMlink.dbf
12 PEAK_RIDERSHIP_FILE_8          ..\i4_WKABAMlink.dbf                    //WALK ACCESS
13 PEAK_RIDERSHIP_FILE_9          ..\i4_WKBMAMlink.dbf
14 PEAK_RIDERSHIP_FILE_10         ..\i4_WKCRAMlink.dbf
15 PEAK_RIDERSHIP_FILE_11         ..\i4_WKMRAMlink.dbf
16
17 OFFPEAK_RIDERSHIP_FILE_1       ..\i4_DRABOPlink.dbf                    //DRIVE ACCESS
18 OFFPEAK_RIDERSHIP_FILE_2       ..\i4_DRBMOPlink.dbf
19 OFFPEAK_RIDERSHIP_FILE_3       ..\i4_DRCROPlink.dbf
20 OFFPEAK_RIDERSHIP_FILE_4       ..\i4_DRMROPlink.dbf
21 OFFPEAK_RIDERSHIP_FILE_5       ..\i4_KRABOPlink.dbf                    //KISS AND RIDE ACCESS
22 OFFPEAK_RIDERSHIP_FILE_6       ..\i4_KRBMOPlink.dbf
23 OFFPEAK_RIDERSHIP_FILE_7       ..\i4_KRMROPlink.dbf
24 OFFPEAK_RIDERSHIP_FILE_8       ..\i4_WKABOPlink.dbf                    //WALK ACCESS
25 OFFPEAK_RIDERSHIP_FILE_9       ..\i4_WKBMOPlink.dbf
26 OFFPEAK_RIDERSHIP_FILE_10      ..\i4_WKCROPlink.dbf
27 OFFPEAK_RIDERSHIP_FILE_11      ..\i4_WKMROPlink.dbf
28
29 NEW_PEAK_RIDERSHIP_FILE        PK_VOL.dbf
30 NEW_PEAK_RIDERSHIP_FORMAT      DBASE
31 NEW_OFFPEAK_RIDERSHIP_FILE     OP_VOL.dbf
32 NEW_OFFPEAK_RIDERSHIP_FORMAT   DBASE
```

The output from the LineSum_Volume.ctl process is pk_vol.dbf and op_vol.dbf. Either of these transit loaded-link files can be brought into Cube Base as the transit layer, as is shown in Figure 46 through Figure 50.

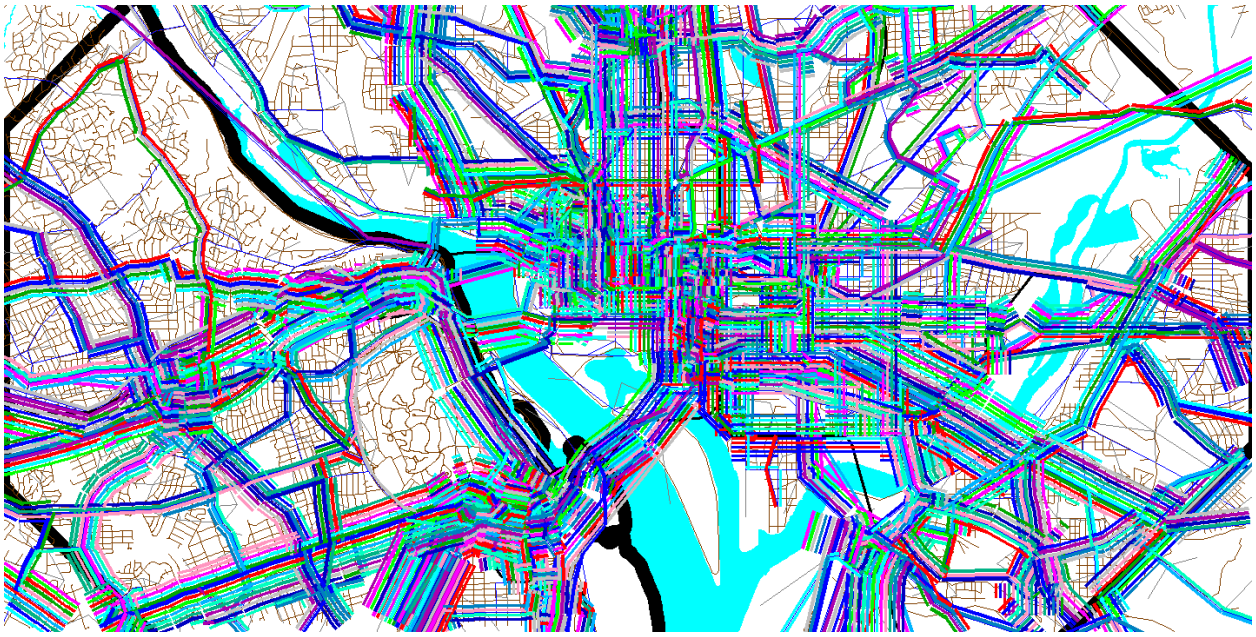


Figure 46 Using the pk_vol.dbf file in Cube Base as the transit layer: All transit routes turned on, but non-transit links (modes 11-16) turned off

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

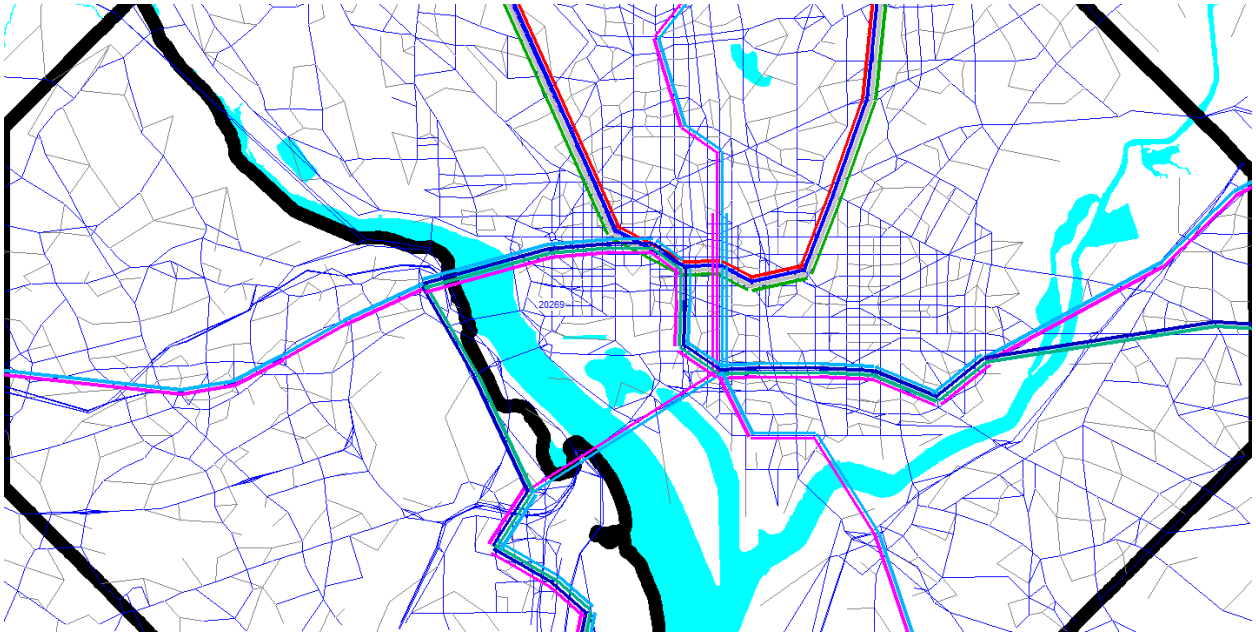


Figure 47 Using the pk_vol.dbf file in Cube Base as the transit layer: Only mode-3 (Metrorail) links turned on

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

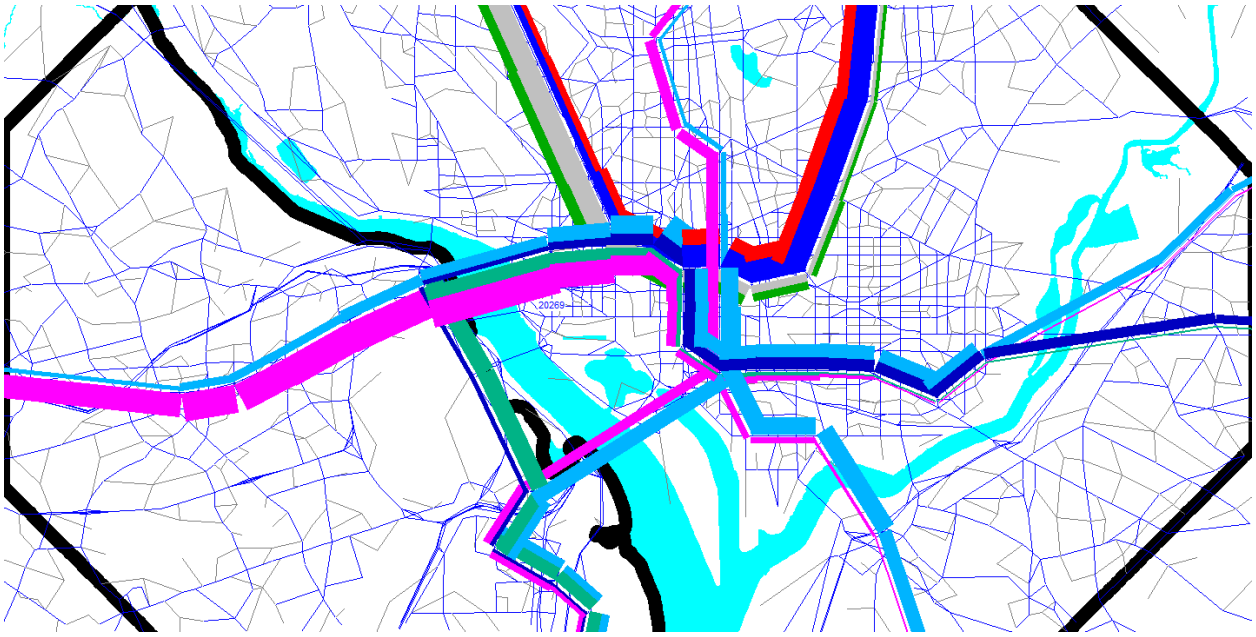


Figure 48 Using the pk_vol.dbf file in Cube Base as the transit layer: Only mode-3 (Metrorail) links turned on; using multi-bandwidth to represent transit loads (ab_vol): Arlington and DC

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

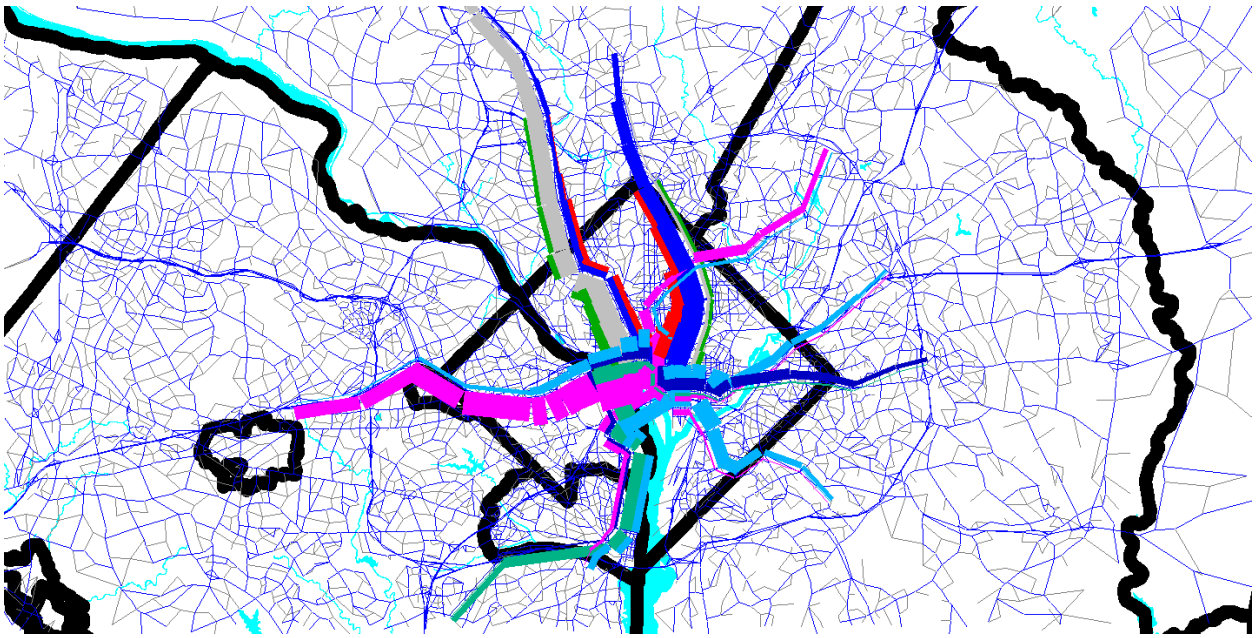


Figure 49 Using the pk_vol.dbf file in Cube Base as the transit layer: Only mode-3 (Metrorail) links turned on; using multi-bandwidth to represent transit loads (ab_vol): Metrorail system

Ref: "X:\modelRuns\fy12\Ver2.3.36\2007_pseu\zonehwy.net"

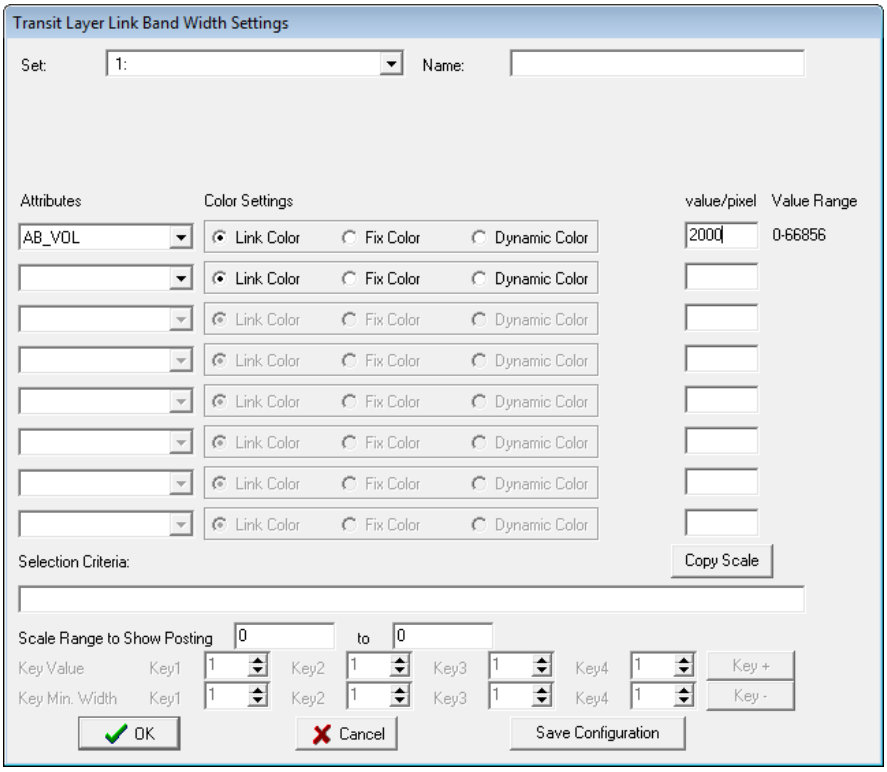


Figure 50 Using the multi-bandwidth option in Cube Base to show transit volumes on the Metrorail system.

24.2.2 Generating transit assignment summaries using LineSum

The LineSum C++ program summarizes transit line volume data stored in a TRNBUILD loaded link DBF file. It can be used to create the following summaries:

- Boarding/alighting information
- Station access information
- Link-based summaries (i.e., between stations).
- Transit route/line summaries

An example of a control file used to generate an access report showing riders who arrive at and depart from Metrorail stations (via transit access links) can be seen in Figure 51. The station_names.dbf file is now stored in the "inputs" folder (not the "controls") folder.

Figure 51 Generating a Metrorail station access report (lineSum_MR_access.ctl)

```
## Access reports focus on riders who arrive or depart using transit access links
## i.e., the summary does not include transfers
TITLE                          Metrorail Station Access Summmary
DEFAULT_FILE_FORMAT            DBASE

PEAK_RIDERSHIP_FILE_1                                PK_VOL.DBF
PEAK_RIDERSHIP_FORMAT_1                              DBASE
OFFPEAK_RIDERSHIP_FILE_1                             OP_VOL.DBF
OFFPEAK_RIDERSHIP_FORMAT_1                           DBASE

STOP_NAME_FILE                 ..\inputs\station_names.dbf
STOP_NAME_FORMAT               DBASE

ACCESS_REPORT_TITLE_1                                      All
ACCESS_REPORT_STOPS_1                                      8001..8100, 8119..8140, 8145..8148, 8150..8154,
8160..8166, 8169..8182
##ACCESS_REPORT_MODES_1                                    11,12,14,15,16
ACCESS_REPORT_MODES_1                                      ALL
##ACCESS_REPORT_DETAILS_1       MODE
NEW_ACCESS_REPORT_FILE_1              MR_access.txt
NEW_ACCESS_REPORT_FORMAT_1            TAB_DELIMITED
```

Similarly, an example of a control file used to generate a Metrorail line summary can be seen in Figure 52. Once again, the station_names.dbf file is now stored in the "inputs" folder (not the "controls") folder.

Figure 52 Generating a Metrorail line summary (lineSum_MR_line.ctl)

```
## Line reports summarize boardings, alightings, and ridership for one or more line
TITLE                          Metrorail Line Summmary
DEFAULT_FILE_FORMAT            DBASE

PEAK_RIDERSHIP_FILE_1                                PK_VOL.DBF
PEAK_RIDERSHIP_FORMAT_1                              DBASE
OFFPEAK_RIDERSHIP_FILE_1                             OP_VOL.DBF
OFFPEAK_RIDERSHIP_FORMAT_1                           DBASE

STOP_NAME_FILE                 ..\inputs\station_names.dbf
STOP_NAME_FORMAT               DBASE

LINE_REPORT_TITLE_1                                        All
LINE_REPORT_LINES_1          All
LINE_REPORT_MODES_1          3
```

```
16  NEW_TOTAL_RIDERSHIP_FILE_1    MR_line.txt
17  NEW_TOTAL_RIDERSHIP_FORMAT_1  TAB_DELIMITED
```

An example of the report generated by the lineSum_MR_**access**.ctl control file can be found in Figure 53. Similarly, an example of the report generated by the lineSum_MR_**line**.ctl control file can be found Figure 54.

More information about using LineSum can be found in its documentation:

- AECOM. (2013). LineSum, Quick Reference, Version 5.0.17. Arlington, Virginia: AECOM.
- AECOM. (2014). LineSum (Version 6.0.2). Arlington, Virginia: AECOM.

Figure 53 An excerpt from the report file generated by lineSum_MR_access.ctl

```
*****************************************
|                                       |
|         LineSum - Version 6.0.2       |
|  Copyright 2014 by TRANSIMS Open-Source  |
|         Tue Sep 11 04:41:33 2018      |
|                                       |
*****************************************

Control File = lineSum_MR_access.ctl
Report File  = lineSum_MR_access.prn (Create)

Metrorail Station Access Summmary

Default File Format = DBASE

LineSum Control Keys:

Peak Ridership File #1 = PK_VOL.DBF

Offpeak Ridership File #1 = OP_VOL.DBF


Stop Name File = ..\..\controls\station_names.dbf

Access Report Title = All
Access Report Stops = 8001..8100, 8119..8140, 8145..8148, 8150..8154, 8160..8166, 8169..8182
Access Report Modes = ALL
New Access Report File #1 = MR_access.txt
New Access Report Format #1 = TAB_DELIMITED


Number of Stop Names = 446  Metrorail Station Access Summmary
Tue Sep 11 04:41:34 2018  LineSum  page 2


Title: All
Modes: All

        ---- Peak ----  -- Offpeak ---  ---- Daily ---
Stop    Arrive  Depart  Arrive  Depart  Arrive  Depart

8001     34719    2676    2252     705   36971    3381  Shady Grove
8002     12771    2899    1209     865   13980    3764  Rockville
8003      5500    4230     947    1400    6447    5630  Twinbrook
8004      6462    7816    1273    2706    7735   10522  White Flint
8005      9806     301    2003     587   11809     888  Grosvenor
8006      4902    7237    1085    1584    5987    8821  Medical Center
```

```
8007    15291   19297    4879    6070   20170   25367  Bethesda
8008    10843    6735    3402    2916   14245    9651  Friendship Heights
8009    10247    5849    2938    1708   13185    7557  Tenleytown
8010     5501    3360    1946    1368    7447    4728  Van Ness-UDC
8011     4685     889    1539     760    6224    1649  Cleveland Park
8012     8082    2629    2660    1537   10742    4166  Woodley Park-Zoo
8013    10939   30437    1946    6301   12885   36738  Dupont Circle
8014     3399   35046    1389    3722    4788   38768  Farragut North
8015      691   31251     295    4081     986   35332  Metro Center
8016      490   20397     707    3286    1197   23683  Gallery Place
8017      251   14986     212    1310     463   16296  Judiciary Square
8018    29588   39035    5116    6321   34704   45356  Union Station
```

Figure 54 The report file generated by lineSum_MR_line.ctl

```
*****************************************
|                                       |
|         LineSum - Version 6.0.2       |
|  Copyright 2012 by TRANSIMS Open-Source  |
|         Tue Sep 11 04:41:34 2018      |
|                                       |
*****************************************

Control File = lineSum_MR_line.ctl
Report File  = lineSum_MR_line.prn (Create)

Metrorail Line Summmary

Default File Format = DBASE

LineSum Control Keys:

Peak Ridership File #1 = PK_VOL.DBF

Offpeak Ridership File #1 = OP_VOL.DBF


Stop Name File = ..\..\controls\station_names.dbf

Line Report Title = All
Line Report Lines = All
Line Report Modes = 3


Number of Stop Names = 267      Metrorail Line Summmary
Tue Sep 11 04:41:35 2018        LineSum  page 2


Title: All
Lines: All
Modes: 3
```

			A->B Direction (Read Down)									B->A Direction (Read Up)									Total		
	Dist	Time	Peak			Off-Peak			Daily			Peak			Off-Peak			Daily			Daily		
Stop	(miles)	(min)	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride
Franconia-	3.49	6.29	12346	0	12346	1380	0	1380	13726	0	13726	0	2446	2446	0	602	602	0	3048	3048	13726	3048	16774
Van Dorn S	3.86	5.08	8410	174	20584	1997	59	3318	10407	233	23902	466	831	2810	76	704	1231	542	1535	4041	10949	1768	27943
King Stree	0.68	2.07	4386	1666	48952	1075	847	7331	5461	2513	56283	549	2619	11717	267	1248	5521	816	3867	17238	6277	6380	73521
Braddock R	1.21	1.98	5789	1541	53201	1657	1113	7872	7446	2654	61073	707	2841	13853	658	2133	6996	1365	4974	20849	8811	7628	81922
Potomac Ya	1.82	2.98	10851	2311	61738	3073	1448	9498	13924	3759	71236	1306	3903	16445	2000	1930	6928	3306	5833	23373	17230	9592	94609
National A	0.49	2.65	0	1198	60540	371	173	9695	371	1371	70235	0	2675	19124	73	686	7540	73	3361	26664	444	4732	96899
Crystal Ci	0.76	2.07	5140	5462	60219	3087	1532	11249	8227	6994	71468	949	17358	35532	1047	5514	12007	1996	22872	47539	10223	29866	119007
Pentagon C	0.61	1.01	8973	5450	63740	2039	825	12463	11012	6275	76203	2029	5116	38617	1118	2343	13230	3147	7459	51847	14159	13734	128050
Pentagon	1.24	2.99	2336	5842	18109	2063	1785	8540	4399	7627	26649	2693	2568	11286	1634	1278	5934	4327	3846	17220	8726	11473	43869
Arlington	0.99	2.14	105	0	18213	75	0	8615	180	0	26828	36	0	11249	25	0	5910	61	0	17159	241	0	43987
Rosslyn	1.35	3.19	5710	13813	88316	1830	6291	14363	7540	20104	102679	11195	14723	47980	5065	4051	13410	16260	18774	61390	23800	38878	164069
Foggy Bott	0.57	2.14	2148	11054	79410	1394	2638	13119	3542	13692	92529	814	29872	77039	841	5620	18193	1655	35492	95232	5197	49184	187761
Farragut W	0.38	0.99	1229	13797	66840	466	1567	12014	1695	15364	78854	834	24187	100391	354	2825	20660	1188	27012	121051	2883	42376	199905

McPherson	0.46	1.11	4155	11702	59294	1362	2010	11367	5517	13712	70661	2426	36361	134327	964	4082	23773	3390	40443	158100	8907	54155	228761
Metro Cent	0.29	0.94	18835	36658	41472	3476	5778	9065	22311	42436	50537	66870	22588	90043	10239	5363	18896	77109	27951	108939	99420	70387	159476
Federal Tr	0.41	2.15	0	6810	34665	30	805	8289	30	7615	42954	70	1264	91236	104	284	19078	174	1548	110314	204	9163	153268
Smithsonia	0.59	2.34	389	8833	26224	191	1748	6731	580	10581	32955	1206	2399	92434	577	759	19261	1783	3158	111695	2363	13739	144650
L'Enfant P	0.33	1.99	12507	12401	26326	3579	3179	7132	16086	15580	33458	46959	21081	66557	7352	6982	18895	54311	28063	85452	70397	43643	118910
Federal Ce	0.57	1.96	53	9530	16851	173	1854	5453	226	11384	22304	990	1976	67546	984	722	18632	1974	2698	86178	2200	14082	108482
Capitol So	0.50	1.99	70	8924	8000	248	1551	4149	318	10475	12149	811	3214	69946	903	985	18713	1714	4199	88659	2032	14674	100808
Eastern Ma	0.63	2.02	160	2580	5578	368	928	3587	528	3508	9165	3809	2248	68386	1950	539	17301	5759	2787	85687	6287	6295	94852
Potomac Av	0.66	0.99	413	1101	4892	268	815	3041	681	1916	7933	9501	434	59320	3706	406	14006	13207	840	73326	13888	2756	81259
Stadium Ar	2.69	3.17	687	515	2528	299	779	1410	986	1294	3938	5186	921	32604	1710	415	8440	6896	1336	41044	7882	2630	44982
Benning Ro	1.42	2.90	266	746	2045	201	608	1004	467	1354	3049	5890	376	27091	2586	362	6215	8476	738	33306	8943	2092	36355
Capitol He	0.97	2.95	119	477	1687	62	429	639	181	906	2326	5397	97	21790	2818	95	3491	8215	192	25281	8396	1098	27607
Addison Ro	1.77	3.13	155	327	1515	44	121	560	199	448	2075	8360	54	13485	1234	28	2282	9594	82	15767	9793	530	17842
Morgan Blv	1.23	2.78	141	466	1189	40	142	459	181	608	1648	3707	45	9823	637	34	1678	4344	79	11501	4525	687	13149
Largo Town				1189			459			1648		9823			1678			11501			11501	1648	
Greenbelt	2.44	2.88	15152	0	15152	1417	0	1417	16569	0	16569	0	1155	1155	0	225	225	0	1380	1380	16569	1380	17949
College Pa	1.94	3.02	5085	694	19543	1384	171	2630	6469	865	22173	210	3534	4476	54	1119	1289	264	4653	5765	6733	5518	27938
PG Plaza	1.24	3.14	5513	687	24364	1339	222	3749	6852	909	28113	481	2172	6163	178	487	1598	659	2659	7761	7511	3568	35874
West Hyatt	1.99	2.92	4343	140	28567	1998	245	5502	6341	385	34069	582	359	5943	251	302	1649	833	661	7592	7174	1046	41661
Fort Totte	1.62	2.89	6778	17364	17977	2895	3176	5221	9673	20540	23198	3378	3340	5902	920	1685	2413	4298	5025	8315	13971	25565	31513
Georgia Av	0.86	3.11	8768	3350	23396	2616	1117	6720	11384	4467	30116	2434	3916	7384	998	1168	2582	3432	5084	9966	14816	9551	40082
Columbia H	0.95	2.02	11346	1047	33692	2676	622	8772	14022	1669	42464	1029	2223	8580	495	1191	3280	1524	3414	11860	15546	5083	54324
U-Street-C	0.51	2.05	5194	2931	35959	2242	979	10038	7436	3910	45997	492	6235	14323	341	2402	5340	833	8637	19663	8269	12547	65660
Shaw-Howar	0.56	1.13	3186	685	38460	1462	380	11121	4648	1065	49581	734	2174	15764	333	1064	6070	1067	3238	21834	5715	4303	71415
Mt Vernon	0.49	1.66	2096	2600	37958	1203	1082	11242	3299	3682	49200	158	11171	26774	211	2561	8418	369	13732	35192	3668	17414	84392
Gallery Pl	0.36	1.92	37196	19641	55514	5690	5039	11892	42886	24680	67406	13001	45140	58913	2840	7040	12619	15841	52180	71532	58727	76860	138938
Archives	0.58	1.97	2411	3268	54655	156	656	11391	2567	3924	66046	4679	10749	64983	44	1454	14028	4723	12203	79011	7290	16127	145057
L'Enfant P	0.79	1.91	14484	21213	30763	2656	3917	6073	17140	25130	36836	10228	39128	66117	3302	11376	19284	13530	50504	85401	30670	75634	122237
Waterfront	0.59	1.80	816	5192	26386	657	911	5817	1473	6103	32203	4152	1394	63360	1867	1059	18477	6019	2453	81837	7492	8556	114040
Navy Yard	1.20	2.06	438	19198	7629	662	3025	3454	1100	22223	11083	6662	4978	61677	3773	1514	16217	10435	6492	77894	11535	28715	88977
Anacostia	1.38	2.98	369	5063	2934	470	1793	2128	839	6856	5062	14738	1087	48028	6810	466	9872	21548	1553	57900	22387	8409	62962
Congress H	0.97	1.78	85	1203	1815	113	642	1598	198	1845	3413	4877	372	43524	2138	195	7930	7015	567	51454	7213	2412	54867
Southern A	1.24	2.76	214	302	1725	112	484	1224	326	786	2949	14918	67	28674	3795	130	4266	18713	197	32940	19039	983	35889
Naylor Roa	1.48	2.34	184	619	1291	74	638	661	258	1257	1952	8961	119	19831	1317	67	3015	10278	186	22846	10536	1443	24798
Suitland	1.64	2.66	35	929	396	12	482	191	47	1411	587	4426	89	15495	1189	19	1844	5615	108	17339	5662	1519	17926
Branch Ave				396			191			587		15495			1844			17339			17339	587	
Vienna	2.39	3.69	21333	0	21333	1868	0	1868	23201	0	23201	0	1330	1330	0	596	596	0	1926	1926	23201	1926	25127
Dunn Lorin	2.49	3.99	6374	190	27519	1218	63	3023	7592	253	30542	113	1542	2757	57	762	1302	170	2304	4059	7762	2557	34601
West Falls	2.09	2.93	3279	54	30744	633	27	3629	3912	81	34373	122	342	2977	48	307	1562	170	649	4539	4082	730	38912
East Falls	2.51	3.96	12817	3272	81908	2585	835	10985	15402	4107	92893	632	1582	22154	434	1213	9219	1066	2795	31373	16468	6902	124266

Metrorail Line Summmary
Tue Sep 11 04:41:35 2018 LineSum page 3

			A->B Direction (Read Down)									B->A Direction (Read Up)									Total		
	Dist	Time	Peak			Off-Peak			Daily			Peak			Off-Peak			Daily			Daily		
Stop	(miles)	(min)	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride	On	Off	Ride
Ballston	0.49	1.67	14638	6083	90465	4959	1756	14188	19597	7839	104653	2657	11870	31363	1544	4254	11933	4201	16124	43296	23798	23963	147949
Virginia S	0.49	2.01	3318	2807	90974	1323	1085	14426	4641	3892	105400	1066	4023	34322	558	1613	12993	1624	5636	47315	6265	9528	152715
Clarendon	0.67	2.52	5780	2744	94010	1787	1484	14727	7567	4228	108737	1673	4925	37567	1361	1905	13536	3034	6830	51103	10601	11058	159840
Court Hous	0.91	1.69	6302	3940	96369	2540	1633	15636	8842	5573	112005	1553	7596	43613	1369	2516	14680	2922	10112	58293	11764	15685	170298
Rosslyn				18164			5429			23593		10410			6171			16581			16581	23593	
Stadium Ar	2.19	3.99	799	0	3333	231	0	1380	1030	0	4713	0	668	23120	0	282	4556	0	950	27676	1030	950	32389
Minnesota	0.91	1.95	360	1094	2603	208	347	1240	568	1441	3843	5891	425	17653	1753	173	2976	7644	598	20629	8212	2039	24472
Deanwood	1.15	1.90	271	247	2626	95	247	1087	366	494	3713	3372	67	14348	1104	71	1942	4476	138	16290	4842	632	20003
Cheverly	1.89	2.99	106	421	2312	19	108	1000	125	529	3312	1597	94	12848	332	16	1627	1929	110	14475	2054	639	17787
Landover	1.36	2.69	240	278	2276	30	195	836	270	473	3112	4593	101	8353	433	20	1214	5026	121	9567	5296	594	12679
New Carrol				2276			836			3112		8353			1214			9567			9567	3112	
Shady Grov	2.61	4.06	34720	0	34720	2262	0	2262	36982	0	36982	0	2677	2677	0	705	705	0	3382	3382	36982	3382	40364
Rockville	2.13	3.29	12479	673	46524	1106	159	3207	13585	832	49731	290	2227	4615	101	704	1306	391	2931	5921	13976	3763	55652
Twinbrook	1.09	3.08	4880	1291	50114	699	353	3555	5579	1644	53669	618	2941	6936	250	1047	2102	868	3988	9038	6447	5632	62707
White Flin	1.35	2.03	5580	2334	53359	842	647	3750	6422	2981	57109	884	5480	11535	433	2060	3728	1317	7540	15263	7739	10521	72372
Grosvenor	2.19	3.05	9180	76	62465	1824	108	5467	11004	184	67932	629	226	11131	182	478	4024	811	704	15155	11815	888	83087
Medical Ce	1.02	2.01	4610	2098	64972	835	398	5905	5445	2496	70877	290	5136	15978	246	1183	4962	536	6319	20940	5981	8815	91817
Bethesda	1.70	3.08	11451	6438	69987	3479	2155	7227	14930	8593	77214	3841	12859	24995	1405	3914	7471	5246	16773	32466	20176	25366	109680
Friendship	0.91	2.41	8133	2004	76118	1801	1157	7870	9934	3161	83988	2712	4731	27016	1605	1754	7623	4317	6485	34639	14251	9646	118627
Tenleytown	1.09	2.03	7407	1674	81849	1782	441	9213	9189	2115	91062	2834	4174	28355	1157	1267	7735	3991	5441	36090	13180	7556	127152
Van Ness-U	0.55	1.82	4602	972	85482	1311	354	10169	5913	1326	95651	906	2388	29840	638	1015	8112	1544	3403	37952	7457	4729	133603
Cleveland	0.80	2.33	3547	213	88814	1083	191	11061	4630	404	99875	1136	676	29376	463	569	8219	1599	1245	37595	6229	1649	137470
Woodley Pa	1.15	1.99	6949	679	95085	2053	407	12706	9002	1086	107791	1132	1947	30197	611	1125	8735	1743	3072	38932	10745	4158	146723
Dupont Cir	0.56	2.28	9505	11510	93080	1494	2224	11977	10999	13734	105057	1435	18923	47687	454	4078	12359	1889	23001	60046	12888	36735	165103
Farragut N	0.79	2.22	1728	18506	76303	841	1307	11509	2569	19813	87812	1670	16539	62557	548	2414	14227	2218	18953	76784	4787	38766	164596
Metro Cent	0.33	1.18	30702	33439	73564	6140	4777	12873	36842	38216	86437	13349	67635	116842	3055	10775	21946	16404	78410	138788	53246	116626	225225
Gallery Pl	0.33	0.92	26852	30441	69977	4602	4202	13274	31454	34643	83251	27957	29690	118577	5986	5415	21372	33943	35105	139949	65397	69748	223200
Judiciary	0.67	2.14	47	11446	58581	57	890	12438	104	12336	71019	204	3543	121917	155	416	21635	359	3959	143552	463	16295	214571
Union Stat	0.73	1.06	4865	24861	38582	1681	3704	10419	6546	28565	49001	24726	14175	111367	3434	2621	20821	28160	16796	132188	34706	45361	181189
New York A	0.96	1.86	685	24610	14655	797	6236	4979	1482	30846	19634	7632	11225	114955	4908	2917	18829	12540	14142	133784	14022	44988	153418
Rhode Isla	0.93	2.23	1569	3640	12582	1234	1672	4542	2803	5312	17124	15376	1857	101437	6658	772	12943	22034	2629	114380	24837	7941	131504
Brookland-	1.30	2.98	459	2036	11004	535	932	4150	994	2968	15154	3115	1448	99768	1496	594	12042	4611	2042	111810	5605	5010	126964
Fort Totte	1.89	3.10	3703	3725	10978	1643	1742	4049	5346	5467	15027	27293	5054	77530	5761	1158	7437	33054	6212	84967	38400	11679	99994
Takoma	1.47	3.22	757	2363	9373	445	888	3607	1202	3251	12980	6122	829	72237	1753	342	6025	7875	1171	78262	9077	4422	91242
Silver Spr	1.75	3.25	658	7872	2161	425	2720	1309	1083	10592	3470	41358	2970	33850	4840	757	1941	46198	3727	35791	47281	14319	39261
Forest Gle	1.58	4.07	63	897	1327	26	457	874	89	1354	2201	5556	163	28456	472	48	1519	6028	211	29975	6117	1565	32176
Wheaton	1.75	3.31	25	1077	273	20	721	174	45	1798	447	14672	116	13902	547	49	1018	15219	165	14920	15264	1963	15367
Glenmont				273			174			447		13902			1018			14920			14920	447	
Route 772/	2.08	3.53	13861	0	13861	515	0	515	14376	0	14376	0	397	397	0	94	94	0	491	491	14376	491	14867
VA 606/Wes	3.15	4.22	1055	124	14792	76	13	578	1131	137	15370	133	234	501	9	30	115	142	264	616	1273	401	15986
Dulles Air	1.83	2.88	0	52	14741	112	10	681	112	62	15422	0	250	749	7	87	194	7	337	943	119	399	16365
Innovation	1.84	4.18	5170	216	19695	843	38	1486	6013	254	21181	152	863	1458	30	535	699	182	1398	2157	6195	1652	23338
Herndon	1.15	1.85	8285	1092	26886	1507	247	2745	9792	1339	29631	315	2808	3950	151	1345	1895	466	4153	5845	10258	5492	35476
Reston Tow	1.27	3.76	2568	2091	27365	1213	906	3051	3781	2997	30416	725	3340	6568	686	1572	2781	1411	4912	9349	5192	7909	39765
Wiehle/Res	5.83	7.70	7272	888	33750	1186	718	3521	8458	1606	37271	1238	1586	6915	1007	832	2608	2245	2418	9523	10703	4024	46794
Spring HIl	0.46	1.03	3854	1231	36375	2077	523	5074	5931	1754	41449	528	4300	10687	504	2676	4779	1032	6976	15466	6963	8730	56915
Greensboro	0.69	1.56	3802	1544	38632	1274	434	5913	5076	1978	44545	798	4174	14061	399	2040	6421	1197	6214	20482	6273	8192	65027
Tysons Cor	1.19	2.79	3238	3237	38632	1801	1343	6373	5039	4580	45005	1361	7001	19703	1310	2679	7791	2671	9680	27494	7710	14260	72499
McLean Tys	3.90	6.10	6484	2512	42602	1967	2029	6310	8451	4541	48912	2132	6084	23654	2176	2515	8130	4308	8599	31784	12759	13140	80696
East Falls				984			706			1690		5429			1250			6679			6679	1690	

```
          L'Enfant P    2.35   5.15  18655     0  35818   5988     0  10048  24643     0  45866      0 39343  67109      0  2883   5702      0 42226  72811  24643 42226 118677
          Pentagon                         8612                3110                11722         24983                1501                26484                26484 11722
          King Stree    0.64   1.89   1624     0   8459    573     0   3882   2197     0  12341      0  2425  28076      0   557   4341      0  2982  32417   2197  2982  44758
          Eisenhower    0.55   1.08    119  6339   2238    124  2682   1323    243  9021   3561   4196  1355  25234   1363   783   3761   5559  2138  28995   5802 11159  32556
          Huntington                       2238                1323                3561         25234                3761                28995                28995  3561

          Total       130.90 261.70       575826              136451              712277              633113              162008              795121              1507398

Metrorail Line Summmary
          Tue Sep 11 04:41:35 2018  LineSum  page 4


                                  ---------------- A->B Direction (Read Down) --------------  --------------- B->A Direction (Read Up) -----------------  -------Total------
                       Dist   Time  -------Peak-------  -----Off-Peak-----  -------Daily------  -------Peak-------  -----Off-Peak-----  -------Daily------  -------Daily------
          Stop        (miles) (min)     On   Off   Ride     On   Off   Ride     On   Off   Ride     On   Off   Ride     On   Off   Ride     On   Off   Ride     On   Off   Ride


          Max           5.83   7.70  37196 36658  96369   6140  6291  15636  42886 42436 112005  66870 67635 134327  10239 11376  23773  77109 78410 158100  99420116626 228761

          Passenger Miles               3932608              612906              4545514             3305303              732957              4038260              8583774
          Passenger Hours                141005               23187              164192              129617               28892              158509              322701
          Average Trip Length (miles)       6.8                 4.5                11.3                 5.2                 4.5                 9.7                21.1
          Average Trip Length (minutes)    14.7                10.2                24.9                12.3                10.7                23.0                47.9

          Tue Sep 11 04:41:35 2018 -- Process Complete with 9 Warnings (0:00:01)
```

Appendix C:

MWCOG Validation Memos

National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Carole Delion, Lisa Shemer, Subrat Mahapatra, MD SHA, Kari Snyder, MDOT
FROM: Dusan Vuksan, Feng Xie, Yu Gao, TPB Staff
SUBJECT: Model Validation for the Traffic Relief Plan
DATE: February 23, 2018
CC: Rich Roisman, Tim Canan, Ron Milone, Anant Choudhary, TPB Staff

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This memorandum documents the 2016 Model Validation efforts related to the Traffic Relief Plan. It provides draft 2016 Model Validation results and a list of regional model output files that are being transmitted at this time.

PROJECT BACKGROUND

The Maryland State Highway Administration (SHA) has requested TPB staff assistance in preparing travel demand forecasts for different future alternatives and strategies for Maryland's Traffic Relief Plan. Although the project assumptions are still evolving, the project aims to assess the impacts of addition of dynamically priced lanes on Capital Beltway (I-495), I-270, and MD-295. It is being led by SHA with consulting support from Gannett Fleming. TPB staff work is being funded by the Maryland portion of the state Technical Assistance Program within the Unified Planning Work Program (UPWP).

VALIDATION TRANSMITTAL

Per standard TPB staff modeling practices, prior to executing future year alternatives, travel demand model output needs to be validated to existing conditions in the study area. TPB staff has executed a model validation run and prepared draft summaries, attached as an appendix to this transmittal memorandum. The summaries compare 2016 model estimates to the 2015 observed data. The appendix also includes the maps of study area and screenlines (Maps 1 and 2). TPB staff is transmitting the following model output files based on the regional model output:

- I4_assign_output.net (Final Loaded Network)
- i4_AM.VTT (Origin / Destination AM vehicle trip table)
- i4_PM.VTT (Origin / Destination PM vehicle trip table)
- i4_MD.VTT (Origin / Destination mid-day vehicle trip table)
- i4_NT.VTT (Origin / Destination night-time vehicle trip table)

The files can be accessed using the following ftp link:

ftp://dtpcog:cog.dtp@ftp.mwcog.org/MD_SHA_TRP_Study_2016_Val_Model_Files.zip

Confidential Pre-Decisional & Deliberative

The Traffic Relief Plan Study inputs were based on Round 9.0 Cooperative Forecasts and the 2016 "Off-Cycle" Constrained Long Range Plan (adopted in October 2017). Highway network refinements were made to the official networks to more accurately reflect the study area transportation networks. The refinements include:

- Review and revisions of the number of lanes on I-495, I-270 and MD-295
- Review and revisions of coding of interchanges with access to/from the above freeways
- Additional refinements in the Fort Meade area (existing NSA interchange added)
- Decrease in highway capacity on MD-295 (degraded from freeway to expressway)

Given the project schedule-related time constraints, the refinements do not include:

- Revisions in external trips mainly impacting MD-295 and I-270 (discussed at one point)
- Zone splits and centroid connector revisions (with the exception of the Fort Meade area)
- Detailed review and revisions of coding of intersecting facilities

Version 2.3.70 travel demand model is the official TPB "production model". Although this model was used as the starting point "base" model, it was subsequently revised to be able to better represent dynamically-priced lanes that do not provide preferential treatment to the high occupancy vehicles (which may be assumed in a number of build alternatives for the project). Essentially, to reflect this policy change, TPB staff removed what is known as the "HOV Skim Replacement" process, with the revised model no longer requiring the "base-run" modeling step for each analysis year. At the same time, the revised model still provides preferential treatment to the carpools on HOT lane facilities in Virginia, as HOV users of Virginia HOT lanes are able to access them free of charge. The resulting model used in preparation of these estimates will be referred to as the Version 2.3.71 travel demand model. Depending on the final build alternatives assumptions, this model may need to be refined further.

DRAFT RESULTS

Model results and summaries are included in the appendix. It is important to note that the selected Average Weekday Daily Traffic (AWDT) counts / observed data represent the 2015 conditions, while model output represents the 2016 conditions. At the time the study commenced, the 2015 counts were readily available in a format that could easily be used (and 2016 counts were not). Also, in recent history, individual facility counts tend to be fairly stable from year-to-year. SHA staff is welcome to review and update the observed counts in the attached tables.

As it is very challenging to validate a model at the link level, the TRP validation effort focused on the screenlines that were selected in consultation with SHA. Tables 1 and 2 show differences between estimated and observed volumes at the screenline level (please refer to Map 2). All of the estimated screenline volumes are within ±20% of the observed counts, with the exception of Screenline I-270-2 (at 33%). In addition, some of the estimated volumes for the Capital Beltway screenlines are close to the 20% margin (e.g., Screenline I-495-2), but these regional model findings are in line with the model validation for the Capital Beltway PEL Study conducted in 2016 and 2017[1].

[1] Dusan Vuksan and Yu Gao, "Model Validation for Capital Beltway Planning Study", TPB Technical Memorandum, August 23, 2016.

As expected, there is more variance in model output at the link level, but most link-level model estimates for I-270, I-495 and MD-295 are within ±25% of the observed counts (Tables 3a, 3b and 3c).

It is anticipated that any discrepancies between the estimated and observed data will be addressed through post-processing by SHA.

NEXT STEPS

TPB staff looks forward to receiving feedback from SHA staff. If current model validation output is acceptable to SHA for the purposes of post-processing, TPB staff will move forward and execute the 2040 No Build.

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APPENDIX

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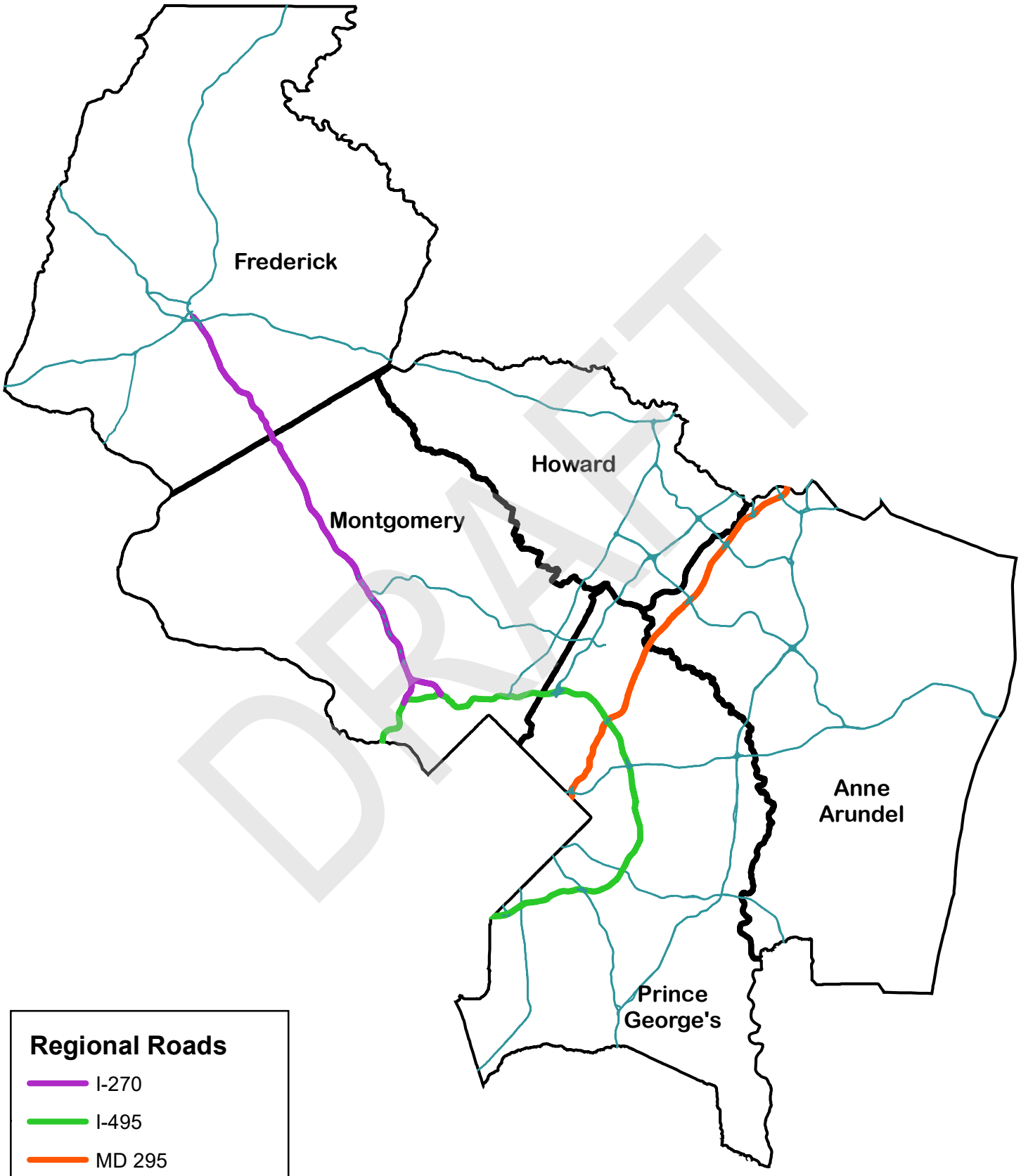
Map 1a. Maryland Traffic Relief Plan Study Area



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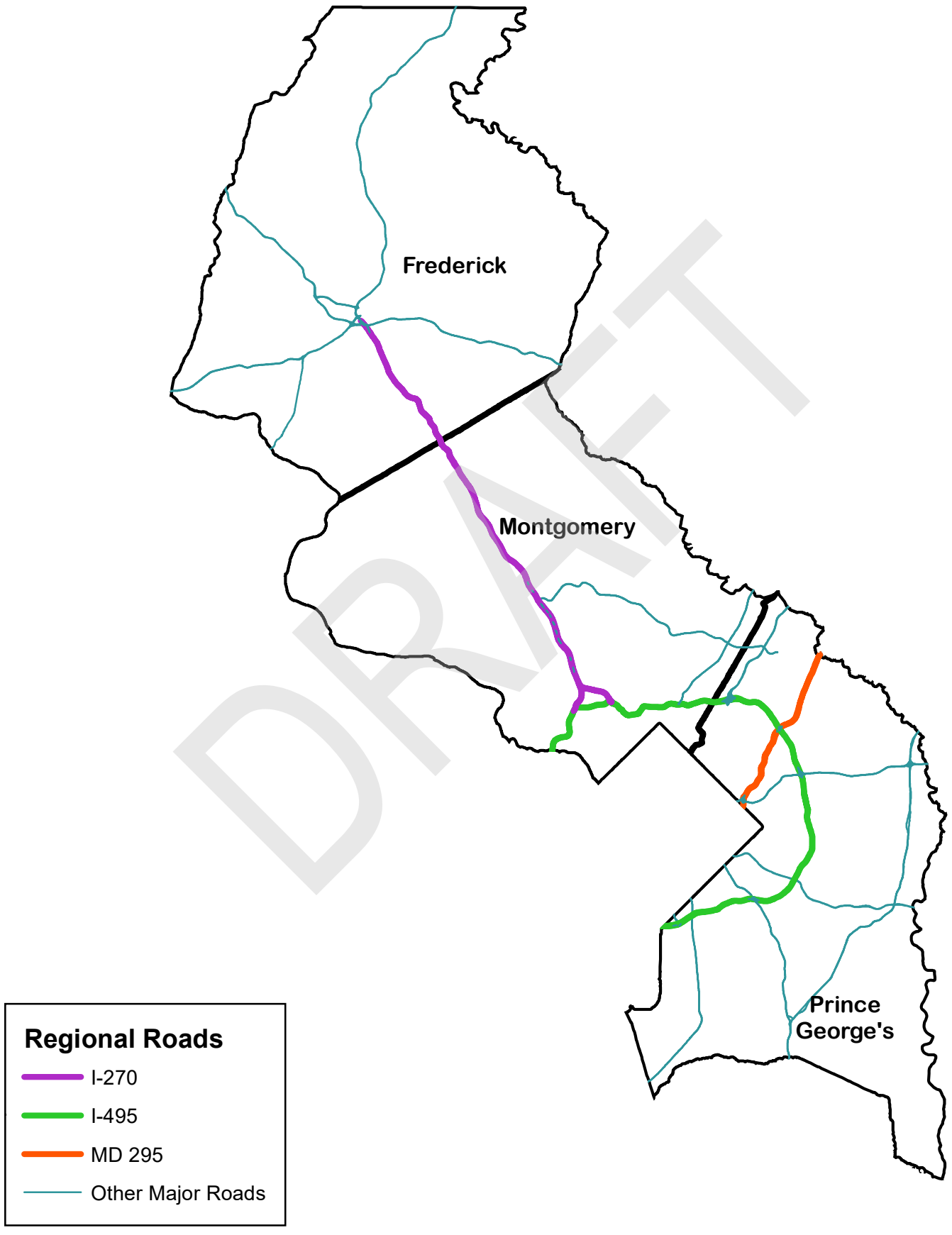
Map 1b. Maryland Traffic Relief Plan Focused Study Area



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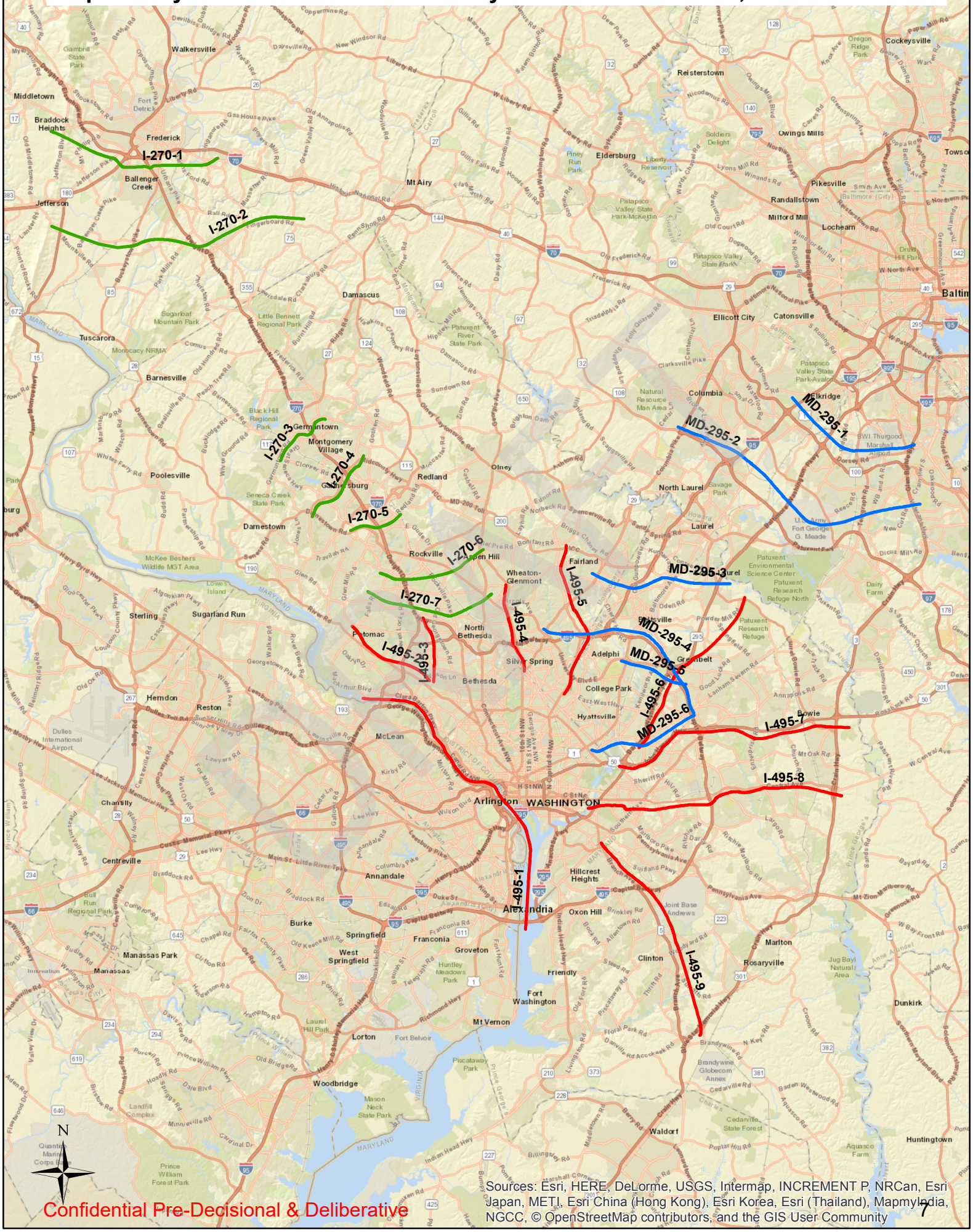
Map 2. Maryland Traffic Relief Plan Study: Screenlines for I-270, I-495 and MD 295



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapmylndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

Confidential Pre-Decisional & Deliberative

Table 1. Observed versus Simulated AAWDT Volumes* by Screenline; 2016 Validation

Screenline ID	Location	2015 Obs. Vol	2016 Sim. Vol	Difference	% Difference
I-270-1	South of I-70	288,116	307,940	19,824	7%
I-270-2	North of Fingerboard Rd	138,134	184,326	46,192	33%
I-270-3	South of Germantown Rd	231,104	249,901	18,797	8%
I-270-4	South of Quince Orchard Rd	363,634	359,373	-4,261	-1%
I-270-5	South of I-370	338,752	342,027	3,275	1%
I-270-6	North of Montrose Rd	436,266	473,757	37,491	9%
I-270-7	North of the Spurs	425,466	475,267	49,801	12%
I-495-1	Potomac River	916,448	935,888	19,440	2%
I-495-2	North of River Rd	302,322	357,450	55,128	18%
I-495-3	Between the Spurs	294,286	319,958	25,672	9%
I-495-4	West of Georgia Ave	421,760	473,152	51,392	12%
I-495-5	East of New Hampshire Ave	485,514	550,779	65,265	13%
I-495-6	East of Baltimore Washington Pkwy	393,800	358,883	-34,917	-9%
I-495-7	South of US 50	612,422	546,973	-65,449	-11%
I-495-8	South of Central Ave	496,968	436,251	-60,717	-12%
I-495-9	East of Branch Ave	362,926	298,519	-64,407	-18%
MD-295-1	North of Dorsey Rd	507,576	567,461	59,885	12%
MD-295-2	North of Patuxent Pkwy	622,442	738,213	115,771	19%
MD-295-3	South of ICC	466,246	530,330	64,084	14%
MD-295-4	North of Capital Beltway	695,960	742,843	46,883	7%
MD-295-5	South of University Blvd	392,356	367,867	-24,489	-6%
MD-295-6	North of US 50	442,280	423,291	-18,989	-4%

Note: * Links with no count are excluded from screenline totals.

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Table 2a. Observed versus Simulated AAWDT Volumes by Facility for I-270 Screenlines; 2016 Validation

Screenline I-270-1

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Jefferson Blvd	1,520	924	-596	-39%
2	Old Swimming Pool Rd	N/A	928	N/A	N/A
3	Jefferson Pike	3,840	3,284	-556	-14%
4	US-15	62,870	91,962	29,092	46%
5	Balenger Creek Pike	13,534	9,727	-3,807	-28%
6	New Design Rd	19,390	19,136	-254	-1%
7	I-270	117,990	140,948	22,958	19%
8	Buckeystown Pike	27,370	21,490	-5,880	-21%
9	Urbana Pike	21,602	12,712	-8,890	-41%
10	Reichs Ford Rd	3,780	3,119	-661	-17%
11	Old National Pike	16,220	4,638	-11,582	-71%
	Subtotal*	288,116	307,940	19,824	7%

Screenline I-270-2

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Catoctin Mountain Hwy	21,180	29,767	8,587	41%
2	Ballenger Creek Pike	N/A	3,991	N/A	N/A
3	New Design Rd	N/A	2,970	N/A	N/A
4	Buckeystown Pike	6,850	10,242	3,392	50%
5	Park Mills Rd	N/A	2,708	N/A	N/A
6	I-270	90,110	117,287	27,177	30%
7	Urbana Pike	13,070	9,444	-3,626	-28%
8	Sugarloaf Pkwy	N/A	702	N/A	N/A
9	Ijamsville Rd	N/A	8,259	N/A	N/A
10	Ed McClain Rd	N/A	4,222	N/A	N/A
11	Green Valley Rd	6,924	17,586	10,662	154%
	Subtotal*	138,134	184,326	46,192	33%

Screenline I-270-3

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Clopper Rd	24,232	26,008	1,776	7%
2	Wisteria Dr	13,272	394	-12,878	-97%
3	Middlebrook Rd	24,540	17,162	-7,378	-30%
4	I-270	136,930	158,538	21,608	16%
5	Frederick Rd	32,130	47,799	15,669	49%
	Subtotal*	231,104	249,901	18,797	8%

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Screenline I-270-4

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Darnestown Rd	27,952	33,296	5,344	19%
2	Great Seneca Hwy	42,620	31,364	-11,256	-26%
3	West Diamond Ave	50,492	35,977	-14,515	-29%
4	I-270	183,660	210,107	26,447	14%
5	North Frederick Ave	36,120	32,181	-3,939	-11%
6	Lost Knife Rd	N/A	3,791	N/A	N/A
7	Midcounty Hwy	22,790	16,448	-6,342	-28%
	Subtotal*	363,634	359,373	-4,261	-1%

Screenline I-270-5

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Great Seneca Hwy	29,372	26,107	-3,265	-11%
2	Omega Rd	N/A	6,779	N/A	N/A
3	Shady Grove Rd	39,630	34,449	-5,181	-13%
4	I-270	224,250	247,714	23,464	10%
5	Piccard Dr	N/A	7,442	N/A	N/A
6	Gaither Rd	N/A	6,646	N/A	N/A
7	Grand Champion Dr	N/A	741	N/A	N/A
8	Frederick Rd	45,500	33,757	-11,743	-26%
	Subtotal*	338,752	342,027	3,275	1%

Screenline I-270-6

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Falls Rd	20,684	18,481	-2,203	-11%
2	Seven Locks Rd	N/A	28,829	N/A	N/A
3	I-270	263,740	291,427	27,687	10%
4	Tower Oaks Blvd	11,272	11,772	500	4%
5	Rockville Pike	49,580	42,255	-7,325	-15%
6	Twinbrook Pkwy	N/A	24,633	N/A	N/A
7	Veirs Mill Rd	44,800	48,481	3,681	8%
8	Bauer Dr	N/A	3,574	N/A	N/A
9	Georgia Ave	46,190	61,341	15,151	33%
	Subtotal*	436,266	473,757	37,491	9%

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Screenline I-270-7

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Falls Rd	21,074	23,256	2,182	10%
2	Seven Locks Rd	N/A	20,802	N/A	N/A
3	I-270	268,380	293,792	25,412	9%
4	Old Georgetown Rd	N/A	38,956	N/A	N/A
5	Rockville Pike	54,870	50,980	-3,890	-7%
6	Connecticut Ave	40,802	57,626	16,824	41%
7	Veirs Mill Rd	40,340	49,613	9,273	23%
	Subtotal*	425,466	475,267	49,801	12%

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Table 2b. Observed versus Simulated AAWDT Volumes by Facility for I-495 Screenlines; 2016 Validation

Screenline I-495-1

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	American Legion Bridge	231,716	282,575	50,859	22%
2	Chain Bridge	31,874	35,831	3,957	12%
3	Key Bridge	41,448	54,124	12,676	31%
4	Roosevelt Bridge	93,813	99,980	6,167	7%
5	Memorial Bridge	57,116	58,490	1,374	2%
6	14th Street Bridge	246,189	182,444	-63,745	-26%
7	Woodrow Wilson Bridge	214,292	222,444	8,152	4%
	Subtotal*	916,448	935,888	19,440	2%

Screenline I-495-2

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Falls Rd	21,094	16,675	-4,419	-21%
2	Bradley Blvd	7,992	10,447	2,455	31%
3	Seven Locks Rd	N/A	14,364	N/A	N/A
4	Capital Beltway	262,112	317,153	55,041	21%
5	Burdette Rd	N/A	6,957	N/A	N/A
6	Wilson La	11,124	13,175	2,051	18%
	Subtotal*	302,322	357,450	55,128	18%

Screenline I-495-3

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	I-270 East Spur	119,200	126,047	6,847	6%
2	Fernwood Rd	N/A	16,541	N/A	N/A
3	Rockledge Dr	N/A	6,459	N/A	N/A
4	Democracy Blvd	31,000	29,864	-1,136	-4%
5	Capital Beltway	119,170	139,201	20,031	17%
6	Greentree Rd	N/A	5,803	N/A	N/A
7	Bradley Blvd	15,262	9,689	-5,573	-37%
8	Wilson La	9,654	15,157	5,503	57%
	Subtotal*	294,286	319,958	25,672	9%

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Screenline I-495-4

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Randolph Rd	28,240	53,714	25,474	90%
2	Lindell St	N/A	5,764	N/A	N/A
3	West University Blvd	33,810	50,111	16,301	48%
4	Veirs Mill Rd	26,446	23,982	-2,464	-9%
5	Plyers Mill Rd	N/A	11,834	N/A	N/A
6	Forest Glen Rd	9,690	7,619	-2,071	-21%
7	Capital Beltway	239,260	242,329	3,069	1%
8	Linden La	11,760	14,203	2,443	21%
9	16th St	29,402	22,993	-6,409	-22%
10	Spring St	N/A	11,561	N/A	N/A
11	East West Hwy	27,020	37,311	10,291	38%
12	Colesville Rd	16,132	20,890	4,758	29%
	Subtotal*	421,760	473,152	51,392	12%

Screenline I-495-5

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	ICC	50,724	68,638	17,914	35%
2	Randolph Rd	38,192	41,547	3,355	9%
3	Columbia Pike	65,682	94,668	28,986	44%
4	Powder Mill Rd	N/A	10,920	N/A	N/A
5	Capital Beltway	265,484	280,772	15,288	6%
6	Adelphi Rd	N/A	34,996	N/A	N/A
7	Metzerott Rd	N/A	12,672	N/A	N/A
8	Merrimac Dr	N/A	5,577	N/A	N/A
9	University Blvd	41,000	41,134	134	0%
10	Erskine St	N/A	5,327	N/A	N/A
11	East West Hwy	24,432	24,020	-412	-2%
	Subtotal*	485,514	550,779	65,265	13%

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Screenline I-495-6

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Cheverly Ave	10,160	4,351	-5,809	-57%
2	Landover Rd	42,482	43,350	868	2%
3	Annapolis Rd	39,364	21,925	-17,439	-44%
4	Veterans Pkwy	23,872	13,536	-10,336	-43%
5	Riverdale Rd	N/A	15,124	N/A	N/A
6	Good Luck Rd	N/A	13,861	N/A	N/A
7	Capital Beltway	200,390	200,117	-273	0%
8	Greenbelt Rd	57,230	52,706	-4,524	-8%
9	Explorer Rd	N/A	6,098	N/A	N/A
10	Soil Conservation Rd	N/A	5,768	N/A	N/A
11	Springfield Rd	N/A	11,476	N/A	N/A
12	Laurel Bowie Rd	20,302	22,898	2,596	13%
	Subtotal*	393,800	358,883	-34,917	-9%

Screenline I-495-7

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Kenilworth Ave	175,792	142,763	-33,029	-19%
2	Columbia Park Rd	19,720	8,991	-10,729	-54%
3	Landover Rd	48,292	40,781	-7,511	-16%
4	Veterans Pkwy	N/A	7,631	N/A	N/A
5	Ardwick-Ardmore Rd	9,482	10,432	950	10%
6	Capital Beltway	222,510	224,762	2,252	1%
7	Whitfield Chapel Rd	10,400	5,326	-5,074	-49%
8	Martin Luther King Jr. Hwy	27,992	35,222	7,230	26%
9	Lottsford Vista Rd	10,490	8,797	-1,693	-16%
10	Enterprise Rd	17,272	13,062	-4,210	-24%
11	Church Rd	6,020	5,769	-251	-4%
12	Collington Rd	N/A	39,621	N/A	N/A
13	Crain Hwy	64,452	51,068	-13,384	-21%
	Subtotal*	612,422	546,973	-65,449	-11%

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Screenline I-495-8

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Anacostia Fwy	109,904	80,120	-29,784	-27%
2	Minnesota St	N/A	23,542	N/A	N/A
3	Ridge Rd SE	N/A	10,196	N/A	N/A
4	Texas Ave SE	6,378	1,295	-5,083	-80%
5	Benning Rd SE	16,718	15,226	-1,492	-9%
6	F St SE	N/A	4,887	N/A	N/A
7	Southern Ave SE	13,476	26,644	13,168	98%
8	Larchmont Ave	N/A	10,022	N/A	N/A
9	Suffolk Ave	N/A	3,359	N/A	N/A
10	Rollins Ave	N/A	1,464	N/A	N/A
11	Addison Rd	19,492	18,029	-1,463	-8%
12	Shady Glen Dr	N/A	11,719	N/A	N/A
13	Ritchie Rd	N/A	18,853	N/A	N/A
14	Capital Beltway	218,552	194,646	-23,906	-11%
15	Harry S Truman Dr	N/A	18,243	N/A	N/A
16	Largo Rd	41,842	30,752	-11,090	-27%
17	Campus Way S	N/A	9,415	N/A	N/A
18	Kettering Dr	N/A	5,687	N/A	N/A
19	Watkins Park Dr	15,224	14,985	-239	-2%
20	Church Rd	N/A	3,555	N/A	N/A
21	Crain Hwy	55,382	54,554	-828	-1%
	Subtotal*	496,968	436,251	-60,717	-12%

Screenline I-495-9

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Suitland Pkwy	36,772	19,064	-17,708	-48%
2	Silver Hill Rd	42,240	35,780	-6,460	-15%
3	Auth Rd	N/A	8,868	N/A	N/A
4	Capital Beltway	197,600	167,731	-29,869	-15%
5	Allentown Rd	35,072	30,137	-4,935	-14%
6	Old Alexander Ferry Rd	N/A	14,527	N/A	N/A
7	Woodyard Rd	19,962	16,587	-3,375	-17%
8	Surratts Rd	N/A	2,656	N/A	N/A
9	Dyson Rd	N/A	1,351	N/A	N/A
10	Mattawoman Dr	N/A	835	N/A	N/A
11	Crain Hwy	31,280	29,220	-2,060	-7%
	Subtotal*	362,926	298,519	-64,407	-18%

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Table 2c. Observed versus Simulated AAWDT Volumes by Facility for MD 295 Screenlines; 2016 Validation

Screenline MD-295-1

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	I-95	207,324	261,557	54,233	26%
2	Washington Blvd	38,432	42,076	3,644	9%
3	MD 295	108,450	92,585	-15,865	-15%
4	Aviation Blvd	20,480	30,216	9,736	48%
5	Aviation Ave	21,070	13,998	-7,072	-34%
6	I-97	111,820	127,029	15,209	14%
	Subtotal*	507,576	567,461	59,885	12%

Screenline MD-295-2

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Columbia Pike	91,082	113,681	22,599	25%
2	Broken Land Pkwy	N/A	38,247	N/A	N/A
3	I-95	217,540	275,040	57,500	26%
4	Washington Blvd	27,222	44,416	17,194	63%
5	Brock Bridge Rd	N/A	7,323	N/A	N/A
6	MD 295	121,752	107,288	-14,464	-12%
7	Annapolis Rd	N/A	16,755	N/A	N/A
8	Telegraph Rd	25,192	35,271	10,079	40%
9	Clark Station Rd	N/A	6,027	N/A	N/A
10	New Cut Rd	12,052	15,213	3,161	26%
11	I-97	127,602	147,304	19,702	15%
	Subtotal*	622,442	738,213	115,771	19%

Screenline MD-295-3

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Columbia Pike	62,110	100,131	38,021	61%
2	I-95	206,640	246,573	39,933	19%
3	Old Gunpowder Rd	N/A	18,846	N/A	N/A
4	Virginia Manor Rd	N/A	15,538	N/A	N/A
5	Baltimore Ave	34,512	44,602	10,090	29%
6	Montpelier Dr	N/A	7,098	N/A	N/A
7	Muirkirk Rd	N/A	9,646	N/A	N/A
8	Laurel Bowie Rd	57,132	43,785	-13,347	-23%
9	MD 295	105,852	95,239	-10,613	-10%
	Subtotal*	466,246	530,330	64,084	14%

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Screenline MD-295-4

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Columbia Pike	72,572	91,472	18,900	26%
2	New Hampshire Ave	57,900	85,273	27,373	47%
3	Riggs Rd	N/A	14,910	N/A	N/A
4	Cherry Hill Rd	22,004	19,613	-2,391	-11%
5	I-95	200,180	245,573	45,393	23%
6	Sellman Rd	N/A	2,088	N/A	N/A
7	Baltimore Ave	47,640	64,308	16,668	35%
8	Rhode Island Ave	N/A	4,942	N/A	N/A
9	Cherrywood La	9,552	10,236	684	7%
10	Kenilworth Ave	36,330	31,675	-4,655	-13%
11	Greenbelt Rd	52,230	41,038	-11,192	-21%
12	MD 295	128,132	105,196	-22,936	-18%
13	Good Luck Rd	N/A	13,599	N/A	N/A
14	Annapolis Rd	69,420	48,459	-20,961	-30%
	Subtotal*	695,960	742,843	46,883	7%

Screenline MD-295-5

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Baltimore Ave	37,092	51,194	14,102	38%
2	Kenilworth Ave	41,110	27,678	-13,432	-33%
3	MD 295	113,764	88,878	-24,886	-22%
4	Capital Beltway	200,390	200,117	-273	0%
	Subtotal*	392,356	367,867	-24,489	-6%

Screenline MD-295-6

Sequence	Facility	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	Bladenburg Rd	16,716	23,943	7,227	43%
2	Kenilworth Ave	33,510	38,037	4,527	14%
3	MD 295	123,292	101,045	-22,247	-18%
4	Cheverly Ave	10,160	4,351	-5,809	-57%
5	Landover Rd	42,482	43,350	868	2%
6	Cooper Lane	N/A	4,993	N/A	N/A
7	Veterans Pkwy	N/A	25,671	N/A	N/A
8	Capital Beltway	216,120	212,565	-3,555	-2%
	Subtotal*	442,280	423,291	-18,989	-4%

Note: * Links with no count are excluded from screenline subtotals.

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Table 3a. Observed versus Simulated AAWDT Volumes on I-270; 2016 Validation

Sequence	Location	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	IS270-.40 MI S OF NEW DESIGN RD	117,990	140,948	22,958	19%
2	IS270-.20 MI S OF BAKER VALLEY RD	90,110	117,287	27,177	30%
3	IS270-50ft S OF FREDERICK CO/L	85,730	124,562	38,832	45%
4	IS270-.50 MI N OF MD121	83,930	127,837	43,907	52%
5	IS 270 South of MD 121 (ATR#04)	105,544	141,566	36,022	34%
6	IS270-.40 MI N OF MD118	121,110	147,808	26,698	22%
7	IS270-.30 MI S OF MD118	136,930	158,538	21,608	16%
8	IS270-.50 MI S OF MIDDLEBROOK RD	175,364	190,777	15,413	9%
9	IS270-.30 MI S OF MD124	183,660	210,107	26,447	14%
10	IS270-.50 MI N OF IS370	231,120	237,465	6,345	3%
11	IS270-.30 MI N OF SHADY GROVE RD	224,730	231,337	6,607	3%
12	IS270-.50 MI N OF MD28	224,250	247,714	23,464	10%
13	IS270-.30 MI S OF MD28	248,810	287,651	38,841	16%
14	IS270-.30 MI N OF MD927 (MONTROSE RD)	263,740	291,427	27,687	10%
15	IS270-.10 MI N OF TUCKERMAN LA	268,380	293,792	25,412	9%
16	IS270Y-.30 MI N OF WESTLAKE TERR	131,850	167,745	35,895	27%
17	IS270Y-.40 MI S OF DEMOCRACY BLVD	133,170	177,952	44,782	34%
18	IS270-.30 MI N OF MD187B	119,200	126,047	6,847	6%
19	IS270-.10 MI S OF MD187	112,380	105,487	-6,893	-6%

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Table 3b. Observed versus Simulated AAWDT Volumes on Capital Beltway; 2016 Validation

Sequence	Location	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	IS495-.10 MI E OF PERSIMMON TREE RD	231,716	239,294	7,578	3%
2	IS495-.70 MI N OF MD190	262,112	317,153	55,041	21%
3	IS495-.50 MI W OF MD187	119,170	139,201	20,031	17%
4	IS495-.30 MI E OF MD187	112,890	134,833	21,943	19%
5	IS495-.20 MI E OF MD355	223,330	244,879	21,549	10%
6	IS495-.80 MI W OF MD97	239,260	242,329	3,069	1%
7	IS495-.20 MI E OF MD97	229,740	234,955	5,215	2%
8	IS495-.20 MI E OF US29	219,320	225,967	6,647	3%
9	IS 495 West of MD 650 (ATR#41)	215,924	237,779	21,855	10%
10	IS495-.10 MI W OF MD212	265,484	280,772	15,288	6%
11	IS95-.30 MI N OF US1	212,110	227,076	14,966	7%
12	IS95-.40 MI S OF US1	223,590	201,338	-22,252	-10%
13	IS95-.30 MI N OF MD201	216,200	191,155	-25,045	-12%
14	IS95-.30 MI S OF MD201	207,020	199,218	-7,802	-4%
15	IS 95 North of Good Luck Rd (ATR#55)	200,390	200,117	-273	0%
16	IS95-.60 MI N OF IS595/US50	216,120	212,565	-3,555	-2%
17	IS95-.10 MI S OF MD704	222,510	224,762	2,252	1%
18	IS95-.40 MI S OF MD202	208,610	214,610	6,000	3%
19	IS 95 South of MD 214 (ATR#43)	218,552	194,646	-23,906	-11%
20	IS95-.50 MI N OF MD4	227,452	193,249	-34,203	-15%
21	IS95-.40 MI S OF MD4	202,400	176,319	-26,081	-13%
22	IS95-.40 MI N OF MD5	197,600	167,731	-29,869	-15%
23	IS 95 at Temple Hill Rd (ATR#49)	162,226	149,136	-13,090	-8%
24	IS95-.40 MI S OF MD414	170,630	148,784	-21,846	-13%
25	IS95-.30 MI S OF MD210	175,912	172,551	-3,361	-2%
26	IS95-.50 MI N OF VIRGINIA ST/L	214,292	222,444	8,152	4%

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Table 3c. Observed versus Simulated AAWDT Volumes on MD 295; 2016 Validation

Sequence	Location	2015 Obs. Vol	2016 Sim. Vol	Difference	% Diff.
1	MD295-.10 MI S OF BALTIMORE CO/L	104,412	84,912	-19,500	-19%
2	MD295-.20 MI S OF IS695	99,332	73,695	-25,637	-26%
3	MD295-.60 MI N OF IS195	121,920	74,891	-47,029	-39%
4	MD295-.30 MI N OF MD100	108,450	92,585	-15,865	-15%
5	MD295-.60 MI S OF MD100	109,500	103,443	-6,057	-6%
6	MD295-.25 MI S OF MD175	121,752	107,288	-14,464	-12%
7	MD295-.50 MI S OF MD32	112,552	115,358	2,806	2%
8	MD295-.30 MI N OF MD197	105,852	95,239	-10,613	-10%
9	MD295-.60 MI S OF MD197	117,252	105,206	-12,046	-10%
10	MD295-.40 MI N OF MD193	110,372	91,028	-19,344	-18%
11	MD295-.30 MI N OF IS95	128,132	105,196	-22,936	-18%
12	MD295-.30 MI S OF IS95	113,764	88,878	-24,886	-22%
13	MD295-.20 MI N OF MD450	118,780	90,848	-27,932	-24%
14	MD295-.20 MI N OF MD202	117,960	101,312	-16,648	-14%
15	MD295-.50 MI N OF US50	123,292	101,045	-22,247	-18%

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National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Carole Delion, Lisa Shemer, Subrat Mahapatra, MD SHA, Kari Snyder, MDOT
FROM: Dusan Vuksan, Feng Xie, Yu Gao, TPB Staff
SUBJECT: Alternative 1 / No Build for the Traffic Relief Plan
DATE: March 22, 2018
CC: Tim Canan, Ron Milone, Anant Choudhary, TPB Staff

This memorandum documents the TPB staff's 2040 Alternative 1 / No Build efforts related to the Traffic Relief Plan. It provides draft Alternative 1 results and a list of regional model output files that are being transmitted at this time.

PROJECT BACKGROUND

The Maryland State Highway Administration (SHA) has requested TPB staff assistance in preparing travel demand forecasts for different future alternatives and strategies for Maryland's Traffic Relief Plan. Although the project assumptions are still evolving, the project aims to assess the impacts of addition of dynamically priced lanes on Capital Beltway (I-495), I-270, and MD-295. It is being led by SHA with consulting support from Gannett Fleming. TPB staff work is being funded by the Maryland portion of the state Technical Assistance Program within the Unified Planning Work Program (UPWP).

VALIDATION TRANSMITTAL

Following the Model Validation transmittal on February 23, 2018, TPB staff completed Alternative 1 / No Build forecasts for the Traffic Relief Plan and prepared draft summaries, attached as an appendix to this transmittal memorandum. The summaries show changes in traffic across the screenlines between 2016 Model Validation (base year) and 2040 Alternative 1 (out year). Alternative 1 is critical as all build alternatives forecasts will be evaluated against it. The appendix also includes the maps of study area and screenlines (Maps 1 and 2). TPB staff is transmitting the following model output files based on the regional model output:

- I4_assign_output.net (Final Loaded Network)
- i4_AM.VTT (Origin / Destination AM vehicle trip table)
- i4_PM.VTT (Origin / Destination PM vehicle trip table)
- i4_MD.VTT (Origin / Destination mid-day vehicle trip table)
- i4_NT.VTT (Origin / Destination night-time vehicle trip table)

The files can be accessed using the following ftp link:

ftp://dtpcog:cog.dtp@ftp.mwcog.org/MD_SHA_TRP_Study_2040_Alt1_Model_Files.zip

Confidential Pre-Decisional & Deliberative

ASSUMPTIONS

The Traffic Relief Plan Study inputs were based on Round 9.0 Cooperative Forecasts and the 2016 "Off-Cycle" Constrained Long Range Plan (adopted in October 2017). The highway network refinements that were implemented in the Model Validation base year networks were carried to the 2040 Alternative 1 /No Build networks as well. They include:

- Review and revisions of the number of lanes on I-495, I-270 and MD-295
- Review and revisions of coding of interchanges with access to/from the above freeways
- Additional refinements in the Fort Meade area (existing NSA interchange added)
- Decrease in highway capacity on MD-295 (degraded from freeway to expressway)

Given the project schedule-related time constraints, the refinements do not include:

- Revisions in external trips mainly impacting MD-295 and I-270 (discussed at one point)
- Zone splits and centroid connector revisions (except for the Fort Meade area)
- Detailed review and revisions of coding of intersecting facilities

In addition to the network revisions of the existing facilities noted above that were first implemented in Model validation, the following assumptions were made in Alternative 1:

- CLRP projects on I-270, Capital Beltway in Maryland and MD-295 are not included, except for:
  - I-270 Innovative Congestion Management improvements (some of which result in additional capacity through implementation of auxiliary lanes)
  - Watkins Mill Road Interchange (I-270)
  - Corridor Cities Transitway (near I-270) and other transit projects in the corridor
  - Greenbelt Metro Station access improvement (I-495)
- Virginia HOT Lanes terminate just to the north of Dulles Toll Road (same as today)
  - However, CLRP projects on the Capital Beltway general purpose lanes between Dulles Toll Road and the American Legion Bridge are included (additional capacity via auxiliary lanes)
- CLRP assumptions are assumed elsewhere in the region, including some of the roadways intersecting the three TRP facilities (e.g., US 15, I-70, etc.).
- Consistent with today's operations, trucks are not allowed on MD-295

Version 2.3.70 travel demand model is the official TPB "production model". Although this model was used as the starting point "base" model, it was subsequently revised to be able to better represent dynamically-priced lanes that do not provide preferential treatment to the high occupancy vehicles (which may be assumed in a number of build alternatives for the project). Essentially, to reflect this policy change, TPB staff removed what is known as the "HOV Skim Replacement" process, with the revised model no longer requiring the "base-run" modeling step for each analysis year. At the same time, the revised model still provides preferential treatment to the carpools on HOT lane facilities in Virginia, as HOV users of Virginia HOT lanes are able to access them free of charge. The resulting model used in preparation of the 2040 Alternative 1 /No Build estimates will be referred to as the

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Version 2.3.71 travel demand model. Depending on the final build alternatives assumptions, this model may need to be refined further.

DRAFT RESULTS

Model results and summaries are included in the appendix. The summaries provide comparisons of estimated 2040 Alternative 1 and 2016 Model Validation traffic. These findings are included to help evaluate the traffic growth in different corridors in Maryland.

The TRP comparisons largely focus on the screenlines that were selected in consultation with SHA. It is important to note that the facilities for which observed data were unavailable were excluded from the estimated-versus-observed volume comparisons in Model Validation (February 23 transmittal). However, for the purposes of simulated-versus-simulated traffic volume comparisons (such as the summaries included in this memo and in future build alternatives), all facilities are included. This ensures that any new CLRP projects that intersect the screenlines are included in assessments of traffic growth between the alternatives.

Tables 1 and 2 show differences between estimated volumes at the screenline level (Map 2). In terms of the percentages, generally, more significant traffic volume growth (greater than 15%) can be observed in the areas of Maryland that are less developed and farther removed from the urban core. At the same time, lower volume growth between now and 2040 can be observed on the screenlines that encompass more developed areas around the Beltway, including Bethesda, Silver Spring, Wheaton, College Park and New Carrollton (less than 10%). The screenline traffic growth is also influenced by any expansion of highway capacity on the screenline facilities and addition of new projects that are in close proximity to the screenlines but not included in them.

Finally, some of the non-freeway links show decreases in volumes between now and 2040 (Tables 1 and 2). This occurs either due to the improvements to nearby facilities, construction of new projects that divert traffic from the existing facilities, or due to increases in population and employment densities that reduce roadway capacity (or in modeling terms, changes in “area type”).

Similar patterns can be observed with respect to the link-level output (Tables 3a, 3b and 3c).

NEXT STEPS

TPB staff looks forward to receiving feedback from SHA staff. If current model validation output is acceptable to SHA for the purposes of post-processing, TPB staff will move forward and execute the 2040 build alternatives.

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APPENDIX

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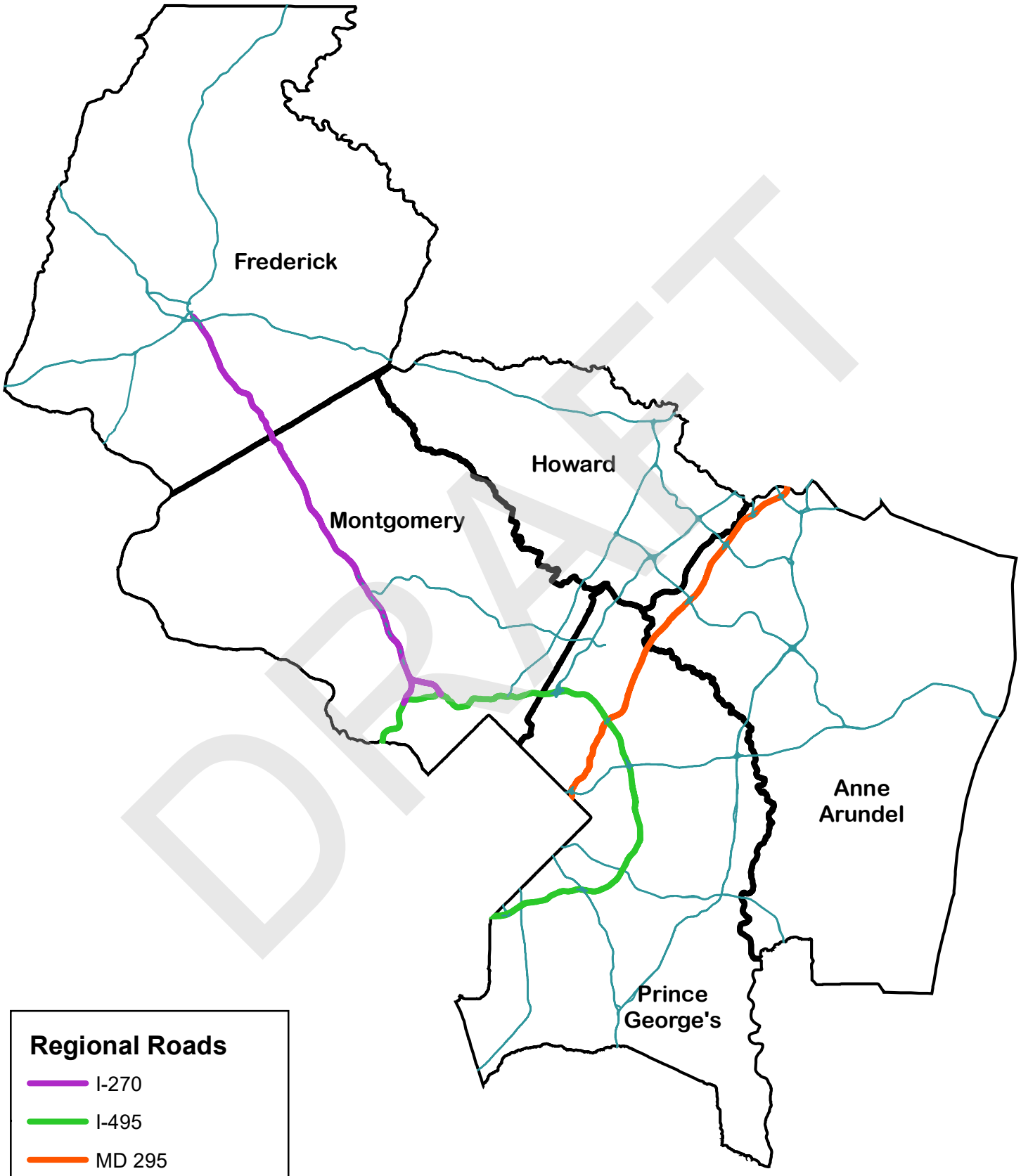
Map 1a. Maryland Traffic Relief Plan Study Area



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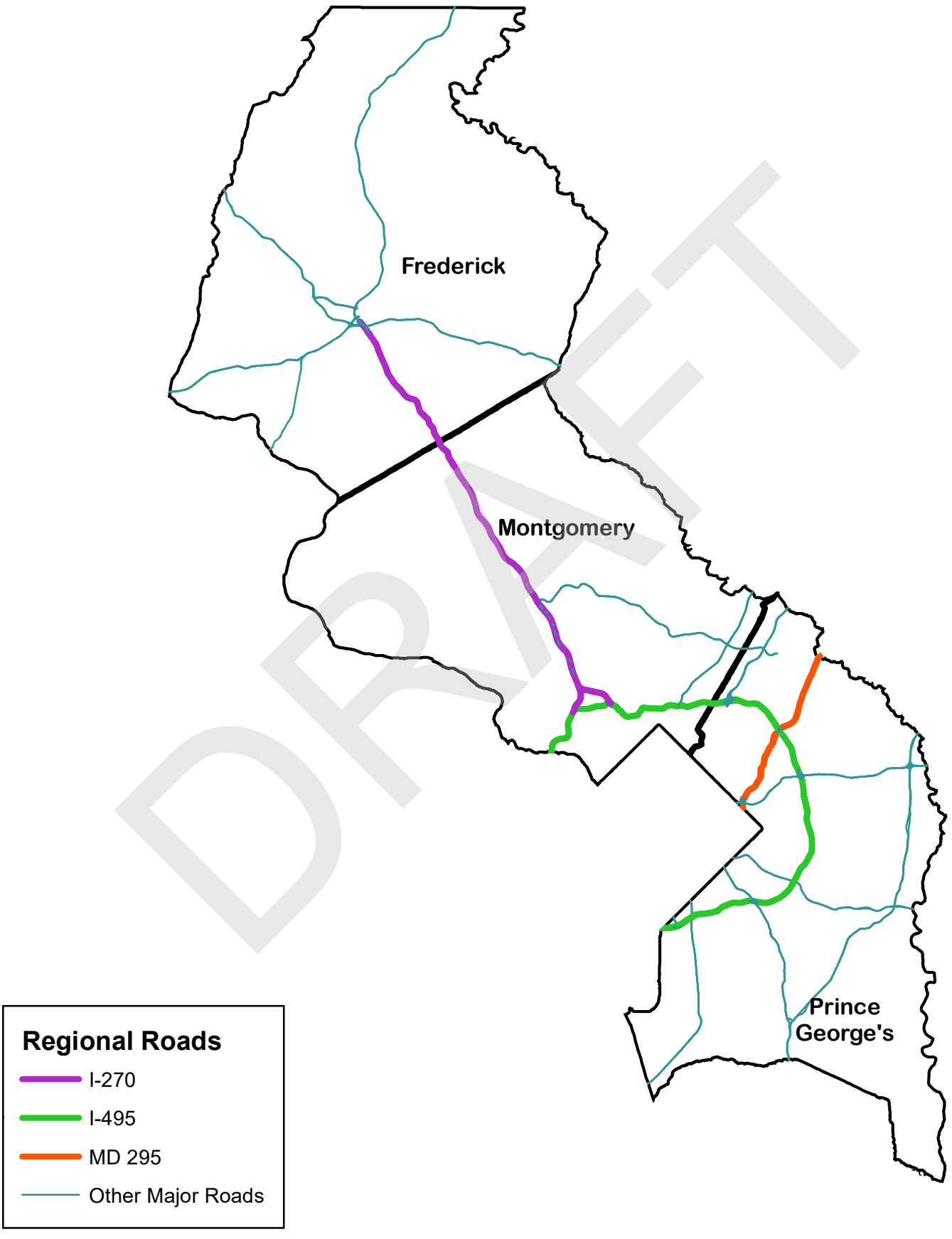
Map 1b. Maryland Traffic Relief Plan Focused Study Area



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Map 2. Maryland Traffic Relief Plan Study: Screenlines for I-270, I-495 and MD 295

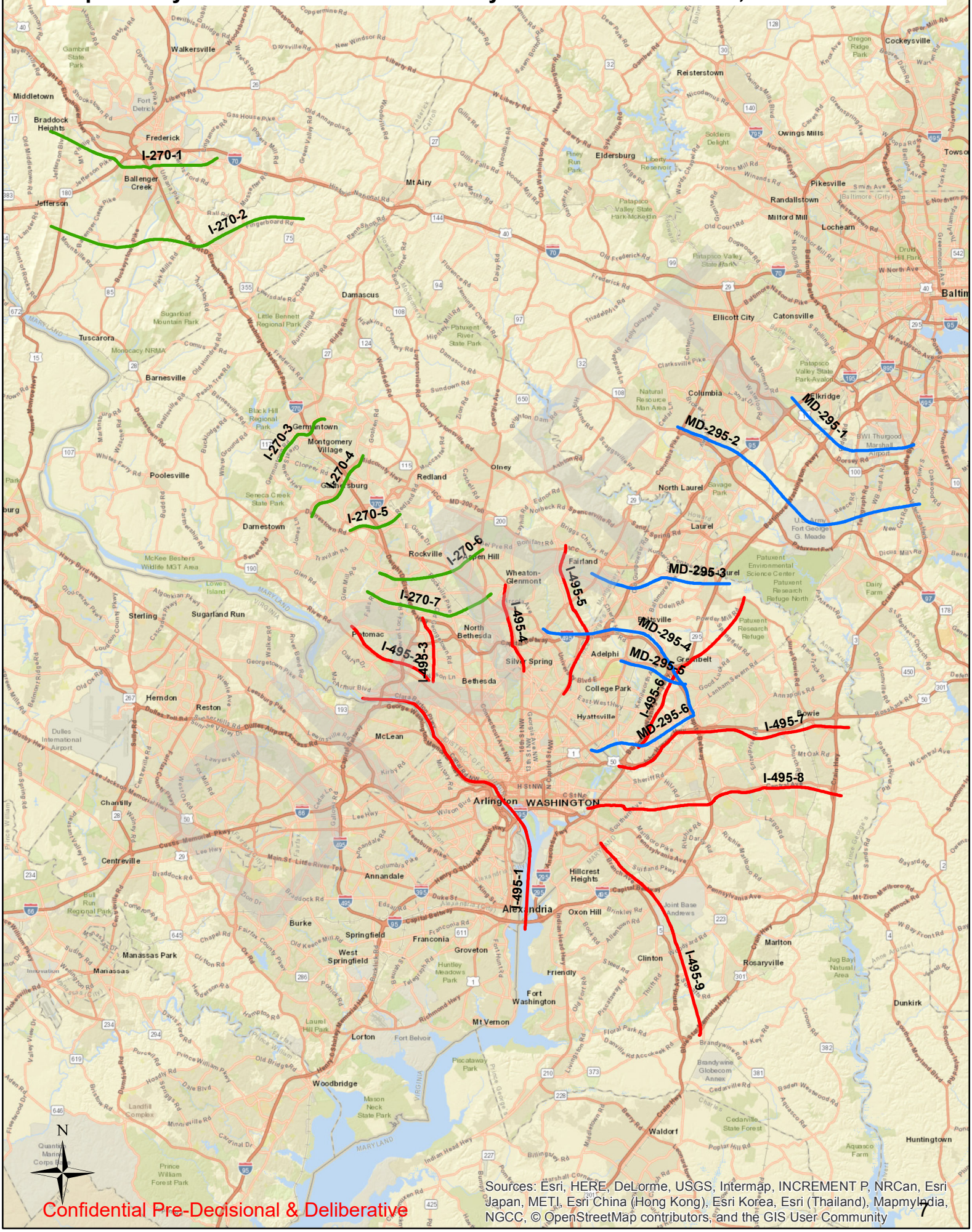
I-270-1
I-270-2
I-270-3
I-270-4
I-270-5
I-270-6
I-270-7
I-495-1
I-495-2
I-495-3
I-495-4
I-495-5
I-495-6
I-495-7
I-495-8
I-495-9
MD-295-1
MD-295-2
MD-295-3
MD-295-4
MD-295-5
MD-295-6
WASHINGTON
Arlington
Alexandria
Bethesda
Silver Spring
College Park
Rockville
Germantown
Gaithersburg
Frederick
Columbia
Laurel
Fairland
Wheaton-Glenmont
North Bethesda
Adelphi
Greenbelt
Bowie
Hyattsville
Tysons
McLean
Reston
Herndon
Chantilly
Centreville
Manassas
Manassas Park
Woodbridge
Annandale
Springfield
Franconia
Burke
Hillcrest Heights
Oxon Hill
Fort Washington
Mt Vernon
Lorton
Fort Belvoir
Waldorf
Clinton
Marlton
Rosaryville
Dunkirk
Huntingtown
Damascus
Olney
Redland
Darnestown
Poolesville
Barnesville
Tuscarora
Mt Airy
Middletown
Braddock Heights
Walkersville
Ellicott City
Catonsville
Columbia
North Laurel
Savage
Elkridge
Baltimore
Owings Mills
Reisterstown
Cockeysville
Lochearn
Randallstown
Pikesville
Milford Mill
Eldersburg
Sterling
Sugarland Run
Potomac
Dulles International Airport
Mason Neck State Park
Piscataway Park
Joint Base Andrews
Brandywine Globecom Annex
Cedarville State Forest
Patuxent Research Refuge
Patuxent Environmental Science Center
Patuxent Research Refuge North
Fort George G. Meade
BWI Thurgood Marshall Airport
Patapsco Valley State Park-Avalon
Patapsco Valley State Park-McKeldin
Liberty Reservoir
Soldiers Delight
Piney Run Park
Natural Resource Man Area
Seneca Creek State Park
Sugarloaf Mountain Park
Little Bennett Regional Park
Black Hill Regional Park
Patuxent River State Park
Monocacy NRMA
McKee Beshers Wildlife MGT Area
Bull Run Regional Park
Prince William Forest Park
Gambrill State Park
Jefferson
Ballenger Creek
Hillcrest Heights
Mt Oak Rd
Mt Zion Marlboro Rd
Dunkirk
Huntingtown
Aquasco Farm
Waldorf
Marlton
Rosaryville
Clinton
Friendly
Oxon Hill
Hillcrest Heights
Fort Washington
Mt Vernon
Lorton
Fort Belvoir
Woodbridge
Dumfries
Quantico Marine Corps Base
Landfill Complex
Prince William Forest Park
Mason Neck State Park
Piscataway Park
Joint Base Andrews
Brandywine Globecom Annex
Cedarville State Forest
Aquasco Farm
Huntingtown
Dunkirk
Rosaryville
Marlton
Clinton
Waldorf
Bowie
Greenbelt
Adelphi
Silver Spring
Bethesda
College Park
Hyattsville
North Bethesda
Wheaton-Glenmont
Fairland
Laurel
Columbia
Ellicott City
Catonsville
Elkridge
Baltimore
Owings Mills
Reisterstown
Cockeysville
Lochearn
Randallstown
Pikesville
Milford Mill
Eldersburg
Mt Airy
Damascus
Olney
Redland
Darnestown
Poolesville
Barnesville
Tuscarora
Middletown
Braddock Heights
Walkersville
Frederick
Jefferson
Ballenger Creek
Germantown
Montgomery Village
Gaithersburg
Rockville
Glen Echo
Sterling
Sugarland Run
Potomac
Herndon
Reston
Chantilly
Centreville
Manassas
Manassas Park
Woodbridge
Annandale
Springfield
Franconia
Burke
Alexandria
Arlington
WASHINGTON
McLean
Dulles International Airport
Bull Run Regional Park
Prince William Forest Park
Gambrill State Park
Sugarloaf Mountain Park
Little Bennett Regional Park
Black Hill Regional Park
Patuxent River State Park
Monocacy NRMA
McKee Beshers Wildlife MGT Area
Seneca Creek State Park
Patapsco Valley State Park-McKeldin
Liberty Reservoir
Soldiers Delight
Piney Run Park
Natural Resource Man Area
Patapsco Valley State Park-Avalon
Patuxent Environmental Science Center
Patuxent Research Refuge
Patuxent Research Refuge North
Fort George G. Meade
BWI Thurgood Marshall Airport

Table 1. 2016 Validation versus 2040 Alternative 1/True No Build Simulated AAWDT Volumes* by Screenline

Screenline ID	Location	2016	2040 Alt 1	Difference	% Difference
I-270-1	South of I-70	308,868	389,806	80,938	26%
I-270-2	North of Fingerboard Rd	207,178	247,339	40,161	19%
I-270-3	South of Germantown Rd	249,901	270,202	20,301	8%
I-270-4	South of Quince Orchard Rd	363,164	427,742	64,578	18%
I-270-5	South of I-370	363,635	423,624	59,989	16%
I-270-6	North of Montrose Rd	530,793	588,394	57,601	11%
I-270-7	North of the Spurs	535,025	604,483	69,458	13%
I-495-1	Potomac River	935,888	1,054,571	118,683	13%
I-495-2	North of River Rd	378,771	417,362	38,591	10%
I-495-3	Between the Spurs	348,761	376,816	28,055	8%
I-495-4	West of Georgia Ave	502,311	538,443	36,132	7%
I-495-5	East of New Hampshire Ave	620,271	671,641	51,370	8%
I-495-6	East of Baltimore Washington Pkwy	411,210	448,946	37,736	9%
I-495-7	South of US 50	594,225	660,440	66,215	11%
I-495-8	South of Central Ave	557,193	614,266	57,073	10%
I-495-9	East of Branch Ave	326,756	379,544	52,788	16%
MD-295-1	North of Dorsey Rd	567,461	645,621	78,160	14%
MD-295-2	North of Patuxent Pkwy	806,565	921,108	114,543	14%
MD-295-3	South of ICC	581,458	651,186	69,728	12%
MD-295-4	North of Capital Beltway	778,382	842,627	64,245	8%
MD-295-5	South of University Blvd	367,867	395,368	27,501	7%
MD-295-6	North of US 50	453,955	483,122	29,167	6%

Note: * All links on the screenlines are included.

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Table 2a. 2016 vs. 2040 Alt 1 Simulated AAWDT Volumes by Facility for I-270 Screenlines

Screenline I-270-1

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Jefferson Blvd	924	1,498	574	62%
2	Old Swimming Pool Rd	928	1,553	625	67%
3	Jefferson Pike	3,284	7,046	3,762	115%
4	US-15	91,962	113,502	21,540	23%
5	Balenger Creek Pike	9,727	11,456	1,729	18%
6	New Design Rd	19,136	21,862	2,726	14%
7	I-270	140,948	169,723	28,775	20%
8	Buckeystown Pike	21,490	33,024	11,534	54%
9	Urbana Pike	12,712	17,517	4,805	38%
10	Reichs Ford Rd	3,119	4,452	1,333	43%
11	Old National Pike	4,638	8,172	3,534	76%
	Subtotal*	308,868	389,806	80,938	26%

Screenline I-270-2

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Catoctin Mountain Hwy	29,767	32,326	2,559	9%
2	Ballenger Creek Pike	3,991	5,998	2,007	50%
3	New Design Rd	2,970	5,309	2,339	79%
4	Buckeystown Pike	10,242	15,558	5,316	52%
5	Park Mills Rd	2,708	4,117	1,409	52%
6	I-270	117,287	131,876	14,589	12%
7	Urbana Pike	9,444	9,965	521	6%
8	Sugarloaf Pkwy	702	882	180	26%
9	Ijamsville Rd	8,259	15,107	6,848	83%
10	Ed McClain Rd	4,222	7,263	3,041	72%
11	Green Valley Rd	17,586	18,938	1,352	8%
	Subtotal*	207,178	247,339	40,161	19%

Screenline I-270-3

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Clopper Rd	26,008	21,257	-4,751	-18%
2	Wisteria Dr	394	975	581	147%
3	Middlebrook Rd	17,162	32,709	15,547	91%
4	I-270	158,538	178,758	20,220	13%
5	Frederick Rd	47,799	36,503	-11,296	-24%
	Subtotal*	249,901	270,202	20,301	8%

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Screenline I-270-4

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Darnestown Rd	33,296	31,186	-2,110	-6%
2	Great Seneca Hwy	31,364	35,414	4,050	13%
3	West Diamond Ave	35,977	35,201	-776	-2%
4	I-270	210,107	254,437	44,330	21%
5	North Frederick Ave	32,181	36,720	4,539	14%
6	Lost Knife Rd	3,791	3,476	-315	-8%
7	Midcounty Hwy	16,448	31,307	14,859	90%
	Subtotal*	363,164	427,742	64,578	18%

Screenline I-270-5

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Great Seneca Hwy	26,107	25,013	-1,094	-4%
2	Omega Rd	6,779	12,641	5,862	86%
3	Shady Grove Rd	34,449	34,221	-228	-1%
4	I-270	247,714	293,859	46,145	19%
5	Piccard Dr	7,442	9,513	2,071	28%
6	Gaither Rd	6,646	8,930	2,284	34%
7	Grand Champion Dr	741	1,101	360	49%
8	Frederick Rd	33,757	38,346	4,589	14%
	Subtotal*	363,635	423,624	59,989	16%

Screenline I-270-6

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Falls Rd	18,481	19,251	770	4%
2	Seven Locks Rd	28,829	31,197	2,368	8%
3	I-270	291,427	335,117	43,690	15%
4	Tower Oaks Blvd	11,772	14,748	2,976	25%
5	Rockville Pike	42,255	49,314	7,059	17%
6	Twinbrook Pkwy	24,633	23,963	-670	-3%
7	Veirs Mill Rd	48,481	41,768	-6,713	-14%
8	Bauer Dr	3,574	4,764	1,190	33%
9	Georgia Ave	61,341	68,274	6,933	11%
	Subtotal*	530,793	588,394	57,601	11%

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Screenline I-270-7

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Falls Rd	23,256	24,459	1,203	5%
2	Seven Locks Rd	20,802	20,330	-472	-2%
3	I-270	293,792	335,698	41,906	14%
4	Old Georgetown Rd	38,956	49,086	10,130	26%
5	Rockville Pike	50,980	61,394	10,414	20%
6	Connecticut Ave	57,626	59,819	2,193	4%
7	Veirs Mill Rd	49,613	53,697	4,084	8%
	Subtotal*	535,025	604,483	69,458	13%

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Table 2b. 2016 vs. 2040 Alt 1 Simulated AAWDT Volumes by Facility for I-495 Screenlines

Screenline I-495-1

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	American Legion Bridge	282,575	320,989	38,414	14%
2	Chain Bridge	35,831	43,420	7,589	21%
3	Key Bridge	54,124	55,159	1,035	2%
4	Roosevelt Bridge	99,980	115,955	15,975	16%
5	Memorial Bridge	58,490	69,430	10,940	19%
6	14th Street Bridge	182,444	195,026	12,582	7%
7	Woodrow Wilson Bridge	222,444	254,592	32,148	14%
	Subtotal*	935,888	1,054,571	118,683	13%

Screenline I-495-2

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Falls Rd	16,675	19,348	2,673	16%
2	Bradley Blvd	10,447	11,600	1,153	11%
3	Seven Locks Rd	14,364	16,706	2,342	16%
4	Capital Beltway	317,153	344,957	27,804	9%
5	Burdette Rd	6,957	9,395	2,438	35%
6	Wilson La	13,175	15,356	2,181	17%
	Subtotal*	378,771	417,362	38,591	10%

Screenline I-495-3

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	I-270 East Spur	126,047	136,806	10,759	9%
2	Fernwood Rd	16,541	17,908	1,367	8%
3	Rockledge Dr	6,459	8,046	1,587	25%
4	Democracy Blvd	29,864	33,803	3,939	13%
5	Capital Beltway	139,201	146,814	7,613	5%
6	Greentree Rd	5,803	7,683	1,880	32%
7	Bradley Blvd	9,689	10,256	567	6%
8	Wilson La	15,157	15,500	343	2%
	Subtotal*	348,761	376,816	28,055	8%

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Screenline I-495-4

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Randolph Rd	53,714	60,658	6,944	13%
2	Lindell St	5,764	6,075	311	5%
3	West University Blvd	50,111	55,033	4,922	10%
4	Veirs Mill Rd	23,982	27,143	3,161	13%
5	Plyers Mill Rd	11,834	12,217	383	3%
6	Forest Glen Rd	7,619	8,263	644	8%
7	Capital Beltway	242,329	250,875	8,546	4%
8	Linden La	14,203	14,742	539	4%
9	16th St	22,993	28,159	5,166	22%
10	Spring St	11,561	13,047	1,486	13%
11	East West Hwy	37,311	38,973	1,662	4%
12	Colesville Rd	20,890	23,259	2,369	11%
	Subtotal*	502,311	538,443	36,132	7%

Screenline I-495-5

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	ICC	68,638	81,909	13,271	19%
2	Randolph Rd	41,547	45,633	4,086	10%
3	Columbia Pike	94,668	102,984	8,316	9%
4	Powder Mill Rd	10,920	10,981	61	1%
5	Capital Beltway	280,772	292,711	11,939	4%
6	Adelphi Rd	34,996	39,190	4,194	12%
7	Metzerott Rd	12,672	16,790	4,118	32%
8	Merrimac Dr	5,577	6,447	870	16%
9	University Blvd	41,134	40,393	-741	-2%
10	Erskine St	5,327	6,313	986	19%
11	East West Hwy	24,020	28,290	4,270	18%
	Subtotal*	620,271	671,641	51,370	8%

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Screenline I-495-6

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Cheverly Ave	4,351	4,693	342	8%
2	Landover Rd	43,350	47,412	4,062	9%
3	Annapolis Rd	21,925	24,139	2,214	10%
4	Veterans Pkwy	13,536	15,104	1,568	12%
5	Riverdale Rd	15,124	15,434	310	2%
6	Good Luck Rd	13,861	20,899	7,038	51%
7	Capital Beltway	200,117	212,342	12,225	6%
8	Greenbelt Rd	52,706	53,577	871	2%
9	Explorer Rd	6,098	6,940	842	14%
10	Soil Conservation Rd	5,768	8,024	2,256	39%
11	Springfield Rd	11,476	13,910	2,434	21%
12	Laurel Bowie Rd	22,898	26,472	3,574	16%
	Subtotal*	411,210	448,946	37,736	9%

Screenline I-495-7

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Kenilworth Ave	142,763	149,482	6,719	5%
2	Columbia Park Rd	8,991	13,467	4,476	50%
3	Landover Rd	40,781	46,833	6,052	15%
4	Veterans Pkwy	7,631	8,716	1,085	14%
5	Ardwick-Ardmore Rd	10,432	10,303	-129	-1%
6	Capital Beltway	224,762	240,128	15,366	7%
7	Whitfield Chapel Rd	5,326	7,303	1,977	37%
8	Martin Luther King Jr. Hwy	35,222	38,586	3,364	10%
9	Lottsford Vista Rd	8,797	13,560	4,763	54%
10	Enterprise Rd	13,062	15,021	1,959	15%
11	Church Rd	5,769	8,514	2,745	48%
12	Collington Rd	39,621	44,804	5,183	13%
13	Crain Hwy	51,068	63,723	12,655	25%
	Subtotal*	594,225	660,440	66,215	11%

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Screenline I-495-8

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Anacostia Fwy	80,120	78,339	-1,781	-2%
2	Minnesota St	23,542	22,061	-1,481	-6%
3	Ridge Rd SE	10,196	10,230	34	0%
4	Texas Ave SE	1,295	2,597	1,302	101%
5	Benning Rd SE	15,226	18,359	3,133	21%
6	F St SE	4,887	6,130	1,243	25%
7	Southern Ave SE	26,644	31,382	4,738	18%
8	Larchmont Ave	10,022	11,528	1,506	15%
9	Suffolk Ave	3,359	4,986	1,627	48%
10	Rollins Ave	1,464	3,588	2,124	145%
11	Addison Rd	18,029	22,323	4,294	24%
12	*Karen Blvd (Not Coded in 2016)*	*N/A*	*8,044*	*N/A*	*N/A*
13	Shady Glen Dr	11,719	10,662	-1,057	-9%
14	Ritchie Rd	18,853	22,544	3,691	20%
15	Capital Beltway	194,646	214,922	20,276	10%
16	Harry S Truman Dr	18,243	18,562	319	2%
17	Largo Rd	30,752	23,608	-7,144	-23%
18	Campus Way S	9,415	10,493	1,078	11%
19	Kettering Dr	5,687	8,412	2,725	48%
20	Watkins Park Dr	14,985	16,106	1,121	7%
21	Church Rd	3,555	7,234	3,679	103%
22	Crain Hwy	54,554	62,156	7,602	14%
	Subtotal*	557,193	614,266	57,073	10%

Screenline I-495-9

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Suitland Pkwy	19,064	21,959	2,895	15%
2	Silver Hill Rd	35,780	43,282	7,502	21%
3	Auth Rd	8,868	12,583	3,715	42%
4	*I-495 to Branch Ave. Metro Connection (New Facility)*	*N/A*	*4,305*	*N/A*	*N/A*
5	Capital Beltway	167,731	180,479	12,748	8%
6	Allentown Rd	30,137	41,675	11,538	38%
7	Old Alexander Ferry Rd	14,527	16,593	2,066	14%
8	Woodyard Rd	16,587	20,095	3,508	21%
9	Surratts Rd	2,656	3,405	749	28%
10	Dyson Rd	1,351	3,467	2,116	157%
11	Mattawoman Dr	835	2,309	1,474	177%
12	Crain Hwy	29,220	29,392	172	1%
	Subtotal*	326,756	379,544	52,788	16%

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Table 2c. 2016 vs. 2040 Alt 1 Simulated AAWDT Volumes by Facility for MD 295 Screenlines

Screenline MD-295-1

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	I-95	261,557	284,092	22,535	9%
2	Washington Blvd	42,076	47,165	5,089	12%
3	MD 295	92,585	106,492	13,907	15%
4	Aviation Blvd	30,216	42,147	11,931	39%
5	Aviation Ave	13,998	20,239	6,241	45%
6	I-97	127,029	145,486	18,457	15%
	Subtotal*	567,461	645,621	78,160	14%

Screenline MD-295-2

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Columbia Pike	113,681	124,981	11,300	10%
2	Broken Land Pkwy	38,247	49,628	11,381	30%
3	I-95	275,040	293,151	18,111	7%
4	Washington Blvd	44,416	43,040	-1,376	-3%
5	Brock Bridge Rd	7,323	9,152	1,829	25%
6	MD 295	107,288	119,185	11,897	11%
7	Annapolis Rd	16,755	53,827	37,072	221%
8	Telegraph Rd	35,271	36,909	1,638	5%
9	Clark Station Rd	6,027	7,872	1,845	31%
10	New Cut Rd	15,213	19,213	4,000	26%
11	I-97	147,304	164,150	16,846	11%
	Subtotal*	806,565	921,108	114,543	14%

Screenline MD-295-3

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Columbia Pike	100,131	106,551	6,420	6%
2	I-95	246,573	261,824	15,251	6%
3	Old Gunpowder Rd	18,846	30,414	11,568	61%
4	Virginia Manor Rd	15,538	17,044	1,506	10%
5	Baltimore Ave	44,602	48,945	4,343	10%
6	*Old Baltimore Pike Extended (New Facility)*	*N/A*	*6,390*	*N/A*	*N/A*
7	Montpelier Dr	7,098	8,382	1,284	18%
8	Muirkirk Rd	9,646	11,506	1,860	19%
9	Laurel Bowie Rd	43,785	51,535	7,750	18%
10	MD 295	95,239	108,596	13,357	14%
	Subtotal*	581,458	651,186	69,728	12%

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Screenline MD-295-4

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Columbia Pike	91,472	97,871	6,399	7%
2	New Hampshire Ave	85,273	87,786	2,513	3%
3	Riggs Rd	14,910	16,611	1,701	11%
4	Cherry Hill Rd	19,613	34,986	15,373	78%
5	I-95	245,573	259,564	13,991	6%
6	Sellman Rd	2,088	2,676	588	28%
7	Baltimore Ave	64,308	67,567	3,259	5%
8	Rhode Island Ave	4,942	8,626	3,684	75%
9	Cherrywood La	10,236	10,191	-45	0%
10	Kenilworth Ave	31,675	35,556	3,881	12%
11	Greenbelt Rd	41,038	41,461	423	1%
12	MD 295	105,196	109,023	3,827	4%
13	Good Luck Rd	13,599	20,439	6,840	50%
14	Annapolis Rd	48,459	50,269	1,810	4%
	Subtotal*	778,382	842,627	64,245	8%

Screenline MD-295-5

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Baltimore Ave	51,194	54,756	3,562	7%
2	Kenilworth Ave	27,678	31,358	3,680	13%
3	MD 295	88,878	96,911	8,033	9%
4	Capital Beltway	200,117	212,342	12,225	6%
	Subtotal*	367,867	395,368	27,501	7%

Screenline MD-295-6

Sequence	Facility	2016	2040 Alt 1	Difference	% Diff.
1	Bladenburg Rd	23,943	23,317	-626	-3%
2	Kenilworth Ave	38,037	40,365	2,328	6%
3	MD 295	101,045	111,094	10,049	10%
4	Cheverly Ave	4,351	4,693	342	8%
5	Landover Rd	43,350	47,412	4,062	9%
6	Cooper Lane	4,993	5,643	650	13%
7	Veterans Pkwy	25,671	28,549	2,878	11%
8	Capital Beltway	212,565	222,048	9,483	4%
	Subtotal*	453,955	483,122	29,167	6%

Note: * All links on the screenlines are included.

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Table 3a. Simulated AAWDT Volumes on I-270; 2016 Validation vs. 2040 Alt 1/True No Build

Sequence	Location	2016	2040 Alt 1	Difference	% Diff.
1	IS270-.40 MI S OF NEW DESIGN RD	140,948	169,723	28,775	20%
2	IS270-.20 MI S OF BAKER VALLEY RD	117,287	131,876	14,589	12%
3	IS270-50ft S OF FREDERICK CO/L	124,562	141,024	16,461	13%
4	IS270-.50 MI N OF MD121	127,837	143,187	15,350	12%
5	IS 270 South of MD 121 (ATR#04)	141,566	164,758	23,192	16%
6	IS270-.40 MI N OF MD118	147,808	168,437	20,629	14%
7	IS270-.30 MI S OF MD118	158,538	178,758	20,220	13%
8	IS270-.50 MI S OF MIDDLEBROOK RD	190,777	207,582	16,805	9%
9	IS270-.30 MI S OF MD124	210,107	254,437	44,330	21%
10	IS270-.50 MI N OF IS370	237,465	280,686	43,221	18%
11	IS270-.30 MI N OF SHADY GROVE RD	231,337	280,853	49,516	21%
12	IS270-.50 MI N OF MD28	247,714	293,859	46,146	19%
13	IS270-.30 MI S OF MD28	287,651	330,549	42,898	15%
14	IS270-.30 MI N OF MD927 (MONTROSE RD)	291,427	335,117	43,689	15%
15	IS270-.10 MI N OF TUCKERMAN LA	293,792	335,698	41,907	14%
16	IS270Y-.30 MI N OF WESTLAKE TERR	167,745	198,893	31,148	19%
17	IS270Y-.40 MI S OF DEMOCRACY BLVD	177,952	198,143	20,191	11%
18	IS270-.30 MI N OF MD187B	126,047	136,806	10,759	9%
19	IS270-.10 MI S OF MD187	105,487	114,495	9,008	9%

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Table 3b. Simulated AAWDT Volumes on Capital Beltway; 2016 Validation vs. 2040 Alt 1/True No Build

Sequence	Location	2016	2040 Alt 1	Difference	% Diff.
1	IS495-.10 MI E OF PERSIMMON TREE RD	239,294	264,080	24,786	10%
2	IS495-.70 MI N OF MD190	317,153	344,957	27,804	9%
3	IS495-.50 MI W OF MD187	139,201	146,814	7,613	5%
4	IS495-.30 MI E OF MD187	134,833	142,380	7,547	6%
5	IS495-.20 MI E OF MD355	244,879	256,442	11,563	5%
6	IS495-.80 MI W OF MD97	242,329	250,875	8,545	4%
7	IS495-.20 MI E OF MD97	234,955	241,649	6,694	3%
8	IS495-.20 MI E OF US29	225,967	235,021	9,053	4%
9	IS 495 West of MD 650 (ATR#41)	237,779	253,528	15,749	7%
10	IS495-.10 MI W OF MD212	280,772	292,711	11,939	4%
11	IS95-.30 MI N OF US1	227,076	241,866	14,790	7%
12	IS95-.40 MI S OF US1	201,338	215,856	14,518	7%
13	IS95-.30 MI N OF MD201	191,155	204,455	13,300	7%
14	IS95-.30 MI S OF MD201	199,218	212,579	13,361	7%
15	IS 95 North of Good Luck Rd (ATR#55)	200,117	212,342	12,225	6%
16	IS95-.60 MI N OF IS595/US50	212,565	222,048	9,483	4%
17	IS95-.10 MI S OF MD704	224,762	240,128	15,367	7%
18	IS95-.40 MI S OF MD202	214,610	228,942	14,332	7%
19	IS 95 South of MD 214 (ATR#43)	194,646	214,922	20,276	10%
20	IS95-.50 MI N OF MD4	193,249	210,845	17,596	9%
21	IS95-.40 MI S OF MD4	176,319	200,506	24,187	14%
22	IS95-.40 MI N OF MD5	167,731	180,479	12,749	8%
23	IS 95 at Temple Hill Rd (ATR#49)	149,136	170,533	21,397	14%
24	IS95-.40 MI S OF MD414	148,784	172,622	23,837	16%
25	IS95-.30 MI S OF MD210	172,551	202,714	30,163	17%
26	IS95-.50 MI N OF VIRGINIA ST/L	222,444	254,592	32,149	14%

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Table 3c. Simulated AAWDT Volumes on MD 295; 2016 Validation vs. 2040 Alt 1/True No Build

Sequence	Location	2016	2040 Alt 1	Difference	% Diff.
1	MD295-.10 MI S OF BALTIMORE CO/L	84,912	102,907	17,995	21%
2	MD295-.20 MI S OF IS695	73,695	82,356	8,661	12%
3	MD295-.60 MI N OF IS195	74,891	82,372	7,481	10%
4	MD295-.30 MI N OF MD100	92,585	106,492	13,907	15%
5	MD295-.60 MI S OF MD100	103,443	122,722	19,279	19%
6	MD295-.25 MI S OF MD175	107,288	119,185	11,897	11%
7	MD295-.50 MI S OF MD32	115,358	120,412	5,054	4%
8	MD295-.30 MI N OF MD197	95,239	108,596	13,357	14%
9	MD295-.60 MI S OF MD197	105,206	114,712	9,505	9%
10	MD295-.40 MI N OF MD193	91,028	97,096	6,069	7%
11	MD295-.30 MI N OF IS95	105,196	109,023	3,827	4%
12	MD295-.30 MI S OF IS95	88,878	96,911	8,034	9%
13	MD295-.20 MI N OF MD450	90,848	96,620	5,772	6%
14	MD295-.20 MI N OF MD202	101,312	109,058	7,746	8%
15	MD295-.50 MI N OF US50	101,045	111,094	10,049	10%

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National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Carole Delion, Lisa Shemer, Subrat Mahapatra, MD SHA, Kari Snyder, MDOT

FROM: Dusan Vuksan, Feng Xie, Yu Gao, TPB Staff

SUBJECT: Summary of Findings for the Traffic Relief Plan Study based on the Regional Travel Demand Modeling Process

DATE: August 16, 2018

CC: Tim Canan, Ron Milone, Anant Choudhary, TPB Staff

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1. INTRODUCTION

The Maryland State Highway Administration (SHA) has requested Transportation Planning Board (TPB) staff assistance in preparing travel demand forecasts for different future alternatives and strategies for Maryland's Traffic Relief Plan Study (TRP). The study is assessing the impacts of addition of dynamically-priced electronic toll lanes (ETLs) on I-270, Capital Beltway (I-495) and MD-295. It is being led by SHA with consulting support from multiple firms. TPB staff work was funded by the Maryland portion of the state Technical Assistance Program within the Unified Planning Work Program (UPWP). This draft technical memorandum documents the work activity undertaken by TPB staff in support of the study during the fiscal year 2018 (July 1, 2017 through June 30, 2018).

The regional travel demand modeling documented in this memorandum is one of several steps in the evaluation of alternatives, and the data generated by TPB staff will be refined further using additional data sources and techniques (i.e., volume refinement, microsimulation, etc.). As such, this memorandum is not prescriptive and does not recommend any specific alternative(s).

MEMORANDUM STRUCTURE

The primary goal of the memorandum is to document the completed technical work by TPB staff for the first phase of the study in FY 2018.

This technical memorandum is arranged in three sections along with appendices:

1. Introduction
2. Model Validation (2016)
3. Alternatives Assumptions and Analysis (2040)

Appendix A (Focused Study Area Summaries)
Appendix B (Detailed Screenline Summaries)

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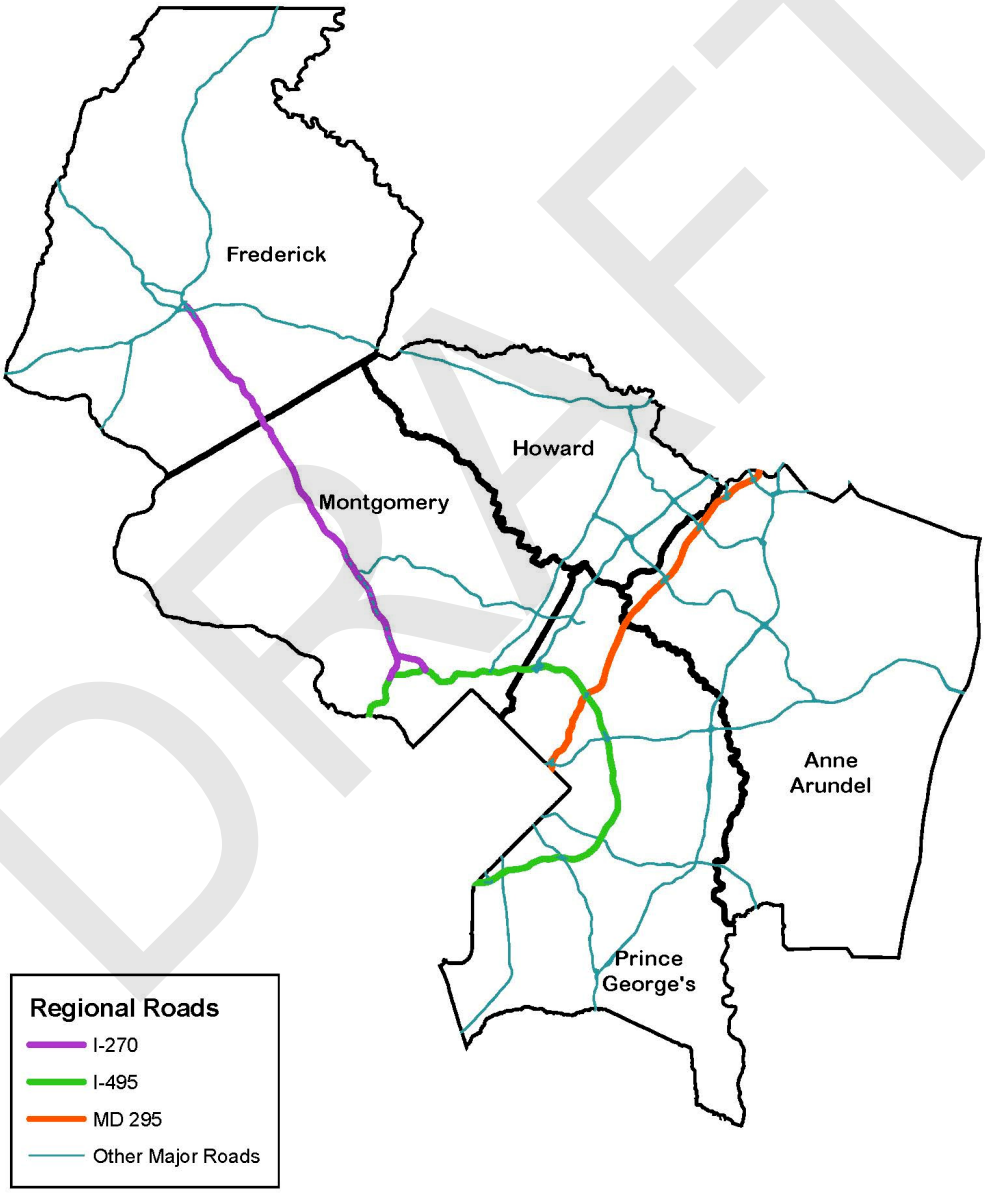
STUDY AREA DEFINITION

The geographic scope of the project is exceptionally large in relation to most project planning studies that are typically undertaken by TPB staff. It spans five of the major suburban Maryland jurisdictions, including Prince George's, Montgomery, Frederick, Anne Arundel and Howard counties (Map 1).

Map 1. Traffic Relief Plan Study Area



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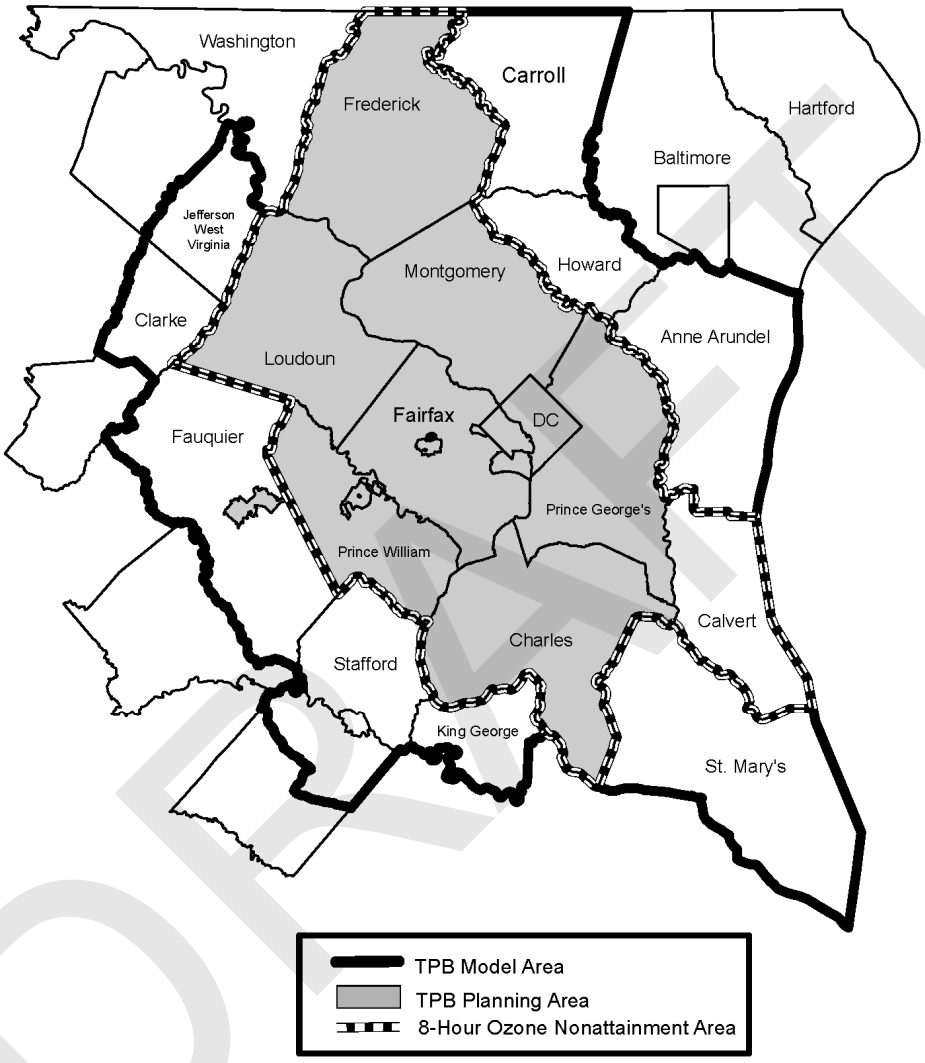
As a reference point, the TPB modeled area extends from West Virginia to the Chesapeake Bay, and from Pennsylvania to Spotsylvania County, Virginia (Map 2).

Map 2. TPB Modeled Area



Some of the analysis was also conducted using the three-county study area, or the "focused study area", which is limited to the pertinent TPB Planning Area jurisdictions impacted by at least one of the build alternatives. It therefore includes Montgomery, Prince George's and Frederick counties. The focused study area allows for additional examination of alternative-specific impacts for those alternatives that do not extend beyond the TPB Planning Area. The map of the "focused study area" and some of the trip-making statistics associated with it are included in Appendix A.

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REGIONAL MODELING TOOLS AND METHODS

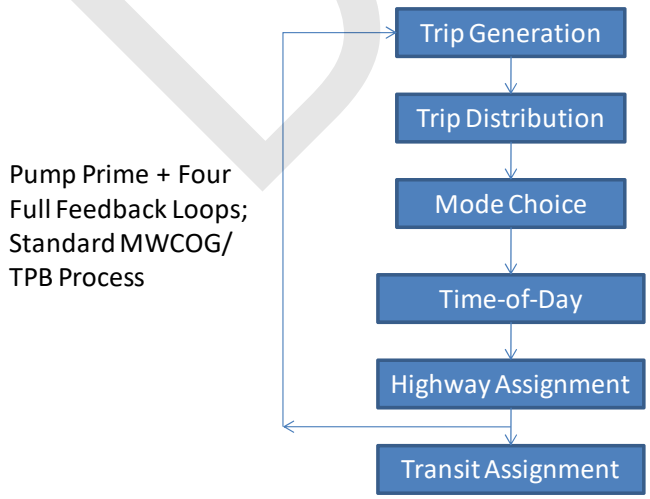
The TPB staff develops and maintains, with consultant assistance, a series of regional travel demand forecasting models that are used for the regional transportation planning process in the Washington, D.C. area. In this series of models, the most recent is the Version 2.3.70 travel demand model, which became official following TPB's approval of the planning assumptions and technical methods used to support the latest Air Quality Conformity (AQC) analysis on October 18, 2017 (also referred to as the Virginia Department of Transportation (VDOT) and the Maryland Department of Transportation (MDOT) off-cycle amendment to the 2016 Constrained Long-Range Plan).

Although Version 2.3.70 travel demand model is the official TPB "production model", it was only used as the starting point "base" model, but was subsequently revised to better represent dynamically-priced lanes that do not provide preferential treatment to high-occupancy vehicles (which are assumed in all build alternatives in this study). Essentially, to reflect this policy assumption, TPB staff removed the "HOV Skim Replacement" procedure from the modeling process, with the revised model no longer requiring the "base-run" modeling step for each analysis year. At the same time, the revised model still provides preferential treatment to the carpools on HOT lane facilities in Virginia, as HOV users of Virginia HOT lanes are able to access them free of charge. The resulting regional model used in preparation of the TRP model estimates by TPB staff for base-year validation and 2040 alternatives analysis is referred to as the Version 2.3.71 travel demand model.

The Version 2.3.71 travel demand model is therefore **not** an official model used in air quality conformity analysis, but it is a model that was specifically developed for modeling of the TRP alternatives. The new methods and features introduced in Version 2.3.71 are being incorporated into the next version of the official TPB model. Following the approval of TPB's current Long-Range Plan update called Visualize 2045 (scheduled for October 2018), an updated user's guide for the next official "conformity" model will be released.

Like its predecessors, the Version 2.3.71 model is a trip-based four step model with feedback loops to trip generation (Exhibit 1).

Exhibit 1. MWCOG / TPB Travel Demand Forecasting Process (Version 2.3.71)



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The Version 2.3 model was initially calibrated and validated to the 2007 conditions using an array of survey data[1], including:

- 2007/2008 Household Travel Survey,
- On-board transit surveys for 2007 and 2008,
- 2007 Highway Performance Monitoring System (HPMS) traffic count data,
- 2007 Air Passenger Survey, and
- 2007 American Community Survey (ACS).

The Version 2.3 travel demand model was subsequently re-validated at the regional level to the 2010 conditions using the following data sources[2]:

- 2010 Census,
- 2010 American Community Survey (ACS),
- 2010/11 TPB Geographically Focused Household Travel Survey (HTS),
- 2010 Highway Performance Monitoring Survey (HMPS) data, and
- 2010 Metrorail fare-gate counts.

The Version 2.3.71 model used in this study was validated in the study area to the 2016 conditions. Model estimates are based on the Round 9.0 Cooperative Forecasts and 2016 Constrained Long-Range Plan (CLRP), with some minor network modifications discussed in subsequent sections. Consistent with the regionally adopted modeling process at the time the work was being performed, the Metrorail constraint for trips to and through the region's core is assumed to more accurately reflect the assumed Metrorail carrying capacity in the future.

Finally, as with other project planning studies conducted in the region, upon completion of regional model runs, SHA and study team consultants plan to post-process the data to arrive at final volume, turning movement and speed estimates, which will be described in forthcoming documentation.

2. MODEL VALIDATION (2016)

The regional TPB model is mainly calibrated and validated to regional targets. However, this level of validation is usually not sufficient for project planning studies, which typically require some level of subarea validation. This step is needed to be able to evaluate model estimation against observed data for specific study areas that are typically significantly smaller than the modeled region. Model validation findings also often lead to input adjustments to improve the model performance.

Model validation for the Traffic Relief Study was conducted for the analysis year 2016. Staff mainly focused on the highway validation in the study area and used aerial photography to add network detail, and to revise the facility type and number of lanes network representation, where necessary.

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[1] MWCOG/TPB, "Calibration Report for the TPB Travel Forecasting Model, Version 2.3, on the 3,722-Zone Area System: Final Report", January 20, 2012, "https://www.mwcog.org/assets/1/28/v2.3_calibration_report_v141.pdf"
[2] Ron Milone, "2010 Validation of the Version 2.3 Travel Demand Model", MWCOG/TPB Memorandum, June 30, 2013, "https://www.mwcog.org/assets/1/28/2010_Validation_Memo_v3.pdf"

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As 2040 alternatives did not contain any new transit service beyond what was already assumed in the CLRP, transit validation was not conducted for this study.

It is important to note that even with all of the implemented network refinements, modeling results are still based on a regional travel demand model, and that it is recommended that the model output be further post-processed and refined.

MODEL VALIDATION RESULTS

Screenline volume model output was the main source of data used to validate the model to observed counts in the study area. A map of screenlines specially formulated for this particular study effort is provided on the following page (Map 3). A summary of observed and estimated volume comparisons at the screenline level of analysis is shown in Table 1. The Average Annual Weekday Daily Traffic (AAWDT) counts / observed data represent the 2015 conditions, as they were the most recent observed data available for analysis when the study began. Furthermore, any differences between the 2015 and 2016 observed traffic counts were considered inconsequential by the project team.

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Map 3. Screenlines for the Traffic Relief Plan

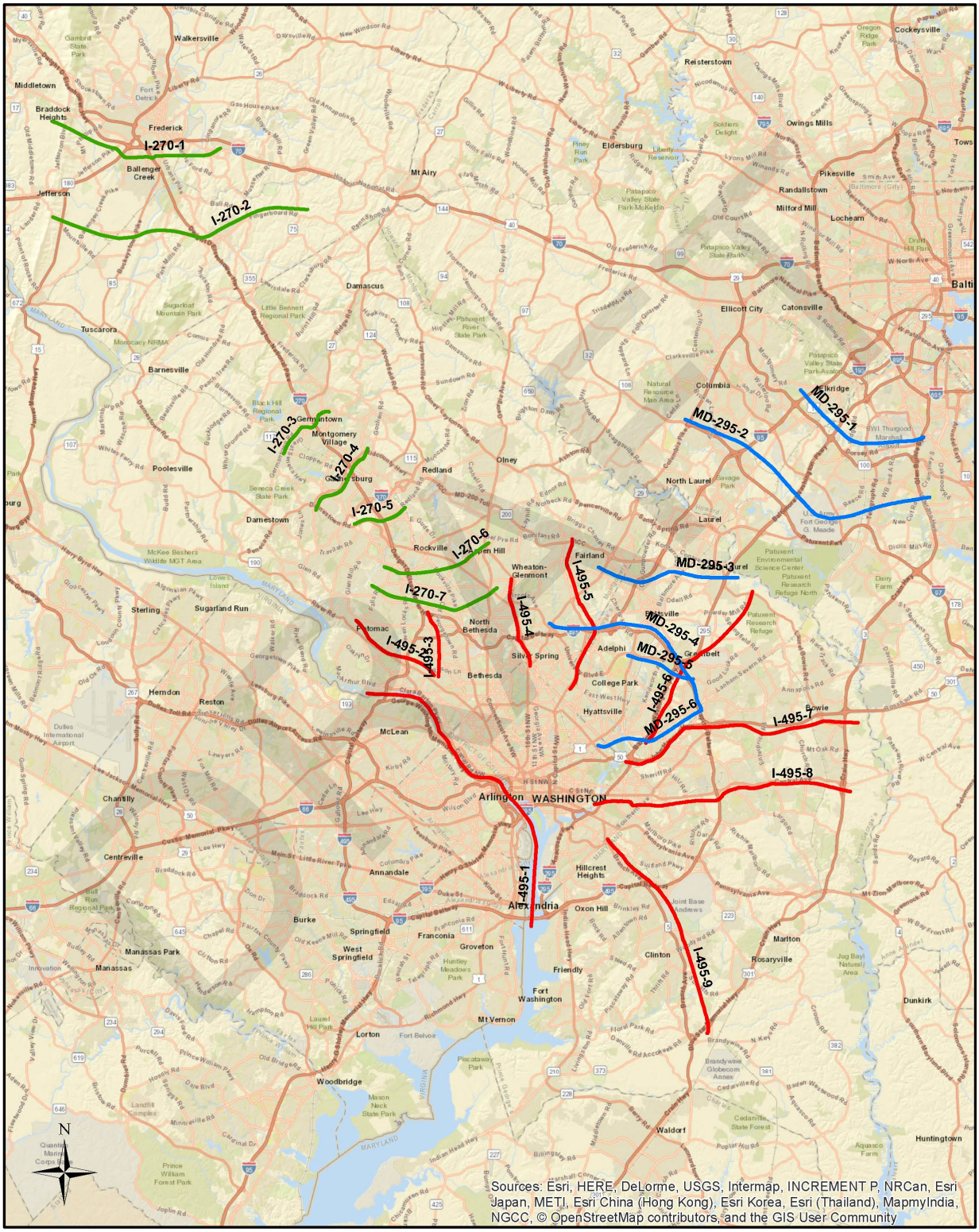

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Table 1. 2016 Validation: 2015 Observed versus 2016 Simulated AAWDT Volumes* by Screenline

Screenline ID	Location	Observed	Simulated	Difference	% Diff.
I-270-1	South of I-70	288,116	307,940	19,824	7%
I-270-2	North of Fingerboard Rd	138,134	184,326	46,192	33%
I-270-3	South of Germantown Rd	231,104	249,901	18,797	8%
I-270-4	South of Quince Orchard Rd	363,634	359,373	-4,261	-1%
I-270-5	South of I-370	338,752	342,027	3,275	1%
I-270-6	North of Montrose Rd	436,266	473,757	37,491	9%
I-270-7	North of the Spurs	425,466	475,267	49,801	12%
I-495-1	Potomac River	916,448	935,888	19,440	2%
I-495-2	North of River Rd	302,322	357,450	55,128	18%
I-495-3	Between the Spurs	294,286	319,958	25,672	9%
I-495-4	West of Georgia Ave	421,760	473,152	51,392	12%
I-495-5	East of New Hampshire Ave	485,514	550,779	65,265	13%
I-495-6	East of Baltimore Washington Pkwy	393,800	358,883	-34,917	-9%
I-495-7	South of US 50	612,422	546,973	-65,449	-11%
I-495-8	South of Central Ave	496,968	436,251	-60,717	-12%
I-495-9	East of Branch Ave	362,926	298,519	-64,407	-18%
MD-295-1	North of Dorsey Rd	507,576	567,461	59,885	12%
MD-295-2	North of Patuxent Pkwy	622,442	738,213	115,771	19%
MD-295-3	South of ICC	466,246	530,330	64,084	14%
MD-295-4	North of Capital Beltway	695,960	742,843	46,883	7%
MD-295-5	South of University Blvd	392,356	367,867	-24,489	-6%
MD-295-6	North of US 50	442,280	423,291	-18,989	-4%

Note: * Links with no count are excluded from screenline totals.

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Table 1 shows that all of the estimated screenline volumes are within ±20% of the observed counts, with the exception of Screenline I-270-2 (at 33%). In addition, some of the estimated volumes for the Capital Beltway screenlines are close to the 20% margin (e.g., Screenline I-495-2), but these regional model findings are in line with the model validation for the Capital Beltway PEL Study conducted in 2016 and 2017[3]. This margin of error is quite reasonable given the coarseness of the regional network coding and the expected margin of error in the land activity inputs at the TAZ level. More detailed screenline and link-level summaries are shown in Appendix B.

3. ALTERNATIVES ASSUMPTIONS AND ANALYSIS (2040)

Based on the guidance received from MD SHA and the project team, TPB staff prepared preliminary forecasts for the assigned alternatives.

The following 2040 scenarios have been modeled and analyzed by TPB staff:

1. Alternative 1 ("True" No Build),
2. Alternative 2,
3. Alternative 3, and
4. Alternative 4.

ALTERNATIVE 1 / NO BUILD

The main purpose of Alternative 1 / No Build in the context of this analysis is to serve as a baseline for comparison of build alternatives – i.e., alternative-specific assumptions for each scenario were incorporated into No Build networks to arrive at build alternatives. Alternative 1 itself was evaluated against 2016 Validation to assess the magnitude of traffic growth in the study area.

The highway network refinements that were implemented in the Model Validation base year networks were carried forward to the 2040 Alternative 1 / No Build networks as well. They include:

- Review and revisions of the number of lanes on I-495, I-270 and MD-295
- Review and revisions of coding of interchanges with access to/from I-495, I-270 and MD-295
- Additional refinements in the Fort Meade area (existing NSA interchange added)
- Decrease in highway capacity on MD-295 (degraded from freeway to expressway)

Given the project schedule-related time constraints, the refinements do **not** include:

- Revisions in external trips, which would mainly impact MD-295 and I-270
- Zone splits and centroid connector revisions (except for the Fort Meade area)
- Detailed review and revisions of coding of intersecting facilities

In addition to the network revisions of the existing facilities noted above that were first implemented in model validation, the following assumptions were used in Alternative 1 (also shown on Map 4):

[3] Dusan Vuksan and Yu Gao, "Summary of Findings for the Capital Beltway Planning Study for FY 2017 based on the Regional Travel Demand Modeling Process", MWCOG/TPB Technical Memorandum, June 29, 2017

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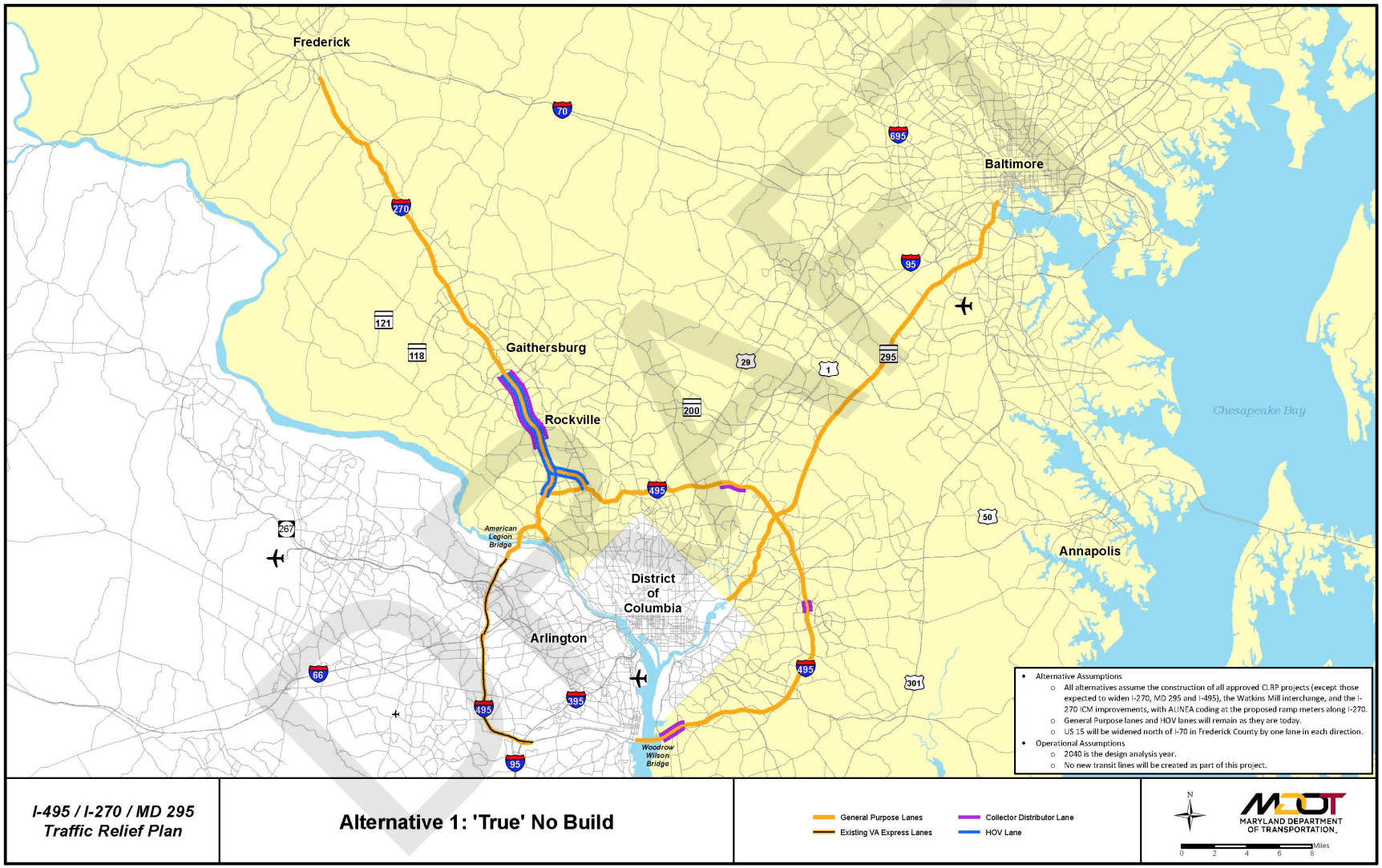
Map 4. Alternative 1 Lane Configuration



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- CLRP projects on I-270, Capital Beltway in Maryland and MD-295 are **not** included, except for:
  - I-270 Innovative Congestion Management improvements (some of which result in additional capacity through implementation of auxiliary lanes)
  - Watkins Mill Road Interchange (I-270)
  - Corridor Cities Transitway (near I-270) and other transit projects in the corridor
  - Greenbelt Metro Station access improvement (I-495)
- Virginia HOT Lanes terminate just to the north of Dulles Toll Road (same as today)
  - However, CLRP projects on the Capital Beltway general purpose lanes (GPLs) between Dulles Toll Road and the American Legion Bridge are included (additional capacity via auxiliary lanes)
- CLRP assumptions are assumed elsewhere in the region, including some of the roadways intersecting the three TRP facilities (e.g., US 15, I-70, etc.)
- Consistent with today's operations, trucks are not allowed on MD-295 south of MD-175 and Capital Beltway HOT lanes in Virginia

Table 2 shows differences between 2040 Alternative 1 and 2016 Model Validation estimated volumes at the screenline level (Map 3). Generally, more significant traffic volume growth (greater than 15%) can be observed in the areas of Maryland that are currently less developed and farther removed from the urban core (i.e., with more room for growth in the future). At the same time, lower volume growth between now and 2040 can be observed on the screenlines that encompass the more developed areas around the Beltway, including Bethesda, Silver Spring, Wheaton, College Park and New Carrollton (less than 10%). The screenline traffic volume growth is also influenced by any highway and transit capacity expansion on the screenline facilities (as assumed in the CLRP), and by addition of new projects that are in close proximity to the screenlines.

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Table 2. 2016 Validation versus 2040 Alternative 1/True No Build Simulated AAWDT Volumes* by Screenline

Screenline ID	Location	2016	2040 Alt. 1	Difference	% Diff.
I-270-1	South of I-70	308,868	389,806	80,938	26%
I-270-2	North of Fingerboard Rd	207,178	247,339	40,161	19%
I-270-3	South of Germantown Rd	249,901	270,202	20,301	8%
I-270-4	South of Quince Orchard Rd	363,164	427,742	64,578	18%
I-270-5	South of I-370	363,635	423,624	59,989	16%
I-270-6	North of Montrose Rd	530,793	588,394	57,601	11%
I-270-7	North of the Spurs	535,025	604,483	69,458	13%
I-495-1	Potomac River	935,888	1,054,571	118,683	13%
I-495-2	North of River Rd	378,771	417,362	38,591	10%
I-495-3	Between the Spurs	348,761	376,816	28,055	8%
I-495-4	West of Georgia Ave	502,311	538,443	36,132	7%
I-495-5	East of New Hampshire Ave	620,271	671,641	51,370	8%
I-495-6	East of Baltimore Washington Pkwy	411,210	448,946	37,736	9%
I-495-7	South of US 50	594,225	660,440	66,215	11%
I-495-8	South of Central Ave	557,193	614,266	57,073	10%
I-495-9	East of Branch Ave	326,756	379,544	52,788	16%
MD-295-1	North of Dorsey Rd	567,461	645,621	78,160	14%
MD-295-2	North of Patuxent Pkwy	806,565	921,108	114,543	14%
MD-295-3	South of ICC	581,458	651,186	69,728	12%
MD-295-4	North of Capital Beltway	778,382	842,627	64,245	8%
MD-295-5	South of University Blvd	367,867	395,368	27,501	7%
MD-295-6	North of US 50	453,955	483,122	29,167	6%

Note: * All links on the screenlines are included.

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ALTERNATIVE 2

Alternative 2 provides two dynamically-priced express toll lanes (ETLs) on the Capital Beltway and I-270 south of I-370.

In addition to the network revisions of the existing facilities and specific assumptions related to the CLRP projects discussed in Model Validation and Alternative 1 sections of this memorandum, Alternative 2 assumptions in relation to Alternative 1 (No Build) are provided below and on Map 5[4]:

- Two additional dynamically-priced lanes are added to Capital Beltway in Maryland (in each direction)
- One additional dynamically-priced lane is added and one HOV lane is converted to a dynamically-priced lane on I-270 and I-270 Spurs between I-495 and I-370 (in each direction)
- Dynamically-priced express toll lanes on I-270 and Capital Beltway in Maryland will operate 24 hours in all directions
- Two Virginia HOT Lanes are added between the current terminus of HOT lanes and the American Legion Bridge (in each direction)
- Direct access interchanges and slip ramps between general purpose lanes and electronic toll lanes are added at specific locations on I-270 and Capital Beltway (as shown on Map 5)
- All toll lane users pay toll in Maryland, while 3+ person carpools do not pay to use the HOT lanes in Virginia
- Trucks are allowed to use electronic toll lanes on I-270 and Capital Beltway in Maryland
- Consistent with today's operations, trucks are not allowed on MD-295 south of MD-175 and on Virginia HOT lanes

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[4] The alternative layout maps that are included throughout this memorandum were created by MDOT when the study began. Some of the assumptions have since evolved (e.g., truck use on Baltimore-Washington Parkway in Alternative 4), but the maps have not been updated. Therefore, the maps should be used as a general guide for layout of individual alternatives. The specific assumptions for each alternative are listed in the corresponding section of the memorandum.

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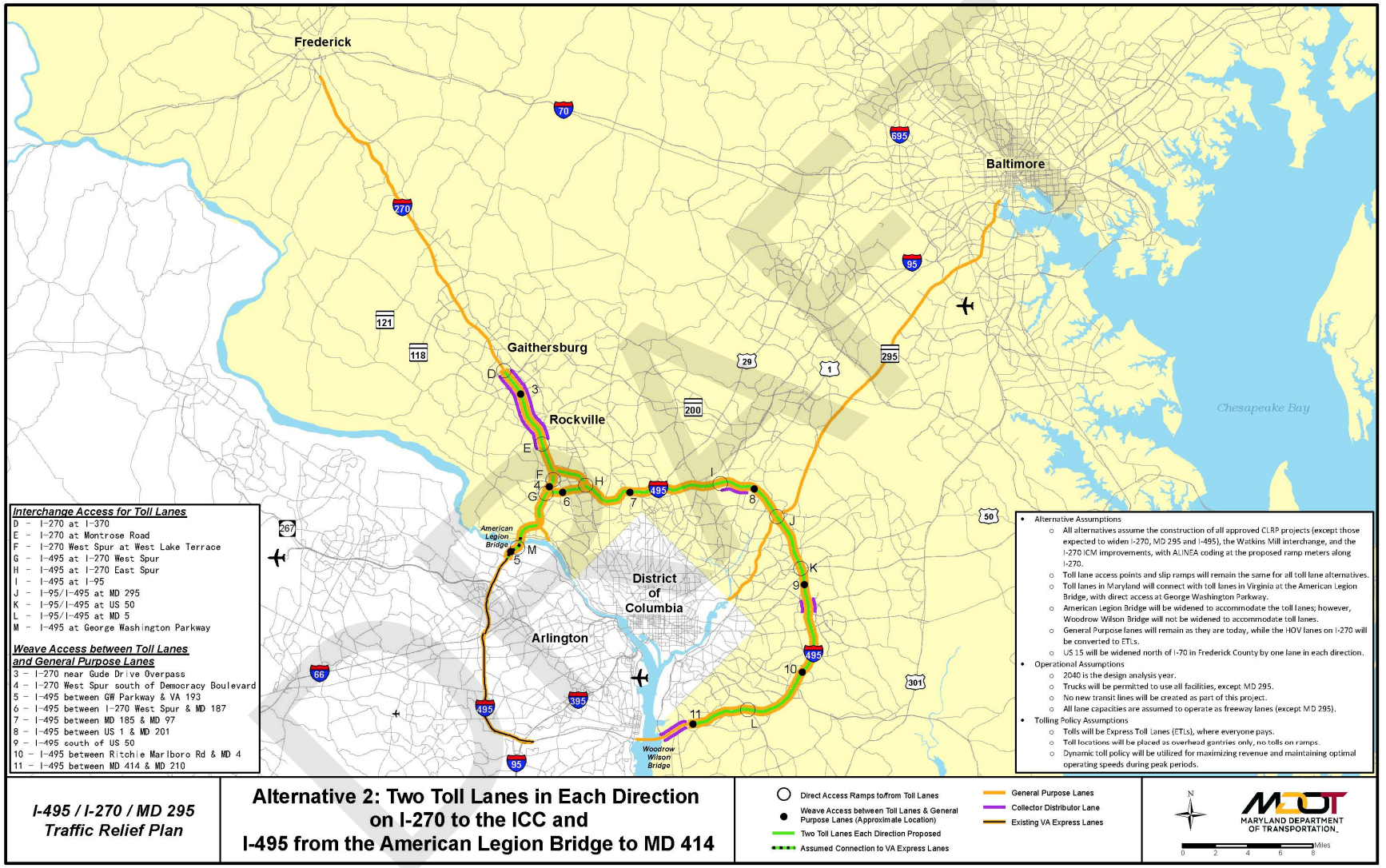
Map 5. Alternative 2 Lane Configuration



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ALTERNATIVE 3

Alternative 3 provides one dynamically-priced express toll lane on the Capital Beltway and I-270 south of I-370.

In addition to the network revisions of the existing facilities and specific assumptions related to the CLRP projects discussed in Model Validation and Alternative 1 sections of this memorandum, Alternative 3 assumptions in relation to Alternative 1 (No Build) are provided below and on Map 6:

- One additional dynamically-priced lane is added to Capital Beltway in Maryland (in each direction)
- One HOV lane is converted to a dynamically-priced lane on I-270 and I-270 Spurs between I-495 and I-370 (in each direction)
- Dynamically-priced express toll lanes on I-270 and Capital Beltway in Maryland will operate 24 hours in all directions
- Two Virginia HOT Lanes are added between the current terminus of HOT lanes and the American Legion Bridge (in each direction)
- Direct access interchanges and slip ramps between general purpose lanes and electronic toll lanes are added at specific locations on I-270 and Capital Beltway (as shown on Map 6)
- All toll lane users pay toll in Maryland, while 3+ person carpools do not pay to use the HOT lanes in Virginia
- Trucks are allowed to use electronic toll lanes on I-270 and Capital Beltway in Maryland
- Consistent with today's operations, trucks are not allowed on MD-295 south of MD-175 and on Virginia HOT lanes

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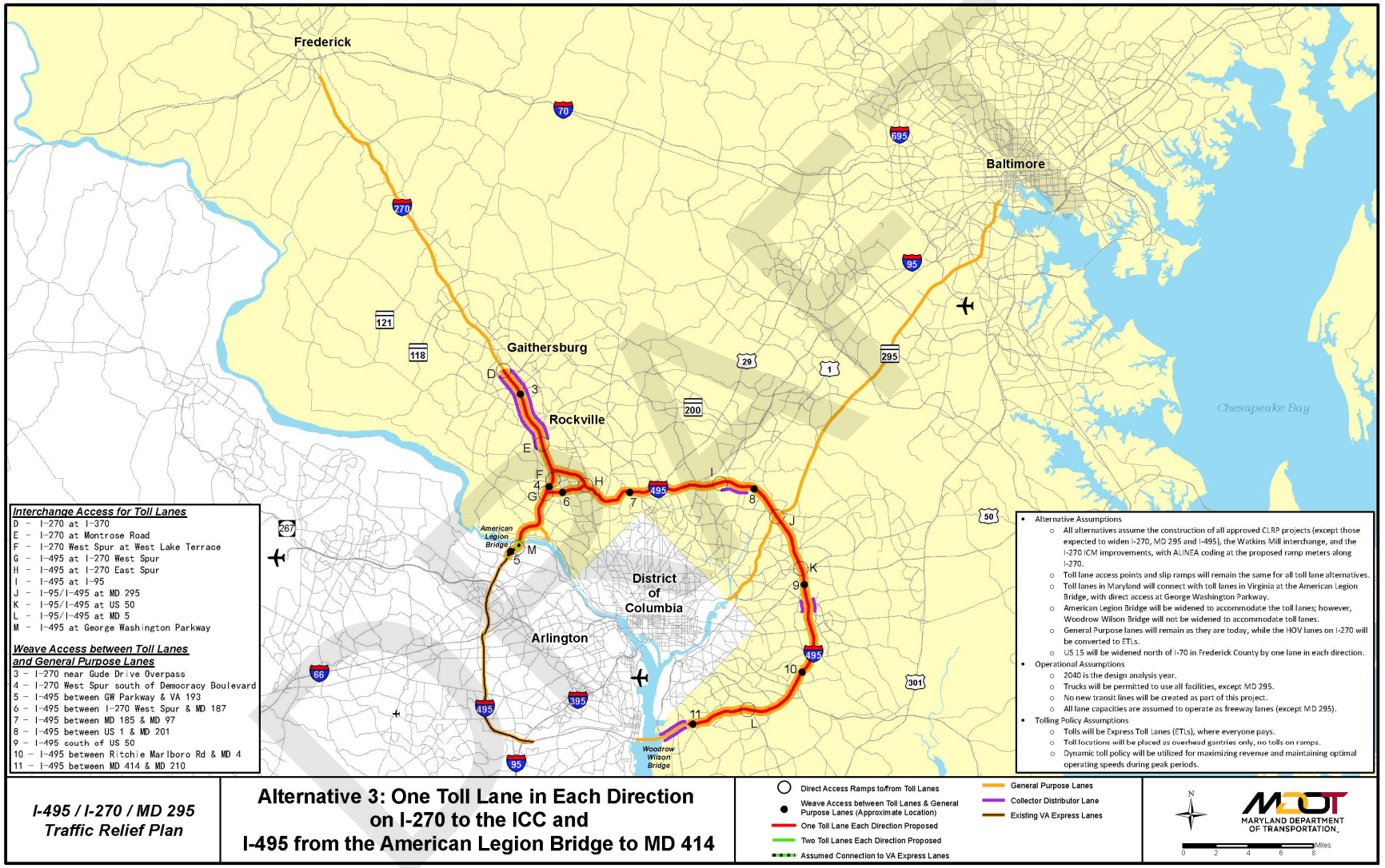
Map 6. Alternative 3 Lane Configuration



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ALTERNATIVE 4

Alternative 4 provides two dynamically-priced express toll lanes (ETLs) on the Capital Beltway, I-270 south of MD-85, and on MD-295 between the Baltimore Beltway and US 50.

In addition to the network revisions of the existing facilities and specific assumptions related to the CLRP projects discussed in Model Validation and Alternative 1 sections of this memorandum, Alternative 4 assumptions in relation to Alternative 1 (No Build) are provided below and on Map 7:

- Two additional dynamically-priced lanes are added to Capital Beltway in Maryland (in each direction)
- One additional dynamically-priced lane is added and one HOV lane is converted to a dynamically-priced lane on I-270 and I-270 Spurs between I-495 and I-370 (in each direction)
- Two additional dynamically-priced lanes are added on I-270 between I-370 and MD 85 (in each direction)[5]
- Two additional dynamically-priced lanes are added on MD-295 between I-695 and US 50 (in each direction)
- Dynamically-priced express toll lanes on I-270, Capital Beltway and MD-295 in Maryland will operate 24 hours in all directions
- Two Virginia HOT Lanes are added between the current terminus of HOT lanes and the American Legion Bridge (in each direction)
- Direct access interchanges and slip ramps between general purpose lanes and electronic toll lanes are added at specific locations on I-270, Capital Beltway and MD-295 (as shown on Map 7)
- All toll lane users pay toll in Maryland, while 3+ person carpools do not pay to use the HOT lanes in Virginia
- Trucks are allowed to use electronic toll lanes on I-270, Capital Beltway, and both the electronic toll lanes and general purpose lanes on MD-295 in Maryland
- Consistent with today's operations, trucks are not allowed on Virginia HOT lanes

[5] The HOV lane currently extends between I-370 and MD-121 in the northbound direction only. In this section of I-270, the HOV lane is converted to a managed lane, and one additional managed lane is added.

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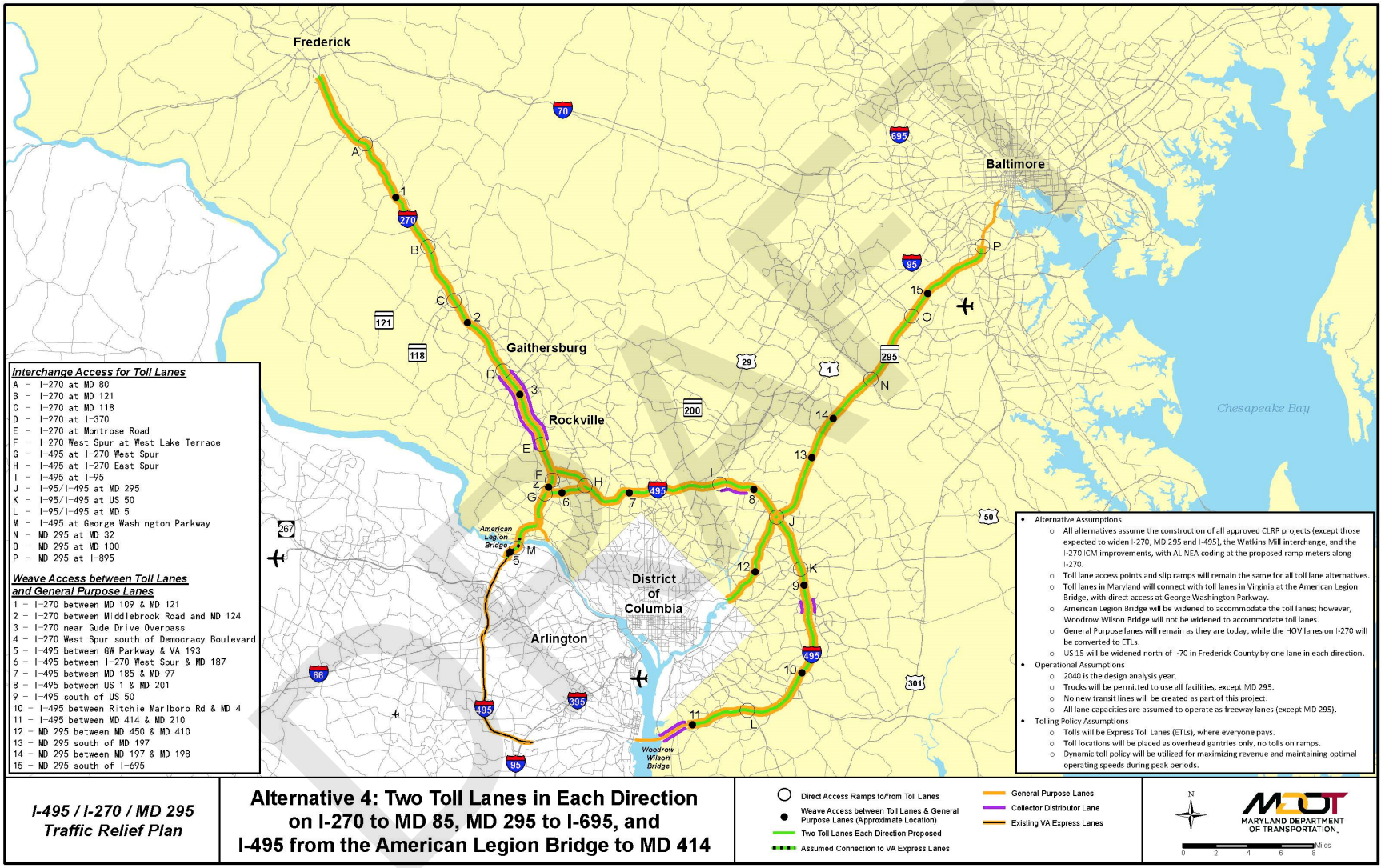
Map 7. Alternative 4 Lane Configuration



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ALTERNATIVES ANALYSIS BASED ON REGIONAL MODEL OUTPUT

The data generated by the regional model, such as traffic volume and speed estimates, will be superseded with study area-focused analysis that includes post-processing of volumes and traffic microsimulation. However, summaries and comparisons of findings created by the TPB modeling process are useful for quality assurance purposes and in providing general high-level trends related to the modeled alternatives. TPB staff has evaluated and reviewed screenline volumes, VMT and vehicle hours of delay in the study area, reliability and tolls.

TRAFFIC VOLUME ANALYSIS

With respect to average weekday daily vehicle volumes on the screenlines, build alternatives carry up to 15% more vehicles than No Build (Table 3) at selected locations. Alternative 3 shows the most modest changes in volumes, as I-270 assumptions for this alternative assume no new freeway capacity, but a managed lane conversion from HOV to ETL. Additional detailed screenline summaries, previously transmitted to SHA, are shown in Appendix B.

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Table 3a. 2040 No Build versus Build Alternatives; Simulated AAWDT Volumes* by Screenline

Screenline ID	Location	Alternative 1	Alternative 2	Alternative 3	Alternative 4
I-270-1	South of I-70	389,806	390,599	389,881	406,676
I-270-2	North of Fingerboard Rd	247,339	247,849	247,183	267,505
I-270-3	South of Germantown Rd	270,202	270,608	269,879	286,604
I-270-4	South of Quince Orchard Rd	427,742	427,549	425,688	439,835
I-270-5	South of I-370	423,624	430,071	418,117	430,972
I-270-6	North of Montrose Rd	588,394	589,498	577,086	588,655
I-270-7	North of the Spurs	604,483	608,216	593,208	607,807
I-495-1	Potomac River	1,054,571	1,080,947	1,075,592	1,084,039
I-495-2	North of River Rd	417,362	455,235	436,491	459,590
I-495-3	Between the Spurs	376,816	426,861	406,475	431,850
I-495-4	West of Georgia Ave	538,443	598,166	572,540	603,746
I-495-5	East of New Hampshire Ave	671,641	714,351	698,271	720,898
I-495-6	East of Baltimore Washington Pkwy	448,946	467,147	461,854	466,943
I-495-7	South of US 50	660,440	672,793	668,675	676,407
I-495-8	South of Central Ave	614,266	623,414	621,688	624,279
I-495-9	East of Branch Ave	379,544	387,415	386,122	387,694
MD-295-1	North of Dorsey Rd	645,621	646,630	646,202	664,135
MD-295-2	North of Patuxent Pkwy	921,108	921,840	921,324	943,408
MD-295-3	South of ICC	651,186	657,814	658,978	698,029
MD-295-4	North of Capital Beltway	842,627	858,680	857,276	885,880
MD-295-5	South of University Blvd	395,368	414,662	408,211	446,117
MD-295-6	North of US 50	483,122	496,917	492,032	512,887

Note: * All links on the screenlines are included.

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Table 3b. 2040 No Build versus Build Alternatives; Percent Differences in Simulated AAWDT Volumes* by Screenline Relative to No Build

Screenline ID	Location	Alternative 1	Alternative 2	Alternative 3	Alternative 4
I-270-1	South of I-70	N/A	0%	0%	4%
I-270-2	North of Fingerboard Rd	N/A	0%	0%	8%
I-270-3	South of Germantown Rd	N/A	0%	0%	6%
I-270-4	South of Quince Orchard Rd	N/A	0%	0%	3%
I-270-5	South of I-370	N/A	2%	-1%	2%
I-270-6	North of Montrose Rd	N/A	0%	-2%	0%
I-270-7	North of the Spurs	N/A	1%	-2%	1%
I-495-1	Potomac River	N/A	3%	2%	3%
I-495-2	North of River Rd	N/A	9%	5%	10%
I-495-3	Between the Spurs	N/A	13%	8%	15%
I-495-4	West of Georgia Ave	N/A	11%	6%	12%
I-495-5	East of New Hampshire Ave	N/A	6%	4%	7%
I-495-6	East of Baltimore Washington Pkwy	N/A	4%	3%	4%
I-495-7	South of US 50	N/A	2%	1%	2%
I-495-8	South of Central Ave	N/A	1%	1%	2%
I-495-9	East of Branch Ave	N/A	2%	2%	2%
MD-295-1	North of Dorsey Rd	N/A	0%	0%	3%
MD-295-2	North of Patuxent Pkwy	N/A	0%	0%	2%
MD-295-3	South of ICC	N/A	1%	1%	7%
MD-295-4	North of Capital Beltway	N/A	2%	2%	5%
MD-295-5	South of University Blvd	N/A	5%	3%	13%
MD-295-6	North of US 50	N/A	3%	2%	6%

Note: * All links on the screenlines are included.

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VEHICLE MILES TRAVELED AND VEHICLE HOURS OF DELAY

Vehicle miles traveled (VMT) and vehicle hours of delay (VHD) in the study area are useful measures in assessing how alternatives perform with respect to congestion. Table 4 indicates that each build alternative carries more vehicles but is less congested than Alternative 1 (No Build) in the study area (Map 1). With respect to relative assessment of alternatives against one another, it is important to note that finding a "perfect geography" to capture the full impact of alternative-specific inputs on delay for these types of scenarios can be challenging. With that in mind, the analysis shows that the alternatives with more significant expansion of the ETL system (i.e., Alternative 4 and Alternative 2) show the most significant increase in VMT and decrease in vehicle hours of delay for the study area.

Table 4a. Simulated Daily Vehicle Miles of Travel (VMT) and Vehicle Hours of Delay (VHD) in Study Area for 2040 Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VMT	95,187,180	96,009,424	95,688,684	96,627,050
VHD	1,644,916	1,577,494	1,612,378	1,326,958

Table 4b. Simulated Daily Vehicle Miles of Travel (VMT) and Vehicle Hours of Delay (VHD) in Study Area; % Differences Relative to Alternative 1 (No Build)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VMT	N/A	0.9%	0.5%	1.5%
VHD	N/A	-4.1%	-2.0%	-19.3%

PERSON MILES TRAVELED ON RELIABLE ROADWAYS

Table 5 provides comparisons of highway user reliability, using a newly developed measure that calculates percentages of person miles traveled on "reliable" roadways. For the purposes of this calculation, "reliable" roadways include HOV and express toll lanes (e.g., HOT lanes in Virginia, ETLs in Maryland, and ICC are all included, but general purpose lanes on Dulles Toll Road are not). The data show that the percentage of travel on reliable roadways is greatest in Alternative 4 due to the significant addition of dynamically-priced lanes throughout Maryland.

Table 5. Daily Auto Person Miles of Travel (PMT) on Reliable Roadways in Study Area for 2040 Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PMT by Auto	128,237,781	129,532,562	129,085,743	131,320,994
PMT by Auto on Reliable Roadways	2,836,840	6,095,845	5,054,562	10,402,530
% Auto PMT on Reliable Roadways	2.2%	4.7%	3.9%	7.9%

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TOLL RATES

The planning-level dynamic tolls were developed by TPB staff using an iterative off-line process designed to estimate toll values that ensure free flow (or near free flow) operating conditions on all tolled segments[6]. Table 6 examines the end-to-end tolls and toll rates for specific roadway segments in AM peak period. It shows that in the peak direction, some of the toll rates are high, at well over $2 per mile. The high toll rate segments include I-270 north of I-370 and MD-295 north of the Beltway, both in Alternative 4. In each case, the toll rates on these segments are high because substantial demand exists in these areas, as indicated by the very high volume-to-capacity ratios on the adjacent GPLs in Alternative 4 and in No Build. Given the high demand, travelers would need to pay more to attain free flow conditions on the dynamically-priced toll lanes (i.e., conversely, if there were low vehicle-to-capacity ratios and no congestion on GPLs, one could argue that ETLs would not be needed).

Table 6. AM Peak Period Toll Rates for 2040 Build Alternatives (in 2016 Dollars per Mile)

Segment	Distance (mile)	Alt. 2	Alt. 3	Alt. 4
Beltway				
VA HOT Lane Northern Terminus to American Legion Bridge*	2.19	1.10	0.74	0.94
American Legion Bridge to VA HOT Lane Northern Terminus*	2.19	1.36	0.54	1.31
American Legion Bridge to I-95	15.18	0.25	0.51	0.20
I-95 to American Legion Bridge	14.94	1.12	1.66	1.09
I-95 to Woodrow Wilson Bridge	24.04	0.20	0.22	0.20
Woodrow Wilson Bridge to I-95	24.37	0.24	0.31	0.24
I-270				
East Spur to I-370	9.71	0.20	0.20	0.20
I-370 to West Spur	9.24	0.87	1.42	1.12
I-370 to MD 85	21.99	N/A	N/A	0.20
MD 85 to I-370	21.96	N/A	N/A	2.26
MD 295				
US 50 to I-495	5.32	N/A	N/A	0.20
I-495 to US 50	5.54	N/A	N/A	0.20
I-495 to I-695	21.46	N/A	N/A	0.20
I-695 to I-495	21.37	N/A	N/A	2.77

Note: * Segment of Virginia HOT lanes

In the case of I-270 north of I-370, high toll rates are a reflection of relatively few alternative routes that are available to the travelers on the I-270 segments with two general purpose lanes. In the case of MD-295, volume-to-capacity ratios are high due to high demand and lower carrying capacity of both general purpose lanes and ETLs.

[6] Near free flow conditions defined as vehicle-to-capacity ratio of less than one.

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Toll rates in other alternatives are lower, although they are still high in selected locations on the Beltway and I-270 (on Capital Beltway near American Legion Bridge and on I-270 south of I-370).

While these modeled toll rates have not been specifically validated and are not considered "investment-grade" forecasts, they are generally a good indicator of location of future bottlenecks where users may have to pay high tolls to keep the traffic moving at or near free flow speeds. It is important to note that some of the toll rates could potentially change if they were estimated following the base year and future year volume refinement (consistent with post-processing methods outlined in NCHRP 765).

GENERAL OBSERVATIONS

Although the information from the regional travel demand model documented in this memorandum will be further refined, certain general findings in regard to the performance of alternatives based on the regional travel demand model are noted below. The observations and analysis do not include any assessments of other important factors that are typically considered in project planning, such as cost-effectiveness, safety and environmental impact, among others.

- Alternative 4, with two ETLs in each direction on all three facilities, shows greatest increase in vehicle miles traveled and decrease in vehicle hours of delay (Table 4).

- Each alternative improves system-wide reliability relative to Alternative 1 (No Build), with Alternative 4 having the largest percentage of auto person miles of travel on reliable roadways (Table 5).

- Estimated toll rates vary, but they are high on certain segments reaching over $2 per mile (Table 6). While TPB's travel forecasting model does not provide "investment-grade" toll forecasts, these findings can indicate that some of the tolls may be relatively high (perhaps similar to what has been observed on the Virginia HOT lanes).

- The analysis shows that dynamically-priced electronic toll lanes will be used extensively in certain sections, with average annual weekday volumes for ETLs surpassing 70,000 (these are "raw" regional model volumes that will be refined further). However, it is important to keep in mind that additional post-processing may be needed regarding the sub-allocation of daily volumes to specific user classes (trucks, single drivers, carpools, etc.) and to specific time-of-day periods (AM peak, Mid-day, PM peak, Night).

NEXT STEPS

TPB staff looks forward to assisting SHA with participating in regional modeling related to future project planning efforts.

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APPENDIX A
FOCUSED STUDY AREA SUMMARIES

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APPENDIX A. SUMMARY STATISTICS FOR FOCUSED STUDY AREA

Map A1. Traffic Relief Plan Focused Study Area

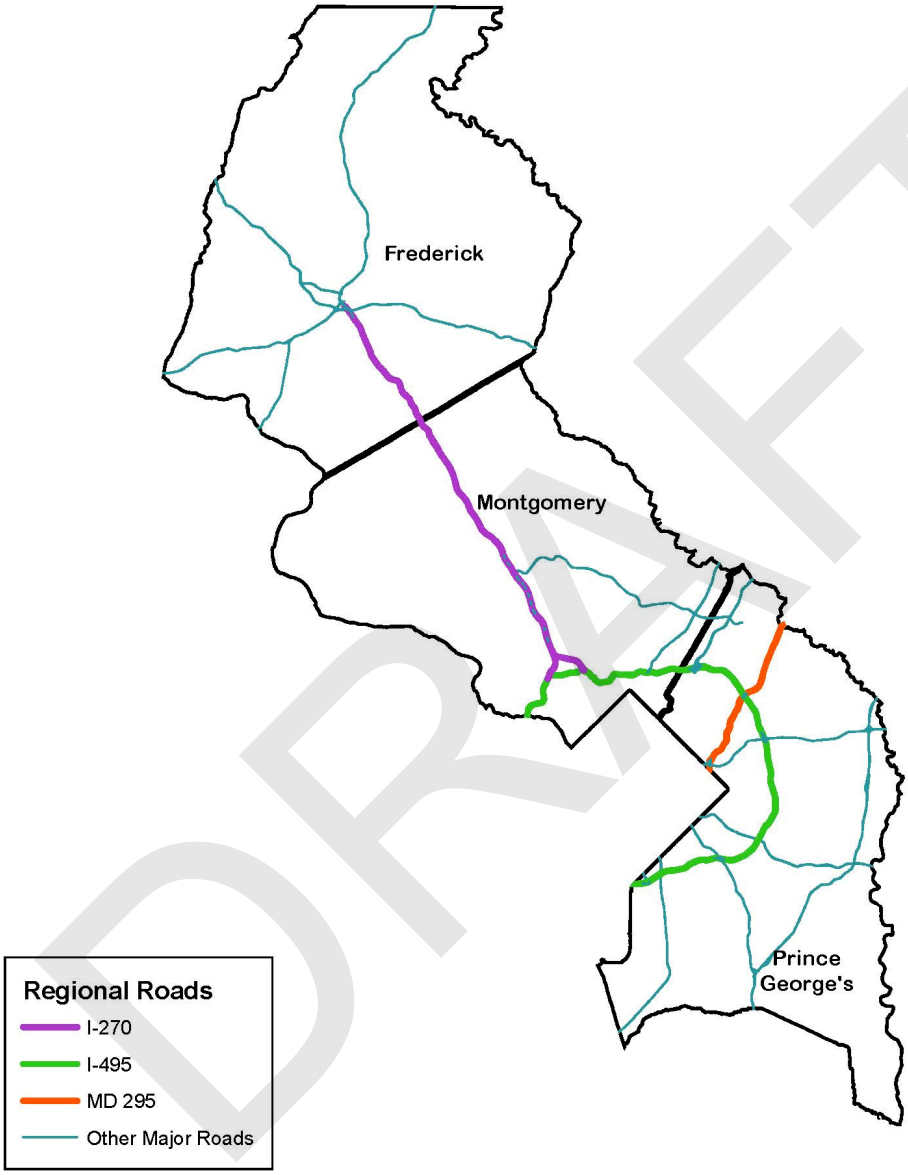

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Table A1. Simulated Daily Vehicle Miles of Travel (VMT) and Vehicle Hours of Delay (VHD) in Focused Study Area for 2040 Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VMT	63,647,743	64,510,582	64,158,315	65,005,958
VHD	902,569	833,028	867,272	713,887

Table A2. Simulated Daily Vehicle Miles of Travel (VMT) and Vehicle Hours of Delay (VHD) in Focused Study Area; % Differences Relative to Alternative 1 (No Build)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VMT	N/A	1.4%	0.8%	2.1%
VHD	N/A	-7.7%	-3.9%	-20.9%

Table A3. Daily Auto Person Miles of Travel (PMT) on Reliable Roadways in Focused Study Area for 2040 Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PMT by Auto	85,847,637	87,229,021	86,715,055	88,799,672
PMT by Auto on Reliable Roadways	2,766,981	6,025,924	4,984,627	8,979,939
% Auto PMT on Reliable Roadways	3.2%	6.9%	5.7%	10.1%

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APPENDIX B
DETAILED SCREENLINE SUMMARIES

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APPENDIX B. DETAILED VOLUME SUMMARIES OF SCREENLINE FACILITIES AND I-270 / I-495 / MD 295 FACILITIES

Table B1. 2016 Validation: 2015 Observed vs. 2016 Simulated AAWDT Volumes by Facility for I-270 / I-495 / MD 295 Screenlines

Screenline I-270-1

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Jefferson Blvd	1,520	924	-596	-39%
2	Old Swimming Pool Rd	N/A	928	N/A	N/A
3	Jefferson Pike	3,840	3,284	-556	-14%
4	US-15	62,870	91,962	29,092	46%
5	Balenger Creek Pike	13,534	9,727	-3,807	-28%
6	New Design Rd	19,390	19,136	-254	-1%
7	I-270	117,990	140,948	22,958	19%
8	Buckeystown Pike	27,370	21,490	-5,880	-21%
9	Urbana Pike	21,602	12,712	-8,890	-41%
10	Reichs Ford Rd	3,780	3,119	-661	-17%
11	Old National Pike	16,220	4,638	-11,582	-71%
	Subtotal*	288,116	307,940	19,824	7%

Screenline I-270-2

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Catoctin Mountain Hwy	21,180	29,767	8,587	41%
2	Ballenger Creek Pike	N/A	3,991	N/A	N/A
3	New Design Rd	N/A	2,970	N/A	N/A
4	Buckeystown Pike	6,850	10,242	3,392	50%
5	Park Mills Rd	N/A	2,708	N/A	N/A
6	I-270	90,110	117,287	27,177	30%
7	Urbana Pike	13,070	9,444	-3,626	-28%
8	Sugarloaf Pkwy	N/A	702	N/A	N/A
9	Ijamsville Rd	N/A	8,259	N/A	N/A
10	Ed McClain Rd	N/A	4,222	N/A	N/A
11	Green Valley Rd	6,924	17,586	10,662	154%
	Subtotal*	138,134	184,326	46,192	33%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-270-3

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Clopper Rd	24,232	26,008	1,776	7%
2	Wisteria Dr	13,272	394	-12,878	-97%
3	Middlebrook Rd	24,540	17,162	-7,378	-30%
4	I-270	136,930	158,538	21,608	16%
5	Frederick Rd	32,130	47,799	15,669	49%
	Subtotal*	231,104	249,901	18,797	8%

Screenline I-270-4

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Darnestown Rd	27,952	33,296	5,344	19%
2	Great Seneca Hwy	42,620	31,364	-11,256	-26%
3	West Diamond Ave	50,492	35,977	-14,515	-29%
4	I-270	183,660	210,107	26,447	14%
5	North Frederick Ave	36,120	32,181	-3,939	-11%
6	Lost Knife Rd	N/A	3,791	N/A	N/A
7	Midcounty Hwy	22,790	16,448	-6,342	-28%
	Subtotal*	363,634	359,373	-4,261	-1%

Screenline I-270-5

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Great Seneca Hwy	29,372	26,107	-3,265	-11%
2	Omega Rd	N/A	6,779	N/A	N/A
3	Shady Grove Rd	39,630	34,449	-5,181	-13%
4	I-270	224,250	247,714	23,464	10%
5	Piccard Dr	N/A	7,442	N/A	N/A
6	Gaither Rd	N/A	6,646	N/A	N/A
7	Grand Champion Dr	N/A	741	N/A	N/A
8	Frederick Rd	45,500	33,757	-11,743	-26%
	Subtotal*	338,752	342,027	3,275	1%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-270-6

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Falls Rd	20,684	18,481	-2,203	-11%
2	Seven Locks Rd	N/A	28,829	N/A	N/A
3	I-270	263,740	291,427	27,687	10%
4	Tower Oaks Blvd	11,272	11,772	500	4%
5	Rockville Pike	49,580	42,255	-7,325	-15%
6	Twinbrook Pkwy	N/A	24,633	N/A	N/A
7	Veirs Mill Rd	44,800	48,481	3,681	8%
8	Bauer Dr	N/A	3,574	N/A	N/A
9	Georgia Ave	46,190	61,341	15,151	33%
	Subtotal*	436,266	473,757	37,491	9%

Screenline I-270-7

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Falls Rd	21,074	23,256	2,182	10%
2	Seven Locks Rd	N/A	20,802	N/A	N/A
3	I-270	268,380	293,792	25,412	9%
4	Old Georgetown Rd	N/A	38,956	N/A	N/A
5	Rockville Pike	54,870	50,980	-3,890	-7%
6	Connecticut Ave	40,802	57,626	16,824	41%
7	Veirs Mill Rd	40,340	49,613	9,273	23%
	Subtotal*	425,466	475,267	49,801	12%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-495-1

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	American Legion Bridge	231,716	282,575	50,859	22%
2	Chain Bridge	31,874	35,831	3,957	12%
3	Key Bridge	41,448	54,124	12,676	31%
4	Roosevelt Bridge	93,813	99,980	6,167	7%
5	Memorial Bridge	57,116	58,490	1,374	2%
6	14th Street Bridge	246,189	182,444	-63,745	-26%
7	Woodrow Wilson Bridge	214,292	222,444	8,152	4%
	Subtotal*	916,448	935,888	19,440	2%

Screenline I-495-2

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Falls Rd	21,094	16,675	-4,419	-21%
2	Bradley Blvd	7,992	10,447	2,455	31%
3	Seven Locks Rd	N/A	14,364	N/A	N/A
4	Capital Beltway	262,112	317,153	55,041	21%
5	Burdette Rd	N/A	6,957	N/A	N/A
6	Wilson La	11,124	13,175	2,051	18%
	Subtotal*	302,322	357,450	55,128	18%

Screenline I-495-3

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	I-270 East Spur	119,200	126,047	6,847	6%
2	Fernwood Rd	N/A	16,541	N/A	N/A
3	Rockledge Dr	N/A	6,459	N/A	N/A
4	Democracy Blvd	31,000	29,864	-1,136	-4%
5	Capital Beltway	119,170	139,201	20,031	17%
6	Greentree Rd	N/A	5,803	N/A	N/A
7	Bradley Blvd	15,262	9,689	-5,573	-37%
8	Wilson La	9,654	15,157	5,503	57%
	Subtotal*	294,286	319,958	25,672	9%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-495-4

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Randolph Rd	28,240	53,714	25,474	90%
2	Lindell St	N/A	5,764	N/A	N/A
3	West University Blvd	33,810	50,111	16,301	48%
4	Veirs Mill Rd	26,446	23,982	-2,464	-9%
5	Plyers Mill Rd	N/A	11,834	N/A	N/A
6	Forest Glen Rd	9,690	7,619	-2,071	-21%
7	Capital Beltway	239,260	242,329	3,069	1%
8	Linden La	11,760	14,203	2,443	21%
9	16th St	29,402	22,993	-6,409	-22%
10	Spring St	N/A	11,561	N/A	N/A
11	East West Hwy	27,020	37,311	10,291	38%
12	Colesville Rd	16,132	20,890	4,758	29%
	Subtotal*	421,760	473,152	51,392	12%

Screenline I-495-5

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	ICC	50,724	68,638	17,914	35%
2	Randolph Rd	38,192	41,547	3,355	9%
3	Columbia Pike	65,682	94,668	28,986	44%
4	Powder Mill Rd	N/A	10,920	N/A	N/A
5	Capital Beltway	265,484	280,772	15,288	6%
6	Adelphi Rd	N/A	34,996	N/A	N/A
7	Metzerott Rd	N/A	12,672	N/A	N/A
8	Merrimac Dr	N/A	5,577	N/A	N/A
9	University Blvd	41,000	41,134	134	0%
10	Erskine St	N/A	5,327	N/A	N/A
11	East West Hwy	24,432	24,020	-412	-2%
	Subtotal*	485,514	550,779	65,265	13%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-495-6

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Cheverly Ave	10,160	4,351	-5,809	-57%
2	Landover Rd	42,482	43,350	868	2%
3	Annapolis Rd	39,364	21,925	-17,439	-44%
4	Veterans Pkwy	23,872	13,536	-10,336	-43%
5	Riverdale Rd	N/A	15,124	N/A	N/A
6	Good Luck Rd	N/A	13,861	N/A	N/A
7	Capital Beltway	200,390	200,117	-273	0%
8	Greenbelt Rd	57,230	52,706	-4,524	-8%
9	Explorer Rd	N/A	6,098	N/A	N/A
10	Soil Conservation Rd	N/A	5,768	N/A	N/A
11	Springfield Rd	N/A	11,476	N/A	N/A
12	Laurel Bowie Rd	20,302	22,898	2,596	13%
	Subtotal*	393,800	358,883	-34,917	-9%

Screenline I-495-7

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Kenilworth Ave	175,792	142,763	-33,029	-19%
2	Columbia Park Rd	19,720	8,991	-10,729	-54%
3	Landover Rd	48,292	40,781	-7,511	-16%
4	Veterans Pkwy	N/A	7,631	N/A	N/A
5	Ardwick-Ardmore Rd	9,482	10,432	950	10%
6	Capital Beltway	222,510	224,762	2,252	1%
7	Whitfield Chapel Rd	10,400	5,326	-5,074	-49%
8	Martin Luther King Jr. Hwy	27,992	35,222	7,230	26%
9	Lottsford Vista Rd	10,490	8,797	-1,693	-16%
10	Enterprise Rd	17,272	13,062	-4,210	-24%
11	Church Rd	6,020	5,769	-251	-4%
12	Collington Rd	N/A	39,621	N/A	N/A
13	Crain Hwy	64,452	51,068	-13,384	-21%
	Subtotal*	612,422	546,973	-65,449	-11%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline I-495-8

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Anacostia Fwy	109,904	80,120	-29,784	-27%
2	Minnesota St	N/A	23,542	N/A	N/A
3	Ridge Rd SE	N/A	10,196	N/A	N/A
4	Texas Ave SE	6,378	1,295	-5,083	-80%
5	Benning Rd SE	16,718	15,226	-1,492	-9%
6	F St SE	N/A	4,887	N/A	N/A
7	Southern Ave SE	13,476	26,644	13,168	98%
8	Larchmont Ave	N/A	10,022	N/A	N/A
9	Suffolk Ave	N/A	3,359	N/A	N/A
10	Rollins Ave	N/A	1,464	N/A	N/A
11	Addison Rd	19,492	18,029	-1,463	-8%
12	Shady Glen Dr	N/A	11,719	N/A	N/A
13	Ritchie Rd	N/A	18,853	N/A	N/A
14	Capital Beltway	218,552	194,646	-23,906	-11%
15	Harry S Truman Dr	N/A	18,243	N/A	N/A
16	Largo Rd	41,842	30,752	-11,090	-27%
17	Campus Way S	N/A	9,415	N/A	N/A
18	Kettering Dr	N/A	5,687	N/A	N/A
19	Watkins Park Dr	15,224	14,985	-239	-2%
20	Church Rd	N/A	3,555	N/A	N/A
21	Crain Hwy	55,382	54,554	-828	-1%
	Subtotal*	496,968	436,251	-60,717	-12%

Screenline I-495-9

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Suitland Pkwy	36,772	19,064	-17,708	-48%
2	Silver Hill Rd	42,240	35,780	-6,460	-15%
3	Auth Rd	N/A	8,868	N/A	N/A
4	Capital Beltway	197,600	167,731	-29,869	-15%
5	Allentown Rd	35,072	30,137	-4,935	-14%
6	Old Alexander Ferry Rd	N/A	14,527	N/A	N/A
7	Woodyard Rd	19,962	16,587	-3,375	-17%
8	Surratts Rd	N/A	2,656	N/A	N/A
9	Dyson Rd	N/A	1,351	N/A	N/A
10	Mattawoman Dr	N/A	835	N/A	N/A
11	Crain Hwy	31,280	29,220	-2,060	-7%
	Subtotal*	362,926	298,519	-64,407	-18%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline MD-295-1

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	I-95	207,324	261,557	54,233	26%
2	Washington Blvd	38,432	42,076	3,644	9%
3	MD 295	108,450	92,585	-15,865	-15%
4	Aviation Blvd	20,480	30,216	9,736	48%
5	Aviation Ave	21,070	13,998	-7,072	-34%
6	I-97	111,820	127,029	15,209	14%
	Subtotal*	507,576	567,461	59,885	12%

Screenline MD-295-2

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Columbia Pike	91,082	113,681	22,599	25%
2	Broken Land Pkwy	N/A	38,247	N/A	N/A
3	I-95	217,540	275,040	57,500	26%
4	Washington Blvd	27,222	44,416	17,194	63%
5	Brock Bridge Rd	N/A	7,323	N/A	N/A
6	MD 295	121,752	107,288	-14,464	-12%
7	Annapolis Rd	N/A	16,755	N/A	N/A
8	Telegraph Rd	25,192	35,271	10,079	40%
9	Clark Station Rd	N/A	6,027	N/A	N/A
10	New Cut Rd	12,052	15,213	3,161	26%
11	I-97	127,602	147,304	19,702	15%
	Subtotal*	622,442	738,213	115,771	19%

Screenline MD-295-3

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Columbia Pike	62,110	100,131	38,021	61%
2	I-95	206,640	246,573	39,933	19%
3	Old Gunpowder Rd	N/A	18,846	N/A	N/A
4	Virginia Manor Rd	N/A	15,538	N/A	N/A
5	Baltimore Ave	34,512	44,602	10,090	29%
6	Montpelier Dr	N/A	7,098	N/A	N/A
7	Muirkirk Rd	N/A	9,646	N/A	N/A
8	Laurel Bowie Rd	57,132	43,785	-13,347	-23%
9	MD 295	105,852	95,239	-10,613	-10%
	Subtotal*	466,246	530,330	64,084	14%

Note: * Links with no count are excluded from screenline subtotals.

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Screenline MD-295-4

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Columbia Pike	72,572	91,472	18,900	26%
2	New Hampshire Ave	57,900	85,273	27,373	47%
3	Riggs Rd	N/A	14,910	N/A	N/A
4	Cherry Hill Rd	22,004	19,613	-2,391	-11%
5	I-95	200,180	245,573	45,393	23%
6	Sellman Rd	N/A	2,088	N/A	N/A
7	Baltimore Ave	47,640	64,308	16,668	35%
8	Rhode Island Ave	N/A	4,942	N/A	N/A
9	Cherrywood La	9,552	10,236	684	7%
10	Kenilworth Ave	36,330	31,675	-4,655	-13%
11	Greenbelt Rd	52,230	41,038	-11,192	-21%
12	MD 295	128,132	105,196	-22,936	-18%
13	Good Luck Rd	N/A	13,599	N/A	N/A
14	Annapolis Rd	69,420	48,459	-20,961	-30%
	Subtotal*	695,960	742,843	46,883	7%

Screenline MD-295-5

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Baltimore Ave	37,092	51,194	14,102	38%
2	Kenilworth Ave	41,110	27,678	-13,432	-33%
3	MD 295	113,764	88,878	-24,886	-22%
4	Capital Beltway	200,390	200,117	-273	0%
	Subtotal*	392,356	367,867	-24,489	-6%

Screenline MD-295-6

Sequence	Facility	Observed	Simulated	Difference	% Diff.
1	Bladenburg Rd	16,716	23,943	7,227	43%
2	Kenilworth Ave	33,510	38,037	4,527	14%
3	MD 295	123,292	101,045	-22,247	-18%
4	Cheverly Ave	10,160	4,351	-5,809	-57%
5	Landover Rd	42,482	43,350	868	2%
6	Cooper Lane	N/A	4,993	N/A	N/A
7	Veterans Pkwy	N/A	25,671	N/A	N/A
8	Capital Beltway	216,120	212,565	-3,555	-2%
	Subtotal*	442,280	423,291	-18,989	-4%

Note: * Links with no count are excluded from screenline subtotals.

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Table B2. 2016 Validation: 2015 Observed vs. 2016 Simulated AAWDT Volumes on I-270 / I-495 / MD 295

I-270 Locations

Sequence	Location	Observed	Simulated	Difference	% Diff.
1	IS270-.40 MI S OF NEW DESIGN RD	117,990	140,948	22,958	19%
2	IS270-.20 MI S OF BAKER VALLEY RD	90,110	117,287	27,177	30%
3	IS270-50ft S OF FREDERICK CO/L	85,730	124,562	38,832	45%
4	IS270-.50 MI N OF MD121	83,930	127,837	43,907	52%
5	IS 270 South of MD 121 (ATR#04)	105,544	141,566	36,022	34%
6	IS270-.40 MI N OF MD118	121,110	147,808	26,698	22%
7	IS270-.30 MI S OF MD118	136,930	158,538	21,608	16%
8	IS270-.50 MI S OF MIDDLEBROOK RD	175,364	190,777	15,413	9%
9	IS270-.30 MI S OF MD124	183,660	210,107	26,447	14%
10	IS270-.50 MI N OF IS370	231,120	237,465	6,345	3%
11	IS270-.30 MI N OF SHADY GROVE RD	224,730	231,337	6,607	3%
12	IS270-.50 MI N OF MD28	224,250	247,714	23,464	10%
13	IS270-.30 MI S OF MD28	248,810	287,651	38,841	16%
14	IS270-.30 MI N OF MD927 (MONTROSE RD)	263,740	291,427	27,687	10%
15	IS270-.10 MI N OF TUCKERMAN LA	268,380	293,792	25,412	9%
16	IS270Y-.30 MI N OF WESTLAKE TERR	131,850	167,745	35,895	27%
17	IS270Y-.40 MI S OF DEMOCRACY BLVD	133,170	177,952	44,782	34%
18	IS270-.30 MI N OF MD187B	119,200	126,047	6,847	6%
19	IS270-.10 MI S OF MD187	112,380	105,487	-6,893	-6%

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I-495 Locations

Sequence	Location	Observed	Simulated	Difference	% Diff.
1	IS495-.10 MI E OF PERSIMMON TREE RD	231,716	239,294	7,578	3%
2	IS495-.70 MI N OF MD190	262,112	317,153	55,041	21%
3	IS495-.50 MI W OF MD187	119,170	139,201	20,031	17%
4	IS495-.30 MI E OF MD187	112,890	134,833	21,943	19%
5	IS495-.20 MI E OF MD355	223,330	244,879	21,549	10%
6	IS495-.80 MI W OF MD97	239,260	242,329	3,069	1%
7	IS495-.20 MI E OF MD97	229,740	234,955	5,215	2%
8	IS495-.20 MI E OF US29	219,320	225,967	6,647	3%
9	IS 495 West of MD 650 (ATR#41)	215,924	237,779	21,855	10%
10	IS495-.10 MI W OF MD212	265,484	280,772	15,288	6%
11	IS95-.30 MI N OF US1	212,110	227,076	14,966	7%
12	IS95-.40 MI S OF US1	223,590	201,338	-22,252	-10%
13	IS95-.30 MI N OF MD201	216,200	191,155	-25,045	-12%
14	IS95-.30 MI S OF MD201	207,020	199,218	-7,802	-4%
15	IS 95 North of Good Luck Rd (ATR#55)	200,390	200,117	-273	0%
16	IS95-.60 MI N OF IS595/US50	216,120	212,565	-3,555	-2%
17	IS95-.10 MI S OF MD704	222,510	224,762	2,252	1%
18	IS95-.40 MI S OF MD202	208,610	214,610	6,000	3%
19	IS 95 South of MD 214 (ATR#43)	218,552	194,646	-23,906	-11%
20	IS95-.50 MI N OF MD4	227,452	193,249	-34,203	-15%
21	IS95-.40 MI S OF MD4	202,400	176,319	-26,081	-13%
22	IS95-.40 MI N OF MD5	197,600	167,731	-29,869	-15%
23	IS 95 at Temple Hill Rd (ATR#49)	162,226	149,136	-13,090	-8%
24	IS95-.40 MI S OF MD414	170,630	148,784	-21,846	-13%
25	IS95-.30 MI S OF MD210	175,912	172,551	-3,361	-2%
26	IS95-.50 MI N OF VIRGINIA ST/L	214,292	222,444	8,152	4%

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MD 295 Locations

Sequence	Location	Observed	Simulated	Difference	% Diff.
1	MD295-.10 MI S OF BALTIMORE CO/L	104,412	84,912	-19,500	-19%
2	MD295-.20 MI S OF IS695	99,332	73,695	-25,637	-26%
3	MD295-.60 MI N OF IS195	121,920	74,891	-47,029	-39%
4	MD295-.30 MI N OF MD100	108,450	92,585	-15,865	-15%
5	MD295-.60 MI S OF MD100	109,500	103,443	-6,057	-6%
6	MD295-.25 MI S OF MD175	121,752	107,288	-14,464	-12%
7	MD295-.50 MI S OF MD32	112,552	115,358	2,806	2%
8	MD295-.30 MI N OF MD197	105,852	95,239	-10,613	-10%
9	MD295-.60 MI S OF MD197	117,252	105,206	-12,046	-10%
10	MD295-.40 MI N OF MD193	110,372	91,028	-19,344	-18%
11	MD295-.30 MI N OF IS95	128,132	105,196	-22,936	-18%
12	MD295-.30 MI S OF IS95	113,764	88,878	-24,886	-22%
13	MD295-.20 MI N OF MD450	118,780	90,848	-27,932	-24%
14	MD295-.20 MI N OF MD202	117,960	101,312	-16,648	-14%
15	MD295-.50 MI N OF US50	123,292	101,045	-22,247	-18%

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Table B3. 2040 Simulated AAWDT Volumes by Facility for I-270 / I-495 / MD 295 Screenlines

Screenline I-270-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Jefferson Blvd	1,498	1,461	1,447	1,293
2	Old Swimming Pool Rd	1,553	1,531	1,526	1,361
3	Jefferson Pike	7,046	7,088	7,030	7,244
4	US-15	113,502	114,139	113,638	114,838
5	Balenger Creek Pike	11,456	11,167	11,271	10,741
6	New Design Rd	21,862	21,625	21,598	21,507
7	I-270	169,723	170,268	170,088	189,284
8	Buckeystown Pike	33,024	32,839	32,951	35,481
9	Urbana Pike	17,517	17,609	17,550	14,621
10	Reichs Ford Rd	4,452	4,451	4,474	4,325
11	Old National Pike	8,172	8,422	8,307	5,981
	Subtotal*	389,806	390,599	389,881	406,676

Screenline I-270-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Catoctin Mountain Hwy	32,326	32,538	32,455	31,495
2	Ballenger Creek Pike	5,998	5,709	5,767	4,693
3	New Design Rd	5,309	5,119	5,157	3,636
4	Buckeystown Pike	15,558	15,393	15,303	12,550
5	Park Mills Rd	4,117	4,138	4,068	3,482
6	I-270	131,876	132,442	132,264	160,445
7	Urbana Pike	9,965	10,138	10,053	9,547
8	Sugarloaf Pkwy	882	961	855	667
9	Ijamsville Rd	15,107	15,175	15,117	14,675
10	Ed McClain Rd	7,263	7,321	7,242	7,247
11	Green Valley Rd	18,938	18,917	18,901	19,069
	Subtotal*	247,339	247,849	247,183	267,505

Screenline I-270-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Clopper Rd	21,257	21,223	21,221	20,756
2	Wisteria Dr	975	958	963	925
3	Middlebrook Rd	32,709	32,641	32,502	31,667
4	I-270	178,758	178,951	178,549	197,252
5	Frederick Rd	36,503	36,835	36,644	36,004
	Subtotal*	270,202	270,608	269,879	286,604

Note: * All links on the screenlines are included.

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Screenline I-270-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Darnestown Rd	31,186	31,056	31,016	30,333
2	Great Seneca Hwy	35,414	35,509	35,266	34,892
3	West Diamond Ave	35,201	35,303	35,041	34,583
4	I-270	254,437	254,795	253,262	270,077
5	North Frederick Ave	36,720	36,656	36,606	35,752
6	Lost Knife Rd	3,476	3,390	3,459	3,430
7	Midcounty Hwy	31,307	30,841	31,038	30,768
	Subtotal*	427,742	427,549	425,688	439,835

Screenline I-270-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Great Seneca Hwy	25,013	24,776	25,301	25,281
2	Omega Rd	12,641	12,749	12,700	12,545
3	Shady Grove Rd	34,221	34,717	35,659	34,996
4	I-270	293,859	300,123	285,453	300,752
5	Piccard Dr	9,513	9,472	9,513	9,491
6	Gaither Rd	8,930	8,742	9,381	8,843
7	Grand Champion Dr	1,101	1,077	1,236	1,090
8	Frederick Rd	38,346	38,415	38,874	37,974
	Subtotal*	423,624	430,071	418,117	430,972

Screenline I-270-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	19,251	19,116	19,211	19,016
2	Seven Locks Rd	31,197	30,714	30,758	30,352
3	I-270	335,117	339,243	323,887	339,306
4	Tower Oaks Blvd	14,748	14,196	14,874	14,497
5	Rockville Pike	49,314	49,247	49,806	49,074
6	Twinbrook Pkwy	23,963	22,961	23,321	22,836
7	Veirs Mill Rd	41,768	41,126	41,492	41,396
8	Bauer Dr	4,764	4,539	4,843	4,466
9	Georgia Ave	68,274	68,357	68,894	67,710
	Subtotal*	588,394	589,498	577,086	588,655

Note: * All links on the screenlines are included.

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Screenline I-270-7

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	24,459	24,485	24,718	24,454
2	Seven Locks Rd	20,330	20,459	20,761	20,308
3	I-270	335,698	338,885	322,130	339,594
4	Old Georgetown Rd	49,086	48,323	48,638	48,284
5	Rockville Pike	61,394	62,981	63,085	62,828
6	Connecticut Ave	59,819	60,377	60,986	59,653
7	Veirs Mill Rd	53,697	52,706	52,890	52,685
	Subtotal*	604,483	608,216	593,208	607,807

Screenline I-495-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	American Legion Bridge	320,989	362,972	350,317	365,892
2	Chain Bridge	43,420	40,414	41,771	39,857
3	Key Bridge	55,159	53,985	54,824	54,000
4	Roosevelt Bridge	115,955	113,385	114,645	113,403
5	Memorial Bridge	69,430	67,611	68,397	67,800
6	14th Street Bridge	195,026	192,457	193,121	192,441
7	Woodrow Wilson Bridge	254,592	250,123	252,518	250,647
	Subtotal*	1,054,571	1,080,947	1,075,592	1,084,039

Screenline I-495-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	19,348	18,238	19,210	17,958
2	Bradley Blvd	11,600	10,886	11,552	10,866
3	Seven Locks Rd	16,706	15,967	16,894	15,745
4	Capital Beltway	344,957	386,896	364,715	392,132
5	Burdette Rd	9,395	8,612	9,406	8,379
6	Wilson La	15,356	14,636	14,715	14,510
	Subtotal*	417,362	455,235	436,491	459,590

Note: * All links on the screenlines are included.

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Screenline I-495-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	I-270 East Spur	136,806	142,064	133,712	142,763
2	Fernwood Rd	17,908	22,640	20,477	23,616
3	Rockledge Dr	8,046	3,506	5,211	3,463
4	Democracy Blvd	33,803	32,627	31,221	33,633
5	Capital Beltway	146,814	193,818	182,983	196,241
6	Greentree Rd	7,683	6,687	7,085	6,671
7	Bradley Blvd	10,256	10,653	10,473	10,598
8	Wilson La	15,500	14,866	15,312	14,867
	Subtotal*	376,816	426,861	406,475	431,850

Screenline I-495-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Randolph Rd	60,658	57,956	58,943	58,359
2	Lindell St	6,075	5,831	5,928	5,906
3	West University Blvd	55,033	54,002	54,310	54,483
4	Veirs Mill Rd	27,143	26,470	26,634	26,253
5	Plyers Mill Rd	12,217	12,034	12,178	12,089
6	Forest Glen Rd	8,263	8,074	8,243	8,133
7	Capital Beltway	250,875	317,168	289,672	321,806
8	Linden La	14,742	13,999	14,350	14,269
9	16th St	28,159	28,416	28,681	28,704
10	Spring St	13,047	12,222	12,510	12,439
11	East West Hwy	38,973	38,845	38,434	38,839
12	Colesville Rd	23,259	23,148	22,657	22,466
	Subtotal*	538,443	598,166	572,540	603,746

Screenline I-495-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	ICC	81,909	74,160	77,454	75,947
2	Randolph Rd	45,633	43,971	44,855	44,521
3	Columbia Pike	102,984	102,512	102,652	101,452
4	Powder Mill Rd	10,981	10,398	10,639	10,402
5	Capital Beltway	292,711	347,938	325,965	353,584
6	Adelphi Rd	39,190	40,089	40,031	39,517
7	Metzerott Rd	16,790	15,859	16,311	15,797
8	Merrimac Dr	6,447	6,385	6,502	6,514
9	University Blvd	40,393	39,914	40,018	40,065
10	Erskine St	6,313	6,292	6,298	6,305
11	East West Hwy	28,290	26,834	27,546	26,794
	Subtotal*	671,641	714,351	698,271	720,898

Note: * All links on the screenlines are included.

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Screenline I-495-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Cheverly Ave	4,693	4,142	4,341	4,210
2	Landover Rd	47,412	46,233	46,825	44,296
3	Annapolis Rd	24,139	22,763	23,364	21,354
4	Veterans Pkwy	15,104	14,675	14,799	14,727
5	Riverdale Rd	15,434	15,343	15,499	14,713
6	Good Luck Rd	20,899	20,846	20,971	20,647
7	Capital Beltway	212,342	236,948	228,353	242,030
8	Greenbelt Rd	53,577	53,844	53,932	53,579
9	Explorer Rd	6,940	6,401	6,561	6,913
10	Soil Conservation Rd	8,024	6,959	7,434	6,587
11	Springfield Rd	13,910	13,108	13,485	12,693
12	Laurel Bowie Rd	26,472	25,884	26,290	25,193
	Subtotal*	448,946	467,147	461,854	466,943

Screenline I-495-7

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Kenilworth Ave	149,482	144,860	146,972	149,443
2	Columbia Park Rd	13,467	12,456	12,960	12,919
3	Landover Rd	46,833	46,012	46,516	45,488
4	Veterans Pkwy	8,716	8,263	8,512	8,212
5	Ardwick-Ardmore Rd	10,303	9,677	10,113	9,581
6	Capital Beltway	240,128	272,780	258,900	274,019
7	Whitfield Chapel Rd	7,303	6,365	6,896	6,069
8	Martin Luther King Jr. Hwy	38,586	36,684	37,474	36,330
9	Lottsford Vista Rd	13,560	10,084	12,018	9,807
10	Enterprise Rd	15,021	13,292	13,932	13,276
11	Church Rd	8,514	6,867	7,525	6,549
12	Collington Rd	44,804	43,907	44,453	44,385
13	Crain Hwy	63,723	61,545	62,404	60,328
	Subtotal*	660,440	672,793	668,675	676,407

Note: * All links on the screenlines are included.

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Screenline I-495-8

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Anacostia Fwy	78,339	76,746	77,644	77,554
2	Minnesota St	22,061	21,691	21,869	21,755
3	Ridge Rd SE	10,230	10,204	10,238	10,152
4	Texas Ave SE	2,597	2,133	2,356	2,210
5	Benning Rd SE	18,359	18,185	18,245	18,225
6	F St SE	6,130	5,775	5,958	5,715
7	Southern Ave SE	31,382	30,690	30,979	30,594
8	Larchmont Ave	11,528	11,102	11,193	10,979
9	Suffolk Ave	4,986	4,547	4,707	4,257
10	Rollins Ave	3,588	3,018	3,101	2,853
11	Addison Rd	22,323	21,135	21,435	21,158
12	*Karen Blvd (Not Coded in 2016)*	*8,044*	*6,954*	*7,391*	*7,088*
13	Shady Glen Dr	10,662	10,227	10,395	10,223
14	Ritchie Rd	22,544	19,872	20,608	19,729
15	Capital Beltway	214,922	240,551	233,363	242,622
16	Harry S Truman Dr	18,562	18,344	18,320	18,383
17	Largo Rd	23,608	23,400	23,567	23,515
18	Campus Way S	10,493	10,070	9,882	10,192
19	Kettering Dr	8,412	6,807	7,280	6,447
20	Watkins Park Dr	16,106	15,253	15,560	15,424
21	Church Rd	7,234	5,542	6,271	4,832
22	Crain Hwy	62,156	61,169	61,325	60,372
	Subtotal*	614,266	623,414	621,688	624,279

Screenline I-495-9

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Suitland Pkwy	21,959	21,951	22,070	21,825
2	Silver Hill Rd	43,282	40,900	41,408	41,067
3	Auth Rd	12,583	12,916	12,742	12,913
4	*I-495 to Branch Ave. Metro Connection (New Facility)*	*4,305*	*4,217*	*4,239*	*4,204*
5	Capital Beltway	180,479	194,085	191,386	195,258
6	Allentown Rd	41,675	39,935	40,393	40,496
7	Old Alexander Ferry Rd	16,593	16,848	16,778	16,749
8	Woodyard Rd	20,095	19,656	19,804	19,579
9	Surratts Rd	3,405	3,438	3,394	3,378
10	Dyson Rd	3,467	3,232	3,291	3,154
11	Mattawoman Dr	2,309	2,282	2,341	2,263
12	Crain Hwy	29,392	27,955	28,277	26,808
	Subtotal*	379,544	387,415	386,122	387,694

Note: * All links on the screenlines are included.

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Screenline MD-295-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	I-95	284,092	284,799	284,312	277,689
2	Washington Blvd	47,165	47,505	47,044	43,957
3	MD 295	106,492	107,176	107,222	144,461
4	Aviation Blvd	42,147	41,795	41,814	38,525
5	Aviation Ave	20,239	20,251	20,612	18,702
6	I-97	145,486	145,104	145,199	140,801
	Subtotal*	645,621	646,630	646,202	664,135

Screenline MD-295-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	124,981	124,848	124,479	123,685
2	Broken Land Pkwy	49,628	49,573	49,426	47,841
3	I-95	293,151	294,475	293,837	289,588
4	Washington Blvd	43,040	43,155	43,294	41,079
5	Brock Bridge Rd	9,152	9,339	9,252	7,661
6	MD 295	119,185	119,572	119,616	166,254
7	Annapolis Rd	53,827	53,247	53,347	48,443
8	Telegraph Rd	36,909	36,945	37,078	35,683
9	Clark Station Rd	7,872	7,700	7,725	6,813
10	New Cut Rd	19,213	19,246	19,622	16,595
11	I-97	164,150	163,740	163,648	159,767
	Subtotal*	921,108	921,840	921,324	943,408

Screenline MD-295-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	106,551	106,524	106,770	104,907
2	I-95	261,824	266,914	267,038	264,297
3	Old Gunpowder Rd	30,414	31,894	31,909	30,181
4	Virginia Manor Rd	17,044	18,178	18,460	16,875
5	Baltimore Ave	48,945	47,821	47,755	43,995
6	*Old Baltimore Pike Extended (New Facility)*	*6,390*	*6,477*	*6,609*	*5,251*
7	Montpelier Dr	8,382	8,693	8,615	7,071
8	Muirkirk Rd	11,506	11,842	11,841	12,449
9	Laurel Bowie Rd	51,535	50,808	51,415	54,790
10	MD 295	108,596	108,664	108,566	158,213
	Subtotal*	651,186	657,814	658,978	698,029

Note: * All links on the screenlines are included.

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Screenline MD-295-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	97,871	98,210	98,326	97,882
2	New Hampshire Ave	87,786	87,917	88,303	87,151
3	Riggs Rd	16,611	16,483	16,586	15,778
4	Cherry Hill Rd	34,986	35,696	36,014	34,705
5	I-95	259,564	270,144	268,886	267,177
6	Sellman Rd	2,676	2,627	2,716	2,440
7	Baltimore Ave	67,567	68,848	68,616	68,269
8	Rhode Island Ave	8,626	8,365	8,471	7,885
9	Cherrywood La	10,191	10,398	10,407	10,401
10	Kenilworth Ave	35,556	34,766	35,154	33,093
11	Greenbelt Rd	41,461	40,179	40,662	40,454
12	MD 295	109,023	113,433	112,008	151,014
13	Good Luck Rd	20,439	20,502	20,589	19,593
14	Annapolis Rd	50,269	51,112	50,540	50,039
	Subtotal*	842,627	858,680	857,276	885,880

Screenline MD-295-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Baltimore Ave	54,756	54,003	54,225	53,380
2	Kenilworth Ave	31,358	30,419	30,636	28,921
3	MD 295	96,911	93,292	94,997	121,787
4	Capital Beltway	212,342	236,948	228,353	242,030
	Subtotal*	395,368	414,662	408,211	446,117

Screenline MD-295-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Bladenburg Rd	23,317	22,552	22,816	21,940
2	Kenilworth Ave	40,365	38,168	38,863	34,576
3	MD 295	111,094	106,689	108,689	123,288
4	Cheverly Ave	4,693	4,142	4,341	4,210
5	Landover Rd	47,412	46,233	46,825	44,296
6	Cooper Lane	5,643	5,109	5,313	4,993
7	Veterans Pkwy	28,549	27,439	27,972	27,295
8	Capital Beltway	222,048	246,585	237,212	252,288
	Subtotal*	483,122	496,917	492,032	512,887

Note: * All links on the screenlines are included.

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Table B4. 2040 Simulated AAWDT Volumes by Facility for I-270 / I-495 / MD 295 Screenlines; % Differences Relative to Alternative 1 (No Build)

Screenline I-270-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Jefferson Blvd	N/A	-2%	-3%	-14%
2	Old Swimming Pool Rd	N/A	-1%	-2%	-12%
3	Jefferson Pike	N/A	1%	0%	3%
4	US-15	N/A	1%	0%	1%
5	Balenger Creek Pike	N/A	-3%	-2%	-6%
6	New Design Rd	N/A	-1%	-1%	-2%
7	I-270	N/A	0%	0%	12%
8	Buckeystown Pike	N/A	-1%	0%	7%
9	Urbana Pike	N/A	1%	0%	-17%
10	Reichs Ford Rd	N/A	0%	0%	-3%
11	Old National Pike	N/A	3%	2%	-27%
	Subtotal*	N/A	0%	0%	4%

Screenline I-270-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Catoctin Mountain Hwy	N/A	1%	0%	-3%
2	Ballenger Creek Pike	N/A	-5%	-4%	-22%
3	New Design Rd	N/A	-4%	-3%	-32%
4	Buckeystown Pike	N/A	-1%	-2%	-19%
5	Park Mills Rd	N/A	1%	-1%	-15%
6	I-270	N/A	0%	0%	22%
7	Urbana Pike	N/A	2%	1%	-4%
8	Sugarloaf Pkwy	N/A	9%	-3%	-24%
9	Ijamsville Rd	N/A	0%	0%	-3%
10	Ed McClain Rd	N/A	1%	0%	0%
11	Green Valley Rd	N/A	0%	0%	1%
	Subtotal*	N/A	0%	0%	8%

Screenline I-270-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Clopper Rd	N/A	0%	0%	-2%
2	Wisteria Dr	N/A	-2%	-1%	-5%
3	Middlebrook Rd	N/A	0%	-1%	-3%
4	I-270	N/A	0%	0%	10%
5	Frederick Rd	N/A	1%	0%	-1%
	Subtotal*	N/A	0%	0%	6%

Note: * All links on the screenlines are included.

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Screenline I-270-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Darnestown Rd	N/A	0%	-1%	-3%
2	Great Seneca Hwy	N/A	0%	0%	-1%
3	West Diamond Ave	N/A	0%	0%	-2%
4	I-270	N/A	0%	0%	6%
5	North Frederick Ave	N/A	0%	0%	-3%
6	Lost Knife Rd	N/A	-2%	-1%	-1%
7	Midcounty Hwy	N/A	-1%	-1%	-2%
	Subtotal*	N/A	0%	0%	3%

Screenline I-270-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Great Seneca Hwy	N/A	-1%	1%	1%
2	Omega Rd	N/A	1%	0%	-1%
3	Shady Grove Rd	N/A	1%	4%	2%
4	I-270	N/A	2%	-3%	2%
5	Piccard Dr	N/A	0%	0%	0%
6	Gaither Rd	N/A	-2%	5%	-1%
7	Grand Champion Dr	N/A	-2%	12%	-1%
8	Frederick Rd	N/A	0%	1%	-1%
	Subtotal*	N/A	2%	-1%	2%

Screenline I-270-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	N/A	-1%	0%	-1%
2	Seven Locks Rd	N/A	-2%	-1%	-3%
3	I-270	N/A	1%	-3%	1%
4	Tower Oaks Blvd	N/A	-4%	1%	-2%
5	Rockville Pike	N/A	0%	1%	0%
6	Twinbrook Pkwy	N/A	-4%	-3%	-5%
7	Veirs Mill Rd	N/A	-2%	-1%	-1%
8	Bauer Dr	N/A	-5%	2%	-6%
9	Georgia Ave	N/A	0%	1%	-1%
	Subtotal*	N/A	0%	-2%	0%

Note: * All links on the screenlines are included.

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Screenline I-270-7

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	N/A	0%	1%	0%
2	Seven Locks Rd	N/A	1%	2%	0%
3	I-270	N/A	1%	-4%	1%
4	Old Georgetown Rd	N/A	-2%	-1%	-2%
5	Rockville Pike	N/A	3%	3%	2%
6	Connecticut Ave	N/A	1%	2%	0%
7	Veirs Mill Rd	N/A	-2%	-2%	-2%
	Subtotal*	N/A	1%	-2%	1%

Screenline I-495-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	American Legion Bridge	N/A	13%	9%	14%
2	Chain Bridge	N/A	-7%	-4%	-8%
3	Key Bridge	N/A	-2%	-1%	-2%
4	Roosevelt Bridge	N/A	-2%	-1%	-2%
5	Memorial Bridge	N/A	-3%	-1%	-2%
6	14th Street Bridge	N/A	-1%	-1%	-1%
7	Woodrow Wilson Bridge	N/A	-2%	-1%	-2%
	Subtotal*	N/A	3%	2%	3%

Screenline I-495-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Falls Rd	N/A	-6%	-1%	-7%
2	Bradley Blvd	N/A	-6%	0%	-6%
3	Seven Locks Rd	N/A	-4%	1%	-6%
4	Capital Beltway	N/A	12%	6%	14%
5	Burdette Rd	N/A	-8%	0%	-11%
6	Wilson La	N/A	-5%	-4%	-6%
	Subtotal*	N/A	9%	5%	10%

Note: * All links on the screenlines are included.

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Screenline I-495-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	I-270 East Spur	N/A	4%	-2%	4%
2	Fernwood Rd	N/A	26%	14%	32%
3	Rockledge Dr	N/A	-56%	-35%	-57%
4	Democracy Blvd	N/A	-3%	-8%	-1%
5	Capital Beltway	N/A	32%	25%	34%
6	Greentree Rd	N/A	-13%	-8%	-13%
7	Bradley Blvd	N/A	4%	2%	3%
8	Wilson La	N/A	-4%	-1%	-4%
	Subtotal*	N/A	13%	8%	15%

Screenline I-495-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Randolph Rd	N/A	-4%	-3%	-4%
2	Lindell St	N/A	-4%	-2%	-3%
3	West University Blvd	N/A	-2%	-1%	-1%
4	Veirs Mill Rd	N/A	-2%	-2%	-3%
5	Plyers Mill Rd	N/A	-2%	0%	-1%
6	Forest Glen Rd	N/A	-2%	0%	-2%
7	Capital Beltway	N/A	26%	15%	28%
8	Linden La	N/A	-5%	-3%	-3%
9	16th St	N/A	1%	2%	2%
10	Spring St	N/A	-6%	-4%	-5%
11	East West Hwy	N/A	0%	-1%	0%
12	Colesville Rd	N/A	0%	-3%	-3%
	Subtotal*	N/A	11%	6%	12%

Screenline I-495-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	ICC	N/A	-9%	-5%	-7%
2	Randolph Rd	N/A	-4%	-2%	-2%
3	Columbia Pike	N/A	0%	0%	-1%
4	Powder Mill Rd	N/A	-5%	-3%	-5%
5	Capital Beltway	N/A	19%	11%	21%
6	Adelphi Rd	N/A	2%	2%	1%
7	Metzerott Rd	N/A	-6%	-3%	-6%
8	Merrimac Dr	N/A	-1%	1%	1%
9	University Blvd	N/A	-1%	-1%	-1%
10	Erskine St	N/A	0%	0%	0%
11	East West Hwy	N/A	-5%	-3%	-5%
	Subtotal*	N/A	6%	4%	7%

Note: * All links on the screenlines are included.

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Screenline I-495-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Cheverly Ave	N/A	-12%	-7%	-10%
2	Landover Rd	N/A	-2%	-1%	-7%
3	Annapolis Rd	N/A	-6%	-3%	-12%
4	Veterans Pkwy	N/A	-3%	-2%	-2%
5	Riverdale Rd	N/A	-1%	0%	-5%
6	Good Luck Rd	N/A	0%	0%	-1%
7	Capital Beltway	N/A	12%	8%	14%
8	Greenbelt Rd	N/A	0%	1%	0%
9	Explorer Rd	N/A	-8%	-5%	0%
10	Soil Conservation Rd	N/A	-13%	-7%	-18%
11	Springfield Rd	N/A	-6%	-3%	-9%
12	Laurel Bowie Rd	N/A	-2%	-1%	-5%
	Subtotal*	N/A	4%	3%	4%

Screenline I-495-7

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Kenilworth Ave	N/A	-3%	-2%	0%
2	Columbia Park Rd	N/A	-8%	-4%	-4%
3	Landover Rd	N/A	-2%	-1%	-3%
4	Veterans Pkwy	N/A	-5%	-2%	-6%
5	Ardwick-Ardmore Rd	N/A	-6%	-2%	-7%
6	Capital Beltway	N/A	14%	8%	14%
7	Whitfield Chapel Rd	N/A	-13%	-6%	-17%
8	Martin Luther King Jr. Hwy	N/A	-5%	-3%	-6%
9	Lottsford Vista Rd	N/A	-26%	-11%	-28%
10	Enterprise Rd	N/A	-12%	-7%	-12%
11	Church Rd	N/A	-19%	-12%	-23%
12	Collington Rd	N/A	-2%	-1%	-1%
13	Crain Hwy	N/A	-3%	-2%	-5%
	Subtotal*	N/A	2%	1%	2%

Note: * All links on the screenlines are included.

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Screenline I-495-8

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Anacostia Fwy	N/A	-2%	-1%	-1%
2	Minnesota St	N/A	-2%	-1%	-1%
3	Ridge Rd SE	N/A	0%	0%	-1%
4	Texas Ave SE	N/A	-18%	-9%	-15%
5	Benning Rd SE	N/A	-1%	-1%	-1%
6	F St SE	N/A	-6%	-3%	-7%
7	Southern Ave SE	N/A	-2%	-1%	-3%
8	Larchmont Ave	N/A	-4%	-3%	-5%
9	Suffolk Ave	N/A	-9%	-6%	-15%
10	Rollins Ave	N/A	-16%	-14%	-20%
11	Addison Rd	N/A	-5%	-4%	-5%
12	*Karen Blvd (Not Coded in 2016)*	*N/A*	*-14%*	*-8%*	*-12%*
13	Shady Glen Dr	N/A	-4%	-2%	-4%
14	Ritchie Rd	N/A	-12%	-9%	-12%
15	Capital Beltway	N/A	12%	9%	13%
16	Harry S Truman Dr	N/A	-1%	-1%	-1%
17	Largo Rd	N/A	-1%	0%	0%
18	Campus Way S	N/A	-4%	-6%	-3%
19	Kettering Dr	N/A	-19%	-13%	-23%
20	Watkins Park Dr	N/A	-5%	-3%	-4%
21	Church Rd	N/A	-23%	-13%	-33%
22	Crain Hwy	N/A	-2%	-1%	-3%
	Subtotal*	N/A	1%	1%	2%

Screenline I-495-9

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Suitland Pkwy	N/A	0%	1%	-1%
2	Silver Hill Rd	N/A	-6%	-4%	-5%
3	Auth Rd	N/A	3%	1%	3%
4	*I-495 to Branch Ave. Metro Connection (New Facility)*	*N/A*	*-2%*	*-2%*	*-2%*
5	Capital Beltway	N/A	8%	6%	8%
6	Allentown Rd	N/A	-4%	-3%	-3%
7	Old Alexander Ferry Rd	N/A	2%	1%	1%
8	Woodyard Rd	N/A	-2%	-1%	-3%
9	Surratts Rd	N/A	1%	0%	-1%
10	Dyson Rd	N/A	-7%	-5%	-9%
11	Mattawoman Dr	N/A	-1%	1%	-2%
12	Crain Hwy	N/A	-5%	-4%	-9%
	Subtotal*	N/A	2%	2%	2%

Note: * All links on the screenlines are included.

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Screenline MD-295-1

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	I-95	N/A	0%	0%	-2%
2	Washington Blvd	N/A	1%	0%	-7%
3	MD 295	N/A	1%	1%	36%
4	Aviation Blvd	N/A	-1%	-1%	-9%
5	Aviation Ave	N/A	0%	2%	-8%
6	I-97	N/A	0%	0%	-3%
	Subtotal*	N/A	0%	0%	3%

Screenline MD-295-2

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	N/A	0%	0%	-1%
2	Broken Land Pkwy	N/A	0%	0%	-4%
3	I-95	N/A	0%	0%	-1%
4	Washington Blvd	N/A	0%	1%	-5%
5	Brock Bridge Rd	N/A	2%	1%	-16%
6	MD 295	N/A	0%	0%	39%
7	Annapolis Rd	N/A	-1%	-1%	-10%
8	Telegraph Rd	N/A	0%	0%	-3%
9	Clark Station Rd	N/A	-2%	-2%	-13%
10	New Cut Rd	N/A	0%	2%	-14%
11	I-97	N/A	0%	0%	-3%
	Subtotal*	N/A	0%	0%	2%

Screenline MD-295-3

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	N/A	0%	0%	-2%
2	I-95	N/A	2%	2%	1%
3	Old Gunpowder Rd	N/A	5%	5%	-1%
4	Virginia Manor Rd	N/A	7%	8%	-1%
5	Baltimore Ave	N/A	-2%	-2%	-10%
6	*Old Baltimore Pike Extended (New Facility)*	*N/A*	*1%*	*3%*	*-18%*
7	Montpelier Dr	N/A	4%	3%	-16%
8	Muirkirk Rd	N/A	3%	3%	8%
9	Laurel Bowie Rd	N/A	-1%	0%	6%
10	MD 295	N/A	0%	0%	46%
	Subtotal*	N/A	1%	1%	7%

Note: * All links on the screenlines are included.

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Confidential Pre-Decisional & Deliberative

Screenline MD-295-4

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Columbia Pike	N/A	0%	0%	0%
2	New Hampshire Ave	N/A	0%	1%	-1%
3	Riggs Rd	N/A	-1%	0%	-5%
4	Cherry Hill Rd	N/A	2%	3%	-1%
5	I-95	N/A	4%	4%	3%
6	Sellman Rd	N/A	-2%	1%	-9%
7	Baltimore Ave	N/A	2%	2%	1%
8	Rhode Island Ave	N/A	-3%	-2%	-9%
9	Cherrywood La	N/A	2%	2%	2%
10	Kenilworth Ave	N/A	-2%	-1%	-7%
11	Greenbelt Rd	N/A	-3%	-2%	-2%
12	MD 295	N/A	4%	3%	39%
13	Good Luck Rd	N/A	0%	1%	-4%
14	Annapolis Rd	N/A	2%	1%	0%
	Subtotal*	N/A	2%	2%	5%

Screenline MD-295-5

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Baltimore Ave	N/A	-1%	-1%	-3%
2	Kenilworth Ave	N/A	-3%	-2%	-8%
3	MD 295	N/A	-4%	-2%	26%
4	Capital Beltway	N/A	12%	8%	14%
	Subtotal*	N/A	5%	3%	13%

Screenline MD-295-6

Sequence	Facility	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1	Bladenburg Rd	N/A	-3%	-2%	-6%
2	Kenilworth Ave	N/A	-5%	-4%	-14%
3	MD 295	N/A	-4%	-2%	11%
4	Cheverly Ave	N/A	-12%	-7%	-10%
5	Landover Rd	N/A	-2%	-1%	-7%
6	Cooper Lane	N/A	-9%	-6%	-12%
7	Veterans Pkwy	N/A	-4%	-2%	-4%
8	Capital Beltway	N/A	11%	7%	14%
	Subtotal*	N/A	3%	2%	6%

Note: * All links on the screenlines are included.

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Table B5. 2040 Simulated AAWDT Volumes on I-270 / I-495 / MD 295

I-270 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	IS270-.40 MI S OF NEW DESIGN RD	169,723	0	169,723	170,268	0	170,268	170,088	0	170,088	170,927	18,357	189,284
2	IS270-.20 MI S OF BAKER VALLEY RD	131,876	0	131,876	132,442	0	132,442	132,264	0	132,264	127,241	33,204	160,445
3	IS270-50ft S OF FREDERICK CO/L	141,024	0	141,024	141,673	0	141,673	141,368	0	141,368	132,636	40,493	173,128
4	IS270-.50 MI N OF MD121	143,187	0	143,187	143,856	0	143,856	143,529	0	143,529	132,021	47,538	179,559
5	IS 270 South of MD 121 (ATR#04)	157,892	6,867	164,758	158,066	6,935	165,001	157,914	6,909	164,823	141,994	45,052	187,046
6	IS270-.40 MI N OF MD118	162,450	5,987	168,437	162,610	6,087	168,697	162,440	6,038	168,478	143,191	45,052	188,243
7	IS270-.30 MI S OF MD118	172,265	6,493	178,758	172,364	6,587	178,951	172,005	6,544	178,549	153,152	44,099	197,252
8	IS270-.50 MI S OF MIDDLEBROOK RD	201,089	6,493	207,582	201,067	6,587	207,653	200,730	6,544	207,274	180,786	44,099	224,885
9	IS270-.30 MI S OF MD124	247,647	6,791	254,437	247,811	6,984	254,795	246,368	6,894	253,262	231,074	39,003	270,077
10	IS270-.50 MI N OF IS370	269,426	11,260	280,686	261,460	19,581	281,041	262,993	16,026	279,019	256,448	39,003	295,451
11	IS270-.30 MI N OF SHADY GROVE RD	268,796	12,057	280,853	258,100	27,175	285,275	255,829	17,428	273,257	249,927	36,980	286,907
12	IS270-.50 MI N OF MD28	282,309	11,550	293,859	262,069	38,053	300,123	261,993	23,461	285,453	261,088	39,665	300,752
13	IS270-.30 MI S OF MD28	319,000	11,550	330,549	297,372	38,053	335,425	297,383	23,461	320,844	295,660	39,665	335,325
14	IS270-.30 MI N OF MD927 (MONTROSE RD)	322,967	12,150	335,117	301,190	38,053	339,243	300,426	23,461	323,887	299,642	39,665	339,306
15	IS270-.10 MI N OF TUCKERMAN LA	321,192	14,507	335,698	289,722	49,163	338,885	291,085	31,045	322,130	287,839	51,755	339,594
16	IS270Y-.30 MI N OF WESTLAKE TERR	187,217	11,675	198,893	164,865	31,956	196,821	166,076	22,342	188,418	163,863	32,969	196,832
17	IS270Y-.40 MI S OF DEMOCRACY BLVD	186,474	11,669	198,143	152,022	41,055	193,078	153,329	28,402	181,731	152,033	43,859	195,892
18	IS270-.30 MI N OF MD187B	133,974	2,832	136,806	124,857	17,207	142,064	125,009	8,703	133,712	123,976	18,786	142,763
19	IS270-.10 MI S OF MD187	111,860	2,636	114,495	107,702	17,207	124,909	107,234	8,703	115,938	107,357	18,786	126,143

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I-495 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	IS495-.10 MI E OF PERSIMMON TREE RD	264,080	0	264,080	256,728	56,772	313,499	260,580	32,709	293,289	257,178	61,566	318,744
2	IS495-.70 MI N OF MD190	344,957	0	344,957	330,125	56,772	386,896	332,006	32,709	364,715	330,566	61,566	392,132
3	IS495-.50 MI W OF MD187	146,814	0	146,814	138,970	54,849	193,818	150,074	32,909	182,983	141,975	54,265	196,241
4	IS495-.30 MI E OF MD187	142,380	0	142,380	134,059	54,849	188,908	141,686	32,909	174,595	137,674	54,265	191,940
5	IS495-.20 MI E OF MD355	256,442	0	256,442	250,392	72,056	322,447	253,751	41,612	295,364	253,685	73,052	326,736
6	IS495-.80 MI W OF MD97	250,875	0	250,875	245,112	72,056	317,168	248,060	41,612	289,672	248,754	73,052	321,806
7	IS495-.20 MI E OF MD97	241,649	0	241,649	241,329	59,598	300,927	240,886	36,243	277,129	243,016	62,565	305,580
8	IS495-.20 MI E OF US29	235,021	0	235,021	230,617	59,598	290,215	231,047	36,243	267,290	232,548	62,565	295,112
9	IS 495 West of MD 650 (ATR#41)	253,528	0	253,528	248,434	59,598	308,032	249,306	36,243	285,549	250,917	62,565	313,482
10	IS495-.10 MI W OF MD212	292,711	0	292,711	288,340	59,598	347,938	289,722	36,243	325,965	291,019	62,565	353,584
11	IS95-.30 MI N OF US1	241,866	0	241,866	216,422	22,546	238,968	222,644	16,348	238,992	220,541	24,681	245,221
12	IS95-.40 MI S OF US1	215,856	0	215,856	208,311	22,546	230,857	210,721	16,348	227,069	206,533	24,681	231,214
13	IS95-.30 MI N OF MD201	204,455	0	204,455	190,582	30,513	221,095	195,463	21,172	216,635	189,443	32,181	221,624
14	IS95-.30 MI S OF MD201	212,579	0	212,579	200,322	30,513	230,835	204,132	21,172	225,304	199,285	32,181	231,466
15	IS 95 North of Good Luck Rd (ATR#55)	212,342	0	212,342	204,624	32,324	236,948	207,228	21,125	228,353	205,987	36,043	242,030
16	IS95-.60 MI N OF IS595/US50	222,048	0	222,048	214,260	32,324	246,585	216,087	21,125	237,212	216,246	36,043	252,288
17	IS95-.10 MI S OF MD704	240,128	0	240,128	227,081	45,700	272,780	232,758	26,142	258,900	227,860	46,160	274,019
18	IS95-.40 MI S OF MD202	228,942	0	228,942	226,932	32,514	259,445	226,314	21,568	247,882	227,431	33,404	260,835
19	IS 95 South of MD 214 (ATR#43)	214,922	0	214,922	208,037	32,514	240,551	211,795	21,568	233,363	209,218	33,404	242,622
20	IS95-.50 MI N OF MD4	210,845	0	210,845	207,172	24,395	231,567	207,472	19,162	226,634	207,608	25,662	233,269
21	IS95-.40 MI S OF MD4	200,506	0	200,506	192,781	24,395	217,176	194,650	19,162	213,812	193,327	25,662	218,989
22	IS95-.40 MI N OF MD5	180,479	0	180,479	169,690	24,395	194,085	172,224	19,162	191,386	169,597	25,662	195,258
23	IS 95 at Temple Hill Rd (ATR#49)	170,533	0	170,533	161,398	13,967	175,364	164,517	11,130	175,648	161,569	14,278	175,847
24	IS95-.40 MI S OF MD414	172,622	0	172,622	162,195	13,967	176,161	165,144	11,130	176,275	162,423	14,278	176,701
25	IS95-.30 MI S OF MD210	202,714	0	202,714	200,607	0	200,607	202,171	0	202,171	200,889	0	200,889
26	IS95-.50 MI N OF VIRGINIA ST/L	254,592	0	254,592	250,123	0	250,123	252,518	0	252,518	250,647	0	250,647

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MD 295 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	MD295-.10 MI S OF BALTIMORE CO/L	102,907	0	102,907	102,908	0	102,908	102,907	0	102,907	102,906	0	102,906
2	MD295-.20 MI S OF IS695	82,356	0	82,356	82,025	0	82,025	82,764	0	82,764	69,229	34,917	104,146
3	MD295-.60 MI N OF IS195	82,372	0	82,372	81,915	0	81,915	82,632	0	82,632	69,166	34,917	104,082
4	MD295-.30 MI N OF MD100	106,492	0	106,492	107,176	0	107,176	107,222	0	107,222	96,881	47,580	144,461
5	MD295-.60 MI S OF MD100	122,722	0	122,722	122,940	0	122,940	122,989	0	122,989	114,052	51,781	165,833
6	MD295-.25 MI S OF MD175	119,185	0	119,185	119,572	0	119,572	119,616	0	119,616	114,473	51,781	166,254
7	MD295-.50 MI S OF MD32	120,412	0	120,412	120,590	0	120,590	120,465	0	120,465	115,210	53,749	168,959
8	MD295-.30 MI N OF MD197	108,596	0	108,596	108,664	0	108,664	108,566	0	108,566	106,068	52,145	158,213
9	MD295-.60 MI S OF MD197	114,712	0	114,712	114,373	0	114,373	114,371	0	114,371	110,520	52,145	162,665
10	MD295-.40 MI N OF MD193	97,096	0	97,096	98,078	0	98,078	97,554	0	97,554	97,685	42,258	139,943
11	MD295-.30 MI N OF IS95	109,023	0	109,023	113,433	0	113,433	112,008	0	112,008	108,756	42,258	151,014
12	MD295-.30 MI S OF IS95	96,911	0	96,911	93,292	0	93,292	94,997	0	94,997	89,706	32,081	121,787
13	MD295-.20 MI N OF MD450	96,620	0	96,620	93,564	0	93,564	95,229	0	95,229	96,035	22,533	118,568
14	MD295-.20 MI N OF MD202	109,058	0	109,058	104,952	0	104,952	107,014	0	107,014	104,971	22,533	127,504
15	MD295-.50 MI N OF US50	111,094	0	111,094	106,689	0	106,689	108,689	0	108,689	100,755	22,533	123,288

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Table B6. 2040 Simulated AAWDT Volumes on I-270 / I-495 / MD 295; % Differences Relative to Alternative 1 (No Build)

I-270 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	IS270-.40 MI S OF NEW DESIGN RD	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	1%	N/A	12%
2	IS270-.20 MI S OF BAKER VALLEY RD	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-4%	N/A	22%
3	IS270-50ft S OF FREDERICK CO/L	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-6%	N/A	23%
4	IS270-.50 MI N OF MD121	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-8%	N/A	25%
5	IS 270 South of MD 121 (ATR#04)	N/A	N/A	N/A	0%	1%	0%	0%	1%	0%	-10%	556%	14%
6	IS270-.40 MI N OF MD118	N/A	N/A	N/A	0%	2%	0%	0%	1%	0%	-12%	652%	12%
7	IS270-.30 MI S OF MD118	N/A	N/A	N/A	0%	1%	0%	0%	1%	0%	-11%	579%	10%
8	IS270-.50 MI S OF MIDDLEBROOK RD	N/A	N/A	N/A	0%	1%	0%	0%	1%	0%	-10%	579%	8%
9	IS270-.30 MI S OF MD124	N/A	N/A	N/A	0%	3%	0%	-1%	2%	0%	-7%	474%	6%
10	IS270-.50 MI N OF IS370	N/A	N/A	N/A	-3%	74%	0%	-2%	42%	-1%	-5%	246%	5%
11	IS270-.30 MI N OF SHADY GROVE RD	N/A	N/A	N/A	-4%	125%	2%	-5%	45%	-3%	-7%	207%	2%
12	IS270-.50 MI N OF MD28	N/A	N/A	N/A	-7%	229%	2%	-7%	103%	-3%	-8%	243%	2%
13	IS270-.30 MI S OF MD28	N/A	N/A	N/A	-7%	229%	1%	-7%	103%	-3%	-7%	243%	1%
14	IS270-.30 MI N OF MD927 (MONTROSE RD)	N/A	N/A	N/A	-7%	213%	1%	-7%	93%	-3%	-7%	226%	1%
15	IS270-.10 MI N OF TUCKERMAN LA	N/A	N/A	N/A	-10%	239%	1%	-9%	114%	-4%	-10%	257%	1%
16	IS270Y-.30 MI N OF WESTLAKE TERR	N/A	N/A	N/A	-12%	174%	-1%	-11%	91%	-5%	-12%	182%	-1%
17	IS270Y-.40 MI S OF DEMOCRACY BLVD	N/A	N/A	N/A	-18%	252%	-3%	-18%	143%	-8%	-18%	276%	-1%
18	IS270-.30 MI N OF MD187B	N/A	N/A	N/A	-7%	508%	4%	-7%	207%	-2%	-7%	563%	4%
19	IS270-.10 MI S OF MD187	N/A	N/A	N/A	-4%	553%	9%	-4%	230%	1%	-4%	613%	10%

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I-495 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	IS495-.10 MI E OF PERSIMMON TREE RD	N/A	N/A	N/A	-3%	N/A	19%	-1%	N/A	11%	-3%	N/A	21%
2	IS495-.70 MI N OF MD190	N/A	N/A	N/A	-4%	N/A	12%	-4%	N/A	6%	-4%	N/A	14%
3	IS495-.50 MI W OF MD187	N/A	N/A	N/A	-5%	N/A	32%	2%	N/A	25%	-3%	N/A	34%
4	IS495-.30 MI E OF MD187	N/A	N/A	N/A	-6%	N/A	33%	0%	N/A	23%	-3%	N/A	35%
5	IS495-.20 MI E OF MD355	N/A	N/A	N/A	-2%	N/A	26%	-1%	N/A	15%	-1%	N/A	27%
6	IS495-.80 MI W OF MD97	N/A	N/A	N/A	-2%	N/A	26%	-1%	N/A	15%	-1%	N/A	28%
7	IS495-.20 MI E OF MD97	N/A	N/A	N/A	0%	N/A	25%	0%	N/A	15%	1%	N/A	26%
8	IS495-.20 MI E OF US29	N/A	N/A	N/A	-2%	N/A	23%	-2%	N/A	14%	-1%	N/A	26%
9	IS 495 West of MD 650 (ATR#41)	N/A	N/A	N/A	-2%	N/A	21%	-2%	N/A	13%	-1%	N/A	24%
10	IS495-.10 MI W OF MD212	N/A	N/A	N/A	-1%	N/A	19%	-1%	N/A	11%	-1%	N/A	21%
11	IS95-.30 MI N OF US1	N/A	N/A	N/A	-11%	N/A	-1%	-8%	N/A	-1%	-9%	N/A	1%
12	IS95-.40 MI S OF US1	N/A	N/A	N/A	-3%	N/A	7%	-2%	N/A	5%	-4%	N/A	7%
13	IS95-.30 MI N OF MD201	N/A	N/A	N/A	-7%	N/A	8%	-4%	N/A	6%	-7%	N/A	8%
14	IS95-.30 MI S OF MD201	N/A	N/A	N/A	-6%	N/A	9%	-4%	N/A	6%	-6%	N/A	9%
15	IS 95 North of Good Luck Rd (ATR#55)	N/A	N/A	N/A	-4%	N/A	12%	-2%	N/A	8%	-3%	N/A	14%
16	IS95-.60 MI N OF IS595/US50	N/A	N/A	N/A	-4%	N/A	11%	-3%	N/A	7%	-3%	N/A	14%
17	IS95-.10 MI S OF MD704	N/A	N/A	N/A	-5%	N/A	14%	-3%	N/A	8%	-5%	N/A	14%
18	IS95-.40 MI S OF MD202	N/A	N/A	N/A	-1%	N/A	13%	-1%	N/A	8%	-1%	N/A	14%
19	IS 95 South of MD 214 (ATR#43)	N/A	N/A	N/A	-3%	N/A	12%	-1%	N/A	9%	-3%	N/A	13%
20	IS95-.50 MI N OF MD4	N/A	N/A	N/A	-2%	N/A	10%	-2%	N/A	7%	-2%	N/A	11%
21	IS95-.40 MI S OF MD4	N/A	N/A	N/A	-4%	N/A	8%	-3%	N/A	7%	-4%	N/A	9%
22	IS95-.40 MI N OF MD5	N/A	N/A	N/A	-6%	N/A	8%	-5%	N/A	6%	-6%	N/A	8%
23	IS 95 at Temple Hill Rd (ATR#49)	N/A	N/A	N/A	-5%	N/A	3%	-4%	N/A	3%	-5%	N/A	3%
24	IS95-.40 MI S OF MD414	N/A	N/A	N/A	-6%	N/A	2%	-4%	N/A	2%	-6%	N/A	2%
25	IS95-.30 MI S OF MD210	N/A	N/A	N/A	-1%	N/A	-1%	0%	N/A	0%	-1%	N/A	-1%
26	IS95-.50 MI N OF VIRGINIA ST/L	N/A	N/A	N/A	-2%	N/A	-2%	-1%	N/A	-1%	-2%	N/A	-2%

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MD 295 Locations

Seq#	Location	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total	GPL	HOV/ETL	Total
1	MD295-.10 MI S OF BALTIMORE CO/L	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	0%	N/A	0%
2	MD295-.20 MI S OF IS695	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-16%	N/A	26%
3	MD295-.60 MI N OF IS195	N/A	N/A	N/A	-1%	N/A	-1%	0%	N/A	0%	-16%	N/A	26%
4	MD295-.30 MI N OF MD100	N/A	N/A	N/A	1%	N/A	1%	1%	N/A	1%	-9%	N/A	36%
5	MD295-.60 MI S OF MD100	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-7%	N/A	35%
6	MD295-.25 MI S OF MD175	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-4%	N/A	39%
7	MD295-.50 MI S OF MD32	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-4%	N/A	40%
8	MD295-.30 MI N OF MD197	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-2%	N/A	46%
9	MD295-.60 MI S OF MD197	N/A	N/A	N/A	0%	N/A	0%	0%	N/A	0%	-4%	N/A	42%
10	MD295-.40 MI N OF MD193	N/A	N/A	N/A	1%	N/A	1%	0%	N/A	0%	1%	N/A	44%
11	MD295-.30 MI N OF IS95	N/A	N/A	N/A	4%	N/A	4%	3%	N/A	3%	0%	N/A	39%
12	MD295-.30 MI S OF IS95	N/A	N/A	N/A	-4%	N/A	-4%	-2%	N/A	-2%	-7%	N/A	26%
13	MD295-.20 MI N OF MD450	N/A	N/A	N/A	-3%	N/A	-3%	-1%	N/A	-1%	-1%	N/A	23%
14	MD295-.20 MI N OF MD202	N/A	N/A	N/A	-4%	N/A	-4%	-2%	N/A	-2%	-4%	N/A	17%
15	MD295-.50 MI N OF US50	N/A	N/A	N/A	-4%	N/A	-4%	-2%	N/A	-2%	-9%	N/A	11%

DRAFT

Confidential Pre-Decisional & Deliberative

National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Kari Snyder, MDOT Staff
FROM: Dusan Vuksan, Feng Xie, TPB Staff
SUBJECT: 2045 Sensitivity Analysis of TRP-Related Projects in Visualize 2045
DATE: January 11, 2019
CC: Kanti Srikanth, Tim Canan, Mark Moran, Jinchul Park, TPB Staff

INTRODUCTION

The Maryland Department of Transportation (MDOT) has requested Transportation Planning Board (TPB) staff's assistance in an analysis to better understand the impact of Maryland's Traffic Relief Plan (TRP) projects (as specified in the Visualize 2045 Plan) on regional travel demand, performance and emissions. As specified in the Scope of Work for the project, the analysis assesses how the TRP-related projects included in the Visualize 2045 Plan will affect the performance of the Washington, D.C. region's transportation system, such as vehicle-hours-of-delay (VHD), vehicle-miles-traveled (VMT), and mobile source emissions. A preliminary memorandum documenting the 2030 analysis was provided to MDOT on December 21, 2018. This preliminary technical memorandum documents the impacts of TRP-related projects on overall system performance in 2045.

ALTERNATIVES

MDOT is interested in examining the changes in the region's transportation system performance that can reasonably be attributed to the TRP-related projects in Visualize 2045. This would require a "before/after" or "Build/No Build" analysis of the TRP-related projects. Typically, regional, sub-regional and scenario planning studies use the Metropolitan Planning Organization's (MPO) long-range plan forecasts as a "baseline" or "no build" option. However, in this case, the TPB's long-range plan (Visualize 2045) already includes the TRP and as such will serve as an "After" or "Build" alternative. Staff's technical analysis has developed a "Before" or "No Build" alternative by removing only the TRP-related projects from the existing network inputs [1] to the travel demand model. Other future year Visualize 2045 constrained element projects are included in both "No Build" and "Build" scenarios (i.e., US 301 expansion is included in "No Build" and "Build" in this context).

MDOT has also requested that the impacts of the TRP-related projects be examined in years 2030 and 2045. The complete list of alternatives that are being examined as part of this "study" are

[1] As part of Visualize 2045, the Virginia Department of Transportation (VDOT) modified the extension of the Virginia Beltway HOT Lanes to coordinate with the Maryland TRP project. In Visualize 2045, VDOT assumed two HOT lanes in each direction from George Washington Parkway to the American Legion Bridge to match the proposed managed lane configuration in Maryland. The prior 2016 Constrained Long Range Plan assumed one lane per direction in this section. In addition to removing the TRP project in Maryland, "No Build" scenario reverts to one managed lane in each direction for this segment of Beltway in Virginia.

shown in Table 1. This memorandum summarizes the system performance for TRP No Build and TRP Build scenarios for the analysis year 2045 (shown in red in Table 1).

Table 1. Alternatives for Analysis

	TRP "No Build"	TRP "Build"
2030	Completed	Completed for Visualize 2045
2045	**Completed**	Completed for Visualize 2045

It is important to note that this effort is not part of the ongoing MDOT I-495 and I-270 Managed Lanes project development studies. These sensitivity tests are being done to quantify the estimates of potential system performance improvements of the TRP-related projects. Such information will help MDOT with the project's stakeholders' outreach. Additionally, this analysis does not attempt to analyze or recommend specific TRP alternatives.

The TRP-related projects in Visualize 2045, assumed in TRP Build scenario, are as follows:

- Two additional managed lanes in each direction on Capital Beltway/I-495 in Maryland
- Two additional managed lanes in each direction on I-270 (including the Spurs) from the Beltway to I-70; the existing I-270 HOV lanes are not removed nor converted to other types of managed lanes
- Direct-access points are constructed at key locations

Project descriptions for I-495 and I-270 Managed Lanes are included in Appendix A of this memorandum.

ANALYSIS METHODOLOGY

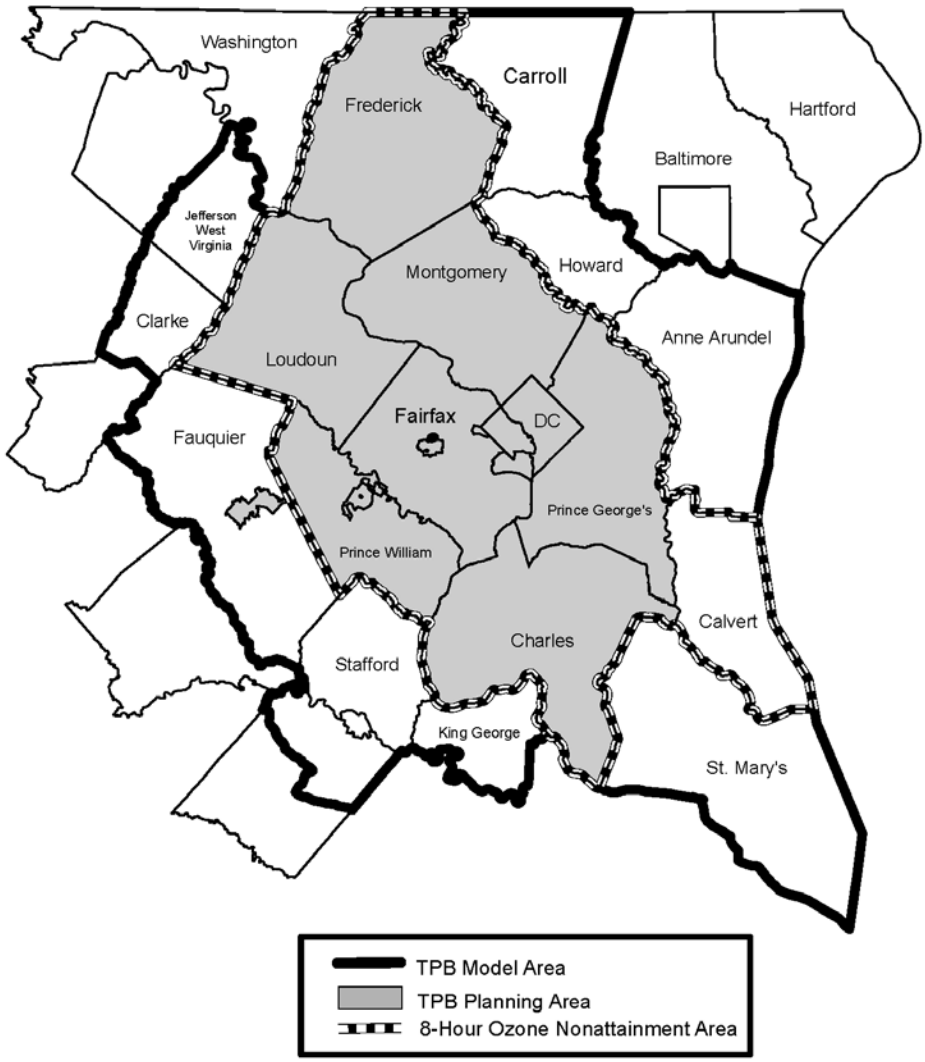
The 2045 TRP No Build alternative was modeled using the TPB's typical modeling process, which was also applied to the 2045 TRP Build alternative as a part of the Visualize 2045 analysis. The methodology includes:

- Toll development process [2]
- Final travel demand model run with newly developed tolls
- MOVES mobile emissions runs

As this study or "test" has been designed to assess the TRP impacts regionally, and not at the link level, detailed base-year model validation was not conducted. The transportation performance and greenhouse gas impacts are assessed for the TPB Planning Area, while the nitrogen oxide (NOx) and volatile organic compounds (VOCs) are analyzed for the 8-Hour Ozone Nonattainment Area (as depicted on Map 1).

[2] Although TRP's tolled facilities were removed from the analysis in TRP No Build alternative, the toll development process was performed for the Virginia facilities as their toll rates could be impacted when the TRP-related managed lane facilities in Maryland are removed from the transportation networks.

Map 1. TPB Planning Area



MODEL INPUTS AND VERSION

The analysis model is the current model of record, which is the TPB Version 2.3.75 travel demand model with the Round 9.1 Cooperative Forecasts of land activity, the transportation inputs for the constrained element of the Visualize 2045 Long Range Plan and the alternative-specific inputs

discussed in the "Alternatives" section of this memorandum (where applicable). Consistent with the Visualize 2045 analysis, mobile emissions analysis was conducted using the EPA's MOVES2014a model.

2045 ANALYSIS YEAR SUMMARY FINDINGS

In general, the TRP projects appear to help improve mobility, accessibility, reliability, and reduce congestion. Specifically, of all the performance measures that were evaluated, the analysis shows that congestion reduction and reliability will experience the greatest gains resulting from the implementation of system of managed lanes. On the other hand, TRP projects are forecast to have less of an impact on emissions, with two of the three pollutants analyzed in this technical report forecast to increase slightly. These findings are all in line with the 2030 analysis that was provided to MDOT in December 2018.

Specifically, the number and share of HOV trips will increase, while SOV and transit will decrease for both work and all daily trips. VMT will increase while vehicle hours of delay (VHD) will decrease. Similarly, the number of lane miles that are congested will decrease, as will the proportion of congested lane miles. Person miles traveled (PMT) will increase, while PMT on reliable modes of travel will increase. Average number of jobs accessible within 45 minutes of travel by auto and transit will increase. The magnitude of change across the various performance measures varies and will need to be assessed relative to the base value of the specific performance measure.

TRANSPORTATION SYSTEM PERFORMANCE

The regional-level transportation system performance findings of the 2045 TRP sensitivity test are summarized below for the TPB Planning Area. The summaries highlight impacts of the TRP-related projects on the transportation system in 2045 (as "2045 TRP Build minus 2045 TRP No Build" comparisons).

It is important to note that the summaries presented in this memorandum are based on a regional travel demand model that was not specifically validated against observed data for the TRP study area. For example, link-level simulated volumes on I-270 were not compared against observed counts. This was determined acceptable for this study since the results are being examined at the regional level, and the model has previously been calibrated and validated at the regional and screen-line levels. As such, the findings of this analysis would not be applicable to individual roadways and smaller area geographies without a reevaluation of the model validation.

Also, as the changes in estimates of various performance measures are examined, it should be noted that those performance measures that are designed to respond to changes in land use do not change, since the land use assumptions in this analysis for Build and No Build scenarios were not changed.

MODE CHOICE

Tables 2a and 2b display mode shifts resulting from the implementation of TRP in 2045. They show that the TRP facilities mainly impact the commute trips, which largely occur in peak periods. **For both the commute and all trip purposes, HOV/Carpool mode benefits the most from the system of**

managed lanes, while transit and SOV person trips decline in TRP Build scenario. All users have to pay to access managed lanes, but commuting carpools have a large value of time, which explains the shift from other modes to carpooling in TRP Build (i.e., tolls are not as significant when three-person work carpool participants share the costs associated with tolls). However, it is important to be cognizant of the scale of magnitude of change. In many instances, the percent difference between Build and No Build is close to zero, especially for all trip purposes shown in Table 2b, even when the absolute change in measurable.

Table 2a. Mode Choice for Commute Trips in 2045

	TRP No Build	TRP Build	Difference	% Diff.
Commute Trips	4,143,400	4,142,600	-800	0%
SOV	2,333,100	2,324,000	-9,100	0%
HOV/Carpool	421,600	444,600	23,000	5%
Transit	1,121,100	1,106,300	-14,800	-1%
Non-Motorized	267,700	267,600	-100	0%

Table 2b. Mode Choice for All Trip Purposes in 2045

	TRP No Build	TRP Build	Difference	% Diff.
All Trips	20,823,200	20,819,600	-3,600	0%
SOV	7,929,400	7,917,500	-11,900	0%
HOV/Carpool	8,199,600	8,224,000	24,400	0%
Transit	1,565,800	1,550,300	-15,500	-1%
Non-Motorized	3,128,400	3,127,900	-500	0%

VMT AND CONGESTION

Table 3 displays the effects of the TRP-related projects on vehicular travel and congestion on the region's roadway system. As can be seen, the implementation of the TRP managed lane system results in a 1% increase in daily vehicle miles traveled (VMT). In addition, two important congestion indicators, daily vehicle hours of delay (VHD) and AM peak lane miles of congestion, decrease by 11% and 7%, respectively, relative to TRP No Build.

Table 3. Vehicle Miles Traveled and Congestion in 2045

	TRP No Build	TRP Build	Difference	% Diff.
Average Weekday Measures				
VMT	144,171,000	145,597,000	1,426,000	1%
VHD	1,940,000	1,729,000	-211,000	-11%
AM Peak Measures				
Lane Miles of Congestion	2,900	2,700	-200	-7%
Peak Hour % Congested Lane Miles	16.1%	14.4%	-1.7%	N/A

TRANSPORTATION SYSTEM RELIABILITY

Table 4 below examines the transportation system reliability in TRP No Build and TRP Build scenarios. Consistent with the Visualize 2045 performance analysis, system reliability is defined as percentage of person miles traveled (PMT) on reliable travel modes [3]. Since the TRP managed lanes facilities are categorized as a "reliable mode," construction and implementation of the TRP-related projects were expected to improve the system reliability. Consequently, PMT on reliable modes in TRP Build increases by 20% relative to TRP No Build, and percentage of PMT on reliable modes increases from 12.9% to 15.3%.

Table 4. Transportation System Reliability in 2045

	TRP No Build	TRP Build	Difference	% Diff.
System Person Miles Traveled (PMT)	213,862,000	216,471,000	2,609,000	1%
PMT on Reliable Modes	27,671,000	33,148,000	5,477,000	20%
Percentage of PMT on Reliable Modes	12.9%	15.3%	2.4%	

ACCESSIBILITY

Table 5 examines the change in average system accessibility that can be attributed to the TRP projects. In this analysis, accessibility is measured as average number of jobs that can be accessed in AM Peak within 45 minutes by auto or transit. As shown in Table 5, the average auto accessibility increases by 5% and the average transit accessibility increases by 1% in TRP Build scenario.

[3] Reliable modes refer to express toll lanes with dynamic toll rates (HOT/ETL), HOV lanes, ICC, Dulles Airport Access Road, Fixed Guide-way Transit (Metrorail, Commuter Rail, Light Rail, Streetcar), Bus Rapid Transit, long-haul express buses, and non-motorized travel (bike/pedestrian).

Table 5. Average Number of Jobs Accessible in AM Peak Period within 45 minutes in 2045

	TRP No Build	TRP Build	Difference	% Diff.
Average Auto Accessibility	866,000	909,000	43,000	5%
Average Transit Accessibility	514,000	518,000	3,000	1%

MOBILE EMISSIONS

Emissions estimates for the two 2045 scenarios are summarized in Table 6 for the ozone season pollutants and greenhouse gases. While VOC emissions are estimated to decrease (slightly), NOx and CO2 (GHG) emissions are estimated to increase slightly.

Table 6. Emissions Estimates in 2030

	Pollutant	TRP No Build	TRP Build	Difference	% Diff.
Ozone Season	VOC (tons/day)	18.396	18.393	-0.003	0.0%
	NOx (tons/day)	19.395	19.527	0.132	0.7%
Greenhouse Gases	GHG (metric tons of CO2 Equivalent/year)	17,404,249	17,482,572	78,323	0.5%

NEXT STEPS

Staff have completed the 2045 analysis and documented the draft findings in this memorandum. Final technical memorandum for the study will be completed at the end of January. The major tasks related to this study, shared in the Scope of Work, are specified below.

- December 14, 2019: 2030 Evaluation / Preliminary Memorandum; COMPLETE
- January 18, 2019: 2045 Evaluation / Preliminary Memorandum; COMPLETE
- January 31, 2019: Final Memorandum

APPENDIX A

VISUALIZE 2045
PROJECT DESCRIPTIONS
FOR I-270 AND I-495

I-270 MANAGED LANES

PROPOSED MAJOR ADDITION
VISUALIZE 2045

From I-495, Capital Beltway to I-70/US 40

Basic Project Information

Project Length.....34 Miles

Anticipated Completion.....2020-2025*

Estimated Cost of Construction.....$4 billion

Submitting Agency.....Maryland DOT

Anticipated Funding Sources.....

☐ Federal ☐ State ☐ Local ☒ **Private** ☐ Bonds ☐ Other

CEID.....1186

HIGHWAY TRANSIT BICYCLE OR PEDESTRIAN



FINAL COMMENT PERIOD
September 7 – October 7, 2018
See reverse for details, or visit www.mwcog.org/TPBcomment.

Project Description

The I-270 component of MDOT's "Traffic Relief Plan" project will add two new managed lanes in each direction along I-270 between the Capital Beltway (I-495) and I-70/US 40.

*Actual completion year will depend on awarded contract. For air quality conformity modeling purposes, the completion date is presumed to be 2025.

Existing Support for this Project

This project has undergone review at the local, state, and/or sub-regional levels and is included in the following approved plans:

☒ Montgomery County 2017 Transportation Priority Letter

☒ MDOT/SHA Traffic Relief Plan

See official Visualize 2045 Project Description Form for more information about this project.

Goal 1: *Provide a Range of Transportation Options*

Goal 2: *Promote Dynamic Activity Centers*

Goal 3: *Ensure System Maintenance, Preservation, and Safety*

Goal 4: *Maximize Operational Effectiveness and Safety*

Goal 5: *Protect and Enhance the Natural Environment*

Goal 6: *Support Interregional and International Travel and Commerce*

See reverse side for more information about how this project advances regional goals and addresses certain federal planning requirements.

I-270 MANAGED LANES

PROPOSED MAJOR ADDITION
VISUALIZE 2045

How this project supports or advances goals in the Regional Transportation Priorities Plan

The Priorities Plan called upon the region to use tolling and pricing mechanisms to manage road congestion and raise revenue. This project adds a key corridor to the region's express lane network and will expand transportation choices (Goal 1) by adding lanes that will be dynamically managed to ensure free-flowing travel for drivers and express bus services. The 34-mile project connects numerous Activity Centers, which are the region's primary engines for economic growth and opportunity (Goal 2).

Goal 1: Provide a Range of Transportation Options

Provides, enhances, supports, or promotes the following travel mode options:

☒ Single Driver (SOV) ☒ Carpool/HOV ☐ Metrorail ☐ Commuter Rail
☐ Streetcar/Light Rail ☐ BRT ☒ Express/Commuter Bus ☒ Metrobus ☒ Local Bus
☐ Bicycling ☐ Walking ☐ Other

☒ Improves accessibility for historically transportation-disadvantaged individuals (i.e., persons with disabilities, low incomes, and/or limited English proficiency)

Goal 2: Promote Dynamic Activity Centers

☒ Begins or ends in an Activity Center
☒ Connects two or more Activity Centers
☐ Promotes non-auto travel within one or more Activity Centers

Goal 3: Ensure System Maintenance, Preservation, and Safety

☒ Contributes to enhanced system maintenance, preservation, or safety

Goal 4: Maximize Operational Effectiveness and Safety

☐ Reduces travel time on highways and/or transit without building new capacity (e.g., ITS, bus priority treatments, etc.)
☒ Enhances safety for motorists, transit users, pedestrians, and/or bicyclists

Goal 5: Protect and Enhance the Natural Environment

Expected to contribute to reductions in emissions of:

☒ Criteria Pollutants (NOx, VOCs, PM2.5) ☒ Greenhouse Gases

Goal 6: Support Interregional and International Travel & Commerce

Enhances, supports, or promotes the following freight carrier modes:

☒ Long-haul Truck ☒ Local Delivery ☐ Rail ☐ Air

Enhances, supports, or promotes the following passenger carrier modes:

☐ Air ☐ Amtrak Intercity Passenger Rail ☒ Intercity Bus

Comment on this project or on Visualize 2045

December 14, 2017-January 13, 2018 Comment on the projects before they are included in the federally required Air Quality Conformity Analysis

September 13-October 13, 2018 Comment on projects and any other aspect of the draft Visualize 2045 plan before final TPB adoption.

Visualize2045.org | tpbcomment@mwcog.org | (202) 962-3262
777 North Capitol St. NE, Suite 300, Washington, DC 20002

Addressing Federal Planning Factors

This project addresses the following federal planning factors designed to guide development of Visualize 2045:

☒ Support Economic Vitality
☒ Increase Safety for All Users
☒ Support Homeland and Personal Security
☒ Increase Accessibility and Mobility of People and/or Freight
☒ Protect and Enhance the Environment
☒ Enhance Integration and Connectivity
☒ Promote Efficient System Management and Operation
☐ Emphasize System Preservation
☐ Improve Resiliency or Mitigate Stormwater
☐ Enhance Travel and Tourism

Consideration of Alternatives to Adding SOV Capacity

The agency or agencies submitting this project considered the following congestion-mitigation measures before proposing to significantly increase capacity for single-occupant vehicles (SOVs):

☒ Transportation demand management measures (including growth management and congestion pricing)
☒ Traffic operational improvements
☒ Public transportation improvements
☒ Intelligent Transportation Systems (ITS) technologies
☒ Other congestion management strategies
☐ Not applicable – This project does not increase SOV capacity or is exempt from consideration of alternatives.

See the Congestion Management Documentation form for more information.

Information about how projects advance regional goals and address federal planning requirements is self-reported by the agencies submitting projects for inclusion in Visualize 2045.

The information on this form was last updated on December 14, 2017.

I-495 MANAGED LANES

PROPOSED MAJOR ADDITION
VISUALIZE 2045

From the American Legion Bridge to the Woodrow Wilson Bridge

Basic Project Information

Project Length.....22 Miles

Anticipated Completion.....2020-2025*

Estimated Cost of Construction.....$4.2 billion

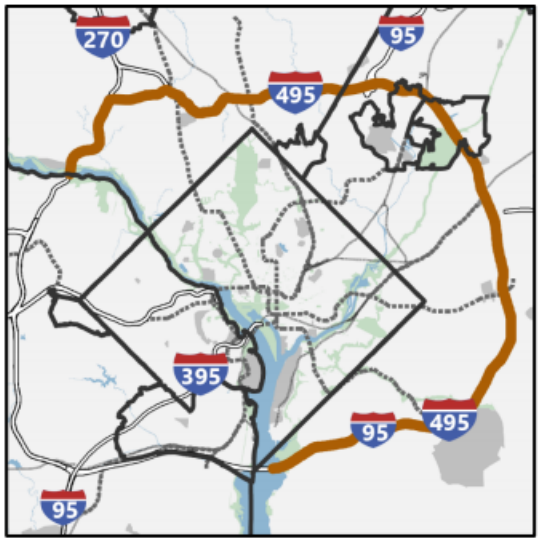
Submitting Agency.....Maryland DOT

Anticipated Funding Sources.....

☐ Federal ☐ State ☐ Local ☒ **Private** ☐ Bonds ☐ Other

CEID.....1182, 3281

HIGHWAY TRANSIT BICYCLE OR PEDESTRIAN



FINAL COMMENT PERIOD
September 7 – October 7, 2018
See reverse for details, or visit www.mwcog.org/TPBcomment.

Project Description

The I-495 component of MDOT's "Traffic Relief Plan" project will add two new managed lanes in each direction along the Capital Beltway between the Virginia end of the American Legion Bridge to the Maryland end of the Woodrow Wilson Bridge.

*Actual completion year will depend on awarded contract. For air quality conformity modeling purposes, the completion date is presumed to be 2025.

Existing Support for this Project

This project has been reviewed at the local, state, and/or sub-regional levels and is included in the following approved plans:

☒ Montgomery County 2017 Transportation Priority Letter

☒ 2009 Prince George's County Master Plan of Transportation (MPO

☒ 1990 Heights Sector Plan

See official Visualize 2045 Project Description Form for more information about this project.

Goal 1: *Provide a Range of Transportation Options*

Goal 2: *Promote Dynamic Activity Centers*

Goal 3: *Ensure System Maintenance, Preservation, and Safety*

Goal 4: *Maximize Operational Effectiveness and Safety*

Goal 5: *Protect and Enhance the Natural Environment*

Goal 6: *Support Interregional and International Travel and Commerce*

See reverse side for more information about how this project advances regional goals and addresses certain federal planning requirements.

I-495 MANAGED LANES

PROPOSED MAJOR ADDITION
VISUALIZE 2045

How this project supports or advances goals in the Regional Transportation Priorities Plan

New managed lanes on the entire 42-mile length of Maryland's Capital Beltway will dramatically expand transportation choices (Goal 1) in the region by adding dynamically managed lanes to ensure free-flowing travel for drivers and for express bus services. Along with the I-270 Managed Lanes, this project significantly expands the region's network of recent and forthcoming priced-lane projects. The project will connect numerous Activity Centers (Goal 2), the region's focal points for economic growth.

Goal 1: Provide a Range of Transportation Options

Provides, enhances, supports, or promotes the following travel mode options:

☒ Single Driver (SOV) ☒ Carpool/HOV ☐ Metrorail ☐ Commuter Rail
☐ Streetcar/Light Rail ☐ BRT ☒ Express/Commuter Bus ☒ Metrobus ☒ Local Bus
☐ Bicycling ☐ Walking ☐ Other

☒ Improves accessibility for historically transportation-disadvantaged individuals (i.e., persons with disabilities, low incomes, and/or limited English proficiency)

Goal 2: Promote Dynamic Activity Centers

☒ Begins or ends in an Activity Center
☒ Connects two or more Activity Centers
☐ Promotes non-auto travel within one or more Activity Centers

Goal 3: Ensure System Maintenance, Preservation, and Safety

☒ Contributes to enhanced system maintenance, preservation, or safety

Goal 4: Maximize Operational Effectiveness and Safety

☐ Reduces travel time on highways and/or transit without building new capacity (e.g., ITS, bus priority treatments, etc.)
☒ Enhances safety for motorists, transit users, pedestrians, and/or bicyclists

Goal 5: Protect and Enhance the Natural Environment

Expected to contribute to reductions in emissions of:
☒ Criteria Pollutants (NOx, VOCs, PM2.5) ☒ Greenhouse Gases

Goal 6: Support Interregional and International Travel and Commerce

Enhances, supports, or promotes the following freight carrier modes:
☒ Long-haul Truck ☒ Local Delivery ☐ Rail ☐ Air

Enhances, supports, or promotes the following passenger carrier modes:
☐ Air ☐ Amtrak Intercity Passenger Rail ☒ Intercity Bus

Comment on this project or on Visualize 2045

December 14, 2017-January 13, 2018 Comment on the projects before they are included in the federally required Air Quality Conformity Analysis

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☒ Protect and Enhance the Environment
☒ Enhance Integration and Connectivity
☒ Promote Efficient System Management and Operation
☐ Emphasize System Preservation
☐ Improve Resiliency or Mitigate Stormwater
☐ Enhance Travel and Tourism

Consideration of Alternatives to Adding SOV Capacity

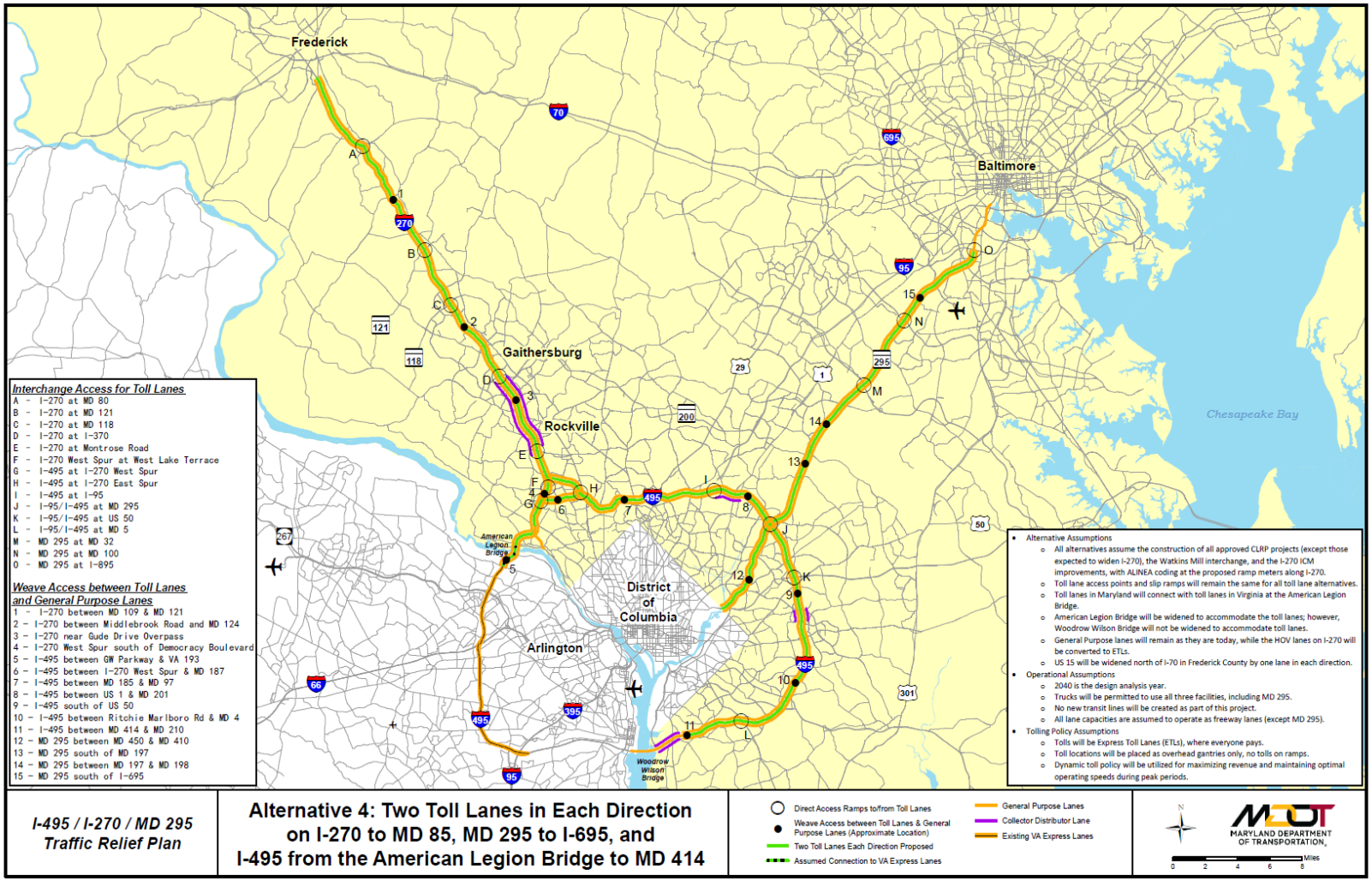
The agency or agencies submitting this project considered the following congestion-mitigation measures before proposing to significantly increase capacity for single-occupant vehicles (SOVs):

☒ Transportation demand management measures (including growth management and congestion pricing)
☒ Traffic operational improvements
☒ Public transportation improvements
☒ Intelligent Transportation Systems (ITS) technologies
☒ Other congestion management strategies
☐ Not applicable – This project does not increase SOV capacity or is exempt from consideration of alternatives.

See the Congestion Management Documentation form for more information.

Information about how projects advance regional goals and address federal planning requirements is self-reported by the agencies submitting projects for inclusion in Visualize 2045.

The information on this form was last updated on December 14, 2017.



I-495 / I-270 / MD 295 Traffic Relief Plan

Alternative 4: Two Toll Lanes in Each Direction on I-270 to MD 85, MD 295 to I-695, and I-495 from the American Legion Bridge to MD 414

Appendix D:

VISSIM Calibration Memo

1) Background and Purpose

The purpose of this document is to provide calibration and validation results for the existing VISSIM model that was used as a basis for the I-495 and I-270 Managed Lane Study traffic modeling. Efforts included building and calibrating a VISSIM model of I-495 and I-270 that will be used for NEPA Managed Lane Study. Developing models to accurately depict existing conditions is critical to effectively evaluate future traffic operations along both corridors. Detailed assumptions and methodologies for existing model calibration and validation are outlined below.

2) Data Collection

The study area of this project includes I-270 from MD 85 to I-495 and I-495 from VA 193 to the Woodrow Wilson Bridge. The I-270 Spur between I-270 and I-495 is also included. All interchanges also include their ramp junctions, and adjacent signals are included at specific locations.

a) Peak Period Traffic Volumes

Peak period traffic volumes were developed for the study area. The AM and PM peak periods were determined to be 6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM, respectively. The traffic demand was balanced throughout the network for both periods.

b) Signal Timings

Signal timing data was provided for signalized intersections within the study area to ensure that the VISSIM models included accurate existing signal timings.

c) Travel Times and Speeds

Regional Integrated Information System (RITIS) data was provided for segments along both I-495 and I-270 for the month of May 2017.

3) VISSIM Model Development

MDOT SHA Travel Forecasting and Analysis Division (TFAD) provided a previously-calibrated VISSIM model for the study area. Lane geometry was confirmed based on aerial photography. Model calibration required specific updates, which included traffic volume inputs and routing decisions, traffic signal timings, turning speed reduction zones, driver and link behavior types, and lane change distances. These updates enabled the VISSIM model to simulate the typical weekday AM and PM peak periods under existing conditions. Discussed below is a summary of the VISSIM basic inputs, calibration requirements established for this study, and the model results and outputs.

a) Vehicle Inputs and Routing Decisions

The AM and PM models both include a seeding time of 3,600 seconds (1 hour) with four 3,600 second simulation periods for a total 14,400 seconds (4 hours) of actual simulation time, during which data was collected by the VISSIM model. The simulation time is equivalent to the aforementioned peak periods. The initialization time was necessary to populate the network and produce the appropriate congestion on the network prior to data recording.

The entry volume input data was coded for both the seeding period and each of the simulation hours in the peak period. The arrival distribution input data was set to “Exact Volume” rather than the default of “Stochastic Volume” to prevent significant volume variation at the turning movement level. Heavy vehicle and HOV percentages were established within

the individual vehicle compositions as a component of the entry volume input data. Vehicle composition included 85% SOV, 12% HOV, and 3% truck volumes for all vehicle inputs.

The static routing decisions were coded in VISSIM such that the beginning of each route is as far upstream of the first decision point as possible; this method allows vehicles to make a routing decision as soon as possible, preventing unnecessary friction and congestion. In instances where routing decisions were close together, route combinations were applied to ensure realistic lane changing behavior.

b) Speeds

Posted speed limits were used as the desired speeds with +/- 5 mph linear distribution due to the severe congestion experienced along the corridor. This was the case for most locations within the study area. However, at select locations, the desired speeds were modified further for calibration purposes.

Turning movement speeds along the arterials were coded as:

i) Reduced Speed Right Turns: 8 MPH to 12 MPH
ii) Reduced Speed Left Turns: 11 MPH to 14 MPH
iii) Accelerated AM Right Turns: 7.5 MPH to 15.5 MPH
iv) Accelerated AM Left Turns: 12.4 MPH to 18.6 MPH
v) Accelerated PM Right Turns: 12 MPH to 15.5 MPH
vi) Accelerated PM Left Turns: 15 MPH to 20 MPH

4) VISSIM Calibration and Validation

Model calibration and validation refers to the process that confirms the model provides a reasonable approximation of existing field conditions and incorporates model refinements to bring it within an accepted range of validation targets. For this study, the model was run five times per peak period.

During the VISSIM model calibration; attention was given to the following parameters:

i) Modified lane changing distances to ensure smooth yet realistic traffic flow in both peak and off-peak directions.
ii) Modified driver behavior parameters and link behavior types; driver and link behavior types from the provided files were maintained, where possible.

The existing travel time data along both highways showed high-variability between travel times in both the AM and PM peak hours. Travelers experienced a significant drop in speed during the peak periods. The speed data from RITIS is shown in **Figure 1** for I-495 and **Figure 2** for I-270. This high variability can be seen in the differences between the average speeds and the 5th and 95th percentile speeds.

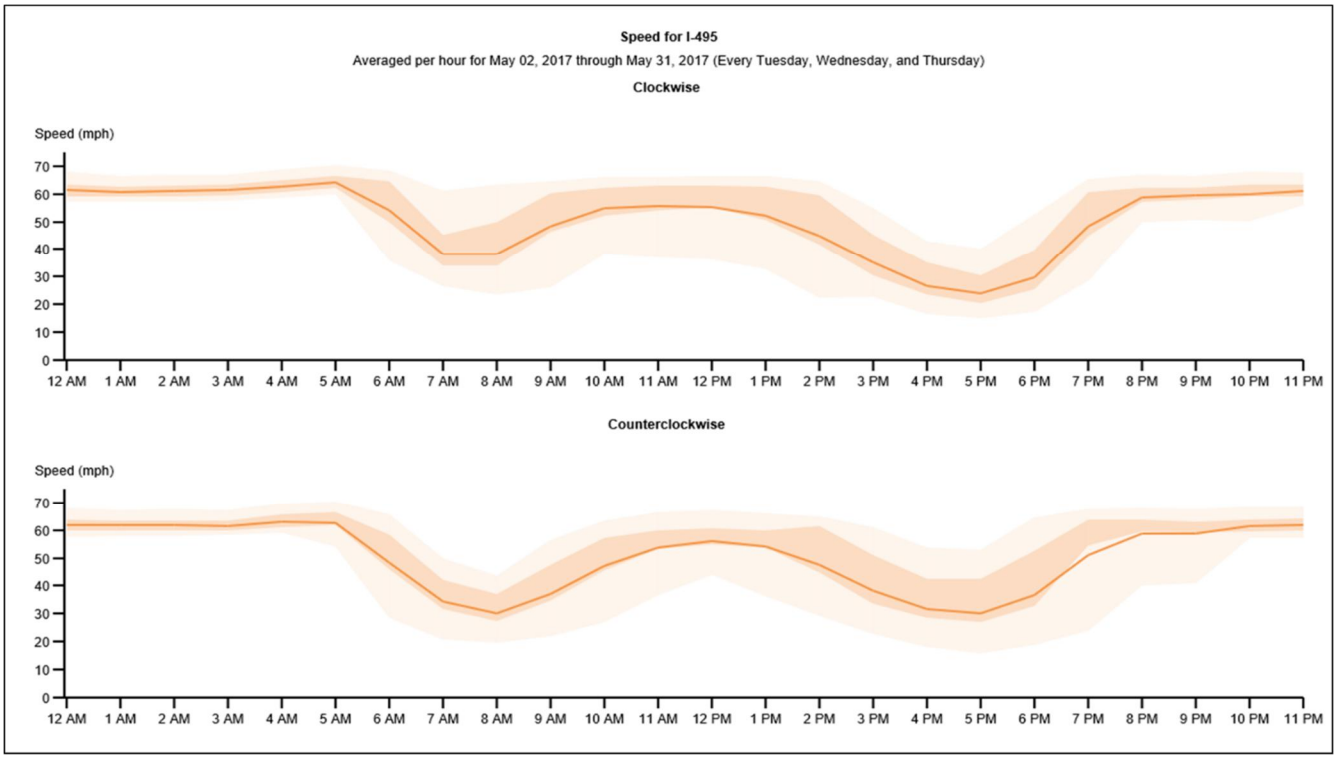


Figure 1: Existing Speed Graph for I-495

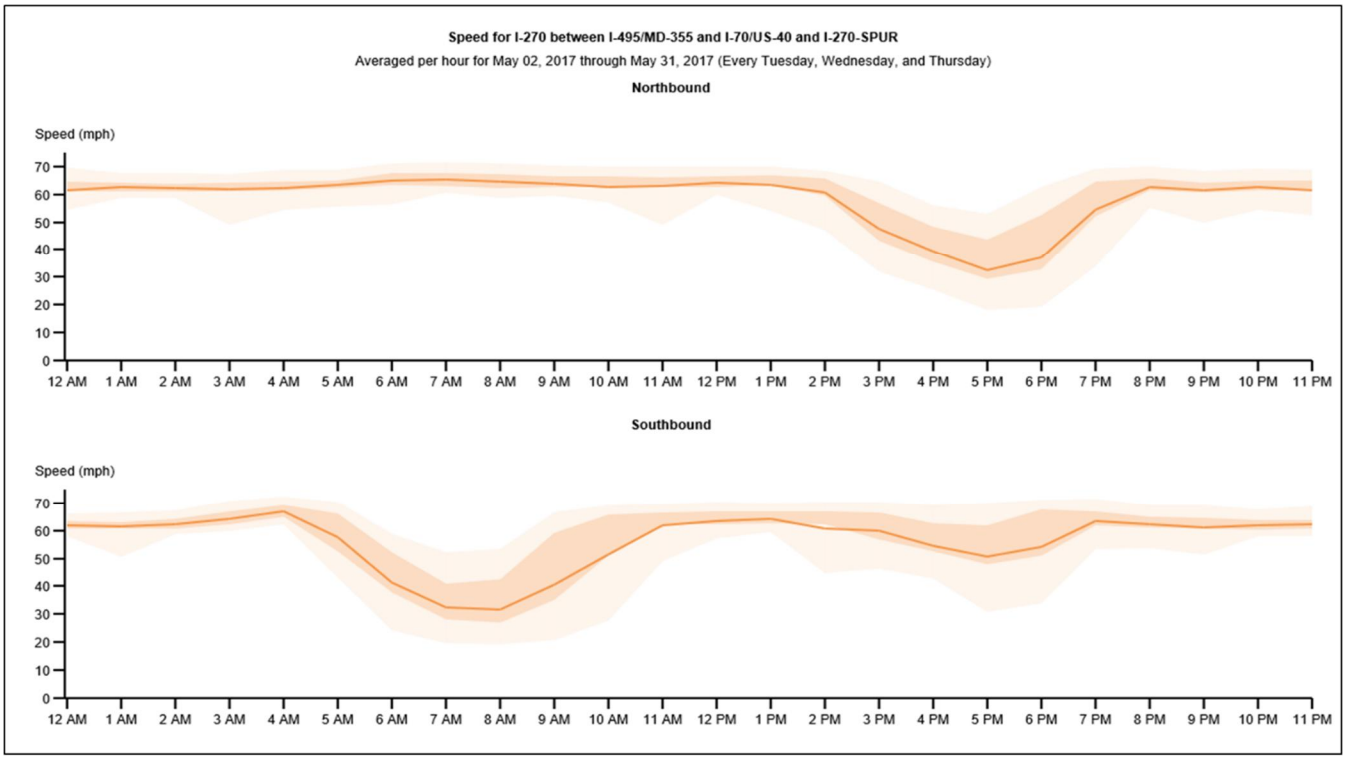


Figure 2: Existing Speed Graph for I-270

The validation targets for the I-270 and I-495 model were:

a) Volumes
   - Throughput volumes within 10%, GEH within 5

b) Speed
   - ±15 MPH for I-495 Inner Loop/Clockwise in the AM Peak Hour
   - ±14 MPH for I-495 Outer Loop/Counter-clockwise in the AM Peak Hour
   - ±17 MPH for I-270 Southbound in the AM Peak Hour
   - ±6 MPH for I-270 Northbound in the AM Peak Hour
   - ±16 MPH for I-495 Inner Loop/Clockwise in the PM Peak Hour
   - ±19 MPH for I-495 Outer Loop/Counter-clockwise in the PM Peak Hour
   - ±12 MPH for I-270 Southbound in the PM Peak Hour
   - ±16 MPH for I-270 Northbound in the PM Peak Hour

These targets were chosen based on the complexity and size of the network and the variability of the field-measured travel time runs along certain travel time segments. Priority was given to corridor travel speeds since it will be an important measure of effectiveness for evaluation.

5) Summary of Results

The results are summarized below in **Figures A1, A2, and A3** in the appendix. These tables show the travel time along the I-495 and I-270 corridors, the length and % of each corridor meeting the simulation targets, and the length and % of each segment over 0.5 miles long in each corridor meeting the simulation targets in the 8-9 AM and 5-6 PM peak hours, respectively. Most evaluation periods show close correlation in terms of speed (and as a result, travel time) with a few exceptions.

- I-270 Southbound from 6 AM to 8 AM
- I-270 Northbound from 3 PM to 7 PM

For the longer segment evaluation for the 8-9 AM and 5-6 PM peak hours, there was a relatively high rate of compliance for both volume and speed found on I-270 NB in the AM peak hour and I-270 SB in the PM peak hour. Except for I-270 in the PM peak hour, most of the longer evaluated segments were compliant with regards to speed.

It should be noted that the speeds are reflective of May 2017 (Tuesdays, Wednesdays, and Thursdays) but the volumes were collected over multiple days, months, and years. Due to the size of the study area, there was not a cost-effective method to collect all volume data on the same day. Additionally, due to oversaturated conditions along both corridors, the traffic conditions are very volatile and can change dramatically from day to day. The goal of calibrating the existing model is to develop a model that is representative of a typical day along the corridor, while also considering the volatility of the corridor and reliability of each data set.

The VISSIM study area network for the I-270 and I-495 Managed Lane Study is larger and more complex than most traffic simulation models, due to the duration of daily congestion and variability of the day-to-day traffic speeds and volumes along the corridors. When evaluating the combination of model speeds and traffic volumes compared to the field-collected data, while also considering the variability along the corridor, the model appears to be reasonably calibrated, thereby providing the sensitivity necessary to evaluate the future year conditions for alternative analysis. Additional refinements to the modeling may be completed as the study progresses and a preferred alternative is selected.

APPENDIX A

Figures A1 to A3 show the travel time summary and compliance summaries

Figures A4 to A59 show the volume, speed, and travel time result summaries for all the I-495 mainline segments.

Figures A57 to A104 show the volume, speed, and travel time result summaries for all the I-270 mainline segments.

Figures A105 to A120 show the volume, speed, and travel time result summaries for all the I-495 ramp segments.

Figures A121 to A136 show the volume, speed, and travel time result summaries for all the I-270 ramp segments.

Figures A137 to A144 show the volume, speed, and travel time result summaries for all the I-270 Spur ramp segments.

Time Period	Segment	Length (miles)	Field Travel Time (min)	Simulated Travel Time (min)	Difference (min)	Difference (%)
6-7 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	43.4	46.0	-2.6	-6%
7-8 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	65.8	54.6	11.2	17%
8-9 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	66.2	53.1	13.0	20%
9-10 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	53.2	50.3	3.0	6%
6-7 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	49.3	54.1	-4.9	-10%
7-8 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	69.6	66.8	2.8	4%
8-9 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	79.9	69.1	10.8	13%
9-10 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	64.7	61.8	2.9	5%
6-7 AM	I-270 from I-495 to MD 85	31.1	28.5	29.5	-1.0	-3%
7-8 AM	I-270 from I-495 to MD 85	31.1	28.5	29.7	-1.1	-4%
8-9 AM	I-270 from I-495 to MD 85	31.1	28.7	29.8	-1.1	-4%
9-10 AM	I-270 from I-495 to MD 85	31.1	29.3	29.8	-0.5	-2%
6-7 AM	I-270 from MD 85 to I-495	31.3	48.3	51.5	-3.2	-7%
7-8 AM	I-270 from MD 85 to I-495	31.3	61.7	59.9	1.8	3%
8-9 AM	I-270 from MD 85 to I-495	31.3	56.9	48.8	8.1	14%
9-10 AM	I-270 from MD 85 to I-495	31.3	42.8	41.6	1.3	3%
3-4 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	72.9	64.0	8.9	12%
4-5 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	97.4	84.8	12.7	13%
5-6 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	109.2	104.6	4.5	4%
6-7 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	86.7	94.9	-8.2	-9%
3-4 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	63.7	62.6	1.1	2%
4-5 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	77.3	71.4	5.9	8%
5-6 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	81.5	83.6	-2.2	-3%
6-7 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	65.8	84.8	-19.0	-29%
3-4 PM	I-270 from I-495 to MD 85	31.1	44.5	41.0	3.5	8%
4-5 PM	I-270 from I-495 to MD 85	31.1	53.9	44.4	9.5	18%
5-6 PM	I-270 from I-495 to MD 85	31.1	65.5	50.3	15.1	23%
6-7 PM	I-270 from I-495 to MD 85	31.1	46.6	49.1	-2.4	-5%
3-4 PM	I-270 from MD 85 to I-495	31.3	29.4	30.9	-1.5	-5%
4-5 PM	I-270 from MD 85 to I-495	31.3	31.4	31.3	0.0	0%
5-6 PM	I-270 from MD 85 to I-495	31.3	32.9	31.7	1.2	4%
6-7 PM	I-270 from MD 85 to I-495	31.3	30.1	31.3	-1.1	-4%

Figure A.1: Travel Time Summary

Time Period	Segment	Total Length (Miles)	Total Length of Segments Meeting Volume Criteria (Miles)	Total Length of Segments Meeting Volume Criteria (%)	Total Length of Segments Meeting Speed Criteria (Miles)	Total Length of Segments Meeting Speed Criteria (%)	Total Length of Segments Meeting Both Volume and Speed Criteria (Miles)	Total Length of Segments Meeting Both Volume and Speed Criteria (%)
6-7 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	11.6	26.7%	41.4	95.7%	11.6	26.7%
7-8 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	11.7	27.0%	37.0	85.5%	13.0	30.1%
8-9 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	5.8	13.4%	36.8	85.1%	4.6	10.6%
9-10 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	5.5	12.7%	37.4	86.5%	5.5	12.7%
6-7 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	14.0	32.2%	40.1	92.0%	11.4	26.2%
7-8 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	13.9	31.8%	34.5	79.2%	13.6	31.1%
8-9 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	10.9	25.1%	34.6	79.3%	8.0	18.5%
9-10 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	7.8	17.8%	34.7	79.6%	40.8	93.5%
6-7 AM	I-270 from I-495 to MD 85	33.1	6.0	18.3%	31.1	94.0%	6.0	18.3%
7-8 AM	I-270 from I-495 to MD 85	33.1	20.2	61.1%	31.1	94.0%	19.2	58.1%
8-9 AM	I-270 from I-495 to MD 85	33.1	20.8	62.9%	31.1	93.9%	19.9	60.0%
9-10 AM	I-270 from I-495 to MD 85	33.1	8.3	24.9%	30.9	93.4%	7.3	22.0%
6-7 AM	I-270 from MD 85 to I-495	33.3	3.2	9.6%	25.1	75.3%	3.0	8.9%
7-8 AM	I-270 from MD 85 to I-495	33.3	1.3	3.9%	29.3	87.9%	1.3	3.9%
8-9 AM	I-270 from MD 85 to I-495	33.3	3.5	10.5%	24.8	74.4%	3.5	10.5%
9-10 AM	I-270 from MD 85 to I-495	33.3	12.3	36.9%	28.5	85.5%	11.3	33.8%
3-4 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	16.3	37.7%	33.6	77.5%	12.5	28.8%
4-5 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	5.8	13.5%	37.0	85.5%	5.8	13.5%
5-6 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	11.4	26.4%	35.3	81.5%	10.3	23.8%
6-7 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	43.3	12.0	27.7%	38.0	87.7%	11.4	26.4%
3-4 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	29.5	67.8%	31.5	72.2%	20.7	47.4%
4-5 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	23.1	52.9%	29.8	68.4%	15.3	35.1%
5-6 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	18.4	42.3%	31.9	73.3%	10.9	25.1%
6-7 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	43.6	16.4	37.7%	37.1	85.2%	13.3	30.5%
3-4 PM	I-270 from I-495 to MD 85	33.1	1.0	3.0%	23.1	69.8%	0.0	0.0%
4-5 PM	I-270 from I-495 to MD 85	33.1	0.7	2.1%	20.4	61.5%	0.7	2.1%
5-6 PM	I-270 from I-495 to MD 85	33.1	1.0	3.1%	12.5	37.6%	0.1	0.2%
6-7 PM	I-270 from I-495 to MD 85	33.1	2.0	6.0%	25.7	77.7%	0.0	0.0%
3-4 PM	I-270 from MD 85 to I-495	33.3	18.1	54.2%	31.1	93.2%	18.1	54.2%
4-5 PM	I-270 from MD 85 to I-495	33.3	17.3	52.0%	31.1	93.2%	17.3	52.0%
5-6 PM	I-270 from MD 85 to I-495	33.3	23.2	69.4%	29.9	89.7%	23.2	69.4%
6-7 PM	I-270 from MD 85 to I-495	33.3	8.1	24.2%	30.6	91.8%	8.1	24.2%

Figure A.2: All Segments Compliance Summary

Time Period	Segment	Total Length of Segments (Length >=0.5 Miles) (Miles)	Total Length of Segments (Length >= 0.5 Miles) Meeting Volume Criteria (Miles)	Total Length of Segments (Length >= 0.5 Miles) Meeting Volume Criteria (%)	Total Length of Segments (Length >= 0.5 Miles) Meeting Speed Criteria (Miles)	Total Length of Segments (Length >= 0.5 Miles) Meeting Speed Criteria (%)	Total Length of Segments (Length >= 0.5 Miles) Meeting Both Volume and Speed Criteria (Miles)	Total Length of Segments (Length >= 0.5 Miles)Meeting Both Volume and Speed Criteria (%)
8-9 AM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	33.1	5.8	17.5%	27.3	82.6%	4.6	13.8%
8-9 AM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	34.9	9.5	27.3%	27.4	78.5%	7.1	20.3%
8-9 AM	I-270 from I-495 to MD 85	31.0	18.9	60.8%	29.0	93.6%	17.9	57.7%
8-9 AM	I-270 from MD 85 to I-495	29.9	3.3	11.0%	21.9	73.2%	3.3	11.0%
5-6 PM	I-495 Inner Loop from VA 193 to Woodrow Wilson Bridge	33.1	8.3	25.2%	26.5	80.0%	7.2	21.8%
5-6 PM	I-495 Outer Loop from Woodrow Wilson Bridge to VA 193	34.9	14.7	42.0%	26.2	75.1%	8.4	24.0%
5-6 PM	I-270 from I-495 to MD 85	31.0	1.0	3.2%	11.2	36.2%	0.0	0.0%
5-6 PM	I-270 from MD 85 to I-495	29.9	20.2	67.6%	26.7	89.4%	20.2	67.6%

Figure A-3: Long Segments Compliance Summary

I-495 Mainline Volume Tables

Legend
Higher Throughput in Model
Higher Throughput in Field
Criteria Not Met

Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	7362	7431	-1%	Yes	0.8023	Yes
AMERICAN LEGION BRIDGE		7963	#DIV/0!	#DIV/0!	126.198	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	5390	7445	-38%	No	25.6553	No
BETWEEN MD 190 AND I-270	6278	7146	-14%	No	10.5978	No
BETWEEN I-270 WEST AND MD 187	3253	4303	-32%	No	17.079	No
BETWEEN I-270 EAST AND MD 187	3068	3992	-30%	No	15.5559	No
BETWEEN MD 355 AND MD 185	5795	6131	-6%	Yes	4.34799	Yes
BETWEEN MD 185 AND MD 97	5213	5714	-10%	Yes	6.7714	No
BETWEEN MD 97 AND US 29	5121	5436	-6%	Yes	4.33227	Yes
BETWEEN MD US 29 AND MD 193	5668	5449	4%	Yes	2.9408	Yes
BETWEEN MD 193 AND MD 650	4254	5763	-35%	No	21.3191	No
BETWEEN MD 650 AND I-95	6777	7066	-4%	Yes	3.4678	Yes
BETWEEN US 1 AND I-95	6157	6934	-13%	No	9.60694	No
BETWEEN GREENBELT STATION AND US 1	6942	7735	-11%	No	9.25415	No
BETWEEN GREENBELT STATION AND MD 201	5917	7383	-25%	No	17.9715	No
BETWEEN MD 201 AND MD 295	5930	6857	-16%	No	11.5904	No
BETWEEN MD 295 AND MD 450	3972	6082	-53%	No	29.7597	No
BETWEEN MD 450 AND US 50	5574	6502	-17%	No	11.9458	No
BETWEEN US 50 AND MD 202	5839	7360	-26%	No	18.7171	No
BETWEEN MD 202 AND ARENA DR	5714	5898	-3%	Yes	2.41479	Yes
BETWEEN ARENA DR AND MD 214	5949	7233	-22%	No	15.8099	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	4010	7168	-79%	No	42.2363	No
BETWEEN RITCHIE MARLBORO AND MD 4	6802	7295	-7%	Yes	5.86632	No
BETWEEN MD 4 AND FORESTVILLE RD	6362	6826	-7%	Yes	5.71102	No
BETWEEN FORESTVILLE AND MD 218		6179	#DIV/0!	#DIV/0!	111.162	No
BETWEEN MD 218 AND MD 5	6215	6345	-2%	Yes	1.63418	Yes
BETWEEN MD 5 AND MD 414	4685	6746	-44%	No	27.2646	No
BETWEEN MD 414 AND MD 210	6577	6818	-4%	Yes	2.94181	Yes
BETWEEN MD 210 AND I-295	7551	7768	-3%	Yes	2.4738	Yes
WOODROW WILSON BRIDGE	7825	9506	-21%	No	18.0606	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	5676	7420	-31%	No	21.5551	No
BETWEEN MD 210 AND I-295	3965	4357	-10%	Yes	6.0694	No
BETWEEN MD 414 AND MD 210	3932	4588	-17%	No	10.0508	No
BETWEEN MD 5 AND MD 414	3230	4373	-35%	No	18.542	No
BETWEEN MD 218 AND MD 5	5647	5686	-1%	Yes	0.51146	Yes
BETWEEN FORESTVILLE AND MD 218		5071	#DIV/0!	#DIV/0!	100.703	No
BETWEEN MD 4 AND FORESTVILLE RD	5588	5698	-2%	Yes	1.46101	Yes
BETWEEN RITCHIE MARLBORO AND MD 4	6389	6513	-2%	Yes	1.53767	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	4297	7405	-72%	No	40.6346	No
BETWEEN ARENA DR AND MD 214	6675	7771	-16%	No	12.8902	No
BETWEEN MD 202 AND ARENA DR	6552	5864	11%	No	8.7385	No
BETWEEN US 50 AND MD 202	6590	7725	-17%	No	13.4158	No
BETWEEN MD 450 AND US 50	7101	8340	-17%	No	14.0982	No
BETWEEN MD 295 AND MD 450	5383	8385	-56%	No	36.1791	No
BETWEEN MD 201 AND MD 295	6123	8390	-37%	No	26.6153	No
BETWEEN GREENBELT STATION AND MD 201	6843	7814	-14%	No	11.3369	No
BETWEEN GREENBELT STATION AND US 1	7031	7871	-12%	No	9.73414	No
BETWEEN US 1 AND I-95	6926	7618	-10%	Yes	8.1091	No
BETWEEN MD 650 AND I-95	8317	8219	1%	Yes	1.07777	Yes
BETWEEN MD 193 AND MD 650	5235	7088	-35%	No	23.6095	No
BETWEEN MD US 29 AND MD 193	6569	6998	-7%	Yes	5.20572	No
BETWEEN MD 97 AND US 29	7595	7633	0%	Yes	0.42977	Yes
BETWEEN MD 185 AND MD 97	8092	7968	2%	Yes	1.38097	Yes
BETWEEN MD 355 AND MD 185	6497	6636	-2%	Yes	1.71226	Yes
BETWEEN I-270 EAST AND MD 187	3779	3665	3%	Yes	1.8686	Yes
BETWEEN I-270 WEST AND MD 187	3848	3830	0%	Yes	0.29455	Yes
BETWEEN MD 190 AND I-270	8930	9565	-7%	Yes	6.60586	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	5852	8017	-37%	No	25.9959	No
AMERICAN LEGION BRIDGE		8160	#DIV/0!	#DIV/0!	127.746	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	7894	5925	25%	No	23.6909	No

Figure A.4: I-495 Mainline 6-7 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	9289	8040	13%	No	13.4237	No
AMERICAN LEGION BRIDGE		8348	#DIV/0!	#DIV/0!	129.209	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6651	7820	-18%	No	13.7373	No
BETWEEN MD 190 AND I-270	8502	7830	8%	Yes	7.44208	No
BETWEEN I-270 WEST AND MD 187	4095	4482	-9%	Yes	5.90214	No
BETWEEN I-270 EAST AND MD 187	3333	4273	-28%	No	15.239	No
BETWEEN MD 355 AND MD 185	6761	7811	-16%	No	12.2983	No
BETWEEN MD 185 AND MD 97	7227	7301	-1%	Yes	0.86825	Yes
BETWEEN MD 97 AND US 29	6750	7143	-6%	Yes	4.7153	Yes
BETWEEN MD US 29 AND MD 193	6575	6846	-4%	Yes	3.30518	Yes
BETWEEN MD 193 AND MD 650	5563	7231	-30%	No	20.852	No
BETWEEN MD 650 AND I-95	8538	8275	3%	Yes	2.87395	Yes
BETWEEN US 1 AND I-95	6820	6740	1%	Yes	0.97462	Yes
BETWEEN GREENBELT STATION AND US 1	7823	8100	-4%	Yes	3.10166	Yes
BETWEEN GREENBELT STATION AND MD 201	6778	7607	-12%	No	9.77495	No
BETWEEN MD 201 AND MD 295	6919	7023	-1%	Yes	1.23965	Yes
BETWEEN MD 295 AND MD 450	4747	6345	-34%	No	21.461	No
BETWEEN MD 450 AND US 50	6625	6717	-1%	Yes	1.1203	Yes
BETWEEN US 50 AND MD 202	7212	7644	-6%	Yes	5.00671	No
BETWEEN MD 202 AND ARENA DR	6792	5716	16%	No	13.6127	No
BETWEEN ARENA DR AND MD 214	6901	7371	-7%	Yes	5.55796	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	4335	7266	-68%	No	38.4843	No
BETWEEN RITCHIE MARLBORO AND MD 4	8049	7387	8%	Yes	7.5412	No
BETWEEN MD 4 AND FORESTVILLE RD	6875	6543	5%	Yes	4.05639	Yes
BETWEEN FORESTVILLE AND MD 218		5926	#DIV/0!	#DIV/0!	108.867	No
BETWEEN MD 218 AND MD 5	6317	6110	3%	Yes	2.62924	Yes
BETWEEN MD 5 AND MD 414	4765	5403	-13%	No	8.95123	No
BETWEEN MD 414 AND MD 210	5411	5495	-2%	Yes	1.13078	Yes
BETWEEN MD 210 AND I-295	7990	6639	17%	No	15.7996	No
WOODROW WILSON BRIDGE	8253	9891	-20%	No	17.1949	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	6105	8214	-35%	No	24.9223	No
BETWEEN MD 210 AND I-295	4670	4854	-4%	Yes	2.65921	Yes
BETWEEN MD 414 AND MD 210	4981	5008	-1%	Yes	0.38205	Yes
BETWEEN MD 5 AND MD 414	4224	4938	-17%	No	10.5456	No
BETWEEN MD 218 AND MD 5	6222	6312	-1%	Yes	1.13373	Yes
BETWEEN FORESTVILLE AND MD 218		5667	#DIV/0!	#DIV/0!	106.459	No
BETWEEN MD 4 AND FORESTVILLE RD	6187	6724	-9%	Yes	6.68358	No
BETWEEN RITCHIE MARLBORO AND MD 4	7872	7380	6%	Yes	5.634	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	4848	8351	-72%	No	43.1152	No
BETWEEN ARENA DR AND MD 214	8431	8309	1%	Yes	1.339	Yes
BETWEEN MD 202 AND ARENA DR	6653	5408	19%	No	16.039	No
BETWEEN US 50 AND MD 202	6482	7934	-22%	No	17.1025	No
BETWEEN MD 450 AND US 50	7767	8613	-11%	No	9.34552	No
BETWEEN MD 295 AND MD 450	5797	8586	-48%	No	32.8828	No
BETWEEN MD 201 AND MD 295	6707	8715	-30%	No	22.867	No
BETWEEN GREENBELT STATION AND MD 201	6843	7894	-15%	No	12.2465	No
BETWEEN GREENBELT STATION AND US 1	7145	7997	-12%	No	9.7946	No
BETWEEN US 1 AND I-95	6808	7653	-12%	No	9.94025	No
BETWEEN MD 650 AND I-95	5068	6420	-27%	No	17.8421	No
BETWEEN MD 193 AND MD 650	4594	6115	-33%	No	20.7796	No
BETWEEN MD US 29 AND MD 193	5086	6434	-26%	No	17.7584	No
BETWEEN MD 97 AND US 29	7028	7073	-1%	Yes	0.53592	Yes
BETWEEN MD 185 AND MD 97	8334	8155	2%	Yes	1.96861	Yes
BETWEEN MD 355 AND MD 185	7541	7655	-2%	Yes	1.30498	Yes
BETWEEN I-270 EAST AND MD 187	4259	4290	-1%	Yes	0.47034	Yes
BETWEEN I-270 WEST AND MD 187	4731	4593	3%	Yes	2.01744	Yes
BETWEEN MD 190 AND I-270	9718	9973	-3%	Yes	2.57243	Yes
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6554	8373	-28%	No	21.0553	No
AMERICAN LEGION BRIDGE		8879	#DIV/0!	#DIV/0!	133.255	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8516	6592	23%	No	22.1399	No

Figure A.5: I-495 Mainline 7-8 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	9274	7351	21%	No	21.0976	No
AMERICAN LEGION BRIDGE		8309	#DIV/0!	#DIV/0!	128.911	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6995	7704	-10%	No	8.26453	No
BETWEEN MD 190 AND I-270	9156	8178	11%	No	10.5024	No
BETWEEN I-270 WEST AND MD 187	3590	3908	-9%	Yes	5.19761	No
BETWEEN I-270 EAST AND MD 187	3227	3678	-14%	No	7.66732	No
BETWEEN MD 355 AND MD 185	6439	7145	-11%	No	8.56359	No
BETWEEN MD 185 AND MD 97	6990	7427	-6%	Yes	5.14996	No
BETWEEN MD 97 AND US 29	6634	7111	-7%	Yes	5.75685	No
BETWEEN MD US 29 AND MD 193	6349	6928	-9%	Yes	7.1093	No
BETWEEN MD 193 AND MD 650	5782	7465	-29%	No	20.6766	No
BETWEEN MD 650 AND I-95	7996	7885	1%	Yes	1.24847	Yes
BETWEEN US 1 AND I-95	6536	7316	-12%	No	9.36954	No
BETWEEN GREENBELT STATION AND US 1	7823	8495	-9%	Yes	7.4342	No
BETWEEN GREENBELT STATION AND MD 201	7100	8076	-14%	No	11.2016	No
BETWEEN MD 201 AND MD 295	7248	7814	-8%	Yes	6.52214	No
BETWEEN MD 295 AND MD 450	5134	7123	-39%	No	25.4043	No
BETWEEN MD 450 AND US 50	6730	7493	-11%	No	9.04782	No
BETWEEN US 50 AND MD 202	6983	8300	-19%	No	15.0687	No
BETWEEN MD 202 AND ARENA DR	6361	5958	6%	Yes	5.14138	No
BETWEEN ARENA DR AND MD 214	6544	7726	-18%	No	13.9961	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	4877	7296	-50%	No	31.0093	No
BETWEEN RITCHIE MARLBORO AND MD 4	7255	7169	1%	Yes	1.01268	Yes
BETWEEN MD 4 AND FORESTVILLE RD	6157	6986	-13%	No	10.2264	No
BETWEEN FORESTVILLE AND MD 218		6338	#DIV/0!	#DIV/0!	112.583	No
BETWEEN MD 218 AND MD 5	5807	6538	-13%	No	9.29819	No
BETWEEN MD 5 AND MD 414	4685	5882	-26%	No	16.4612	No
BETWEEN MD 414 AND MD 210	4496	5907	-31%	No	19.5578	No
BETWEEN MD 210 AND I-295	6497	6878	-6%	Yes	4.65599	Yes
WOODROW WILSON BRIDGE	7396	9787	-32%	No	25.7905	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	6319	7836	-24%	No	18.0293	No
BETWEEN MD 210 AND I-295	4053	4593	-13%	No	8.21667	No
BETWEEN MD 414 AND MD 210	4631	4825	-4%	Yes	2.82499	Yes
BETWEEN MD 5 AND MD 414	4224	4594	-9%	Yes	5.57595	No
BETWEEN MD 218 AND MD 5	5552	5737	-3%	Yes	2.4624	Yes
BETWEEN FORESTVILLE AND MD 218		5133	#DIV/0!	#DIV/0!	101.316	No
BETWEEN MD 4 AND FORESTVILLE RD	5987	6145	-3%	Yes	2.02546	Yes
BETWEEN RITCHIE MARLBORO AND MD 4	7302	6956	5%	Yes	4.09491	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5288	7577	-43%	No	28.5373	No
BETWEEN ARENA DR AND MD 214	8197	7733	6%	Yes	5.19906	No
BETWEEN MD 202 AND ARENA DR	6451	4947	23%	No	19.9227	No
BETWEEN US 50 AND MD 202	6806	7770	-14%	No	11.2921	No
BETWEEN MD 450 AND US 50	7767	8535	-10%	Yes	8.50119	No
BETWEEN MD 295 AND MD 450	5797	8368	-44%	No	30.5471	No
BETWEEN MD 201 AND MD 295	6512	8243	-27%	No	20.1559	No
BETWEEN GREENBELT STATION AND MD 201	6734	7449	-11%	No	8.49347	No
BETWEEN GREENBELT STATION AND US 1	6691	7547	-13%	No	10.1424	No
BETWEEN US 1 AND I-95	6573	7357	-12%	No	9.38828	No
BETWEEN MD 650 AND I-95	3769	6723	-78%	No	40.7846	No
BETWEEN MD 193 AND MD 650	4594	5972	-30%	No	18.9555	No
BETWEEN MD US 29 AND MD 193	4980	6275	-26%	No	17.2565	No
BETWEEN MD 97 AND US 29	6121	6885	-12%	No	9.46805	No
BETWEEN MD 185 AND MD 97	8092	8212	-1%	Yes	1.33183	Yes
BETWEEN MD 355 AND MD 185	7773	8273	-6%	Yes	5.5794	No
BETWEEN I-270 EAST AND MD 187	4019	3844	4%	Yes	2.78696	Yes
BETWEEN I-270 WEST AND MD 187	4668	4066	13%	No	9.10972	No
BETWEEN MD 190 AND I-270	9324	9530	-2%	Yes	2.12424	Yes
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6788	8238	-21%	No	16.7232	No
AMERICAN LEGION BRIDGE		9259	#DIV/0!	#DIV/0!	136.079	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8949	6948	22%	No	22.4442	No

Figure A.6: I-495 Mainline 8-9 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	8712	7150	18%	No	17.5395	No
AMERICAN LEGION BRIDGE		8274	#DIV/0!	#DIV/0!	128.637	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6995	7606	-9%	Yes	7.14524	No
BETWEEN MD 190 AND I-270	8502	8028	6%	Yes	5.21662	No
BETWEEN I-270 WEST AND MD 187	3366	3864	-15%	No	8.28678	No
BETWEEN I-270 EAST AND MD 187	2645	3727	-41%	No	19.1733	No
BETWEEN MD 355 AND MD 185	5687	6890	-21%	No	15.1732	No
BETWEEN MD 185 AND MD 97	6753	6798	-1%	Yes	0.54669	Yes
BETWEEN MD 97 AND US 29	6285	6682	-6%	Yes	4.92738	Yes
BETWEEN MD US 29 AND MD 193	5895	6412	-9%	Yes	6.59379	No
BETWEEN MD 193 AND MD 650	5782	6677	-15%	No	11.3396	No
BETWEEN MD 650 AND I-95	7454	7050	5%	Yes	4.75004	Yes
BETWEEN US 1 AND I-95	5778	7342	-27%	No	19.3101	No
BETWEEN GREENBELT STATION AND US 1	6721	8407	-25%	No	19.3857	No
BETWEEN GREENBELT STATION AND MD 201	6885	8253	-20%	No	15.7269	No
BETWEEN MD 201 AND MD 295	6589	7818	-19%	No	14.4832	No
BETWEEN MD 295 AND MD 450	5231	7006	-34%	No	22.6862	No
BETWEEN MD 450 AND US 50	5784	7435	-29%	No	20.3049	No
BETWEEN US 50 AND MD 202	6640	8124	-22%	No	17.2666	No
BETWEEN MD 202 AND ARENA DR	6253	5988	4%	Yes	3.38729	Yes
BETWEEN ARENA DR AND MD 214	6068	7698	-27%	No	19.6414	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5202	7385	-42%	No	27.5203	No
BETWEEN RITCHIE MARLBORO AND MD 4	6008	7549	-26%	No	18.7113	No
BETWEEN MD 4 AND FORESTVILLE RD	5747	6837	-19%	No	13.7445	No
BETWEEN FORESTVILLE AND MD 218		6242	#DIV/0!	#DIV/0!	111.734	No
BETWEEN MD 218 AND MD 5	5502	6470	-18%	No	12.5052	No
BETWEEN MD 5 AND MD 414	4368	5854	-34%	No	20.7793	No
BETWEEN MD 414 AND MD 210	5162	5637	-9%	Yes	6.4609	No
BETWEEN MD 210 AND I-295	4917	6201	-26%	No	17.215	No
WOODROW WILSON BRIDGE	5681	7693	-35%	No	24.6072	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	5569	7304	-31%	No	21.6288	No
BETWEEN MD 210 AND I-295	3789	4484	-18%	No	10.8061	No
BETWEEN MD 414 AND MD 210	4282	4704	-10%	Yes	6.28842	No
BETWEEN MD 5 AND MD 414	4141	4583	-11%	No	6.68867	No
BETWEEN MD 218 AND MD 5	5264	5571	-6%	Yes	4.16764	Yes
BETWEEN FORESTVILLE AND MD 218		5240	#DIV/0!	#DIV/0!	102.374	No
BETWEEN MD 4 AND FORESTVILLE RD	5588	5927	-6%	Yes	4.46444	Yes
BETWEEN RITCHIE MARLBORO AND MD 4	6275	6650	-6%	Yes	4.66171	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5839	6997	-20%	No	14.4487	No
BETWEEN ARENA DR AND MD 214	6792	7259	-7%	Yes	5.56571	No
BETWEEN MD 202 AND ARENA DR	6250	5192	17%	No	13.9913	No
BETWEEN US 50 AND MD 202	6374	7395	-16%	No	12.3052	No
BETWEEN MD 450 AND US 50	6768	7911	-17%	No	13.3361	No
BETWEEN MD 295 AND MD 450	5797	7604	-31%	No	22.0723	No
BETWEEN MD 201 AND MD 295	5249	7356	-40%	No	26.5347	No
BETWEEN GREENBELT STATION AND MD 201	5757	6719	-17%	No	12.1771	No
BETWEEN GREENBELT STATION AND US 1	5443	6813	-25%	No	17.4979	No
BETWEEN US 1 AND I-95	5517	6916	-25%	No	17.7437	No
BETWEEN MD 650 AND I-95	6108	6591	-8%	Yes	6.05531	No
BETWEEN MD 193 AND MD 650	5449	6091	-12%	No	8.44536	No
BETWEEN MD US 29 AND MD 193	5827	6289	-8%	Yes	5.93262	No
BETWEEN MD 97 AND US 29	6348	6970	-10%	Yes	7.61931	No
BETWEEN MD 185 AND MD 97	6884	8216	-19%	No	15.3323	No
BETWEEN MD 355 AND MD 185	6729	7834	-16%	No	12.9438	No
BETWEEN I-270 EAST AND MD 187	3599	4003	-11%	No	6.55288	No
BETWEEN I-270 WEST AND MD 187	4100	4200	-2%	Yes	1.54844	Yes
BETWEEN MD 190 AND I-270	8930	8853	1%	Yes	0.8219	Yes
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6905	7633	-11%	No	8.53303	No
AMERICAN LEGION BRIDGE		8490	#DIV/0!	#DIV/0!	130.303	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8438	6297	25%	No	24.9403	No

Figure A.7: I-495 Mainline 9-10 AM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	7249	6997	3%	Yes	2.98586	Yes
AMERICAN LEGION BRIDGE		8371	#DIV/0!	#DIV/0!	129.387	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6995	7622	-9%	Yes	7.33707	No
BETWEEN MD 190 AND I-270	8763	8951	-2%	Yes	1.99499	Yes
BETWEEN I-270 WEST AND MD 187	3197	4130	-29%	No	15.4069	No
BETWEEN I-270 EAST AND MD 187	2910	3925	-35%	No	17.3664	No
BETWEEN MD 355 AND MD 185	6439	7436	-15%	No	11.9729	No
BETWEEN MD 185 AND MD 97	7701	7446	3%	Yes	2.93596	Yes
BETWEEN MD 97 AND US 29	8147	7770	5%	Yes	4.23163	Yes
BETWEEN MD US 29 AND MD 193	7369	7540	-2%	Yes	1.97768	Yes
BETWEEN MD 193 AND MD 650	7309	7564	-3%	Yes	2.95416	Yes
BETWEEN MD 650 AND I-95	9081	8203	10%	Yes	9.44193	No
BETWEEN US 1 AND I-95	5305	6731	-27%	No	18.379	No
BETWEEN GREENBELT STATION AND US 1	6391	8242	-29%	No	21.6426	No
BETWEEN GREENBELT STATION AND MD 201	6347	8155	-28%	No	21.2269	No
BETWEEN MD 201 AND MD 295	6919	7960	-15%	No	12.072	No
BETWEEN MD 295 AND MD 450	6393	7989	-25%	No	18.8152	No
BETWEEN MD 450 AND US 50	7572	8474	-12%	No	10.0729	No
BETWEEN US 50 AND MD 202	7441	8132	-9%	Yes	7.83081	No
BETWEEN MD 202 AND ARENA DR	7008	5795	17%	No	15.1673	No
BETWEEN ARENA DR AND MD 214	7734	7575	2%	Yes	1.81735	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6936	7225	-4%	Yes	3.43746	Yes
BETWEEN RITCHIE MARLBORO AND MD 4	7595	6488	15%	No	13.1952	No
BETWEEN MD 4 AND FORESTVILLE RD	6465	6098	6%	Yes	4.62737	Yes
BETWEEN FORESTVILLE AND MD 218		5656	#DIV/0!	#DIV/0!	106.353	No
BETWEEN MD 218 AND MD 5	6521	6100	6%	Yes	5.30609	No
BETWEEN MD 5 AND MD 414	4923	4972	-1%	Yes	0.69309	Yes
BETWEEN MD 414 AND MD 210	4829	4763	1%	Yes	0.95303	Yes
BETWEEN MD 210 AND I-295	4565	4916	-8%	Yes	5.09794	No
WOODROW WILSON BRIDGE	6753	7580	-12%	No	9.76331	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	7926	9068	-14%	No	12.3889	No
BETWEEN MD 210 AND I-295	5816	7269	-25%	No	17.9665	No
BETWEEN MD 414 AND MD 210	6641	7087	-7%	Yes	5.37733	No
BETWEEN MD 5 AND MD 414	6211	6523	-5%	Yes	3.91009	Yes
BETWEEN MD 218 AND MD 5	6509	6616	-2%	Yes	1.31469	Yes
BETWEEN FORESTVILLE AND MD 218		6357	#DIV/0!	#DIV/0!	112.752	No
BETWEEN MD 4 AND FORESTVILLE RD	7085	7311	-3%	Yes	2.66673	Yes
BETWEEN RITCHIE MARLBORO AND MD 4	7872	7588	4%	Yes	3.23593	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	7161	7876	-10%	Yes	8.24032	No
BETWEEN ARENA DR AND MD 214	6909	7243	-5%	Yes	3.96469	Yes
BETWEEN MD 202 AND ARENA DR	6451	5059	22%	No	18.3562	No
BETWEEN US 50 AND MD 202	6806	7122	-5%	Yes	3.78667	Yes
BETWEEN MD 450 AND US 50	6879	7136	-4%	Yes	3.07305	Yes
BETWEEN MD 295 AND MD 450	6315	6639	-5%	Yes	4.02892	Yes
BETWEEN MD 201 AND MD 295	6026	7385	-23%	No	16.5931	No
BETWEEN GREENBELT STATION AND MD 201	7277	7330	-1%	Yes	0.62017	Yes
BETWEEN GREENBELT STATION AND US 1	7371	7478	-1%	Yes	1.23601	Yes
BETWEEN US 1 AND I-95	8099	8154	-1%	Yes	0.61288	Yes
BETWEEN MD 650 AND I-95	8447	7021	17%	No	16.215	No
BETWEEN MD 193 AND MD 650	6624	6737	-2%	Yes	1.38557	Yes
BETWEEN MD US 29 AND MD 193	5827	6529	-12%	No	8.92509	No
BETWEEN MD 97 AND US 29	7255	7214	1%	Yes	0.48498	Yes
BETWEEN MD 185 AND MD 97	7609	7632	0%	Yes	0.26633	Yes
BETWEEN MD 355 AND MD 185	7657	7933	-4%	Yes	3.12889	Yes
BETWEEN I-270 EAST AND MD 187	3959	4290	-8%	Yes	5.15016	No
BETWEEN I-270 WEST AND MD 187	4478	4513	-1%	Yes	0.52201	Yes
BETWEEN MD 190 AND I-270	8010	7717	4%	Yes	3.30984	Yes
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7490	7098	5%	Yes	4.59287	Yes
AMERICAN LEGION BRIDGE		8053	#DIV/0!	#DIV/0!	126.909	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8485	5557	35%	No	34.9439	No

Figure A.8: I-495 Mainline 3-4 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	6058	6495	-7%	Yes	5.51908	No
AMERICAN LEGION BRIDGE		7943	#DIV/0!	#DIV/0!	126.036	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6078	7053	-16%	No	12.0329	No
BETWEEN MD 190 AND I-270	7324	8677	-18%	No	15.1212	No
BETWEEN I-270 WEST AND MD 187	2636	3906	-48%	No	22.2056	No
BETWEEN I-270 EAST AND MD 187	2592	3493	-35%	No	16.3388	No
BETWEEN MD 355 AND MD 185	6224	6974	-12%	No	9.22658	No
BETWEEN MD 185 AND MD 97	7820	7382	6%	Yes	5.02387	No
BETWEEN MD 97 AND US 29	8031	7639	5%	Yes	4.43432	Yes
BETWEEN MD US 29 AND MD 193	7709	7431	4%	Yes	3.19519	Yes
BETWEEN MD 193 AND MD 650	7200	7647	-6%	Yes	5.1909	No
BETWEEN MD 650 AND I-95	8945	8366	6%	Yes	6.22074	No
BETWEEN US 1 AND I-95	5399	6880	-27%	No	18.9042	No
BETWEEN GREENBELT STATION AND US 1	6611	8225	-24%	No	18.7396	No
BETWEEN GREENBELT STATION AND MD 201	5702	8118	-42%	No	29.0669	No
BETWEEN MD 201 AND MD 295	6809	8031	-18%	No	14.1807	No
BETWEEN MD 295 AND MD 450	6103	7691	-26%	No	19.1214	No
BETWEEN MD 450 AND US 50	7572	8114	-7%	Yes	6.1201	No
BETWEEN US 50 AND MD 202	6983	7951	-14%	No	11.205	No
BETWEEN MD 202 AND ARENA DR	6361	5792	9%	Yes	7.30265	No
BETWEEN ARENA DR AND MD 214	8329	7641	8%	Yes	7.70501	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6828	7544	-10%	No	8.44923	No
BETWEEN RITCHIE MARLBORO AND MD 4	7822	7018	10%	No	9.33371	No
BETWEEN MD 4 AND FORESTVILLE RD	6670	6922	-4%	Yes	3.05384	Yes
BETWEEN FORESTVILLE AND MD 218		6441	#DIV/0!	#DIV/0!	113.499	No
BETWEEN MD 218 AND MD 5	6826	7068	-4%	Yes	2.90049	Yes
BETWEEN MD 5 AND MD 414	5162	5823	-13%	No	8.91901	No
BETWEEN MD 414 AND MD 210	5328	5564	-4%	Yes	3.19796	Yes
BETWEEN MD 210 AND I-295	5004	5774	-15%	No	10.4923	No
WOODROW WILSON BRIDGE	7289	8634	-18%	No	15.0712	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	8247	9185	-11%	No	10.0446	No
BETWEEN MD 210 AND I-295	7402	7521	-2%	Yes	1.37187	Yes
BETWEEN MD 414 AND MD 210	6728	7291	-8%	Yes	6.72458	No
BETWEEN MD 5 AND MD 414	6294	6512	-3%	Yes	2.72126	Yes
BETWEEN MD 218 AND MD 5	6030	6623	-10%	Yes	7.45236	No
BETWEEN FORESTVILLE AND MD 218		6271	#DIV/0!	#DIV/0!	111.993	No
BETWEEN MD 4 AND FORESTVILLE RD	6386	7305	-14%	No	11.1045	No
BETWEEN RITCHIE MARLBORO AND MD 4	8214	7717	6%	Yes	5.5658	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6941	7252	-4%	Yes	3.6918	Yes
BETWEEN ARENA DR AND MD 214	7377	6963	6%	Yes	4.88624	Yes
BETWEEN MD 202 AND ARENA DR	5342	4671	13%	No	9.48686	No
BETWEEN US 50 AND MD 202	6050	7233	-20%	No	14.5103	No
BETWEEN MD 450 AND US 50	6768	7218	-7%	Yes	5.38122	No
BETWEEN MD 295 AND MD 450	6315	6639	-5%	Yes	4.02279	Yes
BETWEEN MD 201 AND MD 295	5929	7018	-18%	No	13.529	No
BETWEEN GREENBELT STATION AND MD 201	7277	7329	-1%	Yes	0.61141	Yes
BETWEEN GREENBELT STATION AND US 1	7712	7679	0%	Yes	0.37333	Yes
BETWEEN US 1 AND I-95	8334	8406	-1%	Yes	0.78972	Yes
BETWEEN MD 650 AND I-95	8187	7262	11%	No	10.5217	No
BETWEEN MD 193 AND MD 650	6731	6963	-3%	Yes	2.80674	Yes
BETWEEN MD US 29 AND MD 193	6463	6710	-4%	Yes	3.04653	Yes
BETWEEN MD 97 AND US 29	7141	7373	-3%	Yes	2.72339	Yes
BETWEEN MD 185 AND MD 97	7126	7502	-5%	Yes	4.39942	Yes
BETWEEN MD 355 AND MD 185	7193	7594	-6%	Yes	4.65784	Yes
BETWEEN I-270 EAST AND MD 187	3419	3972	-16%	No	9.08888	No
BETWEEN I-270 WEST AND MD 187	3658	4164	-14%	No	8.09495	No
BETWEEN MD 190 AND I-270	8273	7374	11%	No	10.1697	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7022	6829	3%	Yes	2.32522	Yes
AMERICAN LEGION BRIDGE		8141	#DIV/0!	#DIV/0!	127.603	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8135	5659	30%	No	29.8173	No

Figure A.9: I-495 Mainline 4-5 PM Volumes

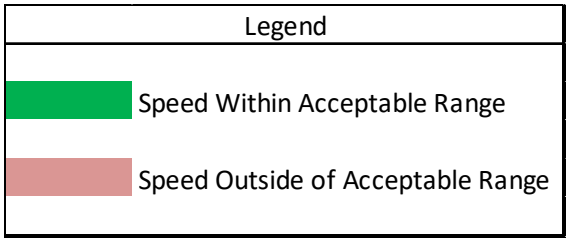
Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	5884	6172	-5%	Yes	3.70306	Yes
AMERICAN LEGION BRIDGE		7808	#DIV/0!	#DIV/0!	124.96	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	5963	6667	-12%	No	8.85903	No
BETWEEN MD 190 AND I-270	6932	8148	-18%	No	14.0066	No
BETWEEN I-270 WEST AND MD 187	2524	3518	-39%	No	18.0847	No
BETWEEN I-270 EAST AND MD 187	2592	3249	-25%	No	12.1573	No
BETWEEN MD 355 AND MD 185	6224	6981	-12%	No	9.31028	No
BETWEEN MD 185 AND MD 97	7109	6997	2%	Yes	1.33661	Yes
BETWEEN MD 97 AND US 29	7332	7196	2%	Yes	1.59865	Yes
BETWEEN MD US 29 AND MD 193	7369	7101	4%	Yes	3.1478	Yes
BETWEEN MD 193 AND MD 650	6872	7428	-8%	Yes	6.57829	No
BETWEEN MD 650 AND I-95	8403	7977	5%	Yes	4.70725	Yes
BETWEEN US 1 AND I-95	5399	6638	-23%	No	15.9739	No
BETWEEN GREENBELT STATION AND US 1	6611	7973	-21%	No	15.9442	No
BETWEEN GREENBELT STATION AND MD 201	5487	7724	-41%	No	27.5269	No
BETWEEN MD 201 AND MD 295	6480	7580	-17%	No	13.1137	No
BETWEEN MD 295 AND MD 450	5812	7234	-24%	No	17.6008	No
BETWEEN MD 450 AND US 50	6941	7835	-13%	No	10.3982	No
BETWEEN US 50 AND MD 202	6754	8140	-21%	No	16.0582	No
BETWEEN MD 202 AND ARENA DR	6361	5761	9%	Yes	7.71347	No
BETWEEN ARENA DR AND MD 214	8448	7745	8%	Yes	7.80996	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6503	7738	-19%	No	14.6328	No
BETWEEN RITCHIE MARLBORO AND MD 4	7595	7383	3%	Yes	2.45558	Yes
BETWEEN MD 4 AND FORESTVILLE RD	6670	7077	-6%	Yes	4.9032	Yes
BETWEEN FORESTVILLE AND MD 218		6630	#DIV/0!	#DIV/0!	115.152	No
BETWEEN MD 218 AND MD 5	6724	7185	-7%	Yes	5.5221	No
BETWEEN MD 5 AND MD 414	5162	6019	-17%	No	11.4554	No
BETWEEN MD 414 AND MD 210	5495	5765	-5%	Yes	3.59511	Yes
BETWEEN MD 210 AND I-295	4741	5790	-22%	No	14.4563	No
WOODROW WILSON BRIDGE	7182	8803	-23%	No	18.1345	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	8247	9193	-11%	No	10.1253	No
BETWEEN MD 210 AND I-295	7314	7435	-2%	Yes	1.40613	Yes
BETWEEN MD 414 AND MD 210	6379	7194	-13%	No	9.88726	No
BETWEEN MD 5 AND MD 414	6046	6409	-6%	Yes	4.60304	Yes
BETWEEN MD 218 AND MD 5	5552	6500	-17%	No	12.2122	No
BETWEEN FORESTVILLE AND MD 218		6186	#DIV/0!	#DIV/0!	111.232	No
BETWEEN MD 4 AND FORESTVILLE RD	6187	7316	-18%	No	13.7431	No
BETWEEN RITCHIE MARLBORO AND MD 4	7872	7611	3%	Yes	2.96639	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6390	7352	-15%	No	11.6055	No
BETWEEN ARENA DR AND MD 214	7260	7037	3%	Yes	2.64349	Yes
BETWEEN MD 202 AND ARENA DR	5947	4484	25%	No	20.258	No
BETWEEN US 50 AND MD 202	6266	7074	-13%	No	9.88753	No
BETWEEN MD 450 AND US 50	6325	6631	-5%	Yes	3.79883	Yes
BETWEEN MD 295 AND MD 450	5901	5960	-1%	Yes	0.76938	Yes
BETWEEN MD 201 AND MD 295	5637	6679	-18%	No	13.2815	No
BETWEEN GREENBELT STATION AND MD 201	6734	7067	-5%	Yes	4.00573	Yes
BETWEEN GREENBELT STATION AND US 1	7712	7608	1%	Yes	1.19401	Yes
BETWEEN US 1 AND I-95	8334	8466	-2%	Yes	1.4348	Yes
BETWEEN MD 650 AND I-95	8187	8012	2%	Yes	1.94171	Yes
BETWEEN MD 193 AND MD 650	6731	7596	-13%	No	10.2229	No
BETWEEN MD US 29 AND MD 193	6569	7028	-7%	Yes	5.56979	No
BETWEEN MD 97 AND US 29	6234	7780	-25%	No	18.4718	No
BETWEEN MD 185 AND MD 97	5918	7778	-31%	No	22.4794	No
BETWEEN MD 355 AND MD 185	6729	7705	-15%	No	11.4916	No
BETWEEN I-270 EAST AND MD 187	3119	3911	-25%	No	13.3586	No
BETWEEN I-270 WEST AND MD 187	3028	4050	-34%	No	17.1834	No
BETWEEN MD 190 AND I-270	8273	6914	16%	No	15.5925	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6905	6511	6%	Yes	4.8137	Yes
AMERICAN LEGION BRIDGE		7776	#DIV/0!	#DIV/0!	124.706	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	7815	5283	32%	No	31.2913	No

Figure A.10: I-495 Mainline 5-6 PM Volumes

Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
BETWEEN VA-193 AND GW MEMORIAL PKWY	6475	6202	4%	Yes	3.43536	Yes
AMERICAN LEGION BRIDGE		7805	#DIV/0!	#DIV/0!	124.942	No
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6422	6849	-7%	Yes	5.24193	No
BETWEEN MD 190 AND I-270	8240	8078	2%	Yes	1.79348	Yes
BETWEEN I-270 WEST AND MD 187	2636	3613	-37%	No	17.4744	No
BETWEEN I-270 EAST AND MD 187	2698	3570	-32%	No	15.5764	No
BETWEEN MD 355 AND MD 185	5795	6880	-19%	No	13.6322	No
BETWEEN MD 185 AND MD 97	6990	6771	3%	Yes	2.63715	Yes
BETWEEN MD 97 AND US 29	6983	6751	3%	Yes	2.8027	Yes
BETWEEN MD US 29 AND MD 193	7369	6413	13%	No	11.5133	No
BETWEEN MD 193 AND MD 650	6545	6804	-4%	Yes	3.17326	Yes
BETWEEN MD 650 AND I-95	8538	7405	13%	No	12.687	No
BETWEEN US 1 AND I-95	5494	5790	-5%	Yes	3.93415	Yes
BETWEEN GREENBELT STATION AND US 1	6501	7482	-15%	No	11.7294	No
BETWEEN GREENBELT STATION AND MD 201	6240	7537	-21%	No	15.6271	No
BETWEEN MD 201 AND MD 295	6589	7553	-15%	No	11.4611	No
BETWEEN MD 295 AND MD 450	5618	6824	-21%	No	15.2873	No
BETWEEN MD 450 AND US 50	5048	7827	-55%	No	34.6334	No
BETWEEN US 50 AND MD 202	7212	8141	-13%	No	10.6031	No
BETWEEN MD 202 AND ARENA DR	6792	5685	16%	No	14.0122	No
BETWEEN ARENA DR AND MD 214	7972	7421	7%	Yes	6.28646	No
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6394	7287	-14%	No	10.7942	No
BETWEEN RITCHIE MARLBORO AND MD 4	7369	7166	3%	Yes	2.38419	Yes
BETWEEN MD 4 AND FORESTVILLE RD	6157	7093	-15%	No	11.4996	No
BETWEEN FORESTVILLE AND MD 218		6559	#DIV/0!	#DIV/0!	114.536	No
BETWEEN MD 218 AND MD 5	6215	6975	-12%	No	9.35551	No
BETWEEN MD 5 AND MD 414	4526	5642	-25%	No	15.6484	No
BETWEEN MD 414 AND MD 210	4745	5154	-9%	Yes	5.81357	No
BETWEEN MD 210 AND I-295	4302	5407	-26%	No	15.8595	No
WOODROW WILSON BRIDGE	6110	8238	-35%	No	25.1241	No
I-495 Outer Loop				Calibration not met		
WOODROW WILSON BRIDGE	7283	8640	-19%	No	15.2057	No
BETWEEN MD 210 AND I-295	6521	6813	-4%	Yes	3.57617	Yes
BETWEEN MD 414 AND MD 210	6379	6500	-2%	Yes	1.50475	Yes
BETWEEN MD 5 AND MD 414	5466	5761	-5%	Yes	3.94065	Yes
BETWEEN MD 218 AND MD 5	5264	5801	-10%	No	7.21305	No
BETWEEN FORESTVILLE AND MD 218		5535	#DIV/0!	#DIV/0!	105.216	No
BETWEEN MD 4 AND FORESTVILLE RD	5688	6571	-16%	No	11.2815	No
BETWEEN RITCHIE MARLBORO AND MD 4	7074	6850	3%	Yes	2.68159	Yes
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6170	7282	-18%	No	13.5619	No
BETWEEN ARENA DR AND MD 214	7143	7049	1%	Yes	1.11887	Yes
BETWEEN MD 202 AND ARENA DR	5141	4752	8%	Yes	5.52734	No
BETWEEN US 50 AND MD 202	5834	6909	-18%	No	13.4675	No
BETWEEN MD 450 AND US 50	5881	6622	-13%	No	9.37493	No
BETWEEN MD 295 AND MD 450	5590	6153	-10%	No	7.34422	No
BETWEEN MD 201 AND MD 295	5540	6883	-24%	No	17.0343	No
BETWEEN GREENBELT STATION AND MD 201	6626	7066	-7%	Yes	5.31188	No
BETWEEN GREENBELT STATION AND US 1	6918	7551	-9%	Yes	7.43929	No
BETWEEN US 1 AND I-95	7395	8156	-10%	No	8.63019	No
BETWEEN MD 650 AND I-95	7407	7307	1%	Yes	1.17172	Yes
BETWEEN MD 193 AND MD 650	6410	6798	-6%	Yes	4.76844	Yes
BETWEEN MD US 29 AND MD 193	6145	6403	-4%	Yes	3.2541	Yes
BETWEEN MD 97 AND US 29	6348	7239	-14%	No	10.8101	No
BETWEEN MD 185 AND MD 97	6280	7464	-19%	No	14.2798	No
BETWEEN MD 355 AND MD 185	6149	7507	-22%	No	16.4315	No
BETWEEN I-270 EAST AND MD 187	2880	3509	-22%	No	11.133	No
BETWEEN I-270 WEST AND MD 187	3217	3632	-13%	No	7.09169	No
BETWEEN MD 190 AND I-270	7091	6819	4%	Yes	3.2585	Yes
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6788	6769	0%	Yes	0.23077	Yes
AMERICAN LEGION BRIDGE		7847	#DIV/0!	#DIV/0!	125.274	No
BETWEEN VA-193 AND GW MEMORIAL PKWY	8408	5343	36%	No	36.9606	No

Figure A.11: I-495 Mainline 6-7 PM Volumes

I-495 Mainline Travel Time and Speed Tables



Travel Segments	Distance (feet)	Distance (miles)	6-7 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**2604.0**	**2762.8**	**-158.8**	**-6%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	58.0	57.5	Yes	32.1	32.4	**-0.3**	**-1%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	57.1	57.2	Yes	29.3	29.3	**0.1**	**0%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	56.4	49.3	Yes	23.4	26.8	**-3.4**	**-14%**
AMERICAN LEGION BRIDGE	794	**0.2**	59.9	38.3	No	9.0	14.1	**-5.1**	**-56%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	53.0	45.9	Yes	6.5	7.5	**-1.0**	**-16%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	52.4	53.2	Yes	13.7	13.5	**0.2**	**1%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	57.5	56.4	Yes	86.4	88.2	**-1.7**	**-2%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	64.1	56.9	Yes	22.6	25.5	**-2.8**	**-13%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	65.7	56.9	Yes	2.7	3.1	**-0.4**	**-15%**
MERGE MD 190	1235	**0.2**	66.1	57.4	Yes	12.7	14.7	**-1.9**	**-15%**
BETWEEN MD 190 AND I 270	6468	**1.2**	66.1	57.1	Yes	66.7	77.2	**-10.5**	**-16%**
MERGE I 270	867	**0.2**	62.0	53.9	Yes	9.5	11.0	**-1.4**	**-15%**
BETWEEN I 270 AND MD 187	7828	**1.5**	61.7	54.7	Yes	86.5	97.6	**-11.1**	**-13%**
MERGE MD 187	2140	**0.4**	63.1	56.2	Yes	23.1	26.0	**-2.9**	**-12%**
BETWEEN MD 187 AND I 270	2278	**0.4**	60.0	55.6	Yes	25.9	27.9	**-2.1**	**-8%**
MERGE BEFORE I 270	1306	**0.2**	58.3	50.5	Yes	15.3	17.6	**-2.4**	**-15%**
MERGE AFTER I 270	564	**0.1**	59.3	57.8	Yes	6.5	6.7	**-0.2**	**-3%**
MD 355 MERGE	1371	**0.3**	60.9	58.9	Yes	15.4	15.9	**-0.5**	**-3%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	59.8	59.2	Yes	69.1	69.8	**-0.7**	**-1%**
MD 185 MERGE	2074	**0.4**	61.1	58.5	Yes	23.2	24.2	**-1.0**	**-4%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	60.7	58.6	Yes	111.3	115.2	**-3.9**	**-4%**
MD 97 MERGE	1461	**0.3**	63.1	57.7	Yes	15.8	17.3	**-1.5**	**-9%**
BETWEEN MD 97 AND US 29	5965	**1.1**	63.3	59.7	Yes	64.3	68.1	**-3.8**	**-6%**
MERGE US 29	1734	**0.3**	63.8	60.3	Yes	18.5	19.6	**-1.1**	**-6%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	63.5	59.6	Yes	17.6	18.8	**-1.2**	**-7%**
MERGE MD 193	2099	**0.4**	64.3	58.0	Yes	22.2	24.7	**-2.4**	**-11%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	65.1	59.0	Yes	63.3	69.9	**-6.5**	**-10%**
MERGE MD 650	3008	**0.6**	63.6	58.5	Yes	32.2	35.1	**-2.8**	**-9%**
BETWEEN MD 650 AND I 95	2869	**0.5**	62.4	60.7	Yes	31.3	32.2	**-0.9**	**-3%**
BEFORE I 95 MERGE	5612	**1.1**	67.0	60.3	Yes	57.1	63.4	**-6.3**	**-11%**
AFTER I 95 MERGE	2578	**0.5**	62.7	55.7	Yes	28.0	31.6	**-3.5**	**-13%**
MERGE US 1	2873	**0.5**	62.0	53.2	Yes	31.6	36.8	**-5.2**	**-17%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	62.5	49.9	Yes	38.6	48.4	**-9.8**	**-25%**
AFTER GREENBELT STATION MERGE	595	**0.1**	63.0	50.1	Yes	6.4	8.1	**-1.7**	**-26%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	63.6	53.4	Yes	47.3	56.3	**-9.0**	**-19%**
MERGE MD 201	3066	**0.6**	62.8	52.8	Yes	33.3	39.6	**-6.3**	**-19%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	61.0	54.5	Yes	21.2	23.8	**-2.5**	**-12%**
MERGE MD 295	2725	**0.5**	63.9	55.4	Yes	29.1	33.5	**-4.4**	**-15%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	65.3	53.6	Yes	111.5	135.8	**-24.2**	**-22%**
MERGE MD 450	1203	**0.2**	62.2	55.9	Yes	13.2	14.7	**-1.5**	**-11%**
BETWEEN MD 450 AND US 50	2809	**0.5**	60.2	55.5	Yes	31.8	34.5	**-2.7**	**-9%**
MERGE US 50	4270	**0.8**	63.6	56.5	Yes	45.8	51.5	**-5.7**	**-13%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	61.2	55.5	Yes	60.8	67.1	**-6.3**	**-10%**
END 495 EXPRESS LANE	515	**0.1**	62.7	54.8	Yes	5.6	6.4	**-0.8**	**-14%**
BEFORE MD 202 MERGE	1817	**0.3**	61.0	54.8	Yes	20.3	22.6	**-2.3**	**-11%**
MERGE MD 202	2462	**0.5**	60.3	54.6	Yes	27.8	30.7	**-2.9**	**-10%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	57.3	54.6	Yes	16.1	16.9	**-0.8**	**-5%**
MERGE ARENA DR	2059	**0.4**	56.4	57.0	Yes	24.9	24.6	**0.3**	**1%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	55.1	56.1	Yes	41.2	40.5	**0.7**	**2%**
MD 214 MERGE	2564	**0.5**	52.7	56.8	Yes	33.2	30.8	**2.4**	**7%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	61.9	54.2	Yes	106.8	122.0	**-15.2**	**-14%**
MERGE MD 4	2628	**0.5**	62.8	55.8	Yes	28.5	32.1	**-3.5**	**-12%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	63.2	58.7	Yes	36.0	38.7	**-2.7**	**-8%**
MERGE FORESTVILLE RD	930	**0.2**	63.2	62.6	Yes	10.0	10.1	**-0.1**	**-1%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	63.4	63.1	Yes	34.6	34.7	**-0.1**	**0%**
MERGE MD 218	1660	**0.3**	63.8	63.0	Yes	17.7	18.0	**-0.2**	**-1%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	62.5	62.4	Yes	69.9	70.0	**-0.1**	**0%**
MERGE MD 5	2751	**0.5**	54.0	61.0	Yes	34.7	30.8	**3.9**	**11%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	49.7	61.2	Yes	164.2	133.1	**31.1**	**19%**
MERGE MD 414	3478	**0.7**	42.6	54.7	Yes	55.7	43.4	**12.3**	**22%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	40.7	46.8	Yes	41.3	36.0	**5.4**	**13%**
MERGE MD 210	5648	**1.1**	32.4	29.4	Yes	118.9	130.8	**-11.9**	**-10%**
BETWEEN MD 210 AND I 295	2959	**0.6**	32.1	27.2	Yes	62.9	74.2	**-11.3**	**-18%**
MERGE I 295	3328	**0.6**	41.3	43.4	Yes	54.9	52.3	**2.5**	**5%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	56.2	57.8	Yes	14.8	14.4	**0.4**	**3%**
WOODROW WILSON BRIDGE	6059	**1.1**	57.7	55.2	Yes	71.6	74.9	**-3.3**	**-5%**

Figure A.12: I-495 Inner Loop Mainline 6-7 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	6-7 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**2957.1**	**3248.4**	**-291.3**	**-10%**
WOODROW WILSON BRIDGE	6160	**1.2**	53.45	56.96	Yes	78.6	73.7	**4.9**	**6%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	59.80	57.14	Yes	7.3	7.7	**-0.3**	**-5%**
MERGE I 295	1023	**0.2**	61.88	57.65	Yes	11.3	12.1	**-0.8**	**-7%**
BETWEEN MD 210 AND I 295	377	**0.1**	60.67	58.52	Yes	4.2	4.4	**-0.2**	**-4%**
MERGE MD 210	8656	**1.6**	59.92	58.35	Yes	98.5	101.2	**-2.7**	**-3%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	61.26	58.62	Yes	49.6	51.8	**-2.2**	**-5%**
MERGE MD 414	2984	**0.6**	51.82	58.83	Yes	39.3	34.6	**4.7**	**12%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	41.07	54.56	Yes	202.7	152.6	**50.1**	**25%**
MERGE MD 5	3740	**0.7**	62.40	53.27	Yes	40.9	47.9	**-7.0**	**-17%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	63.81	53.54	Yes	63.0	75.1	**-12.1**	**-19%**
MERGE MD 218	238	**0.0**	64.26	51.77	Yes	2.5	3.1	**-0.6**	**-24%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	66.23	54.75	Yes	50.5	61.1	**-10.6**	**-21%**
MERGE MD 337	912	**0.2**	65.90	54.50	Yes	9.4	11.4	**-2.0**	**-21%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	64.97	53.16	Yes	33.0	40.3	**-7.3**	**-22%**
MERGE MD 4	3108	**0.6**	65.23	54.32	Yes	32.5	39.0	**-6.5**	**-20%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	62.64	55.22	Yes	68.6	77.8	**-9.2**	**-13%**
MERGE MD 214	2618	**0.5**	58.81	55.79	Yes	30.4	32.0	**-1.6**	**-5%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	58.15	54.38	Yes	32.7	35.0	**-2.3**	**-7%**
MERGE ARENA DR	2437	**0.5**	61.53	54.30	Yes	27.0	30.6	**-3.6**	**-13%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	63.36	50.85	Yes	12.7	15.8	**-3.1**	**-25%**
MERGE MD 202	3055	**0.6**	63.46	54.39	Yes	32.8	38.3	**-5.5**	**-17%**
BEFORE MD 202 MERGE	908	**0.2**	62.65	57.28	Yes	9.9	10.8	**-0.9**	**-9%**
END 495 EXPRESS LANE	594	**0.1**	62.71	52.27	Yes	6.5	7.7	**-1.3**	**-20%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	59.78	53.64	Yes	69.6	77.5	**-8.0**	**-11%**
MERGE US 50	3680	**0.7**	59.39	57.40	Yes	42.2	43.7	**-1.5**	**-3%**
BETWEEN MD 450 AND US 50	2561	**0.5**	53.92	57.72	Yes	32.4	30.2	**2.1**	**7%**
MERGE MD 450	2100	**0.4**	56.10	58.22	Yes	25.5	24.6	**0.9**	**4%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	58.96	54.16	Yes	123.4	134.4	**-11.0**	**-9%**
MERGE MD 295	2479	**0.5**	60.77	52.25	Yes	27.8	32.4	**-4.5**	**-16%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	62.08	51.91	Yes	21.9	26.2	**-4.3**	**-20%**
MERGE MD 201	3054	**0.6**	64.45	51.18	Yes	32.3	40.7	**-8.4**	**-26%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	63.83	54.09	Yes	49.6	58.5	**-8.9**	**-18%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	61.87	56.69	Yes	45.2	49.3	**-4.1**	**-9%**
MERGE US 1	2739	**0.5**	62.71	57.92	Yes	29.8	32.2	**-2.5**	**-8%**
BETWEEN US 1 AND I 95	3225	**0.6**	60.74	57.47	Yes	36.2	38.3	**-2.1**	**-6%**
I 95 MERGE	4389	**0.8**	34.66	54.52	No	86.3	54.9	**31.4**	**36%**
BETWEEN MD 650 AND I 95	4048	**0.8**	25.25	35.17	Yes	109.3	78.5	**30.8**	**28%**
MERGE MD 650	2547	**0.5**	22.01	26.69	Yes	78.9	65.1	**13.8**	**18%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	21.09	20.06	Yes	204.1	214.6	**-10.5**	**-5%**
MERGE MD 193	1353	**0.3**	25.93	16.26	Yes	35.6	56.8	**-21.2**	**-59%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	25.99	18.42	Yes	71.4	100.7	**-29.3**	**-41%**
MERGE US 29	1127	**0.2**	26.95	18.62	Yes	28.5	41.3	**-12.8**	**-45%**
BETWEEN MD 97 AND US 29	5926	**1.1**	34.97	21.92	Yes	115.5	184.3	**-68.8**	**-60%**
MD 97 MERGE	1734	**0.3**	43.38	20.14	No	27.3	58.7	**-31.5**	**-115%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	51.94	41.61	Yes	114.8	143.3	**-28.5**	**-25%**
MD 185 MERGE	3315	**0.6**	53.96	53.03	Yes	41.9	42.6	**-0.7**	**-2%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	57.26	52.71	Yes	74.9	81.3	**-6.5**	**-9%**
MD 355 MERGE	1401	**0.3**	58.77	51.04	Yes	16.3	18.7	**-2.5**	**-15%**
MERGE AFTER I 270	61	**0.0**	58.30	53.19	Yes	0.7	0.8	**-0.1**	**-10%**
MERGE BEFORE I 270	1298	**0.2**	56.95	53.24	Yes	15.5	16.6	**-1.1**	**-7%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	58.09	53.18	Yes	36.3	39.6	**-3.3**	**-9%**
MERGE MD 187	1936	**0.4**	60.36	53.09	Yes	21.9	24.9	**-3.0**	**-14%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	62.48	52.64	Yes	83.4	99.0	**-15.6**	**-19%**
MERGE I 270	1490	**0.3**	59.22	50.23	Yes	17.2	20.2	**-3.1**	**-18%**
BETWEEN MD 190 AND I 270	5753	**1.1**	61.16	51.72	Yes	64.1	75.8	**-11.7**	**-18%**
MERGE MD 190	1537	**0.3**	62.97	52.46	Yes	16.6	20.0	**-3.3**	**-20%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	62.51	52.46	Yes	2.3	2.8	**-0.4**	**-19%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	61.96	49.36	Yes	26.4	33.1	**-6.7**	**-26%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	61.08	50.89	Yes	70.7	84.9	**-14.2**	**-20%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	61.58	52.83	Yes	16.2	18.9	**-2.7**	**-17%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	61.27	52.65	Yes	8.3	9.7	**-1.4**	**-16%**
AMERICAN LEGION BRIDGE	790	**0.1**	61.15	52.46	Yes	8.8	10.3	**-1.5**	**-17%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	58.80	52.46	Yes	9.8	11.0	**-1.2**	**-12%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	60.66	52.46	Yes	48.2	55.7	**-7.5**	**-16%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	61.60	49.79	Yes	7.5	9.3	**-1.8**	**-24%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	61.59	49.79	Yes	18.5	22.9	**-4.4**	**-24%**

Figure A.13: I-495 Outer Loop Mainline 6-7 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	7-8 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**3945.8**	**3274.0**	**671.8**	**17%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	25.7	49.9	No	72.3	37.3	**35.0**	**48%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	25.6	25.4	Yes	65.2	65.9	**-0.7**	**-1%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	30.7	23.6	Yes	42.9	55.8	**-12.9**	**-30%**
AMERICAN LEGION BRIDGE	794	**0.2**	38.9	25.0	Yes	13.9	21.6	**-7.7**	**-56%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	37.6	43.4	Yes	9.2	8.0	**1.2**	**13%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	43.3	51.6	Yes	16.6	13.9	**2.7**	**16%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	53.0	55.8	Yes	93.7	89.0	**4.7**	**5%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	60.8	56.5	Yes	23.8	25.6	**-1.8**	**-8%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	63.1	56.5	Yes	2.8	3.1	**-0.3**	**-12%**
MERGE MD 190	1235	**0.2**	63.5	57.2	Yes	13.3	14.7	**-1.5**	**-11%**
BETWEEN MD 190 AND I 270	6468	**1.2**	63.6	56.7	Yes	69.3	77.7	**-8.4**	**-12%**
MERGE I 270	867	**0.2**	59.9	53.9	Yes	9.9	11.0	**-1.1**	**-11%**
BETWEEN I 270 AND MD 187	7828	**1.5**	59.9	54.2	Yes	89.1	98.6	**-9.5**	**-11%**
MERGE MD 187	2140	**0.4**	60.5	55.9	Yes	24.1	26.1	**-2.0**	**-8%**
BETWEEN MD 187 AND I 270	2278	**0.4**	54.0	54.2	Yes	28.7	28.7	**0.1**	**0%**
MERGE BEFORE I 270	1306	**0.2**	47.9	49.7	Yes	18.6	17.9	**0.7**	**4%**
MERGE AFTER I 270	564	**0.1**	51.5	57.5	Yes	7.5	6.7	**0.8**	**10%**
MD 355 MERGE	1371	**0.3**	52.0	58.3	Yes	18.0	16.0	**1.9**	**11%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	49.4	49.3	Yes	83.7	83.9	**-0.1**	**0%**
MD 185 MERGE	2074	**0.4**	55.9	55.9	Yes	25.3	25.3	**0.0**	**0%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	56.0	57.6	Yes	120.7	117.2	**3.5**	**3%**
MD 97 MERGE	1461	**0.3**	59.5	56.4	Yes	16.8	17.7	**-0.9**	**-5%**
BETWEEN MD 97 AND US 29	5965	**1.1**	60.4	58.5	Yes	67.3	69.5	**-2.2**	**-3%**
MERGE US 29	1734	**0.3**	60.9	60.2	Yes	19.4	19.6	**-0.2**	**-1%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	60.2	58.2	Yes	18.6	19.2	**-0.7**	**-4%**
MERGE MD 193	2099	**0.4**	61.7	50.4	Yes	23.2	28.4	**-5.2**	**-22%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	62.3	57.2	Yes	66.2	72.1	**-5.9**	**-9%**
MERGE MD 650	3008	**0.6**	61.0	56.2	Yes	33.6	36.5	**-2.9**	**-9%**
BETWEEN MD 650 AND I 95	2869	**0.5**	60.5	60.1	Yes	32.3	32.6	**-0.3**	**-1%**
BEFORE I 95 MERGE	5612	**1.1**	62.5	60.2	Yes	61.2	63.6	**-2.4**	**-4%**
AFTER I 95 MERGE	2578	**0.5**	39.7	53.5	Yes	44.2	32.8	**11.4**	**26%**
MERGE US 1	2873	**0.5**	37.7	41.8	Yes	52.0	46.9	**5.1**	**10%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	45.1	43.1	Yes	53.6	56.0	**-2.4**	**-4%**
AFTER GREENBELT STATION MERGE	595	**0.1**	54.4	46.7	Yes	7.5	8.7	**-1.2**	**-17%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	56.9	52.4	Yes	52.9	57.4	**-4.5**	**-9%**
MERGE MD 201	3066	**0.6**	56.8	52.2	Yes	36.8	40.0	**-3.2**	**-9%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	56.2	53.8	Yes	23.0	24.1	**-1.1**	**-5%**
MERGE MD 295	2725	**0.5**	60.2	54.7	Yes	30.8	34.0	**-3.1**	**-10%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	62.0	52.3	Yes	117.3	139.2	**-21.9**	**-19%**
MERGE MD 450	1203	**0.2**	57.3	55.6	Yes	14.3	14.8	**-0.4**	**-3%**
BETWEEN MD 450 AND US 50	2809	**0.5**	54.6	55.6	Yes	35.1	34.5	**0.6**	**2%**
MERGE US 50	4270	**0.8**	54.7	56.1	Yes	53.2	51.9	**1.3**	**2%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	54.0	54.9	Yes	69.0	67.8	**1.2**	**2%**
END 495 EXPRESS LANE	515	**0.1**	61.7	54.6	Yes	5.7	6.4	**-0.7**	**-13%**
BEFORE MD 202 MERGE	1817	**0.3**	60.5	54.6	Yes	20.5	22.7	**-2.2**	**-11%**
MERGE MD 202	2462	**0.5**	60.2	54.5	Yes	27.9	30.8	**-2.9**	**-10%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	58.3	54.5	Yes	15.9	17.0	**-1.1**	**-7%**
MERGE ARENA DR	2059	**0.4**	56.2	56.5	Yes	25.0	24.8	**0.1**	**1%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	54.6	55.9	Yes	41.6	40.7	**1.0**	**2%**
MD 214 MERGE	2564	**0.5**	51.7	56.9	Yes	33.8	30.7	**3.1**	**9%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	55.4	51.4	Yes	119.4	128.5	**-9.2**	**-8%**
MERGE MD 4	2628	**0.5**	60.0	56.9	Yes	29.9	31.5	**-1.6**	**-5%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	61.1	58.8	Yes	37.2	38.7	**-1.4**	**-4%**
MERGE FORESTVILLE RD	930	**0.2**	62.1	62.6	Yes	10.2	10.1	**0.1**	**1%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	62.4	63.2	Yes	35.1	34.7	**0.4**	**1%**
MERGE MD 218	1660	**0.3**	63.4	63.0	Yes	17.8	18.0	**-0.1**	**-1%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	60.9	60.5	Yes	71.8	72.3	**-0.5**	**-1%**
MERGE MD 5	2751	**0.5**	32.0	62.4	No	58.7	30.1	**28.6**	**49%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	18.2	49.7	No	447.5	164.0	**283.5**	**63%**
MERGE MD 414	3478	**0.7**	14.6	37.5	No	162.9	63.3	**99.7**	**61%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	15.7	26.1	Yes	107.3	64.6	**42.7**	**40%**
MERGE MD 210	5648	**1.1**	7.7	11.0	Yes	500.4	350.6	**149.8**	**30%**
BETWEEN MD 210 AND I 295	2959	**0.6**	10.1	14.9	Yes	200.4	135.6	**64.8**	**32%**
MERGE I 295	3328	**0.6**	22.6	39.8	No	100.3	57.1	**43.3**	**43%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	48.8	57.6	Yes	17.0	14.4	**2.6**	**15%**
WOODROW WILSON BRIDGE	6059	**1.1**	50.2	54.3	Yes	82.4	76.1	**6.3**	**8%**

Figure A.14: I-495 Inner Loop Mainline 7-8 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	7-8 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**4173.2**	**4006.7**	**166.5**	**4%**
WOODROW WILSON BRIDGE	6160	**1.2**	49.27	32.26	No	85.3	130.2	**-45.0**	**-53%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	53.58	55.94	Yes	8.2	7.8	**0.3**	**4%**
MERGE I 295	1023	**0.2**	59.43	56.88	Yes	11.7	12.3	**-0.5**	**-4%**
BETWEEN MD 210 AND I 295	377	**0.1**	57.27	58.53	Yes	4.5	4.4	**0.1**	**2%**
MERGE MD 210	8656	**1.6**	57.71	58.54	Yes	102.3	100.8	**1.5**	**1%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	61.76	58.81	Yes	49.2	51.6	**-2.5**	**-5%**
MERGE MD 414	2984	**0.6**	62.81	58.94	Yes	32.4	34.5	**-2.1**	**-7%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	59.97	54.48	Yes	138.9	152.9	**-14.0**	**-10%**
MERGE MD 5	3740	**0.7**	62.35	53.18	Yes	40.9	48.0	**-7.0**	**-17%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	60.43	53.02	Yes	66.5	75.8	**-9.3**	**-14%**
MERGE MD 218	238	**0.0**	59.03	51.42	Yes	2.7	3.2	**-0.4**	**-15%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	57.04	54.48	Yes	58.7	61.4	**-2.8**	**-5%**
MERGE MD 337	912	**0.2**	55.15	54.20	Yes	11.3	11.5	**-0.2**	**-2%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	52.01	51.12	Yes	41.2	41.9	**-0.7**	**-2%**
MERGE MD 4	3108	**0.6**	48.11	53.45	Yes	44.0	39.6	**4.4**	**10%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	43.22	53.97	Yes	99.4	79.6	**19.8**	**20%**
MERGE MD 214	2618	**0.5**	41.77	55.79	No	42.7	32.0	**10.7**	**25%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	41.38	51.16	Yes	46.0	37.2	**8.8**	**19%**
MERGE ARENA DR	2437	**0.5**	39.82	49.88	Yes	41.7	33.3	**8.4**	**20%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	33.33	47.25	Yes	24.1	17.0	**7.1**	**29%**
MERGE MD 202	3055	**0.6**	27.70	41.80	No	75.2	49.8	**25.4**	**34%**
BEFORE MD 202 MERGE	908	**0.2**	28.18	31.09	Yes	22.0	19.9	**2.1**	**9%**
END 495 EXPRESS LANE	594	**0.1**	24.55	29.32	Yes	16.5	13.8	**2.7**	**16%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	33.29	48.62	No	124.9	85.6	**39.4**	**32%**
MERGE US 50	3680	**0.7**	37.75	57.51	No	66.5	43.6	**22.8**	**34%**
BETWEEN MD 450 AND US 50	2561	**0.5**	32.19	53.78	No	54.2	32.5	**21.8**	**40%**
MERGE MD 450	2100	**0.4**	37.37	46.42	Yes	38.3	30.9	**7.5**	**20%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	50.99	50.07	Yes	142.7	145.4	**-2.6**	**-2%**
MERGE MD 295	2479	**0.5**	54.12	51.52	Yes	31.2	32.8	**-1.6**	**-5%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	56.14	51.44	Yes	24.2	26.5	**-2.2**	**-9%**
MERGE MD 201	3054	**0.6**	59.22	51.12	Yes	35.2	40.7	**-5.6**	**-16%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	59.24	54.03	Yes	53.4	58.6	**-5.2**	**-10%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	58.29	56.28	Yes	48.0	49.7	**-1.7**	**-4%**
MERGE US 1	2739	**0.5**	51.76	57.74	Yes	36.1	32.3	**3.7**	**10%**
BETWEEN US 1 AND I 95	3225	**0.6**	42.24	57.24	No	52.1	38.4	**13.6**	**26%**
I 95 MERGE	4389	**0.8**	11.27	44.34	No	265.4	67.5	**197.9**	**75%**
BETWEEN MD 650 AND I 95	4048	**0.8**	9.75	8.79	Yes	283.0	314.0	**-31.0**	**-11%**
MERGE MD 650	2547	**0.5**	9.58	8.12	Yes	181.2	213.8	**-32.6**	**-18%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	11.10	12.57	Yes	387.9	342.6	**45.3**	**12%**
MERGE MD 193	1353	**0.3**	13.53	12.92	Yes	68.2	71.4	**-3.2**	**-5%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	14.32	15.31	Yes	129.6	121.2	**8.4**	**6%**
MERGE US 29	1127	**0.2**	15.30	15.48	Yes	50.3	49.7	**0.6**	**1%**
BETWEEN MD 97 AND US 29	5926	**1.1**	21.11	17.79	Yes	191.4	227.1	**-35.7**	**-19%**
MD 97 MERGE	1734	**0.3**	24.87	20.98	Yes	47.5	56.4	**-8.8**	**-19%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	41.02	43.26	Yes	145.4	137.8	**7.6**	**5%**
MD 185 MERGE	3315	**0.6**	45.39	52.49	Yes	49.8	43.1	**6.7**	**14%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	52.70	51.92	Yes	81.3	82.6	**-1.2**	**-2%**
MD 355 MERGE	1401	**0.3**	56.76	50.86	Yes	16.8	18.8	**-2.0**	**-12%**
MERGE AFTER I 270	61	**0.0**	56.45	52.89	Yes	0.7	0.8	**0.0**	**-7%**
MERGE BEFORE I 270	1298	**0.2**	55.11	53.02	Yes	16.1	16.7	**-0.6**	**-4%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	56.74	52.34	Yes	37.2	40.3	**-3.1**	**-8%**
MERGE MD 187	1936	**0.4**	59.21	52.78	Yes	22.3	25.0	**-2.7**	**-12%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	60.22	52.34	Yes	86.5	99.6	**-13.0**	**-15%**
MERGE I 270	1490	**0.3**	54.15	33.08	No	18.8	30.7	**-11.9**	**-64%**
BETWEEN MD 190 AND I 270	5753	**1.1**	54.34	50.22	Yes	72.2	78.1	**-5.9**	**-8%**
MERGE MD 190	1537	**0.3**	57.51	46.21	Yes	18.2	22.7	**-4.5**	**-24%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	57.17	46.21	Yes	2.6	3.2	**-0.6**	**-24%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	55.85	35.38	No	29.3	46.2	**-16.9**	**-58%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	56.22	50.17	Yes	76.8	86.1	**-9.3**	**-12%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	57.92	52.48	Yes	17.2	19.0	**-1.8**	**-10%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	57.84	52.35	Yes	8.8	9.7	**-0.9**	**-10%**
AMERICAN LEGION BRIDGE	790	**0.1**	57.18	52.64	Yes	9.4	10.2	**-0.8**	**-9%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	56.47	52.64	Yes	10.2	10.9	**-0.7**	**-7%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	58.62	52.64	Yes	49.9	55.5	**-5.7**	**-11%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	59.65	52.64	Yes	7.8	8.8	**-1.0**	**-13%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	59.37	52.64	Yes	19.2	21.6	**-2.4**	**-13%**

Figure A.15: I-495 Outer Loop Mainline 7-8 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	8-9 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**3969.6**	**3187.6**	**782.0**	**20%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	17.1	19.3	Yes	108.9	96.4	**12.5**	**11%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	18.3	10.7	Yes	91.5	156.0	**-64.5**	**-71%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	25.8	20.7	Yes	51.1	63.7	**-12.5**	**-25%**
AMERICAN LEGION BRIDGE	794	**0.2**	35.9	24.4	Yes	15.1	22.2	**-7.1**	**-47%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	35.5	44.0	Yes	9.7	7.9	**1.9**	**19%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	42.7	52.1	Yes	16.9	13.8	**3.0**	**18%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	52.6	55.7	Yes	94.5	89.2	**5.3**	**6%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	58.4	56.4	Yes	24.8	25.7	**-0.9**	**-4%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	59.9	56.4	Yes	2.9	3.1	**-0.2**	**-6%**
MERGE MD 190	1235	**0.2**	60.0	57.0	Yes	14.0	14.8	**-0.7**	**-5%**
BETWEEN MD 190 AND I 270	6468	**1.2**	59.8	55.6	Yes	73.8	79.3	**-5.5**	**-8%**
MERGE I 270	867	**0.2**	58.6	54.2	Yes	10.1	10.9	**-0.8**	**-8%**
BETWEEN I 270 AND MD 187	7828	**1.5**	59.0	55.1	Yes	90.4	96.9	**-6.5**	**-7%**
MERGE MD 187	2140	**0.4**	58.2	56.7	Yes	25.1	25.7	**-0.6**	**-3%**
BETWEEN MD 187 AND I 270	2278	**0.4**	49.4	56.6	Yes	31.5	27.4	**4.0**	**13%**
MERGE BEFORE I 270	1306	**0.2**	48.3	51.4	Yes	18.4	17.3	**1.1**	**6%**
MERGE AFTER I 270	564	**0.1**	47.0	51.6	Yes	8.2	7.5	**0.7**	**9%**
MD 355 MERGE	1371	**0.3**	45.4	57.7	Yes	20.6	16.2	**4.4**	**21%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	38.6	53.3	Yes	107.2	77.6	**29.6**	**28%**
MD 185 MERGE	2074	**0.4**	48.5	57.0	Yes	29.2	24.8	**4.4**	**15%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	47.5	56.9	Yes	142.1	118.8	**23.3**	**16%**
MD 97 MERGE	1461	**0.3**	56.1	56.9	Yes	17.8	17.5	**0.3**	**2%**
BETWEEN MD 97 AND US 29	5965	**1.1**	58.0	58.5	Yes	70.1	69.5	**0.6**	**1%**
MERGE US 29	1734	**0.3**	60.0	60.2	Yes	19.7	19.6	**0.1**	**0%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	59.3	57.7	Yes	18.9	19.4	**-0.5**	**-3%**
MERGE MD 193	2099	**0.4**	60.3	45.7	Yes	23.7	31.3	**-7.5**	**-32%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	60.2	56.6	Yes	68.5	72.8	**-4.3**	**-6%**
MERGE MD 650	3008	**0.6**	59.5	56.6	Yes	34.5	36.2	**-1.7**	**-5%**
BETWEEN MD 650 AND I 95	2869	**0.5**	59.9	60.6	Yes	32.6	32.3	**0.3**	**1%**
BEFORE I 95 MERGE	5612	**1.1**	58.1	57.6	Yes	65.8	66.5	**-0.6**	**-1%**
AFTER I 95 MERGE	2578	**0.5**	26.2	39.9	Yes	67.0	44.0	**23.0**	**34%**
MERGE US 1	2873	**0.5**	25.9	31.4	Yes	75.7	62.4	**13.3**	**18%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	34.4	41.2	Yes	70.2	58.6	**11.6**	**17%**
AFTER GREENBELT STATION MERGE	595	**0.1**	49.6	45.1	Yes	8.2	9.0	**-0.8**	**-10%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	54.4	51.1	Yes	55.3	59.0	**-3.7**	**-7%**
MERGE MD 201	3066	**0.6**	54.8	48.6	Yes	38.2	43.0	**-4.9**	**-13%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	54.2	52.3	Yes	23.9	24.8	**-0.9**	**-4%**
MERGE MD 295	2725	**0.5**	58.1	54.0	Yes	32.0	34.4	**-2.4**	**-8%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	59.3	49.4	Yes	122.8	147.5	**-24.7**	**-20%**
MERGE MD 450	1203	**0.2**	53.7	54.5	Yes	15.3	15.1	**0.2**	**1%**
BETWEEN MD 450 AND US 50	2809	**0.5**	52.9	55.1	Yes	36.2	34.8	**1.4**	**4%**
MERGE US 50	4270	**0.8**	53.5	54.6	Yes	54.4	53.3	**1.1**	**2%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	50.6	54.3	Yes	73.5	68.6	**5.0**	**7%**
END 495 EXPRESS LANE	515	**0.1**	61.8	54.6	Yes	5.7	6.4	**-0.7**	**-13%**
BEFORE MD 202 MERGE	1817	**0.3**	60.7	54.6	Yes	20.4	22.7	**-2.3**	**-11%**
MERGE MD 202	2462	**0.5**	60.7	54.5	Yes	27.6	30.8	**-3.2**	**-11%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	59.5	54.5	Yes	15.5	17.0	**-1.4**	**-9%**
MERGE ARENA DR	2059	**0.4**	56.2	56.5	Yes	25.0	24.8	**0.1**	**1%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	50.9	55.9	Yes	44.7	40.7	**4.0**	**9%**
MD 214 MERGE	2564	**0.5**	44.0	56.9	Yes	39.8	30.7	**9.1**	**23%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	42.6	51.4	Yes	155.3	128.5	**26.8**	**17%**
MERGE MD 4	2628	**0.5**	49.3	56.9	Yes	36.3	31.5	**4.9**	**13%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	53.1	58.5	Yes	42.9	38.9	**4.0**	**9%**
MERGE FORESTVILLE RD	930	**0.2**	59.7	62.4	Yes	10.6	10.2	**0.5**	**4%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	60.7	63.1	Yes	36.1	34.7	**1.4**	**4%**
MERGE MD 218	1660	**0.3**	61.9	62.9	Yes	18.3	18.0	**0.3**	**2%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	61.0	61.4	Yes	71.7	71.2	**0.4**	**1%**
MERGE MD 5	2751	**0.5**	37.2	62.4	No	50.5	30.1	**20.4**	**40%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	20.0	58.3	No	407.2	139.8	**267.3**	**66%**
MERGE MD 414	3478	**0.7**	15.6	51.3	No	151.7	46.3	**105.4**	**70%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	18.6	41.3	No	90.3	40.8	**49.5**	**55%**
MERGE MD 210	5648	**1.1**	11.3	21.9	Yes	339.8	175.7	**164.2**	**48%**
BETWEEN MD 210 AND I 295	2959	**0.6**	12.9	22.6	Yes	156.3	89.3	**67.0**	**43%**
MERGE I 295	3328	**0.6**	23.0	41.5	No	98.6	54.7	**44.0**	**45%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	41.4	57.6	No	20.0	14.4	**5.6**	**28%**
WOODROW WILSON BRIDGE	6059	**1.1**	43.5	54.5	Yes	95.0	75.8	**19.2**	**20%**

Figure A.16: I-495 Inner Loop Mainline 8-9 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	8-9 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**4792.2**	**4147.2**	**645.0**	**13%**
WOODROW WILSON BRIDGE	6160	**1.2**	56.71	26.77	No	74.1	156.9	**-82.9**	**-112%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	57.10	55.66	Yes	7.7	7.9	**-0.2**	**-3%**
MERGE I 295	1023	**0.2**	59.90	56.44	Yes	11.6	12.4	**-0.7**	**-6%**
BETWEEN MD 210 AND I 295	377	**0.1**	57.93	58.52	Yes	4.4	4.4	**0.0**	**1%**
MERGE MD 210	8656	**1.6**	59.49	58.61	Yes	99.2	100.7	**-1.5**	**-2%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	61.74	58.97	Yes	49.2	51.5	**-2.3**	**-5%**
MERGE MD 414	2984	**0.6**	63.78	59.05	Yes	31.9	34.5	**-2.6**	**-8%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	64.47	54.61	Yes	129.2	152.5	**-23.3**	**-18%**
MERGE MD 5	3740	**0.7**	60.23	53.25	Yes	42.3	47.9	**-5.6**	**-13%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	47.96	53.67	Yes	83.8	74.9	**8.9**	**11%**
MERGE MD 218	238	**0.0**	44.75	52.87	Yes	3.6	3.1	**0.6**	**15%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	41.26	54.75	Yes	81.1	61.1	**20.0**	**25%**
MERGE MD 337	912	**0.2**	38.91	54.43	No	16.0	11.4	**4.6**	**29%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	40.60	52.36	Yes	52.8	41.0	**11.9**	**22%**
MERGE MD 4	3108	**0.6**	39.55	53.99	No	53.6	39.2	**14.3**	**27%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	40.53	55.27	No	106.0	77.7	**28.3**	**27%**
MERGE MD 214	2618	**0.5**	39.51	50.90	Yes	45.2	35.1	**10.1**	**22%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	39.05	45.10	Yes	48.7	42.2	**6.5**	**13%**
MERGE ARENA DR	2437	**0.5**	35.04	44.83	Yes	47.4	37.1	**10.4**	**22%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	26.13	28.54	Yes	30.8	28.2	**2.6**	**8%**
MERGE MD 202	3055	**0.6**	22.15	20.72	Yes	94.0	100.5	**-6.5**	**-7%**
BEFORE MD 202 MERGE	908	**0.2**	23.84	13.57	Yes	26.0	45.6	**-19.7**	**-76%**
END 495 EXPRESS LANE	594	**0.1**	20.04	19.20	Yes	20.2	21.1	**-0.9**	**-4%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	30.38	47.11	No	136.9	88.3	**48.6**	**36%**
MERGE US 50	3680	**0.7**	34.76	57.61	No	72.2	43.6	**28.6**	**40%**
BETWEEN MD 450 AND US 50	2561	**0.5**	29.24	55.30	No	59.7	31.6	**28.1**	**47%**
MERGE MD 450	2100	**0.4**	33.37	52.32	No	42.9	27.4	**15.5**	**36%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	47.90	53.19	Yes	151.9	136.8	**15.1**	**10%**
MERGE MD 295	2479	**0.5**	54.76	52.38	Yes	30.9	32.3	**-1.4**	**-5%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	57.46	52.04	Yes	23.7	26.1	**-2.5**	**-10%**
MERGE MD 201	3054	**0.6**	61.66	51.95	Yes	33.8	40.1	**-6.3**	**-19%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	61.91	54.25	Yes	51.1	58.3	**-7.2**	**-14%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	57.21	56.91	Yes	48.9	49.1	**-0.3**	**-1%**
MERGE US 1	2739	**0.5**	52.19	57.87	Yes	35.8	32.3	**3.5**	**10%**
BETWEEN US 1 AND I 95	3225	**0.6**	45.83	57.69	Yes	48.0	38.1	**9.9**	**21%**
I 95 MERGE	4389	**0.8**	10.47	47.73	No	285.7	62.7	**223.1**	**78%**
BETWEEN MD 650 AND I 95	4048	**0.8**	8.26	9.64	Yes	334.3	286.4	**47.9**	**14%**
MERGE MD 650	2547	**0.5**	7.65	7.92	Yes	226.8	219.2	**7.6**	**3%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	8.49	12.15	Yes	507.0	354.4	**152.6**	**30%**
MERGE MD 193	1353	**0.3**	10.45	12.45	Yes	88.3	74.1	**14.2**	**16%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	11.46	14.61	Yes	161.9	127.1	**34.8**	**22%**
MERGE US 29	1127	**0.2**	12.68	14.65	Yes	60.6	52.5	**8.2**	**13%**
BETWEEN MD 97 AND US 29	5926	**1.1**	17.86	16.49	Yes	226.3	245.0	**-18.7**	**-8%**
MD 97 MERGE	1734	**0.3**	21.34	21.09	Yes	55.4	56.1	**-0.7**	**-1%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	40.21	43.44	Yes	148.3	137.3	**11.0**	**7%**
MD 185 MERGE	3315	**0.6**	46.19	49.38	Yes	48.9	45.8	**3.2**	**6%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	49.88	46.98	Yes	85.9	91.2	**-5.3**	**-6%**
MD 355 MERGE	1401	**0.3**	53.44	51.09	Yes	17.9	18.7	**-0.8**	**-5%**
MERGE AFTER I 270	61	**0.0**	53.12	53.15	Yes	0.8	0.8	**0.0**	**0%**
MERGE BEFORE I 270	1298	**0.2**	52.10	53.30	Yes	17.0	16.6	**0.4**	**2%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	52.80	53.06	Yes	39.9	39.7	**0.2**	**0%**
MERGE MD 187	1936	**0.4**	50.48	53.07	Yes	26.1	24.9	**1.3**	**5%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	48.06	52.57	Yes	108.4	99.1	**9.3**	**9%**
MERGE I 270	1490	**0.3**	39.20	43.09	Yes	25.9	23.6	**2.3**	**9%**
BETWEEN MD 190 AND I 270	5753	**1.1**	40.19	50.77	Yes	97.6	77.3	**20.3**	**21%**
MERGE MD 190	1537	**0.3**	39.64	49.33	Yes	26.4	21.2	**5.2**	**20%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	39.39	49.33	Yes	3.7	3.0	**0.7**	**20%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	36.82	38.50	Yes	44.4	42.5	**1.9**	**4%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	42.97	50.00	Yes	100.5	86.4	**14.1**	**14%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	48.06	52.35	Yes	20.7	19.0	**1.7**	**8%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	50.31	52.28	Yes	10.1	9.7	**0.4**	**4%**
AMERICAN LEGION BRIDGE	790	**0.1**	47.55	45.80	Yes	11.3	11.8	**-0.4**	**-4%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	47.10	45.80	Yes	12.2	12.6	**-0.3**	**-3%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	42.90	45.80	Yes	68.2	63.8	**4.3**	**6%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	40.25	47.05	Yes	11.5	9.8	**1.7**	**14%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	45.17	47.05	Yes	25.2	24.2	**1.0**	**4%**

Figure A.17: I-495 Outer Loop Mainline 8-9 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	9-10 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**3194.6**	**3017.2**	**177.4**	**6%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	18.9	13.8	Yes	98.5	134.4	**-35.9**	**-36%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	19.4	10.2	Yes	86.1	163.2	**-77.2**	**-90%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	26.7	20.5	Yes	49.4	64.5	**-15.0**	**-30%**
AMERICAN LEGION BRIDGE	794	**0.2**	37.0	24.6	Yes	14.6	22.0	**-7.4**	**-50%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	34.7	44.8	Yes	10.0	7.7	**2.2**	**22%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	42.2	52.3	Yes	17.1	13.8	**3.3**	**19%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	54.4	55.8	Yes	91.3	89.0	**2.2**	**2%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	60.3	56.4	Yes	24.0	25.7	**-1.7**	**-7%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	61.5	56.4	Yes	2.9	3.1	**-0.3**	**-9%**
MERGE MD 190	1235	**0.2**	61.7	57.0	Yes	13.7	14.8	**-1.1**	**-8%**
BETWEEN MD 190 AND I 270	6468	**1.2**	60.9	56.0	Yes	72.4	78.8	**-6.4**	**-9%**
MERGE I 270	867	**0.2**	58.7	54.2	Yes	10.1	10.9	**-0.8**	**-8%**
BETWEEN I 270 AND MD 187	7828	**1.5**	58.4	55.8	Yes	91.3	95.6	**-4.3**	**-5%**
MERGE MD 187	2140	**0.4**	51.1	57.0	Yes	28.5	25.6	**2.9**	**10%**
BETWEEN MD 187 AND I 270	2278	**0.4**	43.1	56.3	Yes	36.1	27.6	**8.5**	**23%**
MERGE BEFORE I 270	1306	**0.2**	48.6	51.1	Yes	18.3	17.4	**0.9**	**5%**
MERGE AFTER I 270	564	**0.1**	40.1	44.3	Yes	9.6	8.7	**0.9**	**10%**
MD 355 MERGE	1371	**0.3**	39.0	59.1	No	24.0	15.8	**8.2**	**34%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	36.6	58.8	No	113.0	70.3	**42.7**	**38%**
MD 185 MERGE	2074	**0.4**	45.9	57.0	Yes	30.8	24.8	**6.0**	**19%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	44.0	58.5	Yes	153.6	115.5	**38.1**	**25%**
MD 97 MERGE	1461	**0.3**	50.5	57.7	Yes	19.7	17.3	**2.5**	**12%**
BETWEEN MD 97 AND US 29	5965	**1.1**	50.8	58.7	Yes	80.0	69.3	**10.8**	**13%**
MERGE US 29	1734	**0.3**	49.5	60.4	Yes	23.9	19.6	**4.3**	**18%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	45.1	59.5	Yes	24.8	18.8	**6.0**	**24%**
MERGE MD 193	2099	**0.4**	42.4	55.2	Yes	33.8	25.9	**7.9**	**23%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	51.1	58.2	Yes	80.7	70.8	**10.0**	**12%**
MERGE MD 650	3008	**0.6**	57.7	58.3	Yes	35.6	35.2	**0.4**	**1%**
BETWEEN MD 650 AND I 95	2869	**0.5**	60.1	61.1	Yes	32.5	32.0	**0.5**	**2%**
BEFORE I 95 MERGE	5612	**1.1**	62.6	54.6	Yes	61.1	70.0	**-9.0**	**-15%**
AFTER I 95 MERGE	2578	**0.5**	35.2	29.6	Yes	50.0	59.4	**-9.4**	**-19%**
MERGE US 1	2873	**0.5**	31.8	30.1	Yes	61.7	65.1	**-3.5**	**-6%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	35.7	39.9	Yes	67.6	60.6	**7.1**	**10%**
AFTER GREENBELT STATION MERGE	595	**0.1**	46.3	44.9	Yes	8.8	9.0	**-0.3**	**-3%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	50.7	50.5	Yes	59.4	59.6	**-0.3**	**0%**
MERGE MD 201	3066	**0.6**	49.0	48.5	Yes	42.7	43.1	**-0.4**	**-1%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	50.8	52.9	Yes	25.5	24.5	**1.0**	**4%**
MERGE MD 295	2725	**0.5**	56.1	54.7	Yes	33.1	34.0	**-0.8**	**-3%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	55.2	51.0	Yes	131.8	142.8	**-11.1**	**-8%**
MERGE MD 450	1203	**0.2**	47.8	55.0	Yes	17.2	14.9	**2.2**	**13%**
BETWEEN MD 450 AND US 50	2809	**0.5**	49.7	55.2	Yes	38.5	34.7	**3.8**	**10%**
MERGE US 50	4270	**0.8**	51.3	55.2	Yes	56.7	52.7	**4.0**	**7%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	47.6	54.2	Yes	78.2	68.7	**9.5**	**12%**
END 495 EXPRESS LANE	515	**0.1**	56.0	54.2	Yes	6.3	6.5	**-0.2**	**-3%**
BEFORE MD 202 MERGE	1817	**0.3**	55.2	54.2	Yes	22.4	22.9	**-0.4**	**-2%**
MERGE MD 202	2462	**0.5**	54.6	53.9	Yes	30.7	31.1	**-0.4**	**-1%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	53.1	53.9	Yes	17.4	17.1	**0.3**	**1%**
MERGE ARENA DR	2059	**0.4**	51.9	56.0	Yes	27.1	25.1	**2.0**	**7%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	49.8	54.6	Yes	45.6	41.6	**4.0**	**9%**
MD 214 MERGE	2564	**0.5**	46.6	56.5	Yes	37.5	31.0	**6.5**	**17%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	49.6	54.9	Yes	133.2	120.5	**12.7**	**10%**
MERGE MD 4	2628	**0.5**	52.2	56.9	Yes	34.4	31.5	**2.8**	**8%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	53.1	58.3	Yes	42.9	39.1	**3.8**	**9%**
MERGE FORESTVILLE RD	930	**0.2**	53.9	62.4	Yes	11.8	10.2	**1.6**	**14%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	55.6	63.1	Yes	39.4	34.7	**4.7**	**12%**
MERGE MD 218	1660	**0.3**	61.3	62.9	Yes	18.5	18.0	**0.5**	**3%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	62.5	62.0	Yes	70.0	70.5	**-0.6**	**-1%**
MERGE MD 5	2751	**0.5**	57.1	62.5	Yes	32.8	30.0	**2.8**	**9%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	48.6	62.9	Yes	167.8	129.7	**38.2**	**23%**
MERGE MD 414	3478	**0.7**	41.6	61.4	No	57.0	38.6	**18.4**	**32%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	42.2	60.3	No	39.9	27.9	**12.0**	**30%**
MERGE MD 210	5648	**1.1**	38.0	54.8	No	101.3	70.3	**31.0**	**31%**
BETWEEN MD 210 AND I 295	2959	**0.6**	35.2	55.7	No	57.3	36.2	**21.1**	**37%**
MERGE I 295	3328	**0.6**	44.0	57.6	Yes	51.6	39.4	**12.2**	**24%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	54.5	58.2	Yes	15.2	14.3	**1.0**	**6%**
WOODROW WILSON BRIDGE	6059	**1.1**	54.2	55.9	Yes	76.3	73.9	**2.4**	**3%**

Figure A.18: I-495 Inner Loop Mainline 9-10 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	9-10 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**3880.1**	**3705.2**	**174.8**	**5%**
WOODROW WILSON BRIDGE	6160	**1.2**	57.14	40.04	No	73.5	104.9	**-31.4**	**-43%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	57.75	56.33	Yes	7.6	7.8	**-0.2**	**-3%**
MERGE I 295	1023	**0.2**	59.96	56.74	Yes	11.6	12.3	**-0.7**	**-6%**
BETWEEN MD 210 AND I 295	377	**0.1**	57.51	58.48	Yes	4.5	4.4	**0.1**	**2%**
MERGE MD 210	8656	**1.6**	59.45	58.54	Yes	99.3	100.8	**-1.5**	**-2%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	61.93	59.01	Yes	49.0	51.4	**-2.4**	**-5%**
MERGE MD 414	2984	**0.6**	62.30	59.18	Yes	32.7	34.4	**-1.7**	**-5%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	58.09	54.62	Yes	143.3	152.5	**-9.1**	**-6%**
MERGE MD 5	3740	**0.7**	55.48	53.26	Yes	46.0	47.9	**-1.9**	**-4%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	51.80	53.74	Yes	77.6	74.8	**2.8**	**4%**
MERGE MD 218	238	**0.0**	49.97	53.80	Yes	3.2	3.0	**0.2**	**7%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	46.61	54.68	Yes	71.8	61.2	**10.6**	**15%**
MERGE MD 337	912	**0.2**	45.21	54.35	Yes	13.8	11.4	**2.3**	**17%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	45.52	52.83	Yes	47.1	40.6	**6.5**	**14%**
MERGE MD 4	3108	**0.6**	45.31	53.91	Yes	46.8	39.3	**7.5**	**16%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	46.31	55.39	Yes	92.8	77.6	**15.2**	**16%**
MERGE MD 214	2618	**0.5**	44.76	56.00	Yes	39.9	31.9	**8.0**	**20%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	44.69	54.84	Yes	42.6	34.7	**7.9**	**19%**
MERGE ARENA DR	2437	**0.5**	40.90	55.06	No	40.6	30.2	**10.4**	**26%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	34.23	46.48	Yes	23.5	17.3	**6.2**	**26%**
MERGE MD 202	3055	**0.6**	29.43	34.58	Yes	70.8	60.2	**10.5**	**15%**
BEFORE MD 202 MERGE	908	**0.2**	31.87	21.45	Yes	19.4	28.9	**-9.4**	**-49%**
END 495 EXPRESS LANE	594	**0.1**	26.84	23.46	Yes	15.1	17.3	**-2.2**	**-14%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	34.01	47.66	Yes	122.3	87.3	**35.0**	**29%**
MERGE US 50	3680	**0.7**	40.75	57.72	No	61.6	43.5	**18.1**	**29%**
BETWEEN MD 450 AND US 50	2561	**0.5**	35.92	57.80	No	48.6	30.2	**18.4**	**38%**
MERGE MD 450	2100	**0.4**	40.80	58.59	No	35.1	24.4	**10.7**	**30%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	51.58	53.74	Yes	141.1	135.4	**5.7**	**4%**
MERGE MD 295	2479	**0.5**	57.55	52.45	Yes	29.4	32.2	**-2.9**	**-10%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	58.40	52.80	Yes	23.3	25.8	**-2.5**	**-11%**
MERGE MD 201	3054	**0.6**	60.13	52.48	Yes	34.6	39.7	**-5.0**	**-15%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	61.24	54.52	Yes	51.7	58.1	**-6.4**	**-12%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	61.31	57.53	Yes	45.6	48.6	**-3.0**	**-7%**
MERGE US 1	2739	**0.5**	61.26	57.98	Yes	30.5	32.2	**-1.7**	**-6%**
BETWEEN US 1 AND I 95	3225	**0.6**	61.41	57.85	Yes	35.8	38.0	**-2.2**	**-6%**
I 95 MERGE	4389	**0.8**	32.92	46.50	Yes	90.9	64.3	**26.5**	**29%**
BETWEEN MD 650 AND I 95	4048	**0.8**	14.91	16.81	Yes	185.1	164.2	**21.0**	**11%**
MERGE MD 650	2547	**0.5**	12.67	14.87	Yes	137.0	116.8	**20.2**	**15%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	14.24	12.73	Yes	302.4	338.3	**-36.0**	**-12%**
MERGE MD 193	1353	**0.3**	19.19	12.53	Yes	48.1	73.6	**-25.5**	**-53%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	19.01	14.72	Yes	97.6	126.1	**-28.4**	**-29%**
MERGE US 29	1127	**0.2**	19.36	15.03	Yes	39.7	51.1	**-11.4**	**-29%**
BETWEEN MD 97 AND US 29	5926	**1.1**	23.18	17.33	Yes	174.3	233.2	**-58.9**	**-34%**
MD 97 MERGE	1734	**0.3**	27.87	21.50	Yes	42.4	55.0	**-12.6**	**-30%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	43.92	43.34	Yes	135.8	137.6	**-1.8**	**-1%**
MD 185 MERGE	3315	**0.6**	50.04	52.13	Yes	45.2	43.4	**1.8**	**4%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	52.25	50.28	Yes	82.0	85.2	**-3.2**	**-4%**
MD 355 MERGE	1401	**0.3**	53.38	51.02	Yes	17.9	18.7	**-0.8**	**-5%**
MERGE AFTER I 270	61	**0.0**	52.69	53.07	Yes	0.8	0.8	**0.0**	**1%**
MERGE BEFORE I 270	1298	**0.2**	49.51	53.20	Yes	17.9	16.6	**1.2**	**7%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	51.51	53.18	Yes	40.9	39.6	**1.3**	**3%**
MERGE MD 187	1936	**0.4**	50.61	53.01	Yes	26.1	24.9	**1.2**	**5%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	46.65	52.59	Yes	111.7	99.1	**12.6**	**11%**
MERGE I 270	1490	**0.3**	37.84	50.53	Yes	26.8	20.1	**6.7**	**25%**
BETWEEN MD 190 AND I 270	5753	**1.1**	33.70	51.69	No	116.4	75.9	**40.5**	**35%**
MERGE MD 190	1537	**0.3**	28.75	52.75	No	36.4	19.9	**16.6**	**45%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	28.72	52.75	No	5.1	2.8	**2.3**	**46%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	26.35	50.00	No	62.0	32.7	**29.3**	**47%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	33.33	50.93	No	129.6	84.8	**44.8**	**35%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	38.13	52.45	No	26.2	19.0	**7.1**	**27%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	41.74	52.45	Yes	12.2	9.7	**2.5**	**20%**
AMERICAN LEGION BRIDGE	790	**0.1**	46.02	51.28	Yes	11.7	10.5	**1.2**	**10%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	42.98	51.28	Yes	13.4	11.2	**2.2**	**16%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	39.70	51.28	Yes	73.7	57.0	**16.6**	**23%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	37.99	48.78	Yes	12.2	9.5	**2.7**	**22%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	42.85	48.78	Yes	26.6	23.3	**3.2**	**12%**

Figure A.19: I-495 Outer Loop Mainline 9-10 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	3-4 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**4371.2**	**3838.0**	**533.2**	**12%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	12.0	56.2	No	154.9	33.1	**121.8**	**79%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	12.6	47.9	No	133.0	34.9	**98.1**	**74%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	17.1	42.7	No	77.1	30.9	**46.2**	**60%**
AMERICAN LEGION BRIDGE	794	**0.2**	20.6	40.4	No	26.3	13.4	**12.9**	**49%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	22.7	36.8	Yes	15.3	9.4	**5.9**	**38%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	27.2	35.1	Yes	26.4	20.5	**5.9**	**22%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	29.9	21.9	Yes	166.3	226.9	**-60.5**	**-36%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	25.1	15.2	Yes	57.9	95.1	**-37.2**	**-64%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	25.4	15.2	Yes	6.9	11.6	**-4.6**	**-67%**
MERGE MD 190	1235	**0.2**	25.4	16.6	Yes	33.2	50.6	**-17.4**	**-52%**
BETWEEN MD 190 AND I 270	6468	**1.2**	29.1	29.7	Yes	151.5	148.7	**2.8**	**2%**
MERGE I 270	867	**0.2**	53.8	52.4	Yes	11.0	11.3	**-0.3**	**-3%**
BETWEEN I 270 AND MD 187	7828	**1.5**	52.7	52.4	Yes	101.3	101.9	**-0.5**	**-1%**
MERGE MD 187	2140	**0.4**	31.0	53.8	No	47.0	27.1	**19.9**	**42%**
BETWEEN MD 187 AND I 270	2278	**0.4**	15.6	52.6	No	99.7	29.5	**70.2**	**70%**
MERGE BEFORE I 270	1306	**0.2**	15.7	47.7	No	56.9	18.7	**38.2**	**67%**
MERGE AFTER I 270	564	**0.1**	14.2	57.7	No	27.0	6.7	**20.4**	**75%**
MD 355 MERGE	1371	**0.3**	14.4	48.7	No	64.8	19.2	**45.6**	**70%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	16.8	33.5	No	245.9	123.6	**122.3**	**50%**
MD 185 MERGE	2074	**0.4**	19.7	17.9	Yes	72.0	79.2	**-7.2**	**-10%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	30.3	22.5	Yes	222.6	300.1	**-77.5**	**-35%**
MD 97 MERGE	1461	**0.3**	38.6	19.2	No	25.8	51.8	**-26.0**	**-101%**
BETWEEN MD 97 AND US 29	5965	**1.1**	42.9	42.4	Yes	94.8	96.0	**-1.2**	**-1%**
MERGE US 29	1734	**0.3**	44.4	48.4	Yes	26.7	24.4	**2.2**	**8%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	40.0	37.5	Yes	28.0	29.8	**-1.8**	**-6%**
MERGE MD 193	2099	**0.4**	37.1	28.9	Yes	38.5	49.5	**-11.0**	**-29%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	45.1	39.5	Yes	91.3	104.2	**-12.9**	**-14%**
MERGE MD 650	3008	**0.6**	47.9	42.1	Yes	42.8	48.7	**-5.8**	**-14%**
BETWEEN MD 650 AND I 95	2869	**0.5**	46.5	53.4	Yes	42.0	36.6	**5.4**	**13%**
BEFORE I 95 MERGE	5612	**1.1**	53.4	50.7	Yes	71.7	75.5	**-3.8**	**-5%**
AFTER I 95 MERGE	2578	**0.5**	25.8	26.7	Yes	68.2	65.8	**2.4**	**4%**
MERGE US 1	2873	**0.5**	23.1	22.5	Yes	84.6	87.0	**-2.4**	**-3%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	25.2	44.7	No	96.0	54.0	**41.9**	**44%**
AFTER GREENBELT STATION MERGE	595	**0.1**	29.8	46.9	No	13.6	8.7	**5.0**	**36%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	30.2	48.0	No	99.8	62.7	**37.1**	**37%**
MERGE MD 201	3066	**0.6**	28.3	45.4	No	73.8	46.1	**27.7**	**38%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	33.2	47.8	Yes	39.0	27.1	**11.9**	**30%**
MERGE MD 295	2725	**0.5**	34.7	48.1	Yes	53.5	38.6	**14.9**	**28%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	35.9	43.6	Yes	202.8	167.0	**35.8**	**18%**
MERGE MD 450	1203	**0.2**	34.4	50.1	Yes	23.8	16.4	**7.5**	**31%**
BETWEEN MD 450 AND US 50	2809	**0.5**	41.0	45.9	Yes	46.7	41.7	**5.0**	**11%**
MERGE US 50	4270	**0.8**	37.1	31.5	Yes	78.5	92.3	**-13.8**	**-18%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	36.7	36.3	Yes	101.6	102.5	**-1.0**	**-1%**
END 495 EXPRESS LANE	515	**0.1**	37.3	22.3	Yes	9.4	15.8	**-6.4**	**-68%**
BEFORE MD 202 MERGE	1817	**0.3**	39.7	22.3	No	31.2	55.7	**-24.4**	**-78%**
MERGE MD 202	2462	**0.5**	34.7	20.3	Yes	48.4	82.5	**-34.1**	**-71%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	29.6	20.3	Yes	31.3	45.4	**-14.2**	**-45%**
MERGE ARENA DR	2059	**0.4**	28.2	39.6	Yes	49.7	35.5	**14.2**	**29%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	29.5	48.8	No	77.0	46.6	**30.4**	**40%**
MD 214 MERGE	2564	**0.5**	29.7	49.9	No	58.9	35.0	**23.9**	**41%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	44.6	51.1	Yes	148.4	129.3	**19.1**	**13%**
MERGE MD 4	2628	**0.5**	52.5	51.6	Yes	34.1	34.8	**-0.6**	**-2%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	55.6	52.2	Yes	41.0	43.6	**-2.6**	**-6%**
MERGE FORESTVILLE RD	930	**0.2**	57.7	61.2	Yes	11.0	10.4	**0.6**	**6%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	57.2	63.3	Yes	38.3	34.6	**3.7**	**10%**
MERGE MD 218	1660	**0.3**	57.3	62.9	Yes	19.8	18.0	**1.8**	**9%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	60.5	61.6	Yes	72.3	71.0	**1.3**	**2%**
MERGE MD 5	2751	**0.5**	58.5	62.5	Yes	32.0	30.0	**2.0**	**6%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	60.3	63.1	Yes	135.2	129.2	**6.0**	**4%**
MERGE MD 414	3478	**0.7**	63.4	62.4	Yes	37.4	38.0	**-0.6**	**-1%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	62.7	62.5	Yes	26.8	26.9	**-0.1**	**0%**
MERGE MD 210	5648	**1.1**	62.1	58.5	Yes	62.0	65.8	**-3.8**	**-6%**
BETWEEN MD 210 AND I 295	2959	**0.6**	56.3	57.3	Yes	35.8	35.2	**0.6**	**2%**
MERGE I 295	3328	**0.6**	53.6	50.6	Yes	42.4	44.8	**-2.5**	**-6%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	53.5	53.0	Yes	15.5	15.6	**-0.1**	**-1%**
WOODROW WILSON BRIDGE	6059	**1.1**	56.8	54.7	Yes	72.7	75.6	**-2.9**	**-4%**

Figure A.20: I-495 Inner Loop Mainline 3-4 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	3-4 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**3821.9**	**3757.8**	**64.1**	**2%**
WOODROW WILSON BRIDGE	6160	**1.2**	47.95	46.03	Yes	87.6	91.2	**-3.7**	**-4%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	52.03	53.11	Yes	8.4	8.3	**0.2**	**2%**
MERGE I 295	1023	**0.2**	51.42	52.23	Yes	13.6	13.4	**0.2**	**2%**
BETWEEN MD 210 AND I 295	377	**0.1**	45.89	57.32	Yes	5.6	4.5	**1.1**	**20%**
MERGE MD 210	8656	**1.6**	46.27	57.66	Yes	127.5	102.4	**25.2**	**20%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	50.02	56.98	Yes	60.7	53.3	**7.4**	**12%**
MERGE MD 414	2984	**0.6**	49.45	57.86	Yes	41.2	35.2	**6.0**	**15%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	40.80	53.84	Yes	204.1	154.7	**49.4**	**24%**
MERGE MD 5	3740	**0.7**	31.76	52.86	No	80.3	48.2	**32.0**	**40%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	30.18	51.67	No	133.2	77.8	**55.4**	**42%**
MERGE MD 218	238	**0.0**	29.88	52.62	No	5.4	3.1	**2.3**	**43%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	27.25	46.26	No	122.8	72.4	**50.5**	**41%**
MERGE MD 337	912	**0.2**	26.27	24.61	Yes	23.7	25.3	**-1.6**	**-7%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	30.11	37.15	Yes	71.2	57.7	**13.5**	**19%**
MERGE MD 4	3108	**0.6**	32.61	51.90	No	65.0	40.8	**24.2**	**37%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	41.64	50.12	Yes	103.2	85.7	**17.5**	**17%**
MERGE MD 214	2618	**0.5**	42.38	40.34	Yes	42.1	44.3	**-2.1**	**-5%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	37.52	30.84	Yes	50.7	61.7	**-11.0**	**-22%**
MERGE ARENA DR	2437	**0.5**	32.88	26.49	Yes	50.5	62.7	**-12.2**	**-24%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	27.35	17.57	Yes	29.4	45.8	**-16.4**	**-56%**
MERGE MD 202	3055	**0.6**	24.04	14.93	Yes	86.6	139.5	**-52.8**	**-61%**
BEFORE MD 202 MERGE	908	**0.2**	24.65	9.96	Yes	25.1	62.2	**-37.1**	**-148%**
END 495 EXPRESS LANE	594	**0.1**	21.19	14.18	Yes	19.1	28.6	**-9.5**	**-49%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	32.27	35.64	Yes	128.9	116.7	**12.2**	**9%**
MERGE US 50	3680	**0.7**	60.08	57.93	Yes	41.8	43.3	**-1.6**	**-4%**
BETWEEN MD 450 AND US 50	2561	**0.5**	53.01	56.88	Yes	32.9	30.7	**2.2**	**7%**
MERGE MD 450	2100	**0.4**	53.03	56.42	Yes	27.0	25.4	**1.6**	**6%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	52.10	56.58	Yes	139.7	128.6	**11.1**	**8%**
MERGE MD 295	2479	**0.5**	42.89	42.42	Yes	39.4	39.8	**-0.4**	**-1%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	42.18	36.26	Yes	32.3	37.5	**-5.3**	**-16%**
MERGE MD 201	3054	**0.6**	43.84	26.43	Yes	47.5	78.8	**-31.3**	**-66%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	48.61	25.26	No	65.1	125.3	**-60.2**	**-92%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	57.22	46.55	Yes	48.9	60.1	**-11.2**	**-23%**
MERGE US 1	2739	**0.5**	58.20	56.89	Yes	32.1	32.8	**-0.7**	**-2%**
BETWEEN US 1 AND I 95	3225	**0.6**	58.93	57.51	Yes	37.3	38.2	**-0.9**	**-2%**
I 95 MERGE	4389	**0.8**	59.44	57.37	Yes	50.3	52.2	**-1.8**	**-4%**
BETWEEN MD 650 AND I 95	4048	**0.8**	39.14	53.17	Yes	70.5	51.9	**18.6**	**26%**
MERGE MD 650	2547	**0.5**	29.48	52.38	No	58.9	33.1	**25.8**	**44%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	26.23	52.42	No	164.1	82.1	**82.0**	**50%**
MERGE MD 193	1353	**0.3**	31.51	52.27	No	29.3	17.7	**11.6**	**40%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	28.97	52.53	No	64.1	35.3	**28.7**	**45%**
MERGE US 29	1127	**0.2**	27.14	48.97	No	28.3	15.7	**12.6**	**45%**
BETWEEN MD 97 AND US 29	5926	**1.1**	28.71	51.83	No	140.8	78.0	**62.8**	**45%**
MD 97 MERGE	1734	**0.3**	32.07	48.37	Yes	36.9	24.4	**12.4**	**34%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	43.37	49.04	Yes	137.5	121.6	**15.9**	**12%**
MD 185 MERGE	3315	**0.6**	50.79	24.99	No	44.5	90.5	**-46.0**	**-103%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	53.18	47.54	Yes	80.6	90.2	**-9.6**	**-12%**
MD 355 MERGE	1401	**0.3**	52.85	50.98	Yes	18.1	18.7	**-0.7**	**-4%**
MERGE AFTER I 270	61	**0.0**	51.78	52.87	Yes	0.8	0.8	**0.0**	**2%**
MERGE BEFORE I 270	1298	**0.2**	53.34	53.15	Yes	16.6	16.6	**-0.1**	**0%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	52.59	53.16	Yes	40.1	39.7	**0.4**	**1%**
MERGE MD 187	1936	**0.4**	48.79	52.90	Yes	27.1	25.0	**2.1**	**8%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	43.83	51.55	Yes	118.9	101.1	**17.8**	**15%**
MERGE I 270	1490	**0.3**	32.54	48.78	Yes	31.2	20.8	**10.4**	**33%**
BETWEEN MD 190 AND I 270	5753	**1.1**	31.41	40.56	Yes	124.9	96.7	**28.2**	**23%**
MERGE MD 190	1537	**0.3**	30.47	25.45	Yes	34.4	41.2	**-6.8**	**-20%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	30.45	25.45	Yes	4.8	5.7	**-0.9**	**-20%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	29.43	21.34	Yes	55.5	76.6	**-21.1**	**-38%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	36.90	36.03	Yes	117.1	119.9	**-2.8**	**-2%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	39.96	51.42	Yes	25.0	19.4	**5.6**	**22%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	45.26	48.44	Yes	11.2	10.5	**0.7**	**7%**
AMERICAN LEGION BRIDGE	790	**0.1**	41.53	12.97	No	13.0	41.5	**-28.6**	**-220%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	41.86	12.97	No	13.7	44.4	**-30.6**	**-223%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	34.31	12.97	No	85.2	225.5	**-140.3**	**-165%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	30.37	18.81	Yes	15.3	24.6	**-9.4**	**-61%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	34.19	18.81	Yes	33.3	60.5	**-27.2**	**-82%**

Figure A.21: I-495 Outer Loop Mainline 3-4 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	4-5 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**5846.4**	**5086.5**	**759.9**	**13%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	8.2	23.4	Yes	227.9	79.5	**148.4**	**65%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	8.9	9.5	Yes	187.8	176.2	**11.6**	**6%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	12.2	18.1	Yes	108.4	72.9	**35.5**	**33%**
AMERICAN LEGION BRIDGE	794	**0.2**	14.4	17.4	Yes	37.6	31.1	**6.5**	**17%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	14.5	16.2	Yes	23.8	21.3	**2.5**	**11%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	14.7	16.1	Yes	49.1	44.7	**4.4**	**9%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	13.8	14.8	Yes	360.9	334.7	**26.2**	**7%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	11.9	13.5	Yes	122.1	107.7	**14.5**	**12%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	13.4	13.5	Yes	13.1	13.1	**0.0**	**0%**
MERGE MD 190	1235	**0.2**	13.5	14.9	Yes	62.4	56.3	**6.1**	**10%**
BETWEEN MD 190 AND I 270	6468	**1.2**	18.6	27.1	Yes	236.6	162.9	**73.7**	**31%**
MERGE I 270	867	**0.2**	51.3	52.4	Yes	11.5	11.3	**0.2**	**2%**
BETWEEN I 270 AND MD 187	7828	**1.5**	60.9	45.2	Yes	87.7	118.0	**-30.3**	**-35%**
MERGE MD 187	2140	**0.4**	47.4	27.4	No	30.8	53.2	**-22.5**	**-73%**
BETWEEN MD 187 AND I 270	2278	**0.4**	20.7	21.7	Yes	74.9	71.4	**3.5**	**5%**
MERGE BEFORE I 270	1306	**0.2**	10.9	19.4	Yes	81.7	46.0	**35.7**	**44%**
MERGE AFTER I 270	564	**0.1**	14.0	42.7	No	27.5	9.0	**18.5**	**67%**
MD 355 MERGE	1371	**0.3**	13.8	16.0	Yes	68.0	58.5	**9.4**	**14%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	14.0	14.9	Yes	294.6	277.7	**16.9**	**6%**
MD 185 MERGE	2074	**0.4**	14.1	12.6	Yes	100.1	112.7	**-12.6**	**-13%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	21.6	22.0	Yes	312.4	307.4	**5.0**	**2%**
MD 97 MERGE	1461	**0.3**	23.9	18.5	Yes	41.6	53.8	**-12.1**	**-29%**
BETWEEN MD 97 AND US 29	5965	**1.1**	29.2	33.5	Yes	139.3	121.4	**17.8**	**13%**
MERGE US 29	1734	**0.3**	30.1	25.0	Yes	39.3	47.4	**-8.1**	**-21%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	26.2	16.7	Yes	42.7	67.0	**-24.3**	**-57%**
MERGE MD 193	2099	**0.4**	26.3	20.4	Yes	54.4	70.2	**-15.8**	**-29%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	37.1	38.1	Yes	111.1	108.1	**3.0**	**3%**
MERGE MD 650	3008	**0.6**	42.4	41.8	Yes	48.3	49.1	**-0.8**	**-2%**
BETWEEN MD 650 AND I 95	2869	**0.5**	41.1	53.1	Yes	47.5	36.8	**10.7**	**23%**
BEFORE I 95 MERGE	5612	**1.1**	36.3	44.7	Yes	105.6	85.6	**19.9**	**19%**
AFTER I 95 MERGE	2578	**0.5**	14.9	16.8	Yes	117.8	104.8	**13.0**	**11%**
MERGE US 1	2873	**0.5**	15.3	21.5	Yes	128.2	91.2	**37.0**	**29%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	18.5	45.3	No	130.8	53.3	**77.5**	**59%**
AFTER GREENBELT STATION MERGE	595	**0.1**	22.4	47.8	No	18.1	8.5	**9.6**	**53%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	22.8	43.2	No	131.9	69.7	**62.2**	**47%**
MERGE MD 201	3066	**0.6**	21.2	42.4	No	98.6	49.3	**49.2**	**50%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	25.5	44.5	No	50.8	29.1	**21.7**	**43%**
MERGE MD 295	2725	**0.5**	26.4	41.5	Yes	70.4	44.7	**25.7**	**36%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	27.9	33.4	Yes	260.6	217.9	**42.6**	**16%**
MERGE MD 450	1203	**0.2**	27.1	30.9	Yes	30.3	26.5	**3.8**	**13%**
BETWEEN MD 450 AND US 50	2809	**0.5**	32.9	17.8	Yes	58.2	107.3	**-49.1**	**-84%**
MERGE US 50	4270	**0.8**	24.7	16.8	Yes	117.7	173.5	**-55.8**	**-47%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	27.3	29.0	Yes	136.3	128.3	**8.0**	**6%**
END 495 EXPRESS LANE	515	**0.1**	24.2	20.4	Yes	14.5	17.2	**-2.7**	**-19%**
BEFORE MD 202 MERGE	1817	**0.3**	25.0	20.4	Yes	49.6	60.8	**-11.2**	**-23%**
MERGE MD 202	2462	**0.5**	21.3	20.5	Yes	78.9	82.0	**-3.1**	**-4%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	18.5	20.5	Yes	49.9	45.1	**4.8**	**10%**
MERGE ARENA DR	2059	**0.4**	19.1	38.5	No	73.6	36.5	**37.1**	**50%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	21.8	45.6	No	104.3	49.8	**54.5**	**52%**
MD 214 MERGE	2564	**0.5**	22.9	42.9	No	76.3	40.8	**35.5**	**47%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	42.9	51.1	Yes	154.0	129.4	**24.6**	**16%**
MERGE MD 4	2628	**0.5**	53.7	51.2	Yes	33.3	35.0	**-1.7**	**-5%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	53.4	52.1	Yes	42.6	43.7	**-1.1**	**-3%**
MERGE FORESTVILLE RD	930	**0.2**	54.2	61.1	Yes	11.7	10.4	**1.3**	**11%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	54.8	63.1	Yes	40.0	34.7	**5.2**	**13%**
MERGE MD 218	1660	**0.3**	55.0	62.4	Yes	20.6	18.1	**2.4**	**12%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	59.8	60.2	Yes	73.1	72.7	**0.5**	**1%**
MERGE MD 5	2751	**0.5**	63.0	62.3	Yes	29.8	30.1	**-0.3**	**-1%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	64.4	62.9	Yes	126.6	129.7	**-3.1**	**-2%**
MERGE MD 414	3478	**0.7**	63.6	62.2	Yes	37.3	38.1	**-0.8**	**-2%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	61.4	61.9	Yes	27.4	27.2	**0.2**	**1%**
MERGE MD 210	5648	**1.1**	48.9	53.7	Yes	78.7	71.7	**7.0**	**9%**
BETWEEN MD 210 AND I 295	2959	**0.6**	34.5	38.3	Yes	58.4	52.7	**5.7**	**10%**
MERGE I 295	3328	**0.6**	34.5	37.8	Yes	65.7	60.1	**5.6**	**9%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	44.7	52.7	Yes	18.6	15.8	**2.8**	**15%**
WOODROW WILSON BRIDGE	6059	**1.1**	49.7	54.6	Yes	83.2	75.6	**7.6**	**9%**

Figure A.22: I-495 Inner Loop Mainline 4-5 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	4-5 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**4639.4**	**4283.9**	**355.5**	**8%**
WOODROW WILSON BRIDGE	6160	**1.2**	48.38	41.56	Yes	86.8	101.0	**-14.2**	**-16%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	52.64	54.11	Yes	8.3	8.1	**0.2**	**3%**
MERGE I 295	1023	**0.2**	57.74	54.57	Yes	12.1	12.8	**-0.7**	**-6%**
BETWEEN MD 210 AND I 295	377	**0.1**	54.57	57.73	Yes	4.7	4.5	**0.3**	**5%**
MERGE MD 210	8656	**1.6**	53.46	57.50	Yes	110.4	102.6	**7.8**	**7%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	53.40	56.43	Yes	56.8	53.8	**3.0**	**5%**
MERGE MD 414	2984	**0.6**	45.29	57.78	Yes	44.9	35.2	**9.7**	**22%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	30.89	53.86	No	269.6	154.6	**115.0**	**43%**
MERGE MD 5	3740	**0.7**	20.96	52.86	No	121.7	48.2	**73.5**	**60%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	21.54	50.70	No	186.6	79.3	**107.3**	**58%**
MERGE MD 218	238	**0.0**	21.19	43.40	No	7.7	3.7	**3.9**	**51%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	19.50	32.81	Yes	171.7	102.0	**69.7**	**41%**
MERGE MD 337	912	**0.2**	19.57	19.68	Yes	31.8	31.6	**0.2**	**1%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	24.86	36.71	Yes	86.3	58.4	**27.8**	**32%**
MERGE MD 4	3108	**0.6**	26.92	51.78	No	78.7	40.9	**37.8**	**48%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	39.62	25.39	Yes	108.5	169.3	**-60.8**	**-56%**
MERGE MD 214	2618	**0.5**	40.98	11.76	No	43.6	151.8	**-108.2**	**-249%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	36.62	14.44	No	51.9	131.7	**-79.8**	**-154%**
MERGE ARENA DR	2437	**0.5**	31.13	17.11	Yes	53.4	97.1	**-43.7**	**-82%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	24.06	13.05	Yes	33.4	61.6	**-28.2**	**-84%**
MERGE MD 202	3055	**0.6**	21.17	13.15	Yes	98.4	158.4	**-60.0**	**-61%**
BEFORE MD 202 MERGE	908	**0.2**	21.85	9.90	Yes	28.3	62.6	**-34.2**	**-121%**
END 495 EXPRESS LANE	594	**0.1**	19.41	14.85	Yes	20.9	27.3	**-6.4**	**-31%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	31.16	36.34	Yes	133.5	114.5	**19.0**	**14%**
MERGE US 50	3680	**0.7**	50.68	57.89	Yes	49.5	43.3	**6.2**	**12%**
BETWEEN MD 450 AND US 50	2561	**0.5**	41.31	56.49	Yes	42.3	30.9	**11.4**	**27%**
MERGE MD 450	2100	**0.4**	40.03	55.42	Yes	35.8	25.8	**9.9**	**28%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	40.20	37.53	Yes	181.1	193.9	**-12.9**	**-7%**
MERGE MD 295	2479	**0.5**	31.99	14.95	Yes	52.8	113.1	**-60.3**	**-114%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	31.26	16.18	Yes	43.5	84.1	**-40.6**	**-93%**
MERGE MD 201	3054	**0.6**	33.61	16.52	Yes	62.0	126.0	**-64.1**	**-103%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	42.55	21.96	No	74.4	144.1	**-69.7**	**-94%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	56.13	47.22	Yes	49.8	59.2	**-9.4**	**-19%**
MERGE US 1	2739	**0.5**	57.38	56.81	Yes	32.5	32.9	**-0.3**	**-1%**
BETWEEN US 1 AND I 95	3225	**0.6**	57.99	57.35	Yes	37.9	38.3	**-0.4**	**-1%**
I 95 MERGE	4389	**0.8**	63.10	57.30	Yes	47.4	52.2	**-4.8**	**-10%**
BETWEEN MD 650 AND I 95	4048	**0.8**	51.10	53.09	Yes	54.0	52.0	**2.0**	**4%**
MERGE MD 650	2547	**0.5**	41.67	52.30	Yes	41.7	33.2	**8.5**	**20%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	31.56	52.18	No	136.4	82.5	**53.9**	**40%**
MERGE MD 193	1353	**0.3**	34.58	52.14	Yes	26.7	17.7	**9.0**	**34%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	31.33	52.45	No	59.2	35.4	**23.9**	**40%**
MERGE US 29	1127	**0.2**	28.91	47.30	Yes	26.6	16.3	**10.3**	**39%**
BETWEEN MD 97 AND US 29	5926	**1.1**	29.81	52.37	No	135.5	77.2	**58.4**	**43%**
MD 97 MERGE	1734	**0.3**	32.98	51.45	Yes	35.9	23.0	**12.9**	**36%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	39.58	51.84	Yes	150.6	115.0	**35.6**	**24%**
MD 185 MERGE	3315	**0.6**	47.77	47.36	Yes	47.3	47.7	**-0.4**	**-1%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	48.09	50.26	Yes	89.1	85.3	**3.9**	**4%**
MD 355 MERGE	1401	**0.3**	45.86	51.03	Yes	20.8	18.7	**2.1**	**10%**
MERGE AFTER I 270	61	**0.0**	45.22	53.02	Yes	0.9	0.8	**0.1**	**15%**
MERGE BEFORE I 270	1298	**0.2**	44.23	53.18	Yes	20.0	16.6	**3.4**	**17%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	40.82	52.68	Yes	51.6	40.0	**11.6**	**23%**
MERGE MD 187	1936	**0.4**	30.37	53.02	No	43.5	24.9	**18.6**	**43%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	21.14	40.05	Yes	246.5	130.1	**116.4**	**47%**
MERGE I 270	1490	**0.3**	16.47	26.74	Yes	61.7	38.0	**23.7**	**38%**
BETWEEN MD 190 AND I 270	5753	**1.1**	17.31	19.03	Yes	226.5	206.1	**20.4**	**9%**
MERGE MD 190	1537	**0.3**	17.79	14.61	Yes	58.9	71.7	**-12.8**	**-22%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	17.80	14.61	Yes	8.2	10.0	**-1.8**	**-22%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	17.65	15.50	Yes	92.6	105.5	**-12.9**	**-14%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	23.80	32.81	Yes	181.6	131.7	**49.9**	**27%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	27.26	38.47	Yes	36.6	25.9	**10.7**	**29%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	33.14	31.08	Yes	15.3	16.4	**-1.0**	**-7%**
AMERICAN LEGION BRIDGE	790	**0.1**	28.52	52.64	No	18.9	10.2	**8.7**	**46%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	32.31	52.64	No	17.8	10.9	**6.9**	**39%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	25.32	52.64	No	115.5	55.5	**59.9**	**52%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	22.88	52.64	No	20.2	8.8	**11.4**	**57%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	28.36	52.64	No	40.1	21.6	**18.5**	**46%**

Figure A.23: I-495 Outer Loop Mainline 4-5 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	5-6 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**6551.1**	**6278.3**	**272.9**	**4%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	7.8	7.4	Yes	237.6	252.5	**-14.8**	**-6%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	8.8	8.7	Yes	190.7	192.8	**-2.2**	**-1%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	12.0	18.3	Yes	110.1	72.2	**37.9**	**34%**
AMERICAN LEGION BRIDGE	794	**0.2**	13.7	16.9	Yes	39.6	32.0	**7.7**	**19%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	13.8	14.5	Yes	25.0	23.8	**1.2**	**5%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	13.5	14.4	Yes	53.1	49.8	**3.3**	**6%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	12.5	13.3	Yes	397.3	372.4	**24.9**	**6%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	10.5	12.1	Yes	137.8	120.3	**17.5**	**13%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	11.5	12.1	Yes	15.4	14.6	**0.7**	**5%**
MERGE MD 190	1235	**0.2**	11.6	13.2	Yes	72.8	64.0	**8.8**	**12%**
BETWEEN MD 190 AND I 270	6468	**1.2**	16.4	21.1	Yes	268.2	209.4	**58.9**	**22%**
MERGE I 270	867	**0.2**	49.5	38.2	Yes	11.9	15.5	**-3.5**	**-29%**
BETWEEN I 270 AND MD 187	7828	**1.5**	58.8	28.8	No	90.8	185.1	**-94.3**	**-104%**
MERGE MD 187	2140	**0.4**	28.7	12.0	No	50.9	121.9	**-71.1**	**-140%**
BETWEEN MD 187 AND I 270	2278	**0.4**	10.9	10.0	Yes	142.5	154.7	**-12.2**	**-9%**
MERGE BEFORE I 270	1306	**0.2**	9.5	12.9	Yes	93.9	68.8	**25.0**	**27%**
MERGE AFTER I 270	564	**0.1**	10.4	12.4	Yes	37.2	31.2	**6.0**	**16%**
MD 355 MERGE	1371	**0.3**	10.4	12.4	Yes	89.9	75.2	**14.7**	**16%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	12.6	14.2	Yes	327.8	291.2	**36.5**	**11%**
MD 185 MERGE	2074	**0.4**	13.3	11.2	Yes	106.5	126.8	**-20.3**	**-19%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	21.4	19.1	Yes	316.0	353.8	**-37.8**	**-12%**
MD 97 MERGE	1461	**0.3**	24.1	15.7	Yes	41.3	63.5	**-22.2**	**-54%**
BETWEEN MD 97 AND US 29	5965	**1.1**	28.5	23.9	Yes	142.6	170.5	**-27.9**	**-20%**
MERGE US 29	1734	**0.3**	28.5	14.5	Yes	41.5	81.7	**-40.2**	**-97%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	23.4	14.8	Yes	47.8	75.4	**-27.6**	**-58%**
MERGE MD 193	2099	**0.4**	23.5	18.9	Yes	60.8	75.5	**-14.7**	**-24%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	32.1	39.6	Yes	128.3	104.2	**24.1**	**19%**
MERGE MD 650	3008	**0.6**	33.8	41.5	Yes	60.7	49.5	**11.3**	**19%**
BETWEEN MD 650 AND I 95	2869	**0.5**	32.2	53.4	No	60.8	36.6	**24.2**	**40%**
BEFORE I 95 MERGE	5612	**1.1**	25.7	46.4	No	149.1	82.5	**66.5**	**45%**
AFTER I 95 MERGE	2578	**0.5**	12.6	15.3	Yes	139.9	115.2	**24.7**	**18%**
MERGE US 1	2873	**0.5**	13.7	20.1	Yes	142.7	97.2	**45.5**	**32%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	17.1	39.2	No	140.9	61.6	**79.4**	**56%**
AFTER GREENBELT STATION MERGE	595	**0.1**	21.0	38.8	No	19.3	10.5	**8.9**	**46%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	21.5	27.5	Yes	140.0	109.5	**30.4**	**22%**
MERGE MD 201	3066	**0.6**	20.2	29.3	Yes	103.3	71.4	**31.8**	**31%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	25.6	27.3	Yes	50.6	47.4	**3.1**	**6%**
MERGE MD 295	2725	**0.5**	26.2	26.8	Yes	70.8	69.3	**1.5**	**2%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	28.3	26.9	Yes	257.1	270.5	**-13.4**	**-5%**
MERGE MD 450	1203	**0.2**	27.2	22.5	Yes	30.2	36.4	**-6.2**	**-21%**
BETWEEN MD 450 AND US 50	2809	**0.5**	31.2	13.2	No	61.4	145.5	**-84.1**	**-137%**
MERGE US 50	4270	**0.8**	21.8	17.0	Yes	133.8	171.5	**-37.7**	**-28%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	26.4	30.8	Yes	141.1	120.8	**20.3**	**14%**
END 495 EXPRESS LANE	515	**0.1**	24.7	20.4	Yes	14.2	17.2	**-3.0**	**-21%**
BEFORE MD 202 MERGE	1817	**0.3**	24.0	20.4	Yes	51.7	60.8	**-9.1**	**-18%**
MERGE MD 202	2462	**0.5**	21.0	20.5	Yes	80.0	82.0	**-2.0**	**-2%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	18.9	20.5	Yes	49.0	45.1	**3.9**	**8%**
MERGE ARENA DR	2059	**0.4**	19.6	38.5	No	71.7	36.5	**35.3**	**49%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	22.9	45.6	No	99.1	49.8	**49.2**	**50%**
MD 214 MERGE	2564	**0.5**	25.1	42.9	No	69.5	40.8	**28.7**	**41%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	42.2	51.1	Yes	156.6	129.4	**27.2**	**17%**
MERGE MD 4	2628	**0.5**	49.0	51.2	Yes	36.6	35.0	**1.6**	**4%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	47.9	52.0	Yes	47.5	43.8	**3.7**	**8%**
MERGE FORESTVILLE RD	930	**0.2**	50.4	61.0	Yes	12.6	10.4	**2.2**	**17%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	52.0	63.1	Yes	42.1	34.7	**7.4**	**18%**
MERGE MD 218	1660	**0.3**	52.6	62.3	Yes	21.5	18.2	**3.4**	**16%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	56.3	60.3	Yes	77.7	72.5	**5.2**	**7%**
MERGE MD 5	2751	**0.5**	61.4	62.4	Yes	30.6	30.1	**0.5**	**2%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	63.6	62.7	Yes	128.2	130.0	**-1.8**	**-1%**
MERGE MD 414	3478	**0.7**	62.6	62.1	Yes	37.9	38.2	**-0.3**	**-1%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	55.7	59.4	Yes	30.2	28.4	**1.9**	**6%**
MERGE MD 210	5648	**1.1**	21.9	20.9	Yes	175.5	184.3	**-8.8**	**-5%**
BETWEEN MD 210 AND I 295	2959	**0.6**	16.7	14.1	Yes	120.9	143.2	**-22.4**	**-19%**
MERGE I 295	3328	**0.6**	22.8	36.1	Yes	99.4	62.8	**36.6**	**37%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	38.4	52.9	Yes	21.6	15.7	**5.9**	**27%**
WOODROW WILSON BRIDGE	6059	**1.1**	42.1	54.7	Yes	98.2	75.5	**22.7**	**23%**

Figure A.24: I-495 Inner Loop Mainline 5-6 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	5-6 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**4888.5**	**5018.6**	**-130.2**	**-3%**
WOODROW WILSON BRIDGE	6160	**1.2**	47.84	34.47	Yes	87.8	121.8	**-34.0**	**-39%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	52.41	54.39	Yes	8.4	8.1	**0.3**	**4%**
MERGE I 295	1023	**0.2**	56.75	54.56	Yes	12.3	12.8	**-0.5**	**-4%**
BETWEEN MD 210 AND I 295	377	**0.1**	51.52	57.86	Yes	5.0	4.4	**0.5**	**11%**
MERGE MD 210	8656	**1.6**	48.61	57.56	Yes	121.4	102.5	**18.9**	**16%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	50.90	56.55	Yes	59.6	53.7	**6.0**	**10%**
MERGE MD 414	2984	**0.6**	48.04	57.81	Yes	42.4	35.2	**7.2**	**17%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	35.58	53.88	No	234.0	154.5	**79.5**	**34%**
MERGE MD 5	3740	**0.7**	24.62	52.84	No	103.6	48.3	**55.3**	**53%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	24.41	48.82	No	164.7	82.4	**82.4**	**50%**
MERGE MD 218	238	**0.0**	24.34	39.09	Yes	6.7	4.1	**2.5**	**38%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	22.17	29.99	Yes	151.0	111.6	**39.3**	**26%**
MERGE MD 337	912	**0.2**	22.31	22.04	Yes	27.9	28.2	**-0.3**	**-1%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	28.16	37.07	Yes	76.1	57.9	**18.3**	**24%**
MERGE MD 4	3108	**0.6**	31.86	50.19	No	66.5	42.2	**24.3**	**37%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	42.77	33.53	Yes	100.5	128.2	**-27.7**	**-28%**
MERGE MD 214	2618	**0.5**	41.22	16.60	No	43.3	107.5	**-64.2**	**-148%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	34.90	15.29	No	54.5	124.4	**-69.9**	**-128%**
MERGE ARENA DR	2437	**0.5**	27.70	17.53	Yes	60.0	94.8	**-34.8**	**-58%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	19.88	12.10	Yes	40.4	66.5	**-26.0**	**-64%**
MERGE MD 202	3055	**0.6**	16.75	12.13	Yes	124.4	171.6	**-47.3**	**-38%**
BEFORE MD 202 MERGE	908	**0.2**	17.99	9.36	Yes	34.4	66.2	**-31.7**	**-92%**
END 495 EXPRESS LANE	594	**0.1**	15.67	14.09	Yes	25.8	28.7	**-2.9**	**-11%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	24.54	35.36	Yes	169.5	117.6	**51.8**	**31%**
MERGE US 50	3680	**0.7**	26.05	56.71	No	96.3	44.2	**52.1**	**54%**
BETWEEN MD 450 AND US 50	2561	**0.5**	21.52	45.04	No	81.1	38.8	**42.4**	**52%**
MERGE MD 450	2100	**0.4**	22.98	34.22	Yes	62.3	41.9	**20.5**	**33%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	28.54	19.89	Yes	255.0	365.9	**-110.9**	**-43%**
MERGE MD 295	2479	**0.5**	23.35	10.87	Yes	72.4	155.5	**-83.1**	**-115%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	23.61	13.81	Yes	57.6	98.5	**-40.9**	**-71%**
MERGE MD 201	3054	**0.6**	26.48	14.81	Yes	78.6	140.7	**-62.0**	**-79%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	37.26	19.85	No	85.0	159.5	**-74.5**	**-88%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	54.26	46.90	Yes	51.5	59.6	**-8.1**	**-16%**
MERGE US 1	2739	**0.5**	56.15	56.65	Yes	33.3	33.0	**0.3**	**1%**
BETWEEN US 1 AND I 95	3225	**0.6**	54.66	57.07	Yes	40.2	38.5	**1.7**	**4%**
I 95 MERGE	4389	**0.8**	62.24	57.18	Yes	48.1	52.3	**-4.3**	**-9%**
BETWEEN MD 650 AND I 95	4048	**0.8**	48.91	52.83	Yes	56.4	52.2	**4.2**	**7%**
MERGE MD 650	2547	**0.5**	42.68	51.92	Yes	40.7	33.4	**7.2**	**18%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	42.36	50.04	Yes	101.6	86.0	**15.6**	**15%**
MERGE MD 193	1353	**0.3**	42.20	52.20	Yes	21.9	17.7	**4.2**	**19%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	39.98	51.72	Yes	46.4	35.9	**10.5**	**23%**
MERGE US 29	1127	**0.2**	38.31	42.28	Yes	20.1	18.2	**1.9**	**9%**
BETWEEN MD 97 AND US 29	5926	**1.1**	37.64	52.14	Yes	107.3	77.5	**29.8**	**28%**
MD 97 MERGE	1734	**0.3**	35.19	51.35	No	33.6	23.0	**10.6**	**31%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	39.83	51.75	Yes	149.7	115.2	**34.5**	**23%**
MD 185 MERGE	3315	**0.6**	43.53	50.88	Yes	51.9	44.4	**7.5**	**14%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	38.03	50.17	Yes	112.7	85.4	**27.3**	**24%**
MD 355 MERGE	1401	**0.3**	36.53	50.99	Yes	26.1	18.7	**7.4**	**28%**
MERGE AFTER I 270	61	**0.0**	39.05	53.09	Yes	1.1	0.8	**0.3**	**26%**
MERGE BEFORE I 270	1298	**0.2**	36.23	53.16	No	24.4	16.6	**7.8**	**32%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	35.64	51.27	Yes	59.1	41.1	**18.0**	**30%**
MERGE MD 187	1936	**0.4**	24.45	50.13	No	54.0	26.3	**27.7**	**51%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	19.97	21.38	Yes	260.9	243.7	**17.2**	**7%**
MERGE I 270	1490	**0.3**	14.55	13.01	Yes	69.8	78.0	**-8.3**	**-12%**
BETWEEN MD 190 AND I 270	5753	**1.1**	16.17	14.26	Yes	242.5	275.0	**-32.5**	**-13%**
MERGE MD 190	1537	**0.3**	16.54	12.99	Yes	63.4	80.6	**-17.3**	**-27%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	16.50	12.99	Yes	8.9	11.3	**-2.4**	**-27%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	16.41	14.01	Yes	99.6	116.6	**-17.0**	**-17%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	21.80	34.03	Yes	198.2	127.0	**71.2**	**36%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	24.82	48.58	No	40.2	20.5	**19.6**	**49%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	31.23	38.69	Yes	16.3	13.1	**3.1**	**19%**
AMERICAN LEGION BRIDGE	790	**0.1**	32.10	14.53	No	16.8	37.1	**-20.3**	**-121%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	34.31	14.53	No	16.8	39.6	**-22.8**	**-136%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	26.93	14.53	Yes	108.6	201.2	**-92.7**	**-85%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	24.25	19.87	Yes	19.1	23.3	**-4.2**	**-22%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	29.32	19.87	Yes	38.8	57.3	**-18.5**	**-48%**

Figure A.25: I-495 Outer Loop Mainline 5-6 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	6-7 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Inner Loop	**228612**	**43.3**				**5202.6**	**5694.0**	**-491.5**	**-9%**
VA-193/GEORGETOWN PIKE/EXIT 13	2729	**0.5**	9.2	9.0	Yes	203.2	207.6	**-4.4**	**-2%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	2453	**0.5**	10.2	8.7	Yes	163.8	193.1	**-29.3**	**-18%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	1935	**0.4**	14.3	18.5	Yes	92.5	71.5	**21.0**	**23%**
AMERICAN LEGION BRIDGE	794	**0.2**	15.3	17.2	Yes	35.4	31.4	**4.0**	**11%**
BEFORE AMERICAN LEGION BRIDGE	508	**0.1**	18.0	15.1	Yes	19.3	23.0	**-3.7**	**-19%**
MERGE CLARA BARTON PARKWAY	1055	**0.2**	19.2	15.1	Yes	37.4	47.7	**-10.3**	**-27%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	7287	**1.4**	18.8	14.2	Yes	264.9	349.8	**-84.9**	**-32%**
MERGE CABIN JOHN PARKWAY	2126	**0.4**	14.8	12.4	Yes	97.9	116.7	**-18.7**	**-19%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	259	**0.0**	15.5	12.4	Yes	11.4	14.2	**-2.8**	**-25%**
MERGE MD 190	1235	**0.2**	15.5	13.6	Yes	54.3	61.9	**-7.6**	**-14%**
BETWEEN MD 190 AND I 270	6468	**1.2**	20.6	20.9	Yes	213.8	210.6	**3.2**	**1%**
MERGE I 270	867	**0.2**	50.3	35.6	Yes	11.7	16.6	**-4.9**	**-41%**
BETWEEN I 270 AND MD 187	7828	**1.5**	52.4	31.8	No	101.8	167.6	**-65.8**	**-65%**
MERGE MD 187	2140	**0.4**	22.6	18.1	Yes	64.7	80.5	**-15.8**	**-24%**
BETWEEN MD 187 AND I 270	2278	**0.4**	14.4	14.6	Yes	108.0	106.0	**2.0**	**2%**
MERGE BEFORE I 270	1306	**0.2**	14.4	16.6	Yes	61.9	53.7	**8.2**	**13%**
MERGE AFTER I 270	564	**0.1**	14.8	16.3	Yes	26.0	23.6	**2.4**	**9%**
MD 355 MERGE	1371	**0.3**	14.5	14.1	Yes	64.4	66.1	**-1.7**	**-3%**
BETWEEN MD 355 AND MD 185	6065	**1.1**	16.3	14.5	Yes	254.2	286.1	**-31.8**	**-13%**
MD 185 MERGE	2074	**0.4**	16.5	10.7	Yes	85.9	132.1	**-46.2**	**-54%**
BETWEEN MD 185 AND MD 97	9907	**1.9**	25.4	18.2	Yes	266.0	370.6	**-104.6**	**-39%**
MD 97 MERGE	1461	**0.3**	28.7	14.4	Yes	34.7	69.4	**-34.6**	**-100%**
BETWEEN MD 97 AND US 29	5965	**1.1**	32.0	21.8	Yes	126.9	186.2	**-59.2**	**-47%**
MERGE US 29	1734	**0.3**	34.1	12.0	No	34.7	98.6	**-64.0**	**-185%**
BETWEEN MD US 29 AND MD 193	1640	**0.3**	26.9	12.3	Yes	41.6	90.6	**-49.0**	**-118%**
MERGE MD 193	2099	**0.4**	24.4	15.9	Yes	58.6	90.0	**-31.5**	**-54%**
BETWEEN MD 193 AND MD 650	6046	**1.1**	31.8	29.8	Yes	129.7	138.3	**-8.6**	**-7%**
MERGE MD 650	3008	**0.6**	35.0	38.1	Yes	58.5	53.8	**4.7**	**8%**
BETWEEN MD 650 AND I 95	2869	**0.5**	33.9	47.6	Yes	57.6	41.1	**16.6**	**29%**
BEFORE I 95 MERGE	5612	**1.1**	39.7	48.8	Yes	96.4	78.5	**17.9**	**19%**
AFTER I 95 MERGE	2578	**0.5**	17.5	27.7	Yes	100.6	63.5	**37.1**	**37%**
MERGE US 1	2873	**0.5**	17.9	26.7	Yes	109.3	73.5	**35.8**	**33%**
BEFORE GREENBELT STATION MERGE	3544	**0.7**	21.2	38.3	No	114.1	63.0	**51.1**	**45%**
AFTER GREENBELT STATION MERGE	595	**0.1**	27.8	35.3	Yes	14.6	11.5	**3.1**	**21%**
BETWEEN GREENBELT STATION AND MD 201	4415	**0.8**	31.1	27.2	Yes	96.7	110.5	**-13.7**	**-14%**
MERGE MD 201	3066	**0.6**	30.4	41.7	Yes	68.7	50.1	**18.6**	**27%**
BETWEEN MD 201 AND MD 295 MERGE	1900	**0.4**	35.4	44.0	Yes	36.6	29.5	**7.2**	**20%**
MERGE MD 295	2725	**0.5**	36.5	39.9	Yes	50.9	46.6	**4.3**	**9%**
BETWEEN MD 295 AND MD 450	10677	**2.0**	37.7	35.7	Yes	193.0	203.9	**-10.9**	**-6%**
MERGE MD 450	1203	**0.2**	35.8	30.2	Yes	22.9	27.1	**-4.2**	**-18%**
BETWEEN MD 450 AND US 50	2809	**0.5**	39.6	16.4	No	48.4	116.9	**-68.5**	**-142%**
MERGE US 50	4270	**0.8**	32.8	16.9	Yes	88.7	172.0	**-83.3**	**-94%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	5460	**1.0**	34.5	43.3	Yes	107.9	86.0	**21.9**	**20%**
END 495 EXPRESS LANE	515	**0.1**	35.2	28.2	Yes	10.0	12.4	**-2.5**	**-25%**
BEFORE MD 202 MERGE	1817	**0.3**	33.6	28.2	Yes	36.9	43.9	**-7.0**	**-19%**
MERGE MD 202	2462	**0.5**	29.1	20.9	Yes	57.6	80.3	**-22.7**	**-39%**
BETWEEN MD 202 AND ARENA DR	1355	**0.3**	26.2	20.9	Yes	35.3	44.2	**-8.9**	**-25%**
MERGE ARENA DR	2059	**0.4**	25.3	38.9	Yes	55.5	36.1	**19.4**	**35%**
BETWEEN ARENA DR AND MD 214	3333	**0.6**	27.2	46.8	No	83.7	48.6	**35.1**	**42%**
MD 214 MERGE	2564	**0.5**	28.0	44.0	Yes	62.4	39.7	**22.6**	**36%**
BETWEEN MD 214 AND RITCHIE MARLBORO RD	5923	**1.1**							
MERGE RITCHIE MARLBORO RD	3041	**0.6**							
BETWEEN RITCHIE MARLBORO AND MD 4	9698	**1.8**	43.8	50.8	Yes	151.1	130.1	**20.9**	**14%**
MERGE MD 4	2628	**0.5**	52.5	51.2	Yes	34.1	35.0	**-0.9**	**-3%**
BETWEEN MD 4 AND FORESTVILLE RD	3339	**0.6**	53.8	51.9	Yes	42.3	43.9	**-1.6**	**-4%**
MERGE FORESTVILLE RD	930	**0.2**	55.2	61.0	Yes	11.5	10.4	**1.1**	**9%**
BETWEEN FORESTVILLE AND MD 218	3213	**0.6**	55.3	63.1	Yes	39.6	34.7	**4.9**	**12%**
MERGE MD 218	1660	**0.3**	54.1	62.7	Yes	20.9	18.1	**2.9**	**14%**
BETWEEN MD 218 AND MD 5	6410	**1.2**	51.7	60.6	Yes	84.6	72.1	**12.5**	**15%**
MERGE MD 5	2751	**0.5**	60.3	62.6	Yes	31.1	30.0	**1.1**	**4%**
BETWEEN MD 5 AND MD 414	11958	**2.3**	63.0	62.9	Yes	129.4	129.5	**-0.2**	**0%**
MERGE MD 414	3478	**0.7**	62.4	61.4	Yes	38.0	38.6	**-0.6**	**-2%**
BETWEEN MD 414 AND MD 210	2470	**0.5**	59.0	59.5	Yes	28.5	28.3	**0.2**	**1%**
MERGE MD 210	5648	**1.1**	43.4	42.2	Yes	88.7	91.2	**-2.4**	**-3%**
BETWEEN MD 210 AND I 295	2959	**0.6**	36.1	38.4	Yes	55.8	52.5	**3.3**	**6%**
MERGE I 295	3328	**0.6**	35.4	43.4	Yes	64.2	52.2	**11.9**	**19%**
BEFORE WOODROW WILSON BRIDGE	1217	**0.2**	44.0	53.0	Yes	18.9	15.7	**3.2**	**17%**
WOODROW WILSON BRIDGE	6059	**1.1**	44.7	54.8	Yes	92.4	75.4	**17.0**	**18%**

Figure A.26: I-495 Inner Loop Mainline 6-7 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	6-7 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-495 Outer Loop	**230042**	**43.6**				**3948.2**	**5087.2**	**-1139.1**	**-29%**
WOODROW WILSON BRIDGE	6160	**1.2**	47.58	36.04	Yes	88.3	116.5	**-28.3**	**-32%**
BEFORE WOODROW WILSON BRIDGE	644	**0.1**	52.67	54.94	Yes	8.3	8.0	**0.3**	**4%**
MERGE I 295	1023	**0.2**	58.18	55.38	Yes	12.0	12.6	**-0.6**	**-5%**
BETWEEN MD 210 AND I 295	377	**0.1**	55.84	58.00	Yes	4.6	4.4	**0.2**	**4%**
MERGE MD 210	8656	**1.6**	57.31	57.69	Yes	103.0	102.3	**0.7**	**1%**
BETWEEN MD 414 AND MD 210	4452	**0.8**	58.84	57.17	Yes	51.6	53.1	**-1.5**	**-3%**
MERGE MD 414	2984	**0.6**	60.50	57.94	Yes	33.6	35.1	**-1.5**	**-4%**
BETWEEN MD 5 AND MD 414	12214	**2.3**	51.28	53.98	Yes	162.4	154.3	**8.1**	**5%**
MERGE MD 5	3740	**0.7**	39.94	52.99	Yes	63.8	48.1	**15.7**	**25%**
BETWEEN MD 218 AND MD 5	5897	**1.1**	37.68	51.71	Yes	106.7	77.7	**28.9**	**27%**
MERGE MD 218	238	**0.0**	35.99	51.28	Yes	4.5	3.2	**1.3**	**30%**
BETWEEN FORESTVILLE AND MD 218	4910	**0.9**	33.85	46.84	Yes	98.9	71.5	**27.4**	**28%**
MERGE MD 337	912	**0.2**	33.82	41.21	Yes	18.4	15.1	**3.3**	**18%**
BETWEEN MD 4 AND FORESTVILLE RD	3145	**0.6**	39.60	43.17	Yes	54.1	49.7	**4.5**	**8%**
MERGE MD 4	3108	**0.6**	42.00	51.87	Yes	50.4	40.8	**9.6**	**19%**
BETWEEN RITCHIE MARLBORO AND MD 4	9857	**1.9**							
MERGE RITCHIE MARLBORO RD	2341	**0.4**							
BETWEEN MD 214 AND RITCHIE MARLBORO RD	6303	**1.2**	45.50	46.21	Yes	94.4	93.0	**1.4**	**2%**
MERGE MD 214	2618	**0.5**	46.37	26.72	No	38.5	66.8	**-28.3**	**-74%**
BETWEEN ARENA DR AND MD 214	2789	**0.5**	42.45	17.27	No	44.8	110.1	**-65.3**	**-146%**
MERGE ARENA DR	2437	**0.5**	35.67	17.46	Yes	46.6	95.2	**-48.6**	**-104%**
BETWEEN MD 202 AND ARENA DR	1179	**0.2**	27.89	13.50	Yes	28.8	59.6	**-30.8**	**-107%**
MERGE MD 202	3055	**0.6**	23.00	13.72	Yes	90.5	151.8	**-61.2**	**-68%**
BEFORE MD 202 MERGE	908	**0.2**	22.67	9.35	Yes	27.3	66.2	**-38.9**	**-142%**
END 495 EXPRESS LANE	594	**0.1**	19.88	13.16	Yes	20.4	30.8	**-10.4**	**-51%**
BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)	6101	**1.2**	27.15	34.39	Yes	153.2	120.9	**32.3**	**21%**
MERGE US 50	3680	**0.7**	26.15	51.27	No	96.0	48.9	**47.0**	**49%**
BETWEEN MD 450 AND US 50	2561	**0.5**	21.59	36.54	Yes	80.9	47.8	**33.1**	**41%**
MERGE MD 450	2100	**0.4**	22.15	32.44	Yes	64.6	44.1	**20.5**	**32%**
BETWEEN MD 295 AND MD 450	10674	**2.0**	25.96	26.66	Yes	280.4	273.0	**7.4**	**3%**
MERGE MD 295	2479	**0.5**	26.13	14.46	Yes	64.7	116.9	**-52.2**	**-81%**
BETWEEN MD 201 AND MD 295 MERGE	1996	**0.4**	25.89	15.82	Yes	52.6	86.0	**-33.5**	**-64%**
MERGE MD 201	3054	**0.6**	27.20	14.99	Yes	76.6	138.9	**-62.3**	**-81%**
BETWEEN GREENBELT STATION AND MD 201	4643	**0.9**	34.44	20.11	Yes	91.9	157.4	**-65.5**	**-71%**
BETWEEN GREENBELT STATION AND US 1	4102	**0.8**	53.60	46.39	Yes	52.2	60.3	**-8.1**	**-16%**
MERGE US 1	2739	**0.5**	57.81	56.86	Yes	32.3	32.8	**-0.5**	**-2%**
BETWEEN US 1 AND I 95	3225	**0.6**	59.72	57.34	Yes	36.8	38.3	**-1.5**	**-4%**
I 95 MERGE	4389	**0.8**	61.93	57.30	Yes	48.3	52.2	**-3.9**	**-8%**
BETWEEN MD 650 AND I 95	4048	**0.8**	45.34	53.03	Yes	60.9	52.1	**8.8**	**15%**
MERGE MD 650	2547	**0.5**	50.20	52.38	Yes	34.6	33.2	**1.4**	**4%**
BETWEEN MD 193 AND MD 650	6315	**1.2**	54.84	51.66	Yes	78.5	83.3	**-4.8**	**-6%**
MERGE MD 193	1353	**0.3**	54.27	52.20	Yes	17.0	17.7	**-0.7**	**-4%**
BETWEEN MD US 29 AND MD 193	2722	**0.5**	52.84	51.67	Yes	35.1	35.9	**-0.8**	**-2%**
MERGE US 29	1127	**0.2**	53.48	46.39	Yes	14.4	16.6	**-2.2**	**-15%**
BETWEEN MD 97 AND US 29	5926	**1.1**	52.45	52.31	Yes	77.0	77.2	**-0.2**	**0%**
MD 97 MERGE	1734	**0.3**	51.57	51.18	Yes	22.9	23.1	**-0.2**	**-1%**
BETWEEN MD 185 AND MD 97	8746	**1.7**	53.40	52.07	Yes	111.7	114.5	**-2.8**	**-3%**
MD 185 MERGE	3315	**0.6**	54.07	45.28	Yes	41.8	49.9	**-8.1**	**-19%**
BETWEEN MD 355 AND MD 185	6287	**1.2**	50.36	46.85	Yes	85.1	91.5	**-6.4**	**-8%**
MD 355 MERGE	1401	**0.3**	46.50	50.84	Yes	20.5	18.8	**1.8**	**9%**
MERGE AFTER I 270	61	**0.0**	46.22	53.22	Yes	0.9	0.8	**0.1**	**13%**
MERGE BEFORE I 270	1298	**0.2**	53.59	53.37	Yes	16.5	16.6	**-0.1**	**0%**
BETWEEN I 270 EAST AND MD 187	3092	**0.6**	47.98	43.48	Yes	43.9	48.5	**-4.5**	**-10%**
MERGE MD 187	1936	**0.4**	41.73	11.53	No	31.6	114.5	**-82.9**	**-262%**
BETWEEN I 270 WEST AND MD 187	7643	**1.4**	33.14	8.28	No	157.2	629.6	**-472.4**	**-300%**
MERGE I 270	1490	**0.3**	21.71	12.49	Yes	46.8	81.3	**-34.6**	**-74%**
BETWEEN MD 190 AND I 270	5753	**1.1**	21.29	14.22	Yes	184.2	275.9	**-91.7**	**-50%**
MERGE MD 190	1537	**0.3**	21.27	14.11	Yes	49.2	74.3	**-25.0**	**-51%**
BETWEEN CABIN JOHN PARKWAY AND MD 190	214	**0.0**	21.32	14.11	Yes	6.9	10.4	**-3.5**	**-51%**
MERGE CABIN JOHN PARKWAY	2397	**0.5**	20.87	15.12	Yes	78.3	108.1	**-29.8**	**-38%**
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	6336	**1.2**	28.49	35.08	Yes	151.6	123.1	**28.5**	**19%**
MERGE CLARA BARTON PARKWAY	1463	**0.3**	30.54	53.51	No	32.7	18.6	**14.0**	**43%**
BEFORE AMERICAN LEGION BRIDGE	746	**0.1**	35.91	53.62	Yes	14.2	9.5	**4.7**	**33%**
AMERICAN LEGION BRIDGE	790	**0.1**	44.12	20.13	No	12.2	26.7	**-14.5**	**-119%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	843	**0.2**	42.14	20.13	No	13.6	28.6	**-14.9**	**-109%**
GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14	4288	**0.8**	36.07	20.13	Yes	81.1	145.2	**-64.2**	**-79%**
VA-193/GEORGETOWN PIKE/EXIT 13	679	**0.1**	32.90	20.50	Yes	14.1	22.6	**-8.5**	**-60%**
VA-193/GEORGETOWN PIKE/EXIT 13	1669	**0.3**	36.71	20.50	Yes	31.0	55.5	**-24.5**	**-79%**

Figure A.27: I-495 Outer Loop Mainline 6-7 PM Travel Time and Speed

I-495 Mainline Travel Time Graphs

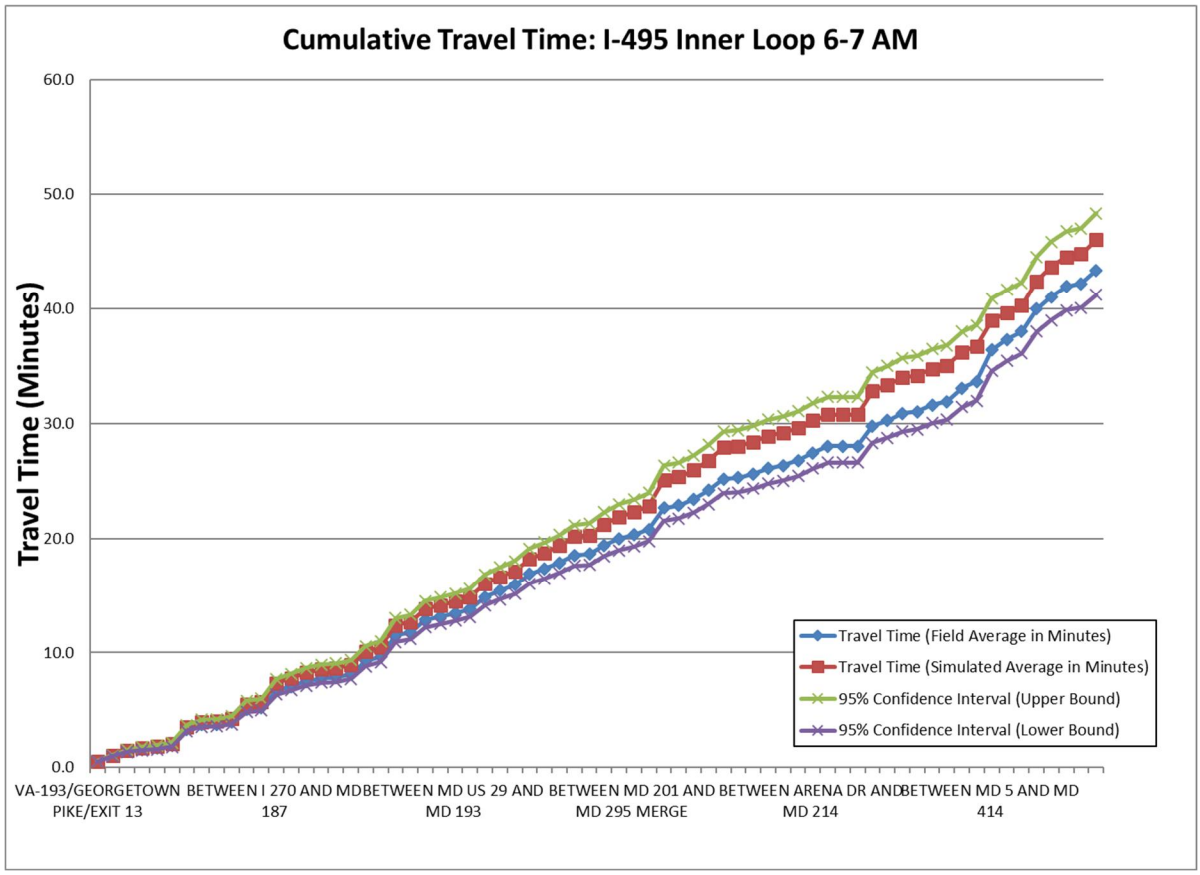


Figure A.28: I-495 Inner Loop Mainline 6-7 AM Cumulative Travel Time

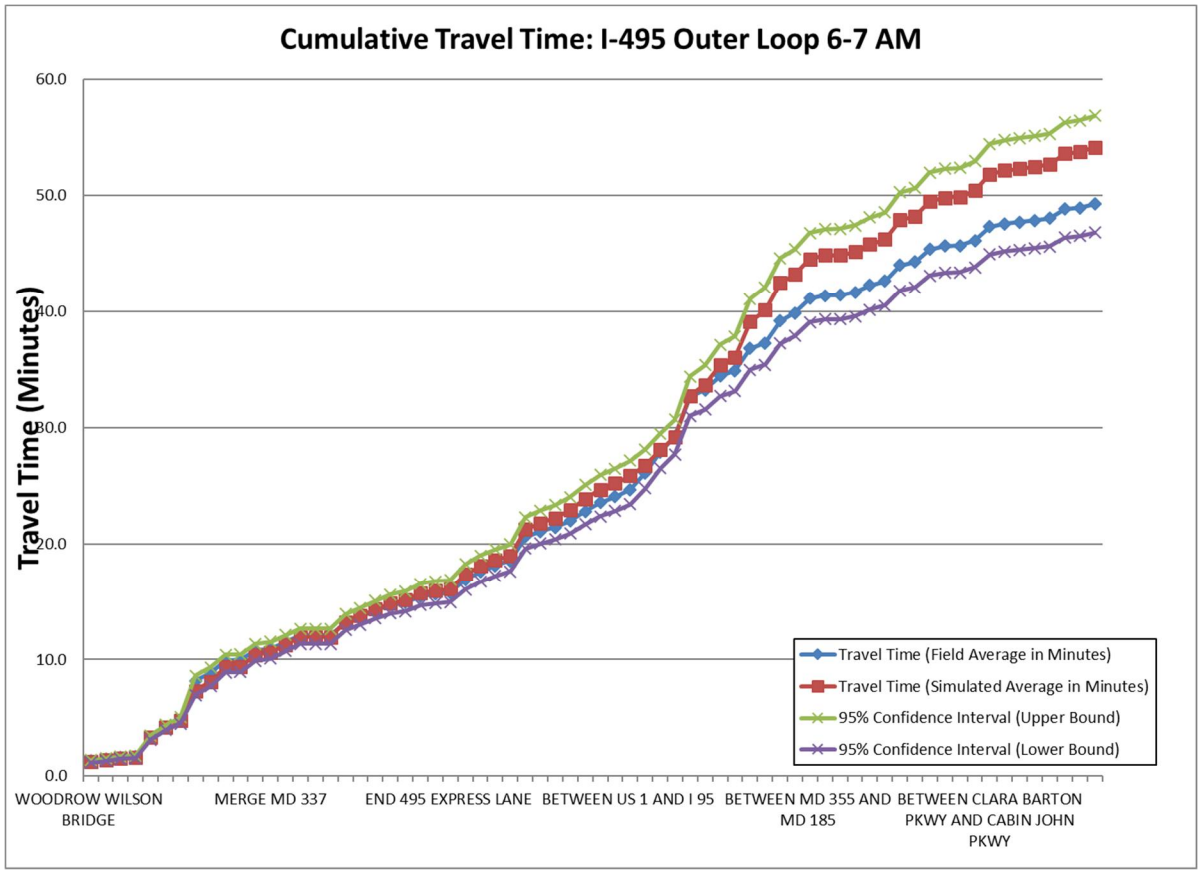


Figure A.29: I-495 Outer Loop Mainline 6-7 AM Cumulative Travel Time

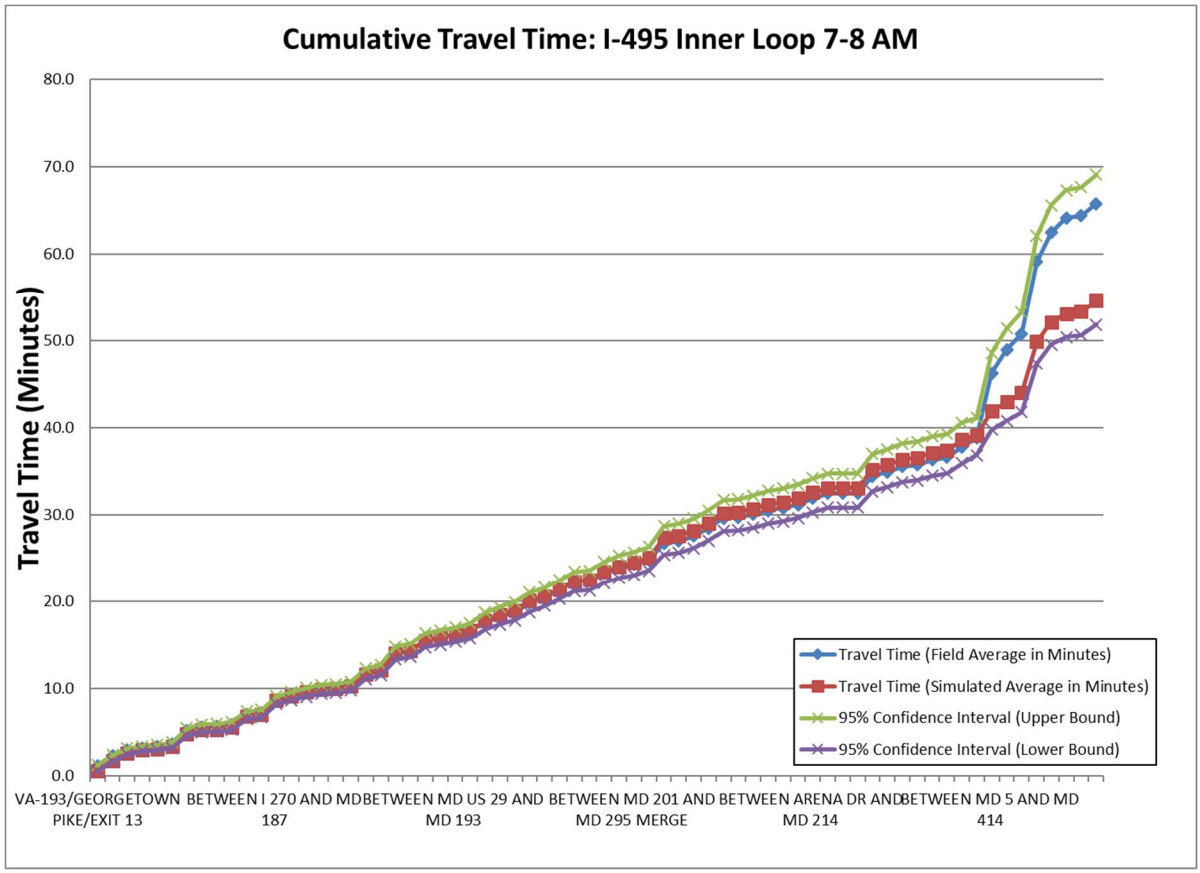


Figure A.30: I-495 Inner Loop Mainline 7-8 AM Cumulative Travel Time

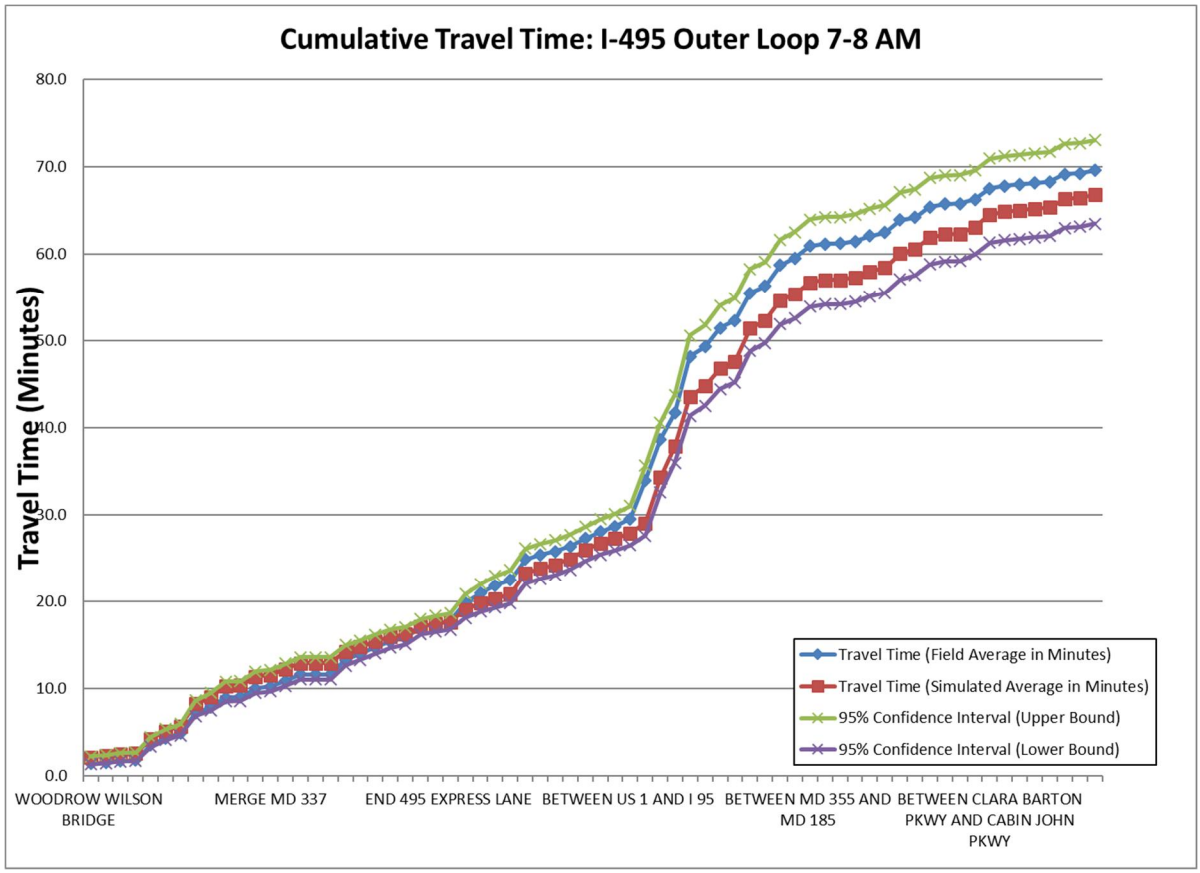


Figure A.31: I-495 Outer Loop Mainline 7-8 AM Cumulative Travel Time

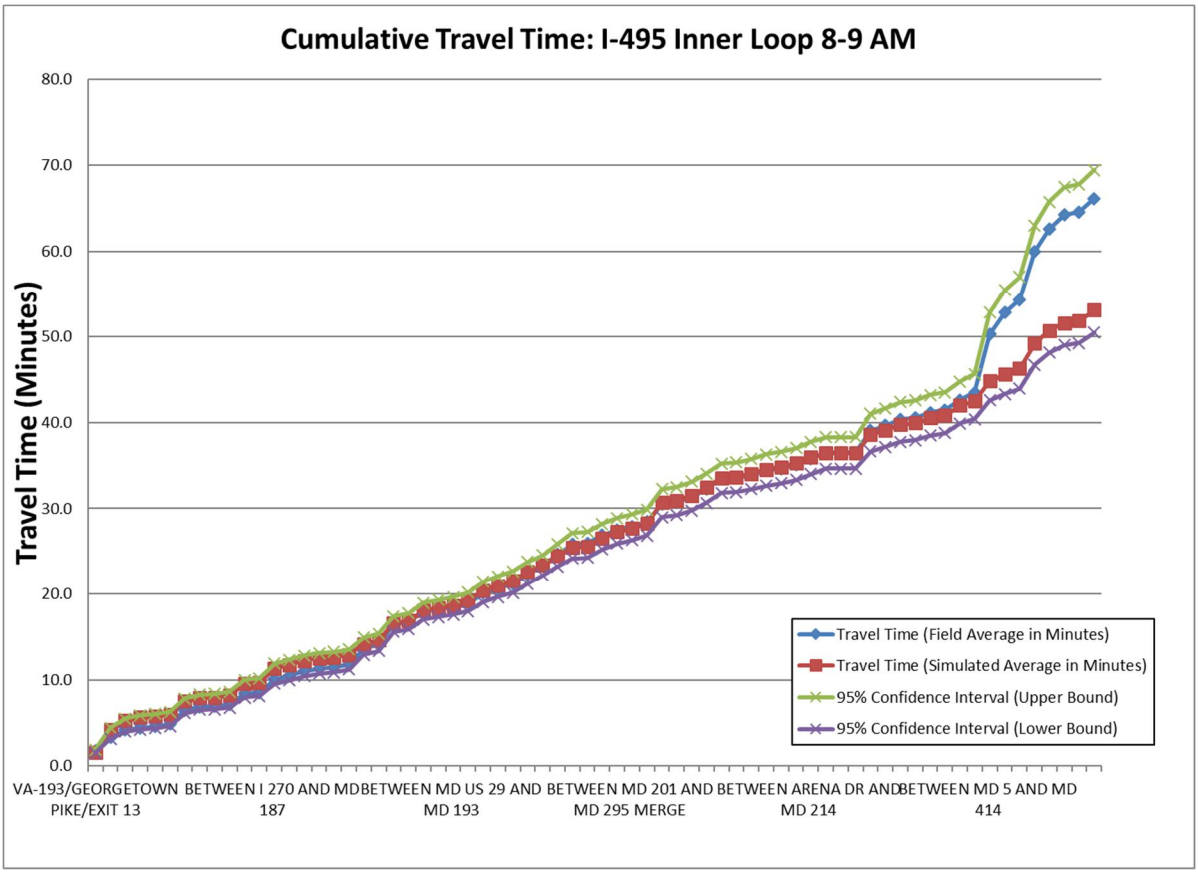


Figure A.32: I-495 Inner Loop Mainline 8-9 AM Cumulative Travel Time

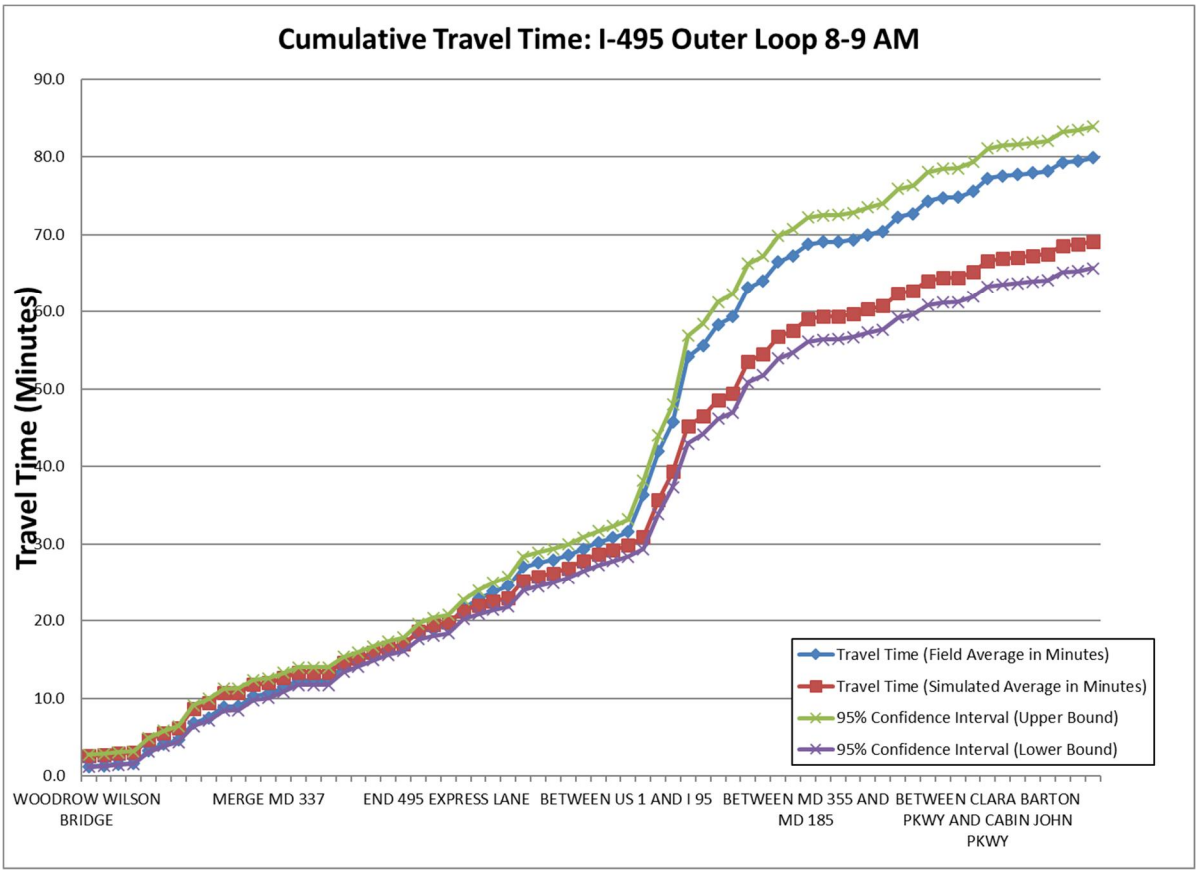


Figure A.33: I-495 Outer Loop Mainline 8-9 AM Cumulative Travel Time

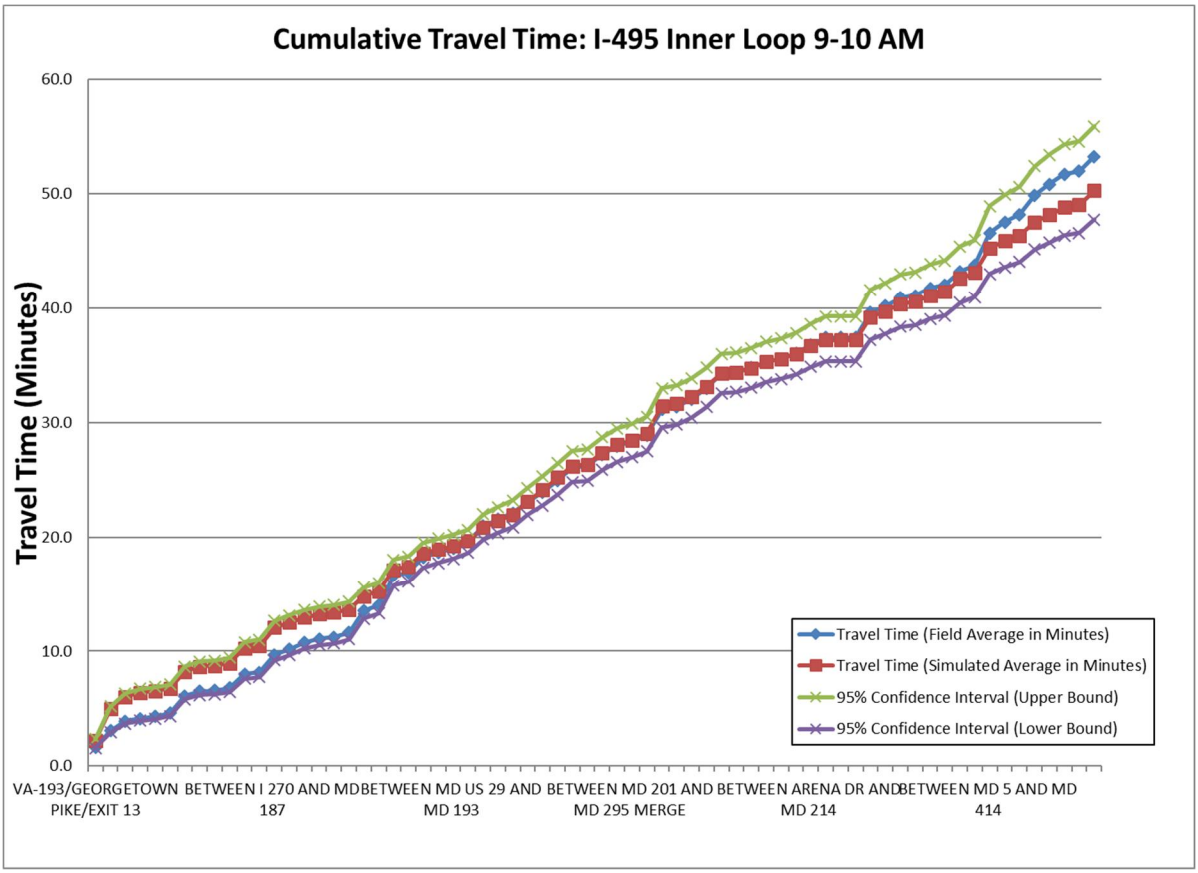


Figure A.34: I-495 Inner Loop Mainline 9-10 AM Cumulative Travel Time

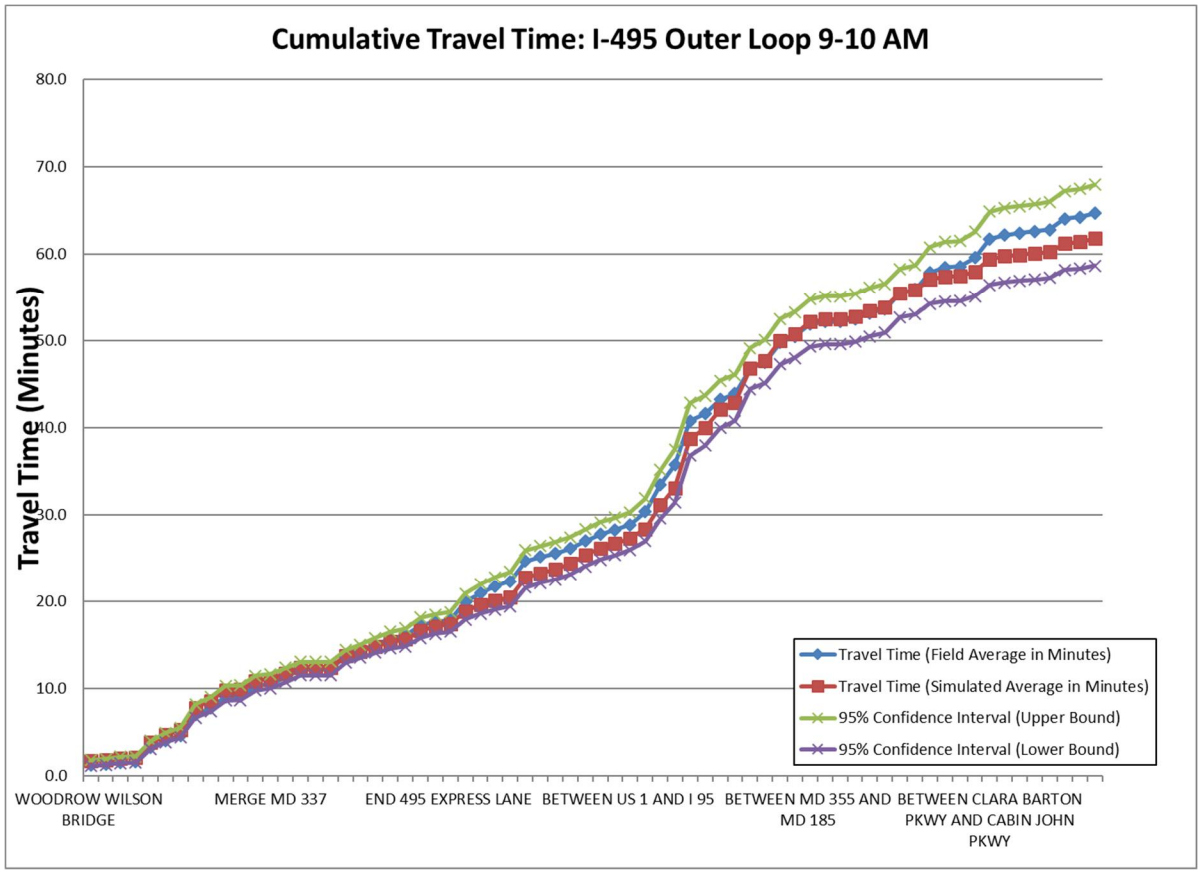


Figure A.35: I-495 Outer Loop Mainline 9-10 AM Cumulative Travel Time

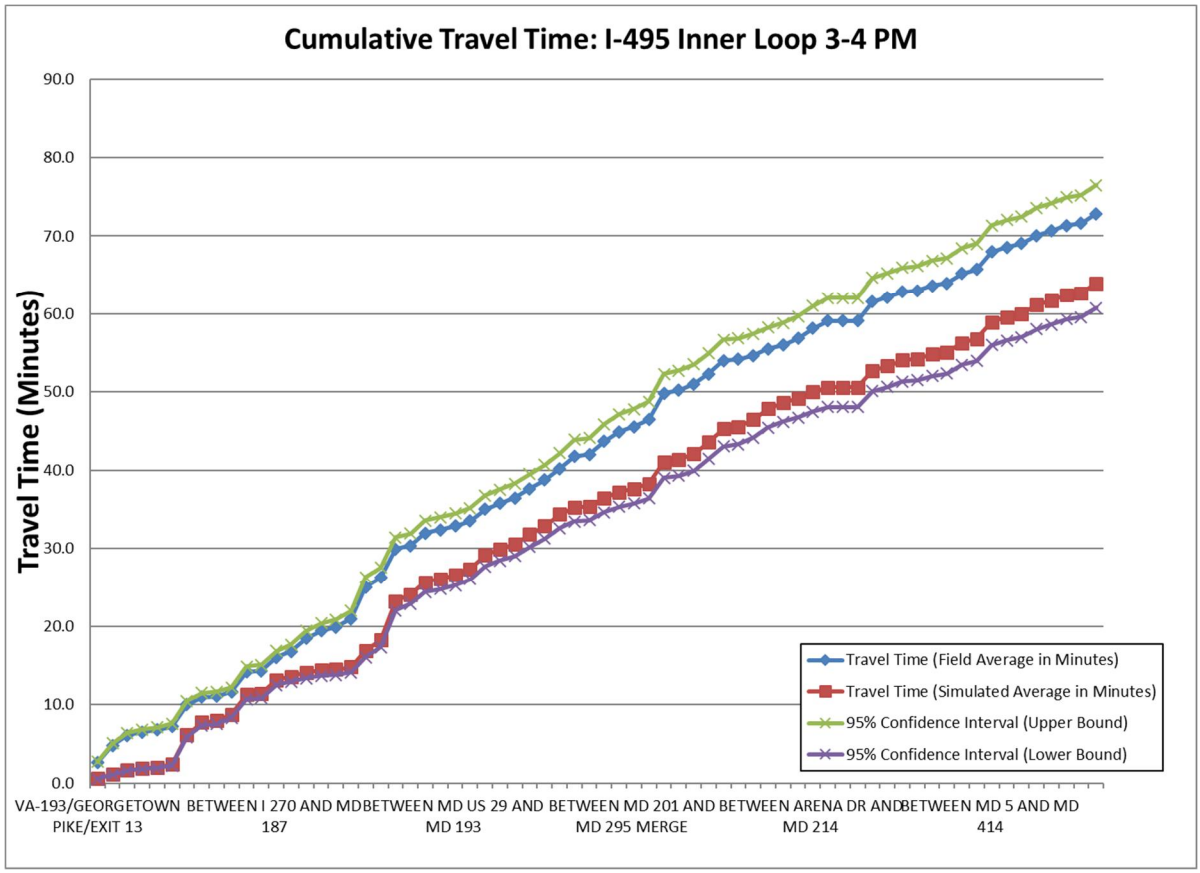


Figure A.36: I-495 Inner Loop Mainline 3-4 PM Cumulative Travel Time

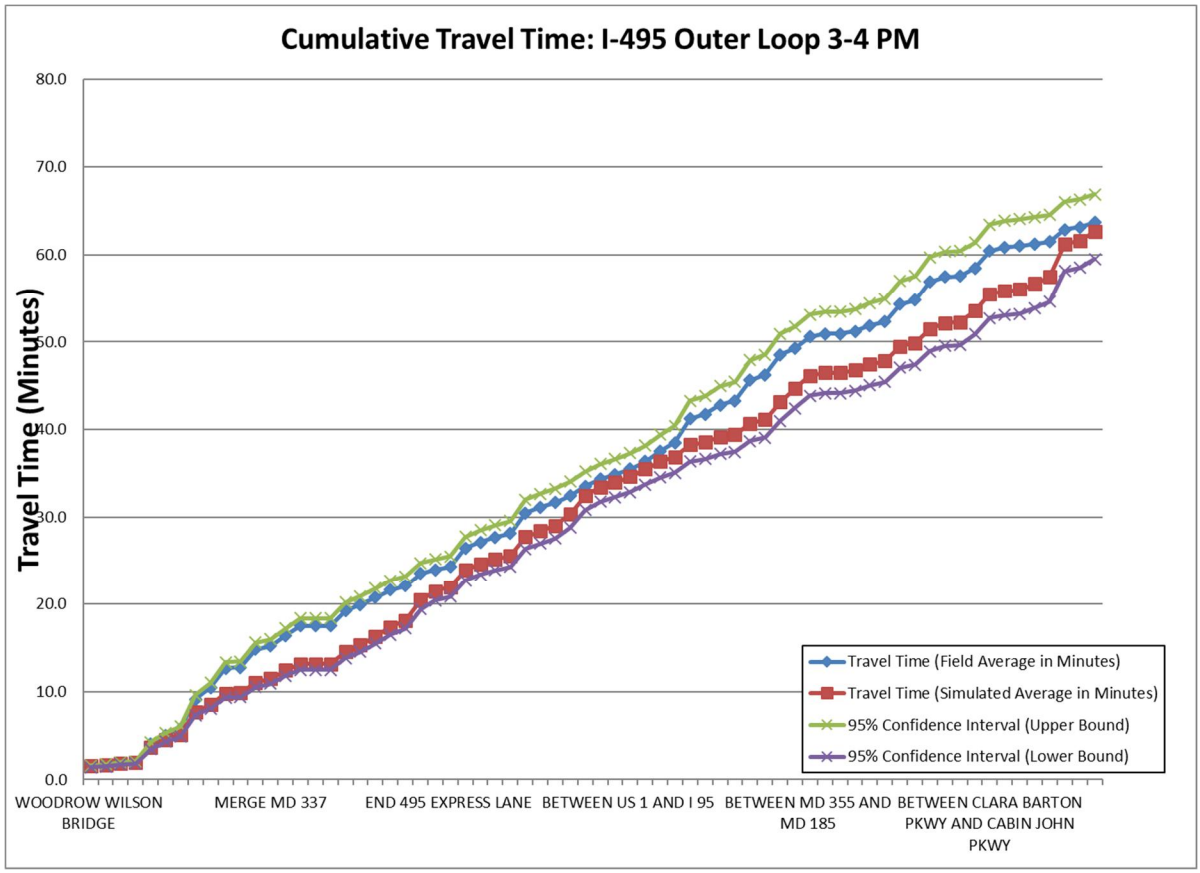


Figure A.37: I-495 Outer Loop Mainline 3-4 PM Cumulative Travel Time

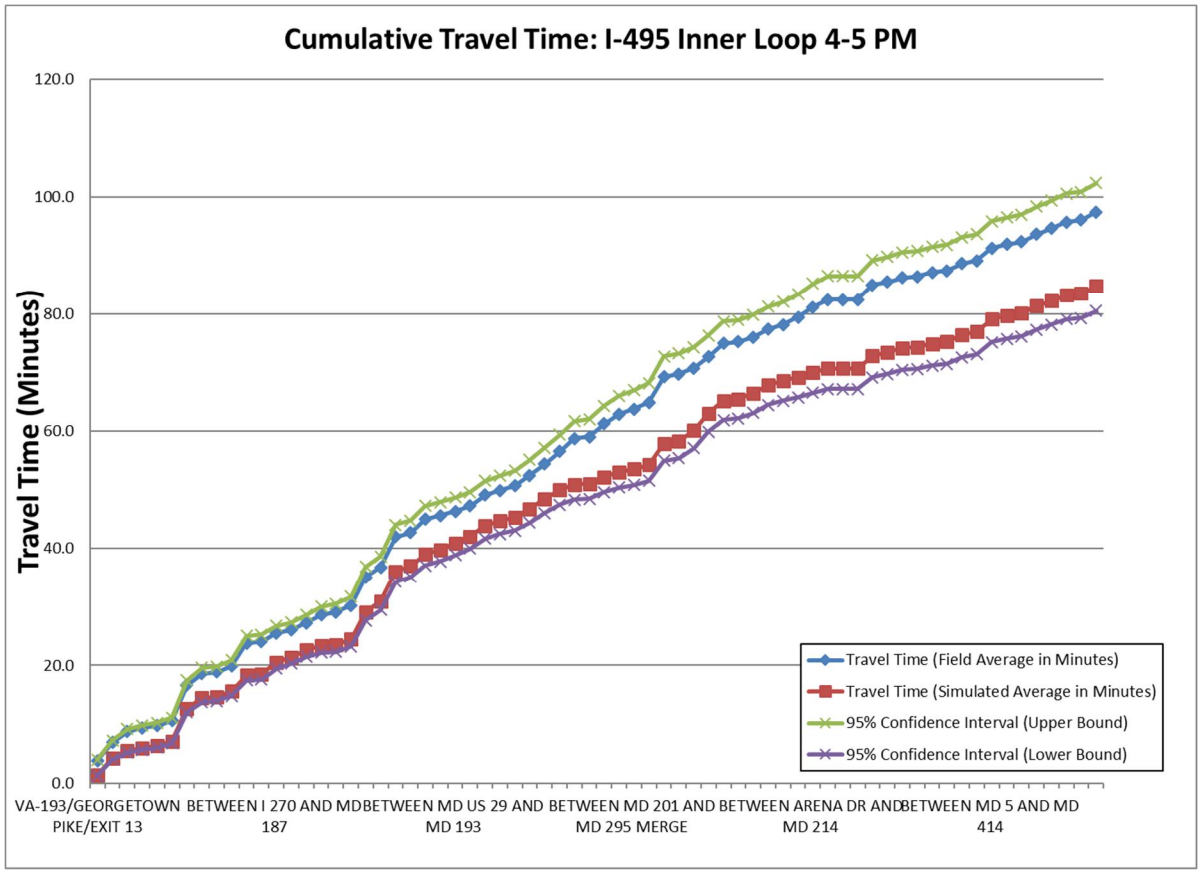


Figure A.38: I-495 Inner Loop Mainline 4-5 PM Cumulative Travel Time

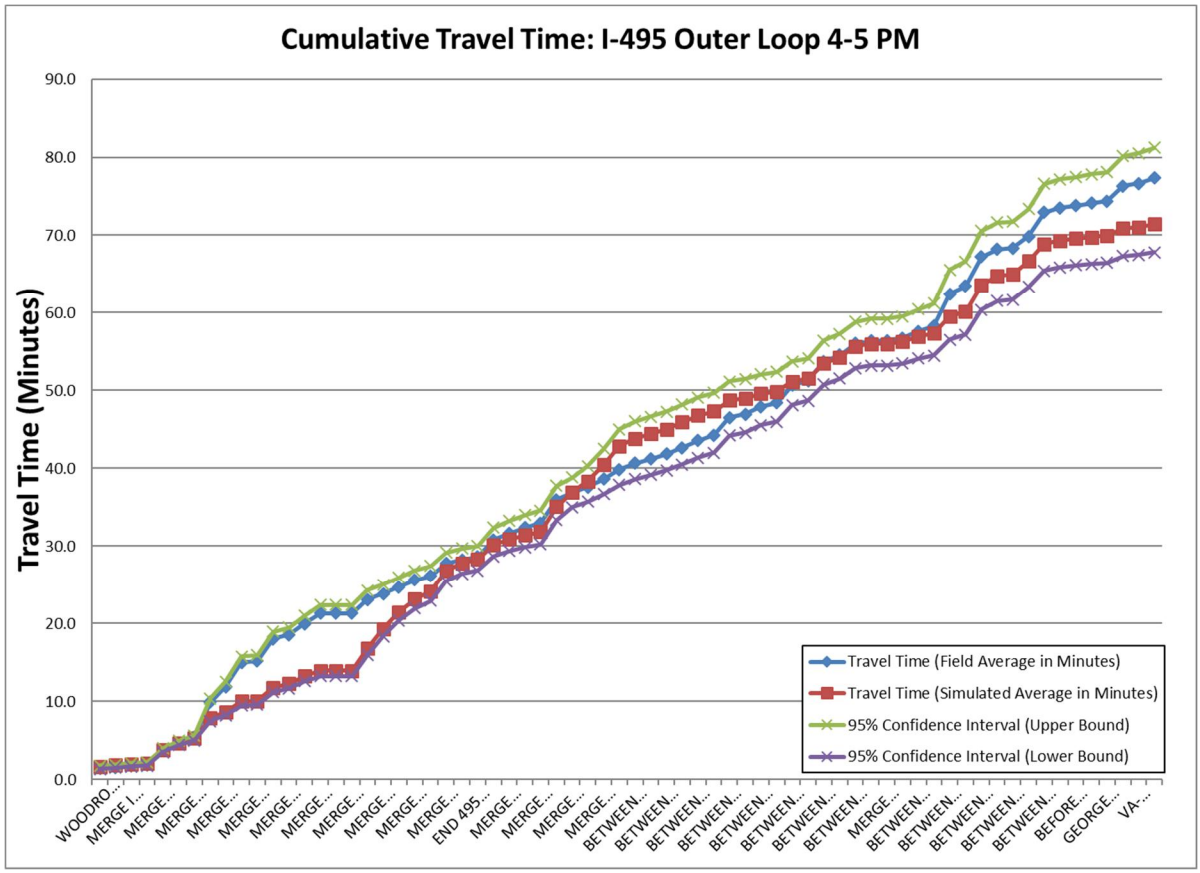


Figure A.39: I-495 Outer Loop Mainline 4-5 PM Cumulative Travel Time

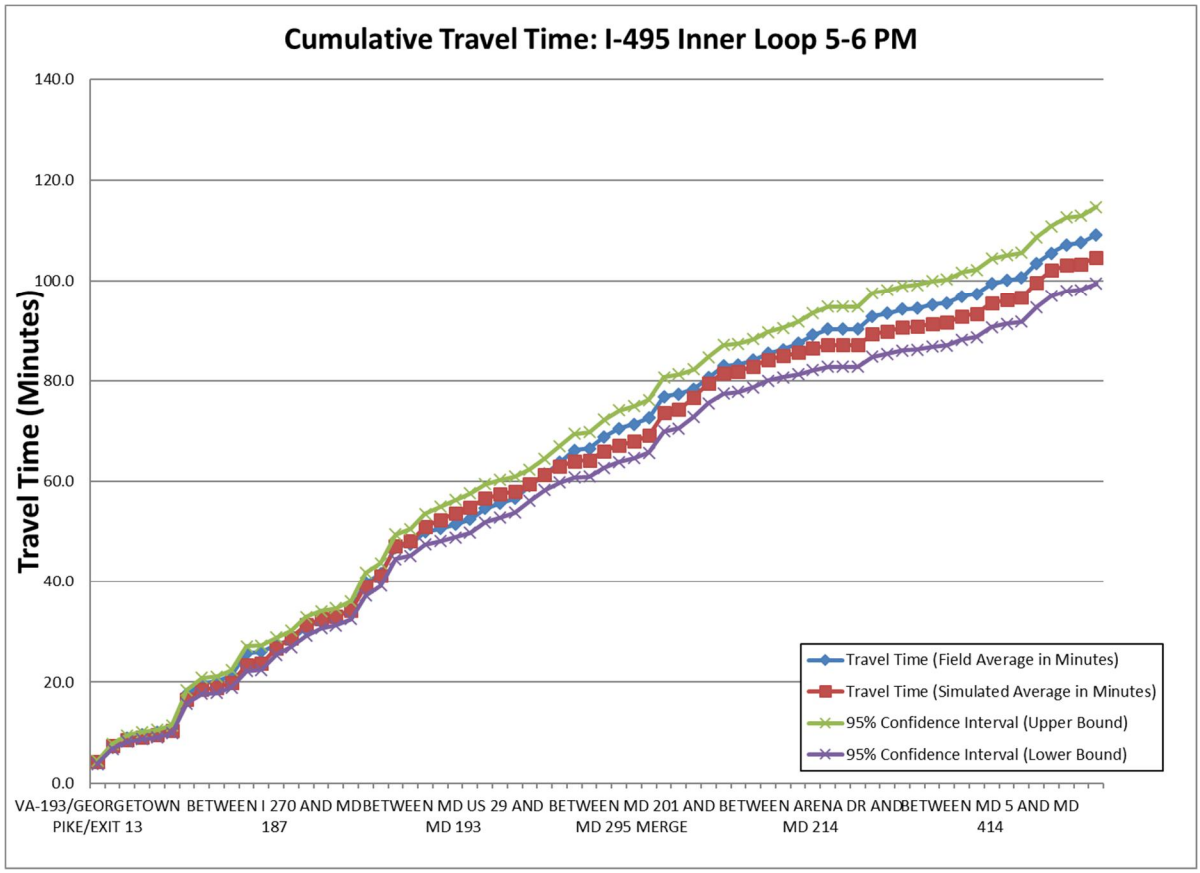


Figure A.40: I-495 Inner Loop Mainline 5-6 PM Cumulative Travel Time

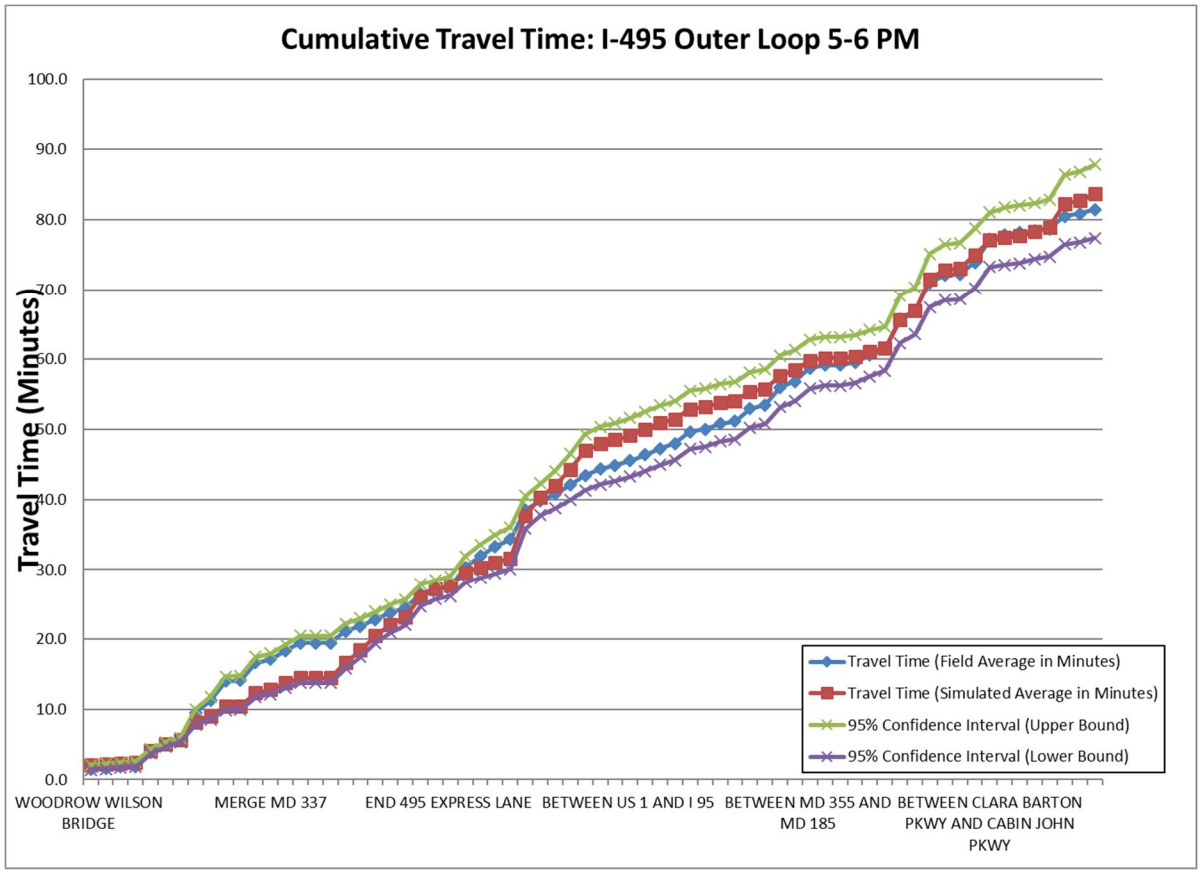


Figure A.41: I-495 Outer Loop Mainline 5-6 PM Cumulative Travel Time

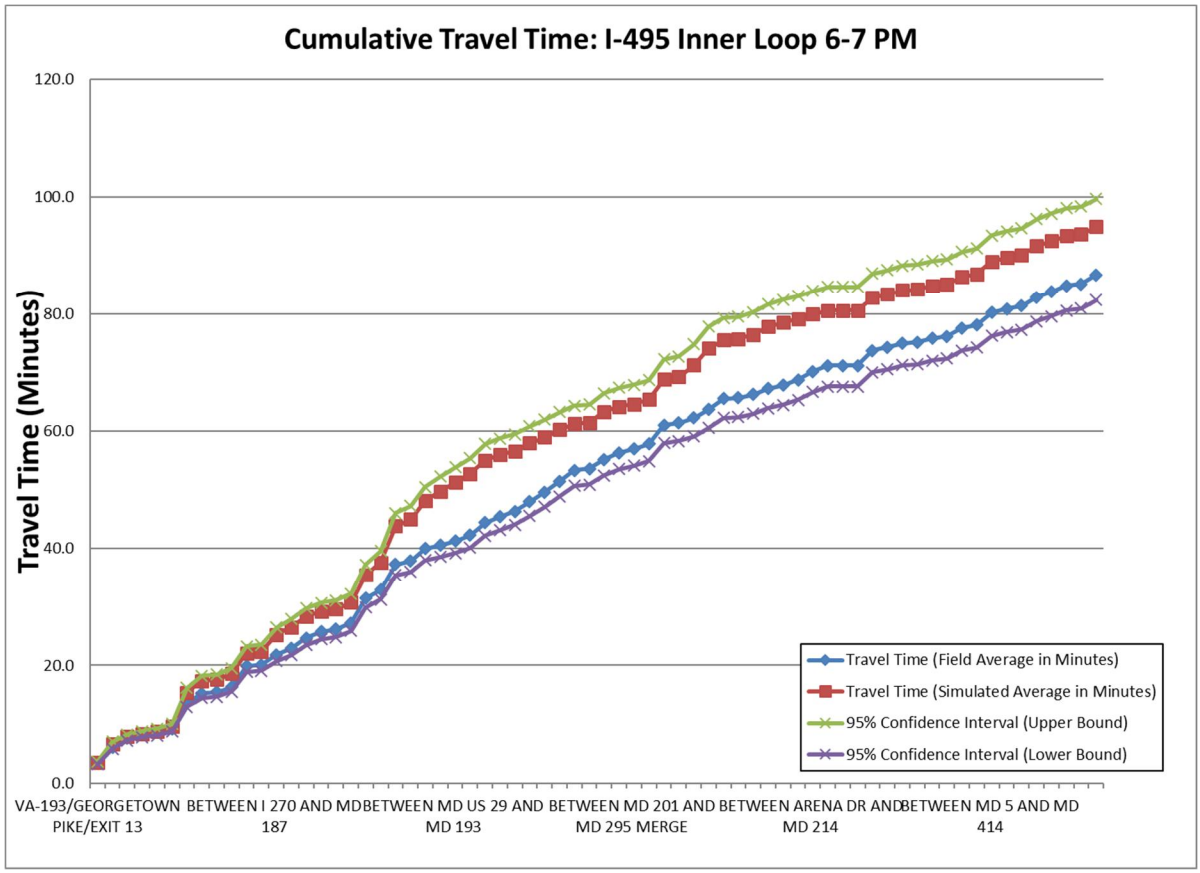


Figure A.42: I-495 Inner Loop Mainline 6-7 PM Cumulative Travel Time

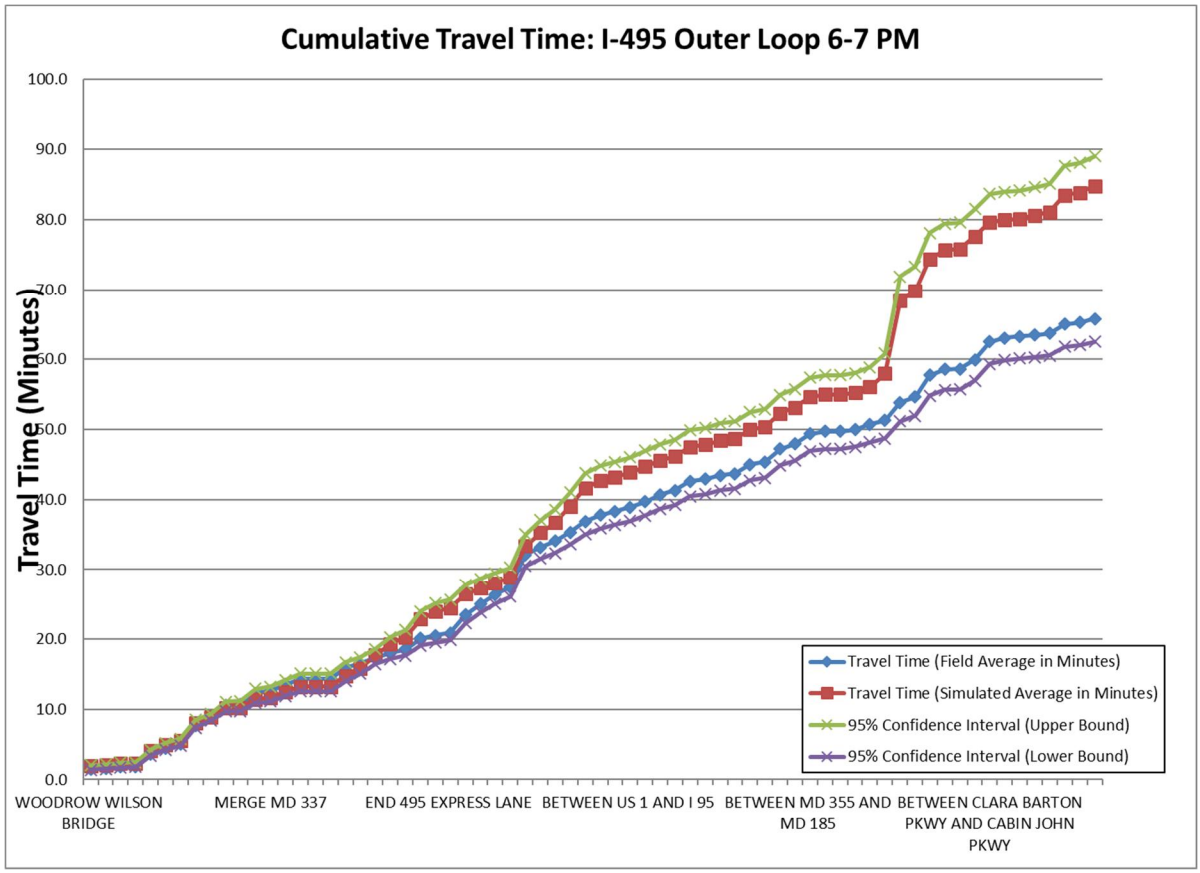


Figure A.43: I-495 Outer Loop Mainline 6-7 PM Cumulative Travel Time

I-495 Mainline Overall Comparison Tables

Legend
Criteria Met
Critera Not Met

I-495 Inner Loop 6-7 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	Yes	Yes	Yes	Yes	-1%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	0%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-14%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				No	-56%	AMERICAN LEGION BRIDGE
				Yes	-16%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	1%	MERGE CLARA BARTON PARKWAY
				Yes	-2%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-13%	MERGE CABIN JOHN PARKWAY
				Yes	-15%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	Yes	No	No	Yes	-15%	MERGE MD 190
				Yes	-16%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	-15%	MERGE I 270
				Yes	-13%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	-12%	MERGE MD 187
				Yes	-8%	BETWEEN MD 187 AND I 270
				Yes	-15%	MERGE BEFORE I 270
				Yes	-3%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	Yes	Yes	Yes	-3%	MD 355 MERGE
				Yes	-1%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	Yes	Yes	No	Yes	-4%	MD 185 MERGE
				Yes	-4%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	Yes	-9%	MD 97 MERGE
				Yes	-6%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	No	Yes	Yes	Yes	-6%	MERGE US 29
				Yes	-7%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	-11%	MERGE MD 193
				Yes	-10%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	Yes	Yes	Yes	Yes	-9%	MERGE MD 650
				Yes	-3%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-11%	BEFORE I 95 MERGE
				Yes	-13%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-17%	MERGE US 1
				Yes	-25%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-26%	AFTER GREENBELT STATION MERGE
				Yes	-19%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-19%	MERGE MD 201
				Yes	-12%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-15%	MERGE MD 295
				Yes	-22%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	-11%	MERGE MD 450
				Yes	-9%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-13%	MERGE US 50
				Yes	-10%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-14%	END 495 EXPRESS LANE
				Yes	-11%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	Yes	Yes	Yes	Yes	-10%	MERGE MD 202
				Yes	-5%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	Yes	No	No	Yes	1%	MERGE ARENA DR
				Yes	2%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	7%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	Yes	Yes	No			MERGE RITCHIE MARLBORO RD
				Yes	-14%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	No	Yes	-12%	MERGE MD 4
				Yes	-8%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	-1%	MERGE FORESTVILLE RD
				Yes	0%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	-1%	MERGE MD 218
				Yes	0%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	11%	MERGE MD 5
				Yes	19%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	22%	MERGE MD 414
				Yes	13%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	-10%	MERGE MD 210
				Yes	-18%	BETWEEN MD 210 AND I 295
				Yes	5%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	3%	BEFORE WOODROW WILSON BRIDGE
				Yes	-5%	WOODROW WILSON BRIDGE

Figure A.44: I-495 Inner Loop Mainline 6-7 AM Overall Comparison

I-495 Outer Loop 6-7 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	Yes	6%	WOODROW WILSON BRIDGE
				Yes	-5%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	Yes	No	Yes	-7%	MERGE I 295
				Yes	-4%	BETWEEN MD 210 AND I 295
				Yes	-3%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	No	No	Yes	-5%	BETWEEN MD 414 AND MD 210
				Yes	12%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	25%	BETWEEN MD 5 AND MD 414
				Yes	-17%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	-19%	BETWEEN MD 218 AND MD 5
				Yes	-24%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	-21%	BETWEEN FORESTVILLE AND MD 218
				Yes	-21%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	-22%	BETWEEN MD 4 AND FORESTVILLE RD
				Yes	-20%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	Yes	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	-13%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				Yes	-5%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	Yes	No	No	Yes	-7%	BETWEEN ARENA DR AND MD 214
				Yes	-13%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-25%	BETWEEN MD 202 AND ARENA DR
				Yes	-17%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-9%	BEFORE MD 202 MERGE
				Yes	-20%	END 495 EXPRESS LANE
				Yes	-11%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-3%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	7%	BETWEEN MD 450 AND US 50
				Yes	4%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-9%	BETWEEN MD 295 AND MD 450
				Yes	-16%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-20%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-26%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-18%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-9%	BETWEEN GREENBELT STATION AND US 1
				Yes	-8%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	Yes	No	Yes	-6%	BETWEEN US 1 AND I 95
				No	36%	I 95 MERGE
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	28%	BETWEEN MD 650 AND I 95
				Yes	18%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	-5%	BETWEEN MD 193 AND MD 650
				Yes	-59%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	Yes	No	Yes	-41%	BETWEEN MD US 29 AND MD 193
				Yes	-45%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	Yes	-60%	BETWEEN MD 97 AND US 29
				No	-115%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	No	Yes	Yes	Yes	-25%	BETWEEN MD 185 AND MD 97
				Yes	-2%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	Yes	Yes	Yes	-9%	BETWEEN MD 355 AND MD 185
				Yes	-15%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	No	Yes	Yes	Yes	-10%	MERGE AFTER I 270
				Yes	-7%	MERGE BEFORE I 270
				Yes	-9%	BETWEEN I 270 EAST AND MD 187
				Yes	-14%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	No	Yes	Yes	Yes	-19%	BETWEEN I 270 WEST AND MD 187
				Yes	-18%	MERGE I 270
BETWEEN MD 190 AND I-270	Yes	Yes	No	Yes	-18%	BETWEEN MD 190 AND I 270
				Yes	-20%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	-19%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	-26%	MERGE CABIN JOHN PARKWAY
				Yes	-20%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				Yes	-17%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	-16%	BEFORE AMERICAN LEGION BRIDGE
				Yes	-17%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	-12%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-16%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-24%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-24%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.45: I-495 Outer Loop Mainline 6-7 AM Overall Comparison

I-495 Inner Loop 7-8 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	No	48%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-1%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-30%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	-56%	AMERICAN LEGION BRIDGE
				Yes	13%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	16%	MERGE CLARA BARTON PARKWAY
				Yes	5%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-8%	MERGE CABIN JOHN PARKWAY
				Yes	-12%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	No	Yes	No	Yes	-11%	MERGE MD 190
				Yes	-12%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	Yes	No	Yes	-11%	MERGE I 270
				Yes	-11%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	-8%	MERGE MD 187
				Yes	0%	BETWEEN MD 187 AND I 270
				Yes	4%	MERGE BEFORE I 270
				Yes	10%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	11%	MD 355 MERGE
				Yes	0%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	Yes	Yes	Yes	Yes	0%	MD 185 MERGE
				Yes	3%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	Yes	-5%	MD 97 MERGE
				Yes	-3%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	Yes	Yes	Yes	Yes	-1%	MERGE US 29
				Yes	-4%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	-22%	MERGE MD 193
				Yes	-9%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	-9%	MERGE MD 650
				Yes	-1%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	No	Yes	Yes	Yes	-4%	BEFORE I 95 MERGE
				Yes	26%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	Yes	Yes	Yes	10%	MERGE US 1
				Yes	-4%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-17%	AFTER GREENBELT STATION MERGE
				Yes	-9%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	Yes	Yes	Yes	-9%	MERGE MD 201
				Yes	-5%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-10%	MERGE MD 295
				Yes	-19%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	Yes	Yes	Yes	-3%	MERGE MD 450
				Yes	2%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	Yes	No	Yes	2%	MERGE US 50
				Yes	2%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-13%	END 495 EXPRESS LANE
				Yes	-11%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-10%	MERGE MD 202
				Yes	-7%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	Yes	Yes	No	Yes	1%	MERGE ARENA DR
				Yes	2%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	9%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	No			MERGE RITCHIE MARLBORO RD
				Yes	-8%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	No	Yes	Yes	Yes	-5%	MERGE MD 4
				Yes	-4%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	1%	MERGE FORESTVILLE RD
				Yes	1%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	No	Yes	Yes	Yes	-1%	MERGE MD 218
				Yes	-1%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	No	49%	MERGE MD 5
				No	63%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	No	61%	MERGE MD 414
				Yes	40%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	No	No	No	Yes	30%	MERGE MD 210
				Yes	32%	BETWEEN MD 210 AND I 295
				No	43%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	15%	BEFORE WOODROW WILSON BRIDGE
				Yes	8%	WOODROW WILSON BRIDGE

Figure A.46: I-495 Inner Loop Mainline 7-8 AM Overall Comparison

I-495 Outer Loop 7-8 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	No	-53%	WOODROW WILSON BRIDGE
				Yes	4%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	-4%	MERGE I 295
				Yes	2%	BETWEEN MD 210 AND I 295
				Yes	1%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	-5%	BETWEEN MD 414 AND MD 210
				Yes	-7%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	-10%	BETWEEN MD 5 AND MD 414
				Yes	-17%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	-14%	BETWEEN MD 218 AND MD 5
				Yes	-15%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	-5%	BETWEEN FORESTVILLE AND MD 218
				Yes	-2%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	No	Yes	-2%	BETWEEN MD 4 AND FORESTVILLE RD
				Yes	10%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	No			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	20%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				No	25%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	No	Yes	Yes	Yes	19%	BETWEEN ARENA DR AND MD 214
				Yes	20%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	29%	BETWEEN MD 202 AND ARENA DR
				No	34%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	9%	BEFORE MD 202 MERGE
				Yes	16%	END 495 EXPRESS LANE
				No	32%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				No	34%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	No	No	No	40%	BETWEEN MD 450 AND US 50
				Yes	20%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-2%	BETWEEN MD 295 AND MD 450
				Yes	-5%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-9%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-16%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-10%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-4%	BETWEEN GREENBELT STATION AND US 1
				Yes	10%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	No	No	No	26%	BETWEEN US 1 AND I 95
				No	75%	I 95 MERGE
BETWEEN MD 650 AND I-95	Yes	No	No	Yes	-11%	BETWEEN MD 650 AND I 95
				Yes	-18%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	12%	BETWEEN MD 193 AND MD 650
				Yes	-5%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	No	No	Yes	6%	BETWEEN MD US 29 AND MD 193
				Yes	1%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	Yes	-19%	BETWEEN MD 97 AND US 29
				Yes	-19%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	No	Yes	Yes	Yes	5%	BETWEEN MD 185 AND MD 97
				Yes	14%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	Yes	Yes	Yes	-2%	BETWEEN MD 355 AND MD 185
				Yes	-12%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	Yes	Yes	Yes	-7%	MERGE AFTER I 270
				Yes	-4%	MERGE BEFORE I 270
				Yes	-8%	BETWEEN I 270 EAST AND MD 187
				Yes	-12%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	No	Yes	Yes	Yes	-15%	BETWEEN I 270 WEST AND MD 187
				No	-64%	MERGE I 270
BETWEEN MD 190 AND I-270	Yes	Yes	Yes	Yes	-8%	BETWEEN MD 190 AND I 270
				Yes	-24%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	-24%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				No	-58%	MERGE CABIN JOHN PARKWAY
				Yes	-12%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				Yes	-10%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	-10%	BEFORE AMERICAN LEGION BRIDGE
				Yes	-9%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	-7%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-11%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-13%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-13%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.47: I-495 Outer Loop Mainline 7-8 AM Overall Comparison

I-495 Inner Loop 8-9 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	11%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-71%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-25%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	-47%	AMERICAN LEGION BRIDGE
				Yes	19%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	18%	MERGE CLARA BARTON PARKWAY
				Yes	6%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-4%	MERGE CABIN JOHN PARKWAY
				Yes	-6%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	No	No	No	Yes	-5%	MERGE MD 190
				Yes	-8%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	Yes	No	Yes	-8%	MERGE I 270
				Yes	-7%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	-3%	MERGE MD 187
				Yes	13%	BETWEEN MD 187 AND I 270
				Yes	6%	MERGE BEFORE I 270
				Yes	9%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	21%	MD 355 MERGE
				Yes	28%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	Yes	Yes	No	Yes	15%	MD 185 MERGE
				Yes	16%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	Yes	Yes	No	Yes	2%	MD 97 MERGE
				Yes	1%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	Yes	Yes	No	Yes	0%	MERGE US 29
				Yes	-3%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	-32%	MERGE MD 193
				Yes	-6%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	-5%	MERGE MD 650
				Yes	1%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-1%	BEFORE I 95 MERGE
				Yes	34%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	Yes	No	Yes	18%	MERGE US 1
				Yes	17%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-10%	AFTER GREENBELT STATION MERGE
				Yes	-7%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	Yes	No	Yes	-13%	MERGE MD 201
				Yes	-4%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-8%	MERGE MD 295
				Yes	-20%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	1%	MERGE MD 450
				Yes	4%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	2%	MERGE US 50
				Yes	7%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-13%	END 495 EXPRESS LANE
				Yes	-11%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	Yes	No	Yes	-11%	MERGE MD 202
				Yes	-9%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	Yes	No	No	Yes	1%	MERGE ARENA DR
				Yes	9%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	23%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			MERGE RITCHIE MARLBORO RD
				Yes	17%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	13%	MERGE MD 4
				Yes	9%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	4%	MERGE FORESTVILLE RD
				Yes	4%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	No	No	Yes	2%	MERGE MD 218
				Yes	1%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	No	40%	MERGE MD 5
				No	66%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	No	No	No	70%	MERGE MD 414
				No	55%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	48%	MERGE MD 210
				Yes	43%	BETWEEN MD 210 AND I 295
				No	45%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	No	28%	BEFORE WOODROW WILSON BRIDGE
				Yes	20%	WOODROW WILSON BRIDGE

Figure A.48: I-495 Inner Loop Mainline 8-9 AM Overall Comparison

I-495 Outer Loop 8-9 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	No	-112%	WOODROW WILSON BRIDGE
				Yes	-3%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	-6%	MERGE I 295
				Yes	1%	BETWEEN MD 210 AND I 295
				Yes	-2%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	-5%	BETWEEN MD 414 AND MD 210
				Yes	-8%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	Yes	No	Yes	-18%	BETWEEN MD 5 AND MD 414
				Yes	-13%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	11%	BETWEEN MD 218 AND MD 5
				Yes	15%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	25%	BETWEEN FORESTVILLE AND MD 218
				No	29%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	22%	BETWEEN MD 4 AND FORESTVILLE RD
				No	27%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	No	27%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				Yes	22%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	No	Yes	No	Yes	13%	BETWEEN ARENA DR AND MD 214
				Yes	22%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	8%	BETWEEN MD 202 AND ARENA DR
				Yes	-7%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-76%	BEFORE MD 202 MERGE
				Yes	-4%	END 495 EXPRESS LANE
				No	36%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				No	40%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	Yes	No	No	47%	BETWEEN MD 450 AND US 50
				No	36%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	10%	BETWEEN MD 295 AND MD 450
				Yes	-5%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-10%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-19%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-14%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-1%	BETWEEN GREENBELT STATION AND US 1
				Yes	10%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	No	No	Yes	21%	BETWEEN US 1 AND I 95
				No	78%	I 95 MERGE
BETWEEN MD 650 AND I-95	Yes	No	No	Yes	14%	BETWEEN MD 650 AND I 95
				Yes	3%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	30%	BETWEEN MD 193 AND MD 650
				Yes	16%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	No	No	Yes	22%	BETWEEN MD US 29 AND MD 193
				Yes	13%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	No	No	Yes	-8%	BETWEEN MD 97 AND US 29
				Yes	-1%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	Yes	Yes	Yes	7%	BETWEEN MD 185 AND MD 97
				Yes	6%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	Yes	No	Yes	-6%	BETWEEN MD 355 AND MD 185
				Yes	-5%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	No	Yes	Yes	Yes	0%	MERGE AFTER I 270
				Yes	2%	MERGE BEFORE I 270
				Yes	0%	BETWEEN I 270 EAST AND MD 187
				Yes	5%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	No	No	No	Yes	9%	BETWEEN I 270 WEST AND MD 187
				Yes	9%	MERGE I 270
BETWEEN MD 190 AND I-270	Yes	Yes	Yes	Yes	21%	BETWEEN MD 190 AND I 270
				Yes	20%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	20%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	4%	MERGE CABIN JOHN PARKWAY
				Yes	14%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				Yes	8%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	4%	BEFORE AMERICAN LEGION BRIDGE
				Yes	-4%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	-3%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	6%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	14%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	4%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.49: I-495 Outer Loop Mainline 8-9 AM Overall Comparison

I-495 Inner Loop 9-10 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	-36%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-90%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-30%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	-50%	AMERICAN LEGION BRIDGE
				Yes	22%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	Yes	No	Yes	19%	MERGE CLARA BARTON PARKWAY
				Yes	2%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-7%	MERGE CABIN JOHN PARKWAY
				Yes	-9%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	No	Yes	No	Yes	-8%	MERGE MD 190
				Yes	-9%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	-8%	MERGE I 270
				Yes	-5%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	10%	MERGE MD 187
				Yes	23%	BETWEEN MD 187 AND I 270
				Yes	5%	MERGE BEFORE I 270
				Yes	10%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	No	34%	MD 355 MERGE
				No	38%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	Yes	Yes	Yes	Yes	19%	MD 185 MERGE
				Yes	25%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	Yes	12%	MD 97 MERGE
				Yes	13%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	Yes	Yes	No	Yes	18%	MERGE US 29
				Yes	24%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	23%	MERGE MD 193
				Yes	12%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	1%	MERGE MD 650
				Yes	2%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-15%	BEFORE I 95 MERGE
				Yes	-19%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-6%	MERGE US 1
				Yes	10%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-3%	AFTER GREENBELT STATION MERGE
				Yes	0%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-1%	MERGE MD 201
				Yes	4%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	-3%	MERGE MD 295
				Yes	-8%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	13%	MERGE MD 450
				Yes	10%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	7%	MERGE US 50
				Yes	12%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-3%	END 495 EXPRESS LANE
				Yes	-2%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	Yes	Yes	Yes	-1%	MERGE MD 202
				Yes	1%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	Yes	No	No	Yes	7%	MERGE ARENA DR
				Yes	9%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	17%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	Yes	No	No			MERGE RITCHIE MARLBORO RD
				Yes	10%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	8%	MERGE MD 4
				Yes	9%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	14%	MERGE FORESTVILLE RD
				Yes	12%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	No	No	Yes	3%	MERGE MD 218
				Yes	-1%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	9%	MERGE MD 5
				Yes	23%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	No	No	32%	MERGE MD 414
				No	30%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	No	No	No	31%	MERGE MD 210
				No	37%	BETWEEN MD 210 AND I 295
				Yes	24%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	6%	BEFORE WOODROW WILSON BRIDGE
				Yes	3%	WOODROW WILSON BRIDGE

Figure A.50: I-495 Inner Loop Mainline 9-10 AM Overall Comparison

I-495 Outer Loop 9-10 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	No	-43%	WOODROW WILSON BRIDGE
				Yes	-3%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	-6%	MERGE I 295
				Yes	2%	BETWEEN MD 210 AND I 295
				Yes	-2%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	No	Yes	-5%	BETWEEN MD 414 AND MD 210
				Yes	-5%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	-6%	BETWEEN MD 5 AND MD 414
				Yes	-4%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	4%	BETWEEN MD 218 AND MD 5
				Yes	7%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	15%	BETWEEN FORESTVILLE AND MD 218
				Yes	17%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	14%	BETWEEN MD 4 AND FORESTVILLE RD
				Yes	16%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	Yes	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	16%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				Yes	20%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	Yes	Yes	No	Yes	19%	BETWEEN ARENA DR AND MD 214
				No	26%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	26%	BETWEEN MD 202 AND ARENA DR
				Yes	15%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-49%	BEFORE MD 202 MERGE
				Yes	-14%	END 495 EXPRESS LANE
				Yes	29%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				No	29%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	No	No	No	38%	BETWEEN MD 450 AND US 50
				No	30%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	4%	BETWEEN MD 295 AND MD 450
				Yes	-10%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-11%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-15%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	-12%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-7%	BETWEEN GREENBELT STATION AND US 1
				Yes	-6%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-6%	BETWEEN US 1 AND I 95
				Yes	29%	I 95 MERGE
BETWEEN MD 650 AND I-95	Yes	Yes	No	Yes	11%	BETWEEN MD 650 AND I 95
				Yes	15%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	-12%	BETWEEN MD 193 AND MD 650
				Yes	-53%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	Yes	No	Yes	-29%	BETWEEN MD US 29 AND MD 193
				Yes	-29%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	Yes	No	Yes	-34%	BETWEEN MD 97 AND US 29
				Yes	-30%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	No	No	Yes	-1%	BETWEEN MD 185 AND MD 97
				Yes	4%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	-4%	BETWEEN MD 355 AND MD 185
				Yes	-5%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	1%	MERGE AFTER I 270
				Yes	7%	MERGE BEFORE I 270
				Yes	3%	BETWEEN I 270 EAST AND MD 187
				Yes	5%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	Yes	Yes	Yes	Yes	11%	BETWEEN I 270 WEST AND MD 187
				Yes	25%	MERGE I 270
BETWEEN MD 190 AND I-270	No	Yes	Yes	No	35%	BETWEEN MD 190 AND I 270
				No	45%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	No	46%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				No	47%	MERGE CABIN JOHN PARKWAY
				No	35%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				No	27%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	20%	BEFORE AMERICAN LEGION BRIDGE
				Yes	10%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	Yes	16%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	23%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	22%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	12%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.51: I-495 Outer Loop Mainline 9-10 AM Overall Comparison

I-495 Inner Loop 3-4 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	Yes	Yes	No	79%	VA-193/GEORGETOWN PIKE/EXIT 13
				No	74%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				No	60%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				No	49%	AMERICAN LEGION BRIDGE
				Yes	38%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	Yes	No	Yes	22%	MERGE CLARA BARTON PARKWAY
				Yes	-36%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-64%	MERGE CABIN JOHN PARKWAY
				Yes	-67%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	Yes	Yes	Yes	Yes	-52%	MERGE MD 190
				Yes	2%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	-3%	MERGE I 270
				Yes	-1%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	No	42%	MERGE MD 187
				No	70%	BETWEEN MD 187 AND I 270
				No	67%	MERGE BEFORE I 270
				No	75%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	No	70%	MD 355 MERGE
				No	50%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	No	Yes	Yes	Yes	-10%	MD 185 MERGE
				Yes	-35%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	No	Yes	Yes	No	-101%	MD 97 MERGE
				Yes	-1%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	Yes	Yes	Yes	Yes	8%	MERGE US 29
				Yes	-6%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	Yes	Yes	Yes	-29%	MERGE MD 193
				Yes	-14%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	No	Yes	-14%	MERGE MD 650
				Yes	13%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-5%	BEFORE I 95 MERGE
				Yes	4%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	-3%	MERGE US 1
				No	44%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	No	36%	AFTER GREENBELT STATION MERGE
				No	37%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	No	38%	MERGE MD 201
				Yes	30%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	28%	MERGE MD 295
				Yes	18%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	31%	MERGE MD 450
				Yes	11%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	Yes	No	Yes	-18%	MERGE US 50
				Yes	-1%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-68%	END 495 EXPRESS LANE
				No	-78%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-71%	MERGE MD 202
				Yes	-45%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	No	Yes	Yes	Yes	29%	MERGE ARENA DR
				No	40%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	Yes	Yes	No	41%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	No	No			MERGE RITCHIE MARLBORO RD
				Yes	13%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	No	Yes	Yes	Yes	-2%	MERGE MD 4
				Yes	-6%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	6%	MERGE FORESTVILLE RD
				Yes	10%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	No	Yes	No	Yes	9%	MERGE MD 218
				Yes	2%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	Yes	Yes	Yes	6%	MERGE MD 5
				Yes	4%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	No	Yes	Yes	Yes	-1%	MERGE MD 414
				Yes	0%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	Yes	No	Yes	-6%	MERGE MD 210
				Yes	2%	BETWEEN MD 210 AND I 295
				Yes	-6%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	-1%	BEFORE WOODROW WILSON BRIDGE
				Yes	-4%	WOODROW WILSON BRIDGE

Figure A.52: I-495 Inner Loop Mainline 3-4 PM Overall Comparison

I-495 Outer Loop 3-4 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	Yes	-4%	WOODROW WILSON BRIDGE
				Yes	2%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	2%	MERGE I 295
				Yes	20%	BETWEEN MD 210 AND I 295
				Yes	20%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	No	Yes	12%	BETWEEN MD 414 AND MD 210
				Yes	15%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	Yes	Yes	Yes	24%	BETWEEN MD 5 AND MD 414
				No	40%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	No	42%	BETWEEN MD 218 AND MD 5
				No	43%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				No	41%	BETWEEN FORESTVILLE AND MD 218
				Yes	-7%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	19%	BETWEEN MD 4 AND FORESTVILLE RD
				No	37%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	Yes	No	Yes	17%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				Yes	-5%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	Yes	Yes	Yes	Yes	-22%	BETWEEN ARENA DR AND MD 214
				Yes	-24%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-56%	BETWEEN MD 202 AND ARENA DR
				Yes	-61%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	Yes	Yes	Yes	-148%	BEFORE MD 202 MERGE
				Yes	-49%	END 495 EXPRESS LANE
				Yes	9%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-4%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	Yes	Yes	Yes	7%	BETWEEN MD 450 AND US 50
				Yes	6%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	Yes	Yes	Yes	8%	BETWEEN MD 295 AND MD 450
				Yes	-1%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-16%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-66%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	Yes	Yes	No	-92%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	Yes	Yes	Yes	-23%	BETWEEN GREENBELT STATION AND US 1
				Yes	-2%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	Yes	Yes	Yes	-2%	BETWEEN US 1 AND I 95
				Yes	-4%	I 95 MERGE
BETWEEN MD 650 AND I-95	No	No	No	Yes	26%	BETWEEN MD 650 AND I 95
				No	44%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	Yes	Yes	No	50%	BETWEEN MD 193 AND MD 650
				No	40%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	No	No	No	45%	BETWEEN MD US 29 AND MD 193
				No	45%	MERGE US 29
BETWEEN MD 97 AND US 29	No	Yes	Yes	No	45%	BETWEEN MD 97 AND US 29
				Yes	34%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	Yes	Yes	Yes	12%	BETWEEN MD 185 AND MD 97
				No	-103%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	Yes	Yes	Yes	-12%	BETWEEN MD 355 AND MD 185
				Yes	-4%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	Yes	No	Yes	2%	MERGE AFTER I 270
				Yes	0%	MERGE BEFORE I 270
				Yes	1%	BETWEEN I 270 EAST AND MD 187
				Yes	8%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	Yes	Yes	Yes	Yes	15%	BETWEEN I 270 WEST AND MD 187
				Yes	33%	MERGE I 270
BETWEEN MD 190 AND I-270	No	Yes	Yes	Yes	23%	BETWEEN MD 190 AND I 270
				Yes	-20%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	No	Yes	Yes	Yes	-20%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	-38%	MERGE CABIN JOHN PARKWAY
				Yes	-2%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				Yes	22%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	7%	BEFORE AMERICAN LEGION BRIDGE
				No	-220%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	No	-223%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				No	-165%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-61%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-82%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.53: I-495 Outer Loop Mainline 3-4 PM Overall Comparison

I-495 Inner Loop 4-5 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	Yes	Yes	No	Yes	65%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	6%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	33%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	17%	AMERICAN LEGION BRIDGE
				Yes	11%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	9%	MERGE CLARA BARTON PARKWAY
				Yes	7%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	12%	MERGE CABIN JOHN PARKWAY
				Yes	0%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	Yes	No	No	Yes	10%	MERGE MD 190
				Yes	31%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	2%	MERGE I 270
				Yes	-35%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	No	-73%	MERGE MD 187
				Yes	5%	BETWEEN MD 187 AND I 270
				Yes	44%	MERGE BEFORE I 270
				No	67%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	14%	MD 355 MERGE
				Yes	6%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	No	Yes	No	Yes	-13%	MD 185 MERGE
				Yes	2%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	No	Yes	Yes	Yes	-29%	MD 97 MERGE
				Yes	13%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	No	Yes	Yes	Yes	-21%	MERGE US 29
				Yes	-57%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	Yes	No	Yes	-29%	MERGE MD 193
				Yes	3%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	No	Yes	-2%	MERGE MD 650
				Yes	23%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	Yes	19%	BEFORE I 95 MERGE
				Yes	11%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	29%	MERGE US 1
				No	59%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	No	53%	AFTER GREENBELT STATION MERGE
				No	47%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	No	50%	MERGE MD 201
				No	43%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	36%	MERGE MD 295
				Yes	16%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	Yes	No	Yes	13%	MERGE MD 450
				Yes	-84%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-47%	MERGE US 50
				Yes	6%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-19%	END 495 EXPRESS LANE
				Yes	-23%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	Yes	No	Yes	-4%	MERGE MD 202
				Yes	10%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	No	Yes	No	No	50%	MERGE ARENA DR
				No	52%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	No	47%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	No	No			MERGE RITCHIE MARLBORO RD
				Yes	16%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	-5%	MERGE MD 4
				Yes	-3%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	11%	MERGE FORESTVILLE RD
				Yes	13%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	Yes	Yes	Yes	12%	MERGE MD 218
				Yes	1%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	-1%	MERGE MD 5
				Yes	-2%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	-2%	MERGE MD 414
				Yes	1%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	9%	MERGE MD 210
				Yes	10%	BETWEEN MD 210 AND I 295
				Yes	9%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	15%	BEFORE WOODROW WILSON BRIDGE
				Yes	9%	WOODROW WILSON BRIDGE

Figure A.54: I-495 Inner Loop Mainline 4-5 PM Overall Comparison

I-495 Outer Loop 4-5 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	Yes	-16%	WOODROW WILSON BRIDGE
				Yes	3%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	-6%	MERGE I 295
				Yes	5%	BETWEEN MD 210 AND I 295
				Yes	7%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	No	Yes	5%	BETWEEN MD 414 AND MD 210
				Yes	22%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	Yes	Yes	No	43%	BETWEEN MD 5 AND MD 414
				No	60%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	Yes	No	No	58%	BETWEEN MD 218 AND MD 5
				No	51%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	41%	BETWEEN FORESTVILLE AND MD 218
				Yes	1%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	32%	BETWEEN MD 4 AND FORESTVILLE RD
				No	48%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	No			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	Yes	Yes	Yes	-56%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				No	-249%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	No	Yes	Yes	No	-154%	BETWEEN ARENA DR AND MD 214
				Yes	-82%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-84%	BETWEEN MD 202 AND ARENA DR
				Yes	-61%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-121%	BEFORE MD 202 MERGE
				Yes	-31%	END 495 EXPRESS LANE
				Yes	14%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	12%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	Yes	No	Yes	27%	BETWEEN MD 450 AND US 50
				Yes	28%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	Yes	Yes	Yes	-7%	BETWEEN MD 295 AND MD 450
				Yes	-114%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-93%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-103%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	Yes	Yes	No	-94%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	No	Yes	Yes	Yes	-19%	BETWEEN GREENBELT STATION AND US 1
				Yes	-1%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	Yes	Yes	Yes	-1%	BETWEEN US 1 AND I 95
				Yes	-10%	I 95 MERGE
BETWEEN MD 650 AND I-95	No	No	No	Yes	4%	BETWEEN MD 650 AND I 95
				Yes	20%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	Yes	Yes	No	40%	BETWEEN MD 193 AND MD 650
				Yes	34%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	Yes	Yes	No	40%	BETWEEN MD US 29 AND MD 193
				Yes	39%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	Yes	Yes	No	43%	BETWEEN MD 97 AND US 29
				Yes	36%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	Yes	Yes	Yes	24%	BETWEEN MD 185 AND MD 97
				Yes	-1%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	Yes	Yes	Yes	4%	BETWEEN MD 355 AND MD 185
				Yes	10%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	15%	MERGE AFTER I 270
				Yes	17%	MERGE BEFORE I 270
				Yes	23%	BETWEEN I 270 EAST AND MD 187
				No	43%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	47%	BETWEEN I 270 WEST AND MD 187
				Yes	38%	MERGE I 270
BETWEEN MD 190 AND I-270	No	No	No	Yes	9%	BETWEEN MD 190 AND I 270
				Yes	-22%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	No	Yes	Yes	Yes	-22%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	-14%	MERGE CABIN JOHN PARKWAY
				Yes	27%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				Yes	29%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	-7%	BEFORE AMERICAN LEGION BRIDGE
				No	46%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	No	39%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				No	52%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				No	57%	VA-193/GEORGETOWN PIKE/EXIT 13
				No	46%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.55: I-495 Outer Loop Mainline 4-5 PM Overall Comparison

I-495 Inner Loop 5-6 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	Yes	Yes	Yes	Yes	-6%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-1%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	34%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	19%	AMERICAN LEGION BRIDGE
				Yes	5%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	No	No	Yes	6%	MERGE CLARA BARTON PARKWAY
				Yes	6%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	13%	MERGE CABIN JOHN PARKWAY
				Yes	5%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	Yes	No	No	Yes	12%	MERGE MD 190
				Yes	22%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	-29%	MERGE I 270
				No	-104%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	No	-140%	MERGE MD 187
				Yes	-9%	BETWEEN MD 187 AND I 270
				Yes	27%	MERGE BEFORE I 270
				Yes	16%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	16%	MD 355 MERGE
				Yes	11%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	No	Yes	Yes	Yes	-19%	MD 185 MERGE
				Yes	-12%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	No	Yes	Yes	Yes	-54%	MD 97 MERGE
				Yes	-20%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	No	Yes	Yes	Yes	-97%	MERGE US 29
				Yes	-58%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	Yes	No	Yes	-24%	MERGE MD 193
				Yes	19%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	19%	MERGE MD 650
				No	40%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	No	No	No	45%	BEFORE I 95 MERGE
				Yes	18%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	32%	MERGE US 1
				No	56%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	No	46%	AFTER GREENBELT STATION MERGE
				Yes	22%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	31%	MERGE MD 201
				Yes	6%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	2%	MERGE MD 295
				Yes	-5%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	-21%	MERGE MD 450
				No	-137%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-28%	MERGE US 50
				Yes	14%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-21%	END 495 EXPRESS LANE
				Yes	-18%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	Yes	No	Yes	-2%	MERGE MD 202
				Yes	8%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	No	Yes	No	No	49%	MERGE ARENA DR
				No	50%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	No	41%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			MERGE RITCHIE MARLBORO RD
				Yes	17%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	Yes	Yes	Yes	4%	MERGE MD 4
				Yes	8%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	17%	MERGE FORESTVILLE RD
				Yes	18%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	Yes	No	Yes	16%	MERGE MD 218
				Yes	7%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	2%	MERGE MD 5
				Yes	-1%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	-1%	MERGE MD 414
				Yes	6%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	-5%	MERGE MD 210
				Yes	-19%	BETWEEN MD 210 AND I 295
				Yes	37%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	27%	BEFORE WOODROW WILSON BRIDGE
				Yes	23%	WOODROW WILSON BRIDGE

Figure A.56: I-495 Inner Loop Mainline 5-6 PM Overall Comparison

I-495 Outer Loop 5-6 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	Yes	-39%	WOODROW WILSON BRIDGE
				Yes	4%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	-4%	MERGE I 295
				Yes	11%	BETWEEN MD 210 AND I 295
				Yes	16%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	No	No	Yes	10%	BETWEEN MD 414 AND MD 210
				Yes	17%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	Yes	Yes	No	34%	BETWEEN MD 5 AND MD 414
				No	53%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	No	No	No	50%	BETWEEN MD 218 AND MD 5
				Yes	38%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	26%	BETWEEN FORESTVILLE AND MD 218
				Yes	-1%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	24%	BETWEEN MD 4 AND FORESTVILLE RD
				No	37%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	-28%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				No	-148%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	No	Yes	Yes	No	-128%	BETWEEN ARENA DR AND MD 214
				Yes	-58%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-64%	BETWEEN MD 202 AND ARENA DR
				Yes	-38%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-92%	BEFORE MD 202 MERGE
				Yes	-11%	END 495 EXPRESS LANE
				Yes	31%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				No	54%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	Yes	Yes	No	52%	BETWEEN MD 450 AND US 50
				Yes	33%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	Yes	Yes	Yes	-43%	BETWEEN MD 295 AND MD 450
				Yes	-115%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-71%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-79%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	Yes	Yes	No	-88%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	No	Yes	Yes	Yes	-16%	BETWEEN GREENBELT STATION AND US 1
				Yes	1%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	Yes	Yes	Yes	4%	BETWEEN US 1 AND I 95
				Yes	-9%	I 95 MERGE
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	7%	BETWEEN MD 650 AND I 95
				Yes	18%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	No	No	Yes	15%	BETWEEN MD 193 AND MD 650
				Yes	19%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	Yes	No	Yes	23%	BETWEEN MD US 29 AND MD 193
				Yes	9%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	No	No	Yes	28%	BETWEEN MD 97 AND US 29
				No	31%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	No	No	Yes	23%	BETWEEN MD 185 AND MD 97
				Yes	14%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	24%	BETWEEN MD 355 AND MD 185
				Yes	28%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	26%	MERGE AFTER I 270
				No	32%	MERGE BEFORE I 270
				Yes	30%	BETWEEN I 270 EAST AND MD 187
				No	51%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	7%	BETWEEN I 270 WEST AND MD 187
				Yes	-12%	MERGE I 270
BETWEEN MD 190 AND I-270	No	No	No	Yes	-13%	BETWEEN MD 190 AND I 270
				Yes	-27%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	No	Yes	Yes	Yes	-27%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	-17%	MERGE CABIN JOHN PARKWAY
				Yes	36%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				No	49%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	19%	BEFORE AMERICAN LEGION BRIDGE
				No	-121%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	No	-136%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-85%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-22%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-48%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.57: I-495 Outer Loop Mainline 5-6 PM Overall Comparison

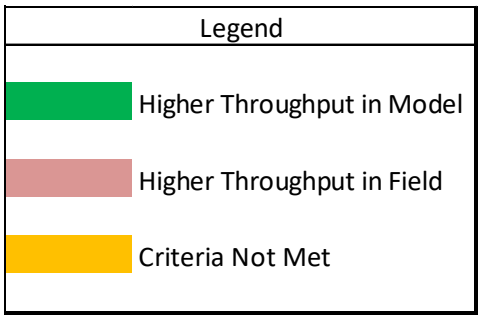
I-495 Inner Loop 6-7 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	Yes	Yes	Yes	-2%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-18%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	23%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
AMERICAN LEGION BRIDGE				Yes	11%	AMERICAN LEGION BRIDGE
				Yes	-19%	BEFORE AMERICAN LEGION BRIDGE
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	Yes	Yes	No	Yes	-27%	MERGE CLARA BARTON PARKWAY
				Yes	-32%	BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY
				Yes	-19%	MERGE CABIN JOHN PARKWAY
				Yes	-25%	BETWEEN CABIN JOHN PARKWAY AND MD 190
BETWEEN MD 190 AND I-270	No	Yes	Yes	Yes	-14%	MERGE MD 190
				Yes	1%	BETWEEN MD 190 AND I 270
BETWEEN I-270 WEST AND MD 187	Yes	No	No	Yes	-41%	MERGE I 270
				No	-65%	BETWEEN I 270 AND MD 187
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	-24%	MERGE MD 187
				Yes	2%	BETWEEN MD 187 AND I 270
				Yes	13%	MERGE BEFORE I 270
				Yes	9%	MERGE AFTER I 270
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	-3%	MD 355 MERGE
				Yes	-13%	BETWEEN MD 355 AND MD 185
BETWEEN MD 185 AND MD 97	No	Yes	Yes	Yes	-54%	MD 185 MERGE
				Yes	-39%	BETWEEN MD 185 AND MD 97
BETWEEN MD 97 AND US 29	No	Yes	Yes	Yes	-100%	MD 97 MERGE
				Yes	-47%	BETWEEN MD 97 AND US 29
BETWEEN MD US 29 AND MD 193	No	No	No	No	-185%	MERGE US 29
				Yes	-118%	BETWEEN MD US 29 AND MD 193
BETWEEN MD 193 AND MD 650	Yes	Yes	Yes	Yes	-54%	MERGE MD 193
				Yes	-7%	BETWEEN MD 193 AND MD 650
BETWEEN MD 650 AND I-95	No	No	No	Yes	8%	MERGE MD 650
				Yes	29%	BETWEEN MD 650 AND I 95
BETWEEN US 1 AND I-95	Yes	Yes	Yes	Yes	19%	BEFORE I 95 MERGE
				Yes	37%	AFTER I 95 MERGE
BETWEEN GREENBELT STATION AND US 1	Yes	No	No	Yes	33%	MERGE US 1
				No	45%	BEFORE GREENBELT STATION MERGE
BETWEEN GREENBELT STATION AND MD 201	Yes	No	No	Yes	21%	AFTER GREENBELT STATION MERGE
				Yes	-14%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	27%	MERGE MD 201
				Yes	20%	BETWEEN MD 201 AND MD 295 MERGE
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	9%	MERGE MD 295
				Yes	-6%	BETWEEN MD 295 AND MD 450
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	-18%	MERGE MD 450
				No	-142%	BETWEEN MD 450 AND US 50
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-94%	MERGE US 50
				Yes	20%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				Yes	-25%	END 495 EXPRESS LANE
				Yes	-19%	BEFORE MD 202 MERGE
BETWEEN MD 202 AND ARENA DR	No	No	No	Yes	-39%	MERGE MD 202
				Yes	-25%	BETWEEN MD 202 AND ARENA DR
BETWEEN ARENA DR AND MD 214	No	Yes	No	Yes	35%	MERGE ARENA DR
				No	42%	BETWEEN ARENA DR AND MD 214
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	36%	MD 214 MERGE
						BETWEEN MD 214 AND RITCHIE MARLBORO RD
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			MERGE RITCHIE MARLBORO RD
				Yes	14%	BETWEEN RITCHIE MARLBORO AND MD 4
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	-3%	MERGE MD 4
				Yes	-4%	BETWEEN MD 4 AND FORESTVILLE RD
BETWEEN FORESTVILLE AND MD 218				Yes	9%	MERGE FORESTVILLE RD
				Yes	12%	BETWEEN FORESTVILLE AND MD 218
BETWEEN MD 218 AND MD 5	Yes	No	No	Yes	14%	MERGE MD 218
				Yes	15%	BETWEEN MD 218 AND MD 5
BETWEEN MD 5 AND MD 414	Yes	No	No	Yes	4%	MERGE MD 5
				Yes	0%	BETWEEN MD 5 AND MD 414
BETWEEN MD 414 AND MD 210	Yes	Yes	No	Yes	-2%	MERGE MD 414
				Yes	1%	BETWEEN MD 414 AND MD 210
BETWEEN MD 210 AND I-295	Yes	No	No	Yes	-3%	MERGE MD 210
				Yes	6%	BETWEEN MD 210 AND I 295
				Yes	19%	MERGE I 295
WOODROW WILSON BRIDGE	Yes	No	No	Yes	17%	BEFORE WOODROW WILSON BRIDGE
				Yes	18%	WOODROW WILSON BRIDGE

Figure A.58: I-495 Inner Loop Mainline 6-7 PM Overall Comparison

I-495 Outer Loop 6-7 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
WOODROW WILSON BRIDGE	Yes	No	No	Yes	-32%	WOODROW WILSON BRIDGE
				Yes	4%	BEFORE WOODROW WILSON BRIDGE
BETWEEN MD 210 AND I-295	Yes	Yes	Yes	Yes	-5%	MERGE I 295
				Yes	4%	BETWEEN MD 210 AND I 295
				Yes	1%	MERGE MD 210
BETWEEN MD 414 AND MD 210	Yes	Yes	Yes	Yes	-3%	BETWEEN MD 414 AND MD 210
				Yes	-4%	MERGE MD 414
BETWEEN MD 5 AND MD 414	Yes	Yes	Yes	Yes	5%	BETWEEN MD 5 AND MD 414
				Yes	25%	MERGE MD 5
BETWEEN MD 218 AND MD 5	Yes	No	No	Yes	27%	BETWEEN MD 218 AND MD 5
				Yes	30%	MERGE MD 218
BETWEEN FORESTVILLE AND MD 218				Yes	28%	BETWEEN FORESTVILLE AND MD 218
				Yes	18%	MERGE MD 337
BETWEEN MD 4 AND FORESTVILLE RD	Yes	No	No	Yes	8%	BETWEEN MD 4 AND FORESTVILLE RD
				Yes	19%	MERGE MD 4
BETWEEN RITCHIE MARLBORO AND MD 4	No	Yes	Yes			BETWEEN RITCHIE MARLBORO AND MD 4
						MERGE RITCHIE MARLBORO RD
BETWEEN MD 214 AND RITCHIE MARLBORO RD	Yes	No	No	Yes	2%	BETWEEN MD 214 AND RITCHIE MARLBORO RD
				No	-74%	MERGE MD 214
BETWEEN ARENA DR AND MD 214	No	Yes	Yes	No	-146%	BETWEEN ARENA DR AND MD 214
				Yes	-104%	MERGE ARENA DR
BETWEEN MD 202 AND ARENA DR	No	Yes	No	Yes	-107%	BETWEEN MD 202 AND ARENA DR
				Yes	-68%	MERGE MD 202
BETWEEN US 50 AND MD 202	Yes	No	No	Yes	-142%	BEFORE MD 202 MERGE
				Yes	-51%	END 495 EXPRESS LANE
				Yes	21%	BETWEEN US 50 AND MD 202 (495 EXPRESS LANE)
				No	49%	MERGE US 50
BETWEEN MD 450 AND US 50	Yes	No	No	Yes	41%	BETWEEN MD 450 AND US 50
				Yes	32%	MERGE MD 450
BETWEEN MD 295 AND MD 450	Yes	No	No	Yes	3%	BETWEEN MD 295 AND MD 450
				Yes	-81%	MERGE MD 295
BETWEEN MD 201 AND MD 295	Yes	No	No	Yes	-64%	BETWEEN MD 201 AND MD 295 MERGE
				Yes	-81%	MERGE MD 201
BETWEEN GREENBELT STATION AND MD 201	Yes	Yes	No	Yes	-71%	BETWEEN GREENBELT STATION AND MD 201
BETWEEN GREENBELT STATION AND US 1	Yes	Yes	No	Yes	-16%	BETWEEN GREENBELT STATION AND US 1
				Yes	-2%	MERGE US 1
BETWEEN US 1 AND I-95	Yes	No	No	Yes	-4%	BETWEEN US 1 AND I 95
				Yes	-8%	I 95 MERGE
BETWEEN MD 650 AND I-95	No	Yes	Yes	Yes	15%	BETWEEN MD 650 AND I 95
				Yes	4%	MERGE MD 650
BETWEEN MD 193 AND MD 650	Yes	Yes	Yes	Yes	-6%	BETWEEN MD 193 AND MD 650
				Yes	-4%	MERGE MD 193
BETWEEN MD US 29 AND MD 193	Yes	Yes	Yes	Yes	-2%	BETWEEN MD US 29 AND MD 193
				Yes	-15%	MERGE US 29
BETWEEN MD 97 AND US 29	Yes	No	No	Yes	0%	BETWEEN MD 97 AND US 29
				Yes	-1%	MD 97 MERGE
BETWEEN MD 185 AND MD 97	Yes	No	No	Yes	-3%	BETWEEN MD 185 AND MD 97
				Yes	-19%	MD 185 MERGE
BETWEEN MD 355 AND MD 185	Yes	No	No	Yes	-8%	BETWEEN MD 355 AND MD 185
				Yes	9%	MD 355 MERGE
BETWEEN I-270 EAST AND MD 187	Yes	No	No	Yes	13%	MERGE AFTER I 270
				Yes	0%	MERGE BEFORE I 270
				Yes	-10%	BETWEEN I 270 EAST AND MD 187
				No	-262%	MERGE MD 187
BETWEEN I-270 WEST AND MD 187	Yes	No	No	No	-300%	BETWEEN I 270 WEST AND MD 187
				Yes	-74%	MERGE I 270
BETWEEN MD 190 AND I-270	No	Yes	Yes	Yes	-50%	BETWEEN MD 190 AND I 270
				Yes	-51%	MERGE MD 190
BETWEEN CLARA BARTON PKWY AND CABIN JOHN PKWY	No	Yes	Yes	Yes	-51%	BETWEEN CABIN JOHN PARKWAY AND MD 190
				Yes	-38%	MERGE CABIN JOHN PARKWAY
				Yes	19%	BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY
				No	43%	MERGE CLARA BARTON PARKWAY
AMERICAN LEGION BRIDGE				Yes	33%	BEFORE AMERICAN LEGION BRIDGE
				No	-119%	AMERICAN LEGION BRIDGE
BETWEEN VA-193 AND GW MEMORIAL PKWY	No	No	No	No	-109%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-79%	GEORGE WASHINGTON MEMORIAL PKWY/EXIT 14
				Yes	-60%	VA-193/GEORGETOWN PIKE/EXIT 13
				Yes	-79%	VA-193/GEORGETOWN PIKE/EXIT 13

Figure A.59: I-495 Outer Loop Mainline 6-7 PM Overall Comparison

I-270 Mainline Volume Tables



Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2583	3163	-22%	No	10.812	No
BETWEEN MD 80 AND MD 109	3122	3493	-12%	No	6.44673	No
BETWEEN MD 109 AND MD 121	3310	3963	-20%	No	10.8207	No
BETWEEN MD 121 AND MD 27	3502	5071	-45%	No	23.9577	No
BETWEEN MD 27 AND MD 118	4975	5613	-13%	No	8.76524	No
BETWEEN MD 118 AND MIDDLEBROOK RD	4119	6045	-47%	No	27.0139	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	5793	7735	-34%	No	23.6156	No
BETWEEN MD 124 AND MD 117	7886	8092	-3%	Yes	2.30751	Yes
BETWEEN MD 117 AND I-370	9827	9852	0%	Yes	0.24699	Yes
BETWEEN I-370 AND SHADY GROVE RD	10244	6177	40%	No	44.8807	No
BETWEEN SHADY GROVE RD AND MD 28	9384	6863	27%	No	27.9765	No
BETWEEN MD 28 AND MD 189	9995	6338	37%	No	40.4706	No
BETWEEN MD 189 AND MONTROSE RD	8609	6184	28%	No	28.1936	No
BETWEEN MONTROSE RD AND I-270 SPLIT	10171	9669	5%	Yes	5.04274	No
BETWEEN I-270 SPLIT AND MD 187	3941	3674	7%	Yes	4.32292	Yes
BETWEEN MD 187 AND I-495		3009	#DIV/0!	#DIV/0!	77.5725	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4308	5836	-35%	No	21.4585	No
BETWEEN DEMOCRACY BLVD AND I-495	4988	5677	-14%	No	9.43195	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	2363	2987	-26%	No	12.0603	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	2049	2913	-42%	No	17.346	No
BETWEEN MD 187 AND I-495		2476	#DIV/0!	#DIV/0!	70.3669	No
BETWEEN I-270 SPLIT AND MD 187	1844	1913	-4%	Yes	1.59772	Yes
BETWEEN MONTROSE RD AND I-270 SPLIT	4088	4858	-19%	No	11.5095	No
BETWEEN MD 189 AND MONTROSE RD	5214	2746	47%	No	39.1204	No
BETWEEN MD 28 AND MD 189	2919	2592	11%	No	6.22942	No
BETWEEN SHADY GROVE RD AND MD 28	2648	1927	27%	No	15.0862	No
BETWEEN I-370 AND SHADY GROVE RD	2468	1709	31%	No	16.6202	No
BETWEEN MD 117 AND I-370	2541	2819	-11%	No	5.37004	No
BETWEEN MD 124 AND MD 117	2257	2380	-5%	Yes	2.54935	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	2015	2843	-41%	No	16.8003	No
BETWEEN MD 118 AND MIDDLEBROOK RD	1789	2412	-35%	No	13.5883	No
BETWEEN MD 27 AND MD 118	1918	2183	-14%	No	5.8575	No
BETWEEN MD 121 AND MD 27	1575	1975	-25%	No	9.49985	No
BETWEEN MD 109 AND MD 121	1421	1639	-15%	No	5.56711	No
BETWEEN MD 80 AND MD 109	1147	1573	-37%	No	11.5578	No
BETWEEN MD 85 AND MD 80	1575	1729	-10%	Yes	3.77691	Yes

Figure A.60: I-270 Mainline 6-7 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2890	3301	-14%	No	7.38714	No
BETWEEN MD 80 AND MD 109	3038	3524	-16%	No	8.48884	No
BETWEEN MD 109 AND MD 121	3433	3955	-15%	No	8.59256	No
BETWEEN MD 121 AND MD 27	3608	4792	-33%	No	18.2731	No
BETWEEN MD 27 AND MD 118	3717	5150	-39%	No	21.5146	No
BETWEEN MD 118 AND MIDDLEBROOK RD	3465	5768	-66%	No	33.8919	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	5705	7605	-33%	No	23.2848	No
BETWEEN MD 124 AND MD 117	6721	7995	-19%	No	14.8494	No
BETWEEN MD 117 AND I-370	9364	9817	-5%	Yes	4.62822	Yes
BETWEEN I-370 AND SHADY GROVE RD	8893	5129	42%	No	44.9565	No
BETWEEN SHADY GROVE RD AND MD 28	8293	5832	30%	No	29.2809	No
BETWEEN MD 28 AND MD 189	9020	5542	39%	No	40.7633	No
BETWEEN MD 189 AND MONTROSE RD	8720	5523	37%	No	37.8808	No
BETWEEN MONTROSE RD AND I-270 SPLIT	10964	10191	7%	Yes	7.51355	No
BETWEEN I-270 SPLIT AND MD 187	4418	4805	-9%	Yes	5.69168	No
BETWEEN MD 187 AND I-495		3994	#DIV/0!	#DIV/0!	89.3784	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4252	5448	-28%	No	17.1668	No
BETWEEN DEMOCRACY BLVD AND I-495	4926	5405	-10%	Yes	6.66468	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	3938	3472	12%	No	7.66006	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	3492	3542	-1%	Yes	0.84311	Yes
BETWEEN MD 187 AND I-495		3390	#DIV/0!	#DIV/0!	82.3347	No
BETWEEN I-270 SPLIT AND MD 187	2499	2531	-1%	Yes	0.64306	Yes
BETWEEN MONTROSE RD AND I-270 SPLIT	6405	6086	5%	Yes	4.03972	Yes
BETWEEN MD 189 AND MONTROSE RD	7362	3362	54%	No	54.6256	No
BETWEEN MD 28 AND MD 189	5077	3172	38%	No	29.6626	No
BETWEEN SHADY GROVE RD AND MD 28	4375	2693	38%	No	28.2986	No
BETWEEN I-370 AND SHADY GROVE RD	3589	2316	35%	No	23.433	No
BETWEEN MD 117 AND I-370	4505	4067	10%	Yes	6.69034	No
BETWEEN MD 124 AND MD 117	3574	3043	15%	No	9.23164	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	3241	3718	-15%	No	8.0783	No
BETWEEN MD 118 AND MIDDLEBROOK RD	2719	3007	-11%	No	5.38703	No
BETWEEN MD 27 AND MD 118	2685	2705	-1%	Yes	0.39006	Yes
BETWEEN MD 121 AND MD 27	2257	2384	-6%	Yes	2.62617	Yes
BETWEEN MD 109 AND MD 121	2153	2194	-2%	Yes	0.86876	Yes
BETWEEN MD 80 AND MD 109	2029	2094	-3%	Yes	1.42614	Yes
BETWEEN MD 85 AND MD 80	2594	2429	6%	Yes	3.29244	Yes

Figure A.61: I-270 Mainline 7-8 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2715	3078	-13%	No	6.74481	No
BETWEEN MD 80 AND MD 109	3038	3533	-16%	No	8.63164	No
BETWEEN MD 109 AND MD 121	2166	3951	-82%	No	32.2802	No
BETWEEN MD 121 AND MD 27	3502	4618	-32%	No	17.5146	No
BETWEEN MD 27 AND MD 118	3946	4821	-22%	No	13.2087	No
BETWEEN MD 118 AND MIDDLEBROOK RD	5165	5542	-7%	Yes	5.1492	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	6056	7156	-18%	No	13.5339	No
BETWEEN MD 124 AND MD 117	5645	7717	-37%	No	25.3438	No
BETWEEN MD 117 AND I-370	9017	9442	-5%	Yes	4.4187	Yes
BETWEEN I-370 AND SHADY GROVE RD	7655	4267	44%	No	43.8891	No
BETWEEN SHADY GROVE RD AND MD 28	8293	4778	42%	No	43.4796	No
BETWEEN MD 28 AND MD 189	8898	4624	48%	No	51.9862	No
BETWEEN MD 189 AND MONTROSE RD	8278	4818	42%	No	42.7619	No
BETWEEN MONTROSE RD AND I-270 SPLIT	10171	9779	4%	Yes	3.92744	Yes
BETWEEN I-270 SPLIT AND MD 187	4538	4553	0%	Yes	0.21507	Yes
BETWEEN MD 187 AND I-495		3611	#DIV/0!	#DIV/0!	84.9794	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4028	5221	-30%	No	17.5432	No
BETWEEN DEMOCRACY BLVD AND I-495	4495	5306	-18%	No	11.5851	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	5155	4403	15%	No	10.8818	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4478	4467	0%	Yes	0.16822	Yes
BETWEEN MD 187 AND I-495		4622	#DIV/0!	#DIV/0!	96.1457	No
BETWEEN I-270 SPLIT AND MD 187	2856	3950	-38%	No	18.7458	No
BETWEEN MONTROSE RD AND I-270 SPLIT	8313	8417	-1%	Yes	1.13983	Yes
BETWEEN MD 189 AND MONTROSE RD	9509	4665	51%	No	57.5439	No
BETWEEN MD 28 AND MD 189	7615	4347	43%	No	42.264	No
BETWEEN SHADY GROVE RD AND MD 28	6332	3490	45%	No	40.5504	No
BETWEEN I-370 AND SHADY GROVE RD	4599	2917	37%	No	27.4468	No
BETWEEN MD 117 AND I-370	6007	4798	20%	No	16.445	No
BETWEEN MD 124 AND MD 117	4232	3448	19%	No	12.6517	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	3854	4277	-11%	No	6.62648	No
BETWEEN MD 118 AND MIDDLEBROOK RD	3291	3392	-3%	Yes	1.73865	Yes
BETWEEN MD 27 AND MD 118	2557	2809	-10%	Yes	4.86037	Yes
BETWEEN MD 121 AND MD 27	2362	2461	-4%	Yes	2.02104	Yes
BETWEEN MD 109 AND MD 121	2110	2312	-10%	Yes	4.29593	Yes
BETWEEN MD 80 AND MD 109	2294	2295	0%	Yes	0.02609	Yes
BETWEEN MD 85 AND MD 80	2641	2636	0%	Yes	0.09247	Yes

Figure A.62: I-270 Mainline 8-9 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2715	2874	-6%	Yes	3.00777	Yes
BETWEEN MD 80 AND MD 109	3038	3274	-8%	Yes	4.19218	Yes
BETWEEN MD 109 AND MD 121	2166	3844	-77%	No	30.6144	No
BETWEEN MD 121 AND MD 27	3502	4517	-29%	No	16.0295	No
BETWEEN MD 27 AND MD 118	3946	4885	-24%	No	14.124	No
BETWEEN MD 118 AND MIDDLEBROOK RD	5165	5265	-2%	Yes	1.3882	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	6056	6719	-11%	No	8.29256	No
BETWEEN MD 124 AND MD 117	5645	7140	-26%	No	18.6985	No
BETWEEN MD 117 AND I-370	9017	8766	3%	Yes	2.66454	Yes
BETWEEN I-370 AND SHADY GROVE RD	7655	4469	42%	No	40.9238	No
BETWEEN SHADY GROVE RD AND MD 28	8293	5735	31%	No	30.5402	No
BETWEEN MD 28 AND MD 189	8898	5460	39%	No	40.5731	No
BETWEEN MD 189 AND MONTROSE RD	8278	5375	35%	No	35.1356	No
BETWEEN MONTROSE RD AND I-270 SPLIT	10171	9211	9%	Yes	9.74925	No
BETWEEN I-270 SPLIT AND MD 187	4538	4145	9%	Yes	5.9606	No
BETWEEN MD 187 AND I-495		3370	#DIV/0!	#DIV/0!	82.0975	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4028	4897	-22%	No	13.0122	No
BETWEEN DEMOCRACY BLVD AND I-495	4495	4615	-3%	Yes	1.77066	Yes
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	4868	4304	12%	No	8.33221	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	4403	4370	1%	Yes	0.50582	Yes
BETWEEN MD 187 AND I-495		4000	#DIV/0!	#DIV/0!	89.4399	No
BETWEEN I-270 SPLIT AND MD 187	2796	3563	-27%	No	13.6066	No
BETWEEN MONTROSE RD AND I-270 SPLIT	7768	8041	-4%	Yes	3.06783	Yes
BETWEEN MD 189 AND MONTROSE RD	9202	4548	51%	No	56.1258	No
BETWEEN MD 28 AND MD 189	7361	4282	42%	No	40.3619	No
BETWEEN SHADY GROVE RD AND MD 28	6102	3390	44%	No	39.3664	No
BETWEEN I-370 AND SHADY GROVE RD	4150	2813	32%	No	22.6547	No
BETWEEN MD 117 AND I-370	5429	5082	6%	Yes	4.78304	Yes
BETWEEN MD 124 AND MD 117	3856	4112	-7%	Yes	4.05194	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	3942	4890	-24%	No	14.2586	No
BETWEEN MD 118 AND MIDDLEBROOK RD	3076	3927	-28%	No	14.3735	No
BETWEEN MD 27 AND MD 118	2365	3157	-33%	No	15.0639	No
BETWEEN MD 121 AND MD 27	2467	2648	-7%	Yes	3.57907	Yes
BETWEEN MD 109 AND MD 121	1766	2339	-32%	No	12.6426	No
BETWEEN MD 80 AND MD 109	1941	2279	-17%	No	7.35827	No
BETWEEN MD 85 AND MD 80	2224	2523	-13%	No	6.13232	No

Figure A.63: I-270 Mainline 9-10 AM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2189	2007	8%	Yes	3.97346	Yes
BETWEEN MD 80 AND MD 109	1956	1794	8%	Yes	3.74123	Yes
BETWEEN MD 109 AND MD 121	1880	1891	-1%	Yes	0.25907	Yes
BETWEEN MD 121 AND MD 27	2812	2233	21%	No	11.5335	No
BETWEEN MD 27 AND MD 118	2802	2735	2%	Yes	1.28292	Yes
BETWEEN MD 118 AND MIDDLEBROOK RD	3400	3232	5%	Yes	2.92184	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	4827	4128	14%	No	10.4423	No
BETWEEN MD 124 AND MD 117	4480	4370	2%	Yes	1.66118	Yes
BETWEEN MD 117 AND I-370	5780	5689	2%	Yes	1.20832	Yes
BETWEEN I-370 AND SHADY GROVE RD	3827	3081	19%	No	12.6889	No
BETWEEN SHADY GROVE RD AND MD 28	5783	4007	31%	No	25.3805	No
BETWEEN MD 28 AND MD 189	6826	3614	47%	No	44.453	No
BETWEEN MD 189 AND MONTROSE RD	6071	3607	41%	No	35.4293	No
BETWEEN MONTROSE RD AND I-270 SPLIT	7397	6717	9%	Yes	8.09162	No
BETWEEN I-270 SPLIT AND MD 187	3224	3468	-8%	Yes	4.21395	Yes
BETWEEN MD 187 AND I-495		3517	#DIV/0!	#DIV/0!	83.863	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	3524	3226	8%	Yes	5.13395	No
BETWEEN DEMOCRACY BLVD AND I-495	4003	3266	18%	No	12.2293	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	5298	4960	6%	Yes	4.7231	Yes
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5997	5401	10%	Yes	7.9017	No
BETWEEN MD 187 AND I-495		4337	#DIV/0!	#DIV/0!	93.1316	No
BETWEEN I-270 SPLIT AND MD 187	4521	4872	-8%	Yes	5.12177	No
BETWEEN MONTROSE RD AND I-270 SPLIT	9540	10836	-14%	No	12.8423	No
BETWEEN MD 189 AND MONTROSE RD	11042	7325	34%	No	38.7929	No
BETWEEN MD 28 AND MD 189	10534	7109	33%	No	36.4719	No
BETWEEN SHADY GROVE RD AND MD 28	9786	7350	25%	No	26.3171	No
BETWEEN I-370 AND SHADY GROVE RD	9983	6524	35%	No	38.0712	No
BETWEEN MD 117 AND I-370	9703	8209	15%	No	15.784	No
BETWEEN MD 124 AND MD 117	8088	6818	16%	No	14.7109	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	6920	8204	-19%	No	14.7654	No
BETWEEN MD 118 AND MIDDLEBROOK RD	6368	6790	-7%	Yes	5.20578	No
BETWEEN MD 27 AND MD 118	5625	6073	-8%	Yes	5.85142	No
BETWEEN MD 121 AND MD 27	4146	4504	-9%	Yes	5.4362	No
BETWEEN MD 109 AND MD 121	3359	4105	-22%	No	12.2154	No
BETWEEN MD 80 AND MD 109	3749	4063	-8%	Yes	5.02024	No
BETWEEN MD 85 AND MD 80	3382	4097	-21%	No	11.6962	No

Figure A.64: I-270 Mainline 3-4 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2539	2338	8%	Yes	4.06521	Yes
BETWEEN MD 80 AND MD 109	2206	2140	3%	Yes	1.41584	Yes
BETWEEN MD 109 AND MD 121	2125	2215	-4%	Yes	1.93202	Yes
BETWEEN MD 121 AND MD 27	2971	2610	12%	No	6.82898	No
BETWEEN MD 27 AND MD 118	2974	3025	-2%	Yes	0.92211	Yes
BETWEEN MD 118 AND MIDDLEBROOK RD	3596	3610	0%	Yes	0.2374	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	4915	4491	9%	Yes	6.1827	No
BETWEEN MD 124 AND MD 117	4480	4870	-9%	Yes	5.70392	No
BETWEEN MD 117 AND I-370	6358	6476	-2%	Yes	1.46994	Yes
BETWEEN I-370 AND SHADY GROVE RD	5741	3350	42%	No	35.4599	No
BETWEEN SHADY GROVE RD AND MD 28	5892	4215	28%	No	23.5943	No
BETWEEN MD 28 AND MD 189	6704	3814	43%	No	39.8477	No
BETWEEN MD 189 AND MONTROSE RD	5960	3808	36%	No	30.8011	No
BETWEEN MONTROSE RD AND I-270 SPLIT	7001	7212	-3%	Yes	2.50296	Yes
BETWEEN I-270 SPLIT AND MD 187	3284	3590	-9%	Yes	5.21536	No
BETWEEN MD 187 AND I-495		3642	#DIV/0!	#DIV/0!	85.3464	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	2965	3568	-20%	No	10.5506	No
BETWEEN DEMOCRACY BLVD AND I-495	2833	3398	-20%	No	10.1267	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	5298	4886	8%	Yes	5.77368	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5997	5354	11%	No	8.53169	No
BETWEEN MD 187 AND I-495		4287	#DIV/0!	#DIV/0!	92.5959	No
BETWEEN I-270 SPLIT AND MD 187	4521	5037	-11%	No	7.45713	No
BETWEEN MONTROSE RD AND I-270 SPLIT	9540	10943	-15%	No	13.866	No
BETWEEN MD 189 AND MONTROSE RD	11042	7831	29%	No	33.0604	No
BETWEEN MD 28 AND MD 189	10534	7530	29%	No	31.6145	No
BETWEEN SHADY GROVE RD AND MD 28	9786	7581	23%	No	23.6625	No
BETWEEN I-370 AND SHADY GROVE RD	9983	6427	36%	No	39.2605	No
BETWEEN MD 117 AND I-370	9703	8025	17%	No	17.8228	No
BETWEEN MD 124 AND MD 117	8088	6763	16%	No	15.3824	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	6920	8114	-17%	No	13.7715	No
BETWEEN MD 118 AND MIDDLEBROOK RD	6368	6716	-5%	Yes	4.30253	Yes
BETWEEN MD 27 AND MD 118	5625	6237	-11%	No	7.94355	No
BETWEEN MD 121 AND MD 27	4146	4953	-19%	No	11.9573	No
BETWEEN MD 109 AND MD 121	3359	4275	-27%	No	14.8264	No
BETWEEN MD 80 AND MD 109	3749	4210	-12%	No	7.30395	No
BETWEEN MD 85 AND MD 80	3382	4243	-25%	No	13.9405	No

Figure A.65: I-270 Mainline 4-5 PM Volumes

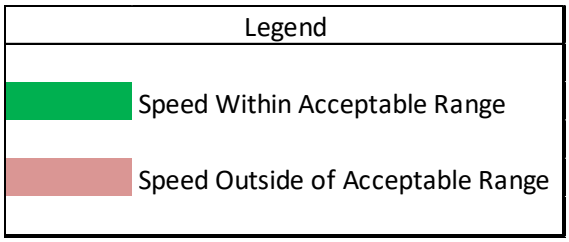
Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2802	2707	3%	Yes	1.8149	Yes
BETWEEN MD 80 AND MD 109	2539	2491	2%	Yes	0.96715	Yes
BETWEEN MD 109 AND MD 121	2452	2569	-5%	Yes	2.32524	Yes
BETWEEN MD 121 AND MD 27	3183	3045	4%	Yes	2.46845	Yes
BETWEEN MD 27 AND MD 118	3203	3259	-2%	Yes	0.97643	Yes
BETWEEN MD 118 AND MIDDLEBROOK RD	3988	3855	3%	Yes	2.12386	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	5178	4955	4%	Yes	3.13293	Yes
BETWEEN MD 124 AND MD 117	5197	5311	-2%	Yes	1.57275	Yes
BETWEEN MD 117 AND I-370	7052	7008	1%	Yes	0.52179	Yes
BETWEEN I-370 AND SHADY GROVE RD	5853	3622	38%	No	32.4134	No
BETWEEN SHADY GROVE RD AND MD 28	6547	4806	27%	No	23.1114	No
BETWEEN MD 28 AND MD 189	7557	4201	44%	No	43.7694	No
BETWEEN MD 189 AND MONTROSE RD	6733	4196	38%	No	34.3198	No
BETWEEN MONTROSE RD AND I-270 SPLIT	7530	7482	1%	Yes	0.55114	Yes
BETWEEN I-270 SPLIT AND MD 187	3881	3562	8%	Yes	5.23753	No
BETWEEN MD 187 AND I-495		3512	#DIV/0!	#DIV/0!	83.8093	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	2462	3881	-58%	No	25.1892	No
BETWEEN DEMOCRACY BLVD AND I-495	2217	3273	-48%	No	20.1598	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	4009	4728	-18%	No	10.8783	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5465	5248	4%	Yes	2.96496	Yes
BETWEEN MD 187 AND I-495		4235	#DIV/0!	#DIV/0!	92.0272	No
BETWEEN I-270 SPLIT AND MD 187	4819	5011	-4%	Yes	2.7422	Yes
BETWEEN MONTROSE RD AND I-270 SPLIT	9404	11017	-17%	No	15.9605	No
BETWEEN MD 189 AND MONTROSE RD	11349	7765	32%	No	36.6668	No
BETWEEN MD 28 AND MD 189	10153	7476	26%	No	28.5134	No
BETWEEN SHADY GROVE RD AND MD 28	9210	7404	20%	No	19.8209	No
BETWEEN I-370 AND SHADY GROVE RD	9197	6291	32%	No	33.0258	No
BETWEEN MD 117 AND I-370	9126	7880	14%	No	13.5096	No
BETWEEN MD 124 AND MD 117	7712	6605	14%	No	13.09	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	6394	7952	-24%	No	18.3985	No
BETWEEN MD 118 AND MIDDLEBROOK RD	5366	6766	-26%	No	17.9784	No
BETWEEN MD 27 AND MD 118	5178	6251	-21%	No	14.1973	No
BETWEEN MD 121 AND MD 27	3937	4955	-26%	No	15.2638	No
BETWEEN MD 109 AND MD 121	3574	4284	-20%	No	11.3271	No
BETWEEN MD 80 AND MD 109	3705	4251	-15%	No	8.6492	No
BETWEEN MD 85 AND MD 80	3613	4146	-15%	No	8.55735	No

Figure A.66: I-270 Mainline 5-6 PM Volumes

Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
BETWEEN MD 85 AND MD 80	2102	2537	-21%	No	9.02227	No
BETWEEN MD 80 AND MD 109	2123	2350	-11%	No	4.80515	Yes
BETWEEN MD 109 AND MD 121	2043	2417	-18%	No	7.91989	No
BETWEEN MD 121 AND MD 27	2706	2890	-7%	Yes	3.47852	Yes
BETWEEN MD 27 AND MD 118	2688	3269	-22%	No	10.6414	No
BETWEEN MD 118 AND MIDDLEBROOK RD	3531	3796	-7%	Yes	4.37011	Yes
BETWEEN MIDDLEBROOK ROAD AND MD 124	4476	4805	-7%	Yes	4.82602	Yes
BETWEEN MD 124 AND MD 117	4301	5062	-18%	No	11.1152	No
BETWEEN MD 117 AND I-370	6012	6380	-6%	Yes	4.67198	Yes
BETWEEN I-370 AND SHADY GROVE RD	5291	3616	32%	No	25.1076	No
BETWEEN SHADY GROVE RD AND MD 28	6002	4538	24%	No	20.1631	No
BETWEEN MD 28 AND MD 189	6826	4057	41%	No	37.5374	No
BETWEEN MD 189 AND MONTROSE RD	5850	4053	31%	No	25.5337	No
BETWEEN MONTROSE RD AND I-270 SPLIT	6605	7281	-10%	No	8.11284	No
BETWEEN I-270 SPLIT AND MD 187	3582	3703	-3%	Yes	2.00076	Yes
BETWEEN MD 187 AND I-495		3465	#DIV/0!	#DIV/0!	83.2466	No
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	2238	3557	-59%	No	24.4997	No
BETWEEN DEMOCRACY BLVD AND I-495	2155	3151	-46%	No	19.3283	No
I-270 NB				Calibration not met		
BETWEEN DEMOCRACY BLVD AND I-495	4367	4673	-7%	Yes	4.55148	Yes
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5389	5099	5%	Yes	4.01167	Yes
BETWEEN MD 187 AND I-495		4532	#DIV/0!	#DIV/0!	95.1998	No
BETWEEN I-270 SPLIT AND MD 187	4581	4966	-8%	Yes	5.56885	No
BETWEEN MONTROSE RD AND I-270 SPLIT	9812	10695	-9%	Yes	8.72016	No
BETWEEN MD 189 AND MONTROSE RD	11196	7853	30%	No	34.2515	No
BETWEEN MD 28 AND MD 189	9646	7567	22%	No	22.4071	No
BETWEEN SHADY GROVE RD AND MD 28	8520	7415	13%	No	12.3852	No
BETWEEN I-370 AND SHADY GROVE RD	8861	6252	29%	No	30.0164	No
BETWEEN MD 117 AND I-370	9241	7966	14%	No	13.7431	No
BETWEEN MD 124 AND MD 117	7806	6701	14%	No	12.9744	No
BETWEEN MIDDLEBROOK ROAD AND MD 124	6394	8063	-26%	No	19.6305	No
BETWEEN MD 118 AND MIDDLEBROOK RD	5652	6693	-18%	No	13.244	No
BETWEEN MD 27 AND MD 118	5050	6077	-20%	No	13.772	No
BETWEEN MD 121 AND MD 27	3674	4679	-27%	No	15.5474	No
BETWEEN MD 109 AND MD 121	3359	4232	-26%	No	14.1703	No
BETWEEN MD 80 AND MD 109	3617	4045	-12%	No	6.91493	No
BETWEEN MD 85 AND MD 80	3382	3848	-14%	No	7.75456	No

Figure A.67: I-270 Mainline 6-7 PM Volumes

I-270 Mainline Travel Time and Speed Tables



Travel Segments	Distance (feet)	Distance (miles)	6-7 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**2897.0**	**3089.4**	**-192.3**	**-7%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	60.0	57.5	Yes	29.0	30.2	**-1.2**	**-4%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	31.6	52.9	No	551.8	328.9	**222.9**	**40%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	22.5	35.2	Yes	25.6	16.4	**9.2**	**36%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	30.0	25.6	Yes	427.2	499.6	**-72.4**	**-17%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	27.5	23.0	Yes	22.8	27.3	**-4.5**	**-20%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	47.7	44.8	Yes	262.0	278.8	**-16.8**	**-6%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	58.3	51.8	Yes	27.5	31.0	**-3.5**	**-13%**
FROM MD-121 TO MD-27	**10608**	**2.0**	47.7	51.8	Yes	151.7	139.5	**12.1**	**8%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	27.7	35.2	Yes	93.5	73.7	**19.8**	**21%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	26.6	19.5	Yes	47.4	64.8	**-17.4**	**-37%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	26.4	18.3	Yes	84.7	122.1	**-37.3**	**-44%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	32.5	32.7	Yes	54.3	53.9	**0.4**	**1%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	36.1	44.6	Yes	27.6	22.3	**5.3**	**19%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	35.1	35.5	Yes	198.4	196.1	**2.3**	**1%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	32.7	20.1	Yes	33.6	54.8	**-21.2**	**-63%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	38.0	23.9	Yes	54.6	86.8	**-32.2**	**-59%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	43.5	28.9	Yes	22.9	34.5	**-11.6**	**-51%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	47.7	32.1	Yes	53.3	79.1	**-25.8**	**-48%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	51.2	42.9	Yes	42.0	50.1	**-8.1**	**-19%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	44.3	35.5	Yes	72.8	90.8	**-18.0**	**-25%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	43.3	43.7	Yes	1.2	1.2	**0.0**	**1%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	43.4	34.9	Yes	155.2	193.0	**-37.8**	**-24%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	45.1	44.0	Yes	0.8	0.8	**0.0**	**-3%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	45.8	42.5	Yes	61.5	66.3	**-4.8**	**-8%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	45.7	35.4	Yes	46.0	59.3	**-13.3**	**-29%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	46.4	33.2	Yes	49.7	69.5	**-19.9**	**-40%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	46.9	32.3	Yes	70.2	101.8	**-31.6**	**-45%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	49.0	25.7	No	85.7	163.1	**-77.4**	**-90%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	59.2	35.0	No	14.4	24.3	**-10.0**	**-69%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	62.8	61.8	Yes	46.2	47.0	**-0.7**	**-2%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	62.6	62.7	Yes	67.4	67.4	**0.1**	**0%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	58.9	63.2	Yes	16.2	15.0	**1.1**	**7%**
I-270 NB	**164322**	**31.1**				**1711.7**	**1770.2**	**-58.5**	**-3%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	60.2	63.7	Yes	70.5	66.6	**3.9**	**6%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	61.8	63.6	Yes	44.6	43.3	**1.3**	**3%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	61.6	63.2	Yes	3.8	3.7	**0.1**	**2%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	64.2	63.2	Yes	75.1	76.4	**-1.3**	**-2%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	66.1	63.5	Yes	52.4	54.5	**-2.1**	**-4%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	65.7	62.6	Yes	33.5	35.1	**-1.7**	**-5%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	65.9	63.7	Yes	31.9	33.0	**-1.1**	**-3%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	66.9	63.6	Yes	41.5	43.7	**-2.2**	**-5%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	67.1	63.3	Yes	0.5	0.5	**0.0**	**-6%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	59.2	63.7	Yes	115.4	107.2	**8.2**	**7%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	66.5	63.8	Yes	0.8	0.8	**0.0**	**-4%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	67.0	63.7	Yes	49.1	51.7	**-2.5**	**-5%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	67.4	63.2	Yes	1.7	1.9	**-0.1**	**-7%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	66.4	63.2	Yes	81.5	85.7	**-4.2**	**-5%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	66.3	63.7	Yes	0.3	0.3	**0.0**	**-4%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	67.0	63.8	Yes	33.0	34.7	**-1.7**	**-5%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	66.6	63.8	Yes	0.3	0.3	**0.0**	**-4%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	66.6	63.5	Yes	123.3	129.2	**-6.0**	**-5%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	65.7	63.6	Yes	12.7	13.1	**-0.4**	**-3%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	64.8	63.3	Yes	25.5	26.1	**-0.6**	**-2%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	64.9	63.6	Yes	36.0	36.7	**-0.7**	**-2%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	64.8	63.8	Yes	15.6	15.9	**-0.2**	**-2%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	65.8	63.6	Yes	34.8	36.0	**-1.2**	**-3%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	65.4	63.5	Yes	120.3	123.7	**-3.5**	**-3%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	65.4	63.4	Yes	10.0	10.3	**-0.3**	**-3%**
FROM MD-121 TO MD-109	**20431**	**3.9**	67.4	63.3	Yes	206.6	219.9	**-13.4**	**-6%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	65.4	63.0	Yes	9.6	10.0	**-0.4**	**-4%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	66.7	62.7	Yes	191.0	203.1	**-12.1**	**-6%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	66.3	62.9	Yes	9.7	10.2	**-0.5**	**-5%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	66.9	63.1	Yes	253.8	269.1	**-15.3**	**-6%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	62.5	61.6	Yes	27.1	27.5	**-0.4**	**-1%**

Figure A.68: I-270 Mainline 6-7 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	7-8 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**3702.6**	**3595.3**	**107.3**	**3%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	55.3	57.3	Yes	31.4	30.3	**1.1**	**3%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	34.8	47.7	Yes	499.7	365.0	**134.7**	**27%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	24.4	23.7	Yes	23.6	24.3	**-0.7**	**-3%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	33.4	24.1	Yes	382.6	530.0	**-147.4**	**-39%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	31.0	22.6	Yes	20.3	27.8	**-7.6**	**-37%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	45.8	44.9	Yes	273.1	278.2	**-5.0**	**-2%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	39.8	52.1	Yes	40.4	30.8	**9.6**	**24%**
FROM MD-121 TO MD-27	**10608**	**2.0**	29.9	48.5	No	242.1	149.1	**93.0**	**38%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	15.8	23.5	Yes	163.7	110.1	**53.6**	**33%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	16.6	15.7	Yes	76.0	80.4	**-4.4**	**-6%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	17.8	15.9	Yes	125.7	140.9	**-15.2**	**-12%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	23.1	28.1	Yes	76.2	62.7	**13.5**	**18%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	26.3	36.9	Yes	37.9	27.0	**10.9**	**29%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	27.5	29.5	Yes	253.0	235.9	**17.1**	**7%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	25.2	18.3	Yes	43.6	60.0	**-16.4**	**-38%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	29.6	23.0	Yes	70.0	90.4	**-20.3**	**-29%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	34.6	32.1	Yes	28.9	31.1	**-2.3**	**-8%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	38.0	35.5	Yes	66.9	71.6	**-4.7**	**-7%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	29.6	33.5	Yes	72.5	64.3	**8.3**	**11%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	18.4	19.9	Yes	174.8	162.3	**12.5**	**7%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	21.0	39.2	No	2.5	1.3	**1.2**	**46%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	19.6	27.2	Yes	344.3	248.2	**96.2**	**28%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	27.7	35.1	Yes	1.3	1.0	**0.3**	**21%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	29.6	22.0	Yes	95.1	127.9	**-32.8**	**-35%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	26.0	18.7	Yes	80.9	112.6	**-31.6**	**-39%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	22.5	21.6	Yes	102.7	107.0	**-4.4**	**-4%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	28.1	21.2	Yes	116.9	154.9	**-38.0**	**-32%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	40.6	34.9	Yes	103.4	120.3	**-17.0**	**-16%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	56.5	46.1	Yes	15.1	18.5	**-3.4**	**-23%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	60.6	60.9	Yes	47.9	47.7	**0.2**	**0%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	58.7	61.6	Yes	71.9	68.6	**3.3**	**5%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	52.4	63.0	Yes	18.2	15.1	**3.1**	**17%**
I-270 NB	**164322**	**31.1**				**1711.1**	**1779.6**	**-68.5**	**-4%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	58.4	63.4	Yes	72.5	66.8	**5.7**	**8%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	60.6	63.2	Yes	45.5	43.6	**1.9**	**4%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	60.7	62.9	Yes	3.8	3.7	**0.1**	**3%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	63.0	62.9	Yes	76.6	76.7	**-0.2**	**0%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	66.6	63.3	Yes	52.0	54.7	**-2.7**	**-5%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	65.8	62.7	Yes	33.4	35.1	**-1.7**	**-5%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	66.4	63.6	Yes	31.6	33.0	**-1.4**	**-4%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	66.4	63.1	Yes	41.9	44.0	**-2.2**	**-5%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	66.3	62.1	Yes	0.5	0.5	**0.0**	**-7%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	65.8	63.4	Yes	103.7	107.8	**-4.1**	**-4%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	66.9	63.6	Yes	0.8	0.8	**0.0**	**-5%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	67.4	63.4	Yes	48.8	51.9	**-3.1**	**-6%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	67.6	62.4	Yes	1.7	1.9	**-0.1**	**-8%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	66.7	62.4	Yes	81.2	86.8	**-5.6**	**-7%**
FROM JUST SOUTH OF MD-117 TO MD-117	**29**	**0.0**	66.6	63.2	Yes	0.3	0.3	**0.0**	**-5%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	66.9	63.7	Yes	33.1	34.8	**-1.7**	**-5%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	66.8	63.7	Yes	0.3	0.3	**0.0**	**-5%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	66.2	63.3	Yes	124.0	129.7	**-5.7**	**-5%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	65.0	63.4	Yes	12.8	13.1	**-0.3**	**-3%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	64.4	63.0	Yes	25.7	26.2	**-0.5**	**-2%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	64.7	63.2	Yes	36.1	36.9	**-0.8**	**-2%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	64.5	63.7	Yes	15.7	15.9	**-0.2**	**-1%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	65.9	63.4	Yes	34.7	36.1	**-1.4**	**-4%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	64.8	63.2	Yes	121.3	124.3	**-3.0**	**-2%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	64.9	62.9	Yes	10.1	10.4	**-0.3**	**-3%**
FROM MD-121 TO MD-109	**20431**	**3.9**	66.8	63.2	Yes	208.7	220.5	**-11.9**	**-6%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	65.2	62.5	Yes	9.6	10.0	**-0.4**	**-4%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	66.6	62.2	Yes	191.4	204.7	**-13.3**	**-7%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	66.0	62.5	Yes	9.8	10.3	**-0.5**	**-6%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	66.3	62.7	Yes	255.9	270.8	**-14.9**	**-6%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	61.5	61.3	Yes	27.5	27.6	**-0.1**	**0%**

Figure A.69: I-270 Mainline 7-8 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	8-9 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**3415.0**	**2929.1**	**485.8**	**14%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	58.6	57.2	Yes	29.7	30.4	**-0.7**	**-2%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	50.6	42.6	Yes	344.3	409.0	**-64.7**	**-19%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	36.3	17.4	No	15.9	33.1	**-17.2**	**-108%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	40.9	24.4	Yes	313.1	524.4	**-211.3**	**-67%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	36.2	23.1	Yes	17.3	27.2	**-9.9**	**-57%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	46.0	44.3	Yes	271.5	281.9	**-10.4**	**-4%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	39.7	52.0	Yes	40.5	30.9	**9.6**	**24%**
FROM MD-121 TO MD-27	**10608**	**2.0**	29.4	51.0	No	245.9	141.7	**104.2**	**42%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	18.3	47.0	No	141.9	55.2	**86.8**	**61%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	19.9	43.6	No	63.6	29.0	**34.6**	**54%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	21.2	40.0	No	105.5	55.9	**49.7**	**47%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	28.3	42.1	Yes	62.3	41.9	**20.4**	**33%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	33.2	46.8	Yes	30.0	21.3	**8.7**	**29%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	32.1	39.7	Yes	217.1	175.6	**41.6**	**19%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	27.8	26.9	Yes	39.6	40.8	**-1.2**	**-3%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	32.0	26.3	Yes	64.7	78.8	**-14.0**	**-22%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	38.0	37.0	Yes	26.3	27.0	**-0.7**	**-3%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	43.4	40.2	Yes	58.6	63.2	**-4.7**	**-8%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	37.1	45.1	Yes	57.9	47.7	**10.2**	**18%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	19.3	29.6	Yes	167.4	108.8	**58.6**	**35%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	19.4	37.1	No	2.7	1.4	**1.3**	**48%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	17.6	47.2	No	383.5	142.9	**240.5**	**63%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	25.0	46.1	No	1.4	0.8	**0.7**	**46%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	25.6	42.6	No	110.2	66.1	**44.0**	**40%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	22.0	34.9	Yes	95.8	60.2	**35.5**	**37%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	19.8	34.9	Yes	116.4	66.0	**50.4**	**43%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	26.8	34.2	Yes	122.8	96.1	**26.6**	**22%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	39.4	37.8	Yes	106.5	111.0	**-4.5**	**-4%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	55.2	42.8	Yes	15.4	19.9	**-4.5**	**-29%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	59.0	50.8	Yes	49.2	57.1	**-7.9**	**-16%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	54.1	61.4	Yes	78.1	68.8	**9.3**	**12%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	47.6	63.1	Yes	20.0	15.1	**4.9**	**25%**
I-270 NB	**164322**	**31.1**				**1723.9**	**1788.0**	**-64.1**	**-4%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	57.7	63.0	Yes	73.4	67.3	**6.1**	**8%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	61.0	62.1	Yes	45.2	44.4	**0.8**	**2%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	60.5	62.1	Yes	3.8	3.7	**0.1**	**3%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	61.5	61.8	Yes	78.4	78.1	**0.4**	**0%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	65.4	62.5	Yes	52.9	55.4	**-2.5**	**-5%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	65.0	62.8	Yes	33.9	35.1	**-1.2**	**-4%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	65.2	63.3	Yes	32.2	33.2	**-1.0**	**-3%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	65.4	62.2	Yes	42.5	44.7	**-2.2**	**-5%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	65.4	59.0	No	0.5	0.6	**-0.1**	**-11%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	64.0	62.4	Yes	106.8	109.5	**-2.7**	**-3%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	66.4	63.3	Yes	0.8	0.8	**0.0**	**-5%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	66.9	63.1	Yes	49.2	52.1	**-3.0**	**-6%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	67.2	62.0	Yes	1.7	1.9	**-0.1**	**-8%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	66.2	62.0	Yes	81.8	87.4	**-5.6**	**-7%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	66.3	62.6	Yes	0.3	0.3	**0.0**	**-6%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	66.7	63.6	Yes	33.2	34.8	**-1.6**	**-5%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	66.8	63.6	Yes	0.3	0.3	**0.0**	**-5%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	66.0	63.2	Yes	124.5	130.0	**-5.5**	**-4%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	63.9	63.3	Yes	13.0	13.2	**-0.1**	**-1%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	63.3	62.8	Yes	26.1	26.3	**-0.2**	**-1%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	63.6	63.2	Yes	36.7	36.9	**-0.3**	**-1%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	63.8	63.7	Yes	15.9	15.9	**0.0**	**0%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	65.5	63.4	Yes	34.9	36.1	**-1.2**	**-3%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	65.1	63.3	Yes	120.8	124.2	**-3.4**	**-3%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	64.6	62.9	Yes	10.1	10.4	**-0.3**	**-3%**
FROM MD-121 TO MD-109	**20431**	**3.9**	66.5	63.1	Yes	209.4	220.7	**-11.3**	**-5%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	65.0	62.2	Yes	9.7	10.1	**-0.4**	**-4%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	66.1	62.0	Yes	192.7	205.3	**-12.6**	**-7%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	65.7	62.3	Yes	9.8	10.4	**-0.5**	**-6%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	66.3	62.6	Yes	255.9	271.2	**-15.3**	**-6%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	61.7	61.2	Yes	27.4	27.7	**-0.2**	**-1%**

Figure A.70: I-270 Mainline 8-9 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	9-10 AM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**2569.5**	**2493.9**	**75.6**	**3%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	61.5	57.6	Yes	28.2	30.2	**-1.9**	**-7%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	62.2	53.0	Yes	279.8	328.7	**-49.0**	**-18%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	55.5	42.8	Yes	10.4	13.5	**-3.1**	**-30%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	52.9	37.9	Yes	242.0	337.5	**-95.5**	**-39%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	43.5	30.4	Yes	14.4	20.7	**-6.3**	**-43%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	48.7	45.3	Yes	256.8	276.2	**-19.4**	**-8%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	59.9	52.1	Yes	26.8	30.8	**-4.0**	**-15%**
FROM MD-121 TO MD-27	**10608**	**2.0**	57.9	52.8	Yes	125.0	137.0	**-12.0**	**-10%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	37.7	52.6	Yes	68.8	49.3	**19.6**	**28%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	32.7	52.1	No	38.6	24.2	**14.3**	**37%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	30.2	50.6	No	74.1	44.2	**29.9**	**40%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	35.3	45.3	Yes	50.0	38.9	**11.0**	**22%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	39.7	46.8	Yes	25.1	21.3	**3.8**	**15%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	42.6	45.3	Yes	163.5	153.7	**9.8**	**6%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	47.9	41.6	Yes	23.0	26.4	**-3.5**	**-15%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	49.5	42.6	Yes	41.9	48.7	**-6.7**	**-16%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	52.0	45.8	Yes	19.2	21.8	**-2.6**	**-14%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	53.8	47.9	Yes	47.2	53.0	**-5.9**	**-12%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	52.8	51.3	Yes	40.7	41.9	**-1.2**	**-3%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	34.9	49.1	Yes	92.3	65.7	**26.6**	**29%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	32.5	49.4	Yes	1.6	1.1	**0.6**	**34%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	28.3	51.5	No	238.2	130.8	**107.4**	**45%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	33.7	49.3	Yes	1.1	0.7	**0.3**	**32%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	34.7	48.4	Yes	81.2	58.2	**23.1**	**28%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	31.0	39.1	Yes	67.8	53.7	**14.0**	**21%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	28.1	36.8	Yes	82.0	62.7	**19.3**	**24%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	34.7	36.3	Yes	94.7	90.6	**4.1**	**4%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	43.2	31.7	Yes	97.0	132.2	**-35.2**	**-36%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	42.9	28.8	Yes	19.8	29.5	**-9.7**	**-49%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	26.5	33.4	Yes	109.4	86.8	**22.6**	**21%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	47.2	61.4	Yes	89.6	68.8	**20.8**	**23%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	49.0	63.1	Yes	19.4	15.1	**4.3**	**22%**
I-270 NB	**164322**	**31.1**				**1758.2**	**1786.6**	**-28.4**	**-2%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	58.7	63.3	Yes	72.2	67.0	**5.2**	**7%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	61.3	62.5	Yes	44.9	44.1	**0.8**	**2%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	60.3	62.3	Yes	3.9	3.7	**0.1**	**3%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	61.5	62.1	Yes	78.5	77.7	**0.8**	**1%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	64.3	62.8	Yes	53.9	55.1	**-1.2**	**-2%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	63.6	62.7	Yes	34.6	35.1	**-0.5**	**-1%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	64.1	63.3	Yes	32.8	33.2	**-0.4**	**-1%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	64.5	62.5	Yes	43.1	44.4	**-1.3**	**-3%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	65.3	60.7	Yes	0.5	0.6	**0.0**	**-8%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	64.4	62.9	Yes	106.0	108.6	**-2.6**	**-2%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	65.1	63.5	Yes	0.8	0.8	**0.0**	**-3%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	65.9	63.3	Yes	49.9	52.0	**-2.1**	**-4%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	66.6	61.5	Yes	1.8	1.9	**-0.1**	**-8%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	65.5	61.5	Yes	82.7	88.1	**-5.5**	**-7%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	65.7	62.7	Yes	0.3	0.3	**0.0**	**-5%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	66.1	63.4	Yes	33.5	34.9	**-1.4**	**-4%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	66.1	63.5	Yes	0.3	0.3	**0.0**	**-4%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	65.6	63.0	Yes	125.2	130.5	**-5.3**	**-4%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	64.1	63.1	Yes	13.0	13.2	**-0.2**	**-2%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	63.1	62.1	Yes	26.2	26.6	**-0.4**	**-2%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	63.8	63.0	Yes	36.6	37.0	**-0.5**	**-1%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	63.4	63.7	Yes	16.0	15.9	**0.1**	**0%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	65.0	63.3	Yes	35.2	36.1	**-0.9**	**-3%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	63.8	63.3	Yes	123.2	124.2	**-1.0**	**-1%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	50.3	63.0	No	13.0	10.4	**2.6**	**20%**
FROM MD-121 TO MD-109	**20431**	**3.9**	59.6	63.1	Yes	233.7	220.8	**12.9**	**6%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	65.0	62.4	Yes	9.6	10.0	**-0.4**	**-4%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	65.9	62.2	Yes	193.2	205.0	**-11.7**	**-6%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	65.0	62.3	Yes	9.9	10.3	**-0.4**	**-4%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	66.4	62.6	Yes	255.6	270.9	**-15.2**	**-6%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	60.4	61.2	Yes	28.0	27.7	**0.4**	**1%**

Figure A.71: I-270 Mainline 9-10 AM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	3-4 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**1765.1**	**1854.4**	**-89.3**	**-5%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	62.4	58.0	Yes	27.8	30.0	**-2.1**	**-8%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	64.4	61.5	Yes	270.3	283.0	**-12.7**	**-5%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	65.1	58.0	Yes	8.9	9.9	**-1.1**	**-12%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	65.6	59.6	Yes	195.1	214.8	**-19.6**	**-10%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	64.9	59.1	Yes	9.7	10.6	**-0.9**	**-10%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	64.4	58.2	Yes	194.2	214.7	**-20.5**	**-11%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	66.2	61.8	Yes	24.3	26.0	**-1.7**	**-7%**
FROM MD-121 TO MD-27	**10608**	**2.0**	67.6	63.3	Yes	107.0	114.3	**-7.3**	**-7%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	65.6	63.1	Yes	39.5	41.1	**-1.6**	**-4%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	64.7	63.0	Yes	19.5	20.1	**-0.5**	**-3%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	65.0	62.7	Yes	34.4	35.7	**-1.3**	**-4%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	65.0	62.3	Yes	27.1	28.3	**-1.2**	**-4%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	66.7	63.2	Yes	14.9	15.8	**-0.8**	**-6%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	66.3	63.3	Yes	105.1	110.0	**-4.9**	**-5%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	65.3	63.5	Yes	16.8	17.3	**-0.5**	**-3%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	63.0	61.6	Yes	32.9	33.7	**-0.8**	**-2%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	63.2	62.2	Yes	15.8	16.0	**-0.2**	**-2%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	63.1	62.6	Yes	40.3	40.6	**-0.3**	**-1%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	65.1	63.5	Yes	33.0	33.9	**-0.8**	**-3%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	65.2	61.9	Yes	49.5	52.1	**-2.7**	**-5%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	65.6	59.2	Yes	0.8	0.9	**-0.1**	**-11%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	66.5	60.1	Yes	101.4	112.2	**-10.8**	**-11%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	65.3	59.3	Yes	0.5	0.6	**-0.1**	**-10%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	64.6	60.4	Yes	43.6	46.6	**-3.0**	**-7%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	65.6	60.5	Yes	32.0	34.8	**-2.7**	**-9%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	66.8	60.4	Yes	34.5	38.2	**-3.7**	**-11%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	66.0	60.5	Yes	49.8	54.3	**-4.5**	**-9%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	62.7	59.7	Yes	66.9	70.3	**-3.4**	**-5%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	60.3	59.6	Yes	14.1	14.3	**-0.2**	**-1%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	62.4	58.6	Yes	46.5	49.5	**-3.0**	**-6%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	56.8	60.5	Yes	74.3	69.8	**4.5**	**6%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	27.7	63.1	No	34.3	15.1	**19.3**	**56%**
I-270 NB	**164322**	**31.1**				**2669.6**	**2457.0**	**212.6**	**8%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	26.7	58.1	No	158.7	72.9	**85.8**	**54%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	37.2	53.9	No	74.1	51.1	**23.0**	**31%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	45.1	43.4	Yes	5.2	5.4	**-0.2**	**-4%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	49.6	43.8	Yes	97.3	110.1	**-12.9**	**-13%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	55.6	50.9	Yes	62.3	68.0	**-5.7**	**-9%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	50.6	52.9	Yes	43.5	41.6	**1.9**	**4%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	44.1	52.8	Yes	47.6	39.8	**7.8**	**16%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	46.7	51.9	Yes	59.5	53.6	**6.0**	**10%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	54.4	50.7	Yes	0.6	0.7	**0.0**	**-7%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	59.4	52.3	Yes	114.9	130.6	**-15.7**	**-14%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	60.9	52.4	Yes	0.8	1.0	**-0.1**	**-16%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	61.0	45.4	Yes	54.0	72.5	**-18.5**	**-34%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	62.0	28.7	No	1.9	4.1	**-2.2**	**-116%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	61.4	28.7	No	88.2	188.8	**-100.6**	**-114%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	60.5	21.9	No	0.3	0.9	**-0.6**	**-176%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	57.9	20.5	No	38.2	108.0	**-69.7**	**-182%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	56.5	20.9	No	0.3	0.9	**-0.6**	**-170%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	49.0	36.0	Yes	167.5	228.3	**-60.8**	**-36%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	39.1	36.3	Yes	21.3	23.0	**-1.6**	**-8%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	34.3	37.3	Yes	48.2	44.3	**3.9**	**8%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	31.6	45.6	Yes	73.9	51.2	**22.8**	**31%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	38.9	48.0	Yes	26.1	21.1	**4.9**	**19%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	47.8	47.8	Yes	47.8	47.8	**0.0**	**0%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	46.7	45.2	Yes	168.3	174.0	**-5.7**	**-3%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	46.3	45.6	Yes	14.1	14.4	**-0.2**	**-2%**
FROM MD-121 TO MD-109	**20431**	**3.9**	40.0	50.5	Yes	348.4	275.6	**72.7**	**21%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	31.3	52.2	No	20.0	12.0	**8.0**	**40%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	28.8	52.1	No	442.7	244.7	**198.0**	**45%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	21.8	52.4	No	29.5	12.3	**17.2**	**58%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	43.9	52.0	Yes	386.5	326.5	**59.9**	**16%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	60.9	52.7	Yes	27.8	32.1	**-4.3**	**-16%**

Figure A.72: I-270 Mainline 3-4 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	4-5 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)	Speed In Range?	Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**1881.9**	**1880.6**	**1.3**	**0%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	60.0	57.9	Yes	29.0	30.0	**-1.0**	**-4%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	49.4	61.0	Yes	352.3	285.5	**66.8**	**19%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	64.1	57.7	Yes	9.0	10.0	**-1.0**	**-11%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	64.9	58.6	Yes	197.3	218.5	**-21.2**	**-11%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	65.1	58.2	Yes	9.6	10.8	**-1.2**	**-12%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	64.2	57.5	Yes	194.7	217.3	**-22.6**	**-12%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	66.1	61.4	Yes	24.3	26.1	**-1.9**	**-8%**
FROM MD-121 TO MD-27	**10608**	**2.0**	67.6	63.2	Yes	106.9	114.5	**-7.6**	**-7%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	65.2	62.9	Yes	39.8	41.2	**-1.4**	**-4%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	64.3	62.9	Yes	19.6	20.1	**-0.4**	**-2%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	65.3	62.6	Yes	34.2	35.7	**-1.5**	**-4%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	65.2	62.0	Yes	27.0	28.4	**-1.4**	**-5%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	66.7	63.0	Yes	14.9	15.8	**-0.9**	**-6%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	66.5	63.2	Yes	104.7	110.1	**-5.4**	**-5%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	64.7	63.4	Yes	17.0	17.3	**-0.4**	**-2%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	62.6	61.4	Yes	33.1	33.8	**-0.6**	**-2%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	63.2	61.5	Yes	15.8	16.2	**-0.4**	**-3%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	62.6	61.5	Yes	40.6	41.3	**-0.7**	**-2%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	65.3	63.4	Yes	32.9	33.9	**-0.9**	**-3%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	65.3	62.0	Yes	49.4	52.0	**-2.6**	**-5%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	65.6	59.4	Yes	0.8	0.9	**-0.1**	**-10%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	66.2	60.3	Yes	101.8	111.9	**-10.1**	**-10%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	65.4	59.3	Yes	0.5	0.6	**-0.1**	**-10%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	64.8	60.6	Yes	43.5	46.5	**-3.0**	**-7%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	65.4	60.5	Yes	32.1	34.7	**-2.6**	**-8%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	66.9	60.4	Yes	34.5	38.2	**-3.7**	**-11%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	67.1	60.6	Yes	49.0	54.3	**-5.3**	**-11%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	64.3	59.5	Yes	65.2	70.5	**-5.3**	**-8%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	61.4	59.5	Yes	13.9	14.3	**-0.4**	**-3%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	62.3	58.5	Yes	46.6	49.6	**-3.0**	**-6%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	46.5	57.2	Yes	90.8	73.8	**17.0**	**19%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	18.7	35.7	No	50.9	26.7	**24.3**	**48%**
I-270 NB	**164322**	**31.1**				**3236.8**	**2666.3**	**570.5**	**18%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	22.3	55.9	No	189.8	75.9	**114.0**	**60%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	28.7	35.8	Yes	95.9	77.0	**18.8**	**20%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	33.6	35.2	Yes	6.9	6.6	**0.3**	**5%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	34.0	40.6	Yes	141.8	119.0	**22.8**	**16%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	37.4	51.5	Yes	92.6	67.2	**25.4**	**27%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	24.4	52.8	No	90.2	41.7	**48.5**	**54%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	19.8	52.7	No	106.2	39.8	**66.4**	**63%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	29.8	48.3	No	93.2	57.5	**35.7**	**38%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	44.3	49.3	Yes	0.8	0.7	**0.1**	**10%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	55.0	51.6	Yes	124.2	132.4	**-8.1**	**-7%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	57.4	49.0	Yes	0.9	1.0	**-0.2**	**-17%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	56.8	35.7	No	57.9	92.2	**-34.2**	**-59%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	57.7	24.8	No	2.0	4.7	**-2.7**	**-133%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	52.5	24.8	No	103.1	218.1	**-115.0**	**-112%**
FROM JUST SOUTH OF MD-117 TO MD-117	**29**	**0.0**	51.8	22.9	No	0.4	0.9	**-0.5**	**-127%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	46.5	20.2	No	47.7	109.5	**-61.8**	**-130%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	42.2	20.5	No	0.4	0.9	**-0.5**	**-106%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	33.8	29.4	Yes	242.7	279.4	**-36.7**	**-15%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	28.4	25.5	Yes	29.3	32.7	**-3.3**	**-11%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	25.7	35.7	Yes	64.4	46.3	**18.1**	**28%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	24.5	45.5	No	95.4	51.3	**44.2**	**46%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	32.5	48.0	Yes	31.2	21.1	**10.1**	**32%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	42.7	47.6	Yes	53.6	48.1	**5.5**	**10%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	40.0	38.0	Yes	196.4	206.9	**-10.5**	**-5%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	38.7	29.2	Yes	16.9	22.4	**-5.5**	**-32%**
FROM MD-121 TO MD-109	**20431**	**3.9**	34.3	49.1	Yes	406.0	283.6	**122.4**	**30%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	27.7	51.7	No	22.6	12.1	**10.5**	**46%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	29.6	52.0	No	430.3	244.9	**185.3**	**43%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	19.9	51.9	No	32.4	12.4	**20.0**	**62%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	39.7	51.7	Yes	427.2	328.0	**99.2**	**23%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	49.4	52.7	Yes	34.3	32.1	**2.1**	**6%**

Figure A.73: I-270 Mainline 4-5 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	5-6 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)		Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**1973.3**	**1902.3**	**71.0**	**4%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	54.2	57.8	Yes	32.1	30.1	**2.0**	**6%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	50.9	60.6	Yes	342.1	287.5	**54.6**	**16%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	62.7	57.1	Yes	9.2	10.1	**-0.9**	**-10%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	64.3	57.5	Yes	198.9	222.4	**-23.5**	**-12%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	64.1	57.3	Yes	9.8	11.0	**-1.2**	**-12%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	63.6	56.7	Yes	196.4	220.6	**-24.1**	**-12%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	66.4	61.4	Yes	24.2	26.1	**-1.9**	**-8%**
FROM MD-121 TO MD-27	**10608**	**2.0**	68.1	63.1	Yes	106.1	114.6	**-8.5**	**-8%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	65.4	62.9	Yes	39.6	41.2	**-1.5**	**-4%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	64.5	62.7	Yes	19.6	20.1	**-0.5**	**-3%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	65.0	62.3	Yes	34.4	35.9	**-1.5**	**-4%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	64.7	61.8	Yes	27.3	28.6	**-1.3**	**-5%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	66.6	62.9	Yes	14.9	15.8	**-0.9**	**-6%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	66.6	63.0	Yes	104.6	110.4	**-5.8**	**-6%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	64.5	63.4	Yes	17.0	17.4	**-0.3**	**-2%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	62.6	61.0	Yes	33.1	34.0	**-0.9**	**-3%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	62.9	60.9	Yes	15.9	16.4	**-0.5**	**-3%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	62.3	60.6	Yes	40.8	41.9	**-1.1**	**-3%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	65.8	63.2	Yes	32.7	34.0	**-1.3**	**-4%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	65.8	61.6	Yes	49.0	52.3	**-3.3**	**-7%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	65.8	58.8	Yes	0.8	0.9	**-0.1**	**-12%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	66.2	59.6	Yes	101.8	113.1	**-11.3**	**-11%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	63.6	58.4	Yes	0.6	0.6	**0.0**	**-9%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	64.0	60.1	Yes	44.0	46.9	**-2.9**	**-7%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	64.9	59.9	Yes	32.4	35.1	**-2.7**	**-8%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	64.5	59.8	Yes	35.8	38.5	**-2.8**	**-8%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	63.8	60.0	Yes	51.5	54.8	**-3.3**	**-6%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	62.6	59.3	Yes	67.0	70.7	**-3.7**	**-6%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	60.5	59.4	Yes	14.1	14.3	**-0.3**	**-2%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	59.4	58.6	Yes	48.8	49.5	**-0.7**	**-1%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	25.9	53.9	No	163.1	78.4	**84.6**	**52%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	14.5	32.7	No	65.8	29.1	**36.7**	**56%**
I-270 NB	**164322**	**31.1**				**3928.7**	**3020.2**	**908.4**	**23%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	19.2	47.1	No	220.5	90.0	**130.5**	**59%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	25.3	20.7	Yes	109.0	133.1	**-24.1**	**-22%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	30.4	32.8	Yes	7.6	7.1	**0.5**	**7%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	24.2	38.5	Yes	199.1	125.3	**73.7**	**37%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	28.1	51.1	No	123.4	67.7	**55.7**	**45%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	20.6	52.9	No	107.0	41.6	**65.4**	**61%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	17.5	52.7	No	120.3	39.8	**80.5**	**67%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	27.9	48.6	No	99.5	57.1	**42.3**	**43%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	43.2	48.9	Yes	0.8	0.7	**0.1**	**12%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	50.9	44.2	Yes	134.2	154.7	**-20.4**	**-15%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	50.7	26.8	No	1.0	1.9	**-0.9**	**-89%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	45.0	25.3	No	73.1	130.4	**-57.2**	**-78%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	45.7	22.2	No	2.6	5.3	**-2.7**	**-106%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	33.0	22.2	Yes	163.9	243.9	**-80.0**	**-49%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	38.0	20.5	No	0.5	1.0	**-0.4**	**-86%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	28.6	19.1	Yes	77.6	115.7	**-38.1**	**-49%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	23.3	19.5	Yes	0.8	1.0	**-0.2**	**-20%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	22.7	26.0	Yes	362.3	316.2	**46.0**	**13%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	23.4	24.4	Yes	35.6	34.1	**1.5**	**4%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	22.0	35.9	Yes	75.0	46.0	**29.0**	**39%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	21.3	45.6	No	109.3	51.2	**58.1**	**53%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	29.7	46.4	No	34.2	21.9	**12.3**	**36%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	38.5	38.6	Yes	59.4	59.2	**0.2**	**0%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	34.7	24.9	Yes	226.4	315.0	**-88.6**	**-39%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	32.6	15.1	No	20.0	43.2	**-23.2**	**-116%**
FROM MD-121 TO MD-109	**20431**	**3.9**	29.6	48.2	No	470.0	288.8	**181.1**	**39%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	25.0	50.8	No	25.1	12.3	**12.7**	**51%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	27.6	51.9	No	462.4	245.3	**217.1**	**47%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	18.4	52.1	No	35.1	12.4	**22.7**	**65%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	31.8	52.0	No	533.3	326.1	**207.2**	**39%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	42.9	52.7	Yes	39.4	32.1	**7.3**	**19%**

Figure A.74: I-270 Mainline 5-6 PM Travel Time and Speed

Travel Segments	Distance (feet)	Distance (miles)	6-7 PM						
			Speeds (MPH)			Travel Times (sec)		Difference	
			Field (mph)	Simulated (mph)		Field (sec)	Simulated (sec)	Difference (sec)	Difference (%)
I-270 SB	**165516**	**31.3**				**1808.6**	**1877.4**	**-68.8**	**-4%**
BETWEEN MD-85 ON AND OFF RAMPS	**2549**	**0.5**	43.1	57.9	No	40.4	30.0	**10.3**	**26%**
FROM MD-85 ON RAMP TO MD-80	**25540**	**4.8**	57.8	60.7	Yes	301.5	287.0	**14.4**	**5%**
BETWEEN MD-80 ON AND OFF RAMPS	**845**	**0.2**	64.2	57.4	Yes	9.0	10.0	**-1.1**	**-12%**
FROM MD-80 ON RAMP TO MD-109	**18767**	**3.6**	65.7	57.9	Yes	194.9	220.8	**-25.9**	**-13%**
BETWEEN MD-109 ON AND OFF RAMPS	**922**	**0.2**	65.5	57.0	Yes	9.6	11.0	**-1.4**	**-15%**
FROM MD-109 ON RAMP TO MD-121	**18329**	**3.5**	64.7	56.7	Yes	193.2	220.2	**-27.0**	**-14%**
BETWEEN MD-121 ON AND OFF RAMPS	**2354**	**0.4**	66.3	61.5	Yes	24.2	26.1	**-1.9**	**-8%**
FROM MD-121 TO MD-27	**10608**	**2.0**	68.0	63.1	Yes	106.4	114.6	**-8.2**	**-8%**
BETWEEN MD-27 ON AND OFF RAMPS	**3802**	**0.7**	65.9	62.9	Yes	39.3	41.2	**-1.9**	**-5%**
FROM MD-27 ON RAMP TO MD-118	**1852**	**0.4**	65.0	62.9	Yes	19.4	20.1	**-0.6**	**-3%**
BETWEEN MD-118 ON AND OFF RAMPS	**3278**	**0.6**	65.4	62.6	Yes	34.2	35.7	**-1.5**	**-5%**
FROM MD-118 ON RAMP TO MIDDLEBROOK RD	**2587**	**0.5**	65.6	61.9	Yes	26.9	28.5	**-1.6**	**-6%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1460**	**0.3**	67.0	62.8	Yes	14.9	15.8	**-1.0**	**-7%**
FROM MIDDLEBROOK RD ON RAMP TO MD-124	**10210**	**1.9**	66.7	63.2	Yes	104.4	110.2	**-5.8**	**-6%**
BETWEEN MD-124 ON AND OFF RAMPS	**1613**	**0.3**	65.5	63.4	Yes	16.8	17.4	**-0.6**	**-3%**
FROM MD-124 ON RAMP TO MD-117	**3042**	**0.6**	64.1	61.6	Yes	32.4	33.7	**-1.3**	**-4%**
BETWEEN MD-117 ON AND OFF RAMPS	**1463**	**0.3**	64.8	61.9	Yes	15.4	16.1	**-0.7**	**-5%**
FROM MD-117 TO I-370 INTERCHANGE	**3727**	**0.7**	64.4	62.4	Yes	39.5	40.7	**-1.2**	**-3%**
BETWEEN I-370 ON AND OFF RAMPS	**3154**	**0.6**	66.3	63.3	Yes	32.4	33.9	**-1.5**	**-5%**
FROM I-370 ON RAMP TO SHADY GROVE RD	**4729**	**0.9**	66.2	61.8	Yes	48.7	52.2	**-3.4**	**-7%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**77**	**0.0**	66.0	59.2	Yes	0.8	0.9	**-0.1**	**-12%**
FROM SHADY GROVE RD ON RAMP TO MD-28	**9889**	**1.9**	67.3	60.1	Yes	100.2	112.2	**-12.0**	**-12%**
BETWEEN MD-28 ON AND OFF RAMPS	**52**	**0.0**	66.2	59.1	Yes	0.5	0.6	**-0.1**	**-12%**
FROM MD-28 ON RAMP TO MD-189	**4132**	**0.8**	65.8	60.5	Yes	42.8	46.6	**-3.8**	**-9%**
BETWEEN MD-189 ON AND OFF RAMPS	**3083**	**0.6**	66.3	60.3	Yes	31.7	34.8	**-3.2**	**-10%**
FROM MD-189 ON RAMP TO MONTROSE RD	**3383**	**0.6**	67.3	60.2	Yes	34.3	38.3	**-4.0**	**-12%**
BETWEEN MONTROSE RD ON AND OFF RAMPS	**4822**	**0.9**	66.7	60.3	Yes	49.3	54.5	**-5.2**	**-11%**
FROM MONTROSE RD ON RAMP TO I-270 SPUR	**6153**	**1.2**	64.2	59.6	Yes	65.3	70.4	**-5.1**	**-8%**
FROM I-270 SPUR MD-187	**1248**	**0.2**	61.1	59.6	Yes	13.9	14.3	**-0.3**	**-2%**
BETWEEN MD-187 SPUR ON AND OFF RAMPS	**4256**	**0.8**	62.3	58.5	Yes	46.6	49.6	**-3.0**	**-6%**
FROM MD-187 ON RAMP TO I-495 INTERCHANGE	**6196**	**1.2**	50.2	59.4	Yes	84.2	71.1	**13.1**	**16%**
BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS	**1395**	**0.3**	26.7	51.2	No	35.6	18.6	**17.0**	**48%**
I-270 NB	**164322**	**31.1**				**2797.6**	**2944.1**	**-146.5**	**-5%**
FROM GROSVENOR LANE TO EXIT 1A	**6217**	**1.2**	21.2	22.7	Yes	200.0	186.7	**13.3**	**7%**
BETWEEN EXIT 1A AND 1B	**4042**	**0.8**	27.3	18.3	Yes	101.1	150.9	**-49.7**	**-49%**
FROM MD-187 TO I-270 SPUR	**341**	**0.1**	34.5	31.7	Yes	6.7	7.4	**-0.6**	**-9%**
FROM TUCKERMAN LANE TO I-270 LOCAL	**7076**	**1.3**	41.0	38.8	Yes	117.6	124.2	**-6.6**	**-6%**
FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL	**5080**	**1.0**	48.6	51.4	Yes	71.3	67.4	**3.9**	**5%**
FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189	**3227**	**0.6**	43.9	52.8	Yes	50.1	41.6	**8.5**	**17%**
BETWEEN MD-189 ON AND OFF RAMPS	**3080**	**0.6**	38.0	52.7	Yes	55.2	39.8	**15.3**	**28%**
FROM MD-189 TO JUST SOUTH OF MD-28	**4076**	**0.8**	40.2	47.9	Yes	69.1	58.0	**11.1**	**16%**
BETWEEN MD-28 ON AND OFF RAMPS	**49**	**0.0**	49.6	48.5	Yes	0.7	0.7	**0.0**	**-2%**
FROM MD-28 ON RAMP TO REDLAND BLVD	**10016**	**1.9**	57.1	37.3	No	119.7	183.3	**-63.6**	**-53%**
BETWEEN SHADY GROVE RD ON AND OFF RAMPS	**74**	**0.0**	58.6	24.5	No	0.9	2.0	**-1.2**	**-139%**
FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE	**4827**	**0.9**	57.1	28.5	No	57.6	115.6	**-58.0**	**-101%**
FROM I-370 INTERCHANGE TO MUDDY BRANCH RD	**172**	**0.0**	57.0	26.0	No	2.1	4.5	**-2.5**	**-120%**
FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117	**7943**	**1.5**	44.8	26.0	No	121.0	208.6	**-87.6**	**-72%**
FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117	**29**	**0.0**	41.8	25.5	No	0.5	0.8	**-0.3**	**-64%**
FROM MD-117 TO MD-124 OFF RAMP	**3249**	**0.6**	38.3	23.4	Yes	57.9	94.8	**-36.9**	**-64%**
BETWEEN MD-124 ON AND OFF RAMPS	**27**	**0.0**	36.1	23.4	Yes	0.5	0.8	**-0.3**	**-54%**
FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD	**12046**	**2.3**	32.4	32.8	Yes	253.9	250.1	**3.7**	**1%**
BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS	**1221**	**0.2**	28.9	28.1	Yes	28.8	29.7	**-0.8**	**-3%**
FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP	**2423**	**0.5**	26.5	37.1	Yes	62.3	44.5	**17.8**	**29%**
BETWEEN MD-118 ON AND OFF RAMPS	**3423**	**0.6**	25.3	45.5	No	92.1	51.3	**40.8**	**44%**
FROM MD-118 ON RAMP TO MD-27	**1487**	**0.3**	34.5	46.4	Yes	29.4	21.9	**7.5**	**26%**
BETWEEN MD-27 ON AND OFF RAMPS	**3356**	**0.6**	47.3	41.3	Yes	48.3	55.4	**-7.1**	**-15%**
FROM MD-27 ON RAMP TO MD-121 OFF RAMP	**11527**	**2.2**	45.5	30.3	Yes	172.8	259.5	**-86.7**	**-50%**
BETWEEN MD-121 ON AND OFF RAMPS	**959**	**0.2**	43.5	20.5	No	15.0	31.9	**-16.9**	**-113%**
FROM MD-121 TO MD-109	**20431**	**3.9**	45.9	48.5	Yes	303.6	287.1	**16.5**	**5%**
BETWEEN MD-109 ON AND OFF RAMPS	**920**	**0.2**	42.5	52.8	Yes	14.8	11.9	**2.9**	**20%**
FROM MD-109 ON RAMP TO MD-80	**18686**	**3.5**	42.1	52.1	Yes	302.9	244.5	**58.4**	**19%**
BETWEEN MD-80 ON AND OFF RAMPS	**946**	**0.2**	32.1	52.5	No	20.1	12.3	**7.8**	**39%**
FROM MD-80 ON RAMP TO MD-85	**24888**	**4.7**	43.5	52.3	Yes	390.1	324.7	**65.4**	**17%**
BETWEEN MD-85 ON AND OFF RAMPS	**2482**	**0.5**	53.5	52.6	Yes	31.6	32.2	**-0.5**	**-2%**

Figure A.75: I-270 Mainline 6-7 PM Travel Time and Speed

I-270 Mainline Travel Time Graphs

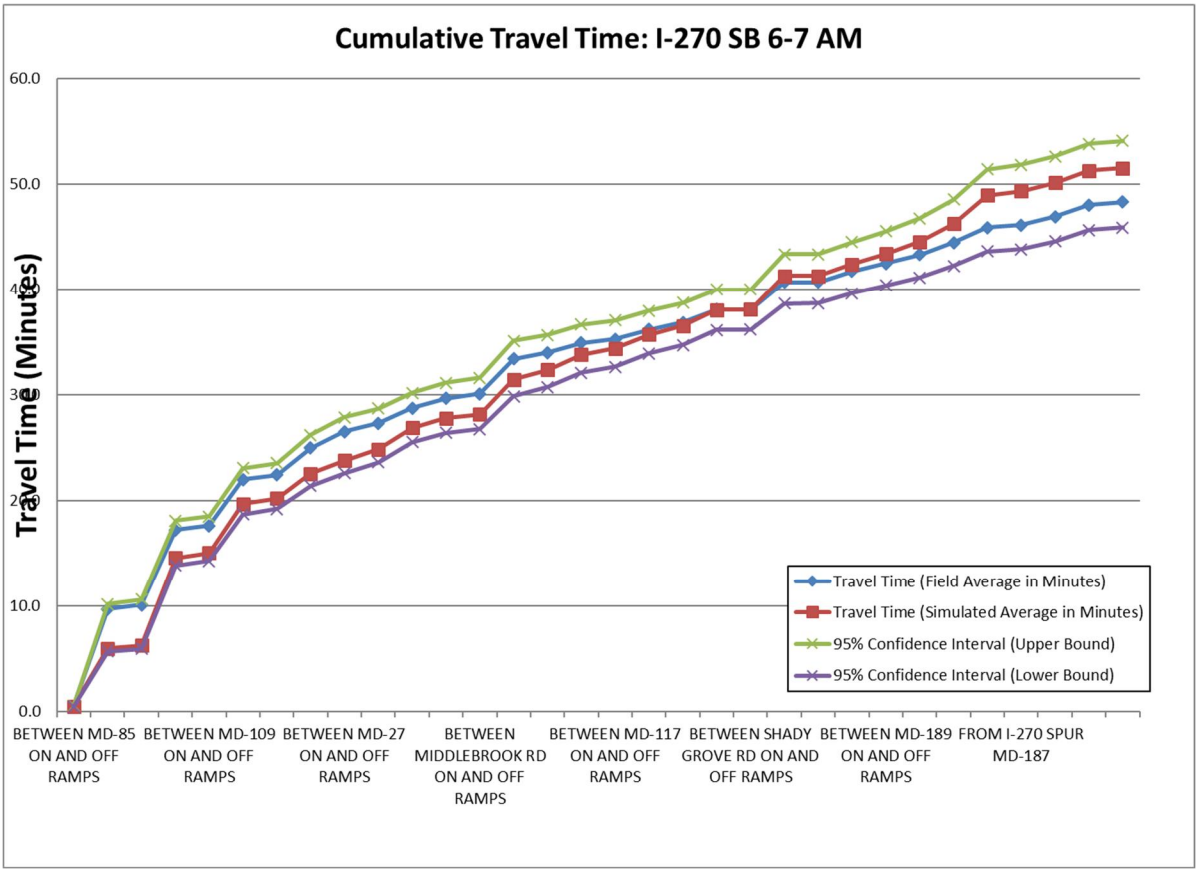


Figure A.76: I-270 SB Mainline 6-7 AM Cumulative Travel Time

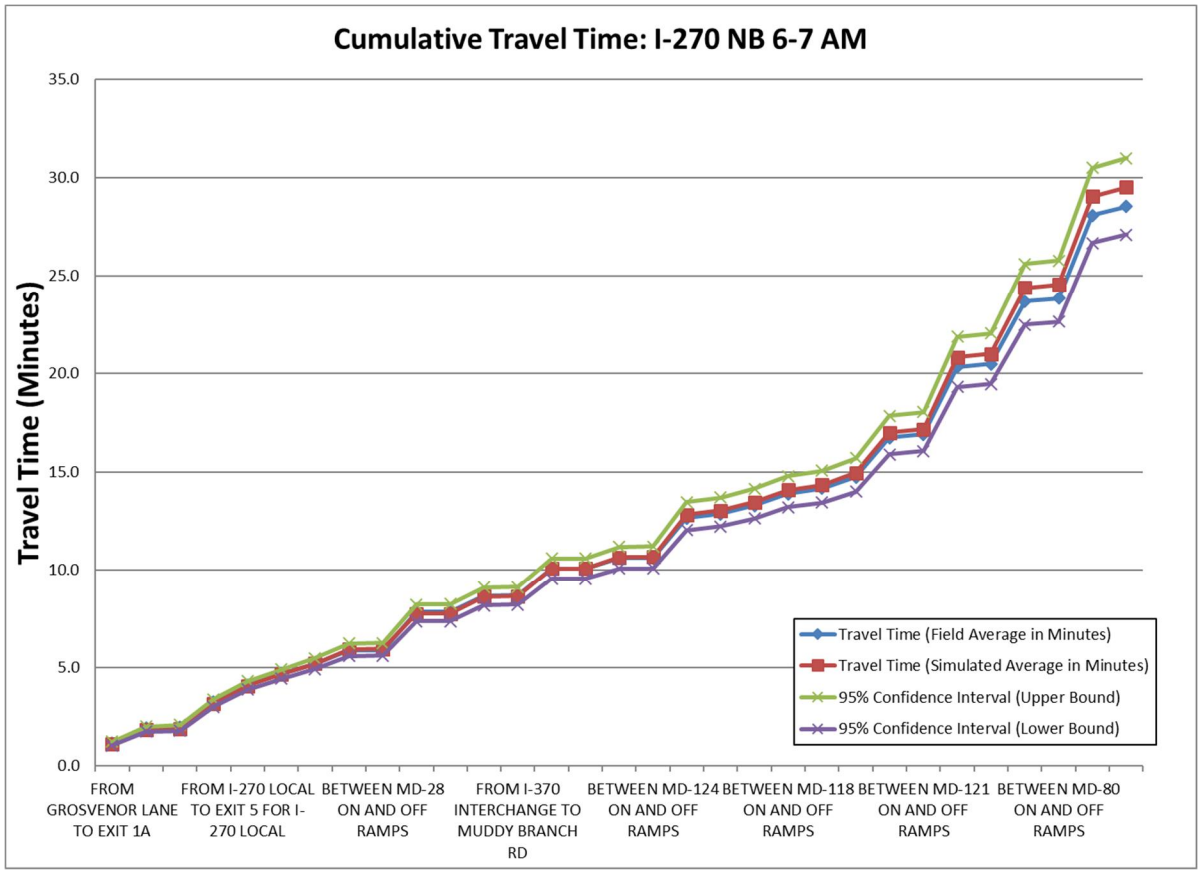


Figure A.77: I-270 NB Mainline 6-7 AM Cumulative Travel Time

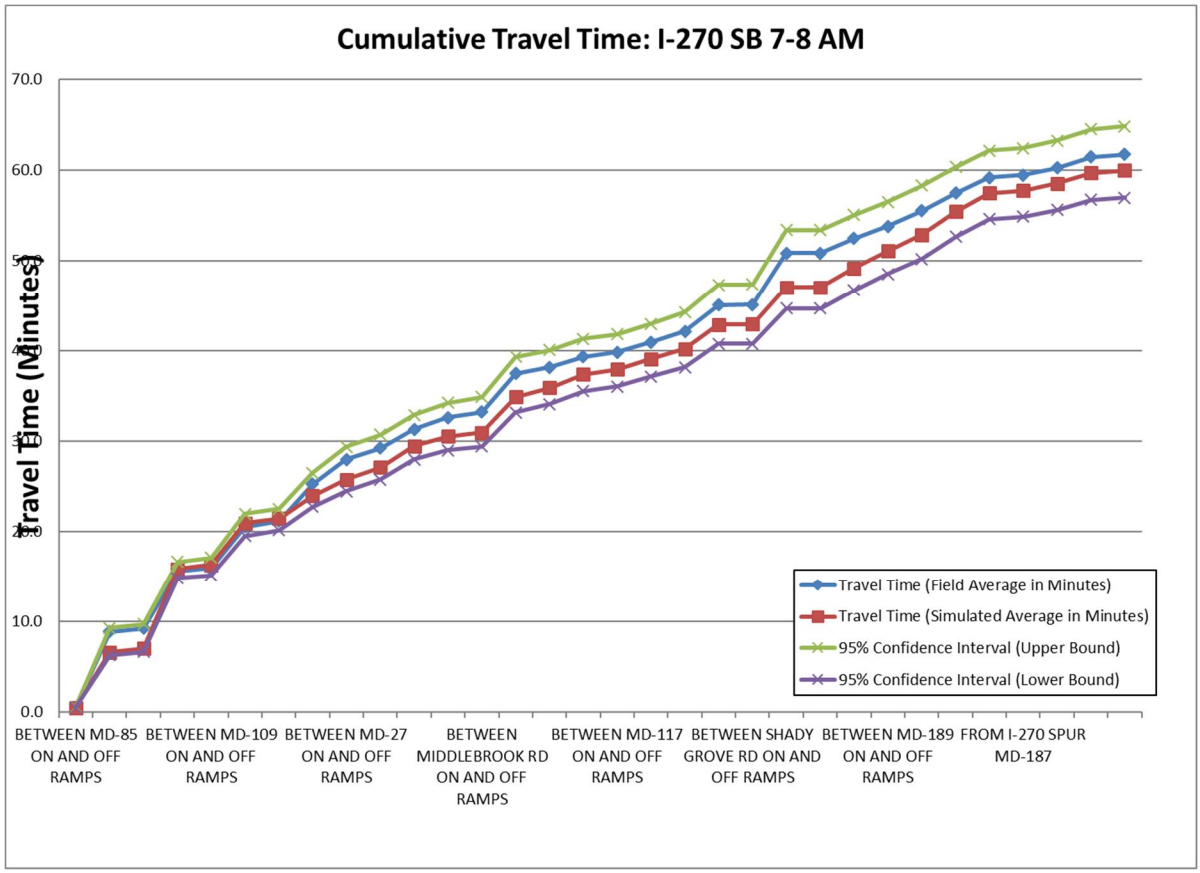


Figure A.78: I-270 SB Mainline 7-8 AM Cumulative Travel Time

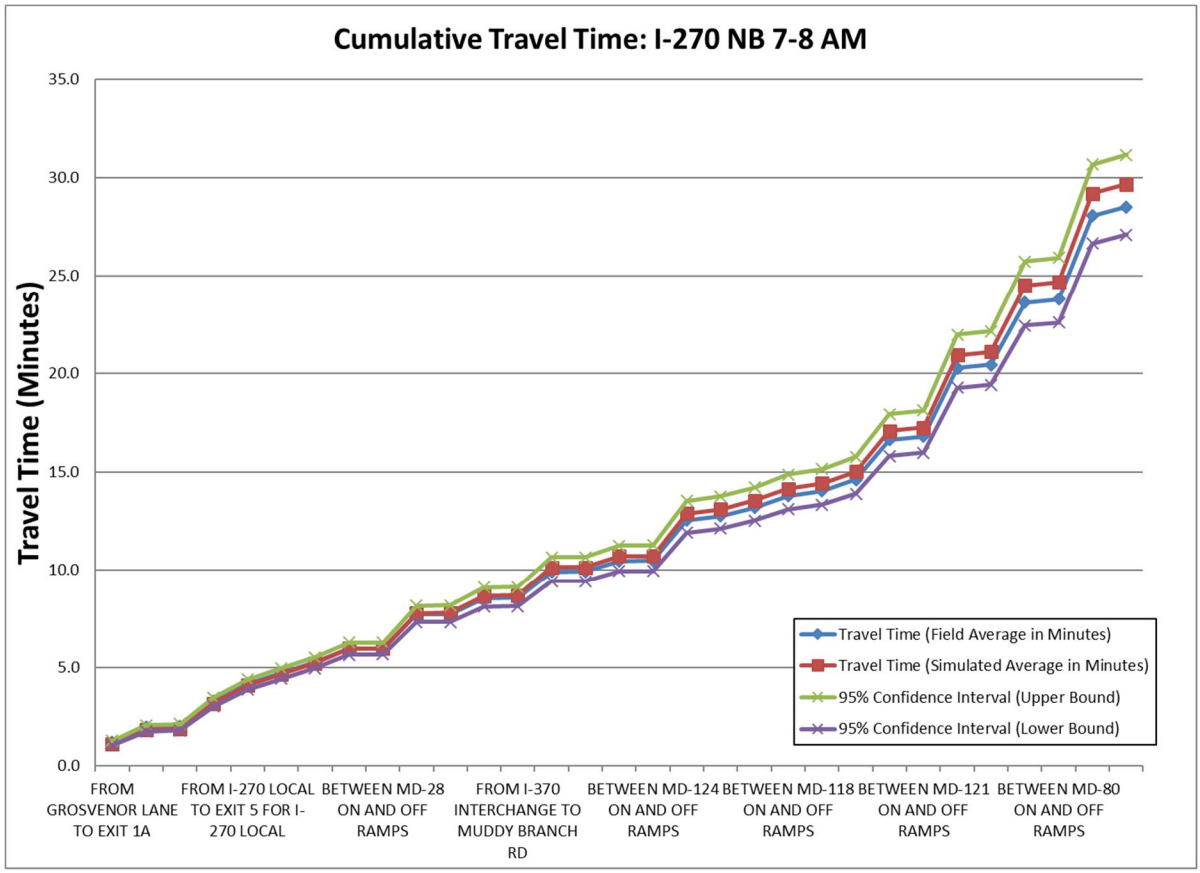


Figure A.79: I-270 NB Mainline 7-8 AM Cumulative Travel Time

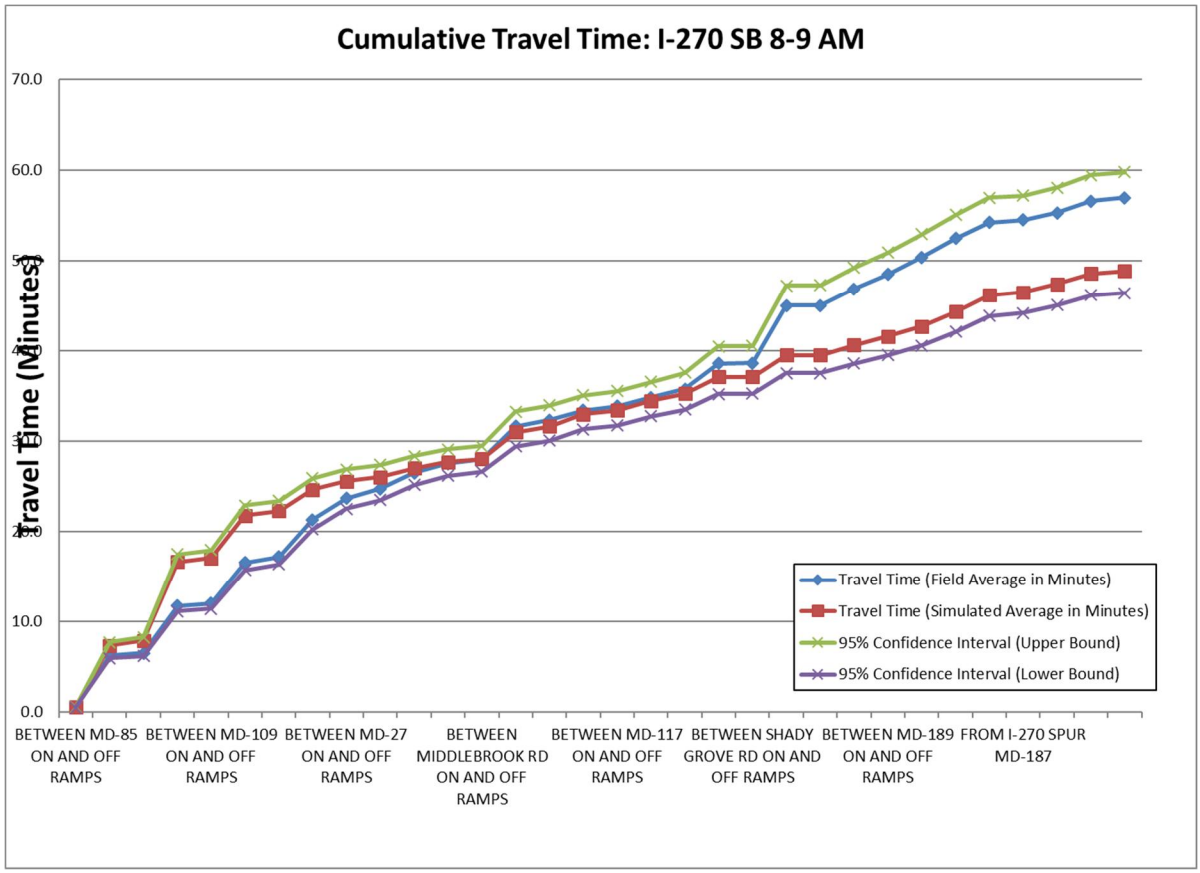


Figure A.80: I-270 SB Mainline 8-9 AM Cumulative Travel Time

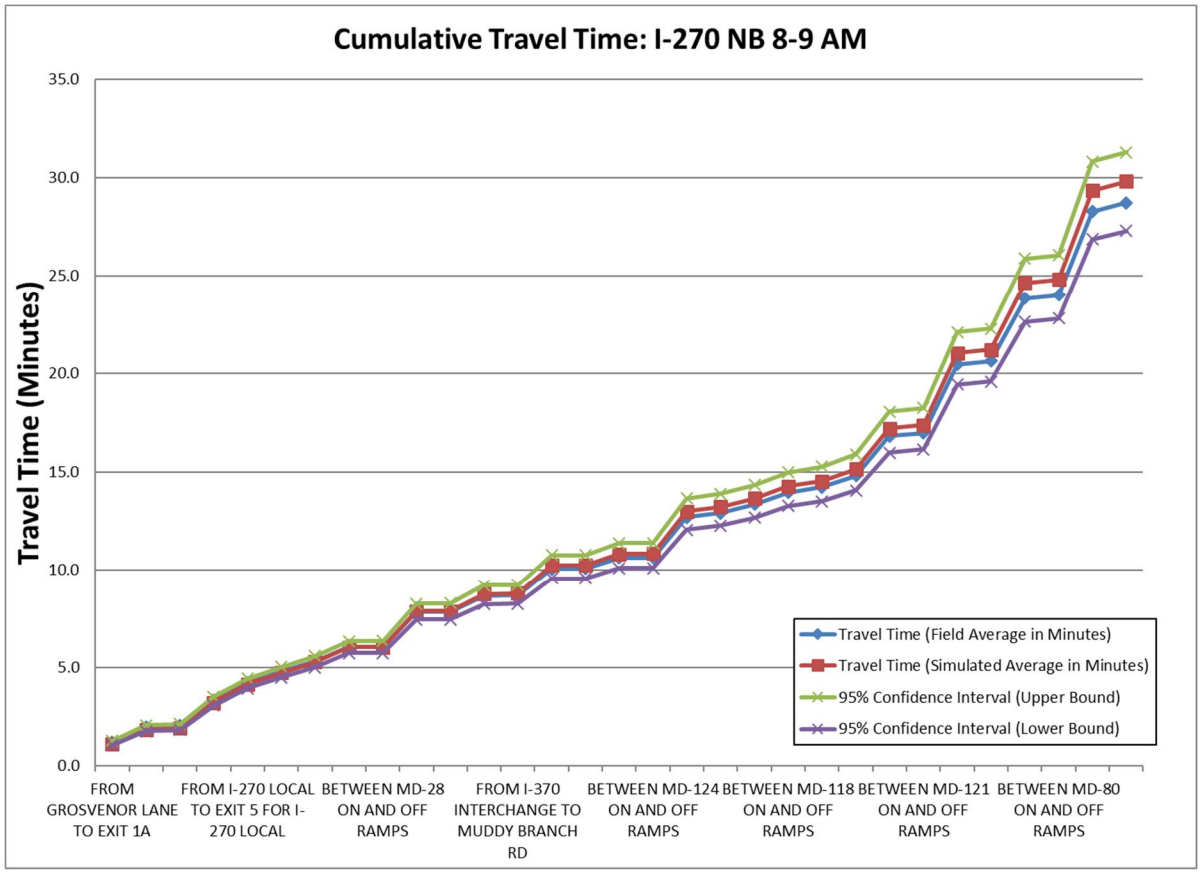


Figure A.81: I-270 NB Mainline 8-9 AM Cumulative Travel Time

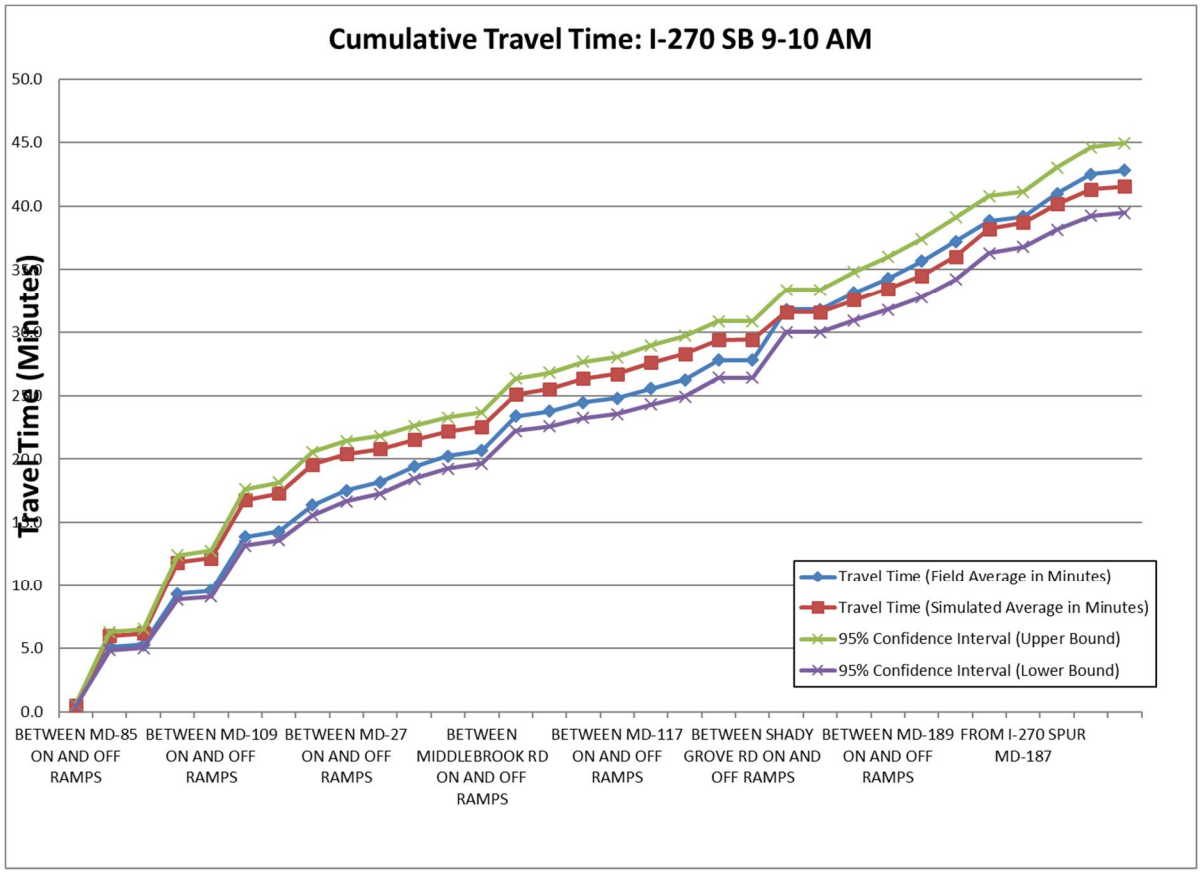


Figure A.82: I-270 SB Mainline 9-10 AM Cumulative Travel Time

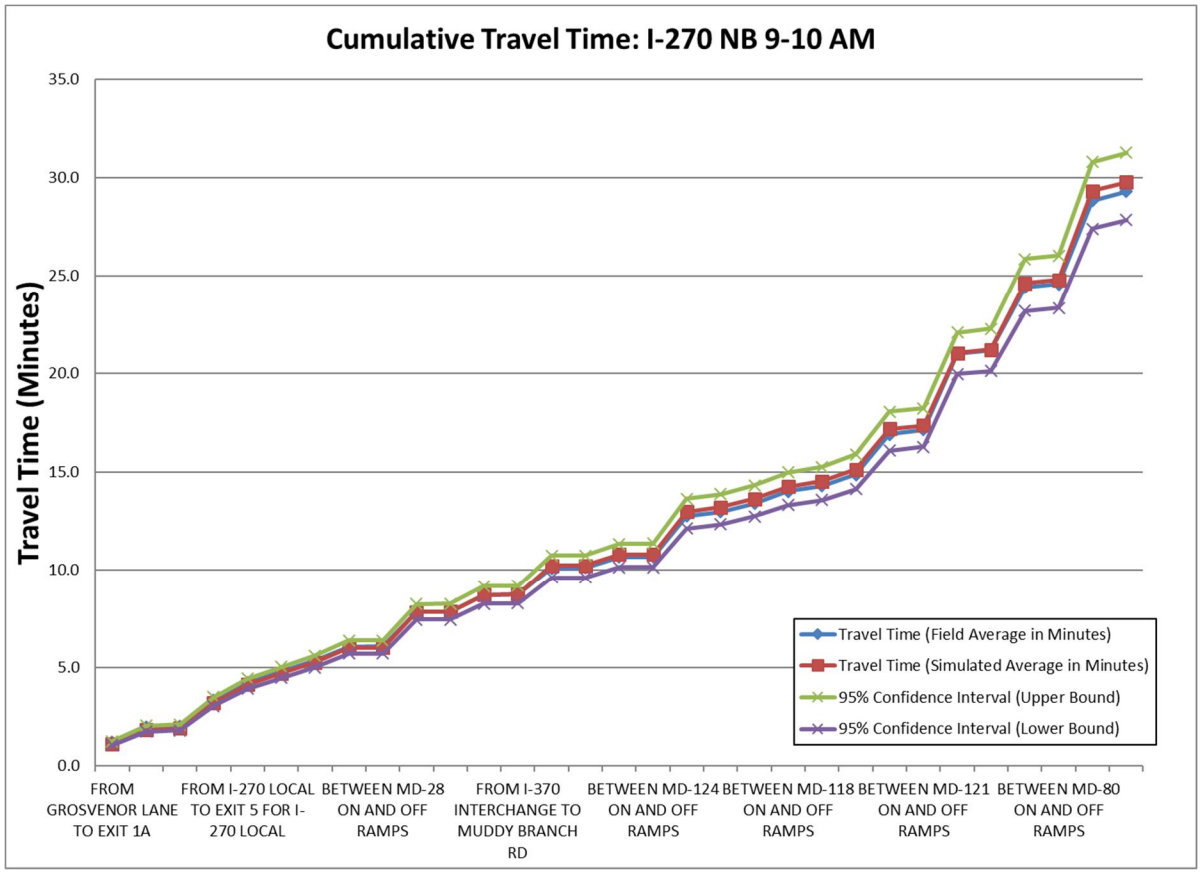


Figure A.83: I-270 NB Mainline 9-10 AM Cumulative Travel Time

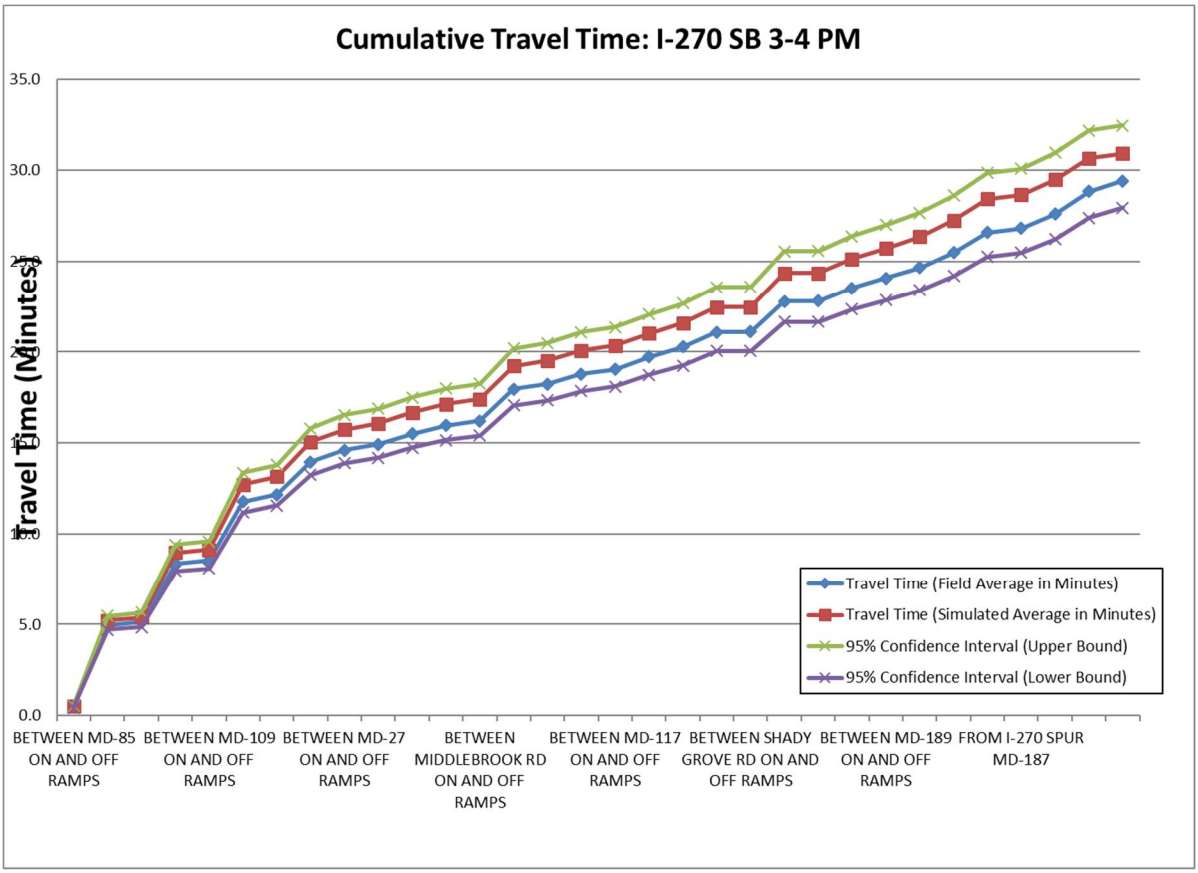


Figure A.84: I-270 SB Mainline 3-4 PM Cumulative Travel Time

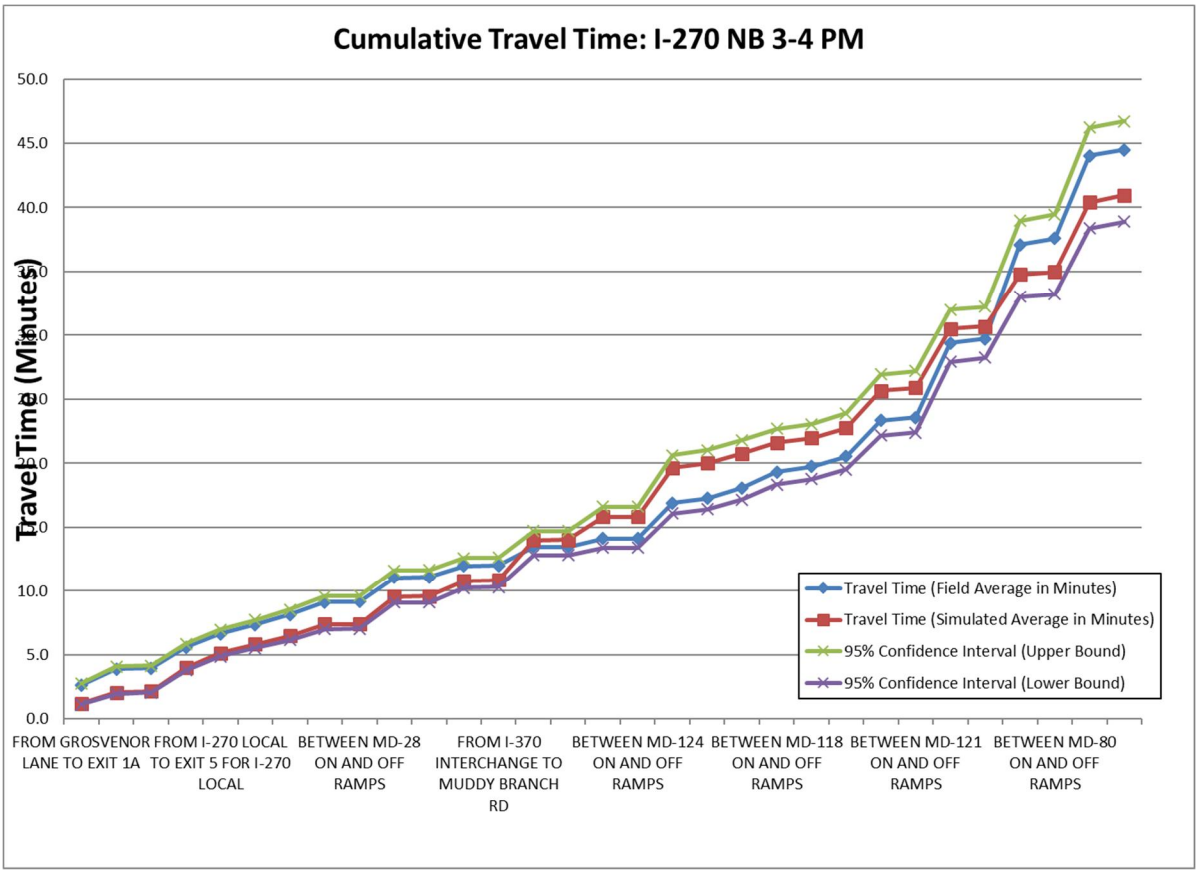


Figure A.85: I-270 NB Mainline 3-4 PM Cumulative Travel Time

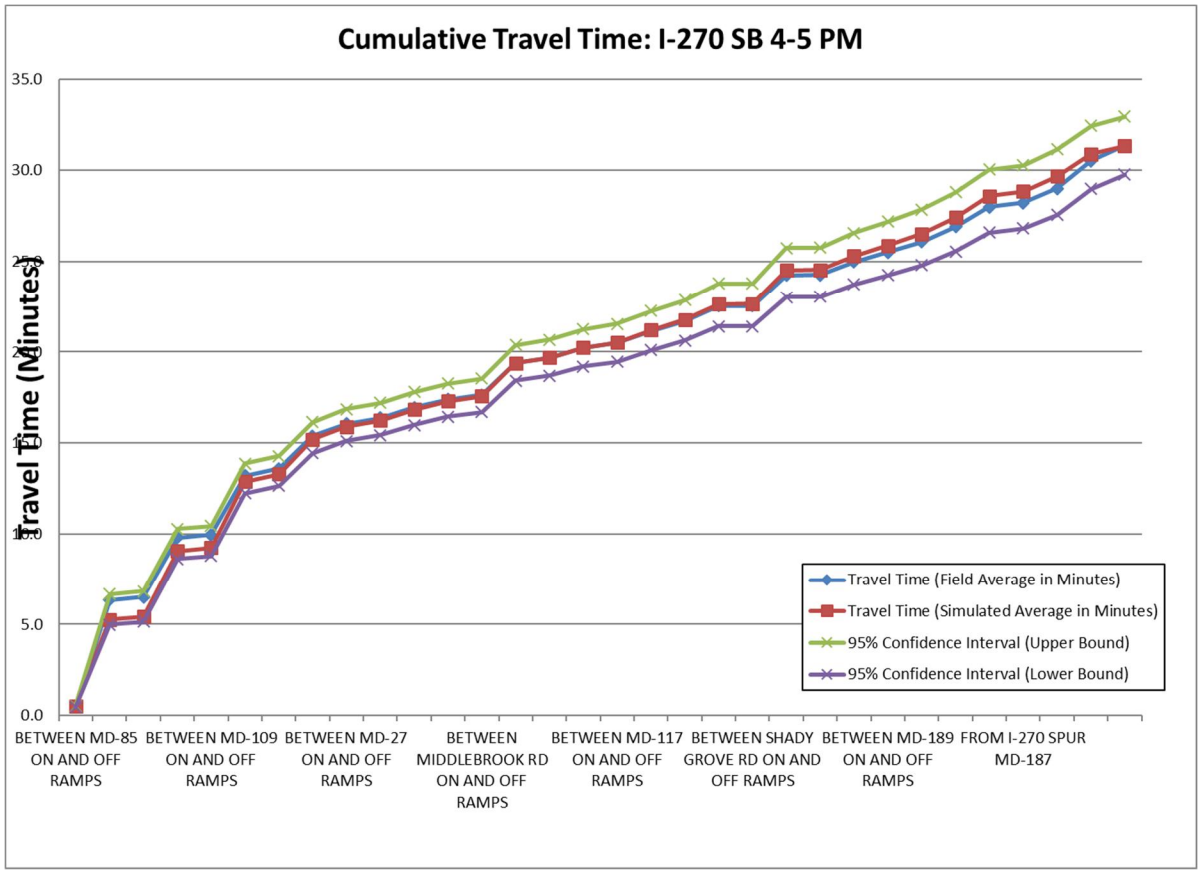


Figure A.86: I-270 SB Mainline 4-5 PM Cumulative Travel Time

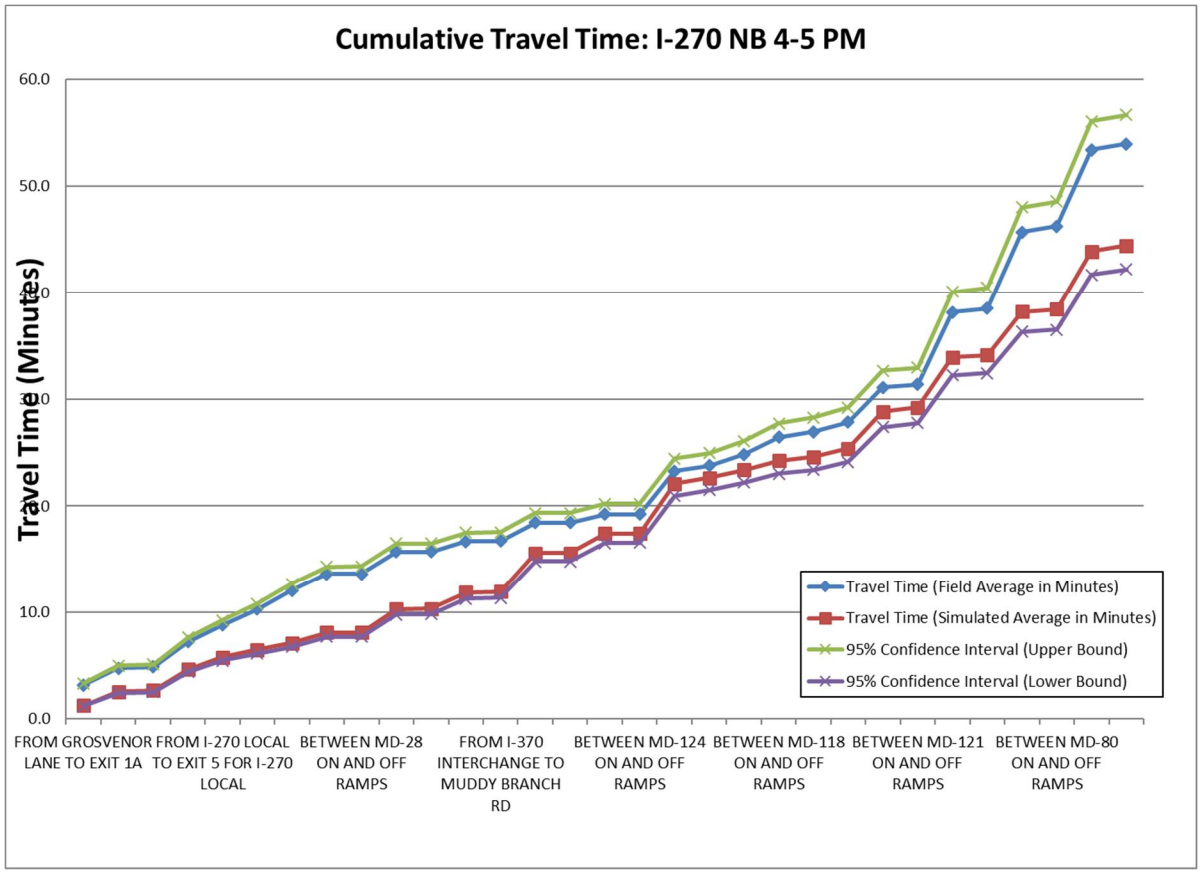


Figure A.87: I-270 NB Mainline 4-5 PM Cumulative Travel Time

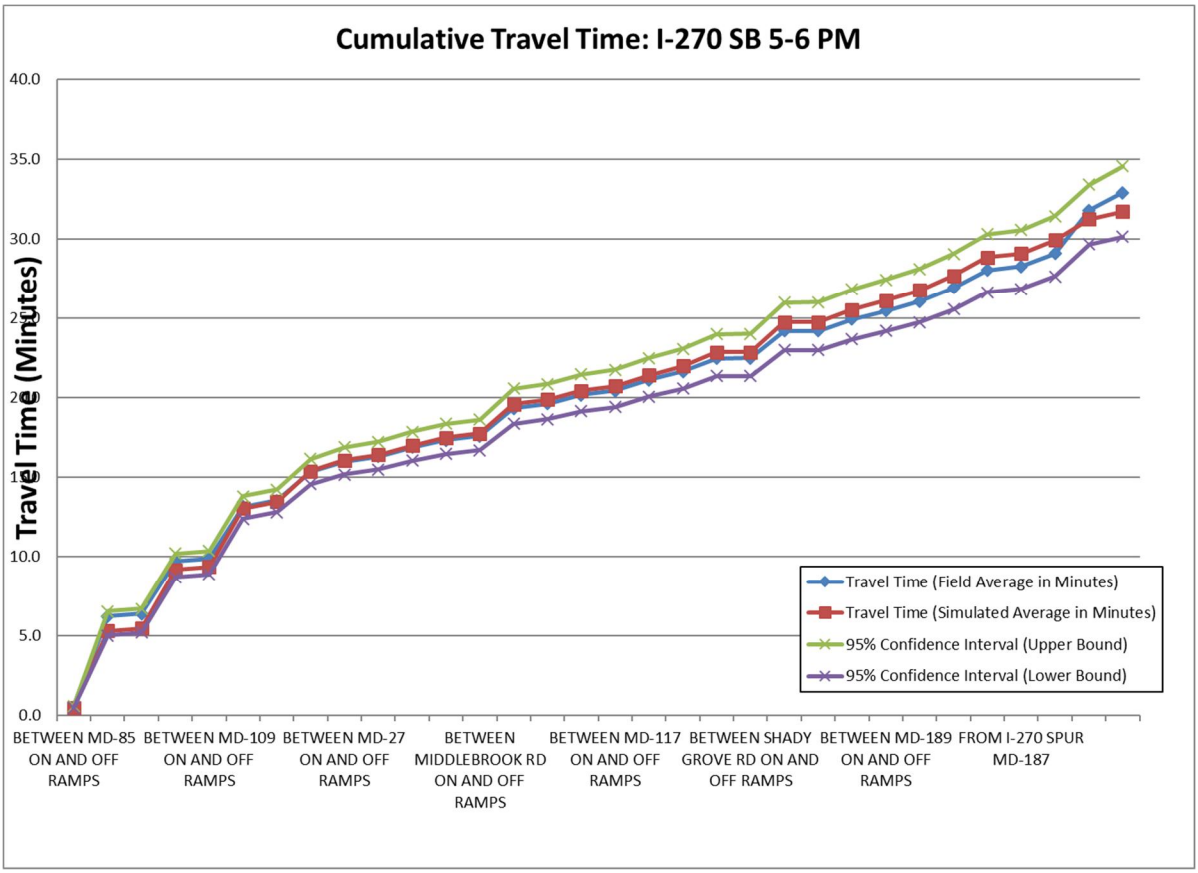


Figure A.88: I-270 SB Mainline 5-6 PM Cumulative Travel Time

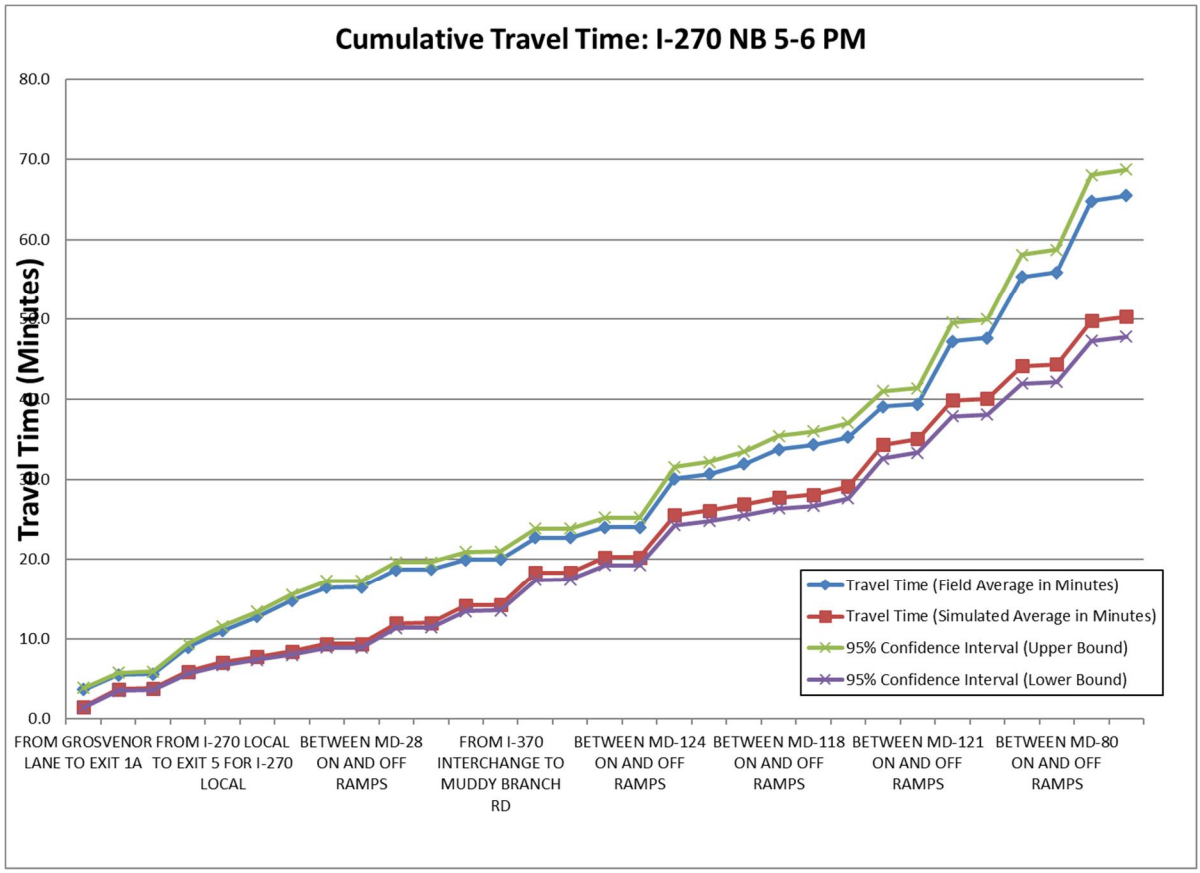


Figure A.89: I-270 NB Mainline 5-6 PM Cumulative Travel Time

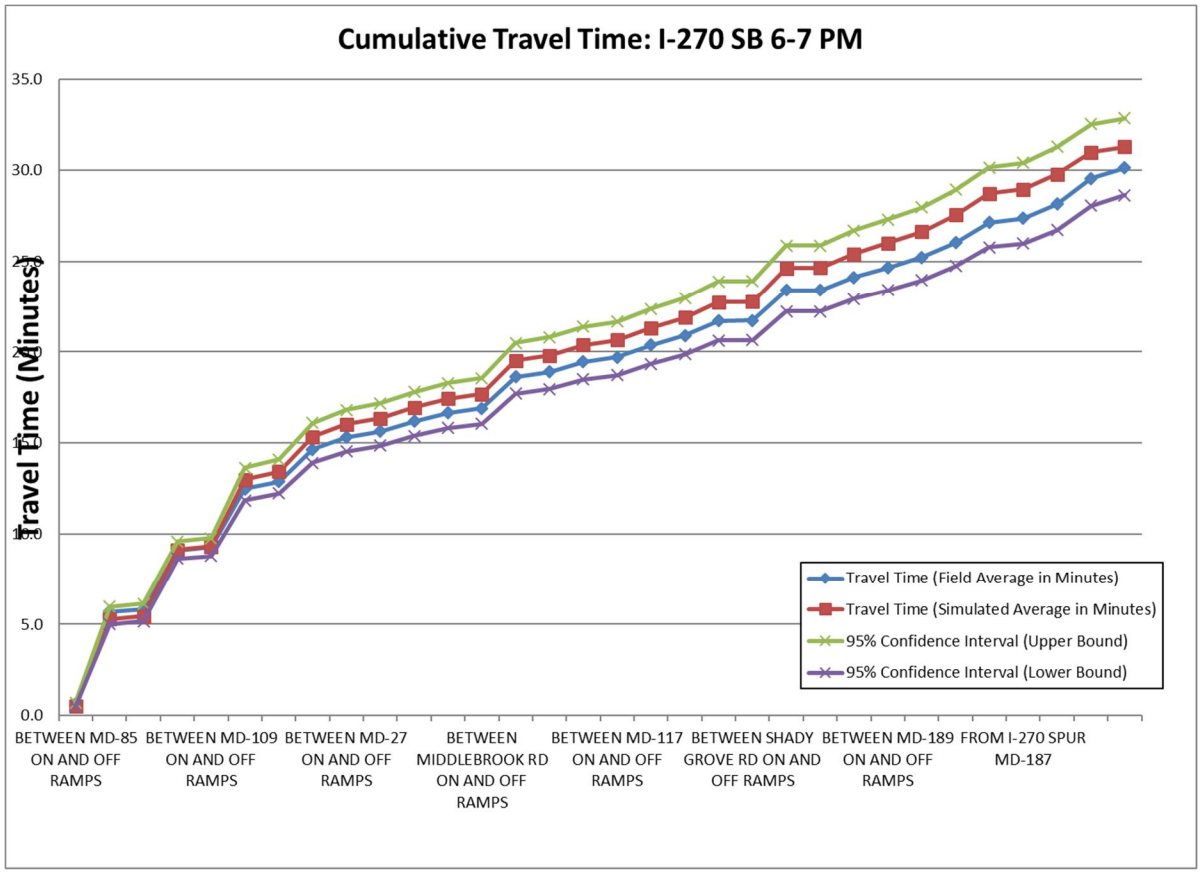


Figure A.90: I-270 SB Mainline 6-7 PM Cumulative Travel Time

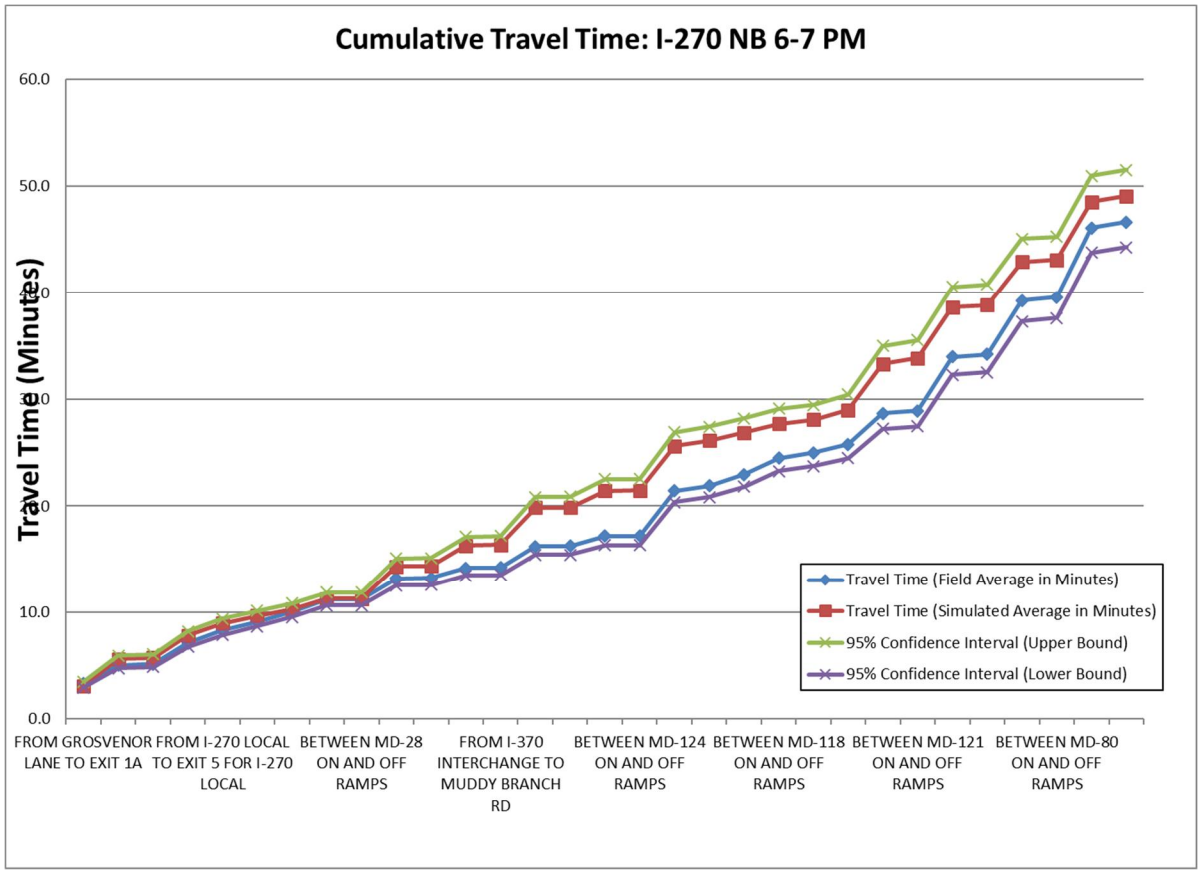


Figure A.91: I-270 NB Mainline 6-7 PM Cumulative Travel Time

I-270 Mainline Overall Comparison Tables

Legend
Criteria Met
Critera Not Met

I-270 SB 6-7 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	Yes	No	No	Yes	-4%	BETWEEN MD-85 ON AND OFF RAMPS
				No	40%	FROM MD-85 ON RAMP TO MD-80
				Yes	36%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	-17%	FROM MD-80 ON RAMP TO MD-109
				Yes	-20%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-6%	FROM MD-109 ON RAMP TO MD-121
				Yes	-13%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	8%	FROM MD-121 TO MD-27
				Yes	21%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	No	No	Yes	-37%	FROM MD-27 ON RAMP TO MD-118
				Yes	-44%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	1%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	19%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	1%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-63%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	Yes	Yes	Yes	-59%	FROM MD-124 ON RAMP TO MD-117
				Yes	-51%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	Yes	Yes	Yes	Yes	-48%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-19%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-25%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	1%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-24%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	-3%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-8%	FROM MD-28 ON RAMP TO MD-189
				Yes	-29%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-40%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-45%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	No	No	-90%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	No	Yes	Yes	No	-69%	FROM I-270 SPUR MD-187
				Yes	-2%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	0%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				Yes	7%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			

Figure A.92: I-270 SB Mainline 6-7 AM Overall Comparison

I-270 NB 6-7 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN MD 187 AND I-495						
				Yes	6%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	3%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	2%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	No	No	Yes	-2%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	-4%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-5%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-3%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	-5%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-6%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	7%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-4%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				Yes	-5%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	Yes	No	No	Yes	-7%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				Yes	-5%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	Yes	Yes	Yes	Yes	-4%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				Yes	-5%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-4%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-5%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	-3%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	-2%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	No	No	Yes	-2%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	-2%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	-3%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-3%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-3%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	-6%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	-4%	BETWEEN MD-109 ON AND OFF RAMPS
				Yes	-6%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	Yes	Yes	Yes	-5%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	-6%	FROM MD-80 ON RAMP TO MD-85
				Yes	-1%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.93: I-270 NB Mainline 6-7 AM Overall Comparison

I-270 SB 7-8 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	Yes	No	No	Yes	3%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	27%	FROM MD-85 ON RAMP TO MD-80
				Yes	-3%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	-39%	FROM MD-80 ON RAMP TO MD-109
				Yes	-37%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-2%	FROM MD-109 ON RAMP TO MD-121
				Yes	24%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	Yes	No	No	No	38%	FROM MD-121 TO MD-27
				Yes	33%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	No	No	Yes	-6%	FROM MD-27 ON RAMP TO MD-118
				Yes	-12%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	18%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	29%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	7%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-38%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	No	No	Yes	-29%	FROM MD-124 ON RAMP TO MD-117
				Yes	-8%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	Yes	Yes	Yes	Yes	-7%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	11%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	7%	FROM I-370 ON RAMP TO SHADY GROVE RD
				No	46%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	28%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	21%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-35%	FROM MD-28 ON RAMP TO MD-189
				Yes	-39%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-4%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-32%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	No	Yes	-16%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	No	Yes	-23%	FROM I-270 SPUR MD-187
				Yes	0%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	5%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				Yes	17%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	Yes	No			

Figure A.94: I-270 SB Mainline 7-8 AM Overall Comparison

I-270 NB 7-8 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	No	No	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	Yes	Yes			
BETWEEN MD 187 AND I-495						
				Yes	8%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	4%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	3%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	Yes	Yes	0%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	-5%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-5%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-4%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	-5%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-7%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-4%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-5%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				Yes	-6%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	Yes	No	Yes	-8%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				Yes	-7%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	Yes	-5%	FROM JUST SOUTH OF MD-117 TO MD-117
				Yes	-5%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-5%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-5%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	-3%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	-2%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	Yes	Yes	Yes	-2%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	-1%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	Yes	Yes	Yes	-4%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-2%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	Yes	Yes	Yes	-3%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	-6%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	Yes	Yes	Yes	-4%	BETWEEN MD-109 ON AND OFF RAMPS
				Yes	-7%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	No	Yes	Yes	Yes	-6%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	-6%	FROM MD-80 ON RAMP TO MD-85
				Yes	0%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.95: I-270 NB Mainline 7-8 AM Overall Comparison

I-270 SB 8-9 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	Yes	No	No	Yes	-2%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	-19%	FROM MD-85 ON RAMP TO MD-80
				No	-108%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	-67%	FROM MD-80 ON RAMP TO MD-109
				Yes	-57%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-4%	FROM MD-109 ON RAMP TO MD-121
				Yes	24%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	Yes	No	No	No	42%	FROM MD-121 TO MD-27
				No	61%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	No	No	No	54%	FROM MD-27 ON RAMP TO MD-118
				No	47%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	No	Yes	33%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	29%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	19%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-3%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	No	No	Yes	-22%	FROM MD-124 ON RAMP TO MD-117
				Yes	-3%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	Yes	Yes	Yes	Yes	-8%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	18%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	35%	FROM I-370 ON RAMP TO SHADY GROVE RD
				No	48%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	No	63%	FROM SHADY GROVE RD ON RAMP TO MD-28
				No	46%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	No	40%	FROM MD-28 ON RAMP TO MD-189
				Yes	37%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	43%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	22%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	Yes	Yes	-4%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	-29%	FROM I-270 SPUR MD-187
				Yes	-16%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	12%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				Yes	25%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			

Figure A.96: I-270 SB Mainline 8-9 AM Overall Comparison

I-270 NB 8-9 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	No	No	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	Yes			
BETWEEN MD 187 AND I-495						
				Yes	8%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	2%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	No	No	Yes	3%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	Yes	Yes	Yes	0%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	-5%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-4%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-3%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	-5%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	No	-11%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-3%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-5%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				Yes	-6%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	No	No	Yes	-8%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				Yes	-7%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	Yes	-6%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				Yes	-5%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-5%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-4%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	Yes	Yes	-1%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	-1%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	Yes	Yes	Yes	-1%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	0%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	Yes	Yes	Yes	-3%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-3%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	Yes	Yes	Yes	-3%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	-5%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	Yes	Yes	Yes	-4%	BETWEEN MD-109 ON AND OFF RAMPS
				Yes	-7%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	No	Yes	Yes	Yes	-6%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	-6%	FROM MD-80 ON RAMP TO MD-85
				Yes	-1%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.97: I-270 NB Mainline 8-9 AM Overall Comparison

I-270 SB 9-10 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	Yes	Yes	Yes	Yes	-7%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	-18%	FROM MD-85 ON RAMP TO MD-80
				Yes	-30%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	Yes	Yes	Yes	Yes	-39%	FROM MD-80 ON RAMP TO MD-109
				Yes	-43%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-8%	FROM MD-109 ON RAMP TO MD-121
				Yes	-15%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	-10%	FROM MD-121 TO MD-27
				Yes	28%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	No	No	No	37%	FROM MD-27 ON RAMP TO MD-118
				No	40%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	Yes	Yes	22%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	15%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	6%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-15%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	No	No	Yes	-16%	FROM MD-124 ON RAMP TO MD-117
				Yes	-14%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	No	Yes	Yes	Yes	-12%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-3%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	29%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	34%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	No	45%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	32%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	28%	FROM MD-28 ON RAMP TO MD-189
				Yes	21%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	24%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	4%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	No	Yes	-36%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	No	Yes	No	Yes	-49%	FROM I-270 SPUR MD-187
				Yes	21%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	23%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				Yes	22%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	Yes	Yes			

Figure A.98: I-270 SB Mainline 9-10 AM Overall Comparison

I-270 NB 9-10 AM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	No	No	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	Yes			
BETWEEN MD 187 AND I-495						
				Yes	7%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	2%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	No	No	Yes	3%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	Yes	Yes	Yes	1%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	-2%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-1%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-1%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	-3%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-8%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-2%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-3%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				Yes	-4%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	Yes	Yes	Yes	-8%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				Yes	-7%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	Yes	Yes	Yes	Yes	-5%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				Yes	-4%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-4%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-4%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	-2%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	-2%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	No	No	Yes	-1%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	0%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	Yes	Yes	Yes	-3%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-1%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	No	20%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	6%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	-4%	BETWEEN MD-109 ON AND OFF RAMPS
				Yes	-6%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	No	No	Yes	-4%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	-6%	FROM MD-80 ON RAMP TO MD-85
				Yes	1%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.99: I-270 NB Mainline 9-10 AM Overall Comparison

I-270 SB 3-4 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	No	Yes	Yes	Yes	-8%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	-5%	FROM MD-85 ON RAMP TO MD-80
				Yes	-12%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	No	Yes	Yes	Yes	-10%	FROM MD-80 ON RAMP TO MD-109
				Yes	-10%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	Yes	Yes	Yes	-11%	FROM MD-109 ON RAMP TO MD-121
				Yes	-7%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	No	No	No	Yes	-7%	FROM MD-121 TO MD-27
				Yes	-4%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	No	Yes	Yes	Yes	-3%	FROM MD-27 ON RAMP TO MD-118
				Yes	-4%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	No	Yes	Yes	Yes	-4%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	-6%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	No	No	No	Yes	-5%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-3%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	No	Yes	Yes	Yes	-2%	FROM MD-124 ON RAMP TO MD-117
				Yes	-2%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	No	Yes	Yes	Yes	-1%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-3%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-5%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	-11%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-11%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	-10%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-7%	FROM MD-28 ON RAMP TO MD-189
				Yes	-9%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-11%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-9%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	No	Yes	-5%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	-1%	FROM I-270 SPUR MD-187
				Yes	-6%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	6%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				No	56%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	No			
BETWEEN DEMOCRACY BLVD AND I-495	No	No	No			

Figure A.100: I-270 SB Mainline 3-4 PM Overall Comparison

I-270 NB 3-4 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	No	Yes	Yes			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	No			
BETWEEN MD 187 AND I-495						
				No	54%	FROM GROSVENOR LANE TO EXIT 1A
				No	31%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	No	Yes	-4%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	No	No	Yes	-13%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	-9%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	4%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	16%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	10%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-7%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-14%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-16%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				Yes	-34%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	No	No	No	-116%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				No	-114%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	No	-176%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				No	-182%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	No	-170%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-36%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	No	Yes	-8%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	8%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	Yes	No	Yes	31%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	19%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	Yes	No	Yes	0%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-3%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-2%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	21%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	Yes	No	No	40%	BETWEEN MD-109 ON AND OFF RAMPS
				No	45%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	No	No	No	58%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	16%	FROM MD-80 ON RAMP TO MD-85
				Yes	-16%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.101: I-270 NB Mainline 3-4 PM Overall Comparison

I-270 SB 4-5 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	No	Yes	Yes	Yes	-4%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	19%	FROM MD-85 ON RAMP TO MD-80
				Yes	-11%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	No	Yes	Yes	Yes	-11%	FROM MD-80 ON RAMP TO MD-109
				Yes	-12%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	Yes	Yes	Yes	-12%	FROM MD-109 ON RAMP TO MD-121
				Yes	-8%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	No	No	No	Yes	-7%	FROM MD-121 TO MD-27
				Yes	-4%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	Yes	Yes	Yes	-2%	FROM MD-27 ON RAMP TO MD-118
				Yes	-4%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	Yes	Yes	-5%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	-6%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	No	Yes	No	Yes	-5%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-2%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	Yes	No	Yes	-2%	FROM MD-124 ON RAMP TO MD-117
				Yes	-3%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	Yes	Yes	Yes	Yes	-2%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-3%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-5%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	-10%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-10%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	-10%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-7%	FROM MD-28 ON RAMP TO MD-189
				Yes	-8%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-11%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-11%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	Yes	Yes	Yes	-8%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	No	Yes	-3%	FROM I-270 SPUR MD-187
				Yes	-6%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	19%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				No	48%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			

Figure A.102: I-270 SB Mainline 4-5 PM Overall Comparison

I-270 NB 4-5 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	No	Yes	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	No	No			
BETWEEN MD 187 AND I-495						
				No	60%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	20%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	No	No	Yes	5%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	No	No	Yes	16%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	27%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	No	54%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	No	63%	BETWEEN MD-189 ON AND OFF RAMPS
				No	38%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	10%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-7%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-17%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				No	-59%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	No	No	No	-133%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				No	-112%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	No	-127%	FROM JUST SOUTH OF MD-117 TO MD-117
				No	-130%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	No	-106%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	-15%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	Yes	Yes	-11%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	28%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	No	No	No	46%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	32%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	10%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-5%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-32%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	30%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	No	No	No	46%	BETWEEN MD-109 ON AND OFF RAMPS
				No	43%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	No	No	No	62%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	23%	FROM MD-80 ON RAMP TO MD-85
				Yes	6%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.103: I-270 NB Mainline 4-5 PM Overall Comparison

I-270 SB 5-6 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	No	Yes	Yes	Yes	6%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	16%	FROM MD-85 ON RAMP TO MD-80
				Yes	-10%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	No	Yes	Yes	Yes	-12%	FROM MD-80 ON RAMP TO MD-109
				Yes	-12%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	Yes	Yes	Yes	-12%	FROM MD-109 ON RAMP TO MD-121
				Yes	-8%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	No	Yes	Yes	Yes	-8%	FROM MD-121 TO MD-27
				Yes	-4%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	Yes	Yes	Yes	-3%	FROM MD-27 ON RAMP TO MD-118
				Yes	-4%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	No	Yes	Yes	Yes	-5%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	-6%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	No	Yes	Yes	Yes	-6%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-2%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	Yes	Yes	Yes	-3%	FROM MD-124 ON RAMP TO MD-117
				Yes	-3%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	No	Yes	Yes	Yes	-3%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-4%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-7%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	-12%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-11%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	-9%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-7%	FROM MD-28 ON RAMP TO MD-189
				Yes	-8%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-8%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-6%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	No	Yes	Yes	Yes	-6%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	No	Yes	No	Yes	-2%	FROM I-270 SPUR MD-187
				Yes	-1%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				No	52%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				No	56%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			

Figure A.104: I-270 SB Mainline 5-6 PM Overall Comparison

I-270 NB 5-6 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	Yes			
BETWEEN MD 187 AND I-495						
				No	59%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	-22%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	7%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	No	No	Yes	37%	FROM TUCKERMAN LANE TO I-270 LOCAL
				No	45%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	No	61%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	No	67%	BETWEEN MD-189 ON AND OFF RAMPS
				No	43%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	12%	BETWEEN MD-28 ON AND OFF RAMPS
				Yes	-15%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	No	-89%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				No	-78%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	No	No	No	-106%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				Yes	-49%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	No	-86%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				Yes	-49%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-20%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	13%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	4%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	39%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	No	No	No	53%	BETWEEN MD-118 ON AND OFF RAMPS
				No	36%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	0%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-39%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	No	-116%	BETWEEN MD-121 ON AND OFF RAMPS
				No	39%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	No	No	No	51%	BETWEEN MD-109 ON AND OFF RAMPS
				No	47%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	No	No	No	65%	BETWEEN MD-80 ON AND OFF RAMPS
				No	39%	FROM MD-80 ON RAMP TO MD-85
				Yes	19%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.105: I-270 NB Mainline 5-6 PM Overall Comparison

I-270 SB 6-7 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN MD 85 AND MD 80	Yes	No	No	No	26%	BETWEEN MD-85 ON AND OFF RAMPS
				Yes	5%	FROM MD-85 ON RAMP TO MD-80
				Yes	-12%	BETWEEN MD-80 ON AND OFF RAMPS
BETWEEN MD 80 AND MD 109	Yes	No	Yes	Yes	-13%	FROM MD-80 ON RAMP TO MD-109
				Yes	-15%	BETWEEN MD-109 ON AND OFF RAMPS
BETWEEN MD 109 AND MD 121	Yes	No	No	Yes	-14%	FROM MD-109 ON RAMP TO MD-121
				Yes	-8%	BETWEEN MD-121 ON AND OFF RAMPS
BETWEEN MD 121 AND MD 27	Yes	Yes	Yes	Yes	-8%	FROM MD-121 TO MD-27
				Yes	-5%	BETWEEN MD-27 ON AND OFF RAMPS
BETWEEN MD 27 AND MD 118	Yes	No	No	Yes	-3%	FROM MD-27 ON RAMP TO MD-118
				Yes	-5%	BETWEEN MD-118 ON AND OFF RAMPS
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	Yes	Yes	Yes	-6%	FROM MD-118 ON RAMP TO MIDDLEBROOK RD
				Yes	-7%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	Yes	Yes	Yes	-6%	FROM MIDDLEBROOK RD ON RAMP TO MD-124
				Yes	-3%	BETWEEN MD-124 ON AND OFF RAMPS
BETWEEN MD 124 AND MD 117	Yes	No	No	Yes	-4%	FROM MD-124 ON RAMP TO MD-117
				Yes	-5%	BETWEEN MD-117 ON AND OFF RAMPS
BETWEEN MD 117 AND I-370	Yes	Yes	Yes	Yes	-3%	FROM MD-117 TO I-370 INTERCHANGE
				Yes	-5%	BETWEEN I-370 ON AND OFF RAMPS
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	Yes	-7%	FROM I-370 ON RAMP TO SHADY GROVE RD
				Yes	-12%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-12%	FROM SHADY GROVE RD ON RAMP TO MD-28
				Yes	-12%	BETWEEN MD-28 ON AND OFF RAMPS
BETWEEN MD 28 AND MD 189	No	No	No	Yes	-9%	FROM MD-28 ON RAMP TO MD-189
				Yes	-10%	BETWEEN MD-189 ON AND OFF RAMPS
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	-12%	FROM MD-189 ON RAMP TO MONTROSE RD
				Yes	-11%	BETWEEN MONTROSE RD ON AND OFF RAMPS
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	No	No	Yes	-8%	FROM MONTROSE RD ON RAMP TO I-270 SPUR
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	Yes	Yes	-2%	FROM I-270 SPUR MD-187
				Yes	-6%	BETWEEN MD-187 SPUR ON AND OFF RAMPS
BETWEEN MD 187 AND I-495				Yes	16%	FROM MD-187 ON RAMP TO I-495 INTERCHANGE
				No	48%	BETWEEN I-495 INTERCHANGE ON AND OFF RAMPS
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	Yes	No	No			
BETWEEN DEMOCRACY BLVD AND I-495	Yes	No	No			

Figure A.106: I-270 SB Mainline 6-7 PM Overall Comparison

I-270 NB 6-7 PM						
Volume Segment	More Throughput in Model?	Volume Difference Less than 10%?	GEH Less than 5?	Speed within Acceptable Range?	Travel Time % Difference	Travel Time Segment
BETWEEN DEMOCRACY BLVD AND I-495	Yes	Yes	Yes			
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	No	Yes	Yes			
BETWEEN MD 187 AND I-495						
				Yes	7%	FROM GROSVENOR LANE TO EXIT 1A
				Yes	-49%	BETWEEN EXIT 1A AND 1B
BETWEEN I-270 SPLIT AND MD 187	Yes	Yes	No	Yes	-9%	FROM MD-187 TO I-270 SPUR
BETWEEN MONTROSE RD AND I-270 SPLIT	Yes	Yes	No	Yes	-6%	FROM TUCKERMAN LANE TO I-270 LOCAL
				Yes	5%	FROM I-270 LOCAL TO EXIT 5 FOR I-270 LOCAL
BETWEEN MD 189 AND MONTROSE RD	No	No	No	Yes	17%	FROM EXIT 5 FOR I-270 LOCAL TO JUST SOUTH OF MD-189
BETWEEN MD 28 AND MD 189	No	No	No	Yes	28%	BETWEEN MD-189 ON AND OFF RAMPS
				Yes	16%	FROM MD-189 TO JUST SOUTH OF MD-28
BETWEEN SHADY GROVE RD AND MD 28	No	No	No	Yes	-2%	BETWEEN MD-28 ON AND OFF RAMPS
				No	-53%	FROM MD-28 ON RAMP TO REDLAND BLVD
BETWEEN I-370 AND SHADY GROVE RD	No	No	No	No	-139%	BETWEEN SHADY GROVE RD ON AND OFF RAMPS
				No	-101%	FROM SHADY GROVE RD ON RAMP TO I-370 INTERCHANGE
BETWEEN MD 117 AND I-370	No	No	No	No	-120%	FROM I-370 INTERCHANGE TO MUDDY BRANCH RD
				No	-72%	FROM MUDDY BRANCH RD TO JUST SOUTH OF MD-117
BETWEEN MD 124 AND MD 117	No	No	No	No	-64%	FROM JUST SOUTH OF MD-117 INTERCHANGE TO MD-117
				Yes	-64%	FROM MD-117 TO MD-124 OFF RAMP
BETWEEN MIDDLEBROOK ROAD AND MD 124	Yes	No	No	Yes	-54%	BETWEEN MD-124 ON AND OFF RAMPS
				Yes	1%	FROM MD-124 ON RAMP TO JUST SOUTH OF MIDDLEBROOK RD
BETWEEN MD 118 AND MIDDLEBROOK RD	Yes	No	No	Yes	-3%	BETWEEN MIDDLEBROOK RD ON AND OFF RAMPS
				Yes	29%	FROM MIDDLEBROOK RD ON RAMP TO MD-118 OFF RAMP
BETWEEN MD 27 AND MD 118	Yes	No	No	No	44%	BETWEEN MD-118 ON AND OFF RAMPS
				Yes	26%	FROM MD-118 ON RAMP TO MD-27
BETWEEN MD 121 AND MD 27	Yes	No	No	Yes	-15%	BETWEEN MD-27 ON AND OFF RAMPS
				Yes	-50%	FROM MD-27 ON RAMP TO MD-121 OFF RAMP
BETWEEN MD 109 AND MD 121	Yes	No	No	No	-113%	BETWEEN MD-121 ON AND OFF RAMPS
				Yes	5%	FROM MD-121 TO MD-109
BETWEEN MD 80 AND MD 109	Yes	No	No	Yes	20%	BETWEEN MD-109 ON AND OFF RAMPS
				Yes	19%	FROM MD-109 ON RAMP TO MD-80
BETWEEN MD 85 AND MD 80	Yes	No	No	No	39%	BETWEEN MD-80 ON AND OFF RAMPS
				Yes	17%	FROM MD-80 ON RAMP TO MD-85
				Yes	-2%	BETWEEN MD-85 ON AND OFF RAMPS

Figure A.107: I-270 NB Mainline 6-7 PM Overall Comparison

I-495 Ramp Volume Tables

Legend
Higher Throughput in Model
Higher Throughput in Field
Criteria Not Met

Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	686	688	0%	Yes	0.0763	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	30	161	-438%	No	13.4219	No
FROM I-495 TO MD 190	662	822	-24%	No	5.85642	No
FROM CABIN JOHN PARKWAY TO I-495	65	253	-289%	No	14.8954	No
FROM MD WB 190 TO I-495	416	846	-103%	No	17.1015	No
FROM I-495 TO I-270 SPUR NB	2363	3779	-60%	No	25.5559	No
FROM I-495 TO MD 187	439	523	-19%	No	3.80826	Yes
FROM MD 187 TO I-495	153	305	-100%	No	10.0582	No
FROM I-495 TO MD 355 SB	502	493	2%	Yes	0.39224	Yes
FROM I-270 SB TO I-495	2443	2389	2%	Yes	1.10884	Yes
FROM MD 355 SB TO I-495	575	849	-48%	No	10.2686	No
FROM MD 355 NB TO I-495	126	200	-59%	No	5.81348	No
FROM I-495 TO MD 185	786	1076	-37%	No	9.49681	No
FROM MD 185 SB TO I-495	134	190	-41%	No	4.36386	Yes
FROM MD 185 NB TO I-495	395	695	-76%	No	12.8414	No
FROM I-495 TO MD 97 SB	938	942	0%	Yes	0.11417	Yes
FROM MD 97 SB TO I-495	661	707	-7%	Yes	1.74005	Yes
FROM I-495 TO MD 97 NB	259	280	-8%	Yes	1.26427	Yes
FROM MD 97 NB TO I-495	311	447	-44%	No	6.96246	No
FROM I-495 TO US 29 SB	62	143	-130%	No	7.96094	No
FROM I-495 TO US 29 NB	302	640	-112%	No	15.5648	No
FROM US 29 NB TO I-495	221	573	-159%	No	17.6566	No
FROM I-495 TO MD 193 EB	383	499	-30%	No	5.50156	No
FROM MD 193 EB TO I-495	327	521	-59%	No	9.39996	No
FROM MD 193 WB TO I-495	262	376	-44%	No	6.39552	No
FROM I-495 TO MD 650 SB	515	357	31%	No	7.59295	No
FROM MD 650 SB TO I-495	639	616	4%	Yes	0.91817	Yes
FROM I-495 TO MD 650 NB	325	493	-52%	No	8.31816	No
FROM MD 650 NB TO I-495	1071	1033	4%	Yes	1.17159	Yes
I-495 TO I-95 NB/PARK AND RIDE LOT	3151	2831	10%	No	5.84646	No
I-95 SB (TO US 1) TO I-495	301	386	-28%	No	4.56091	Yes
PARK AND RIDE LOT TO I-495	102	103	-1%	Yes	0.07412	Yes
I-95 SB TO I-495	2928	3505	-20%	No	10.1738	No
I-495 TO US 1 SB	468	1622	-246%	No	35.6871	No
US 1 SB TO I-495	342	401	-17%	No	3.07352	Yes
I-495 TO US 1 NB	351	426	-21%	No	3.81717	Yes
US 1 NB TO I-495	335	435	-30%	No	5.08456	No
FROM I-495 TO GREENBELT METRO	337	366	-8%	Yes	1.52068	Yes
FROM I-495 TO MD 201	796	1297	-63%	No	15.487	No
FROM MD 201 SB TO I-495	333	443	-33%	No	5.56081	No
FROM MD 201 NB TO I-495	333	446	-34%	No	5.70214	No
FROM I-495 TO MD 295 SB	1490	1281	14%	No	5.62885	No
FROM MD 295 SB SB TO I-495	1113	1110	0%	Yes	0.08248	Yes
FROM I-495 TO MD 295 NB	401	618	-54%	No	9.62353	No
FROM M 295 NB TO I-495	19	23	-21%	No	0.87287	Yes
FROM I-495 TO MD 450	533	624	-17%	No	3.76349	Yes
FROM MD 450 TO I-495	1011	1099	-9%	Yes	2.69422	Yes
FROM I-495 TO US 50 EB	937	1125	-20%	No	5.84016	No
FROM I-495 TO US 50 WB	407	722	-77%	No	13.2399	No
FROM US 50 TO I-495	2604	2682	-3%	Yes	1.50756	Yes
FROM I-495 TO MD 202 WB	250	314	-26%	No	3.7971	Yes
FROM MD I-495 TO MD 202 EB	342	661	-93%	No	14.2541	No
FROM MD 202 TO I-495	307	711	-132%	No	17.8981	No
FROM I-495 TO ARENA DRIVE	173	280	-62%	No	7.08036	No
FROM ARENA DRIVE TO I-495	79	231	-192%	No	12.2089	No
FROM I-495 TO MD 214 WB	607	699	-15%	No	3.60024	Yes
FROM I-495 TO MD 214 EB	253	587	-132%	No	16.2878	No
FROM MD 214 TO I-495	813	1061	-31%	No	8.10181	No
FROM I-495 TO RITCHIE MARLBORO ROAD	445	956	-115%	No	19.2916	No
FROM RITCHIE MARLBORO ROAD TO I-495	643	1002	-56%	No	12.5178	No
FROM I-495 TO MD 4 WB	1132	1082	4%	Yes	1.49518	Yes
FROM MD 4 WB TO I-495	831	7071	-751%	No	99.2754	No
FROM I-495 TO MD 4 EB	851	704	17%	No	5.29068	No
FROM MD 4 EB TO I-495	427	423	1%	Yes	0.20619	Yes
FROM I-495 TO FORESTVILLE ROAD	510	636	-25%	No	5.25385	No
FROM SUITLAND ROAD TO I-495	223	219	2%	Yes	0.25218	Yes
FROM I-495 TO MD 5 SB/MD 535	1527	1869	-22%	No	8.28808	No
FROM MD 5 NB/MD 535 TO I-495	1749	1192	32%	No	14.5395	No
FROM MD 5 SB TO I-495	100	341	-241%	No	16.2053	No
FROM I-495 TO MD 414	278	353	-27%	No	4.20918	Yes
FROM MD 414 NB TO I-495	614	285	54%	No	15.5039	No
FROM I-495 TO MD 414 SB	308	421	-37%	No	5.90666	No
FROM MD 414 SB TO I-495	550	439	20%	No	4.97973	Yes
FROM I-495 TO MD 210	711	872	-23%	No	5.72269	No
FROM MD 210 NB (LOOP RAMP) TO I-495	1430	1371	4%	Yes	1.56981	Yes
FROM MD 210 SB TO I-495	331	424	-28%	No	4.78657	Yes
FROM MD 210 NB (FLYOVER RAMP) TO I-495	473	974	-106%	No	18.6106	No
FROM I-495 TO I-295 NB	786	686	13%	No	3.69558	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	1055	1094	-4%	Yes	1.18977	Yes
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	88	101	-15%	No	1.36211	Yes
FROM I-295 SB TO I-495	719	960	-34%	No	8.32577	No

Figure A.108: I-495 Inner Loop Ramp 6-7 AM Volumes

Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	507	2660	-425%	No	54.0964	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	238	480	-102%	No	12.7613	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	361	544	-51%	No	8.5817	No
FROM I-495 TO MD 414 (OXON HILL ROAD)	243	492	-102%	No	12.9888	No
FROM MD 414 (OXON HILL ROAD) TO I-495	580	720	-24%	No	5.49125	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	98	225	-130%	No	10.0093	No
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	180	232	-29%	No	3.60669	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	427	469	-10%	Yes	1.99585	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	450	436	3%	Yes	0.68911	Yes
FROM I-495 TO MD 5 EB	646	815	-26%	No	6.25283	No
FROM MD 5 EB TO I-495	373	403	-8%	Yes	1.52302	Yes
FROM I-495 TO MD 5 WB	260	302	-16%	No	2.51986	Yes
FROM MD 5 WB TO I-495	1787	1883	-5%	Yes	2.24682	Yes
FROM I-495 TO MD 337	568	615	-8%	Yes	1.9325	Yes
FROM MD 337 TO I-495	664	782	-18%	No	4.39738	Yes
FROM I-495 TO MD 4 EB	504	457	9%	Yes	2.13245	Yes
FROM MD 4 EB TO I-495	570	561	2%	Yes	0.37847	Yes
FROM I-495 TO MD 4 WB	355	582	-64%	No	10.4976	No
FROM MD 4 WB TO I-495	991	1210	-22%	No	6.6016	No
FROM I-495 TO RITCHIE MARLBORO ROAD	471	521	-11%	No	2.23412	Yes
FROM RITCHIE MARLBORO ROAD TO I-495	987	1230	-25%	No	7.29858	No
FROM I-495 TO MD 214	561	964	-72%	No	14.5944	No
FROM MD 214 EB TO I-495	491	573	-17%	No	3.56557	Yes
FROM MD 214 WB TO I-495	525	552	-5%	Yes	1.15287	Yes
FROM I-495 TO ARENA DRIVE	381	432	-13%	No	2.5055	Yes
FROM ARENA DRIVE TO I-495	93	361	-288%	No	17.7995	No
FROM I-495 TO MD 202	732	851	-16%	No	4.22982	Yes
FROM MD 202 EB TO I-495	171	0	100%	No	18.4932	No
FROM MD 202 TO I-495	890	893	0%	Yes	0.10884	Yes
FROM I-495 TO US 50 EB	851	1026	-21%	No	5.70465	No
FROM I-495 TO US 50 WB	958	873	9%	Yes	2.82616	Yes
FROM US 50 TO I-495	2393	5874	-145%	No	54.1464	No
FROM I-495 TO MD 450 EB	533	662	-24%	No	5.25805	No
FROM I-495 TO MD 450 WB	191	242	-26%	No	3.4341	Yes
FROM MD 450 TO I-495	792	826	-4%	Yes	1.20407	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1619	1571	3%	Yes	1.21449	Yes
FROM MD 295 SB TO I-495	995	1048	-5%	Yes	1.64283	Yes
FROM I-495 TO MD 295 SB	23	53	-132%	No	4.89915	Yes
FROM MD 295 SB TO I-495	566	459	19%	No	4.72647	Yes
FROM I-495 TO MD 201	1093	1261	-15%	No	4.88987	Yes
FROM MD 201 NB TO I-495	691	466	33%	No	9.36613	No
FROM MD 201 SB TO I-495	118	131	-11%	No	1.1869	Yes
FROM GREENBELT METRO STATION TO I-495	30	51	-69%	No	3.26559	Yes
FROM I-495 TO US 1	651	876	-35%	No	8.14288	No
FROM US 1 NB TO I-495	260	351	-35%	No	5.20638	No
FROM US 1 SB TO I-495	347	361	-4%	Yes	0.71777	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	2364	3084	-30%	No	13.7997	No
FROM PARK AND RIDE LOT TO I-495	61	85	-39%	No	2.80899	Yes
FROM I-95 SB TO I-495	3093	2547	18%	No	10.2768	No
FROM I-495 TO MD 650 NB	540	552	-2%	Yes	0.49227	Yes
FROM MD 650 NB TO I-495	262	260	1%	Yes	0.15482	Yes
FROM I-495 TO MD 650 SB	660	631	4%	Yes	1.13148	Yes
FROM MD 650 SB TO I-495	317	375	-18%	No	3.10522	Yes
FROM I-495 TO MD 193 WB	360	356	1%	Yes	0.21141	Yes
FROM MD 193 WB TO I-495	740	711	4%	Yes	1.07666	Yes
FROM US 29 NB TO I-495	41	178	-335%	No	13.1086	No
FROM I-495 TO US 29 SB	403	368	9%	Yes	1.76959	Yes
FROM US 29 SB FROM TO I-495	1266	894	29%	No	11.3279	No
FROM I-495 TO MD 97	435	497	-14%	No	2.87209	Yes
FROM MD 97 NB TO I-495	470	850	-81%	No	14.7915	No
FROM MD 97 SB TO I-495	544	734	-35%	No	7.49797	No
FROM I-495 TO MD 185	1765	1793	-2%	Yes	0.65795	Yes
FROM MD 185 NB TO I-495	235	592	-152%	No	17.5466	No
FROM MD 185 SB TO I-495	540	624	-16%	No	3.4919	Yes
FROM I-495 TO MD 355 NB	723	886	-23%	No	5.75515	No
FROM I-495 TO I-270 NB	2170	3044	-40%	No	17.122	No
MD 355 NB TO I-495	199	322	-62%	No	7.63447	No
FROM I-495 TO MD 187	327	416	-27%	No	4.61754	Yes
FROM MD 187 TO I-495	223	662	-197%	No	20.8782	No
FROM I-270 SPUR SB TO I-495	4988	5264	-6%	Yes	3.84807	Yes
FROM MD 190 WB TO I-495	250	440	-76%	No	10.2176	No
FROM I-495 TO MD 190	832	834	0%	Yes	0.05198	Yes
FROM MD 190 EB TO I-495	459	1376	-200%	No	30.2738	No
FROM I-495 TO CABIN JOHN PARKWAY	1523	1211	20%	No	8.4386	No
FROM I-495 TO CLARA BARTON PARKWAY WB	183	141	23%	No	3.34169	Yes
FROM CLARA BARTON PARKWAY TO I-495	264	772	-192%	No	22.3202	No

Figure A.109: I-495 Outer Loop Ramp 6-7 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	716	704	2%	Yes	0.45035	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	108	172	-59%	No	5.39027	No
FROM I-495 TO MD 190	851	824	3%	Yes	0.93298	Yes
FROM CABIN JOHN PARKWAY TO I-495	238	260	-9%	Yes	1.3787	Yes
FROM MD WB 190 TO I-495	981	913	7%	Yes	2.20143	Yes
FROM I-495 TO I-270 SPUR NB	3938	3798	4%	Yes	2.24699	Yes
FROM I-495 TO MD 187	644	517	20%	No	5.29301	No
FROM MD 187 TO I-495	310	290	6%	Yes	1.1547	Yes
FROM I-495 TO MD 355 SB	475	454	5%	Yes	0.99784	Yes
FROM I-270 SB TO I-495	2635	2542	4%	Yes	1.83289	Yes
FROM MD 355 SB TO I-495	998	837	16%	No	5.30662	No
FROM MD 355 NB TO I-495	218	185	15%	No	2.34309	Yes
FROM I-495 TO MD 185	1044	1086	-4%	Yes	1.2794	Yes
FROM MD 185 SB TO I-495	178	193	-9%	Yes	1.11931	Yes
FROM MD 185 NB TO I-495	827	699	15%	No	4.63391	Yes
FROM I-495 TO MD 97 SB	1113	995	11%	No	3.62673	Yes
FROM MD 97 SB TO I-495	831	684	18%	No	5.35057	No
FROM I-495 TO MD 97 NB	335	295	12%	No	2.25374	Yes
FROM MD 97 NB TO I-495	531	444	16%	No	3.96399	Yes
FROM I-495 TO US 29 SB	150	156	-4%	Yes	0.50508	Yes
FROM I-495 TO US 29 NB	779	661	15%	No	4.417	Yes
FROM US 29 NB TO I-495	491	554	-13%	No	2.76672	Yes
FROM I-495 TO MD 193 EB	534	510	4%	Yes	1.05045	Yes
FROM MD 193 EB TO I-495	450	515	-14%	No	2.94814	Yes
FROM MD 193 WB TO I-495	288	369	-28%	No	4.48201	Yes
FROM I-495 TO MD 650 SB	662	353	47%	No	13.742	No
FROM MD 650 SB TO I-495	657	639	3%	Yes	0.69722	Yes
FROM I-495 TO MD 650 NB	533	505	5%	Yes	1.21794	Yes
FROM MD 650 NB TO I-495	856	1038	-21%	No	5.89874	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3287	2924	11%	No	6.51851	No
I-95 SB (TO US 1) TO I-495	549	443	19%	No	4.77137	Yes
PARK AND RIDE LOT TO I-495	114	97	15%	No	1.65509	Yes
I-95 SB TO I-495	2921	3682	-26%	No	13.2443	No
I-495 TO US 1 SB	714	1699	-138%	No	28.3635	No
US 1 SB TO I-495	529	411	22%	No	5.44293	No
I-495 TO US 1 NB	337	458	-36%	No	6.069	No
US 1 NB TO I-495	521	446	14%	No	3.41085	Yes
FROM I-495 TO GREENBELT METRO	488	341	30%	No	7.23367	No
FROM I-495 TO MD 201	1090	1356	-24%	No	7.59269	No
FROM MD 201 SB TO I-495	447	455	-2%	Yes	0.38842	Yes
FROM MD 201 NB TO I-495	413	449	-9%	Yes	1.74585	Yes
FROM I-495 TO MD 295 SB	1501	1292	14%	No	5.60664	No
FROM MD 295 SB SB TO I-495	1025	1132	-10%	No	3.25817	Yes
FROM I-495 TO MD 295 NB	563	619	-10%	Yes	2.31357	Yes
FROM M 295 NB TO I-495	28	24	14%	No	0.78446	Yes
FROM I-495 TO MD 450	751	629	16%	No	4.64446	Yes
FROM MD 450 TO I-495	1166	1048	10%	No	3.562	Yes
FROM I-495 TO US 50 EB	1304	1134	13%	No	4.86167	Yes
FROM I-495 TO US 50 WB	334	739	-121%	No	17.4764	No
FROM US 50 TO I-495	2850	2629	8%	Yes	4.23212	Yes
FROM I-495 TO MD 202 WB	359	337	6%	Yes	1.20656	Yes
FROM MD I-495 TO MD 202 EB	715	677	5%	Yes	1.44039	Yes
FROM MD 202 TO I-495	440	735	-67%	No	12.1708	No
FROM I-495 TO ARENA DRIVE	233	268	-15%	No	2.21138	Yes
FROM ARENA DRIVE TO I-495	145	223	-53%	No	5.71726	No
FROM I-495 TO MD 214 WB	767	706	8%	Yes	2.25713	Yes
FROM I-495 TO MD 214 EB	597	592	1%	Yes	0.19479	Yes
FROM MD 214 TO I-495	1129	1041	8%	Yes	2.67932	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	618	963	-56%	No	12.2786	No
FROM RITCHIE MARLBORO ROAD TO I-495	949	1056	-11%	No	3.37173	Yes
FROM I-495 TO MD 4 WB	1532	1065	30%	No	12.9673	No
FROM MD 4 WB TO I-495	914	7058	-672%	No	97.3132	No
FROM I-495 TO MD 4 EB	755	701	7%	Yes	1.99194	Yes
FROM MD 4 EB TO I-495	523	436	17%	No	3.97306	Yes
FROM I-495 TO FORESTVILLE ROAD	620	589	5%	Yes	1.27115	Yes
FROM SUITLAND ROAD TO I-495	197	225	-14%	No	1.94423	Yes
FROM I-495 TO MD 5 SB/MD 535	2416	1876	22%	No	11.6511	No
FROM MD 5 NB/MD 535 TO I-495	1068	1115	-4%	Yes	1.4301	Yes
FROM MD 5 SB TO I-495	157	367	-134%	No	12.9615	No
FROM I-495 TO MD 414	448	342	24%	No	5.36029	No
FROM MD 414 NB TO I-495	410	304	26%	No	5.63855	No
FROM I-495 TO MD 414 SB	404	429	-6%	Yes	1.20085	Yes
FROM MD 414 SB TO I-495	513	462	10%	Yes	2.30985	Yes
FROM I-495 TO MD 210	441	863	-96%	No	16.5104	No
FROM MD 210 NB (LOOP RAMP) TO I-495	1042	1361	-31%	No	9.18952	No
FROM MD 210 SB TO I-495	216	423	-96%	No	11.5807	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	563	960	-70%	No	14.3786	No
FROM I-495 TO I-295 NB	352	559	-59%	No	9.69898	No
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	1052	1088	-3%	Yes	1.10813	Yes
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	62	100	-60%	No	4.17311	Yes
FROM I-295 SB TO I-495	1150	938	18%	No	6.5775	No

Figure A.110: I-495 Inner Loop Ramp 7-8 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	703	2668	-280%	No	47.8671	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	352	506	-44%	No	7.4242	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	600	542	10%	Yes	2.4165	Yes
FROM I-495 TO MD 414 (OXON HILL ROAD)	294	511	-74%	No	10.827	No
FROM MD 414 (OXON HILL ROAD) TO I-495	706	696	1%	Yes	0.38717	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	156	222	-42%	No	4.81739	Yes
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	274	237	14%	No	2.33097	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	481	471	2%	Yes	0.45835	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	726	430	41%	No	12.3354	No
FROM I-495 TO MD 5 EB	825	850	-3%	Yes	0.84672	Yes
FROM MD 5 EB TO I-495	432	403	7%	Yes	1.43174	Yes
FROM I-495 TO MD 5 WB	423	317	25%	No	5.53854	No
FROM MD 5 WB TO I-495	1818	1852	-2%	Yes	0.7879	Yes
FROM I-495 TO MD 337	809	603	25%	No	7.75291	No
FROM MD 337 TO I-495	1034	778	25%	No	8.52282	No
FROM I-495 TO MD 4 EB	491	437	11%	No	2.53078	Yes
FROM MD 4 EB TO I-495	687	575	16%	No	4.46904	Yes
FROM I-495 TO MD 4 WB	711	589	17%	No	4.77497	Yes
FROM MD 4 WB TO I-495	1039	1214	-17%	No	5.1997	No
FROM I-495 TO RITCHIE MARLBORO ROAD	663	520	22%	No	5.90155	No
FROM RITCHIE MARLBORO ROAD TO I-495	1419	1199	16%	No	6.09509	No
FROM I-495 TO MD 214	978	947	3%	Yes	0.99922	Yes
FROM MD 214 EB TO I-495	625	587	6%	Yes	1.54364	Yes
FROM MD 214 WB TO I-495	606	548	10%	Yes	2.42524	Yes
FROM I-495 TO ARENA DRIVE	499	445	11%	No	2.50923	Yes
FROM ARENA DRIVE TO I-495	169	366	-116%	No	12.0325	No
FROM I-495 TO MD 202	1080	863	20%	No	6.97901	No
FROM MD 202 EB TO I-495	176	0	100%	No	18.7617	No
FROM MD 202 TO I-495	1239	912	26%	No	9.97109	No
FROM I-495 TO US 50 EB	1031	1028	0%	Yes	0.1013	Yes
FROM I-495 TO US 50 WB	967	865	11%	No	3.36169	Yes
FROM US 50 TO I-495	2664	5852	-120%	No	48.8557	No
FROM I-495 TO MD 450 EB	752	675	10%	No	2.90189	Yes
FROM I-495 TO MD 450 WB	202	246	-22%	No	2.95575	Yes
FROM MD 450 TO I-495	894	812	9%	Yes	2.81639	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1515	1580	-4%	Yes	1.64605	Yes
FROM MD 295 SB TO I-495	1187	1023	14%	No	4.94919	Yes
FROM I-495 TO MD 295 SB	27	47	-73%	No	3.25238	Yes
FROM MD 295 SB TO I-495	608	487	20%	No	5.19378	No
FROM I-495 TO MD 201	1486	1255	16%	No	6.23983	No
FROM MD 201 NB TO I-495	603	458	24%	No	6.28383	No
FROM MD 201 SB TO I-495	135	132	3%	Yes	0.3032	Yes
FROM GREENBELT METRO STATION TO I-495	58	45	23%	No	1.88576	Yes
FROM I-495 TO US 1	1150	892	22%	No	8.07434	No
FROM US 1 NB TO I-495	423	378	11%	No	2.27429	Yes
FROM US 1 SB TO I-495	347	371	-7%	Yes	1.2537	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	3711	3105	16%	No	10.3851	No
FROM PARK AND RIDE LOT TO I-495	97	87	10%	No	1.04257	Yes
FROM I-95 SB TO I-495	2286	2672	-17%	No	7.75263	No
FROM I-495 TO MD 650 NB	635	564	11%	No	2.89977	Yes
FROM MD 650 NB TO I-495	319	253	21%	No	3.88703	Yes
FROM I-495 TO MD 650 SB	663	633	5%	Yes	1.17851	Yes
FROM MD 650 SB TO I-495	415	374	10%	No	2.09008	Yes
FROM I-495 TO MD 193 WB	350	349	0%	Yes	0.08026	Yes
FROM MD 193 WB TO I-495	597	700	-17%	No	4.04466	Yes
FROM US 29 NB TO I-495	104	183	-76%	No	6.57679	No
FROM I-495 TO US 29 SB	377	421	-12%	No	2.21492	Yes
FROM US 29 SB FROM TO I-495	1475	872	41%	No	17.619	No
FROM I-495 TO MD 97	287	518	-80%	No	11.4927	No
FROM MD 97 NB TO I-495	1041	830	20%	No	6.91587	No
FROM MD 97 SB TO I-495	918	720	22%	No	6.90942	No
FROM I-495 TO MD 185	1452	1727	-19%	No	6.90367	No
FROM MD 185 NB TO I-495	653	610	7%	Yes	1.73136	Yes
FROM MD 185 SB TO I-495	721	619	14%	No	3.93058	Yes
FROM I-495 TO MD 355 NB	838	913	-9%	Yes	2.5182	Yes
FROM I-495 TO I-270 NB	2860	3101	-8%	Yes	4.41889	Yes
MD 355 NB TO I-495	389	320	18%	No	3.69258	Yes
FROM I-495 TO MD 187	467	428	8%	Yes	1.86776	Yes
FROM MD 187 TO I-495	406	651	-60%	No	10.6476	No
FROM I-270 SPUR SB TO I-495	4926	5265	-7%	Yes	4.74905	Yes
FROM MD 190 WB TO I-495	423	438	-4%	Yes	0.72294	Yes
FROM I-495 TO MD 190	1125	848	25%	No	8.81924	No
FROM MD 190 EB TO I-495	705	1409	-100%	No	21.6474	No
FROM I-495 TO CABIN JOHN PARKWAY	925	1243	-34%	No	9.6656	No
FROM I-495 TO CLARA BARTON PARKWAY WB	162	154	5%	Yes	0.63645	Yes
FROM CLARA BARTON PARKWAY TO I-495	695	768	-10%	No	2.69007	Yes

Figure A.111: I-495 Outer Loop Ramp 7-8 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	776	703	9%	Yes	2.68444	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	117	167	-43%	No	4.21503	Yes
FROM I-495 TO MD 190	905	817	10%	Yes	2.99029	Yes
FROM CABIN JOHN PARKWAY TO I-495	297	249	16%	No	2.92089	Yes
FROM MD WB 190 TO I-495	1427	892	37%	No	15.7115	No
FROM I-495 TO I-270 SPUR NB	5155	3754	27%	No	20.9993	No
FROM I-495 TO MD 187	657	491	25%	No	6.95109	No
FROM MD 187 TO I-495	321	297	8%	Yes	1.37981	Yes
FROM I-495 TO MD 355 SB	382	473	-24%	No	4.38977	Yes
FROM I-270 SB TO I-495	2770	2583	7%	Yes	3.62442	Yes
FROM MD 355 SB TO I-495	1089	853	22%	No	7.59062	No
FROM MD 355 NB TO I-495	235	186	21%	No	3.3773	Yes
FROM I-495 TO MD 185	1014	1078	-6%	Yes	1.98647	Yes
FROM MD 185 SB TO I-495	234	193	18%	No	2.82392	Yes
FROM MD 185 NB TO I-495	895	719	20%	No	6.18621	No
FROM I-495 TO MD 97 SB	1203	1009	16%	No	5.84128	No
FROM MD 97 SB TO I-495	767	694	9%	Yes	2.69145	Yes
FROM I-495 TO MD 97 NB	305	300	2%	Yes	0.30192	Yes
FROM MD 97 NB TO I-495	497	444	11%	No	2.43156	Yes
FROM I-495 TO US 29 SB	182	147	20%	No	2.76997	Yes
FROM I-495 TO US 29 NB	834	674	19%	No	5.82686	No
FROM US 29 NB TO I-495	735	561	24%	No	6.82489	No
FROM I-495 TO MD 193 EB	507	518	-2%	Yes	0.47491	Yes
FROM MD 193 EB TO I-495	462	499	-8%	Yes	1.66556	Yes
FROM MD 193 WB TO I-495	305	374	-22%	No	3.71904	Yes
FROM I-495 TO MD 650 SB	644	352	45%	No	13.0848	No
FROM MD 650 SB TO I-495	648	649	0%	Yes	0.02945	Yes
FROM I-495 TO MD 650 NB	757	506	33%	No	10.0101	No
FROM MD 650 NB TO I-495	660	1010	-53%	No	12.12	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3032	2845	6%	Yes	3.44499	Yes
I-95 SB (TO US 1) TO I-495	669	406	39%	No	11.344	No
PARK AND RIDE LOT TO I-495	113	105	7%	Yes	0.79066	Yes
I-95 SB TO I-495	2593	3440	-33%	No	15.4132	No
I-495 TO US 1 SB	901	1706	-89%	No	22.2967	No
US 1 SB TO I-495	477	417	13%	No	2.8379	Yes
I-495 TO US 1 NB	370	457	-23%	No	4.26675	Yes
US 1 NB TO I-495	550	433	21%	No	5.30135	No
FROM I-495 TO GREENBELT METRO	381	351	8%	Yes	1.55479	Yes
FROM I-495 TO MD 201	1132	1325	-17%	No	5.49957	No
FROM MD 201 SB TO I-495	464	444	4%	Yes	0.96238	Yes
FROM MD 201 NB TO I-495	439	431	2%	Yes	0.40766	Yes
FROM I-495 TO MD 295 SB	1324	1317	1%	Yes	0.18574	Yes
FROM MD 295 SB SB TO I-495	1293	1150	11%	No	4.10629	Yes
FROM I-495 TO MD 295 NB	726	603	17%	No	4.78168	Yes
FROM M 295 NB TO I-495	27	24	11%	No	0.59409	Yes
FROM I-495 TO MD 450	744	632	15%	No	4.27988	Yes
FROM MD 450 TO I-495	1200	1067	11%	No	3.94276	Yes
FROM I-495 TO US 50 EB	1386	1169	16%	No	6.07127	No
FROM I-495 TO US 50 WB	280	723	-158%	No	19.7645	No
FROM US 50 TO I-495	2791	2650	5%	Yes	2.70816	Yes
FROM I-495 TO MD 202 WB	387	333	14%	No	2.8734	Yes
FROM MD I-495 TO MD 202 EB	959	689	28%	No	9.4059	No
FROM MD 202 TO I-495	454	710	-56%	No	10.6208	No
FROM I-495 TO ARENA DRIVE	404	287	29%	No	6.3237	No
FROM ARENA DRIVE TO I-495	145	230	-59%	No	6.22371	No
FROM I-495 TO MD 214 WB	865	700	19%	No	5.91732	No
FROM I-495 TO MD 214 EB	681	584	14%	No	3.86725	Yes
FROM MD 214 TO I-495	1033	1032	0%	Yes	0.02334	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	655	942	-44%	No	10.1404	No
FROM RITCHIE MARLBORO ROAD TO I-495	785	1048	-34%	No	8.69506	No
FROM I-495 TO MD 4 WB	870	1062	-22%	No	6.16985	No
FROM MD 4 WB TO I-495	831	7081	-752%	No	99.3692	No
FROM I-495 TO MD 4 EB	597	709	-19%	No	4.3829	Yes
FROM MD 4 EB TO I-495	429	424	1%	Yes	0.24211	Yes
FROM I-495 TO FORESTVILLE ROAD	635	618	3%	Yes	0.68924	Yes
FROM SUITLAND ROAD TO I-495	207	229	-11%	No	1.47352	Yes
FROM I-495 TO MD 5 SB/MD 535	2211	1901	14%	No	6.8482	No
FROM MD 5 NB/MD 535 TO I-495	887	1148	-29%	No	8.16759	No
FROM MD 5 SB TO I-495	150	358	-139%	No	13.0386	No
FROM I-495 TO MD 414	414	367	11%	No	2.36538	Yes
FROM MD 414 NB TO I-495	303	295	3%	Yes	0.49177	Yes
FROM I-495 TO MD 414 SB	473	421	11%	No	2.45952	Yes
FROM MD 414 SB TO I-495	469	445	5%	Yes	1.14638	Yes
FROM I-495 TO MD 210	436	862	-98%	No	16.722	No
FROM MD 210 NB (LOOP RAMP) TO I-495	962	1337	-39%	No	11.0606	No
FROM MD 210 SB TO I-495	207	416	-101%	No	11.83	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	392	953	-143%	No	21.633	No
FROM I-495 TO I-295 NB	442	539	-22%	No	4.37978	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	1159	1091	6%	Yes	2.03493	Yes
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	104	90	13%	No	1.3952	Yes
FROM I-295 SB TO I-495	1079	962	11%	No	3.67057	Yes

Figure A.112: I-495 Inner Loop Ramp 8-9 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	725	2621	-261%	No	46.3456	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	314	489	-56%	No	8.74476	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	628	558	11%	No	2.88513	Yes
FROM I-495 TO MD 414 (OXON HILL ROAD)	324	521	-61%	No	9.58413	No
FROM MD 414 (OXON HILL ROAD) TO I-495	741	709	4%	Yes	1.18845	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	209	219	-5%	Yes	0.70047	Yes
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	251	227	9%	Yes	1.53586	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	542	455	16%	No	3.88492	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	597	438	27%	No	6.9776	No
FROM I-495 TO MD 5 EB	789	840	-6%	Yes	1.79562	Yes
FROM MD 5 EB TO I-495	396	391	1%	Yes	0.2647	Yes
FROM I-495 TO MD 5 WB	418	304	27%	No	6	No
FROM MD 5 WB TO I-495	1713	1896	-11%	No	4.30223	Yes
FROM I-495 TO MD 337	514	615	-20%	No	4.24093	Yes
FROM MD 337 TO I-495	913	757	17%	No	5.3986	No
FROM I-495 TO MD 4 EB	482	461	4%	Yes	0.96712	Yes
FROM MD 4 EB TO I-495	528	561	-6%	Yes	1.39311	Yes
FROM I-495 TO MD 4 WB	651	561	14%	No	3.67707	Yes
FROM MD 4 WB TO I-495	979	1238	-26%	No	7.78622	No
FROM I-495 TO RITCHIE MARLBORO ROAD	721	514	29%	No	8.31923	No
FROM RITCHIE MARLBORO ROAD TO I-495	987	1189	-20%	No	6.13125	No
FROM I-495 TO MD 214	1006	954	5%	Yes	1.66917	Yes
FROM MD 214 EB TO I-495	593	597	-1%	Yes	0.15375	Yes
FROM MD 214 WB TO I-495	457	554	-21%	No	4.29313	Yes
FROM I-495 TO ARENA DRIVE	703	447	36%	No	10.6991	No
FROM ARENA DRIVE TO I-495	188	375	-99%	No	11.1456	No
FROM I-495 TO MD 202	1213	832	31%	No	11.915	No
FROM MD 202 EB TO I-495	222	0	100%	No	21.0713	No
FROM MD 202 TO I-495	1188	923	22%	No	8.16492	No
FROM I-495 TO US 50 EB	1078	1033	4%	Yes	1.38511	Yes
FROM I-495 TO US 50 WB	866	871	-1%	Yes	0.16119	Yes
FROM US 50 TO I-495	2500	5821	-133%	No	51.4868	No
FROM I-495 TO MD 450 EB	784	651	17%	No	4.98478	Yes
FROM I-495 TO MD 450 WB	283	240	15%	No	2.643	Yes
FROM MD 450 TO I-495	731	809	-11%	No	2.81971	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1547	1562	-1%	Yes	0.38677	Yes
FROM MD 295 SB TO I-495	1126	1021	9%	Yes	3.21252	Yes
FROM I-495 TO MD 295 SB	37	51	-36%	No	2.04101	Yes
FROM MD 295 SB TO I-495	536	483	10%	Yes	2.33667	Yes
FROM I-495 TO MD 201	1572	1265	20%	No	8.15124	No
FROM MD 201 NB TO I-495	519	442	15%	No	3.51272	Yes
FROM MD 201 SB TO I-495	126	123	2%	Yes	0.26887	Yes
FROM GREENBELT METRO STATION TO I-495	55	44	20%	No	1.52601	Yes
FROM I-495 TO US 1	1080	881	18%	No	6.37198	No
FROM US 1 NB TO I-495	418	359	14%	No	3.00651	Yes
FROM US 1 SB TO I-495	380	361	5%	Yes	0.97394	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	3825	3014	21%	No	13.8643	No
FROM PARK AND RIDE LOT TO I-495	89	77	13%	No	1.28876	Yes
FROM I-95 SB TO I-495	1928	2618	-36%	No	14.4727	No
FROM I-495 TO MD 650 NB	689	553	20%	No	5.44691	No
FROM MD 650 NB TO I-495	236	248	-5%	Yes	0.78726	Yes
FROM I-495 TO MD 650 SB	750	592	21%	No	6.10974	No
FROM MD 650 SB TO I-495	330	374	-13%	No	2.3323	Yes
FROM I-495 TO MD 193 WB	390	344	12%	No	2.40118	Yes
FROM MD 193 WB TO I-495	565	675	-19%	No	4.39851	Yes
FROM US 29 NB TO I-495	226	175	23%	No	3.60175	Yes
FROM I-495 TO US 29 SB	352	425	-21%	No	3.70363	Yes
FROM US 29 SB FROM TO I-495	1265	879	31%	No	11.7977	No
FROM I-495 TO MD 97	365	539	-48%	No	8.16301	No
FROM MD 97 NB TO I-495	1285	841	35%	No	13.635	No
FROM MD 97 SB TO I-495	1060	705	34%	No	11.9593	No
FROM I-495 TO MD 185	1512	1748	-16%	No	5.85142	No
FROM MD 185 NB TO I-495	975	593	39%	No	13.6328	No
FROM MD 185 SB TO I-495	724	617	15%	No	4.13223	Yes
FROM I-495 TO MD 355 NB	832	918	-10%	No	2.90733	Yes
FROM I-495 TO I-270 NB	2525	3082	-22%	No	10.5108	No
MD 355 NB TO I-495	402	329	18%	No	3.81838	Yes
FROM I-495 TO MD 187	497	438	12%	No	2.75259	Yes
FROM MD 187 TO I-495	492	652	-33%	No	6.69966	No
FROM I-270 SPUR SB TO I-495	4434	5412	-22%	No	13.9421	No
FROM MD 190 WB TO I-495	653	451	31%	No	8.59769	No
FROM I-495 TO MD 190	1004	848	16%	No	5.1436	No
FROM MD 190 EB TO I-495	630	1403	-123%	No	24.2516	No
FROM I-495 TO CABIN JOHN PARKWAY	1042	1263	-21%	No	6.50285	No
FROM I-495 TO CLARA BARTON PARKWAY WB	101	148	-46%	No	4.17162	Yes
FROM CLARA BARTON PARKWAY TO I-495	1304	781	40%	No	16.2155	No

Figure A.113: I-495 Outer Loop Ramp 8-9 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	822	703	14%	No	4.3001	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	89	161	-81%	No	6.45901	No
FROM I-495 TO MD 190	875	844	4%	Yes	1.0574	Yes
FROM CABIN JOHN PARKWAY TO I-495	232	260	-12%	No	1.75423	Yes
FROM MD WB 190 TO I-495	1235	888	28%	No	10.6422	No
FROM I-495 TO I-270 SPUR NB	4868	3834	21%	No	15.6757	No
FROM I-495 TO MD 187	435	538	-24%	No	4.66977	Yes
FROM MD 187 TO I-495	267	293	-10%	Yes	1.5538	Yes
FROM I-495 TO MD 355 SB	423	455	-8%	Yes	1.51556	Yes
FROM I-270 SB TO I-495	2512	2482	1%	Yes	0.6104	Yes
FROM MD 355 SB TO I-495	834	866	-4%	Yes	1.10608	Yes
FROM MD 355 NB TO I-495	200	195	2%	Yes	0.33789	Yes
FROM I-495 TO MD 185	1034	1072	-4%	Yes	1.1634	Yes
FROM MD 185 SB TO I-495	195	199	-2%	Yes	0.28499	Yes
FROM MD 185 NB TO I-495	709	697	2%	Yes	0.44312	Yes
FROM I-495 TO MD 97 SB	890	980	-10%	No	2.94331	Yes
FROM MD 97 SB TO I-495	621	706	-14%	No	3.30928	Yes
FROM I-495 TO MD 97 NB	318	288	9%	Yes	1.72345	Yes
FROM MD 97 NB TO I-495	468	462	1%	Yes	0.30151	Yes
FROM I-495 TO US 29 SB	224	149	34%	No	5.51204	No
FROM I-495 TO US 29 NB	734	664	10%	Yes	2.63795	Yes
FROM US 29 NB TO I-495	521	547	-5%	Yes	1.10375	Yes
FROM I-495 TO MD 193 EB	427	523	-22%	No	4.38299	Yes
FROM MD 193 EB TO I-495	383	504	-31%	No	5.72351	No
FROM MD 193 WB TO I-495	227	375	-65%	No	8.51794	No
FROM I-495 TO MD 650 SB	570	351	38%	No	10.2184	No
FROM MD 650 SB TO I-495	622	632	-2%	Yes	0.37947	Yes
FROM I-495 TO MD 650 NB	593	532	10%	No	2.59364	Yes
FROM MD 650 NB TO I-495	437	1035	-137%	No	22.0352	No
I-495 TO I-95 NB/PARK AND RIDE LOT	2623	2815	-7%	Yes	3.68682	Yes
I-95 SB (TO US 1) TO I-495	426	458	-8%	Yes	1.52208	Yes
PARK AND RIDE LOT TO I-495	116	102	12%	No	1.36569	Yes
I-95 SB TO I-495	2961	3626	-22%	No	11.5834	No
I-495 TO US 1 SB	784	1712	-118%	No	26.2688	No
US 1 SB TO I-495	336	427	-27%	No	4.65902	Yes
I-495 TO US 1 NB	359	463	-29%	No	5.12994	No
US 1 NB TO I-495	414	457	-10%	No	2.07219	Yes
FROM I-495 TO GREENBELT METRO	169	342	-103%	No	10.8361	No
FROM I-495 TO MD 201	1090	1301	-19%	No	6.1025	No
FROM MD 201 SB TO I-495	436	452	-4%	Yes	0.77108	Yes
FROM MD 201 NB TO I-495	385	451	-17%	No	3.20467	Yes
FROM I-495 TO MD 295 SB	1457	1292	11%	No	4.45053	Yes
FROM MD 295 SB SB TO I-495	1310	1145	13%	No	4.71686	Yes
FROM I-495 TO MD 295 NB	690	603	13%	No	3.44198	Yes
FROM M 295 NB TO I-495	29	26	12%	No	0.67048	Yes
FROM I-495 TO MD 450	561	641	-14%	No	3.24355	Yes
FROM MD 450 TO I-495	1032	1057	-2%	Yes	0.78123	Yes
FROM I-495 TO US 50 EB	1179	1140	3%	Yes	1.15273	Yes
FROM I-495 TO US 50 WB	413	725	-75%	No	13.0616	No
FROM US 50 TO I-495	2612	2623	0%	Yes	0.20524	Yes
FROM I-495 TO MD 202 WB	346	337	3%	Yes	0.48702	Yes
FROM MD I-495 TO MD 202 EB	762	672	12%	No	3.35148	Yes
FROM MD 202 TO I-495	367	722	-97%	No	15.2045	No
FROM I-495 TO ARENA DRIVE	321	279	13%	No	2.43981	Yes
FROM ARENA DRIVE TO I-495	138	237	-72%	No	7.22994	No
FROM I-495 TO MD 214 WB	639	704	-10%	No	2.51778	Yes
FROM I-495 TO MD 214 EB	675	577	15%	No	3.91687	Yes
FROM MD 214 TO I-495	835	1070	-28%	No	7.59919	No
FROM I-495 TO RITCHIE MARLBORO ROAD	544	930	-71%	No	14.2265	No
FROM RITCHIE MARLBORO ROAD TO I-495	545	1013	-86%	No	16.7678	No
FROM I-495 TO MD 4 WB	921	1079	-17%	No	4.9964	Yes
FROM MD 4 WB TO I-495	548	7175	-1209%	No	106.64	No
FROM I-495 TO MD 4 EB	667	727	-9%	Yes	2.25413	Yes
FROM MD 4 EB TO I-495	408	411	-1%	Yes	0.13592	Yes
FROM I-495 TO FORESTVILLE ROAD	528	612	-16%	No	3.51837	Yes
FROM SUITLAND ROAD TO I-495	216	228	-6%	Yes	0.82193	Yes
FROM I-495 TO MD 5 SB/MD 535	1927	1915	1%	Yes	0.28522	Yes
FROM MD 5 NB/MD 535 TO I-495	877	1157	-32%	No	8.77276	No
FROM MD 5 SB TO I-495	106	369	-248%	No	17.054	No
FROM I-495 TO MD 414	318	359	-13%	No	2.24163	Yes
FROM MD 414 NB TO I-495	303	294	3%	Yes	0.55009	Yes
FROM I-495 TO MD 414 SB	453	438	3%	Yes	0.72261	Yes
FROM MD 414 SB TO I-495	312	452	-45%	No	7.13978	No
FROM I-495 TO MD 210	537	821	-53%	No	10.8989	No
FROM MD 210 NB (LOOP RAMP) TO I-495	855	1337	-56%	No	14.5526	No
FROM MD 210 SB TO I-495	234	406	-73%	No	9.59089	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	221	971	-339%	No	30.7072	No
FROM I-495 TO I-295 NB	722	533	26%	No	7.53419	No
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	545	1079	-98%	No	18.7471	No
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	213	91	57%	No	9.89551	No
FROM I-295 SB TO I-495	893	944	-6%	Yes	1.66652	Yes

Figure A.114: I-495 Inner Loop Ramp 9-10 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	812	2571	-217%	No	42.7601	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	342	487	-42%	No	7.09964	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	544	534	2%	Yes	0.44155	Yes
FROM I-495 TO MD 414 (OXON HILL ROAD)	314	500	-59%	No	9.23065	No
FROM MD 414 (OXON HILL ROAD) TO I-495	854	698	18%	No	5.61893	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	215	229	-6%	Yes	0.90657	Yes
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	235	244	-4%	Yes	0.59755	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	403	470	-17%	No	3.19537	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	560	429	23%	No	5.879	No
FROM I-495 TO MD 5 EB	754	808	-7%	Yes	1.93227	Yes
FROM MD 5 EB TO I-495	381	394	-3%	Yes	0.67299	Yes
FROM I-495 TO MD 5 WB	299	310	-4%	Yes	0.61617	Yes
FROM MD 5 WB TO I-495	1536	1862	-21%	No	7.91476	No
FROM I-495 TO MD 337	313	621	-98%	No	14.2332	No
FROM MD 337 TO I-495	789	770	2%	Yes	0.68053	Yes
FROM I-495 TO MD 4 EB	506	444	12%	No	2.86845	Yes
FROM MD 4 EB TO I-495	535	560	-5%	Yes	1.079	Yes
FROM I-495 TO MD 4 WB	551	572	-4%	Yes	0.89668	Yes
FROM MD 4 WB TO I-495	810	1261	-56%	No	14.0014	No
FROM I-495 TO RITCHIE MARLBORO ROAD	643	522	19%	No	5.03526	No
FROM RITCHIE MARLBORO ROAD TO I-495	676	1154	-71%	No	15.795	No
FROM I-495 TO MD 214	962	952	1%	Yes	0.31515	Yes
FROM MD 214 EB TO I-495	572	582	-2%	Yes	0.40594	Yes
FROM MD 214 WB TO I-495	404	547	-35%	No	6.55784	No
FROM I-495 TO ARENA DRIVE	601	439	27%	No	7.10417	No
FROM ARENA DRIVE TO I-495	182	360	-98%	No	10.7873	No
FROM I-495 TO MD 202	824	805	2%	Yes	0.67456	Yes
FROM MD 202 EB TO I-495	138	0	100%	No	16.6132	No
FROM MD 202 TO I-495	1003	899	10%	No	3.38076	Yes
FROM I-495 TO US 50 EB	1120	1019	9%	Yes	3.08056	Yes
FROM I-495 TO US 50 WB	934	873	7%	Yes	2.02093	Yes
FROM US 50 TO I-495	2449	5754	-135%	No	51.606	No
FROM I-495 TO MD 450 EB	702	670	5%	Yes	1.24108	Yes
FROM I-495 TO MD 450 WB	257	251	2%	Yes	0.3607	Yes
FROM MD 450 TO I-495	586	816	-39%	No	8.66964	No
FROM I-495 TO MD 295 NB/MD 193 EB	1626	1560	4%	Yes	1.65362	Yes
FROM MD 295 SB TO I-495	893	1044	-17%	No	4.85979	Yes
FROM I-495 TO MD 295 SB	52	50	4%	Yes	0.31545	Yes
FROM MD 295 SB TO I-495	477	457	4%	Yes	0.93718	Yes
FROM I-495 TO MD 201	1162	1255	-8%	Yes	2.66817	Yes
FROM MD 201 NB TO I-495	483	449	7%	Yes	1.58681	Yes
FROM MD 201 SB TO I-495	131	126	4%	Yes	0.48566	Yes
FROM GREENBELT METRO STATION TO I-495	39	46	-18%	No	1.07375	Yes
FROM I-495 TO US 1	720	897	-25%	No	6.20829	No
FROM US 1 NB TO I-495	299	370	-24%	No	3.89498	Yes
FROM US 1 SB TO I-495	389	374	4%	Yes	0.79383	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	2683	3031	-13%	No	6.51518	No
FROM PARK AND RIDE LOT TO I-495	95	81	15%	No	1.49241	Yes
FROM I-95 SB TO I-495	1614	2706	-68%	No	23.4914	No
FROM I-495 TO MD 650 NB	703	551	22%	No	6.0703	No
FROM MD 650 NB TO I-495	224	258	-15%	No	2.19013	Yes
FROM I-495 TO MD 650 SB	650	572	12%	No	3.14511	Yes
FROM MD 650 SB TO I-495	395	373	6%	Yes	1.14857	Yes
FROM I-495 TO MD 193 WB	405	348	14%	No	2.92423	Yes
FROM MD 193 WB TO I-495	438	696	-59%	No	10.8164	No
FROM US 29 NB TO I-495	331	181	45%	No	9.41085	No
FROM I-495 TO US 29 SB	517	434	16%	No	3.79433	Yes
FROM US 29 SB FROM TO I-495	1277	889	30%	No	11.7984	No
FROM I-495 TO MD 97	596	508	15%	No	3.75659	Yes
FROM MD 97 NB TO I-495	873	870	0%	Yes	0.1101	Yes
FROM MD 97 SB TO I-495	722	705	2%	Yes	0.63643	Yes
FROM I-495 TO MD 185	1596	1722	-8%	Yes	3.09348	Yes
FROM MD 185 NB TO I-495	683	603	12%	No	3.14473	Yes
FROM MD 185 SB TO I-495	588	627	-7%	Yes	1.57233	Yes
FROM I-495 TO MD 355 NB	904	917	-1%	Yes	0.43908	Yes
FROM I-495 TO I-270 NB	2640	3121	-18%	No	8.96659	No
MD 355 NB TO I-495	341	315	8%	Yes	1.46378	Yes
FROM I-495 TO MD 187	432	430	1%	Yes	0.10839	Yes
FROM MD 187 TO I-495	417	664	-59%	No	10.6338	No
FROM I-270 SPUR SB TO I-495	4495	5183	-15%	No	9.88686	No
FROM MD 190 WB TO I-495	532	460	14%	No	3.25617	Yes
FROM I-495 TO MD 190	978	827	15%	No	5.01769	No
FROM MD 190 EB TO I-495	556	1399	-152%	No	26.9631	No
FROM I-495 TO CABIN JOHN PARKWAY	1335	1219	9%	Yes	3.2461	Yes
FROM I-495 TO CLARA BARTON PARKWAY WB	114	154	-35%	No	3.47545	Yes
FROM CLARA BARTON PARKWAY TO I-495	1049	785	25%	No	8.7269	No

Figure A.115: I-495 Outer Loop Ramp 9-10 AM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	793	1016	-28%	No	7.40702	No
FROM CLARA BARTON PARKWAY EB TO I-495	188	193	-3%	Yes	0.34426	Yes
FROM I-495 TO MD 190	480	710	-48%	No	9.43834	No
FROM CABIN JOHN PARKWAY TO I-495	888	1280	-44%	No	11.9062	No
FROM MD WB 190 TO I-495	1279	1083	15%	No	5.71852	No
FROM I-495 TO I-270 SPUR NB	5298	4870	8%	Yes	6.00262	No
FROM I-495 TO MD 187	428	449	-5%	Yes	1.01464	Yes
FROM MD 187 TO I-495	277	305	-10%	No	1.62708	Yes
FROM I-495 TO MD 355 SB	318	310	2%	Yes	0.43727	Yes
FROM I-270 SB TO I-495	2761	2847	-3%	Yes	1.61472	Yes
FROM MD 355 SB TO I-495	749	739	1%	Yes	0.36662	Yes
FROM MD 355 NB TO I-495	412	324	21%	No	4.58732	Yes
FROM I-495 TO MD 185	768	770	0%	Yes	0.0541	Yes
FROM MD 185 SB TO I-495	346	287	17%	No	3.3311	Yes
FROM MD 185 NB TO I-495	1669	1456	13%	No	5.4016	No
FROM I-495 TO MD 97 SB	449	558	-24%	No	4.85766	Yes
FROM MD 97 SB TO I-495	725	617	15%	No	4.15926	Yes
FROM I-495 TO MD 97 NB	244	295	-21%	No	3.09213	Yes
FROM MD 97 NB TO I-495	650	568	13%	No	3.31234	Yes
FROM I-495 TO US 29 SB	150	198	-32%	No	3.65651	Yes
FROM I-495 TO US 29 NB	918	1032	-12%	No	3.64315	Yes
FROM US 29 NB TO I-495	835	966	-16%	No	4.37348	Yes
FROM I-495 TO MD 193 EB	641	636	1%	Yes	0.19787	Yes
FROM MD 193 EB TO I-495	338	447	-32%	No	5.47833	No
FROM MD 193 WB TO I-495	257	460	-79%	No	10.7101	No
FROM I-495 TO MD 650 SB	570	437	23%	No	5.93911	No
FROM MD 650 SB TO I-495	669	576	14%	No	3.71707	Yes
FROM I-495 TO MD 650 NB	299	324	-8%	Yes	1.41648	Yes
FROM MD 650 NB TO I-495	408	839	-106%	No	17.269	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3435	3051	11%	No	6.74759	No
I-95 SB (TO US 1) TO I-495	305	320	-5%	Yes	0.84853	Yes
PARK AND RIDE LOT TO I-495	100	78	22%	No	2.332	Yes
I-95 SB TO I-495	2020	3199	-58%	No	23.0843	No
I-495 TO US 1 SB	796	2045	-157%	No	33.1444	No
US 1 SB TO I-495	374	346	7%	Yes	1.47573	Yes
I-495 TO US 1 NB	415	478	-15%	No	2.95863	Yes
US 1 NB TO I-495	432	441	-2%	Yes	0.44268	Yes
FROM I-495 TO GREENBELT METRO	77	110	-43%	No	3.43634	Yes
FROM I-495 TO MD 201	838	1400	-67%	No	16.8005	No
FROM MD 201 SB TO I-495	605	638	-5%	Yes	1.32371	Yes
FROM MD 201 NB TO I-495	720	671	7%	Yes	1.8773	Yes
FROM I-495 TO MD 295 SB	1330	1187	11%	No	4.03822	Yes
FROM MD 295 SB SB TO I-495	1539	1219	21%	No	8.62436	No
FROM I-495 TO MD 295 NB	330	422	-28%	No	4.73243	Yes
FROM M 295 NB TO I-495	39	24	39%	No	2.72256	Yes
FROM I-495 TO MD 450	590	533	10%	Yes	2.42711	Yes
FROM MD 450 TO I-495	1183	1161	2%	Yes	0.64263	Yes
FROM I-495 TO US 50 EB	1822	1898	-4%	Yes	1.75647	Yes
FROM I-495 TO US 50 WB	288	437	-52%	No	7.83764	No
FROM US 50 TO I-495	2445	2354	4%	Yes	1.85257	Yes
FROM I-495 TO MD 202 WB	327	266	19%	No	3.55783	Yes
FROM MD I-495 TO MD 202 EB	817	809	1%	Yes	0.29815	Yes
FROM MD 202 TO I-495	592	806	-36%	No	8.07676	No
FROM I-495 TO ARENA DRIVE	372	549	-48%	No	8.25872	No
FROM ARENA DRIVE TO I-495	241	429	-78%	No	10.248	No
FROM I-495 TO MD 214 WB	685	579	16%	No	4.22682	Yes
FROM I-495 TO MD 214 EB	529	574	-9%	Yes	1.9162	Yes
FROM MD 214 TO I-495	891	966	-8%	Yes	2.45329	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	1002	1564	-56%	No	15.6838	No
FROM RITCHIE MARLBORO ROAD TO I-495	698	1164	-67%	No	15.2654	No
FROM I-495 TO MD 4 WB	800	767	4%	Yes	1.18797	Yes
FROM MD 4 WB TO I-495	521	6873	-1219%	No	104.471	No
FROM I-495 TO MD 4 EB	910	748	18%	No	5.61739	No
FROM MD 4 EB TO I-495	610	657	-8%	Yes	1.84784	Yes
FROM I-495 TO FORESTVILLE ROAD	477	454	5%	Yes	1.08949	Yes
FROM SUITLAND ROAD TO I-495	472	527	-12%	No	2.47178	Yes
FROM I-495 TO MD 5 SB/MD 535	2328	2470	-6%	Yes	2.89414	Yes
FROM MD 5 NB/MD 535 TO I-495	1067	1021	4%	Yes	1.42366	Yes
FROM MD 5 SB TO I-495	197	307	-56%	No	6.92935	No
FROM I-495 TO MD 414	306	349	-14%	No	2.38945	Yes
FROM MD 414 NB TO I-495	341	315	8%	Yes	1.43561	Yes
FROM I-495 TO MD 414 SB	655	699	-7%	Yes	1.6816	Yes
FROM MD 414 SB TO I-495	420	450	-7%	Yes	1.43839	Yes
FROM I-495 TO MD 210	488	839	-72%	No	13.6266	No
FROM MD 210 NB (LOOP RAMP) TO I-495	588	638	-9%	Yes	2.02937	Yes
FROM MD 210 SB TO I-495	256	345	-35%	No	5.10742	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	282	301	-7%	Yes	1.11284	Yes
FROM I-495 TO I-295 NB	389	370	5%	Yes	0.96233	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	714	1297	-82%	No	18.3856	No
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	306	297	3%	Yes	0.54734	Yes
FROM I-295 SB TO I-495	2158	1954	9%	Yes	4.49903	Yes

Figure A.116: I-495 Inner Loop Ramp 3-4 PM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	1732	1569	9%	No	54.0964	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	1078	893	17%	No	12.7613	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	1667	1360	18%	No	8.5817	No
FROM I-495 TO MD 414 (OXON HILL ROAD)	821	1079	-31%	No	12.9888	No
FROM MD 414 (OXON HILL ROAD) TO I-495	903	800	11%	No	5.49125	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	370	693	-87%	No	10.0093	No
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	194	184	5%	No	3.60669	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	494	594	-20%	Yes	1.99585	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	597	555	7%	Yes	0.68911	Yes
FROM I-495 TO MD 5 EB	1453	1379	5%	No	6.25283	No
FROM MD 5 EB TO I-495	525	536	-2%	Yes	1.52302	Yes
FROM I-495 TO MD 5 WB	282	296	-5%	No	2.51986	Yes
FROM MD 5 WB TO I-495	1192	1066	11%	Yes	2.24682	Yes
FROM I-495 TO MD 337	356	391	-10%	Yes	1.9325	Yes
FROM MD 337 TO I-495	1004	892	11%	No	4.39738	Yes
FROM I-495 TO MD 4 EB	838	769	8%	Yes	2.13245	Yes
FROM MD 4 EB TO I-495	852	802	6%	Yes	0.37847	Yes
FROM I-495 TO MD 4 WB	627	680	-8%	No	10.4976	No
FROM MD 4 WB TO I-495	773	959	-24%	No	6.6016	No
FROM I-495 TO RITCHIE MARLBORO ROAD	687	506	26%	No	2.23412	Yes
FROM RITCHIE MARLBORO ROAD TO I-495	599	733	-22%	No	7.29858	No
FROM I-495 TO MD 214	1183	1489	-26%	No	14.5944	No
FROM MD 214 EB TO I-495	766	757	1%	Yes	0.34432	Yes
FROM MD 214 WB TO I-495	329	369	-12%	No	2.11514	Yes
FROM I-495 TO ARENA DRIVE	625	319	49%	No	14.0982	No
FROM ARENA DRIVE TO I-495	231	406	-76%	No	9.80581	No
FROM I-495 TO MD 202	979	988	-1%	Yes	0.27903	Yes
FROM MD 202 EB TO I-495	231	0	100%	No	21.4942	No
FROM MD 202 TO I-495	1176	990	16%	No	5.6678	No
FROM I-495 TO US 50 EB	1811	1722	5%	Yes	2.12959	Yes
FROM I-495 TO US 50 WB	709	642	9%	Yes	2.57788	Yes
FROM US 50 TO I-495	2426	4729	-95%	No	38.5003	No
FROM I-495 TO MD 450 EB	808	884	-9%	Yes	2.61293	Yes
FROM I-495 TO MD 450 WB	325	319	2%	Yes	0.34837	Yes
FROM MD 450 TO I-495	788	708	10%	No	2.93448	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1187	1058	11%	No	3.84264	Yes
FROM MD 295 SB TO I-495	1364	1307	4%	Yes	1.57357	Yes
FROM I-495 TO MD 295 SB	50	38	25%	No	1.88982	Yes
FROM MD 295 SB TO I-495	636	596	6%	Yes	1.62188	Yes
FROM I-495 TO MD 201	991	784	21%	No	6.93954	No
FROM MD 201 NB TO I-495	935	871	7%	Yes	2.14672	Yes
FROM MD 201 SB TO I-495	179	221	-24%	No	2.98659	Yes
FROM GREENBELT METRO STATION TO I-495	167	378	-126%	No	12.782	No
FROM I-495 TO US 1	789	707	10%	No	2.99822	Yes
FROM US 1 NB TO I-495	282	855	-203%	No	24.0398	No
FROM US 1 SB TO I-495	595	572	4%	Yes	0.9417	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	4050	3966	2%	Yes	1.32683	Yes
FROM PARK AND RIDE LOT TO I-495	67	38	43%	No	3.96316	Yes
FROM I-95 SB TO I-495	2959	3060	-3%	Yes	1.84109	Yes
FROM I-495 TO MD 650 NB	713	689	3%	Yes	0.90647	Yes
FROM MD 650 NB TO I-495	500	495	1%	Yes	0.22417	Yes
FROM I-495 TO MD 650 SB	870	802	8%	Yes	2.36948	Yes
FROM MD 650 SB TO I-495	552	625	-13%	No	2.98921	Yes
FROM I-495 TO MD 193 WB	679	834	-23%	No	5.61818	No
FROM MD 193 WB TO I-495	509	540	-6%	Yes	1.3536	Yes
FROM US 29 NB TO I-495	185	230	-24%	No	3.14036	Yes
FROM I-495 TO US 29 SB	414	409	1%	Yes	0.25885	Yes
FROM US 29 SB FROM TO I-495	879	875	0%	Yes	0.14352	Yes
FROM I-495 TO MD 97	889	1086	-22%	No	6.26899	No
FROM MD 97 NB TO I-495	923	890	4%	Yes	1.10443	Yes
FROM MD 97 SB TO I-495	471	407	14%	No	3.05455	Yes
FROM I-495 TO MD 185	877	1091	-24%	No	6.82207	No
FROM MD 185 NB TO I-495	843	742	12%	No	3.58775	Yes
FROM MD 185 SB TO I-495	429	384	10%	No	2.23194	Yes
FROM I-495 TO MD 355 NB	836	963	-15%	No	4.22647	Yes
FROM I-495 TO I-270 NB	2984	3218	-8%	Yes	4.20209	Yes
MD 355 NB TO I-495	486	372	23%	No	5.4911	No
FROM I-495 TO MD 187	342	479	-40%	No	6.76183	No
FROM MD 187 TO I-495	515	679	-32%	No	6.7216	No
FROM I-270 SPUR SB TO I-495	4003	3272	18%	No	12.1291	No
FROM MD 190 WB TO I-495	626	614	2%	Yes	0.47184	Yes
FROM I-495 TO MD 190	810	747	8%	Yes	2.26708	Yes
FROM MD 190 EB TO I-495	289	972	-236%	No	27.1933	No
FROM I-495 TO CABIN JOHN PARKWAY	246	524	-113%	No	14.1682	No
FROM I-495 TO CLARA BARTON PARKWAY WB	58	49	16%	No	1.26611	Yes
FROM CLARA BARTON PARKWAY TO I-495	1092	1194	-9%	Yes	3.01701	Yes

Figure A.117: I-495 Outer Loop Ramp 3-4 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	1186	1096	8%	Yes	2.6795	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	71	182	-156%	No	9.83437	No
FROM I-495 TO MD 190	449	720	-60%	No	11.2184	No
FROM CABIN JOHN PARKWAY TO I-495	1195	1261	-6%	Yes	1.87637	Yes
FROM MD WB 190 TO I-495	1115	1132	-2%	Yes	0.49975	Yes
FROM I-495 TO I-270 SPUR NB	4296	4827	-12%	No	7.85854	No
FROM I-495 TO MD 187	376	473	-26%	No	4.7194	Yes
FROM MD 187 TO I-495	287	311	-8%	Yes	1.37379	Yes
FROM I-495 TO MD 355 SB	273	303	-11%	No	1.73906	Yes
FROM I-270 SB TO I-495	2873	2853	1%	Yes	0.37846	Yes
FROM MD 355 SB TO I-495	752	733	2%	Yes	0.68804	Yes
FROM MD 355 NB TO I-495	336	313	7%	Yes	1.29092	Yes
FROM I-495 TO MD 185	779	838	-8%	Yes	2.0577	Yes
FROM MD 185 SB TO I-495	303	275	9%	Yes	1.6772	Yes
FROM MD 185 NB TO I-495	1588	1513	5%	Yes	1.91755	Yes
FROM I-495 TO MD 97 SB	505	605	-20%	No	4.2549	Yes
FROM MD 97 SB TO I-495	677	617	9%	Yes	2.35884	Yes
FROM I-495 TO MD 97 NB	266	320	-20%	No	3.16864	Yes
FROM MD 97 NB TO I-495	662	572	14%	No	3.62326	Yes
FROM I-495 TO US 29 SB	112	188	-68%	No	6.22319	No
FROM I-495 TO US 29 NB	929	1009	-9%	Yes	2.55424	Yes
FROM US 29 NB TO I-495	1058	950	10%	No	3.42466	Yes
FROM I-495 TO MD 193 EB	587	597	-2%	Yes	0.40076	Yes
FROM MD 193 EB TO I-495	349	422	-21%	No	3.73014	Yes
FROM MD 193 WB TO I-495	318	457	-44%	No	7.07277	No
FROM I-495 TO MD 650 SB	634	430	32%	No	8.83265	No
FROM MD 650 SB TO I-495	678	585	14%	No	3.69049	Yes
FROM I-495 TO MD 650 NB	298	327	-10%	Yes	1.61285	Yes
FROM MD 650 NB TO I-495	418	840	-101%	No	16.8096	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3304	3068	7%	Yes	4.17658	Yes
I-95 SB (TO US 1) TO I-495	372	330	11%	No	2.24179	Yes
PARK AND RIDE LOT TO I-495	98	66	33%	No	3.53381	Yes
I-95 SB TO I-495	1253	3299	-163%	No	42.8864	No
I-495 TO US 1 SB	796	1999	-151%	No	32.1698	No
US 1 SB TO I-495	347	358	-3%	Yes	0.55945	Yes
I-495 TO US 1 NB	458	463	-1%	Yes	0.20976	Yes
US 1 NB TO I-495	472	454	4%	Yes	0.8248	Yes
FROM I-495 TO GREENBELT METRO	100	112	-12%	No	1.14193	Yes
FROM I-495 TO MD 201	908	1405	-55%	No	14.6145	No
FROM MD 201 SB TO I-495	648	652	-1%	Yes	0.16668	Yes
FROM MD 201 NB TO I-495	766	658	14%	No	4.04747	Yes
FROM I-495 TO MD 295 SB	1380	1219	12%	No	4.4805	Yes
FROM MD 295 SB SB TO I-495	1302	1243	5%	Yes	1.66104	Yes
FROM I-495 TO MD 295 NB	241	427	-77%	No	10.1775	No
FROM M 295 NB TO I-495	28	27	4%	Yes	0.19069	Yes
FROM I-495 TO MD 450	544	527	3%	Yes	0.72374	Yes
FROM MD 450 TO I-495	1203	1141	5%	Yes	1.81104	Yes
FROM I-495 TO US 50 EB	2020	1864	8%	Yes	3.53997	Yes
FROM I-495 TO US 50 WB	259	442	-71%	No	9.76317	No
FROM US 50 TO I-495	2398	2364	1%	Yes	0.70707	Yes
FROM I-495 TO MD 202 WB	299	268	11%	No	1.87165	Yes
FROM MD I-495 TO MD 202 EB	877	793	10%	Yes	2.92468	Yes
FROM MD 202 TO I-495	609	818	-34%	No	7.80702	No
FROM I-495 TO ARENA DRIVE	720	559	22%	No	6.37708	No
FROM ARENA DRIVE TO I-495	287	430	-50%	No	7.52873	No
FROM I-495 TO MD 214 WB	604	565	6%	Yes	1.60263	Yes
FROM I-495 TO MD 214 EB	488	601	-23%	No	4.82229	Yes
FROM MD 214 TO I-495	984	989	0%	Yes	0.15124	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	1113	1576	-42%	No	12.627	No
FROM RITCHIE MARLBORO ROAD TO I-495	654	1161	-78%	No	16.8372	No
FROM I-495 TO MD 4 WB	744	758	-2%	Yes	0.50179	Yes
FROM MD 4 WB TO I-495	512	6869	-1242%	No	104.645	No
FROM I-495 TO MD 4 EB	866	727	16%	No	4.91593	Yes
FROM MD 4 EB TO I-495	593	657	-11%	No	2.54051	Yes
FROM I-495 TO FORESTVILLE ROAD	486	457	6%	Yes	1.35893	Yes
FROM SUITLAND ROAD TO I-495	674	547	19%	No	5.15062	No
FROM I-495 TO MD 5 SB/MD 535	2423	2483	-2%	Yes	1.20642	Yes
FROM MD 5 NB/MD 535 TO I-495	1080	982	9%	Yes	3.06803	Yes
FROM MD 5 SB TO I-495	202	296	-46%	No	5.9283	No
FROM I-495 TO MD 414	300	354	-18%	No	2.99946	Yes
FROM MD 414 NB TO I-495	284	328	-16%	No	2.52909	Yes
FROM I-495 TO MD 414 SB	692	733	-6%	Yes	1.51754	Yes
FROM MD 414 SB TO I-495	455	443	3%	Yes	0.56632	Yes
FROM I-495 TO MD 210	549	836	-52%	No	10.8891	No
FROM MD 210 NB (LOOP RAMP) TO I-495	655	650	1%	Yes	0.20555	Yes
FROM MD 210 SB TO I-495	282	384	-36%	No	5.58957	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	372	297	20%	No	4.11519	Yes
FROM I-495 TO I-295 NB	330	374	-13%	No	2.35811	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	1004	1285	-28%	No	8.31306	No
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	310	317	-2%	Yes	0.3813	Yes
FROM I-295 SB TO I-495	1998	1949	2%	Yes	1.10301	Yes

Figure A.118: I-495 Inner Loop Ramp 4-5 Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	1797	1575	12%	No	54.0964	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	732	877	-20%	No	12.7613	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	1738	1354	22%	No	8.5817	No
FROM I-495 TO MD 414 (OXON HILL ROAD)	923	1078	-17%	No	12.9888	No
FROM MD 414 (OXON HILL ROAD) TO I-495	845	832	2%	No	5.49125	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	373	667	-79%	No	10.0093	No
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	185	193	-4%	No	3.60669	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	688	589	14%	Yes	1.99585	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	661	542	18%	Yes	0.68911	Yes
FROM I-495 TO MD 5 EB	1561	1340	14%	No	6.25283	No
FROM MD 5 EB TO I-495	497	553	-11%	Yes	1.52302	Yes
FROM I-495 TO MD 5 WB	302	297	2%	No	2.51986	Yes
FROM MD 5 WB TO I-495	1056	1047	1%	Yes	2.24682	Yes
FROM I-495 TO MD 337	387	376	3%	Yes	1.9325	Yes
FROM MD 337 TO I-495	1107	811	27%	No	4.39738	Yes
FROM I-495 TO MD 4 EB	796	732	8%	Yes	2.13245	Yes
FROM MD 4 EB TO I-495	815	799	2%	Yes	0.37847	Yes
FROM I-495 TO MD 4 WB	546	744	-36%	No	10.4976	No
FROM MD 4 WB TO I-495	798	940	-18%	No	6.6016	No
FROM I-495 TO RITCHIE MARLBORO ROAD	793	513	35%	No	2.23412	Yes
FROM RITCHIE MARLBORO ROAD TO I-495	599	750	-25%	No	7.29858	No
FROM I-495 TO MD 214	1313	1454	-11%	No	14.5944	No
FROM MD 214 EB TO I-495	760	758	0%	Yes	0.08168	Yes
FROM MD 214 WB TO I-495	273	362	-33%	No	4.98175	Yes
FROM I-495 TO ARENA DRIVE	661	304	54%	No	16.266	No
FROM ARENA DRIVE TO I-495	241	409	-70%	No	9.31896	No
FROM I-495 TO MD 202	1101	970	12%	No	4.07095	Yes
FROM MD 202 EB TO I-495	195	0	100%	No	19.7484	No
FROM MD 202 TO I-495	1288	993	23%	No	8.73523	No
FROM I-495 TO US 50 EB	1884	1699	10%	Yes	4.37688	Yes
FROM I-495 TO US 50 WB	668	673	-1%	Yes	0.19309	Yes
FROM US 50 TO I-495	2307	4763	-106%	No	41.3114	No
FROM I-495 TO MD 450 EB	929	890	4%	Yes	1.28481	Yes
FROM I-495 TO MD 450 WB	330	331	0%	Yes	0.06875	Yes
FROM MD 450 TO I-495	812	708	13%	No	3.7631	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1181	1148	3%	Yes	0.97442	Yes
FROM MD 295 SB TO I-495	1279	1247	3%	Yes	0.90043	Yes
FROM I-495 TO MD 295 SB	42	44	-4%	Yes	0.26726	Yes
FROM MD 295 SB TO I-495	739	569	23%	No	6.66835	No
FROM I-495 TO MD 201	991	772	22%	No	7.3762	No
FROM MD 201 NB TO I-495	1061	837	21%	No	7.26275	No
FROM MD 201 SB TO I-495	207	231	-11%	No	1.58889	Yes
FROM GREENBELT METRO STATION TO I-495	321	373	-16%	No	2.77859	Yes
FROM I-495 TO US 1	845	711	16%	No	4.81348	Yes
FROM US 1 NB TO I-495	302	844	-180%	No	22.6503	No
FROM US 1 SB TO I-495	595	610	-3%	Yes	0.62122	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	4391	4001	9%	Yes	6.01675	No
FROM PARK AND RIDE LOT TO I-495	50	40	21%	No	1.56961	Yes
FROM I-95 SB TO I-495	3093	3120	-1%	Yes	0.47547	Yes
FROM I-495 TO MD 650 NB	773	705	9%	Yes	2.50142	Yes
FROM MD 650 NB TO I-495	476	502	-5%	Yes	1.15344	Yes
FROM I-495 TO MD 650 SB	916	823	10%	No	3.17131	Yes
FROM MD 650 SB TO I-495	629	633	-1%	Yes	0.1493	Yes
FROM I-495 TO MD 193 WB	764	853	-12%	No	3.11294	Yes
FROM MD 193 WB TO I-495	478	532	-11%	No	2.40297	Yes
FROM US 29 NB TO I-495	212	227	-7%	Yes	1.02903	Yes
FROM I-495 TO US 29 SB	379	408	-8%	Yes	1.43718	Yes
FROM US 29 SB FROM TO I-495	794	910	-15%	No	3.97409	Yes
FROM I-495 TO MD 97	1145	1081	6%	Yes	1.92597	Yes
FROM MD 97 NB TO I-495	896	896	0%	Yes	0.00835	Yes
FROM MD 97 SB TO I-495	390	386	1%	Yes	0.2158	Yes
FROM I-495 TO MD 185	1015	1080	-6%	Yes	2.00834	Yes
FROM MD 185 NB TO I-495	771	809	-5%	Yes	1.35198	Yes
FROM MD 185 SB TO I-495	384	378	2%	Yes	0.32025	Yes
FROM I-495 TO MD 355 NB	990	934	6%	Yes	1.82187	Yes
FROM I-495 TO I-270 NB	3280	3200	2%	Yes	1.40546	Yes
MD 355 NB TO I-495	324	367	-13%	No	2.28729	Yes
FROM I-495 TO MD 187	490	460	6%	Yes	1.37649	Yes
FROM MD 187 TO I-495	588	700	-19%	No	4.40399	Yes
FROM I-270 SPUR SB TO I-495	2833	3295	-16%	No	8.34637	No
FROM MD 190 WB TO I-495	597	620	-4%	Yes	0.91231	Yes
FROM I-495 TO MD 190	679	715	-5%	Yes	1.3449	Yes
FROM MD 190 EB TO I-495	251	977	-289%	No	29.3061	No
FROM I-495 TO CABIN JOHN PARKWAY	152	473	-211%	No	18.1375	No
FROM I-495 TO CLARA BARTON PARKWAY WB	34	48	-40%	No	2.1148	Yes
FROM CLARA BARTON PARKWAY TO I-495	1401	1181	16%	No	6.13744	No

Figure A.119: I-495 Outer Loop Ramp 4-5 PM Volumes

Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	1463	1050	28%	No	11.6512	No
FROM CLARA BARTON PARKWAY EB TO I-495	45	192	-326%	No	13.4722	No
FROM I-495 TO MD 190	655	716	-9%	Yes	2.31116	Yes
FROM CABIN JOHN PARKWAY TO I-495	1037	1289	-24%	No	7.38249	No
FROM MD WB 190 TO I-495	1056	1094	-4%	Yes	1.14387	Yes
FROM I-495 TO I-270 SPUR NB	4009	4752	-19%	No	11.2224	No
FROM I-495 TO MD 187	458	476	-4%	Yes	0.8444	Yes
FROM MD 187 TO I-495	338	315	7%	Yes	1.30105	Yes
FROM I-495 TO MD 355 SB	275	320	-16%	No	2.62291	Yes
FROM I-270 SB TO I-495	3299	2874	13%	No	7.6499	No
FROM MD 355 SB TO I-495	858	734	14%	No	4.39506	Yes
FROM MD 355 NB TO I-495	299	312	-4%	Yes	0.72961	Yes
FROM I-495 TO MD 185	921	866	6%	Yes	1.85698	Yes
FROM MD 185 SB TO I-495	270	270	0%	Yes	0	Yes
FROM MD 185 NB TO I-495	1613	1480	8%	Yes	3.37553	Yes
FROM I-495 TO MD 97 SB	627	574	8%	Yes	2.17324	Yes
FROM MD 97 SB TO I-495	636	603	5%	Yes	1.34621	Yes
FROM I-495 TO MD 97 NB	329	296	10%	No	1.86676	Yes
FROM MD 97 NB TO I-495	629	566	10%	No	2.58784	Yes
FROM I-495 TO US 29 SB	122	193	-58%	No	5.65742	No
FROM I-495 TO US 29 NB	951	985	-4%	Yes	1.07687	Yes
FROM US 29 NB TO I-495	1045	943	10%	Yes	3.25151	Yes
FROM I-495 TO MD 193 EB	614	574	6%	Yes	1.63079	Yes
FROM MD 193 EB TO I-495	310	418	-35%	No	5.6486	No
FROM MD 193 WB TO I-495	318	464	-46%	No	7.3606	No
FROM I-495 TO MD 650 SB	570	432	24%	No	6.17733	No
FROM MD 650 SB TO I-495	584	577	1%	Yes	0.30094	Yes
FROM I-495 TO MD 650 NB	300	327	-9%	Yes	1.52491	Yes
FROM MD 650 NB TO I-495	296	859	-190%	No	23.42	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3484	3035	13%	No	7.87355	No
I-95 SB (TO US 1) TO I-495	382	344	10%	No	2.00795	Yes
PARK AND RIDE LOT TO I-495	72	71	2%	Yes	0.14796	Yes
I-95 SB TO I-495	1526	3212	-111%	No	34.644	No
I-495 TO US 1 SB	784	2012	-157%	No	32.8431	No
US 1 SB TO I-495	323	332	-3%	Yes	0.49732	Yes
I-495 TO US 1 NB	467	467	0%	Yes	0.01157	Yes
US 1 NB TO I-495	480	451	6%	Yes	1.35589	Yes
FROM I-495 TO GREENBELT METRO	109	107	2%	Yes	0.19245	Yes
FROM I-495 TO MD 201	992	1365	-38%	No	10.8721	No
FROM MD 201 SB TO I-495	676	612	10%	Yes	2.53205	Yes
FROM MD 201 NB TO I-495	640	683	-7%	Yes	1.67187	Yes
FROM I-495 TO MD 295 SB	1441	1199	17%	No	6.66083	No
FROM MD 295 SB SB TO I-495	1147	1254	-9%	Yes	3.07407	Yes
FROM I-495 TO MD 295 NB	242	439	-81%	No	10.6528	No
FROM M 295 NB TO I-495	24	25	-2%	Yes	0.10153	Yes
FROM I-495 TO MD 450	532	517	3%	Yes	0.66596	Yes
FROM MD 450 TO I-495	1192	1156	3%	Yes	1.04332	Yes
FROM I-495 TO US 50 EB	2007	1869	7%	Yes	3.13474	Yes
FROM I-495 TO US 50 WB	242	464	-92%	No	11.8271	No
FROM US 50 TO I-495	2662	2363	11%	No	5.96511	No
FROM I-495 TO MD 202 WB	288	263	9%	Yes	1.50619	Yes
FROM MD I-495 TO MD 202 EB	993	798	20%	No	6.53393	No
FROM MD 202 TO I-495	579	800	-38%	No	8.40762	No
FROM I-495 TO ARENA DRIVE	875	585	33%	No	10.7334	No
FROM ARENA DRIVE TO I-495	313	429	-37%	No	6.02242	No
FROM I-495 TO MD 214 WB	571	573	0%	Yes	0.09407	Yes
FROM I-495 TO MD 214 EB	642	587	9%	Yes	2.20841	Yes
FROM MD 214 TO I-495	941	1021	-9%	Yes	2.56202	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	1076	1552	-44%	No	13.1251	No
FROM RITCHIE MARLBORO ROAD TO I-495	600	1130	-88%	No	18.0205	No
FROM I-495 TO MD 4 WB	778	765	2%	Yes	0.47707	Yes
FROM MD 4 WB TO I-495	457	6907	-1411%	No	106.294	No
FROM I-495 TO MD 4 EB	805	741	8%	Yes	2.30192	Yes
FROM MD 4 EB TO I-495	614	630	-3%	Yes	0.6515	Yes
FROM I-495 TO FORESTVILLE ROAD	521	458	12%	No	2.87084	Yes
FROM SUITLAND ROAD TO I-495	581	552	5%	Yes	1.20779	Yes
FROM I-495 TO MD 5 SB/MD 535	2510	2516	0%	Yes	0.10972	Yes
FROM MD 5 NB/MD 535 TO I-495	1030	975	5%	Yes	1.72908	Yes
FROM MD 5 SB TO I-495	246	300	-22%	No	3.28261	Yes
FROM I-495 TO MD 414	348	351	-1%	Yes	0.17381	Yes
FROM MD 414 NB TO I-495	313	310	1%	Yes	0.16998	Yes
FROM I-495 TO MD 414 SB	705	725	-3%	Yes	0.74796	Yes
FROM MD 414 SB TO I-495	498	429	14%	No	3.21702	Yes
FROM I-495 TO MD 210	602	845	-40%	No	9.03414	No
FROM MD 210 NB (LOOP RAMP) TO I-495	655	655	0%	Yes	0.00977	Yes
FROM MD 210 SB TO I-495	309	354	-15%	No	2.47156	Yes
FROM MD 210 NB (FLYOVER RAMP) TO I-495	352	291	17%	No	3.38744	Yes
FROM I-495 TO I-295 NB	318	387	-22%	No	3.68776	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	992	1281	-29%	No	8.56567	No
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	276	300	-9%	Yes	1.42863	Yes
FROM I-295 SB TO I-495	1708	1958	-15%	No	5.84491	No

Figure A.120: I-495 Inner Loop Ramp 5-6 PM Volumes

Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	1860	1566	16%	No	54.0964	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	932	864	7%	No	12.7613	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	1536	1367	11%	No	8.5817	No
FROM I-495 TO MD 414 (OXON HILL ROAD)	933	1085	-16%	No	12.9888	No
FROM MD 414 (OXON HILL ROAD) TO I-495	820	794	3%	No	5.49125	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	482	687	-43%	No	10.0093	No
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	211	186	12%	No	3.60669	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	697	583	16%	Yes	1.99585	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	680	574	16%	Yes	0.68911	Yes
FROM I-495 TO MD 5 EB	1525	1359	11%	No	6.25283	No
FROM MD 5 EB TO I-495	510	548	-7%	Yes	1.52302	Yes
FROM I-495 TO MD 5 WB	350	307	12%	No	2.51986	Yes
FROM MD 5 WB TO I-495	1049	1072	-2%	Yes	2.24682	Yes
FROM I-495 TO MD 337	488	368	25%	Yes	1.9325	Yes
FROM MD 337 TO I-495	1093	853	22%	No	4.39738	Yes
FROM I-495 TO MD 4 EB	750	704	6%	Yes	2.13245	Yes
FROM MD 4 EB TO I-495	835	804	4%	Yes	0.37847	Yes
FROM I-495 TO MD 4 WB	626	687	-10%	No	10.4976	No
FROM MD 4 WB TO I-495	701	963	-37%	No	6.6016	No
FROM I-495 TO RITCHIE MARLBORO ROAD	819	483	41%	No	2.23412	Yes
FROM RITCHIE MARLBORO ROAD TO I-495	499	749	-50%	No	7.29858	No
FROM I-495 TO MD 214	1348	1475	-9%	No	14.5944	No
FROM MD 214 EB TO I-495	657	724	-10%	No	2.55901	Yes
FROM MD 214 WB TO I-495	263	365	-39%	No	5.73026	No
FROM I-495 TO ARENA DRIVE	704	318	55%	No	17.0625	No
FROM ARENA DRIVE TO I-495	268	386	-44%	No	6.51283	No
FROM I-495 TO MD 202	1218	931	24%	No	8.74732	No
FROM MD 202 EB TO I-495	149	0	100%	No	17.2627	No
FROM MD 202 TO I-495	1279	991	23%	No	8.56438	No
FROM I-495 TO US 50 EB	1653	1688	-2%	Yes	0.85634	Yes
FROM I-495 TO US 50 WB	757	680	10%	No	2.89177	Yes
FROM US 50 TO I-495	2295	4743	-107%	No	41.2704	No
FROM I-495 TO MD 450 EB	963	919	5%	Yes	1.45085	Yes
FROM I-495 TO MD 450 WB	307	319	-4%	Yes	0.67828	Yes
FROM MD 450 TO I-495	860	730	15%	No	4.61985	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1132	1195	-6%	Yes	1.85419	Yes
FROM MD 295 SB TO I-495	1055	1255	-19%	No	5.87786	No
FROM I-495 TO MD 295 SB	37	40	-8%	Yes	0.48349	Yes
FROM MD 295 SB TO I-495	749	602	20%	No	5.67623	No
FROM I-495 TO MD 201	1059	775	27%	No	9.3963	No
FROM MD 201 NB TO I-495	1078	851	21%	No	7.31781	No
FROM MD 201 SB TO I-495	279	219	21%	No	3.78555	Yes
FROM GREENBELT METRO STATION TO I-495	548	367	33%	No	8.47504	No
FROM I-495 TO US 1	859	721	16%	No	4.92839	Yes
FROM US 1 NB TO I-495	350	831	-137%	No	19.7941	No
FROM US 1 SB TO I-495	546	605	-11%	No	2.43909	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	4481	4004	11%	No	7.3312	No
FROM PARK AND RIDE LOT TO I-495	34	41	-21%	No	1.1431	Yes
FROM I-95 SB TO I-495	3093	3088	0%	Yes	0.08544	Yes
FROM I-495 TO MD 650 NB	850	707	17%	No	5.13452	No
FROM MD 650 NB TO I-495	557	491	12%	No	2.89449	Yes
FROM I-495 TO MD 650 SB	879	809	8%	Yes	2.40072	Yes
FROM MD 650 SB TO I-495	692	641	7%	Yes	1.98534	Yes
FROM I-495 TO MD 193 WB	846	868	-3%	Yes	0.75151	Yes
FROM MD 193 WB TO I-495	366	549	-50%	No	8.5557	No
FROM US 29 NB TO I-495	258	243	6%	Yes	0.96377	Yes
FROM I-495 TO US 29 SB	409	424	-4%	Yes	0.71071	Yes
FROM US 29 SB FROM TO I-495	882	900	-2%	Yes	0.60302	Yes
FROM I-495 TO MD 97	1264	1095	13%	No	4.9359	Yes
FROM MD 97 NB TO I-495	865	884	-2%	Yes	0.65091	Yes
FROM MD 97 SB TO I-495	320	402	-25%	No	4.29096	Yes
FROM I-495 TO MD 185	1109	1099	1%	Yes	0.30096	Yes
FROM MD 185 NB TO I-495	789	769	3%	Yes	0.73461	Yes
FROM MD 185 SB TO I-495	320	375	-17%	No	2.93755	Yes
FROM I-495 TO MD 355 NB	1061	958	10%	Yes	3.24178	Yes
FROM I-495 TO I-270 NB	3101	3274	-6%	Yes	3.05549	Yes
MD 355 NB TO I-495	268	348	-30%	No	4.57174	Yes
FROM I-495 TO MD 187	546	454	17%	No	4.13776	Yes
FROM MD 187 TO I-495	575	681	-18%	No	4.22986	Yes
FROM I-270 SPUR SB TO I-495	2217	3293	-49%	No	20.4999	No
FROM MD 190 WB TO I-495	554	622	-12%	No	2.78425	Yes
FROM I-495 TO MD 190	773	678	12%	No	3.53658	Yes
FROM MD 190 EB TO I-495	246	979	-298%	No	29.6106	No
FROM I-495 TO CABIN JOHN PARKWAY	141	447	-217%	No	17.8571	No
FROM I-495 TO CLARA BARTON PARKWAY WB	27	47	-74%	No	3.28798	Yes
FROM CLARA BARTON PARKWAY TO I-495	1317	1210	8%	Yes	3.01021	Yes

Figure A.121: I-495 Outer Loop Ramp 5-6 PM Volumes

Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Inner Loop				Calibration not met		
FROM I-495 TO CLARA BARTON PARKWAY	1007	1041	-3%	Yes	1.0625	Yes
FROM CLARA BARTON PARKWAY EB TO I-495	72	191	-165%	No	10.3773	No
FROM I-495 TO MD 190	666	689	-3%	Yes	0.87411	Yes
FROM CABIN JOHN PARKWAY TO I-495	1001	1321	-32%	No	9.39148	No
FROM MD WB 190 TO I-495	958	1101	-15%	No	4.46432	Yes
FROM I-495 TO I-270 SPUR NB	4367	4798	-10%	Yes	6.37048	No
FROM I-495 TO MD 187	489	491	0%	Yes	0.07907	Yes
FROM MD 187 TO I-495	293	311	-6%	Yes	1.00743	Yes
FROM I-495 TO MD 355 SB	279	304	-9%	Yes	1.4356	Yes
FROM I-270 SB TO I-495	2714	2753	-1%	Yes	0.74118	Yes
FROM MD 355 SB TO I-495	678	745	-10%	Yes	2.51181	Yes
FROM MD 355 NB TO I-495	228	324	-42%	No	5.77852	No
FROM I-495 TO MD 185	1004	770	23%	No	7.848	No
FROM MD 185 SB TO I-495	205	284	-38%	No	5.02288	No
FROM MD 185 NB TO I-495	1585	1441	9%	Yes	3.69548	Yes
FROM I-495 TO MD 97 SB	708	560	21%	No	5.89885	No
FROM MD 97 SB TO I-495	635	594	7%	Yes	1.67446	Yes
FROM I-495 TO MD 97 NB	440	305	31%	No	6.99472	No
FROM MD 97 NB TO I-495	552	591	-7%	Yes	1.6211	Yes
FROM I-495 TO US 29 SB	159	183	-15%	No	1.85377	Yes
FROM I-495 TO US 29 NB	1096	991	10%	Yes	3.24251	Yes
FROM US 29 NB TO I-495	938	966	-3%	Yes	0.91553	Yes
FROM I-495 TO MD 193 EB	561	575	-2%	Yes	0.56657	Yes
FROM MD 193 EB TO I-495	298	418	-40%	No	6.3543	No
FROM MD 193 WB TO I-495	314	463	-47%	No	7.53652	No
FROM I-495 TO MD 650 SB	496	434	13%	No	2.89915	Yes
FROM MD 650 SB TO I-495	568	555	2%	Yes	0.56984	Yes
FROM I-495 TO MD 650 NB	330	312	5%	Yes	0.99052	Yes
FROM MD 650 NB TO I-495	430	863	-101%	No	17.0214	No
I-495 TO I-95 NB/PARK AND RIDE LOT	3523	3080	13%	No	7.71888	No
I-95 SB (TO US 1) TO I-495	326	337	-3%	Yes	0.60416	Yes
PARK AND RIDE LOT TO I-495	35	71	-101%	No	4.88784	Yes
I-95 SB TO I-495	1887	3114	-65%	No	24.5288	No
I-495 TO US 1 SB	761	2005	-163%	No	33.4406	No
US 1 SB TO I-495	359	336	6%	Yes	1.23382	Yes
I-495 TO US 1 NB	406	481	-18%	No	3.54998	Yes
US 1 NB TO I-495	405	435	-7%	Yes	1.47583	Yes
FROM I-495 TO GREENBELT METRO	104	107	-3%	Yes	0.26789	Yes
FROM I-495 TO MD 201	852	1327	-56%	No	14.3771	No
FROM MD 201 SB TO I-495	543	639	-18%	No	3.94891	Yes
FROM MD 201 NB TO I-495	498	652	-31%	No	6.43197	No
FROM I-495 TO MD 295 SB	1473	1170	21%	No	8.34961	No
FROM MD 295 SB SB TO I-495	1204	1201	0%	Yes	0.0793	Yes
FROM I-495 TO MD 295 NB	362	432	-19%	No	3.5132	Yes
FROM M 295 NB TO I-495	31	31	-1%	Yes	0.04481	Yes
FROM I-495 TO MD 450	664	510	23%	No	6.35626	No
FROM MD 450 TO I-495	1097	1151	-5%	Yes	1.59595	Yes
FROM I-495 TO US 50 EB	1798	1868	-4%	Yes	1.635	Yes
FROM I-495 TO US 50 WB	258	430	-67%	No	9.26182	No
FROM US 50 TO I-495	2323	2406	-4%	Yes	1.69671	Yes
FROM I-495 TO MD 202 WB	320	261	18%	No	3.44621	Yes
FROM MD I-495 TO MD 202 EB	825	783	5%	Yes	1.47229	Yes
FROM MD 202 TO I-495	562	766	-36%	No	7.90778	No
FROM I-495 TO ARENA DRIVE	506	560	-11%	No	2.31789	Yes
FROM ARENA DRIVE TO I-495	244	409	-68%	No	9.11942	No
FROM I-495 TO MD 214 WB	576	563	2%	Yes	0.56583	Yes
FROM I-495 TO MD 214 EB	735	595	19%	No	5.43917	No
FROM MD 214 TO I-495	999	1001	0%	Yes	0.07115	Yes
FROM I-495 TO RITCHIE MARLBORO ROAD	915	1563	-71%	No	18.397	No
FROM RITCHIE MARLBORO ROAD TO I-495	600	1156	-93%	No	18.7641	No
FROM I-495 TO MD 4 WB	853	733	14%	No	4.27054	Yes
FROM MD 4 WB TO I-495	320	6925	-2064%	No	109.741	No
FROM I-495 TO MD 4 EB	819	716	13%	No	3.7179	Yes
FROM MD 4 EB TO I-495	610	659	-8%	Yes	1.9258	Yes
FROM I-495 TO FORESTVILLE ROAD	552	468	15%	No	3.73111	Yes
FROM SUITLAND ROAD TO I-495	409	544	-33%	No	6.16318	No
FROM I-495 TO MD 5 SB/MD 535	2520	2474	2%	Yes	0.92055	Yes
FROM MD 5 NB/MD 535 TO I-495	886	1011	-14%	No	4.04304	Yes
FROM MD 5 SB TO I-495	229	307	-34%	No	4.73628	Yes
FROM I-495 TO MD 414	364	339	7%	Yes	1.31988	Yes
FROM MD 414 NB TO I-495	236	319	-35%	No	4.9686	Yes
FROM I-495 TO MD 414 SB	701	706	-1%	Yes	0.18851	Yes
FROM MD 414 SB TO I-495	438	428	2%	Yes	0.48057	Yes
FROM I-495 TO MD 210	536	851	-59%	No	11.97	No
FROM MD 210 NB (LOOP RAMP) TO I-495	574	643	-12%	No	2.77747	Yes
FROM MD 210 SB TO I-495	278	391	-41%	No	6.19097	No
FROM MD 210 NB (FLYOVER RAMP) TO I-495	277	286	-3%	Yes	0.5512	Yes
FROM I-495 TO I-295 NB	346	368	-6%	Yes	1.16436	Yes
FROM NATIONAL HARBOR BOULEVARD WB TO I-495	690	1258	-82%	No	18.1931	No
FROM I-495 TO NATIONAL HARBOR BOULEVARD EB	321	281	13%	No	2.32045	Yes
FROM I-295 SB TO I-495	1889	1972	-4%	Yes	1.89468	Yes

Figure A.122: I-495 Inner Loop Ramp 6-7 PM Volumes

Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-495 Outer Loop				Calibration not met		
FROM I-495 TO I-295 NB/NATIONAL HARBOR BLVD SB	2148	1555	28%	No	54.0964	No
FROM I-495 TO MD 210 SB/HARBORVIEW AVENUE	870	862	1%	No	12.7613	No
I-295 SB/NATIONAL HARBOR BOULEVARD NB TO I-495	1570	1373	13%	No	8.5817	No
FROM I-495 TO MD 414 (OXON HILL ROAD)	973	1063	-9%	No	12.9888	No
FROM MD 414 (OXON HILL ROAD) TO I-495	832	855	-3%	No	5.49125	No
FROM I-495 TO MD 414 (ST. BARNABAS ROAD)	347	676	-95%	No	10.0093	No
FROM MD 414 (ST. BARNABAS ROAD) SB TO I-495	222	195	12%	No	3.60669	Yes
FROM I-495 TO MD 414 (ST. BARNABAS ROAD) NB	595	603	-1%	Yes	1.99585	Yes
FROM MD 414 (ST. BARNABAS ROAD) TO I-495	560	558	0%	Yes	0.68911	Yes
FROM I-495 TO MD 5 EB	1471	1338	9%	No	6.25283	No
FROM MD 5 EB TO I-495	526	562	-7%	Yes	1.52302	Yes
FROM I-495 TO MD 5 WB	291	300	-3%	No	2.51986	Yes
FROM MD 5 WB TO I-495	1161	1060	9%	Yes	2.24682	Yes
FROM I-495 TO MD 337	413	359	13%	Yes	1.9325	Yes
FROM MD 337 TO I-495	838	822	2%	No	4.39738	Yes
FROM I-495 TO MD 4 EB	705	702	0%	Yes	2.13245	Yes
FROM MD 4 EB TO I-495	779	812	-4%	Yes	0.37847	Yes
FROM I-495 TO MD 4 WB	674	676	0%	No	10.4976	No
FROM MD 4 WB TO I-495	556	947	-70%	No	6.6016	No
FROM I-495 TO RITCHIE MARLBORO ROAD	772	464	40%	No	2.23412	Yes
FROM RITCHIE MARLBORO ROAD TO I-495	488	775	-59%	No	7.29858	No
FROM I-495 TO MD 214	1218	1442	-18%	No	14.5944	No
FROM MD 214 EB TO I-495	478	722	-51%	No	9.96126	No
FROM MD 214 WB TO I-495	335	374	-11%	No	2.04553	Yes
FROM I-495 TO ARENA DRIVE	741	312	58%	No	18.7095	No
FROM ARENA DRIVE TO I-495	268	402	-50%	No	7.3212	No
FROM I-495 TO MD 202	1002	937	6%	Yes	2.0794	Yes
FROM MD 202 EB TO I-495	144	0	100%	No	16.9706	No
FROM MD 202 TO I-495	987	995	-1%	Yes	0.23828	Yes
FROM I-495 TO US 50 EB	1524	1704	-12%	No	4.47439	Yes
FROM I-495 TO US 50 WB	827	658	20%	No	6.2021	No
FROM US 50 TO I-495	1962	4703	-140%	No	47.478	No
FROM I-495 TO MD 450 EB	785	866	-10%	No	2.80223	Yes
FROM I-495 TO MD 450 WB	408	335	18%	No	3.77381	Yes
FROM MD 450 TO I-495	716	691	4%	Yes	0.96158	Yes
FROM I-495 TO MD 295 NB/MD 193 EB	1407	1106	21%	No	8.50647	No
FROM MD 295 SB TO I-495	1176	1265	-8%	Yes	2.54051	Yes
FROM I-495 TO MD 295 SB	44	41	7%	Yes	0.46018	Yes
FROM MD 295 SB TO I-495	587	602	-3%	Yes	0.6152	Yes
FROM I-495 TO MD 201	974	812	17%	No	5.43862	No
FROM MD 201 NB TO I-495	835	862	-3%	Yes	0.92691	Yes
FROM MD 201 SB TO I-495	191	212	-11%	No	1.47939	Yes
FROM GREENBELT METRO STATION TO I-495	489	384	21%	No	5.02571	No
FROM I-495 TO US 1	831	724	13%	No	3.8281	Yes
FROM US 1 NB TO I-495	291	858	-195%	No	23.6637	No
FROM US 1 SB TO I-495	521	603	-16%	No	3.46912	Yes
FROM I-495 TO I-95 NB/PARK AND RIDE LOT	3886	4003	-3%	Yes	1.855	Yes
FROM PARK AND RIDE LOT TO I-495	14	39	-179%	No	4.85643	Yes
FROM I-95 SB TO I-495	2600	3051	-17%	No	8.48004	No
FROM I-495 TO MD 650 NB	733	702	4%	Yes	1.15731	Yes
FROM MD 650 NB TO I-495	487	511	-5%	Yes	1.07439	Yes
FROM I-495 TO MD 650 SB	900	820	9%	Yes	2.72798	Yes
FROM MD 650 SB TO I-495	478	652	-36%	No	7.32994	No
FROM I-495 TO MD 193 WB	826	863	-5%	Yes	1.28172	Yes
FROM MD 193 WB TO I-495	366	556	-52%	No	8.83874	No
FROM US 29 NB TO I-495	241	243	-1%	Yes	0.09647	Yes
FROM I-495 TO US 29 SB	461	424	8%	Yes	1.77105	Yes
FROM US 29 SB FROM TO I-495	941	888	6%	Yes	1.7526	Yes
FROM I-495 TO MD 97	1056	1105	-5%	Yes	1.47564	Yes
FROM MD 97 NB TO I-495	911	900	1%	Yes	0.36555	Yes
FROM MD 97 SB TO I-495	335	399	-19%	No	3.34077	Yes
FROM I-495 TO MD 185	1020	1076	-6%	Yes	1.73746	Yes
FROM MD 185 NB TO I-495	717	776	-8%	Yes	2.15942	Yes
FROM MD 185 SB TO I-495	306	377	-23%	No	3.81639	Yes
FROM I-495 TO MD 355 NB	839	948	-13%	No	3.63031	Yes
FROM I-495 TO I-270 NB	3043	3175	-4%	Yes	2.36736	Yes
MD 355 NB TO I-495	203	369	-82%	No	9.82842	No
FROM I-495 TO MD 187	409	455	-11%	No	2.21318	Yes
FROM MD 187 TO I-495	461	664	-44%	No	8.56882	No
FROM I-270 SPUR SB TO I-495	2155	3219	-49%	No	20.5175	No
FROM MD 190 WB TO I-495	615	623	-1%	Yes	0.31153	Yes
FROM I-495 TO MD 190	937	699	25%	No	8.32147	No
FROM MD 190 EB TO I-495	219	971	-343%	No	30.822	No
FROM I-495 TO CABIN JOHN PARKWAY	152	467	-207%	No	17.9158	No
FROM I-495 TO CLARA BARTON PARKWAY WB	72	47	34%	No	3.20524	Yes
FROM CLARA BARTON PARKWAY TO I-495	945	1207	-28%	No	7.98721	No

Figure A.23: I-495 Outer Loop Ramp 6-7 PM Volumes

I-270 Ramp Volume Tables

Legend
Higher Throughput in Model
Higher Throughput in Field
Criteria Not Met

Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	1260	1253	1%	Yes	0.19748	Yes
FROM I-270 SB TO MD 85 NB	229	487	-112%	No	13.6141	No
FROM MD 85 TO I-270 SB	276	451	-63%	No	9.1788	No
FROM I-270 SB TO MD 80	154	265	-72%	No	7.68384	No
FROM MD 80 TO I-270 SB	614	613	0%	Yes	0.04037	Yes
FROM I-270 SB TO MD 109	46	45	3%	Yes	0.18557	Yes
FROM MD 109 TO I-270 SB	723	471	35%	No	10.3363	No
FROM I-270 SB TO MD 121	165	200	-21%	No	2.57319	Yes
FROM MD 121 TO I-270 SB	1204	1026	15%	No	5.33068	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	436	917	-110%	No	18.5011	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	935	882	6%	Yes	1.74997	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	196	368	-88%	No	10.2551	No
FROM I-270 SB TO MD 118	231	299	-29%	No	4.16283	Yes
FROM MD 118 WB TO I-270 SB	276	343	-24%	No	3.80842	Yes
FROM MD 118 EB TO I-270 SB	510	571	-12%	No	2.61336	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	1897	1663	12%	No	5.54021	No
FROM I-270 SB TO MD 124	624	975	-56%	No	12.4136	No
FROM MD 124 TO I-270 SB	1578	1386	12%	No	5.00084	No
FROM MD 117 TO I-270 SB	1655	1706	-3%	Yes	1.23804	Yes
FROM I-270 SB TO I-370 WB	238	473	-99%	No	12.4748	No
FROM I-270 SB TO I-370 EB	1455	1875	-29%	No	10.2815	No
FROM I-370 TO I-270 SB	2355	2536	-8%	Yes	3.65515	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	644	1339	-108%	No	22.0784	No
FROM SHADY GROVE ROAD WB TO I-270 SB	370	488	-32%	No	5.67461	No
FROM SHADY GROVE ROAD EB TO I-270 SB	123	335	-172%	No	14.0094	No
FROM I-270 SB TO MD 28	366	589	-61%	No	10.2152	No
FROM MD 28 WB TO I-270 SB	130	155	-19%	No	2.11429	Yes
FROM MD 28 EB TO I-270 SB	1194	919	23%	No	8.46054	No
FROM I-270 SB TO MD 189	422	811	-92%	No	15.6754	No
FROM MD 189 TO I-270 SB	532	839	-58%	No	11.7341	No
FROM I-270 SB TO MONTROSE ROAD WB	68	226	-233%	No	13.0467	No
FROM MONTROSE ROAD WB TO I-270 SB	602	835	-39%	No	8.69246	No
FROM I-270 SB TO MONTROSE ROAD EB	664	1020	-54%	No	12.2609	No
FROM MONTROSE ROAD EB TO I-270 SB	312	616	-98%	No	14.1225	No
FROM I-270 SB TO I-270 SB SPUR	4308	5197	-21%	No	12.899	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	750	1196	-59%	No	14.2981	No
FROM ROCKLEDGE BOULEVARD TO I-270 SB	75	152	-103%	No	7.24705	No
FROM MD 187 TO I-270 SB	152	313	-106%	No	10.5723	No
FROM I-270 SB TO MD 355 SB	1040	996	4%	Yes	1.37905	Yes
FROM I-270 SB TO I-495 EB	2443	2389	2%	Yes	1.10884	Yes

Figure A.124: I-270 SB Ramp 6-7 AM Volumes

Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	2170	3044	-40%	No	17.122	No
FROM MD 355 NB TO I-270 NB	207	510	-146%	No	15.982	No
FROM I-270 NB TO MD 187	241	491	-104%	No	13.046	No
FROM I-270 NB TO ROCKLEDGE BOULEVARD	275	518	-88%	No	12.2141	No
FROM ROCKLEDGE BOULEVARD TO I-270 NB	121	403	-233%	No	17.4333	No
FROM I-270 NB SPUR TO I-270 NB	2049	2465	-20%	No	8.75644	No
FROM I-270 NB TO MONTROSE ROAD	403	1208	-200%	No	28.3571	No
FROM MONTROSE ROAD EB TO I-270 NB	53	244	-361%	No	15.6876	No
FROM I-270 NB TO MONTROSE ROAD WB	197	287	-46%	No	5.79999	No
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	241	647	-168%	No	19.2679	No
FROM I-270 NB TO MD 189	252	599	-138%	No	16.8124	No
FROM MD 189 TO I-270 NB	151	505	-234%	No	19.5464	No
FROM I-270 NB TO MD 28 EB/NELSON STREET	86	242	-181%	No	12.1816	No
FROM MD 28 EB TO I-270 NB	36	105	-192%	No	8.24025	No
FROM I-270 NB TO MD 28 WB	211	1017	-382%	No	32.5207	No
FROM MD 28 WB TO I-270 NB	192	228	-18%	No	2.45119	Yes
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	835	1302	-56%	No	14.2934	No
FROM SHADY GROVE ROAD EB TO I-270 NB	87	239	-174%	No	11.8755	No
FROM SHADY GROVE ROAD WB TO I-270 NB	68	245	-260%	No	14.12	No
FROM I-270 NB TO I-370	551	954	-73%	No	14.6752	No
FROM I-370 EB TO I-270 NB	145	310	-114%	No	10.9394	No
FROM I-370 WB TO I-270 NB	805	1125	-40%	No	10.3012	No
FROM I-270 NB TO MD 117	521	358	31%	No	7.80121	No
FROM I-270 NB TO MD 124 EB	375	893	-138%	No	20.5803	No
FROM MD 124 EB TO I-270 NB	179	318	-78%	No	8.81762	No
FROM MD 124 WB TO I-270 NB	234	343	-47%	No	6.43064	No
FROM I-270 NB TO MIDDLEBROOK ROAD EB	121	308	-154%	No	12.7414	No
FROM I-270 NB TO MIDDLEBROOK ROAD WB	173	353	-104%	No	11.0737	No
FROM I-270 NB TO MD 118 EB	90	195	-116%	No	8.76174	No
FROM I-270 NB TO MD 118 WB	235	482	-105%	No	13.0234	No
FROM MD 118 TO I-270 NB	239	349	-46%	No	6.41533	No
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	300	568	-89%	No	12.8644	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	152	150	2%	Yes	0.20362	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	84	110	-31%	No	2.6399	Yes
FROM I-270 NB TO MD 121	238	466	-96%	No	12.1524	No
FROM MD 121 TO I-270 NB	94	245	-160%	No	11.5684	No
FROM I-270 NB TO MD 109	89	98	-10%	No	0.93076	Yes
FROM MD 109 TO I-270 NB	29	44	-52%	No	2.48282	Yes
FROM I-270 NB TO MD 80	124	174	-41%	No	4.11491	Yes
FROM MD 80 TO I-270 NB	264	427	-62%	No	8.76927	No
FROM I-270 NB TO MD 85 NB	115	198	-72%	No	6.6	No
FROM I-270 NB TO MD 85 SB	119	379	-218%	No	16.4534	No
FROM MD 85 TO I-270 NB	480	827	-72%	No	13.5824	No

Figure A.125: I-270 NB Ramp 6-7 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	1526	1254	18%	No	7.30264	No
FROM I-270 SB TO MD 85 NB	255	495	-94%	No	12.3827	No
FROM MD 85 TO I-270 SB	263	482	-83%	No	11.3249	No
FROM I-270 SB TO MD 80	206	276	-34%	No	4.52403	Yes
FROM MD 80 TO I-270 SB	747	592	21%	No	6.00063	No
FROM I-270 SB TO MD 109	41	57	-38%	No	2.21996	Yes
FROM MD 109 TO I-270 SB	732	433	41%	No	12.3769	No
FROM I-270 SB TO MD 121	245	207	16%	No	2.5624	Yes
FROM MD 121 TO I-270 SB	873	995	-14%	No	3.99196	Yes
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1119	940	16%	No	5.58692	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	678	891	-31%	No	7.61304	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	181	404	-123%	No	13.0389	No
FROM I-270 SB TO MD 118	416	354	15%	No	3.18633	Yes
FROM MD 118 WB TO I-270 SB	357	326	9%	Yes	1.7052	Yes
FROM MD 118 EB TO I-270 SB	581	548	6%	Yes	1.37826	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	1919	1580	18%	No	8.10481	No
FROM I-270 SB TO MD 124	881	956	-9%	Yes	2.4747	Yes
FROM MD 124 TO I-270 SB	1272	1431	-12%	No	4.31843	Yes
FROM MD 117 TO I-270 SB	1843	1681	9%	Yes	3.87152	Yes
FROM I-270 SB TO I-370 WB	451	511	-13%	No	2.74681	Yes
FROM I-270 SB TO I-370 EB	2044	1976	3%	Yes	1.52799	Yes
FROM I-370 TO I-270 SB	2419	2549	-5%	Yes	2.60836	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	794	1376	-73%	No	17.6688	No
FROM SHADY GROVE ROAD WB TO I-270 SB	446	506	-13%	No	2.7501	Yes
FROM SHADY GROVE ROAD EB TO I-270 SB	250	338	-35%	No	5.14575	No
FROM I-270 SB TO MD 28	367	586	-60%	No	10.0224	No
FROM MD 28 WB TO I-270 SB	201	164	18%	No	2.73886	Yes
FROM MD 28 EB TO I-270 SB	1568	926	41%	No	18.1883	No
FROM I-270 SB TO MD 189	564	779	-38%	No	8.28802	No
FROM MD 189 TO I-270 SB	1125	835	26%	No	9.27229	No
FROM I-270 SB TO MONTROSE ROAD WB	83	237	-185%	No	12.1447	No
FROM MONTROSE ROAD WB TO I-270 SB	783	847	-8%	Yes	2.24182	Yes
FROM I-270 SB TO MONTROSE ROAD EB	664	1014	-53%	No	12.0911	No
FROM MONTROSE ROAD EB TO I-270 SB	715	622	13%	No	3.61695	Yes
FROM I-270 SB TO I-270 SB SPUR	4252	5209	-22%	No	13.9073	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	1231	1233	0%	Yes	0.0641	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 SB	121	144	-19%	No	1.99811	Yes
FROM MD 187 TO I-270 SB	321	301	6%	Yes	1.11969	Yes
FROM I-270 SB TO MD 355 SB	1017	1018	0%	Yes	0.03918	Yes
FROM I-270 SB TO I-495 EB	2635	2542	4%	Yes	1.83289	Yes

Figure A.126: I-270 SB Ramp 7-8 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	2860	3101	-8%	Yes	4.41889	Yes
FROM MD 355 NB TO I-270 NB	647	520	20%	No	5.25755	No
FROM I-270 NB TO MD 187	416	492	-18%	No	3.54437	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	494	555	-12%	No	2.64232	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	398	405	-2%	Yes	0.34935	Yes
FROM I-270 NB SPUR TO I-270 NB	3492	2566	27%	No	16.8301	No
FROM I-270 NB TO MONTROSE ROAD	647	1260	-95%	No	19.845	No
FROM MONTROSE ROAD EB TO I-270 NB	221	245	-11%	No	1.57229	Yes
FROM I-270 NB TO MONTROSE ROAD WB	274	298	-9%	Yes	1.40467	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	642	686	-7%	Yes	1.68845	Yes
FROM I-270 NB TO MD 189	512	597	-17%	No	3.58925	Yes
FROM MD 189 TO I-270 NB	344	526	-53%	No	8.7155	No
FROM I-270 NB TO MD 28 EB/NELSON STREET	258	261	-1%	Yes	0.18623	Yes
FROM MD 28 EB TO I-270 NB	82	111	-35%	No	2.90499	Yes
FROM I-270 NB TO MD 28 WB	378	1111	-194%	No	26.8641	No
FROM MD 28 WB TO I-270 NB	358	217	39%	No	8.29918	No
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	1352	1399	-3%	Yes	1.26727	Yes
FROM SHADY GROVE ROAD EB TO I-270 NB	231	263	-14%	No	2.0515	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	177	237	-34%	No	4.15417	Yes
FROM I-270 NB TO I-370	958	1033	-8%	Yes	2.36151	Yes
FROM I-370 EB TO I-270 NB	354	330	7%	Yes	1.31153	Yes
FROM I-370 WB TO I-270 NB	1459	1243	15%	No	5.89075	No
FROM I-270 NB TO MD 117	919	380	59%	No	21.1731	No
FROM I-270 NB TO MD 124 EB	692	960	-39%	No	9.33291	No
FROM MD 124 EB TO I-270 NB	325	330	-1%	Yes	0.24876	Yes
FROM MD 124 WB TO I-270 NB	350	356	-2%	Yes	0.31935	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	236	340	-44%	No	6.14166	No
FROM I-270 NB TO MIDDLEBROOK ROAD WB	404	401	1%	Yes	0.17451	Yes
FROM I-270 NB TO MD 118 EB	200	227	-14%	No	1.84784	Yes
FROM I-270 NB TO MD 118 WB	511	530	-4%	Yes	0.82195	Yes
FROM MD 118 TO I-270 NB	396	347	12%	No	2.55564	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	495	630	-27%	No	5.70201	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	159	166	-4%	Yes	0.54913	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	130	125	4%	Yes	0.44281	Yes
FROM I-270 NB TO MD 121	283	492	-74%	No	10.6172	No
FROM MD 121 TO I-270 NB	238	253	-6%	Yes	0.9259	Yes
FROM I-270 NB TO MD 109	117	106	9%	Yes	1.04173	Yes
FROM MD 109 TO I-270 NB	60	47	21%	No	1.74111	Yes
FROM I-270 NB TO MD 80	199	181	9%	Yes	1.34301	Yes
FROM MD 80 TO I-270 NB	583	443	24%	No	6.20474	No
FROM I-270 NB TO MD 85 NB	203	202	1%	Yes	0.08787	Yes
FROM I-270 NB TO MD 85 SB	206	376	-83%	No	9.96558	No
FROM MD 85 TO I-270 NB	778	850	-9%	Yes	2.51503	Yes

Figure A.127: I-270 NB Ramp 7-8 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	1456	1278	12%	No	4.80735	Yes
FROM I-270 SB TO MD 85 NB	233	502	-115%	No	14.0215	No
FROM MD 85 TO I-270 SB	263	460	-75%	No	10.3385	No
FROM I-270 SB TO MD 80	247	279	-13%	No	1.95825	Yes
FROM MD 80 TO I-270 SB	678	599	12%	No	3.13662	Yes
FROM I-270 SB TO MD 109	64	57	11%	No	0.89995	Yes
FROM MD 109 TO I-270 SB	620	452	27%	No	7.25649	No
FROM I-270 SB TO MD 121	260	201	23%	No	3.90365	Yes
FROM MD 121 TO I-270 SB	767	996	-30%	No	7.71302	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1316	905	31%	No	12.3416	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	626	888	-42%	No	9.52255	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	171	407	-138%	No	13.8589	No
FROM I-270 SB TO MD 118	420	344	18%	No	3.90193	Yes
FROM MD 118 WB TO I-270 SB	419	348	17%	No	3.65229	Yes
FROM MD 118 EB TO I-270 SB	643	578	10%	No	2.65147	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	1713	1608	6%	Yes	2.5705	Yes
FROM I-270 SB TO MD 124	909	979	-8%	Yes	2.27831	Yes
FROM MD 124 TO I-270 SB	1228	1472	-20%	No	6.64084	No
FROM MD 117 TO I-270 SB	1756	1667	5%	Yes	2.1513	Yes
FROM I-270 SB TO I-370 WB	668	512	23%	No	6.42242	No
FROM I-270 SB TO I-370 EB	2235	1985	11%	No	5.45371	No
FROM I-370 TO I-270 SB	2416	2557	-6%	Yes	2.81776	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	1137	1328	-17%	No	5.44051	No
FROM SHADY GROVE ROAD WB TO I-270 SB	423	499	-18%	No	3.53967	Yes
FROM SHADY GROVE ROAD EB TO I-270 SB	300	329	-10%	Yes	1.64903	Yes
FROM I-270 SB TO MD 28	517	598	-16%	No	3.41013	Yes
FROM MD 28 WB TO I-270 SB	198	173	13%	No	1.83556	Yes
FROM MD 28 EB TO I-270 SB	1474	932	37%	No	15.6347	No
FROM I-270 SB TO MD 189	767	773	-1%	Yes	0.22522	Yes
FROM MD 189 TO I-270 SB	1057	831	21%	No	7.35567	No
FROM I-270 SB TO MONTROSE ROAD WB	88	242	-175%	No	12.0038	No
FROM MONTROSE ROAD WB TO I-270 SB	829	834	-1%	Yes	0.16474	Yes
FROM I-270 SB TO MONTROSE ROAD EB	836	983	-18%	No	4.87434	Yes
FROM MONTROSE ROAD EB TO I-270 SB	744	649	13%	No	3.59967	Yes
FROM I-270 SB TO I-270 SB SPUR	4028	5255	-30%	No	18.0101	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	1336	1189	11%	No	4.12991	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 SB	92	147	-60%	No	5.03128	No
FROM MD 187 TO I-270 SB	328	292	11%	No	2.0739	Yes
FROM I-270 SB TO MD 355 SB	825	1040	-26%	No	7.03296	No
FROM I-270 SB TO I-495 EB	2770	2583	7%	Yes	3.62442	Yes

Figure A.128: I-270 SB Ramp 8-9 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	2525	3082	-22%	No	10.5108	No
FROM MD 355 NB TO I-270 NB	834	500	40%	No	12.9325	No
FROM I-270 NB TO MD 187	493	476	3%	Yes	0.77233	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	638	542	15%	No	3.95226	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	693	409	41%	No	12.0988	No
FROM I-270 NB SPUR TO I-270 NB	4478	2538	43%	No	32.7642	No
FROM I-270 NB TO MONTROSE ROAD	731	1255	-72%	No	16.6149	No
FROM MONTROSE ROAD EB TO I-270 NB	398	241	39%	No	8.76773	No
FROM I-270 NB TO MONTROSE ROAD WB	360	304	16%	No	3.0877	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	937	655	30%	No	9.99522	No
FROM I-270 NB TO MD 189	679	618	9%	Yes	2.40543	Yes
FROM MD 189 TO I-270 NB	621	527	15%	No	3.94521	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	399	239	40%	No	8.97404	No
FROM MD 28 EB TO I-270 NB	86	113	-31%	No	2.65999	Yes
FROM I-270 NB TO MD 28 WB	429	1098	-156%	No	24.2115	No
FROM MD 28 WB TO I-270 NB	471	226	52%	No	13.1397	No
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	1846	1389	25%	No	11.363	No
FROM SHADY GROVE ROAD EB TO I-270 NB	289	255	12%	No	2.04592	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	285	238	16%	No	2.90644	Yes
FROM I-270 NB TO I-370	1337	1052	21%	No	8.26149	No
FROM I-370 EB TO I-270 NB	451	322	29%	No	6.56168	No
FROM I-370 WB TO I-270 NB	1791	1246	30%	No	13.9859	No
FROM I-270 NB TO MD 117	1441	373	74%	No	35.4516	No
FROM I-270 NB TO MD 124 EB	948	971	-2%	Yes	0.73449	Yes
FROM MD 124 EB TO I-270 NB	364	330	9%	Yes	1.85272	Yes
FROM MD 124 WB TO I-270 NB	350	348	1%	Yes	0.13387	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	337	348	-3%	Yes	0.56757	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	480	399	17%	No	3.88868	Yes
FROM I-270 NB TO MD 118 EB	331	229	31%	No	6.07937	No
FROM I-270 NB TO MD 118 WB	638	543	15%	No	3.90943	Yes
FROM MD 118 TO I-270 NB	426	331	22%	No	4.91037	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	655	628	4%	Yes	1.08597	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	162	156	4%	Yes	0.47583	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	135	113	16%	No	1.95222	Yes
FROM I-270 NB TO MD 121	352	510	-45%	No	7.58871	No
FROM MD 121 TO I-270 NB	209	273	-31%	No	4.13763	Yes
FROM I-270 NB TO MD 109	108	114	-6%	Yes	0.56949	Yes
FROM MD 109 TO I-270 NB	85	40	54%	No	5.76689	No
FROM I-270 NB TO MD 80	238	195	18%	No	2.95809	Yes
FROM MD 80 TO I-270 NB	590	440	25%	No	6.59797	No
FROM I-270 NB TO MD 85 NB	248	222	11%	No	1.72959	Yes
FROM I-270 NB TO MD 85 SB	227	414	-82%	No	10.4216	No
FROM MD 85 TO I-270 NB	783	860	-10%	Yes	2.6865	Yes

Figure A.129: I-270 NB Ramp 8-9 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	868	1289	-49%	No	12.8195	No
FROM I-270 SB TO MD 85 NB	240	499	-108%	No	13.4739	No
FROM MD 85 TO I-270 SB	259	485	-87%	No	11.6956	No
FROM I-270 SB TO MD 80	257	271	-5%	Yes	0.84645	Yes
FROM MD 80 TO I-270 SB	458	594	-30%	No	5.92988	No
FROM I-270 SB TO MD 109	73	48	35%	No	3.24962	Yes
FROM MD 109 TO I-270 SB	438	463	-6%	Yes	1.16624	Yes
FROM I-270 SB TO MD 121	172	193	-12%	No	1.55449	Yes
FROM MD 121 TO I-270 SB	740	987	-33%	No	8.40554	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	846	917	-8%	Yes	2.37487	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	791	885	-12%	No	3.23039	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	154	378	-145%	No	13.7222	No
FROM I-270 SB TO MD 118	444	341	23%	No	5.22587	No
FROM MD 118 WB TO I-270 SB	322	334	-4%	Yes	0.66259	Yes
FROM MD 118 EB TO I-270 SB	588	567	4%	Yes	0.88436	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	1415	1632	-15%	No	5.55954	No
FROM I-270 SB TO MD 124	1053	982	7%	Yes	2.24178	Yes
FROM MD 124 TO I-270 SB	1075	1396	-30%	No	9.12572	No
FROM MD 117 TO I-270 SB	1555	1691	-9%	Yes	3.36975	Yes
FROM I-270 SB TO I-370 WB	553	493	11%	No	2.64611	Yes
FROM I-270 SB TO I-370 EB	1726	1936	-12%	No	4.90767	Yes
FROM I-370 TO I-270 SB	2162	2547	-18%	No	7.92941	No
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	1002	1353	-35%	No	10.2221	No
FROM SHADY GROVE ROAD WB TO I-270 SB	431	502	-16%	No	3.26497	Yes
FROM SHADY GROVE ROAD EB TO I-270 SB	285	333	-17%	No	2.71695	Yes
FROM I-270 SB TO MD 28	751	590	21%	No	6.21765	No
FROM MD 28 WB TO I-270 SB	224	169	25%	No	3.96176	Yes
FROM MD 28 EB TO I-270 SB	1456	877	40%	No	16.9608	No
FROM I-270 SB TO MD 189	937	767	18%	No	5.8241	No
FROM MD 189 TO I-270 SB	749	821	-10%	Yes	2.57851	Yes
FROM I-270 SB TO MONTROSE ROAD WB	103	246	-139%	No	10.8403	No
FROM MONTROSE ROAD WB TO I-270 SB	670	814	-21%	No	5.28641	No
FROM I-270 SB TO MONTROSE ROAD EB	1033	995	4%	Yes	1.18542	Yes
FROM MONTROSE ROAD EB TO I-270 SB	555	637	-15%	No	3.34896	Yes
FROM I-270 SB TO I-270 SB SPUR	4028	5024	-25%	No	14.8083	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	1002	1139	-14%	No	4.17984	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 SB	111	150	-35%	No	3.39371	Yes
FROM MD 187 TO I-270 SB	285	314	-10%	No	1.64751	Yes
FROM I-270 SB TO MD 355 SB	859	1006	-17%	No	4.82172	Yes
FROM I-270 SB TO I-495 EB	2512	2482	1%	Yes	0.6104	Yes

Figure A.130: I-270 SB Ramp 9-10 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	2640	3121	-18%	No	8.96659	No
FROM MD 355 NB TO I-270 NB	607	534	12%	No	3.0671	Yes
FROM I-270 NB TO MD 187	437	491	-12%	No	2.48434	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	570	534	6%	Yes	1.53226	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	624	423	32%	No	8.80887	No
FROM I-270 NB SPUR TO I-270 NB	4403	2601	41%	No	30.4554	No
FROM I-270 NB TO MONTROSE ROAD	680	1295	-90%	No	19.564	No
FROM MONTROSE ROAD EB TO I-270 NB	324	252	22%	No	4.22699	Yes
FROM I-270 NB TO MONTROSE ROAD WB	269	288	-7%	Yes	1.12379	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	780	660	15%	No	4.49155	Yes
FROM I-270 NB TO MD 189	652	632	3%	Yes	0.80923	Yes
FROM MD 189 TO I-270 NB	599	507	15%	No	3.93439	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	384	242	37%	No	8.04205	No
FROM MD 28 EB TO I-270 NB	67	98	-47%	No	3.43791	Yes
FROM I-270 NB TO MD 28 WB	415	1089	-162%	No	24.5853	No
FROM MD 28 WB TO I-270 NB	427	234	45%	No	10.6478	No
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	1745	1429	18%	No	7.94547	No
FROM SHADY GROVE ROAD EB TO I-270 NB	289	239	17%	No	3.09341	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	292	238	19%	No	3.33334	Yes
FROM I-270 NB TO I-370	1268	1035	18%	No	6.8818	No
FROM I-370 EB TO I-270 NB	429	322	25%	No	5.50796	No
FROM I-370 WB TO I-270 NB	1440	1228	15%	No	5.80441	No
FROM I-270 NB TO MD 117	1194	387	68%	No	28.7027	No
FROM I-270 NB TO MD 124 EB	909	997	-10%	Yes	2.8506	Yes
FROM MD 124 EB TO I-270 NB	338	324	4%	Yes	0.76951	Yes
FROM MD 124 WB TO I-270 NB	318	343	-8%	Yes	1.36167	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	319	330	-3%	Yes	0.61064	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	382	396	-4%	Yes	0.72239	Yes
FROM I-270 NB TO MD 118 EB	303	217	28%	No	5.33349	No
FROM I-270 NB TO MD 118 WB	557	526	6%	Yes	1.34308	Yes
FROM MD 118 TO I-270 NB	350	343	2%	Yes	0.38955	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	654	612	6%	Yes	1.66935	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	167	160	4%	Yes	0.587	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	129	114	11%	No	1.33746	Yes
FROM I-270 NB TO MD 121	348	510	-47%	No	7.83236	No
FROM MD 121 TO I-270 NB	163	251	-54%	No	6.13195	No
FROM I-270 NB TO MD 109	116	108	7%	Yes	0.77999	Yes
FROM MD 109 TO I-270 NB	76	48	37%	No	3.59138	Yes
FROM I-270 NB TO MD 80	169	201	-19%	No	2.3351	Yes
FROM MD 80 TO I-270 NB	401	454	-13%	No	2.53991	Yes
FROM I-270 NB TO MD 85 NB	248	226	9%	Yes	1.41244	Yes
FROM I-270 NB TO MD 85 SB	164	413	-152%	No	14.6713	No
FROM MD 85 TO I-270 NB	789	832	-5%	Yes	1.51906	Yes

Figure A.131: I-270 NB Ramp 9-10 AM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	826	766	7%	Yes	2.12664	Yes
FROM I-270 SB TO MD 85 NB	225	540	-140%	No	16.1063	No
FROM MD 85 TO I-270 SB	237	564	-138%	No	16.3298	No
FROM I-270 SB TO MD 80	381	440	-15%	No	2.88823	Yes
FROM MD 80 TO I-270 SB	197	253	-28%	No	3.73333	Yes
FROM I-270 SB TO MD 109	72	60	16%	No	1.44496	Yes
FROM MD 109 TO I-270 SB	204	160	22%	No	3.2615	Yes
FROM I-270 SB TO MD 121	177	203	-14%	No	1.85118	Yes
FROM MD 121 TO I-270 SB	402	638	-59%	No	10.3493	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	331	387	-17%	No	2.95557	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	493	551	-12%	No	2.53859	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	100	242	-142%	No	10.8287	No
FROM I-270 SB TO MD 118	304	303	0%	Yes	0.0574	Yes
FROM MD 118 WB TO I-270 SB	310	360	-16%	No	2.73179	Yes
FROM MD 118 EB TO I-270 SB	511	580	-13%	No	2.93354	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	947	993	-5%	Yes	1.46904	Yes
FROM I-270 SB TO MD 124	843	888	-5%	Yes	1.53799	Yes
FROM MD 124 TO I-270 SB	1167	1227	-5%	Yes	1.73422	Yes
FROM MD 117 TO I-270 SB	1303	1495	-15%	No	5.12034	No
FROM I-270 SB TO I-370 WB	454	546	-20%	No	4.12503	Yes
FROM I-270 SB TO I-370 EB	1543	1582	-3%	Yes	0.98663	Yes
FROM I-370 TO I-270 SB	1626	1666	-2%	Yes	0.98593	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	523	335	36%	No	9.09012	No
FROM SHADY GROVE ROAD WB TO I-270 SB	514	709	-38%	No	7.87633	No
FROM SHADY GROVE ROAD EB TO I-270 SB	393	646	-64%	No	11.0809	No
FROM I-270 SB TO MD 28	516	598	-16%	No	3.48465	Yes
FROM MD 28 WB TO I-270 SB	287	261	9%	Yes	1.58618	Yes
FROM MD 28 EB TO I-270 SB	1157	1097	5%	Yes	1.80236	Yes
FROM I-270 SB TO MD 189	714	883	-24%	No	5.98066	No
FROM MD 189 TO I-270 SB	628	625	0%	Yes	0.11986	Yes
FROM I-270 SB TO MONTROSE ROAD WB	152	358	-135%	No	12.8752	No
FROM MONTROSE ROAD WB TO I-270 SB	806	706	12%	No	3.62757	Yes
FROM I-270 SB TO MONTROSE ROAD EB	763	846	-11%	No	2.92627	Yes
FROM MONTROSE ROAD EB TO I-270 SB	438	441	-1%	Yes	0.155	Yes
FROM I-270 SB TO I-270 SB SPUR	3524	3349	5%	Yes	2.99388	Yes
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	570	779	-37%	No	8.04739	No
FROM ROCKLEDGE BOULEVARD TO I-270 SB	301	422	-40%	No	6.35196	No
FROM MD 187 TO I-270 SB	385	372	3%	Yes	0.68117	Yes
FROM I-270 SB TO MD 355 SB	497	714	-44%	No	8.82791	No
FROM I-270 SB TO I-495 EB	2761	2847	-3%	Yes	1.61472	Yes

Figure A.132: I-270 SB Ramp 3-4 PM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	2984	3218	-8%	Yes	4.20209	Yes
FROM MD 355 NB TO I-270 NB	1205	1107	8%	Yes	2.87484	Yes
FROM I-270 NB TO MD 187	311	281	10%	Yes	1.72882	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	161	220	-36%	No	4.24125	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	1282	1206	6%	Yes	2.14759	Yes
FROM I-270 NB SPUR TO I-270 NB	5997	3914	35%	No	29.594	No
FROM I-270 NB TO MONTROSE ROAD	504	995	-97%	No	17.9271	No
FROM MONTROSE ROAD EB TO I-270 NB	402	345	14%	No	2.94937	Yes
FROM I-270 NB TO MONTROSE ROAD WB	302	320	-6%	Yes	0.99273	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	1385	1210	13%	No	4.8583	Yes
FROM I-270 NB TO MD 189	701	733	-5%	Yes	1.20429	Yes
FROM MD 189 TO I-270 NB	855	843	1%	Yes	0.40323	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	328	295	10%	Yes	1.85522	Yes
FROM MD 28 EB TO I-270 NB	113	140	-24%	No	2.42162	Yes
FROM I-270 NB TO MD 28 WB	665	1048	-58%	No	13.0717	No
FROM MD 28 WB TO I-270 NB	750	557	26%	No	7.54978	No
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	2284	1533	33%	No	17.2033	No
FROM SHADY GROVE ROAD EB TO I-270 NB	514	626	-22%	No	4.68121	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	584	762	-30%	No	6.84339	No
FROM I-270 NB TO I-370	2450	2244	8%	Yes	4.26272	Yes
FROM I-370 EB TO I-270 NB	600	710	-18%	No	4.30741	Yes
FROM I-370 WB TO I-270 NB	1491	1415	5%	Yes	2.00044	Yes
FROM I-270 NB TO MD 117	1473	1402	5%	Yes	1.87264	Yes
FROM I-270 NB TO MD 124 EB	1581	1686	-7%	Yes	2.58577	Yes
FROM MD 124 EB TO I-270 NB	536	534	0%	Yes	0.09729	Yes
FROM MD 124 WB TO I-270 NB	409	445	-9%	Yes	1.74216	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	484	482	1%	Yes	0.11378	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	801	832	-4%	Yes	1.09355	Yes
FROM I-270 NB TO MD 118 EB	417	374	10%	No	2.17511	Yes
FROM I-270 NB TO MD 118 WB	662	677	-2%	Yes	0.5605	Yes
FROM MD 118 TO I-270 NB	421	512	-22%	No	4.21323	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1679	1814	-8%	Yes	3.21862	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	169	230	-36%	No	4.3351	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	156	199	-27%	No	3.19224	Yes
FROM I-270 NB TO MD 121	726	806	-11%	No	2.89931	Yes
FROM MD 121 TO I-270 NB	285	271	5%	Yes	0.87004	Yes
FROM I-270 NB TO MD 109	204	216	-6%	Yes	0.82808	Yes
FROM MD 109 TO I-270 NB	140	113	20%	No	2.44747	Yes
FROM I-270 NB TO MD 80	467	580	-24%	No	4.93878	Yes
FROM MD 80 TO I-270 NB	610	499	18%	No	4.70266	Yes
FROM I-270 NB TO MD 85 NB	345	357	-3%	Yes	0.61404	Yes
FROM I-270 NB TO MD 85 SB	161	386	-140%	No	13.6052	No
FROM MD 85 TO I-270 NB	1443	1527	-6%	Yes	2.1798	Yes

Figure A.133: I-270 NB Ramp 3-4 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	728	760	-4%	Yes	1.16411	Yes
FROM I-270 SB TO MD 85 NB	214	521	-144%	No	16.0247	No
FROM MD 85 TO I-270 SB	259	580	-124%	No	15.6725	No
FROM I-270 SB TO MD 80	391	459	-17%	No	3.31012	Yes
FROM MD 80 TO I-270 SB	243	263	-8%	Yes	1.27279	Yes
FROM I-270 SB TO MD 109	73	61	17%	No	1.52998	Yes
FROM MD 109 TO I-270 SB	191	164	14%	No	2.00711	Yes
FROM I-270 SB TO MD 121	220	212	4%	Yes	0.5615	Yes
FROM MD 121 TO I-270 SB	429	543	-27%	No	5.17115	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	377	403	-7%	Yes	1.32901	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	514	551	-7%	Yes	1.5821	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	108	235	-118%	No	9.71332	No
FROM I-270 SB TO MD 118	350	326	7%	Yes	1.33312	Yes
FROM MD 118 WB TO I-270 SB	329	337	-2%	Yes	0.41115	Yes
FROM MD 118 EB TO I-270 SB	616	570	8%	Yes	1.89946	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	922	962	-4%	Yes	1.28715	Yes
FROM I-270 SB TO MD 124	871	884	-1%	Yes	0.43044	Yes
FROM MD 124 TO I-270 SB	1211	1226	-1%	Yes	0.41543	Yes
FROM MD 117 TO I-270 SB	1656	1485	10%	No	4.31496	Yes
FROM I-270 SB TO I-370 WB	573	566	1%	Yes	0.31435	Yes
FROM I-270 SB TO I-370 EB	1923	1588	17%	No	8.00798	No
FROM I-370 TO I-270 SB	1768	1698	4%	Yes	1.69364	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	505	341	32%	No	7.97395	No
FROM SHADY GROVE ROAD WB TO I-270 SB	544	714	-31%	No	6.78764	No
FROM SHADY GROVE ROAD EB TO I-270 SB	493	632	-28%	No	5.85086	No
FROM I-270 SB TO MD 28	483	591	-22%	No	4.66054	Yes
FROM MD 28 WB TO I-270 SB	231	262	-14%	No	1.9899	Yes
FROM MD 28 EB TO I-270 SB	1194	1134	5%	Yes	1.75863	Yes
FROM I-270 SB TO MD 189	793	900	-14%	No	3.68597	Yes
FROM MD 189 TO I-270 SB	554	588	-6%	Yes	1.42286	Yes
FROM I-270 SB TO MONTROSE ROAD WB	164	364	-122%	No	12.2842	No
FROM MONTROSE ROAD WB TO I-270 SB	636	715	-12%	No	3.03025	Yes
FROM I-270 SB TO MONTROSE ROAD EB	812	846	-4%	Yes	1.17227	Yes
FROM MONTROSE ROAD EB TO I-270 SB	425	439	-3%	Yes	0.66164	Yes
FROM I-270 SB TO I-270 SB SPUR	2965	3382	-14%	No	7.40659	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	643	802	-25%	No	5.89774	No
FROM ROCKLEDGE BOULEVARD TO I-270 SB	360	412	-14%	No	2.63443	Yes
FROM MD 187 TO I-270 SB	380	363	5%	Yes	0.90825	Yes
FROM I-270 SB TO MD 355 SB	554	708	-28%	No	6.1213	No
FROM I-270 SB TO I-495 EB	2873	2853	1%	Yes	0.37846	Yes

Figure A.134: I-270 SB Ramp 4-5 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	3280	3200	2%	Yes	1.40546	Yes
FROM MD 355 NB TO I-270 NB	1232	1110	10%	Yes	3.55768	Yes
FROM I-270 NB TO MD 187	353	293	17%	No	3.33849	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	203	230	-13%	No	1.81853	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	1525	1203	21%	No	8.73298	No
FROM I-270 NB SPUR TO I-270 NB	5389	3930	27%	No	21.37	No
FROM I-270 NB TO MONTROSE ROAD	361	994	-175%	No	24.3265	No
FROM MONTROSE ROAD EB TO I-270 NB	312	335	-7%	Yes	1.27876	Yes
FROM I-270 NB TO MONTROSE ROAD WB	245	323	-32%	No	4.64226	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	1548	1280	17%	No	7.12705	No
FROM I-270 NB TO MD 189	682	717	-5%	Yes	1.31401	Yes
FROM MD 189 TO I-270 NB	911	825	9%	Yes	2.92773	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	344	301	12%	No	2.38006	Yes
FROM MD 28 EB TO I-270 NB	110	128	-16%	No	1.628	Yes
FROM I-270 NB TO MD 28 WB	619	1069	-73%	No	15.4747	No
FROM MD 28 WB TO I-270 NB	707	569	19%	No	5.45304	No
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	2400	1524	37%	No	19.783	No
FROM SHADY GROVE ROAD EB TO I-270 NB	537	615	-14%	No	3.23993	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	631	784	-24%	No	5.73434	No
FROM I-270 NB TO I-370	2440	2261	7%	Yes	3.69735	Yes
FROM I-370 EB TO I-270 NB	733	737	0%	Yes	0.12912	Yes
FROM I-370 WB TO I-270 NB	1572	1416	10%	Yes	4.04926	Yes
FROM I-270 NB TO MD 117	1477	1418	4%	Yes	1.54412	Yes
FROM I-270 NB TO MD 124 EB	1699	1663	2%	Yes	0.87192	Yes
FROM MD 124 EB TO I-270 NB	427	501	-17%	No	3.42422	Yes
FROM MD 124 WB TO I-270 NB	325	430	-32%	No	5.40419	No
FROM I-270 NB TO MIDDLEBROOK ROAD EB	420	498	-18%	No	3.61838	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	785	816	-4%	Yes	1.10442	Yes
FROM I-270 NB TO MD 118 EB	439	378	14%	No	3.03093	Yes
FROM I-270 NB TO MD 118 WB	596	688	-15%	No	3.61192	Yes
FROM MD 118 TO I-270 NB	548	484	12%	No	2.82879	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1364	1804	-32%	No	11.0437	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	271	234	14%	No	2.32847	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	208	191	8%	Yes	1.22167	Yes
FROM I-270 NB TO MD 121	703	808	-15%	No	3.80251	Yes
FROM MD 121 TO I-270 NB	227	261	-15%	No	2.19207	Yes
FROM I-270 NB TO MD 109	207	222	-7%	Yes	1.02418	Yes
FROM MD 109 TO I-270 NB	148	111	25%	No	3.25137	Yes
FROM I-270 NB TO MD 80	522	609	-17%	No	3.6585	Yes
FROM MD 80 TO I-270 NB	566	496	12%	No	3.06016	Yes
FROM I-270 NB TO MD 85 NB	318	346	-9%	Yes	1.52327	Yes
FROM I-270 NB TO MD 85 SB	161	412	-156%	No	14.8174	No
FROM MD 85 TO I-270 NB	1568	1511	4%	Yes	1.46559	Yes

Figure A.135: I-270 NB Ramp 4-5 PM Volumes

Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	798	769	4%	Yes	1.02703	Yes
FROM I-270 SB TO MD 85 NB	218	546	-150%	No	16.7618	No
FROM MD 85 TO I-270 SB	268	585	-118%	No	15.33	No
FROM I-270 SB TO MD 80	483	461	5%	Yes	1.01263	Yes
FROM MD 80 TO I-270 SB	336	259	23%	No	4.44881	Yes
FROM I-270 SB TO MD 109	75	64	15%	No	1.31947	Yes
FROM MD 109 TO I-270 SB	193	142	27%	No	3.9614	Yes
FROM I-270 SB TO MD 121	307	206	33%	No	6.3235	No
FROM MD 121 TO I-270 SB	573	628	-10%	Yes	2.24443	Yes
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	437	398	9%	Yes	1.92122	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	565	520	8%	Yes	1.94298	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	129	240	-86%	No	8.18757	No
FROM I-270 SB TO MD 118	479	325	32%	No	7.68082	No
FROM MD 118 WB TO I-270 SB	432	363	16%	No	3.46083	Yes
FROM MD 118 EB TO I-270 SB	663	592	11%	No	2.85487	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	1136	949	16%	No	5.79167	No
FROM I-270 SB TO MD 124	1023	924	10%	Yes	3.17298	Yes
FROM MD 124 TO I-270 SB	1409	1250	11%	No	4.37479	Yes
FROM MD 117 TO I-270 SB	1901	1480	22%	No	10.2523	No
FROM I-270 SB TO I-370 WB	759	552	27%	No	8.07454	No
FROM I-270 SB TO I-370 EB	2025	1604	21%	No	9.89576	No
FROM I-370 TO I-270 SB	1579	1691	-7%	Yes	2.76379	Yes
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	547	326	40%	No	10.5779	No
FROM SHADY GROVE ROAD WB TO I-270 SB	575	711	-24%	No	5.35398	No
FROM SHADY GROVE ROAD EB TO I-270 SB	599	607	-1%	Yes	0.30549	Yes
FROM I-270 SB TO MD 28	605	614	-1%	Yes	0.35446	Yes
FROM MD 28 WB TO I-270 SB	224	275	-23%	No	3.21373	Yes
FROM MD 28 EB TO I-270 SB	1400	1117	20%	No	7.99226	No
FROM I-270 SB TO MD 189	972	881	9%	Yes	3.00647	Yes
FROM MD 189 TO I-270 SB	585	624	-7%	Yes	1.56622	Yes
FROM I-270 SB TO MONTROSE ROAD WB	209	344	-64%	No	8.10549	No
FROM MONTROSE ROAD WB TO I-270 SB	624	690	-11%	No	2.58441	Yes
FROM I-270 SB TO MONTROSE ROAD EB	959	850	11%	No	3.63285	Yes
FROM MONTROSE ROAD EB TO I-270 SB	450	443	2%	Yes	0.34315	Yes
FROM I-270 SB TO I-270 SB SPUR	2462	3377	-37%	No	16.93	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	759	791	-4%	Yes	1.1317	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 SB	416	395	5%	Yes	1.05543	Yes
FROM MD 187 TO I-270 SB	378	370	2%	Yes	0.42667	Yes
FROM I-270 SB TO MD 355 SB	746	731	2%	Yes	0.54273	Yes
FROM I-270 SB TO I-495 EB	3299	2874	13%	No	7.6499	No

Figure A.136: I-270 SB Ramp 5-6 PM Volumes

Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	3101	3274	-6%	Yes	3.05549	Yes
FROM MD 355 NB TO I-270 NB	1208	1119	7%	Yes	2.6092	Yes
FROM I-270 NB TO MD 187	319	270	16%	No	2.88567	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	203	234	-15%	No	2.06454	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	2997	1206	60%	No	39.0821	No
FROM I-270 NB SPUR TO I-270 NB	5465	3975	27%	No	21.6878	No
FROM I-270 NB TO MONTROSE ROAD	319	1010	-217%	No	26.7987	No
FROM MONTROSE ROAD EB TO I-270 NB	271	330	-22%	No	3.37609	Yes
FROM I-270 NB TO MONTROSE ROAD WB	254	326	-28%	No	4.24175	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	1384	1211	13%	No	4.81712	Yes
FROM I-270 NB TO MD 189	629	700	-11%	No	2.7543	Yes
FROM MD 189 TO I-270 NB	1007	865	14%	No	4.63293	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	364	271	26%	No	5.24941	No
FROM MD 28 EB TO I-270 NB	123	141	-14%	No	1.54567	Yes
FROM I-270 NB TO MD 28 WB	607	1075	-77%	No	16.1231	No
FROM MD 28 WB TO I-270 NB	707	580	18%	No	4.9961	Yes
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	2327	1539	34%	No	17.9292	No
FROM SHADY GROVE ROAD EB TO I-270 NB	519	632	-22%	No	4.72029	Yes
FROM SHADY GROVE ROAD WB TO I-270 NB	699	775	-11%	No	2.78155	Yes
FROM I-270 NB TO I-370	2181	2240	-3%	Yes	1.24961	Yes
FROM I-370 EB TO I-270 NB	990	714	28%	No	9.4556	No
FROM I-370 WB TO I-270 NB	1583	1444	9%	Yes	3.56635	Yes
FROM I-270 NB TO MD 117	1396	1416	-1%	Yes	0.54002	Yes
FROM I-270 NB TO MD 124 EB	1798	1670	7%	Yes	3.07387	Yes
FROM MD 124 EB TO I-270 NB	427	524	-23%	No	4.4592	Yes
FROM MD 124 WB TO I-270 NB	344	421	-22%	No	3.9128	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	419	478	-14%	No	2.77452	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	796	824	-3%	Yes	0.97511	Yes
FROM I-270 NB TO MD 118 EB	401	389	3%	Yes	0.61646	Yes
FROM I-270 NB TO MD 118 WB	646	682	-6%	Yes	1.40664	Yes
FROM MD 118 TO I-270 NB	593	490	17%	No	4.42627	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1460	1795	-23%	No	8.29806	No
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	306	230	25%	No	4.67516	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	242	195	20%	No	3.21526	Yes
FROM I-270 NB TO MD 121	786	815	-4%	Yes	1.00747	Yes
FROM MD 121 TO I-270 NB	205	254	-24%	No	3.23448	Yes
FROM I-270 NB TO MD 109	254	226	11%	No	1.824	Yes
FROM MD 109 TO I-270 NB	132	119	10%	Yes	1.13755	Yes
FROM I-270 NB TO MD 80	596	614	-3%	Yes	0.72171	Yes
FROM MD 80 TO I-270 NB	527	522	1%	Yes	0.21832	Yes
FROM I-270 NB TO MD 85 NB	309	351	-14%	No	2.2987	Yes
FROM I-270 NB TO MD 85 SB	193	401	-108%	No	12.0694	No
FROM MD 85 TO I-270 NB	1624	1533	6%	Yes	2.30321	Yes

Figure A.137: I-270 NB Ramp 5-6 PM Volumes

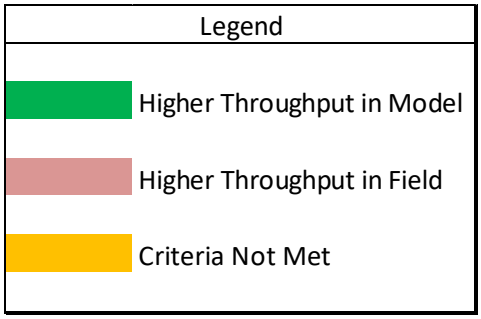
Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 SB				Calibration not met		
FROM I-270 SB TO MD 85 SB	630	747	-19%	No	4.45896	Yes
FROM I-270 SB TO MD 85 NB	225	539	-140%	No	16.0656	No
FROM MD 85 TO I-270 SB	255	559	-119%	No	15.0788	No
FROM I-270 SB TO MD 80	375	461	-23%	No	4.21799	Yes
FROM MD 80 TO I-270 SB	237	253	-7%	Yes	1.0222	Yes
FROM I-270 SB TO MD 109	55	62	-13%	No	0.94688	Yes
FROM MD 109 TO I-270 SB	153	147	4%	Yes	0.4899	Yes
FROM I-270 SB TO MD 121	199	209	-5%	Yes	0.70014	Yes
FROM MD 121 TO I-270 SB	413	660	-60%	No	10.6638	No
FROM I-270 SB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	332	396	-19%	No	3.34198	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 SB	514	553	-8%	Yes	1.69911	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 SB	102	231	-126%	No	9.96603	No
FROM I-270 SB TO MD 118	348	323	7%	Yes	1.35098	Yes
FROM MD 118 WB TO I-270 SB	299	345	-15%	No	2.55004	Yes
FROM MD 118 EB TO I-270 SB	481	564	-17%	No	3.62057	Yes
FROM MIDDLEBROOK ROAD TO I-270 SB	901	946	-5%	Yes	1.47267	Yes
FROM I-270 SB TO MD 124	869	875	-1%	Yes	0.20319	Yes
FROM MD 124 TO I-270 SB	1097	1220	-11%	No	3.61374	Yes
FROM MD 117 TO I-270 SB	1337	1474	-10%	No	3.66081	Yes
FROM I-270 SB TO I-370 WB	570	560	2%	Yes	0.43127	Yes
FROM I-270 SB TO I-370 EB	1458	1632	-12%	No	4.43293	Yes
FROM I-370 TO I-270 SB	1401	1697	-21%	No	7.51479	No
FROM I-270 SB TO SHADY GROVE ROAD/FIELDS ROAD/OMEGA DRIVE	460	333	28%	No	6.39153	No
FROM SHADY GROVE ROAD WB TO I-270 SB	461	723	-57%	No	10.7499	No
FROM SHADY GROVE ROAD EB TO I-270 SB	363	613	-69%	No	11.2972	No
FROM I-270 SB TO MD 28	502	586	-17%	No	3.60147	Yes
FROM MD 28 WB TO I-270 SB	210	265	-26%	No	3.58415	Yes
FROM MD 28 EB TO I-270 SB	1213	1113	8%	Yes	2.9398	Yes
FROM I-270 SB TO MD 189	765	899	-18%	No	4.65393	Yes
FROM MD 189 TO I-270 SB	524	585	-12%	No	2.58015	Yes
FROM I-270 SB TO MONTROSE ROAD WB	167	357	-114%	No	11.7382	No
FROM MONTROSE ROAD WB TO I-270 SB	545	731	-34%	No	7.36381	No
FROM I-270 SB TO MONTROSE ROAD EB	775	864	-11%	No	3.09197	Yes
FROM MONTROSE ROAD EB TO I-270 SB	396	455	-15%	No	2.86024	Yes
FROM I-270 SB TO I-270 SB SPUR	2238	3460	-55%	No	22.8984	No
FROM I-270 SB TO ROCKLEDGE BOULEVARD/MD 187	531	797	-50%	No	10.3228	No
FROM ROCKLEDGE BOULEVARD TO I-270 SB	295	396	-34%	No	5.40878	No
FROM MD 187 TO I-270 SB	319	373	-17%	No	2.89014	Yes
FROM I-270 SB TO MD 355 SB	938	717	24%	No	7.70115	No
FROM I-270 SB TO I-495 EB	2714	2753	-1%	Yes	0.74118	Yes

Figure A.138: I-270 SB Ramp 6-7 PM Volumes

Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 NB				Calibration not met		
FROM I-495 WB TO I-270 NB	3043	3175	-4%	Yes	2.36736	Yes
FROM MD 355 NB TO I-270 NB	1087	1114	-2%	Yes	0.80641	Yes
FROM I-270 NB TO MD 187	365	278	24%	No	4.83721	Yes
FROM I-270 NB TO ROCKLEDGE BOULEVARD	182	248	-36%	No	4.46966	Yes
FROM ROCKLEDGE BOULEVARD TO I-270 NB	2564	1205	53%	No	31.3124	No
FROM I-270 NB SPUR TO I-270 NB	5389	3926	27%	No	21.4411	No
FROM I-270 NB TO MONTROSE ROAD	336	989	-194%	No	25.3773	No
FROM MONTROSE ROAD EB TO I-270 NB	254	338	-33%	No	4.8959	Yes
FROM I-270 NB TO MONTROSE ROAD WB	269	311	-16%	No	2.46632	Yes
FROM MONTROSE ROAD/TOWER OAKS BOULEVARD TO I-270 NB	1216	1268	-4%	Yes	1.48253	Yes
FROM I-270 NB TO MD 189	706	708	0%	Yes	0.07522	Yes
FROM MD 189 TO I-270 NB	874	818	6%	Yes	1.92532	Yes
FROM I-270 NB TO MD 28 EB/NELSON STREET	374	294	21%	No	4.36291	Yes
FROM MD 28 EB TO I-270 NB	72	128	-77%	No	5.57849	No
FROM I-270 NB TO MD 28 WB	504	1035	-105%	No	19.1496	No
FROM MD 28 WB TO I-270 NB	584	577	1%	Yes	0.30094	Yes
FROM I-270 NB TO SHADY GROVE ROAD/REDLAND BOULEVARD	1953	1520	22%	No	10.4036	No
FROM SHADY GROVE ROAD EB TO I-270 NB	346	622	-80%	No	12.526	No
FROM SHADY GROVE ROAD WB TO I-270 NB	516	759	-47%	No	9.62423	No
FROM I-270 NB TO I-370	2184	2221	-2%	Yes	0.78309	Yes
FROM I-370 EB TO I-270 NB	731	715	2%	Yes	0.61375	Yes
FROM I-370 WB TO I-270 NB	1492	1483	1%	Yes	0.23985	Yes
FROM I-270 NB TO MD 117	1339	1439	-7%	Yes	2.67	Yes
FROM I-270 NB TO MD 124 EB	1719	1710	1%	Yes	0.21736	Yes
FROM MD 124 EB TO I-270 NB	389	526	-35%	No	6.38345	No
FROM MD 124 WB TO I-270 NB	376	438	-16%	No	3.07323	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD EB	496	480	3%	Yes	0.72429	Yes
FROM I-270 NB TO MIDDLEBROOK ROAD WB	888	834	6%	Yes	1.85762	Yes
FROM I-270 NB TO MD 118 EB	343	381	-11%	No	1.97164	Yes
FROM I-270 NB TO MD 118 WB	702	680	3%	Yes	0.84651	Yes
FROM MD 118 TO I-270 NB	501	529	-6%	Yes	1.22296	Yes
FROM I-270 NB TO FATHER HURLEY BOULEVARD/RIDGE ROAD	1614	1784	-11%	No	4.12432	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD EB TO I-270 NB	203	235	-16%	No	2.12979	Yes
FROM FATHER HURLEY BOULEVARD/RIDGE ROAD WB TO I-270 NB	168	195	-16%	No	1.96837	Yes
FROM I-270 NB TO MD 121	740	807	-9%	Yes	2.40025	Yes
FROM MD 121 TO I-270 NB	150	270	-80%	No	8.29557	No
FROM I-270 NB TO MD 109	295	227	23%	No	4.20909	Yes
FROM MD 109 TO I-270 NB	93	108	-16%	No	1.49626	Yes
FROM I-270 NB TO MD 80	542	577	-6%	Yes	1.46928	Yes
FROM MD 80 TO I-270 NB	451	503	-12%	No	2.38092	Yes
FROM I-270 NB TO MD 85 NB	323	345	-7%	Yes	1.19033	Yes
FROM I-270 NB TO MD 85 SB	180	420	-133%	No	13.8449	No
FROM MD 85 TO I-270 NB	1419	1499	-6%	Yes	2.10087	Yes

Figure A.139: I-270 NB Ramp 6-7 PM Volumes

I-270 Spur Ramp Volume Tables



Segment	6-7 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	4308	5197	-21%	No	12.899	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	103	61	41%	No	4.70051	Yes
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	309	519	-68%	No	10.3102	No
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	242	364	-50%	No	7.00872	No
FROM I-270 SB SPUR TO I-495 WB	4988	5264	-6%	Yes	3.84807	Yes
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	2363	3779	-60%	No	25.5559	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	522	214	59%	No	16.0399	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	34	129	-278%	No	10.4838	No
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	69	239	-246%	No	13.6844	No
FROM WESTLAKE TERRACE TO I-270 NB SPUR	47	118	-151%	No	7.81684	No
FROM I-270 NB TO MD 85 SB	2049	3840	-87%	No	33.0058	No

Figure A.140: I-270 Spur Ramp 6-7 AM Volumes

Segment	7-8 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	4252	5209	-22%	No	13.9073	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	140	70	50%	No	6.8883	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	530	529	0%	Yes	0.03259	Yes
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	475	367	23%	No	5.2636	No
FROM I-270 SB SPUR TO I-495 WB	4926	5265	-7%	Yes	4.74905	Yes
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	3938	3798	4%	Yes	2.24699	Yes
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	986	218	78%	No	31.2879	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	106	112	-6%	Yes	0.5983	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	214	228	-7%	Yes	0.95829	Yes
FROM WESTLAKE TERRACE TO I-270 NB SPUR	78	109	-40%	No	3.22964	Yes
FROM I-270 NB TO MD 85 SB	3492	3875	-11%	No	6.31458	No

Figure A.141: I-270 Spur Ramp 7-8 AM Volumes

Segment	8-9 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	4028	5255	-30%	No	18.0101	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	226	68	70%	No	13.0578	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	657	545	17%	No	4.57925	Yes
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	512	388	24%	No	5.85801	No
FROM I-270 SB SPUR TO I-495 WB	4434	5412	-22%	No	13.9421	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	5155	3754	27%	No	20.9993	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	1192	213	82%	No	36.9495	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	176	127	28%	No	3.95903	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	344	229	33%	No	6.77791	No
FROM WESTLAKE TERRACE TO I-270 NB SPUR	135	120	11%	No	1.35123	Yes
FROM I-270 NB TO MD 85 SB	4478	3838	14%	No	9.92516	No

Figure A.142: I-270 Spur Ramp 8-9 AM Volumes

Segment	9-10 AM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference <10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	4028	5024	-25%	No	14.8083	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	396	70	82%	No	21.3791	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	584	516	12%	No	2.89953	Yes
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	397	338	15%	No	3.06412	Yes
FROM I-270 SB SPUR TO I-495 WB	4495	5183	-15%	No	9.88686	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	4868	3834	21%	No	15.6757	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	1073	222	79%	No	33.4303	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	177	117	34%	No	4.97145	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	312	229	27%	No	5.04655	No
FROM WESTLAKE TERRACE TO I-270 NB SPUR	176	117	33%	No	4.85181	Yes
FROM I-270 NB TO MD 85 SB	4403	3892	12%	No	7.93465	No

Figure A.143: I-270 Spur Ramp 9-10 AM Volumes

Segment	3-4 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	3524	3349	5%	Yes	2.99388	Yes
FROM I-270 SB SPUR TO WESTLAKE TERRACE	106	32	70%	No	8.90855	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	651	794	-22%	No	5.32007	No
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	611	576	6%	Yes	1.42626	Yes
FROM I-270 SB SPUR TO I-495 WB	4003	3272	18%	No	12.1291	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	5298	4870	8%	Yes	6.00262	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	444	481	-8%	Yes	1.69767	Yes
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	317	256	19%	No	3.63498	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	622	715	-15%	No	3.60626	Yes
FROM WESTLAKE TERRACE TO I-270 NB SPUR	425	644	-51%	No	9.46292	No
FROM I-270 NB TO MD 85 SB	5997	5941	1%	Yes	0.73132	Yes

Figure A.144: I-270 Spur Ramp 3-4 PM Volumes

Segment	4-5 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	2965	3382	-14%	No	7.40659	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	116	39	66%	No	8.74661	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	895	810	10%	Yes	2.91997	Yes
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	667	519	22%	No	6.06673	No
FROM I-270 SB SPUR TO I-495 WB	2833	3295	-16%	No	8.34637	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	4296	4827	-12%	No	7.85854	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	343	500	-46%	No	7.63613	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	281	242	14%	No	2.3957	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	896	699	22%	No	6.96651	No
FROM WESTLAKE TERRACE TO I-270 NB SPUR	565	635	-12%	No	2.85774	Yes
FROM I-270 NB TO MD 85 SB	5389	5917	-10%	Yes	7.02579	No

Figure A.145: I-270 Spur Ramp 4-5 PM Volumes

Segment	5-6 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	2462	3377	-37%	No	16.93	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	123	31	75%	No	10.5585	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	1061	775	27%	No	9.43051	No
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	633	565	11%	No	2.7784	Yes
FROM I-270 SB SPUR TO I-495 WB	2217	3293	-49%	No	20.4999	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	4009	4752	-19%	No	11.2224	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	357	485	-36%	No	6.23834	No
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	253	250	1%	Yes	0.20499	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	938	727	22%	No	7.31291	No
FROM WESTLAKE TERRACE TO I-270 NB SPUR	663	638	4%	Yes	0.97031	Yes
FROM I-270 NB TO MD 85 SB	5465	5867	-7%	Yes	5.34383	No

Figure A.146: I-270 Spur Ramp 5-6 PM Volumes

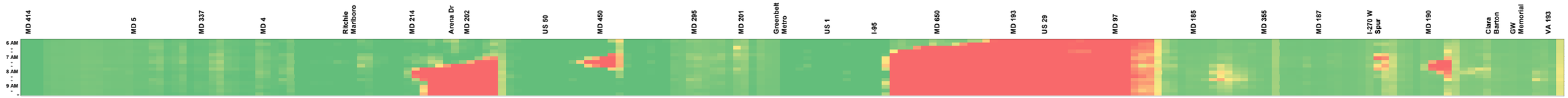
Segment	6-7 PM					
	Count Volume (vehicles)	Simulated Volume (vehicles)	Difference (%)	Difference < 10%?	GEH	GEH <5?
I-270 Spur SB				Calibration not met		
I-270 SB TO I-270 SB SPUR	2238	3460	-55%	No	22.8984	No
FROM I-270 SB SPUR TO WESTLAKE TERRACE	106	34	68%	No	8.56812	No
FROM I-270 SB SPUR TO DEMOCRACY BOULEVARD	752	821	-9%	Yes	2.45165	Yes
FROM DEMOCRACY BOULEVARD TO I-270 SB SPUR	502	508	-1%	Yes	0.24481	Yes
FROM I-270 SB SPUR TO I-495 WB	2155	3219	-49%	No	20.5175	No
I-270 Spur NB				Calibration not met		
FROM I-495 EB TO I-270 NB SPUR	4367	4798	-10%	Yes	6.37048	No
FROM I-270 NB SPUR TO DEMOCRACY BOULEVARD	453	486	-7%	Yes	1.52299	Yes
FROM DEMOCRACY BOULEVARD EB TO I-270 NB SPUR	266	250	6%	Yes	0.99612	Yes
FROM DEMOCRACY BOULEVARD WB TO I-270 SPUR	621	705	-13%	No	3.24348	Yes
FROM WESTLAKE TERRACE TO I-270 NB SPUR	513	632	-23%	No	4.95365	Yes
FROM I-270 NB TO MD 85 SB	5389	5918	-10%	Yes	7.03553	No

Figure A.147p: I-270 Spur Ramp 6-7 PM Volumes

Appendix E:

Existing and Future Speeds and Travel Times

Existing AM - I-495 OL Speed Map



2040 No-Build AM - I-495 OL Speed Map



2040 Alt-5 AM - I-495 OL Speed Map



2040 Alt-8 AM - I-495 OL Speed Map



2040 Alt-9 AM - I-495 OL Speed Map



2040 Alt-10 AM - I-495 OL Speed Map

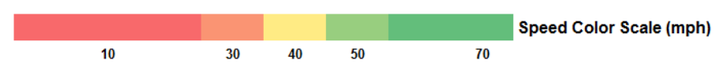


2040 Alt 13B AM - I-495 OL Speed Map

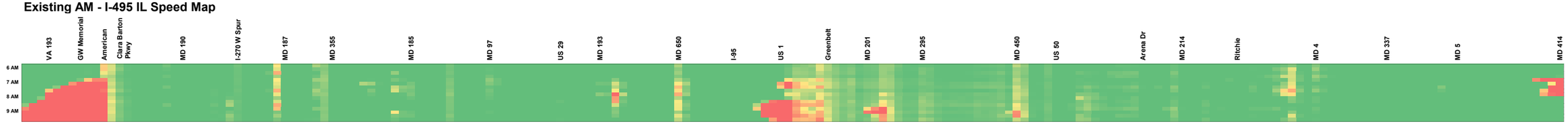


2040 Alt-13C AM - I-495 OL Speed Map





Existing AM - I-495 IL Speed Map



2040 No-Build AM - I-495 IL Speed Map



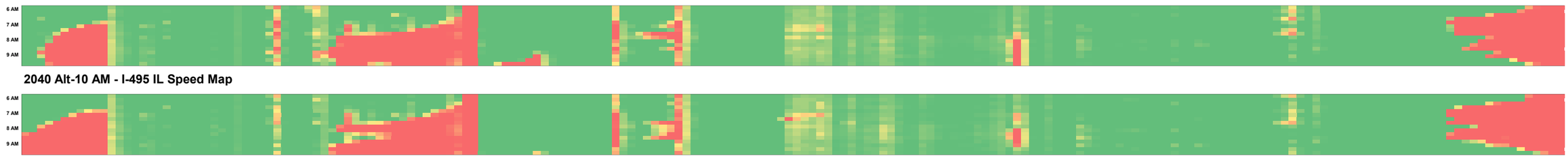
2040 Alt-5 AM - I-495 IL Speed Map



2040 Alt-8 AM - I-495 IL Speed Map



2040 Alt-9 AM - I-495 IL Speed Map



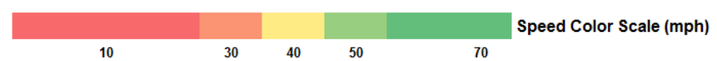
2040 Alt-10 AM - I-495 IL Speed Map

2040 Alt-13B AM - I-495 IL Speed Map



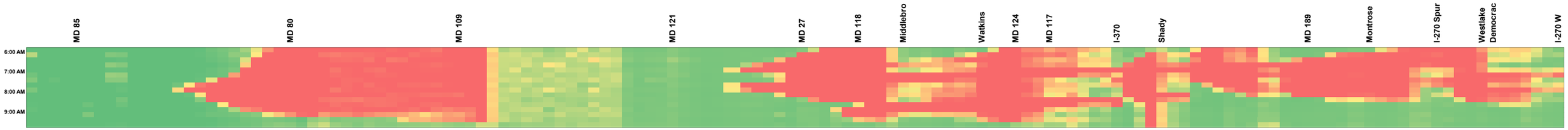
2040 Alt-13C AM - I-495 IL Speed Map





I-270 SB Speed AM

Existing AM - I-270 SB Speed Map



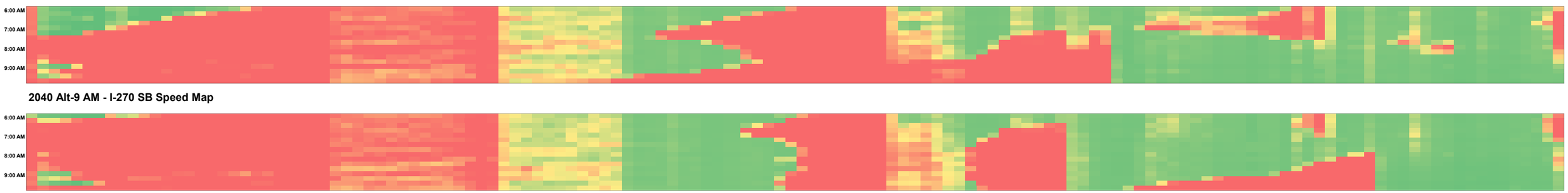
2040 No-Build AM - I-270 SB Speed Map



2040 Alt-5 AM - I-270 SB Speed Map



2040 Alt-8 AM - I-270 SB Speed Map



2040 Alt-9 AM - I-270 SB Speed Map

2040 Alt-10 AM - I-270 SB Speed Map



2040 Alt-13B AM - I-270 SB Speed Map

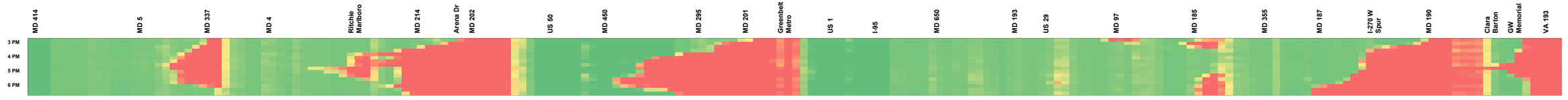


2040 Alt-13C AM - I-270 SB Speed Map





Existing PM - I-495 OL Speed Map



2040 No-Build PM - I-495 OL Speed Map



2040 Alt 5 PM - I-495 OL Speed Map



2040 Alt 8 PM - I-495 OL Speed Map



2040 Alt 9 PM - I-495 OL Speed Map



2040 Alt 10 PM - I-495 OL Speed Map

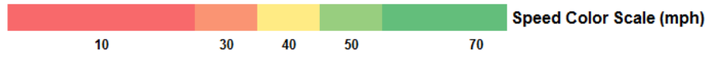


2040 Alt 13B PM - I-495 OL Speed Map

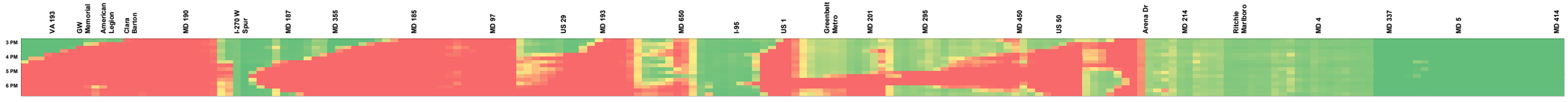


2040 Alt 13C PM - I-495 OL Speed Map





Existing PM - I-495 IL Speed Map



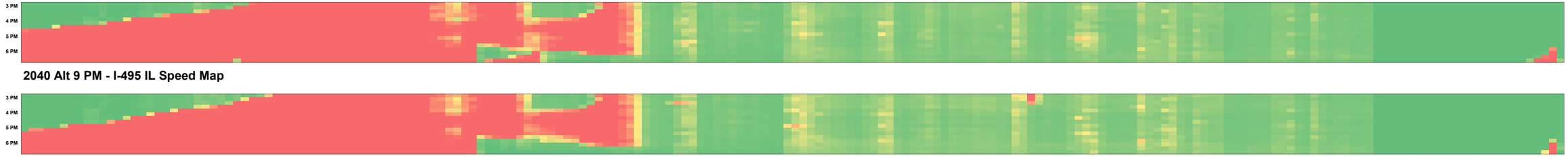
2040 No-Build PM - I-495 IL Speed Map



2040 Alt 5 PM - I-495 IL Speed Map



2040 Alt 8 PM - I-495 IL Speed Map



2040 Alt 9 PM - I-495 IL Speed Map



2040 Alt 10 PM - I-495 IL Speed Map



2040 Alt 13B PM - I-495 IL Speed Map

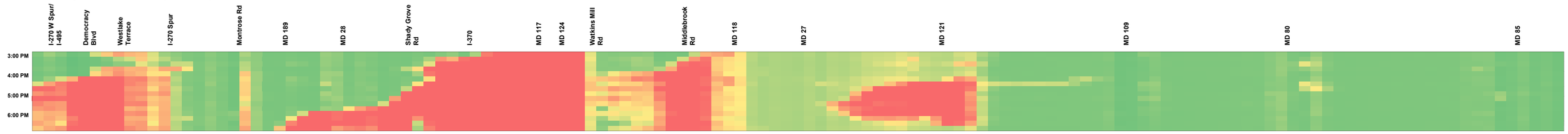


2040 Alt 13C PM - I-495 IL Speed Map



I-270 NB Speed PM

Existing PM - I-270 NB Speed Map



2040 No-Build PM - I-270 NB Speed Map



2040 Alt 5 PM - I-270 NB Speed Map



2040 Alt 8 PM - I-270 NB Speed Map



2040 Alt 9 PM - I-270 NB Speed Map



2040 Alt 10 PM - I-270 NB Speed Map



2040 Alt 13B PM - I-270 NB Speed Map

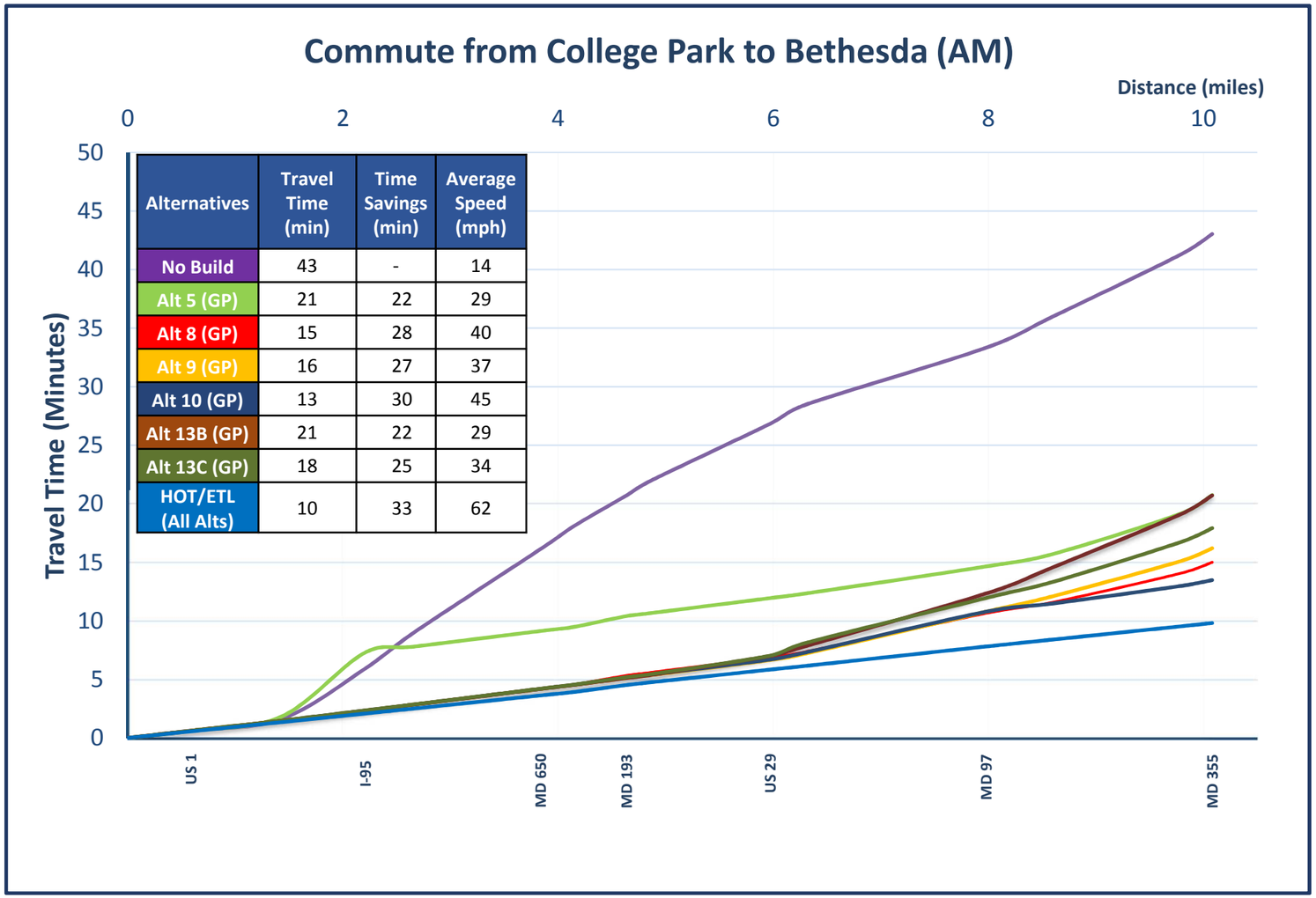


2040 Alt 13C PM - I-270 NB Speed Map



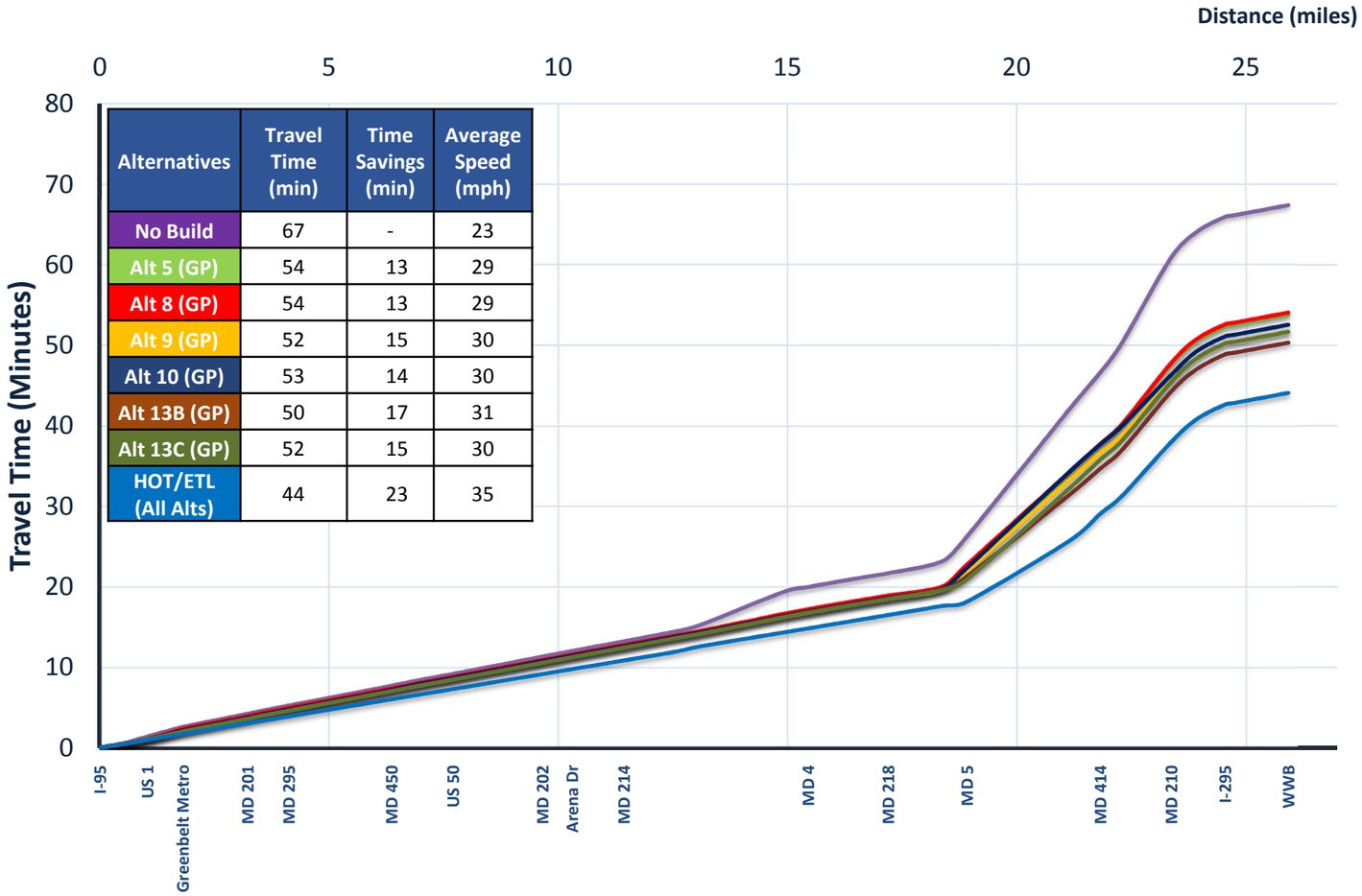
Commute from College Park to Bethesda (AM)

Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	43	-	14
Alt 5 (GP)	21	22	29
Alt 8 (GP)	15	28	40
Alt 9 (GP)	16	27	37
Alt 10 (GP)	13	30	45
Alt 13B (GP)	21	22	29
Alt 13C (GP)	18	25	34
HOT/ETL (All Alts)	10	33	62



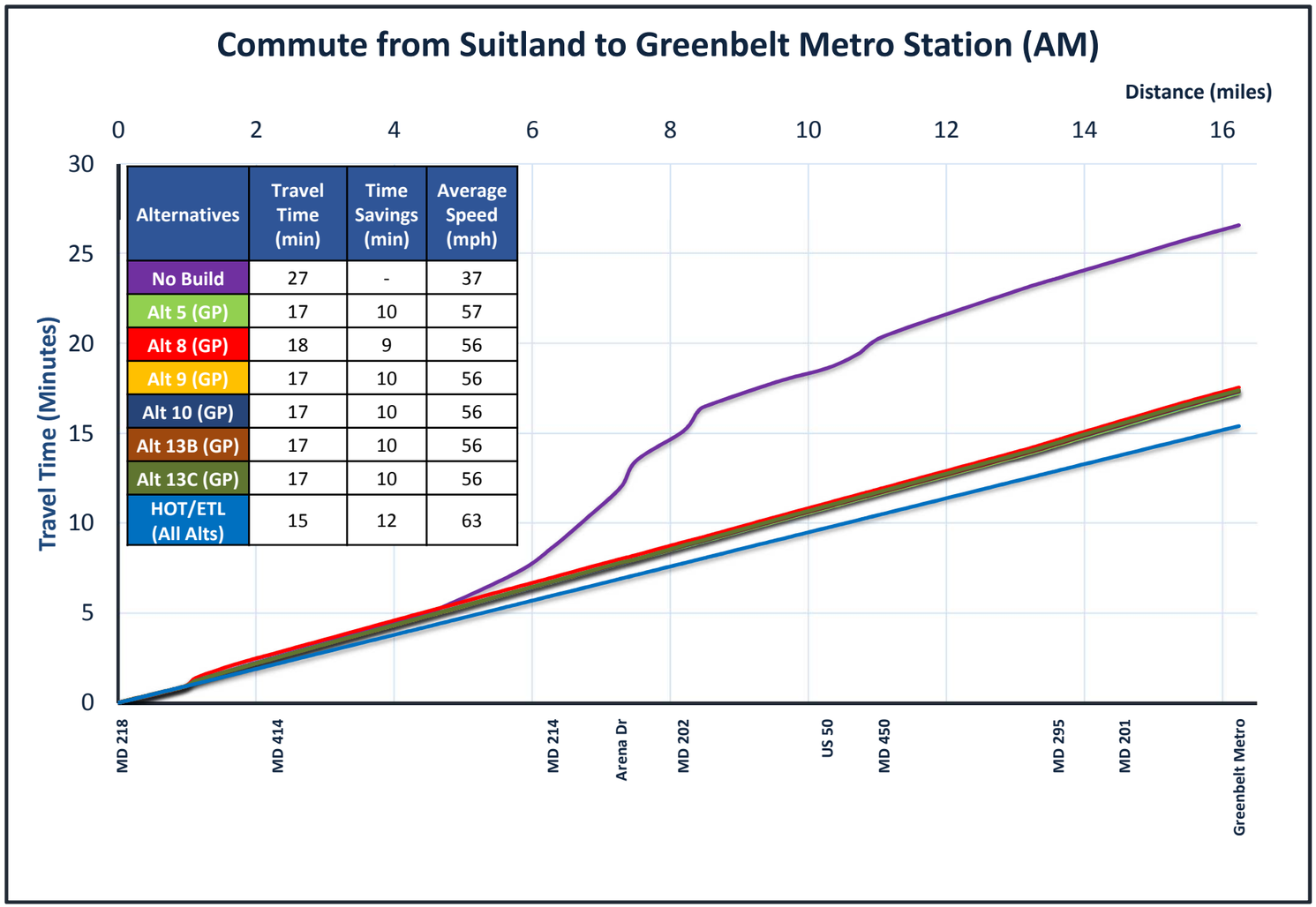
Commute from I-95 to Woodrow Wilson Bridge (AM)

Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	67	-	23
Alt 5 (GP)	54	13	29
Alt 8 (GP)	54	13	29
Alt 9 (GP)	52	15	30
Alt 10 (GP)	53	14	30
Alt 13B (GP)	50	17	31
Alt 13C (GP)	52	15	30
HOT/ETL (All Alts)	44	23	35



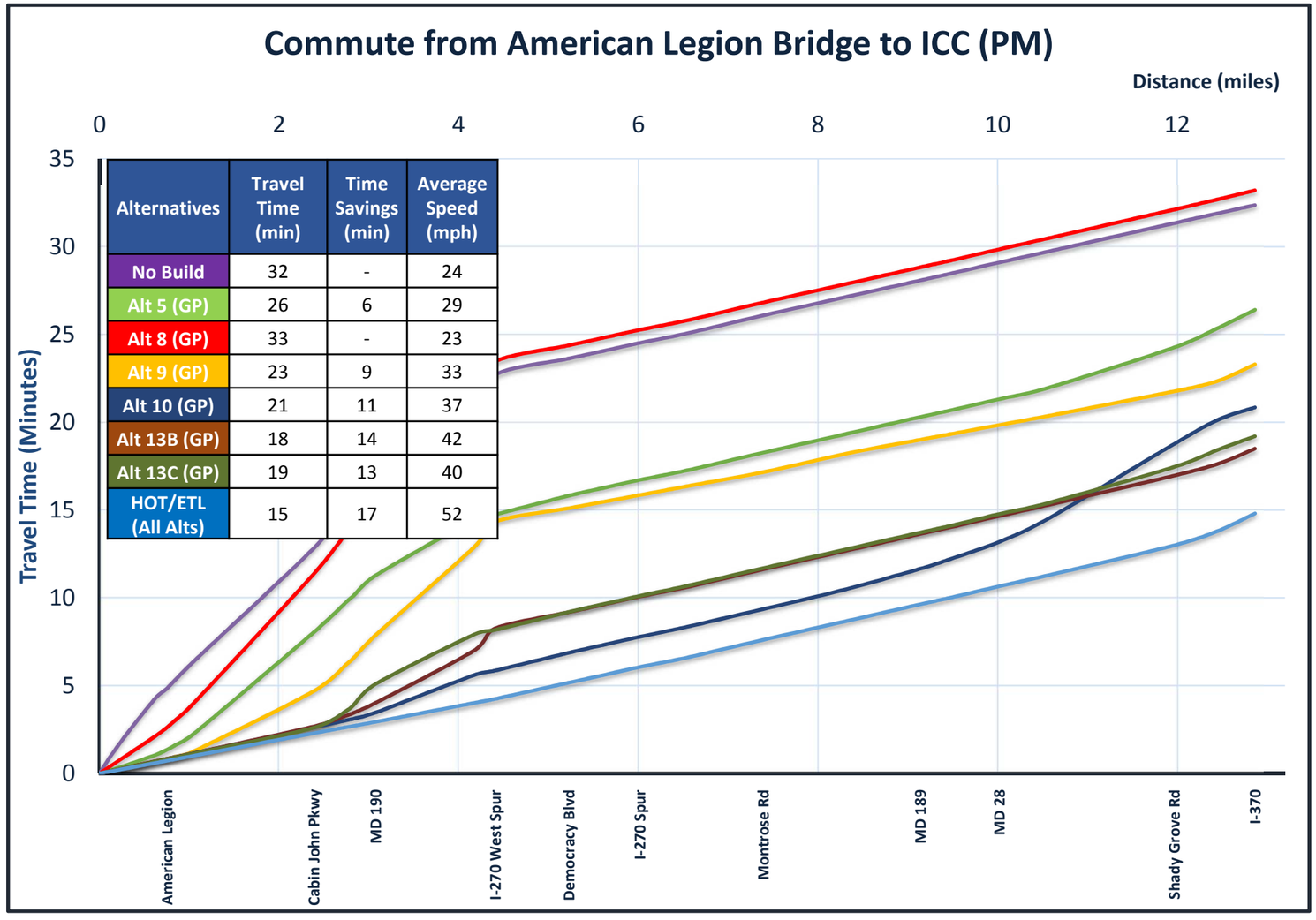
Commute from Suitland to Greenbelt Metro Station (AM)

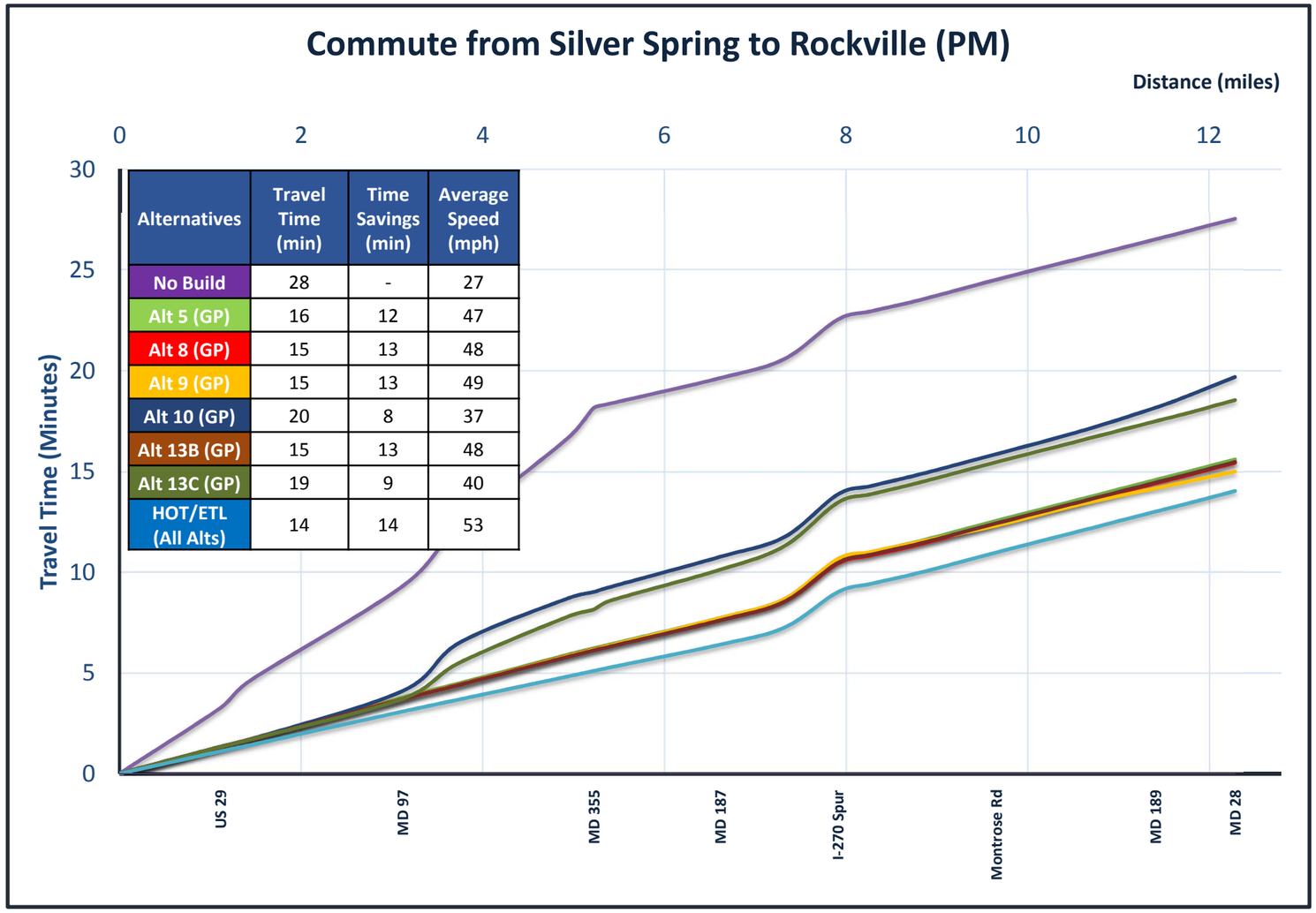
Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	27	-	37
Alt 5 (GP)	17	10	57
Alt 8 (GP)	18	9	56
Alt 9 (GP)	17	10	56
Alt 10 (GP)	17	10	56
Alt 13B (GP)	17	10	56
Alt 13C (GP)	17	10	56
HOT/ETL (All Alts)	15	12	63



Commute from American Legion Bridge to ICC (PM)

Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	32	-	24
Alt 5 (GP)	26	6	29
Alt 8 (GP)	33	-	23
Alt 9 (GP)	23	9	33
Alt 10 (GP)	21	11	37
Alt 13B (GP)	18	14	42
Alt 13C (GP)	19	13	40
HOT/ETL (All Alts)	15	17	52

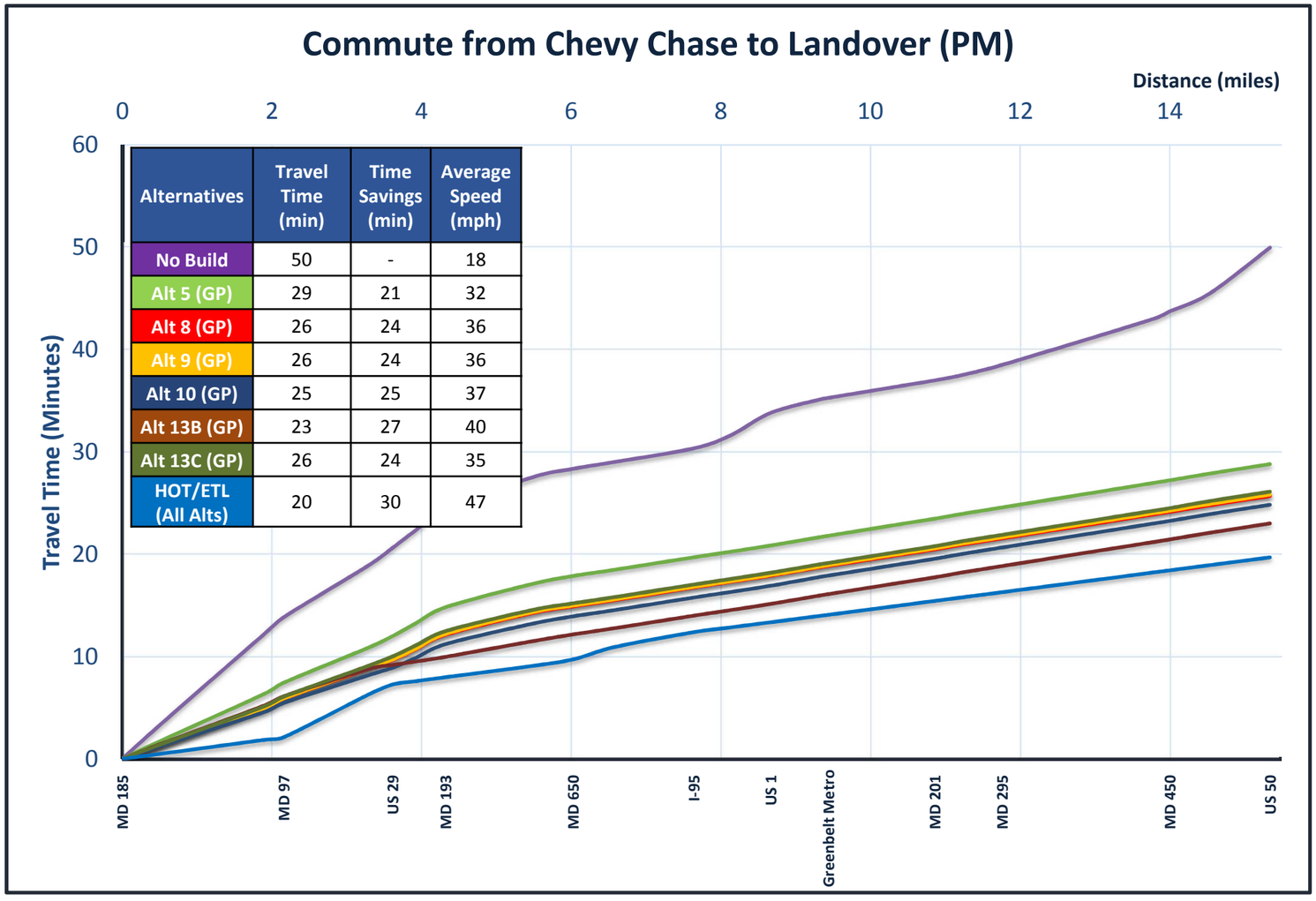




Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	28	-	27
Alt 5 (GP)	16	12	47
Alt 8 (GP)	15	13	48
Alt 9 (GP)	15	13	49
Alt 10 (GP)	20	8	37
Alt 13B (GP)	15	13	48
Alt 13C (GP)	19	9	40
HOT/ETL (All Alts)	14	14	53

Commute from Chevy Chase to Landover (PM)

Alternatives	Travel Time (min)	Time Savings (min)	Average Speed (mph)
No Build	50	-	18
Alt 5 (GP)	29	21	32
Alt 8 (GP)	26	24	36
Alt 9 (GP)	26	24	36
Alt 10 (GP)	25	25	37
Alt 13B (GP)	23	27	40
Alt 13C (GP)	26	24	35
HOT/ETL (All Alts)	20	30	47



Travel Time Matrix - Free Flow Condition

Unit: Minute

From	To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.2	4.3	5.5	7.1	7.9	8.4	7.5	8.4	14.8	13.6	12.9	11.3	10.7	9.2	N/A	10.0	10.4	12.1
Shady Grove Rd	I-270 Exit 8	1.0	0	2.2	3.3	4.5	6.1	6.9	7.4	6.6	7.4	13.8	12.6	11.9	10.3	9.7	8.2	N/A	9.0	9.4	11.1
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.1	2.1	0	1.1	2.3	3.9	4.7	5.2	4.4	5.2	11.6	10.4	9.7	8.1	7.5	6.0	N/A	6.8	7.2	8.9
MD 189 (Falls Rd)	I-270 Exit 5	4.1	3.1	1.0	0	1.2	2.8	3.6	4.1	3.3	4.1	10.5	9.3	8.6	7.0	6.4	4.9	N/A	5.7	6.1	7.8
Montrose Rd	I-270 Exit 4	5.5	4.5	2.4	1.4	0	1.5	2.4	2.9	2.0	2.9	9.2	8.1	7.4	5.7	5.2	3.7	N/A	4.5	4.9	6.5
Split	I-270	7.0	6.0	3.8	2.9	1.5	0	0.8	1.3	0.5	1.4	7.7	6.6	5.8	4.2	3.7	2.2	N/A	2.9	3.3	5.0
Westlake Terrace	I-270 W Spur	7.9	6.9	4.8	3.8	2.4	1.0	0	0.5	N/A	N/A	6.9	5.7	5.0	3.4	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	8.4	7.4	5.2	4.3	2.9	1.4	0.5	0	N/A	N/A	6.4	5.2	4.5	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.6	6.6	4.5	3.5	2.1	0.6	N/A	N/A	0	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.4	2.8	4.5
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.4	7.4	5.2	4.3	2.9	1.4	N/A	N/A	0.8	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6	2.0	3.7
VA 193 (Georgetown Pike)	I-495 Exit 44	15.1	14.1	12.0	11.0	9.6	8.2	7.2	6.7	N/A	N/A	0	1.3	2.1	4.0	4.4	5.9	7.9	8.7	9.1	10.8
George Washington Memorial Pkwy	I-495 Exit 43	13.8	12.8	10.6	9.7	8.3	6.8	5.8	5.4	N/A	N/A	1.2	0	0.8	2.7	3.0	4.5	6.6	7.3	7.7	9.4
Clara Barton Pkwy	I-495 Exit 41	13.0	12.0	9.8	8.9	7.5	6.0	5.1	4.6	N/A	N/A	1.9	0.7	0	1.9	2.2	3.7	5.8	6.5	6.9	8.6
Cabin John Pkwy	I-495 Exit 40	11.1	10.1	8.0	7.0	5.6	4.1	3.2	2.7	N/A	N/A	3.5	2.3	1.6	0	0.3	1.8	3.9	4.7	5.1	6.7
MD 190 (River Rd)	I-495 Exit 39	10.7	9.8	7.6	6.7	5.3	3.8	2.8	2.4	N/A	N/A	4.1	2.9	2.2	0.6	0	1.5	3.6	4.3	4.7	6.4
I-270 West Spur	I-495 Exit 38	9.3	8.3	6.1	5.2	3.8	2.3	1.3	0.9	N/A	N/A	5.5	4.4	3.7	2.0	1.5	0	2.1	2.8	3.2	4.9
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.4	6.3	5.6	3.9	3.4	1.9	0	0.8	1.2	2.9
I-270 East Spur	I-495 Exit 35	9.9	8.9	6.8	5.8	4.4	2.9	N/A	N/A	2.3	1.5	8.5	7.3	6.6	5.0	4.4	2.9	1.0	0	0.4	2.1
MD 355 (Rockville Pike)	I-495 Exit 34	10.2	9.2	7.0	6.1	4.7	3.2	N/A	N/A	2.6	1.8	8.7	7.6	6.9	5.2	4.7	3.2	1.3	0.3	0	1.7
MD 185 (Connecticut Ave)	I-495 Exit 33	11.8	10.8	8.6	7.7	6.3	4.8	N/A	N/A	4.2	3.4	10.3	9.2	8.5	6.8	6.3	4.8	2.9	1.9	1.6	0
MD 97 (Georgia Ave)	I-495 Exit 31	14.3	13.3	11.1	10.2	8.8	7.3	N/A	N/A	6.7	5.9	12.8	11.7	11.0	9.3	8.8	7.3	5.4	4.4	4.1	2.5
US 29 (Colesville Rd)	I-495 Exit 30	15.3	14.3	12.2	11.2	9.8	8.3	N/A	N/A	7.7	6.9	13.9	12.7	12.0	10.4	9.8	8.3	6.4	5.4	5.1	3.5
MD 193 (University Blvd E)	I-495 Exit 29	16.7	15.7	13.6	12.6	11.2	9.8	N/A	N/A	9.1	8.3	15.3	14.1	13.4	11.8	11.2	9.7	7.9	6.8	6.5	5.0
MD 650 (New Hampshire Ave)	I-495 Exit 28	19.0	18.0	15.8	14.9	13.5	12.0	N/A	N/A	11.4	10.6	17.5	16.4	15.7	14.0	13.5	12.0	10.1	9.1	8.8	7.2
I-95	I-495 Exit 27	20.0	19.0	16.9	15.9	14.5	13.1	N/A	N/A	12.4	11.7	18.6	17.4	16.7	15.1	14.5	13.1	11.2	10.1	9.9	8.3
US 1 (Baltimore Ave)	I-495 Exit 25	21.1	20.1	18.0	17.0	15.6	14.2	N/A	N/A	13.5	12.8	19.7	18.6	17.8	16.2	15.7	14.2	12.3	11.2	11.0	9.4
Greenbelt Metro Station	I-495 Exit 24	22.1	21.1	19.0	18.0	16.6	15.2	N/A	N/A	14.5	13.7	20.7	19.5	18.8	17.2	16.6	15.2	13.3	12.2	12.0	10.4
MD 201 (Kenilworth Ave)	I-495 Exit 23	23.5	22.5	20.4	19.4	18.0	16.6	N/A	N/A	15.9	15.1	22.1	20.9	20.2	18.6	18.0	16.5	14.6	13.6	13.3	11.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	24.6	23.6	21.4	20.5	19.1	17.6	N/A	N/A	17.0	16.2	23.1	22.0	21.3	19.6	19.1	17.6	15.7	14.7	14.4	12.8
MD 450 (Annapolis Rd)	I-495 Exit 20	27.3	26.3	24.2	23.2	21.8	20.4	N/A	N/A	19.7	18.9	25.9	24.7	24.0	22.4	21.8	20.3	18.5	17.4	17.1	15.6
US 50 (John Hanson Hwy)	I-495 Exit 19	29.0	28.0	25.8	24.9	23.5	22.0	N/A	N/A	21.4	20.6	27.5	26.4	25.7	24.0	23.5	22.0	20.1	19.1	18.8	17.2
MD 202 (Landover Rd)	I-495 Exit 17	31.2	30.2	28.1	27.1	25.7	24.3	N/A	N/A	23.6	22.9	29.8	28.6	27.9	26.3	25.7	24.3	22.4	21.3	21.1	19.5
Arena Dr	I-495 Exit 16	32.0	31.0	28.8	27.9	26.5	25.0	N/A	N/A	24.4	23.6	30.6	29.4	28.7	27.1	26.5	25.0	23.1	22.1	21.8	20.2
MD 214 (Central Ave)	I-495 Exit 15	33.1	32.1	30.0	29.0	27.6	26.1	N/A	N/A	25.5	24.7	31.7	30.5	29.8	28.2	27.6	26.1	24.2	23.2	22.9	21.3
Ritchie-Marlboro Rd	I-495 Exit 13	34.9	33.9	31.7	30.8	29.4	27.9	N/A	N/A	27.3	26.5	33.5	32.3	31.6	30.0	29.4	27.9	26.0	25.0	24.7	23.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	37.5	36.5	34.4	33.5	32.1	30.6	N/A	N/A	29.9	29.2	36.1	35.0	34.2	32.6	32.1	30.6	28.7	27.7	27.4	25.8
MD 337 (Suitland Pkwy)	I-495 Exit 9	38.9	37.9	35.7	34.8	33.4	31.9	N/A	N/A	31.3	30.5	37.5	36.3	35.6	34.0	33.4	31.9	30.0	29.0	28.7	27.1
MD 5 (Branch Ave)	I-495 Exit 7	41.0	40.0	37.9	36.9	35.5	34.1	N/A	N/A	33.4	32.6	39.6	38.4	37.7	36.1	35.5	34.0	32.2	31.1	30.8	29.3
MD 414 (St Barnabas Rd)	I-495 Exit 4	43.9	42.9	40.8	39.9	38.4	37.0	N/A	N/A	36.3	35.6	42.5	41.4	40.6	39.0	38.5	37.0	35.1	34.0	33.8	32.2

Unit: Minute

From	To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	14.4	16.0	16.8	18.6	20.4	21.5	22.4	23.9	24.9	27.3	28.8	30.9	31.6	32.9	34.7	37.2	38.5	40.7	43.5
Shady Grove Rd	I-270 Exit 8	13.4	15.0	15.8	17.7	19.4	20.5	21.4	22.9	23.9	26.3	27.8	29.9	30.6	31.9	33.7	36.2	37.5	39.7	42.5
MD 28 (W Montgomery Ave)	I-270 Exit 6	11.2	12.8	13.6	15.5	17.2	18.3	19.2	20.7	21.7	24.1	25.6	27.7	28.4	29.7	31.5	34.0	35.3	37.5	40.3
MD 189 (Falls Rd)	I-270 Exit 5	10.1	11.7	12.5	14.4	16.1	17.2	18.1	19.6	20.6	23.0	24.5	26.6	27.3	28.6	30.4	32.9	34.2	36.4	39.2
Montrose Rd	I-270 Exit 4	8.9	10.5	11.3	13.1	14.9	16.0	16.8	18.4	19.4	21.8	23.3	25.4	26.1	27.3	29.2	31.7	32.9	35.2	37.9
Split	I-270	7.4	9.0	9.7	11.6	13.3	14.5	15.3	16.8	17.8	20.3	21.7	23.9	24.6	25.8	27.6	30.2	31.4	33.7	36.4
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.9	8.5	9.2	11.1	12.9	14.0	14.8	16.4	17.3	19.8	21.2	23.4	24.1	25.3	27.1	29.7	30.9	33.2	35.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	6.0	7.6	8.4	10.2	12.0	13.1	14.0	15.5	16.5	18.9	20.4	22.5	23.2	24.5	26.3	28.8	30.1	32.3	35.1
VA 193 (Georgetown Pike)	I-495 Exit 44	13.1	14.7	15.5	17.3	19.1	20.2	21.1	22.6	23.6	26.0	27.5	29.6	30.3	31.6	33.4	35.9	37.2	39.4	42.2
George Washington Memorial Pkwy	I-495 Exit 43	11.8	13.4	14.1	16.0	17.7	18.9	19.7	21.3	22.2	24.7	26.1	28.3	29.0	30.2	32.0	34.6	35.8	38.1	40.8
Clara Barton Pkwy	I-495 Exit 41	11.0	12.6	13.3	15.2	17.0	18.1	18.9	20.5	21.4	23.9	25.3	27.5	28.2	29.4	31.2	33.8	35.0	37.3	40.0
Cabin John Pkwy	I-495 Exit 40	9.1	10.7	11.5	13.3	15.1	16.2	17.0	18.6	19.6	22.0	23.5	25.6	26.3	27.5	29.4	31.9	33.1	35.4	38.1
MD 190 (River Rd)	I-495 Exit 39	8.8	10.4	11.1	13.0	14.7	15.9	16.7	18.2	19.2	21.7	23.1	25.3	26.0	27.2	29.0	31.6	32.8	35.1	37.8
I-270 West Spur	I-495 Exit 38	7.3	8.9	9.6	11.5	13.2	14.4	15.2	16.7	17.7	20.2	21.6	23.8	24.5	25.7	27.5	30.1	31.3	33.6	36.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	5.2	6.8	7.6	9.4	11.2	12.3	13.1	14.7	15.7	18.1	19.6	21.7	22.4	23.6	25.5	28.0	29.2	31.5	34.2
I-270 East Spur	I-495 Exit 35	4.4	6.0	6.8	8.7	10.4	11.5	12.4	13.9	14.9	17.3	18.8	20.9	21.6	22.9	24.7	27.2	28.5	30.7	33.5
MD 355 (Rockville Pike)	I-495 Exit 34	4.0	5.6	6.4	8.3	10.0	11.1	12.0	13.5	14.5	16.9	18.4	20.5	21.2	22.5	24.3	26.8	28.1	30.3	33.1
MD 185 (Connecticut Ave)	I-495 Exit 33	2.4	3.9	4.7	6.6	8.3	9.4	10.3	11.8	12.8	15.3	16.7	18.8	19.5	20.8	22.6	25.2	26.4	28.6	31.4
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.6	2.4	4.2	6.0	7.1	7.9	9.5	10.5	12.9	14.4	16.5	17.2	18.4	20.3	22.8	24.0	26.3	29.0
US 29 (Colesville Rd)	I-495 Exit 30	1.6	0	0.8	2.6	4.4	5.5	6.3	7.9	8.9	11.3	12.8	14.9	15.6	16.8	18.7	21.2	22.4	24.7	27.4
MD 193 (University Blvd E)	I-495 Exit 29	3.0	0.8	0	1.9	3.6	4.7	5.6	7.1	8.1	10.5	12.0	14.1	14.8	16.1	17.9	20.4	21.7	23.9	26.7
MD 650 (New Hampshire Ave)	I-495 Exit 28	5.2	3.0	1.6	0	1.8	2.9	3.7	5.3	6.2	8.7	10.1	12.3	13.0	14.2	16.0	18.6	19.8	22.1	24.8
I-95	I-495 Exit 27	6.3	4.1	2.6	1.8	0	1.1	2.0	3.5	4.5	6.9	8.4	10.5	11.2	12.5	14.3	16.8	18.1	20.3	23.1
US 1 (Baltimore Ave)	I-495 Exit 25	7.4	5.2	3.7	2.9	1.1	0	0.8	2.4	3.4	5.8	7.3	9.4	10.1	11.3	13.2	15.7	16.9	19.2	21.9
Greenbelt Metro Station	I-495 Exit 24	8.4	6.2	4.7	3.9	2.1	1.0	0	1.5	2.5	5.0	6.4	8.6	9.3	10.5	12.3	14.9	16.1	18.4	21.1
MD 201 (Kenilworth Ave)	I-495 Exit 23	9.8	7.6	6.1	5.3	3.5	2.4	1.4	0	1.0	3.4	4.9	7.0	7.7	9.0	10.8	13.3	14.6	16.8	19.6
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	10.8	8.6	7.2	6.4	4.5	3.4	2.4	1.0	0	2.4	3.9	6.0	6.7	8.0	9.8	12.4	13.6	15.8	18.6
MD 450 (Annapolis Rd)	I-495 Exit 20	13.6	11.4	9.9	9.1	7.3	6.2	5.2	3.8	2.8	0	1.5	3.6	4.3	5.5	7.4	9.9	11.1	13.4	16.1
US 50 (John Hanson Hwy)	I-495 Exit 19	15.2	13.0	11.6	10.8	8.9	7.8	6.9	5.5	4.4	1.7	0	2.1	2.8	4.1	5.9	8.4	9.7	11.9	14.7
MD 202 (Landover Rd)	I-495 Exit 17	17.5	15.3	13.8	13.0	11.2	10.1	9.1	7.7	6.7	3.9	2.2	0	0.7	1.9	3.8	6.3	7.5	9.8	12.5
Arena Dr	I-495 Exit 16	18.2	16.1	14.6	13.8	12.0	10.8	9.9	8.5	7.4	4.7	3.0	0.8	0	1.2	3.1	5.6	6.8	9.1	11.8
MD 214 (Central Ave)	I-495 Exit 15	19.4	17.2	15.7	14.9	13.1	12.0	11.0	9.6	8.5	5.8	4.1	1.9	1.1	0	1.8	4.4	5.6	7.9	10.6
Ritchie-Marlboro Rd	I-495 Exit 13	21.1	19.0	17.5	16.7	14.9	13.7	12.8	11.4	10.3	7.6	5.9	3.7	2.9	1.8	0	2.5	3.8	6.0	8.8
MD 4 (Pennsylvania Ave)	I-495 Exit 11	23.8	21.6	20.2	19.3	17.5	16.4	15.4	14.0	13.0	10.2	8.6	6.3	5.6	4.4	2.7	0	1.2	3.5	6.2
MD 337 (Suitland Pkwy)	I-495 Exit 9	25.2	23.0	21.5	20.7	18.9	17.8	16.8	15.4	14.3	11.6	9.9	7.7	6.9	5.8	4.0	1.3	0	2.3	5.0
MD 5 (Branch Ave)	I-495 Exit 7	27.3	25.1	23.6	22.8	21.0	19.9	18.9	17.5	16.5	13.7	12.0	9.8	9.0	7.9	6.1	3.5	2.1	0	2.7
MD 414 (St Barnabas Rd)	I-495 Exit 4	30.2	28.0	26.6	25.7	23.9	22.8	21.8	20.4	19.4	16.6	15.0	12.7	12.0	10.8	9.1	6.4	5.1	2.9	0

Travel Time Matrix - Existing Condition (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	3.8	9.7	12.8	16.3	19.8	22.2	23.1	20.3	21.1	31.1	29.9	29.2	27.1	26.2	24.4	N/A	22.5	22.8	24.5
Shady Grove Rd	I-270 Exit 8	0.8	0	6.0	9.1	12.5	16.1	18.4	19.4	16.5	17.3	27.4	26.2	25.4	23.3	22.4	20.6	N/A	18.7	19.1	20.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.8	0	3.1	6.6	10.1	12.5	13.4	10.6	11.3	21.4	20.2	19.4	17.4	16.5	14.7	N/A	12.7	13.1	14.8
MD 189 (Falls Rd)	I-270 Exit 5	3.5	2.7	0.8	0	3.5	7.0	9.4	10.3	7.5	8.2	18.3	17.1	16.3	14.3	13.4	11.6	N/A	9.6	10.0	11.7
Montrose Rd	I-270 Exit 4	4.7	3.9	2.1	1.2	0	3.5	5.9	6.8	4.0	4.7	14.8	13.6	12.8	10.8	9.9	8.1	N/A	6.2	6.5	8.2
Split	I-270	6.0	5.2	3.3	2.5	1.3	0	2.4	3.3	0.5	1.2	11.3	10.1	9.3	7.3	6.4	4.6	N/A	2.6	3.0	4.7
Westlake Terrace	I-270 W Spur	6.9	6.0	4.2	3.3	2.1	0.8	0	0.9	N/A	N/A	8.9	7.7	7.0	4.9	4.0	2.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.3	6.4	4.6	3.7	2.5	1.2	0.4	0	N/A	N/A	8.0	6.8	6.0	4.0	3.1	1.3	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.6	5.8	3.9	3.1	1.9	0.6	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	2.5	4.2
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.3	6.4	4.6	3.7	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.8	3.4
VA 193 (Georgetown Pike)	I-495 Exit 44	16.2	15.4	13.5	12.7	11.5	10.2	9.3	9.0	N/A	N/A	0	2.9	4.5	6.3	6.7	8.1	10.2	11.0	11.4	13.0
George Washington Memorial Pkwy	I-495 Exit 43	13.3	12.5	10.6	9.8	8.6	7.3	6.4	6.1	N/A	N/A	1.2	0	1.6	3.4	3.8	5.2	7.3	8.1	8.5	10.1
Clara Barton Pkwy	I-495 Exit 41	11.7	10.9	9.0	8.2	7.0	5.7	4.8	4.5	N/A	N/A	2.0	0.8	0	1.8	2.2	3.6	5.7	6.5	6.9	8.5
Cabin John Pkwy	I-495 Exit 40	9.9	9.0	7.2	6.3	5.1	3.8	3.0	2.6	N/A	N/A	4.0	2.8	2.1	0	0.3	1.8	3.8	4.6	5.0	6.7
MD 190 (River Rd)	I-495 Exit 39	9.5	8.7	6.8	6.0	4.8	3.5	2.7	2.3	N/A	N/A	4.9	3.7	3.0	0.9	0	1.5	3.5	4.3	4.7	6.3
I-270 West Spur	I-495 Exit 38	8.1	7.2	5.4	4.6	3.3	2.0	1.2	0.8	N/A	N/A	6.7	5.5	4.8	2.7	1.8	0	2.0	2.8	3.2	4.9
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.7	7.5	6.7	4.7	3.8	2.0	0	0.8	1.2	2.8
I-270 East Spur	I-495 Exit 35	8.6	7.8	5.9	5.1	3.9	2.6	N/A	N/A	2.0	1.3	9.8	8.6	7.8	5.7	4.9	3.0	1.1	0	0.4	2.0
MD 355 (Rockville Pike)	I-495 Exit 34	8.9	8.1	6.2	5.4	4.2	2.9	N/A	N/A	2.3	1.6	10.1	8.9	8.1	6.1	5.2	3.3	1.4	0.3	0	1.6
MD 185 (Connecticut Ave)	I-495 Exit 33	10.6	9.8	7.9	7.1	5.9	4.6	N/A	N/A	4.0	3.4	11.8	10.6	9.8	7.8	6.9	5.1	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	14.3	13.5	11.7	10.8	9.6	8.3	N/A	N/A	7.7	7.1	15.5	14.3	13.5	11.5	10.6	8.8	6.8	5.7	5.4	3.7
US 29 (Colesville Rd)	I-495 Exit 30	17.5	16.7	14.8	14.0	12.8	11.5	N/A	N/A	10.9	10.2	18.7	17.5	16.7	14.6	13.7	11.9	10.0	8.9	8.6	6.9
MD 193 (University Blvd E)	I-495 Exit 29	19.9	19.1	17.3	16.4	15.2	13.9	N/A	N/A	13.3	12.7	21.1	19.9	19.1	17.1	16.2	14.4	12.4	11.3	11.0	9.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	29.3	28.5	26.7	25.8	24.6	23.3	N/A	N/A	22.7	22.1	30.5	29.3	28.5	26.5	25.6	23.8	21.8	20.7	20.4	18.7
I-95	I-495 Exit 27	32.5	31.6	29.8	28.9	27.7	26.4	N/A	N/A	25.9	25.2	33.6	32.4	31.7	29.6	28.7	26.9	24.9	23.9	23.5	21.8
US 1 (Baltimore Ave)	I-495 Exit 25	33.5	32.7	30.8	30.0	28.8	27.5	N/A	N/A	26.9	26.3	34.7	33.5	32.7	30.7	29.8	28.0	26.0	24.9	24.6	22.9
Greenbelt Metro Station	I-495 Exit 24	34.5	33.6	31.8	31.0	29.7	28.4	N/A	N/A	27.9	27.2	35.7	34.5	33.7	31.6	30.7	28.9	26.9	25.9	25.6	23.9
MD 201 (Kenilworth Ave)	I-495 Exit 23	35.9	35.1	33.2	32.4	31.2	29.9	N/A	N/A	29.3	28.6	37.1	35.9	35.1	33.0	32.1	30.3	28.4	27.3	27.0	25.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	37.0	36.2	34.3	33.5	32.3	31.0	N/A	N/A	30.4	29.8	38.2	37.0	36.2	34.2	33.3	31.5	29.5	28.4	28.1	26.4
MD 450 (Annapolis Rd)	I-495 Exit 20	40.2	39.3	37.5	36.6	35.4	34.1	N/A	N/A	33.6	32.9	41.3	40.1	39.4	37.3	36.4	34.6	32.6	31.6	31.3	29.5
US 50 (John Hanson Hwy)	I-495 Exit 19	42.1	41.3	39.5	38.6	37.4	36.1	N/A	N/A	35.5	34.9	43.3	42.1	41.3	39.3	38.4	36.6	34.6	33.5	33.2	31.5
MD 202 (Landover Rd)	I-495 Exit 17	45.5	44.6	42.8	41.9	40.7	39.4	N/A	N/A	38.9	38.2	46.6	45.4	44.7	42.6	41.7	39.9	37.9	36.9	36.5	34.8
Arena Dr	I-495 Exit 16	46.4	45.6	43.7	42.9	41.7	40.4	N/A	N/A	39.8	39.1	47.6	46.4	45.6	43.5	42.6	40.8	38.9	37.8	37.5	35.8
MD 214 (Central Ave)	I-495 Exit 15	47.6	46.7	44.9	44.0	42.8	41.5	N/A	N/A	41.0	40.3	48.7	47.5	46.8	44.7	43.8	42.0	40.0	39.0	38.6	36.9
Ritchie-Marlboro Rd	I-495 Exit 13	49.4	48.5	46.7	45.9	44.6	43.3	N/A	N/A	42.8	42.1	50.6	49.4	48.6	46.5	45.6	43.8	41.8	40.8	40.5	38.8
MD 4 (Pennsylvania Ave)	I-495 Exit 11	52.1	51.2	49.4	48.5	47.3	46.0	N/A	N/A	45.5	44.8	53.2	52.0	51.3	49.2	48.3	46.5	44.5	43.4	43.1	41.4
MD 337 (Suitland Pkwy)	I-495 Exit 9	53.4	52.6	50.7	49.9	48.7	47.4	N/A	N/A	46.8	46.2	54.6	53.4	52.6	50.6	49.7	47.9	45.9	44.8	44.5	42.8
MD 5 (Branch Ave)	I-495 Exit 7	55.6	54.8	53.0	52.1	50.9	49.6	N/A	N/A	49.0	48.4	56.8	55.6	54.8	52.8	51.9	50.1	48.1	47.0	46.7	45.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	58.7	57.8	56.0	55.2	53.9	52.6	N/A	N/A	52.1	51.4	59.8	58.6	57.9	55.8	54.9	53.1	51.1	50.1	49.8	48.0

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	26.7	28.2	28.9	30.7	32.3	33.5	34.7	36.4	37.4	39.9	41.4	43.5	44.2	45.4	47.2	49.8	51.0	53.0	55.5
Shady Grove Rd	I-270 Exit 8	23.0	24.4	25.2	26.9	28.5	29.7	31.0	32.6	33.7	36.1	37.6	39.7	40.4	41.7	43.4	46.1	47.2	49.3	51.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	17.0	18.5	19.2	21.0	22.6	23.8	25.0	26.7	27.7	30.2	31.6	33.8	34.5	35.7	37.5	40.1	41.3	43.3	45.8
MD 189 (Falls Rd)	I-270 Exit 5	13.9	15.4	16.1	17.9	19.5	20.6	21.9	23.6	24.6	27.1	28.5	30.7	31.4	32.6	34.4	37.0	38.1	40.2	42.6
Montrose Rd	I-270 Exit 4	10.4	11.9	12.6	14.4	16.0	17.2	18.4	20.1	21.1	23.6	25.1	27.2	27.9	29.1	30.9	33.5	34.7	36.7	39.2
Split	I-270	6.9	8.4	9.1	10.9	12.5	13.7	14.9	16.6	17.6	20.1	21.5	23.7	24.4	25.6	27.4	30.0	31.1	33.2	35.7
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.4	7.9	8.6	10.4	12.0	13.2	14.4	16.1	17.1	19.6	21.1	23.2	23.9	25.1	26.9	29.5	30.7	32.7	35.2
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.7	7.2	7.9	9.7	11.3	12.4	13.7	15.3	16.4	18.8	20.3	22.5	23.2	24.4	26.2	28.8	29.9	32.0	34.4
VA 193 (Georgetown Pike)	I-495 Exit 44	15.2	16.7	17.4	19.2	20.8	22.0	23.2	24.9	25.9	28.4	29.9	32.0	32.7	33.9	35.7	38.4	39.5	41.5	44.0
George Washington Memorial Pkwy	I-495 Exit 43	12.3	13.8	14.5	16.3	17.9	19.1	20.3	22.0	23.0	25.5	27.0	29.1	29.8	31.0	32.8	35.5	36.6	38.6	41.1
Clara Barton Pkwy	I-495 Exit 41	10.7	12.2	12.9	14.7	16.3	17.5	18.7	20.4	21.4	23.9	25.4	27.5	28.2	29.4	31.2	33.9	35.0	37.0	39.5
Cabin John Pkwy	I-495 Exit 40	8.9	10.4	11.1	12.9	14.5	15.6	16.9	18.6	19.6	22.1	23.5	25.7	26.4	27.6	29.4	32.0	33.1	35.2	37.6
MD 190 (River Rd)	I-495 Exit 39	8.6	10.0	10.8	12.5	14.1	15.3	16.6	18.2	19.3	21.7	23.2	25.3	26.0	27.3	29.0	31.7	32.8	34.9	37.3
I-270 West Spur	I-495 Exit 38	7.1	8.6	9.3	11.1	12.7	13.9	15.1	16.8	17.8	20.3	21.7	23.9	24.6	25.8	27.6	30.2	31.3	33.4	35.9
MD 187 (Old Georgetown Rd)	I-495 Exit 36	5.1	6.5	7.3	9.0	10.6	11.8	13.1	14.7	15.8	18.2	19.7	21.8	22.5	23.8	25.5	28.2	29.3	31.4	33.8
I-270 East Spur	I-495 Exit 35	4.3	5.7	6.5	8.2	9.8	11.0	12.3	13.9	15.0	17.4	18.9	21.0	21.7	23.0	24.7	27.4	28.5	30.6	33.0
MD 355 (Rockville Pike)	I-495 Exit 34	3.9	5.4	6.1	7.9	9.5	10.6	11.9	13.6	14.6	17.1	18.5	20.7	21.4	22.6	24.4	27.0	28.1	30.2	32.6
MD 185 (Connecticut Ave)	I-495 Exit 33	2.2	3.7	4.4	6.2	7.8	9.0	10.2	11.9	12.9	15.4	16.9	19.0	19.7	20.9	22.7	25.4	26.5	28.5	31.0
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.5	2.2	4.0	5.6	6.8	8.0	9.7	10.7	13.2	14.6	16.8	17.5	18.7	20.5	23.1	24.2	26.3	28.8
US 29 (Colesville Rd)	I-495 Exit 30	4.8	0	0.7	2.5	4.1	5.3	6.5	8.2	9.2	11.7	13.2	15.3	16.0	17.2	19.0	21.6	22.8	24.8	27.3
MD 193 (University Blvd E)	I-495 Exit 29	7.2	3.0	0	1.8	3.4	4.6	5.8	7.5	8.5	11.0	12.4	14.6	15.3	16.5	18.3	20.9	22.0	24.1	26.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.6	12.4	7.9	0	1.6	2.8	4.0	5.7	6.7	9.2	10.7	12.8	13.5	14.7	16.5	19.1	20.3	22.3	24.8
I-95	I-495 Exit 27	19.7	15.5	11.0	7.6	0	1.2	2.4	4.1	5.1	7.6	9.1	11.2	11.9	13.1	14.9	17.5	18.7	20.7	23.2
US 1 (Baltimore Ave)	I-495 Exit 25	20.8	16.6	12.1	8.7	1.1	0	1.2	2.9	3.9	6.4	7.9	10.0	10.7	11.9	13.7	16.4	17.5	19.5	22.0
Greenbelt Metro Station	I-495 Exit 24	21.7	17.5	13.0	9.6	2.0	1.0	0	1.7	2.7	5.2	6.6	8.8	9.5	10.7	12.5	15.1	16.2	18.3	20.8
MD 201 (Kenilworth Ave)	I-495 Exit 23	23.2	18.9	14.4	11.1	3.4	2.4	1.4	0	1.0	3.5	5.0	7.1	7.8	9.0	10.8	13.4	14.6	16.6	19.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	24.3	20.1	15.5	12.2	4.6	3.5	2.5	1.1	0	2.5	3.9	6.1	6.8	8.0	9.8	12.4	13.5	15.6	18.1
MD 450 (Annapolis Rd)	I-495 Exit 20	27.4	23.2	18.7	15.3	7.7	6.6	5.7	4.3	3.1	0	1.5	3.6	4.3	5.5	7.3	9.9	11.1	13.1	15.6
US 50 (John Hanson Hwy)	I-495 Exit 19	29.4	25.2	20.7	17.3	9.7	8.6	7.7	6.2	5.1	2.0	0	2.1	2.8	4.1	5.8	8.5	9.6	11.7	14.1
MD 202 (Landover Rd)	I-495 Exit 17	32.7	28.5	24.0	20.6	13.0	11.9	11.0	9.6	8.4	5.3	3.3	0	0.7	1.9	3.7	6.3	7.5	9.5	12.0
Arena Dr	I-495 Exit 16	33.7	29.4	24.9	21.6	13.9	12.9	11.9	10.5	9.4	6.2	4.3	0.9	0	1.2	3.0	5.6	6.8	8.8	11.3
MD 214 (Central Ave)	I-495 Exit 15	34.8	30.6	26.1	22.7	15.1	14.0	13.1	11.7	10.5	7.4	5.4	2.1	1.2	0	1.8	4.4	5.5	7.6	10.1
Ritchie-Marlboro Rd	I-495 Exit 13	36.6	32.4	27.9	24.5	16.9	15.8	14.9	13.5	12.4	9.2	7.2	3.9	3.0	1.8	0	2.6	3.8	5.8	8.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	39.3	35.1	30.6	27.2	19.6	18.5	17.6	16.2	15.0	11.9	9.9	6.6	5.7	4.5	2.7	0	1.1	3.2	5.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	40.7	36.5	32.0	28.6	21.0	19.9	18.9	17.5	16.4	13.3	11.3	8.0	7.0	5.9	4.1	1.4	0	2.0	4.5
MD 5 (Branch Ave)	I-495 Exit 7	42.9	38.7	34.2	30.8	23.2	22.1	21.2	19.7	18.6	15.5	13.5	10.2	9.2	8.1	6.3	3.6	2.2	0	2.5
MD 414 (St Barnabas Rd)	I-495 Exit 4	45.9	41.7	37.2	33.8	26.2	25.1	24.2	22.8	21.6	18.5	16.5	13.2	12.3	11.1	9.3	6.6	5.2	3.0	0

Travel Time Matrix - 2040 No Build (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	2.8	6.8	7.9	9.2	10.8	11.7	12.2	11.3	12.1	19.7	18.5	17.8	15.9	15.3	13.3	N/A	13.5	13.9	16.0
Shady Grove Rd	I-270 Exit 8	0.8	0	4.0	5.2	6.4	8.1	8.9	9.5	8.5	9.3	17.0	15.8	15.0	13.1	12.5	10.5	N/A	10.7	11.1	13.2
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.8	0	1.1	2.4	4.1	4.9	5.5	4.5	5.3	12.9	11.8	11.0	9.1	8.5	6.5	N/A	6.7	7.1	9.2
MD 189 (Falls Rd)	I-270 Exit 5	3.5	2.7	0.8	0	1.2	2.9	3.8	4.3	3.4	4.1	11.8	10.6	9.9	8.0	7.4	5.3	N/A	5.6	5.9	8.0
Montrose Rd	I-270 Exit 4	4.7	3.9	2.0	1.2	0	1.7	2.5	3.1	2.1	2.9	10.6	9.4	8.6	6.7	6.1	4.1	N/A	4.3	4.7	6.8
Split	I-270	6.0	5.2	3.3	2.5	1.3	0	0.9	1.4	0.5	1.2	8.9	7.7	6.9	5.0	4.5	2.4	N/A	2.6	3.0	5.1
Westlake Terrace	I-270 W Spur	6.8	6.0	4.2	3.3	2.1	0.8	0	0.5	N/A	N/A	8.0	6.8	6.1	4.2	3.6	1.6	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.2	6.4	4.5	3.7	2.5	1.2	0.4	0	N/A	N/A	7.5	6.3	5.5	3.7	3.1	1.0	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.6	5.7	3.9	3.1	1.8	0.6	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	2.5	4.7
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.2	6.4	4.6	3.7	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.8	3.9
VA 193 (Georgetown Pike)	I-495 Exit 44	20.3	19.5	17.6	16.8	15.6	14.3	13.5	13.1	N/A	N/A	0	6.6	8.6	10.5	10.8	12.2	14.3	15.1	15.5	17.6
George Washington Memorial Pkwy	I-495 Exit 43	13.7	12.8	11.0	10.2	8.9	7.7	6.8	6.5	N/A	N/A	1.2	0	2.0	3.8	4.2	5.6	7.7	8.5	8.8	11.0
Clara Barton Pkwy	I-495 Exit 41	11.7	10.8	9.0	8.2	6.9	5.7	4.8	4.5	N/A	N/A	2.0	0.8	0	1.8	2.2	3.6	5.7	6.5	6.9	9.0
Cabin John Pkwy	I-495 Exit 40	9.8	9.0	7.1	6.3	5.1	3.8	3.0	2.6	N/A	N/A	3.8	2.6	1.9	0	0.3	1.8	3.8	4.6	5.0	7.1
MD 190 (River Rd)	I-495 Exit 39	9.5	8.7	6.8	6.0	4.8	3.5	2.7	2.3	N/A	N/A	4.4	3.2	2.5	0.6	0	1.5	3.5	4.3	4.7	6.8
I-270 West Spur	I-495 Exit 38	8.0	7.2	5.4	4.5	3.3	2.0	1.2	0.8	N/A	N/A	6.5	5.3	4.5	2.6	2.0	0	2.0	2.8	3.2	5.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.0	15.8	15.1	13.2	12.6	10.6	0	0.8	1.2	3.3
I-270 East Spur	I-495 Exit 35	8.6	7.8	5.9	5.1	3.9	2.6	N/A	N/A	2.0	1.4	24.6	23.4	22.6	20.7	20.1	18.1	7.5	0	0.4	2.5
MD 355 (Rockville Pike)	I-495 Exit 34	10.9	10.0	8.2	7.3	6.1	4.8	N/A	N/A	4.3	3.6	26.8	25.6	24.9	23.0	22.4	20.4	9.8	2.3	0	2.1
MD 185 (Connecticut Ave)	I-495 Exit 33	17.7	16.9	15.0	14.2	13.0	11.7	N/A	N/A	11.1	10.5	33.7	32.5	31.7	29.9	29.3	27.2	16.7	9.1	6.9	0
MD 97 (Georgia Ave)	I-495 Exit 31	25.3	24.4	22.6	21.7	20.5	19.3	N/A	N/A	18.7	18.0	41.2	40.1	39.3	37.4	36.8	34.8	24.2	16.7	14.4	7.5
US 29 (Colesville Rd)	I-495 Exit 30	32.2	31.3	29.5	28.7	27.4	26.2	N/A	N/A	25.6	24.9	48.2	47.0	46.2	44.3	43.7	41.7	31.1	23.6	21.3	14.4
MD 193 (University Blvd E)	I-495 Exit 29	36.1	35.3	33.4	32.6	31.4	30.1	N/A	N/A	29.5	28.9	52.1	50.9	50.1	48.3	47.7	45.6	35.1	27.5	25.3	18.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	47.2	46.4	44.5	43.7	42.5	41.2	N/A	N/A	40.6	40.0	63.2	62.0	61.2	59.4	58.8	56.7	46.2	38.6	36.4	29.5
I-95	I-495 Exit 27	50.6	49.8	48.0	47.1	45.9	44.6	N/A	N/A	44.1	43.4	66.6	65.4	64.7	62.8	62.2	60.2	49.6	42.0	39.8	32.9
US 1 (Baltimore Ave)	I-495 Exit 25	51.8	50.9	49.1	48.2	47.0	45.7	N/A	N/A	45.2	44.5	67.7	66.5	65.8	63.9	63.3	61.3	50.7	43.2	40.9	34.0
Greenbelt Metro Station	I-495 Exit 24	52.7	51.9	50.0	49.2	48.0	46.7	N/A	N/A	46.1	45.5	68.7	67.5	66.7	64.8	64.3	62.2	51.7	44.1	41.9	35.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	54.1	53.3	51.5	50.6	49.4	48.1	N/A	N/A	47.6	46.9	70.1	68.9	68.2	66.3	65.7	63.7	53.1	45.5	43.3	36.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	55.2	54.4	52.5	51.7	50.5	49.2	N/A	N/A	48.7	48.0	71.2	70.0	69.3	67.4	66.8	64.8	54.2	46.6	44.4	37.5
MD 450 (Annapolis Rd)	I-495 Exit 20	58.5	57.6	55.8	55.0	53.7	52.5	N/A	N/A	51.9	51.2	74.5	73.3	72.5	70.6	70.0	68.0	57.4	49.9	47.6	40.7
US 50 (John Hanson Hwy)	I-495 Exit 19	61.0	60.1	58.3	57.5	56.2	55.0	N/A	N/A	54.4	53.7	77.0	75.8	75.0	73.1	72.5	70.5	59.9	52.4	50.1	43.3
MD 202 (Landover Rd)	I-495 Exit 17	66.1	65.2	63.4	62.6	61.3	60.1	N/A	N/A	59.5	58.8	82.1	80.9	80.1	78.2	77.6	75.6	65.0	57.5	55.2	48.4
Arena Dr	I-495 Exit 16	68.5	67.6	65.8	65.0	63.8	62.5	N/A	N/A	61.9	61.2	84.5	83.3	82.5	80.6	80.0	78.0	67.4	59.9	57.6	50.8
MD 214 (Central Ave)	I-495 Exit 15	71.6	70.7	68.9	68.1	66.9	65.6	N/A	N/A	65.0	64.3	87.6	86.4	85.6	83.7	83.1	81.1	70.5	63.0	60.7	53.9
Ritchie-Marlboro Rd	I-495 Exit 13	74.3	73.4	71.6	70.7	69.5	68.2	N/A	N/A	67.7	67.0	90.2	89.0	88.3	86.4	85.8	83.8	73.2	65.7	63.4	56.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	76.9	76.1	74.3	73.4	72.2	70.9	N/A	N/A	70.4	69.7	92.9	91.7	91.0	89.1	88.5	86.5	75.9	68.3	66.1	59.2
MD 337 (Suitland Pkwy)	I-495 Exit 9	78.3	77.5	75.6	74.8	73.6	72.3	N/A	N/A	71.7	71.1	94.3	93.1	92.3	90.5	89.9	87.8	77.3	69.7	67.5	60.6
MD 5 (Branch Ave)	I-495 Exit 7	80.5	79.7	77.8	77.0	75.8	74.5	N/A	N/A	73.9	73.3	96.5	95.3	94.5	92.7	92.1	90.0	79.5	71.9	69.7	62.8
MD 414 (St Barnabas Rd)	I-495 Exit 4	83.6	82.7	80.9	80.0	78.8	77.5	N/A	N/A	77.0	76.3	99.5	98.3	97.6	95.7	95.1	93.1	82.5	75.0	72.7	65.8

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	18.2	19.7	20.4	22.2	23.8	25.2	26.4	28.0	29.0	31.5	32.9	35.1	35.8	37.0	39.1	43.7	44.9	48.5	65.9
Shady Grove Rd	15.5	16.9	17.6	19.4	21.0	22.4	23.6	25.2	26.2	28.7	30.2	32.3	33.0	34.2	36.3	41.0	42.1	45.7	63.1
MD 28 (W Montgomery Ave)	11.4	12.9	13.6	15.4	17.0	18.4	19.6	21.2	22.2	24.7	26.2	28.3	29.0	30.2	32.3	36.9	38.1	41.7	59.1
MD 189 (Falls Rd)	10.3	11.8	12.5	14.3	15.8	17.2	18.4	20.1	21.1	23.6	25.0	27.2	27.9	29.1	31.1	35.8	36.9	40.6	58.0
Montrose Rd	9.1	10.5	11.2	13.0	14.6	16.0	17.2	18.8	19.8	22.3	23.8	25.9	26.6	27.8	29.9	34.6	35.7	39.3	56.7
Split	7.4	8.9	9.6	11.3	12.9	14.3	15.5	17.1	18.2	20.6	22.1	24.2	25.0	26.2	28.2	32.9	34.0	37.7	55.1
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	6.9	8.4	9.1	10.9	12.5	13.8	15.0	16.7	17.7	20.2	21.6	23.8	24.5	25.7	27.7	32.4	33.6	37.2	54.6
MD 187 (Old Georgetown Rd)	6.2	7.6	8.4	10.1	11.7	13.1	14.3	15.9	16.9	19.4	20.9	23.0	23.7	24.9	27.0	31.7	32.8	36.4	53.8
VA 193 (Georgetown Pike)	19.9	21.3	22.0	23.8	25.4	26.8	28.0	29.6	30.6	33.1	34.6	36.7	37.4	38.6	40.7	45.4	46.5	50.1	67.5
George Washington Memorial Pkwy	13.2	14.7	15.4	17.2	18.8	20.1	21.4	23.0	24.0	26.5	27.9	30.1	30.8	32.0	34.1	38.7	39.9	43.5	60.9
Clara Barton Pkwy	11.2	12.7	13.4	15.2	16.8	18.2	19.4	21.0	22.0	24.5	25.9	28.1	28.8	30.0	32.1	36.7	37.9	41.5	58.9
Cabin John Pkwy	9.4	10.9	11.6	13.3	14.9	16.3	17.5	19.1	20.2	22.6	24.1	26.2	26.9	28.1	30.2	34.9	36.0	39.6	57.1
MD 190 (River Rd)	9.1	10.5	11.2	13.0	14.6	16.0	17.2	18.8	19.8	22.3	23.8	25.9	26.6	27.8	29.9	34.6	35.7	39.3	56.7
I-270 West Spur	7.6	9.1	9.8	11.5	13.1	14.5	15.7	17.4	18.4	20.8	22.3	24.5	25.2	26.4	28.4	33.1	34.2	37.9	55.3
MD 187 (Old Georgetown Rd)	5.6	7.0	7.8	9.5	11.1	12.5	13.7	15.3	16.3	18.8	20.3	22.4	23.1	24.3	26.4	31.1	32.2	35.8	53.2
I-270 East Spur	4.8	6.2	6.9	8.7	10.3	11.7	12.9	14.5	15.5	18.0	19.5	21.6	22.3	23.5	25.6	30.3	31.4	35.0	52.4
MD 355 (Rockville Pike)	4.4	5.9	6.6	8.3	9.9	11.3	12.5	14.1	15.2	17.6	19.1	21.2	21.9	23.1	25.2	29.9	31.0	34.6	52.1
MD 185 (Connecticut Ave)	2.3	3.7	4.5	6.2	7.8	9.2	10.4	12.0	13.0	15.5	17.0	19.1	19.8	21.0	23.1	27.8	28.9	32.5	49.9
MD 97 (Georgia Ave)	0	1.5	2.2	3.9	5.5	6.9	8.1	9.8	10.8	13.2	14.7	16.9	17.6	18.8	20.8	25.5	26.6	30.3	47.7
US 29 (Colesville Rd)	6.5	0	0.7	2.5	4.1	5.4	6.7	8.3	9.3	11.8	13.2	15.4	16.1	17.3	19.4	24.0	25.2	28.8	46.2
MD 193 (University Blvd E)	10.4	3.9	0	1.8	3.3	4.7	5.9	7.6	8.6	11.1	12.5	14.7	15.4	16.6	18.6	23.3	24.4	28.1	45.5
MD 650 (New Hampshire Ave)	21.5	15.0	8.9	0	1.6	3.0	4.2	5.8	6.8	9.3	10.8	12.9	13.6	14.8	16.9	21.6	22.7	26.3	43.7
I-95	24.9	18.5	12.3	8.0	0	1.4	2.6	4.2	5.2	7.7	9.2	11.3	12.0	13.2	15.3	20.0	21.1	24.7	42.1
US 1 (Baltimore Ave)	26.1	19.6	13.4	9.1	1.1	0	1.2	2.8	3.9	6.3	7.8	9.9	10.6	11.8	13.9	18.6	19.7	23.3	40.8
Greenbelt Metro Station	27.0	20.5	14.4	10.1	2.1	1.0	0	1.6	2.6	5.1	6.6	8.7	9.4	10.6	12.7	17.4	18.5	22.1	39.5
MD 201 (Kenilworth Ave)	28.4	22.0	15.8	11.5	3.5	2.4	1.4	0	1.0	3.5	5.0	7.1	7.8	9.0	11.1	15.7	16.9	20.5	37.9
MD 295 (Baltimore-Washington Pkwy)	29.5	23.1	16.9	12.6	4.6	3.5	2.5	1.1	0	2.5	3.9	6.1	6.8	8.0	10.0	14.7	15.9	19.5	36.9
MD 450 (Annapolis Rd)	32.8	26.3	20.2	15.8	7.8	6.7	5.8	4.3	3.2	0	1.5	3.6	4.3	5.5	7.6	12.3	13.4	17.0	34.4
US 50 (John Hanson Hwy)	35.3	28.8	22.7	18.3	10.3	9.2	8.3	6.8	5.7	2.5	0	2.1	2.9	4.1	6.1	10.8	11.9	15.6	33.0
MD 202 (Landover Rd)	40.4	33.9	27.8	23.4	15.4	14.3	13.4	11.9	10.8	7.6	5.1	0	0.7	1.9	4.0	8.6	9.8	13.4	30.8
Arena Dr	42.8	36.3	30.2	25.9	17.8	16.7	15.8	14.3	13.2	10.0	7.5	2.4	0	1.2	3.3	7.9	9.1	12.7	30.1
MD 214 (Central Ave)	45.9	39.4	33.3	29.0	20.9	19.8	18.9	17.4	16.4	13.1	10.6	5.5	3.1	0	2.1	6.7	7.9	11.5	28.9
Ritchie-Marlboro Rd	48.6	42.1	35.9	31.6	23.6	22.5	21.6	20.1	19.0	15.8	13.3	8.2	5.8	2.7	0	4.7	5.8	9.4	26.8
MD 4 (Pennsylvania Ave)	51.2	44.8	38.6	34.3	26.3	25.2	24.2	22.8	21.7	18.5	16.0	10.9	8.5	5.4	2.7	0	1.1	4.8	22.2
MD 337 (Suitland Pkwy)	52.6	46.1	40.0	35.7	27.7	26.6	25.6	24.2	23.1	19.9	17.3	12.2	9.8	6.7	4.1	1.4	0	3.6	21.0
MD 5 (Branch Ave)	54.8	48.3	42.2	37.9	29.9	28.8	27.8	26.4	25.3	22.1	19.5	14.4	12.0	8.9	6.3	3.6	2.2	0	17.4
MD 414 (St Barnabas Rd)	57.9	51.4	45.2	40.9	32.9	31.8	30.8	29.4	28.3	25.1	22.6	17.5	15.1	12.0	9.3	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 5 - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.4	5.3	8.2	9.9	12.2	13.1	13.6	12.7	13.5	23.9	22.7	22.0	19.8	18.4	14.5	N/A	14.9	15.4	17.7
Shady Grove Rd	I-270 Exit 8	0.9	0	3.9	6.8	8.5	10.8	11.7	12.2	11.3	12.1	22.5	21.3	20.6	18.4	17.0	13.1	N/A	13.6	14.0	16.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.9	2.0	0	2.9	4.6	6.9	7.8	8.3	7.4	8.2	18.6	17.4	16.7	14.5	13.1	9.2	N/A	9.6	10.1	12.4
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.9	0.9	0	1.7	4.0	4.8	5.4	4.5	5.2	15.7	14.5	13.7	11.5	10.2	6.3	N/A	6.7	7.1	9.4
Montrose Rd	I-270 Exit 4	5.0	4.1	2.1	1.3	0	2.3	3.2	3.7	2.8	3.5	14.0	12.8	12.0	9.9	8.5	4.6	N/A	5.0	5.4	7.8
Split	I-270	6.3	5.4	3.4	2.5	1.3	0	0.9	1.4	0.5	1.3	11.7	10.5	9.7	7.6	6.2	2.3	N/A	2.7	3.2	5.5
Westlake Terrace	I-270 W Spur	7.2	6.2	4.2	3.4	2.1	0.8	0	0.5	N/A	N/A	10.8	9.6	8.9	6.7	5.3	1.5	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.5	6.6	4.6	3.8	2.5	1.2	0.4	0	N/A	N/A	10.3	9.1	8.4	6.2	4.8	0.9	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.9	6.0	4.0	3.1	1.8	0.6	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	2.7	5.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.6	4.6	3.8	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	1.9	4.2
VA 193 (Georgetown Pike)	I-495 Exit 44	17.5	16.6	14.6	13.7	12.4	11.2	10.3	9.9	N/A	N/A	0	3.9	5.5	7.3	7.7	9.1	11.2	12.0	12.4	14.7
George Washington Memorial Pkwy	I-495 Exit 43	13.6	12.7	10.7	9.8	8.6	7.3	6.5	6.1	N/A	N/A	1.2	0	1.6	3.5	3.8	5.3	7.3	8.1	8.6	10.9
Clara Barton Pkwy	I-495 Exit 41	12.0	11.1	9.1	8.2	6.9	5.7	4.8	4.4	N/A	N/A	2.0	0.8	0	1.9	2.2	3.6	5.7	6.5	6.9	9.2
Cabin John Pkwy	I-495 Exit 40	10.1	9.2	7.2	6.3	5.1	3.8	3.0	2.6	N/A	N/A	4.1	2.9	2.2	0	0.3	1.8	3.8	4.7	5.1	7.4
MD 190 (River Rd)	I-495 Exit 39	9.8	8.9	6.9	6.0	4.8	3.5	2.7	2.3	N/A	N/A	5.5	4.3	3.6	1.4	0	1.5	3.5	4.3	4.8	7.1
I-270 West Spur	I-495 Exit 38	8.4	7.4	5.4	4.6	3.3	2.0	1.2	0.8	N/A	N/A	9.4	8.2	7.4	5.2	3.9	0	2.1	2.9	3.3	5.6
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20.6	19.4	18.6	16.4	15.1	11.2	0	0.8	1.2	3.5
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	28.4	27.2	26.4	24.2	22.9	19.0	7.8	0	0.4	2.7
MD 355 (Rockville Pike)	I-495 Exit 34	11.6	10.7	8.7	7.8	6.6	5.3	N/A	N/A	4.7	4.1	31.1	29.9	29.1	26.9	25.6	21.7	10.5	2.7	0	2.3
MD 185 (Connecticut Ave)	I-495 Exit 33	16.5	15.6	13.6	12.7	11.4	10.2	N/A	N/A	9.6	8.9	36.0	34.8	34.0	31.8	30.4	26.6	15.4	7.6	4.9	0
MD 97 (Georgia Ave)	I-495 Exit 31	19.9	18.9	16.9	16.1	14.8	13.5	N/A	N/A	13.0	12.3	39.3	38.1	37.4	35.2	33.8	29.9	18.7	10.9	8.3	3.4
US 29 (Colesville Rd)	I-495 Exit 30	22.7	21.7	19.8	18.9	17.6	16.3	N/A	N/A	15.8	15.1	42.1	40.9	40.2	38.0	36.6	32.8	21.6	13.8	11.1	6.2
MD 193 (University Blvd E)	I-495 Exit 29	24.9	24.0	22.0	21.1	19.8	18.6	N/A	N/A	18.0	17.4	44.4	43.2	42.4	40.2	38.8	35.0	23.8	16.0	13.3	8.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	26.9	26.0	24.0	23.1	21.8	20.6	N/A	N/A	20.0	19.3	46.4	45.2	44.4	42.2	40.8	37.0	25.8	18.0	15.3	10.4
I-95	I-495 Exit 27	33.1	32.1	30.1	29.3	28.0	26.7	N/A	N/A	26.2	25.5	52.5	51.3	50.6	48.4	47.0	43.2	32.0	24.2	21.5	16.6
US 1 (Baltimore Ave)	I-495 Exit 25	34.3	33.4	31.4	30.5	29.2	28.0	N/A	N/A	27.4	26.7	53.8	52.6	51.8	49.6	48.2	44.4	33.2	25.4	22.7	17.8
Greenbelt Metro Station	I-495 Exit 24	35.2	34.3	32.3	31.4	30.2	28.9	N/A	N/A	28.3	27.7	54.7	53.5	52.7	50.6	49.2	45.3	34.1	26.3	23.6	18.7
MD 201 (Kenilworth Ave)	I-495 Exit 23	36.6	35.7	33.7	32.8	31.6	30.3	N/A	N/A	29.7	29.1	56.1	54.9	54.1	51.9	50.6	46.7	35.5	27.7	25.0	20.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	37.7	36.8	34.8	33.9	32.6	31.4	N/A	N/A	30.8	30.2	57.2	56.0	55.2	53.0	51.6	47.8	36.6	28.8	26.1	21.2
MD 450 (Annapolis Rd)	I-495 Exit 20	40.4	39.4	37.4	36.6	35.3	34.0	N/A	N/A	33.5	32.8	59.8	58.6	57.9	55.7	54.3	50.4	39.3	31.4	28.8	23.9
US 50 (John Hanson Hwy)	I-495 Exit 19	41.9	41.0	39.0	38.1	36.9	35.6	N/A	N/A	35.1	34.4	61.4	60.2	59.4	57.3	55.9	52.0	40.8	33.0	30.3	25.4
MD 202 (Landover Rd)	I-495 Exit 17	44.1	43.1	41.1	40.3	39.0	37.7	N/A	N/A	37.2	36.5	63.5	62.3	61.6	59.4	58.0	54.2	43.0	35.1	32.5	27.6
Arena Dr	I-495 Exit 16	44.8	43.9	41.9	41.0	39.7	38.5	N/A	N/A	37.9	37.2	64.3	63.1	62.3	60.1	58.7	54.9	43.7	35.9	33.2	28.3
MD 214 (Central Ave)	I-495 Exit 15	45.9	44.9	42.9	42.1	40.8	39.5	N/A	N/A	39.0	38.3	65.3	64.1	63.4	61.2	59.8	55.9	44.7	36.9	34.2	29.4
Ritchie-Marlboro Rd	I-495 Exit 13	47.6	46.6	44.6	43.8	42.5	41.2	N/A	N/A	40.7	40.0	67.0	65.8	65.1	62.9	61.5	57.6	46.5	38.6	36.0	31.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	50.1	49.2	47.2	46.4	45.1	43.8	N/A	N/A	43.3	42.6	69.6	68.4	67.7	65.5	64.1	60.2	49.0	41.2	38.5	33.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	51.5	50.6	48.6	47.7	46.5	45.2	N/A	N/A	44.6	44.0	71.0	69.8	69.0	66.8	65.5	61.6	50.4	42.6	39.9	35.0
MD 5 (Branch Ave)	I-495 Exit 7	53.7	52.8	50.8	49.9	48.6	47.4	N/A	N/A	46.8	46.2	73.2	72.0	71.2	69.0	67.6	63.8	52.6	44.8	42.1	37.2
MD 414 (St Barnabas Rd)	I-495 Exit 4	56.7	55.8	53.8	52.9	51.7	50.4	N/A	N/A	49.9	49.2	76.2	75.0	74.3	72.1	70.7	66.8	55.6	47.8	45.1	40.3

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	20.6	22.1	23.8	27.8	29.4	30.5	31.6	33.2	34.2	36.7	38.1	40.2	40.9	42.1	43.9	46.3	47.4	50.5	63.5
Shady Grove Rd	I-270 Exit 8	19.2	20.7	22.4	26.4	28.0	29.1	30.2	31.8	32.8	35.3	36.7	38.8	39.5	40.7	42.5	44.9	46.0	49.1	62.1
MD 28 (W Montgomery Ave)	I-270 Exit 6	15.3	16.8	18.5	22.5	24.1	25.2	26.3	27.9	28.9	31.4	32.8	34.9	35.6	36.8	38.6	41.0	42.1	45.2	58.2
MD 189 (Falls Rd)	I-270 Exit 5	12.3	13.9	15.6	19.5	21.1	22.3	23.4	25.0	26.0	28.5	29.9	32.0	32.7	33.9	35.6	38.1	39.2	42.3	55.3
Montrose Rd	I-270 Exit 4	10.6	12.2	13.9	17.9	19.4	20.6	21.7	23.3	24.3	26.8	28.2	30.3	31.0	32.2	33.9	36.4	37.5	40.6	53.6
Split	I-270	8.4	9.9	11.6	15.6	17.1	18.3	19.4	21.0	22.0	24.5	25.9	28.0	28.7	29.9	31.7	34.1	35.2	38.3	51.3
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.9	9.4	11.1	15.1	16.7	17.8	18.9	20.5	21.5	24.0	25.4	27.5	28.2	29.4	31.2	33.6	34.7	37.8	50.8
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.1	8.6	10.3	14.3	15.9	17.0	18.2	19.8	20.8	23.2	24.7	26.8	27.5	28.7	30.4	32.9	34.0	37.0	50.0
VA 193 (Georgetown Pike)	I-495 Exit 44	17.6	19.1	20.8	24.8	26.4	27.5	28.7	30.3	31.3	33.7	35.2	37.3	38.0	39.2	40.9	43.4	44.5	47.6	60.5
George Washington Memorial Pkwy	I-495 Exit 43	13.8	15.3	17.0	21.0	22.5	23.7	24.8	26.4	27.4	29.9	31.3	33.4	34.1	35.3	37.1	39.5	40.6	43.7	56.7
Clara Barton Pkwy	I-495 Exit 41	12.1	13.7	15.4	19.3	20.9	22.1	23.2	24.8	25.8	28.3	29.7	31.8	32.5	33.7	35.4	37.9	39.0	42.1	55.1
Cabin John Pkwy	I-495 Exit 40	10.3	11.8	13.5	17.5	19.1	20.2	21.3	22.9	23.9	26.4	27.8	30.0	30.6	31.8	33.6	36.0	37.1	40.2	53.2
MD 190 (River Rd)	I-495 Exit 39	10.0	11.5	13.2	17.2	18.8	19.9	21.0	22.6	23.6	26.1	27.5	29.6	30.3	31.5	33.3	35.7	36.8	39.9	52.9
I-270 West Spur	I-495 Exit 38	8.5	10.0	11.7	15.7	17.3	18.4	19.6	21.2	22.2	24.6	26.1	28.2	28.9	30.1	31.8	34.3	35.4	38.4	51.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	6.4	8.0	9.7	13.6	15.2	16.4	17.5	19.1	20.1	22.6	24.0	26.1	26.8	28.0	29.7	32.2	33.3	36.4	49.4
I-270 East Spur	I-495 Exit 35	5.6	7.1	8.8	12.8	14.4	15.5	16.7	18.3	19.3	21.7	23.2	25.3	26.0	27.2	28.9	31.4	32.5	35.6	48.6
MD 355 (Rockville Pike)	I-495 Exit 34	5.2	6.7	8.4	12.4	14.0	15.1	16.3	17.9	18.9	21.3	22.8	24.9	25.6	26.8	28.5	31.0	32.1	35.1	48.1
MD 185 (Connecticut Ave)	I-495 Exit 33	2.9	4.4	6.1	10.1	11.7	12.8	14.0	15.6	16.6	19.0	20.4	22.6	23.3	24.4	26.2	28.6	29.8	32.8	45.8
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.5	3.2	7.2	8.8	9.9	11.1	12.7	13.7	16.1	17.6	19.7	20.4	21.6	23.3	25.7	26.9	29.9	42.9
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	1.7	5.7	7.3	8.4	9.5	11.1	12.1	14.6	16.0	18.2	18.8	20.0	21.8	24.2	25.4	28.4	41.4
MD 193 (University Blvd E)	I-495 Exit 29	3.9	1.2	0	4.0	5.6	6.7	7.8	9.4	10.4	12.9	14.3	16.4	17.1	18.3	20.1	22.5	23.6	26.7	39.7
MD 650 (New Hampshire Ave)	I-495 Exit 28	5.9	3.2	1.6	0	1.6	2.7	3.9	5.5	6.5	8.9	10.3	12.5	13.2	14.3	16.1	18.5	19.7	22.7	35.7
I-95	I-495 Exit 27	12.1	9.4	7.8	6.6	0	1.1	2.3	3.9	4.9	7.3	8.8	10.9	11.6	12.8	14.5	17.0	18.1	21.1	34.1
US 1 (Baltimore Ave)	I-495 Exit 25	13.3	10.6	9.0	7.8	1.2	0	1.1	2.7	3.7	6.2	7.6	9.7	10.4	11.6	13.4	15.8	16.9	20.0	33.0
Greenbelt Metro Station	I-495 Exit 24	14.2	11.5	10.0	8.8	2.2	0.9	0	1.6	2.6	5.1	6.5	8.6	9.3	10.5	12.2	14.7	15.8	18.9	31.9
MD 201 (Kenilworth Ave)	I-495 Exit 23	15.6	12.9	11.4	10.2	3.5	2.3	1.4	0	1.0	3.5	4.9	7.0	7.7	8.9	10.6	13.1	14.2	17.3	30.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	16.7	14.0	12.5	11.2	4.6	3.4	2.5	1.1	0	2.5	3.9	6.0	6.7	7.9	9.6	12.1	13.2	16.3	29.3
MD 450 (Annapolis Rd)	I-495 Exit 20	19.4	16.7	15.1	13.9	7.3	6.1	5.1	3.7	2.7	0	1.4	3.6	4.3	5.4	7.2	9.6	10.8	13.8	26.8
US 50 (John Hanson Hwy)	I-495 Exit 19	20.9	18.2	16.7	15.5	8.9	7.6	6.7	5.3	4.2	1.6	0	2.1	2.8	4.0	5.7	8.2	9.3	12.4	25.4
MD 202 (Landover Rd)	I-495 Exit 17	23.1	20.4	18.8	17.6	11.0	9.8	8.8	7.5	6.4	3.7	2.1	0	0.7	1.9	3.6	6.1	7.2	10.3	23.3
Arena Dr	I-495 Exit 16	23.8	21.1	19.5	18.3	11.7	10.5	9.6	8.2	7.1	4.4	2.9	0.7	0	1.2	2.9	5.4	6.5	9.6	22.6
MD 214 (Central Ave)	I-495 Exit 15	24.9	22.2	20.6	19.4	12.8	11.6	10.6	9.2	8.2	5.5	3.9	1.8	1.1	0	1.7	4.2	5.3	8.4	21.4
Ritchie-Marlboro Rd	I-495 Exit 13	26.6	23.9	22.3	21.1	14.5	13.3	12.3	11.0	9.9	7.2	5.6	3.5	2.8	1.7	0	2.4	3.6	6.6	19.6
MD 4 (Pennsylvania Ave)	I-495 Exit 11	29.2	26.4	24.9	23.7	17.1	15.9	14.9	13.5	12.4	9.8	8.2	6.1	5.4	4.3	2.6	0	1.1	4.2	17.2
MD 337 (Suitland Pkwy)	I-495 Exit 9	30.5	27.8	26.3	25.0	18.4	17.2	16.3	14.9	13.8	11.1	9.6	7.4	6.7	5.7	3.9	1.4	0	3.1	16.1
MD 5 (Branch Ave)	I-495 Exit 7	32.7	30.0	28.5	27.2	20.6	19.4	18.5	17.1	16.0	13.3	11.8	9.6	8.9	7.8	6.1	3.6	2.2	0	13.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	35.7	33.0	31.5	30.3	23.7	22.4	21.5	20.1	19.0	16.4	14.8	12.7	12.0	10.9	9.2	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 8 - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.2	4.5	6.8	8.3	10.2	11.0	11.6	10.8	12.5	19.5	18.3	17.5	15.6	14.7	12.5	N/A	15.5	15.9	18.2
Shady Grove Rd	I-270 Exit 8	0.9	0	3.3	5.5	7.1	8.9	9.8	10.3	9.6	11.3	18.3	17.1	16.3	14.4	13.5	11.2	N/A	14.3	14.7	17.0
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.9	2.0	0	2.2	3.7	5.6	6.5	7.0	6.3	8.0	15.0	13.8	13.0	11.1	10.2	7.9	N/A	10.9	11.4	13.7
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.8	0.9	0	1.5	3.4	4.3	4.8	4.0	5.8	12.7	11.6	10.8	8.8	8.0	5.7	N/A	8.7	9.2	11.5
Montrose Rd	I-270 Exit 4	5.0	4.1	2.1	1.3	0	1.9	2.8	3.3	2.5	4.3	11.2	10.0	9.3	7.3	6.5	4.2	N/A	7.2	7.7	10.0
Split	I-270	6.3	5.4	3.4	2.5	1.3	0	0.9	1.4	0.6	2.4	9.3	8.1	7.4	5.4	4.6	2.3	N/A	5.3	5.8	8.1
Westlake Terrace	I-270 W Spur	7.1	6.2	4.2	3.4	2.1	0.8	0	0.5	N/A	N/A	8.5	7.3	6.5	4.6	3.7	1.4	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.5	6.6	4.6	3.8	2.5	1.3	0.4	0	N/A	N/A	7.9	6.7	6.0	4.0	3.2	0.9	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.8	5.9	3.9	3.1	1.8	0.6	N/A	N/A	0	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.7	5.2	7.5
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.6	4.6	3.7	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.0	3.4	5.7
VA 193 (Georgetown Pike)	I-495 Exit 44	17.7	16.8	14.8	14.0	12.7	11.4	10.6	10.2	N/A	N/A	0	4.1	5.7	7.6	7.9	9.3	11.3	12.1	12.6	14.9
George Washington Memorial Pkwy	I-495 Exit 43	13.6	12.7	10.8	9.9	8.6	7.4	6.5	6.1	N/A	N/A	1.2	0	1.6	3.5	3.8	5.3	7.3	8.1	8.5	10.8
Clara Barton Pkwy	I-495 Exit 41	12.0	11.1	9.1	8.3	7.0	5.7	4.9	4.5	N/A	N/A	2.0	0.8	0	1.9	2.2	3.6	5.6	6.4	6.9	9.2
Cabin John Pkwy	I-495 Exit 40	10.1	9.2	7.3	6.4	5.1	3.9	3.0	2.6	N/A	N/A	3.9	2.7	2.0	0	0.3	1.8	3.8	4.6	5.0	7.3
MD 190 (River Rd)	I-495 Exit 39	9.8	8.9	6.9	6.1	4.8	3.5	2.7	2.3	N/A	N/A	4.8	3.6	2.8	0.8	0	1.5	3.5	4.2	4.7	7.0
I-270 West Spur	I-495 Exit 38	8.4	7.4	5.5	4.6	3.4	2.1	1.2	0.8	N/A	N/A	7.0	5.8	5.1	3.1	2.3	0	2.0	2.8	3.2	5.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.6	17.4	16.6	14.7	13.8	11.5	0	0.8	1.3	3.5
I-270 East Spur	I-495 Exit 35	8.9	7.9	6.0	5.1	3.8	2.6	N/A	N/A	2.0	1.3	24.8	23.6	22.8	20.9	20.0	17.7	6.2	0	0.5	2.8
MD 355 (Rockville Pike)	I-495 Exit 34	10.4	9.5	7.5	6.6	5.4	4.1	N/A	N/A	3.6	2.9	26.3	25.1	24.4	22.4	21.6	19.3	7.7	1.5	0	2.3
MD 185 (Connecticut Ave)	I-495 Exit 33	13.7	12.8	10.8	10.0	8.7	7.4	N/A	N/A	6.9	6.2	29.6	28.5	27.7	25.7	24.9	22.6	11.1	4.9	3.3	0
MD 97 (Georgia Ave)	I-495 Exit 31	17.9	17.0	15.1	14.2	12.9	11.7	N/A	N/A	11.1	10.4	33.9	32.7	31.9	30.0	29.1	26.8	15.3	9.1	7.6	4.2
US 29 (Colesville Rd)	I-495 Exit 30	18.9	18.0	16.0	15.1	13.9	12.6	N/A	N/A	12.1	11.4	34.8	33.6	32.9	30.9	30.1	27.8	16.3	10.0	8.5	5.2
MD 193 (University Blvd E)	I-495 Exit 29	22.0	21.0	19.1	18.2	17.0	15.7	N/A	N/A	15.1	14.5	37.9	36.7	35.9	34.0	33.1	30.9	19.3	13.1	11.6	8.2
MD 650 (New Hampshire Ave)	I-495 Exit 28	24.1	23.2	21.2	20.3	19.1	17.8	N/A	N/A	17.3	16.6	40.0	38.8	38.1	36.1	35.3	33.0	21.5	15.2	13.7	10.4
I-95	I-495 Exit 27	25.4	24.5	22.5	21.6	20.4	19.1	N/A	N/A	18.5	17.9	41.3	40.1	39.4	37.4	36.5	34.3	22.7	16.5	15.0	11.7
US 1 (Baltimore Ave)	I-495 Exit 25	26.4	25.5	23.5	22.7	21.4	20.1	N/A	N/A	19.6	18.9	42.3	41.2	40.4	38.4	37.6	35.3	23.8	17.6	16.0	12.7
Greenbelt Metro Station	I-495 Exit 24	27.3	26.4	24.5	23.6	22.3	21.1	N/A	N/A	20.5	19.8	43.3	42.1	41.3	39.4	38.5	36.2	24.7	18.5	17.0	13.6
MD 201 (Kenilworth Ave)	I-495 Exit 23	28.7	27.8	25.9	25.0	23.7	22.5	N/A	N/A	21.9	21.2	44.7	43.5	42.7	40.8	39.9	37.6	26.1	19.9	18.4	15.0
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	29.8	28.9	27.0	26.1	24.8	23.6	N/A	N/A	23.0	22.3	45.8	44.6	43.8	41.9	41.0	38.7	27.2	21.0	19.5	16.1
MD 450 (Annapolis Rd)	I-495 Exit 20	32.5	31.6	29.6	28.8	27.5	26.2	N/A	N/A	25.7	25.0	48.5	47.3	46.5	44.6	43.7	41.4	29.9	23.7	22.1	18.8
US 50 (John Hanson Hwy)	I-495 Exit 19	34.1	33.2	31.2	30.3	29.1	27.8	N/A	N/A	27.3	26.6	50.0	48.8	48.1	46.1	45.3	43.0	31.5	25.2	23.7	20.4
MD 202 (Landover Rd)	I-495 Exit 17	36.2	35.3	33.4	32.5	31.2	30.0	N/A	N/A	29.4	28.7	52.2	51.0	50.2	48.3	47.4	45.1	33.6	27.4	25.9	22.5
Arena Dr	I-495 Exit 16	36.9	36.0	34.1	33.2	31.9	30.7	N/A	N/A	30.1	29.4	52.9	51.7	50.9	49.0	48.1	45.8	34.3	28.1	26.6	23.2
MD 214 (Central Ave)	I-495 Exit 15	38.0	37.1	35.1	34.3	33.0	31.7	N/A	N/A	31.2	30.5	54.0	52.8	52.0	50.1	49.2	46.9	35.4	29.2	27.6	24.3
Ritchie-Marlboro Rd	I-495 Exit 13	39.7	38.8	36.8	36.0	34.7	33.5	N/A	N/A	32.9	32.2	55.7	54.5	53.7	51.8	50.9	48.6	37.1	30.9	29.3	26.0
MD 4 (Pennsylvania Ave)	I-495 Exit 11	42.3	41.4	39.4	38.6	37.3	36.0	N/A	N/A	35.5	34.8	58.3	57.1	56.3	54.3	53.5	51.2	39.7	33.5	31.9	28.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	43.9	43.0	41.0	40.2	38.9	37.6	N/A	N/A	37.1	36.4	59.8	58.7	57.9	55.9	55.1	52.8	41.3	35.1	33.5	30.2
MD 5 (Branch Ave)	I-495 Exit 7	46.1	45.2	43.3	42.4	41.1	39.9	N/A	N/A	39.3	38.6	62.1	60.9	60.1	58.2	57.3	55.0	43.5	37.3	35.8	32.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	49.2	48.3	46.3	45.4	44.2	42.9	N/A	N/A	42.3	41.7	65.1	63.9	63.2	61.2	60.4	58.1	46.5	40.3	38.8	35.5

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	21.0	22.5	23.2	25.9	27.5	28.6	29.9	31.4	32.5	34.9	36.3	38.4	39.1	40.3	42.0	44.7	45.8	48.9	61.8
Shady Grove Rd	19.8	21.3	22.0	24.7	26.3	27.4	28.6	30.2	31.2	33.7	35.1	37.2	37.9	39.1	40.8	43.5	44.6	47.7	60.6
MD 28 (W Montgomery Ave)	16.5	18.0	18.7	21.4	23.0	24.1	25.3	26.9	27.9	30.4	31.8	33.9	34.6	35.7	37.5	40.2	41.3	44.4	57.2
MD 189 (Falls Rd)	14.3	15.8	16.5	19.1	20.7	21.8	23.1	24.7	25.7	28.1	29.6	31.7	32.3	33.5	35.3	37.9	39.1	42.1	55.0
Montrose Rd	12.7	14.2	15.0	17.6	19.2	20.3	21.6	23.2	24.2	26.6	28.0	30.1	30.8	32.0	33.7	36.4	37.5	40.6	53.5
Split	10.9	12.3	13.1	15.7	17.3	18.4	19.7	21.3	22.3	24.7	26.2	28.2	28.9	30.1	31.8	34.5	35.6	38.7	51.6
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	10.2	11.7	12.4	15.1	16.7	17.8	19.1	20.7	21.7	24.1	25.5	27.6	28.3	29.5	31.2	33.9	35.0	38.1	51.0
MD 187 (Old Georgetown Rd)	8.5	10.0	10.7	13.4	15.0	16.1	17.3	18.9	19.9	22.4	23.8	25.9	26.6	27.7	29.5	32.2	33.3	36.4	49.2
VA 193 (Georgetown Pike)	17.7	19.2	19.9	22.5	24.1	25.2	26.5	28.1	29.1	31.5	33.0	35.1	35.7	36.9	38.7	41.3	42.5	45.5	58.4
George Washington Memorial Pkwy	13.6	15.1	15.8	18.5	20.1	21.2	22.4	24.0	25.0	27.5	28.9	31.0	31.7	32.9	34.6	37.3	38.4	41.5	54.4
Clara Barton Pkwy	12.0	13.5	14.2	16.8	18.4	19.5	20.8	22.4	23.4	25.8	27.3	29.4	30.0	31.2	33.0	35.6	36.8	39.8	52.7
Cabin John Pkwy	10.1	11.6	12.3	15.0	16.6	17.7	18.9	20.5	21.5	24.0	25.4	27.5	28.2	29.4	31.1	33.8	34.9	38.0	50.9
MD 190 (River Rd)	9.8	11.3	12.0	14.7	16.3	17.3	18.6	20.2	21.2	23.6	25.1	27.2	27.9	29.0	30.8	33.5	34.6	37.7	50.5
I-270 West Spur	8.3	9.8	10.5	13.2	14.8	15.9	17.1	18.7	19.8	22.2	23.6	25.7	26.4	27.6	29.3	32.0	33.1	36.2	49.1
MD 187 (Old Georgetown Rd)	6.3	7.8	8.5	11.2	12.8	13.9	15.2	16.8	17.8	20.2	21.6	23.7	24.4	25.6	27.3	30.0	31.1	34.2	47.1
I-270 East Spur	5.5	7.0	7.7	10.4	12.0	13.1	14.4	16.0	17.0	19.4	20.8	22.9	23.6	24.8	26.5	29.2	30.3	33.4	46.3
MD 355 (Rockville Pike)	5.1	6.6	7.3	10.0	11.5	12.6	13.9	15.5	16.5	18.9	20.4	22.5	23.2	24.3	26.1	28.7	29.9	32.9	45.8
MD 185 (Connecticut Ave)	2.8	4.3	5.0	7.7	9.3	10.3	11.6	13.2	14.2	16.6	18.1	20.2	20.9	22.0	23.8	26.5	27.6	30.7	43.5
MD 97 (Georgia Ave)	0	1.5	2.2	4.9	6.5	7.6	8.8	10.4	11.4	13.9	15.3	17.4	18.1	19.3	21.0	23.7	24.8	27.9	40.8
US 29 (Colesville Rd)	1.8	0	0.7	3.4	5.0	6.1	7.3	8.9	9.9	12.4	13.8	15.9	16.6	17.8	19.5	22.2	23.3	26.4	39.3
MD 193 (University Blvd E)	4.8	1.1	0	2.7	4.3	5.4	6.6	8.2	9.2	11.7	13.1	15.2	15.9	17.0	18.8	21.5	22.6	25.7	38.6
MD 650 (New Hampshire Ave)	7.0	3.2	1.7	0	1.6	2.7	4.0	5.5	6.6	9.0	10.4	12.5	13.2	14.4	16.1	18.8	19.9	23.0	35.9
I-95	8.2	4.5	2.9	1.8	0	1.1	2.4	4.0	5.0	7.4	8.8	10.9	11.6	12.8	14.5	17.2	18.3	21.4	34.3
US 1 (Baltimore Ave)	9.3	5.5	4.0	2.9	1.0	0	1.3	2.9	3.9	6.3	7.7	9.8	10.5	11.7	13.4	16.1	17.2	20.3	33.2
Greenbelt Metro Station	10.2	6.5	4.9	3.8	2.0	0.9	0	1.6	2.6	5.0	6.5	8.6	9.2	10.4	12.2	14.8	16.0	19.0	31.9
MD 201 (Kenilworth Ave)	11.6	7.8	6.3	5.2	3.4	2.3	1.4	0	1.0	3.4	4.9	7.0	7.7	8.8	10.6	13.3	14.4	17.5	30.3
MD 295 (Baltimore-Washington Pkwy)	12.7	8.9	7.4	6.3	4.5	3.4	2.5	1.1	0	2.4	3.9	6.0	6.6	7.8	9.6	12.2	13.4	16.4	29.3
MD 450 (Annapolis Rd)	15.4	11.6	10.1	9.0	7.2	6.1	5.2	3.8	2.7	0	1.4	3.5	4.2	5.4	7.1	9.8	10.9	14.0	26.9
US 50 (John Hanson Hwy)	17.0	13.2	11.7	10.6	8.7	7.7	6.8	5.4	4.3	1.6	0	2.1	2.8	4.0	5.7	8.4	9.5	12.6	25.5
MD 202 (Landover Rd)	19.1	15.3	13.8	12.7	10.9	9.8	8.9	7.5	6.4	3.7	2.1	0	0.7	1.9	3.6	6.3	7.4	10.5	23.4
Arena Dr	19.8	16.1	14.5	13.4	11.6	10.5	9.6	8.2	7.1	4.4	2.9	0.7	0	1.2	2.9	5.6	6.7	9.8	22.7
MD 214 (Central Ave)	20.9	17.1	15.6	14.5	12.7	11.6	10.7	9.3	8.2	5.5	3.9	1.8	1.1	0	1.7	4.4	5.5	8.6	21.5
Ritchie-Marlboro Rd	22.6	18.8	17.3	16.2	14.4	13.3	12.4	11.0	9.9	7.2	5.6	3.5	2.8	1.7	0	2.7	3.8	6.9	19.8
MD 4 (Pennsylvania Ave)	25.2	21.4	19.9	18.8	16.9	15.9	15.0	13.6	12.5	9.8	8.2	6.1	5.4	4.3	2.6	0	1.1	4.2	17.1
MD 337 (Suitland Pkwy)	26.8	23.0	21.5	20.4	18.5	17.5	16.6	15.2	14.1	11.4	9.8	7.7	7.0	5.9	4.2	1.6	0	3.1	16.0
MD 5 (Branch Ave)	29.0	25.3	23.7	22.6	20.8	19.7	18.8	17.4	16.3	13.6	12.1	9.9	9.2	8.1	6.4	3.8	2.2	0	12.9
MD 414 (St Barnabas Rd)	32.1	28.3	26.7	25.7	23.8	22.8	21.8	20.4	19.3	16.7	15.1	12.9	12.2	11.2	9.5	6.9	5.3	3.0	0

Travel Time Matrix - Alternative 9 - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.1	3.4	4.6	5.9	7.6	8.4	9.0	8.1	8.8	19.1	17.9	17.2	15.0	13.5	9.8	N/A	10.3	10.7	13.0
Shady Grove Rd	I-270 Exit 8	0.9	0	2.3	3.5	4.9	6.5	7.4	7.9	7.0	7.8	18.1	16.9	16.1	13.9	12.5	8.8	N/A	9.3	9.6	12.0
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.9	2.0	0	1.2	2.6	4.2	5.1	5.6	4.7	5.5	15.8	14.6	13.8	11.6	10.2	6.5	N/A	7.0	7.3	9.6
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.9	0.9	0	1.4	3.0	3.9	4.4	3.5	4.3	14.6	13.4	12.6	10.4	9.0	5.3	N/A	5.7	6.1	8.4
Montrose Rd	I-270 Exit 4	5.0	4.1	2.1	1.3	0	1.7	2.5	3.0	2.1	2.9	13.2	12.0	11.2	9.1	7.6	3.9	N/A	4.4	4.8	7.1
Split	I-270	6.3	5.4	3.4	2.5	1.3	0	0.9	1.4	0.5	1.2	11.6	10.4	9.6	7.4	6.0	2.2	N/A	2.7	3.1	5.4
Westlake Terrace	I-270 W Spur	7.1	6.2	4.2	3.4	2.1	0.8	0	0.5	N/A	N/A	10.7	9.5	8.7	6.6	5.1	1.4	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.5	6.6	4.6	3.7	2.5	1.2	0.4	0	N/A	N/A	10.2	9.0	8.2	6.0	4.6	0.9	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.9	5.9	4.0	3.1	1.8	0.6	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	2.6	4.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.6	4.6	3.8	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	1.9	4.2
VA 193 (Georgetown Pike)	I-495 Exit 44	15.8	14.9	12.9	12.0	10.7	9.5	8.6	8.2	N/A	N/A	0	2.3	3.8	5.6	6.0	7.4	9.6	10.4	10.8	13.1
George Washington Memorial Pkwy	I-495 Exit 43	13.5	12.6	10.6	9.7	8.5	7.2	6.4	6.0	N/A	N/A	1.2	0	1.5	3.4	3.7	5.2	7.3	8.1	8.5	10.8
Clara Barton Pkwy	I-495 Exit 41	12.0	11.1	9.1	8.2	7.0	5.7	4.9	4.5	N/A	N/A	2.0	0.8	0	1.9	2.2	3.7	5.8	6.6	7.0	9.3
Cabin John Pkwy	I-495 Exit 40	10.1	9.2	7.2	6.3	5.1	3.8	3.0	2.6	N/A	N/A	4.1	2.9	2.2	0	0.3	1.8	3.9	4.8	5.1	7.5
MD 190 (River Rd)	I-495 Exit 39	9.8	8.9	6.9	6.0	4.8	3.5	2.7	2.3	N/A	N/A	5.6	4.4	3.6	1.5	0	1.5	3.6	4.4	4.8	7.1
I-270 West Spur	I-495 Exit 38	8.4	7.4	5.4	4.6	3.3	2.0	1.2	0.8	N/A	N/A	9.3	8.1	7.3	5.2	3.7	0	2.1	3.0	3.4	5.7
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.4	16.2	15.5	13.3	11.8	8.1	0	0.8	1.2	3.5
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	23.5	22.3	21.5	19.3	17.9	14.2	6.1	0	0.4	2.7
MD 355 (Rockville Pike)	I-495 Exit 34	10.7	9.8	7.8	6.9	5.6	4.4	N/A	N/A	3.8	3.1	25.2	24.0	23.3	21.1	19.6	15.9	7.8	1.8	0	2.3
MD 185 (Connecticut Ave)	I-495 Exit 33	14.7	13.8	11.8	10.9	9.6	8.4	N/A	N/A	7.8	7.1	29.2	28.0	27.3	25.1	23.6	19.9	11.8	5.8	4.0	0
MD 97 (Georgia Ave)	I-495 Exit 31	19.6	18.7	16.7	15.8	14.5	13.3	N/A	N/A	12.7	12.0	34.1	32.9	32.2	30.0	28.5	24.8	16.7	10.7	8.9	4.9
US 29 (Colesville Rd)	I-495 Exit 30	20.8	19.9	17.9	17.0	15.8	14.5	N/A	N/A	14.0	13.3	35.4	34.2	33.4	31.2	29.8	26.1	18.0	11.9	10.1	6.2
MD 193 (University Blvd E)	I-495 Exit 29	24.0	23.1	21.1	20.2	18.9	17.7	N/A	N/A	17.1	16.4	38.5	37.3	36.6	34.4	32.9	29.2	21.1	15.1	13.3	9.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	26.3	25.4	23.4	22.5	21.3	20.0	N/A	N/A	19.5	18.8	40.9	39.7	38.9	36.7	35.3	31.6	23.5	17.4	15.6	11.6
I-95	I-495 Exit 27	27.4	26.5	24.5	23.6	22.3	21.1	N/A	N/A	20.5	19.8	41.9	40.7	40.0	37.8	36.3	32.6	24.5	18.5	16.7	12.7
US 1 (Baltimore Ave)	I-495 Exit 25	28.4	27.5	25.5	24.6	23.4	22.1	N/A	N/A	21.5	20.9	43.0	41.8	41.0	38.8	37.4	33.7	25.5	19.5	17.7	13.7
Greenbelt Metro Station	I-495 Exit 24	29.3	28.4	26.4	25.6	24.3	23.0	N/A	N/A	22.5	21.8	43.9	42.7	41.9	39.8	38.3	34.6	26.5	20.4	18.7	14.7
MD 201 (Kenilworth Ave)	I-495 Exit 23	30.8	29.8	27.8	27.0	25.7	24.4	N/A	N/A	23.9	23.2	45.3	44.1	43.3	41.2	39.7	36.0	27.9	21.8	20.1	16.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	31.8	30.9	28.9	28.1	26.8	25.5	N/A	N/A	25.0	24.3	46.4	45.2	44.4	42.2	40.8	37.1	29.0	22.9	21.2	17.2
MD 450 (Annapolis Rd)	I-495 Exit 20	34.5	33.6	31.6	30.7	29.5	28.2	N/A	N/A	27.6	27.0	49.1	47.9	47.1	44.9	43.5	39.8	31.6	25.6	23.8	19.8
US 50 (John Hanson Hwy)	I-495 Exit 19	36.1	35.2	33.2	32.3	31.0	29.8	N/A	N/A	29.2	28.5	50.6	49.4	48.7	46.5	45.0	41.3	33.2	27.2	25.4	21.4
MD 202 (Landover Rd)	I-495 Exit 17	38.3	37.4	35.4	34.5	33.2	32.0	N/A	N/A	31.4	30.7	52.8	51.6	50.9	48.7	47.2	43.5	35.4	29.4	27.6	23.6
Arena Dr	I-495 Exit 16	39.0	38.1	36.1	35.2	34.0	32.7	N/A	N/A	32.1	31.5	53.6	52.4	51.6	49.4	48.0	44.3	36.2	30.1	28.3	24.3
MD 214 (Central Ave)	I-495 Exit 15	40.1	39.2	37.2	36.3	35.0	33.8	N/A	N/A	33.2	32.6	54.6	53.4	52.7	50.5	49.0	45.3	37.2	31.2	29.4	25.4
Ritchie-Marlboro Rd	I-495 Exit 13	41.8	40.9	38.9	38.0	36.8	35.5	N/A	N/A	34.9	34.3	56.4	55.2	54.4	52.2	50.8	47.1	39.0	32.9	31.1	27.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	44.4	43.5	41.5	40.6	39.4	38.1	N/A	N/A	37.5	36.9	59.0	57.8	57.0	54.8	53.4	49.7	41.5	35.5	33.7	29.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	45.8	44.8	42.8	42.0	40.7	39.4	N/A	N/A	38.9	38.2	60.3	59.1	58.4	56.2	54.7	51.0	42.9	36.8	35.1	31.1
MD 5 (Branch Ave)	I-495 Exit 7	47.9	47.0	45.0	44.2	42.9	41.6	N/A	N/A	41.1	40.4	62.5	61.3	60.5	58.3	56.9	53.2	45.1	39.0	37.3	33.3
MD 414 (St Barnabas Rd)	I-495 Exit 4	51.0	50.1	48.1	47.2	45.9	44.7	N/A	N/A	44.1	43.4	65.5	64.3	63.6	61.4	59.9	56.2	48.1	42.1	40.3	36.3

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	16.9	18.4	19.1	21.4	22.9	24.0	25.0	26.6	27.6	30.0	31.5	33.6	34.3	35.4	37.2	39.7	40.8	43.8	56.3
Shady Grove Rd	I-270 Exit 8	15.9	17.4	18.1	20.3	21.9	22.9	24.0	25.6	26.6	29.0	30.4	32.5	33.2	34.4	36.1	38.7	39.8	42.7	55.2
MD 28 (W Montgomery Ave)	I-270 Exit 6	13.6	15.1	15.8	18.0	19.6	20.6	21.7	23.3	24.3	26.7	28.1	30.2	30.9	32.1	33.8	36.4	37.5	40.4	52.9
MD 189 (Falls Rd)	I-270 Exit 5	12.4	13.8	14.6	16.8	18.4	19.4	20.5	22.0	23.0	25.5	26.9	29.0	29.7	30.9	32.6	35.2	36.3	39.2	51.7
Montrose Rd	I-270 Exit 4	11.0	12.5	13.2	15.4	17.0	18.1	19.1	20.7	21.7	24.1	25.6	27.6	28.3	29.5	31.2	33.8	34.9	37.8	50.3
Split	I-270	9.3	10.8	11.5	13.8	15.3	16.4	17.4	19.0	20.0	22.4	23.9	26.0	26.7	27.8	29.6	32.1	33.3	36.2	48.7
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.9	10.4	11.1	13.3	14.9	15.9	17.0	18.6	19.6	22.0	23.4	25.5	26.2	27.4	29.1	31.7	32.8	35.7	48.2
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.1	9.6	10.3	12.5	14.1	15.2	16.2	17.8	18.8	21.2	22.7	24.7	25.4	26.6	28.3	30.9	32.0	34.9	47.4
VA 193 (Georgetown Pike)	I-495 Exit 44	17.0	18.5	19.2	21.4	23.0	24.1	25.1	26.7	27.7	30.1	31.6	33.7	34.3	35.5	37.2	39.8	40.9	43.8	56.4
George Washington Memorial Pkwy	I-495 Exit 43	14.8	16.2	17.0	19.2	20.8	21.8	22.9	24.4	25.4	27.9	29.3	31.4	32.1	33.3	35.0	37.6	38.7	41.6	54.1
Clara Barton Pkwy	I-495 Exit 41	13.3	14.7	15.5	17.7	19.3	20.3	21.4	22.9	23.9	26.4	27.8	29.9	30.6	31.7	33.5	36.1	37.2	40.1	52.6
Cabin John Pkwy	I-495 Exit 40	11.4	12.9	13.6	15.8	17.4	18.4	19.5	21.1	22.1	24.5	25.9	28.0	28.7	29.9	31.6	34.2	35.3	38.2	50.7
MD 190 (River Rd)	I-495 Exit 39	11.1	12.5	13.3	15.5	17.1	18.1	19.2	20.7	21.7	24.2	25.6	27.7	28.4	29.6	31.3	33.9	35.0	37.9	50.4
I-270 West Spur	I-495 Exit 38	9.6	11.1	11.8	14.0	15.6	16.7	17.7	19.3	20.3	22.7	24.2	26.2	26.9	28.1	29.8	32.4	33.5	36.4	48.9
MD 187 (Old Georgetown Rd)	I-495 Exit 36	7.5	9.0	9.7	11.9	13.5	14.5	15.6	17.2	18.2	20.6	22.0	24.1	24.8	26.0	27.7	30.3	31.4	34.3	46.8
I-270 East Spur	I-495 Exit 35	6.6	8.1	8.8	11.0	12.6	13.7	14.7	16.3	17.3	19.7	21.2	23.3	23.9	25.1	26.8	29.4	30.5	33.4	46.0
MD 355 (Rockville Pike)	I-495 Exit 34	6.2	7.7	8.4	10.7	12.2	13.3	14.3	15.9	16.9	19.3	20.8	22.9	23.6	24.7	26.5	29.0	30.1	33.0	45.6
MD 185 (Connecticut Ave)	I-495 Exit 33	3.9	5.4	6.1	8.3	9.9	11.0	12.0	13.6	14.6	17.0	18.5	20.6	21.2	22.4	24.2	26.7	27.8	30.7	43.3
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.5	2.2	4.4	6.0	7.1	8.1	9.7	10.7	13.1	14.5	16.6	17.3	18.5	20.2	22.8	23.9	26.8	39.3
US 29 (Colesville Rd)	I-495 Exit 30	1.8	0	0.7	2.9	4.5	5.6	6.6	8.2	9.2	11.6	13.1	15.2	15.8	17.0	18.7	21.3	22.4	25.3	37.9
MD 193 (University Blvd E)	I-495 Exit 29	5.0	0.8	0	2.2	3.8	4.9	5.9	7.5	8.5	10.9	12.4	14.4	15.1	16.3	18.0	20.6	21.7	24.6	37.1
MD 650 (New Hampshire Ave)	I-495 Exit 28	7.3	3.2	1.7	0	1.6	2.6	3.7	5.3	6.3	8.7	10.1	12.2	12.9	14.1	15.8	18.4	19.5	22.4	34.9
I-95	I-495 Exit 27	8.4	4.3	2.7	1.8	0	1.1	2.1	3.7	4.7	7.1	8.5	10.6	11.3	12.5	14.2	16.8	17.9	20.8	33.3
US 1 (Baltimore Ave)	I-495 Exit 25	9.4	5.3	3.7	2.9	1.0	0	1.0	2.6	3.6	6.0	7.5	9.6	10.3	11.4	13.2	15.7	16.9	19.8	32.3
Greenbelt Metro Station	I-495 Exit 24	10.4	6.2	4.7	3.8	2.0	0.9	0	1.6	2.6	5.0	6.5	8.5	9.2	10.4	12.1	14.7	15.8	18.7	31.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	11.8	7.6	6.1	5.2	3.4	2.3	1.4	0	1.0	3.4	4.9	7.0	7.6	8.8	10.5	13.1	14.2	17.1	29.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	12.8	8.7	7.2	6.3	4.5	3.4	2.5	1.1	0	2.4	3.9	5.9	6.6	7.8	9.5	12.1	13.2	16.1	28.7
MD 450 (Annapolis Rd)	I-495 Exit 20	15.5	11.4	9.8	9.0	7.1	6.1	5.2	3.8	2.7	0	1.4	3.5	4.2	5.4	7.1	9.7	10.8	13.7	26.2
US 50 (John Hanson Hwy)	I-495 Exit 19	17.1	13.0	11.4	10.5	8.7	7.7	6.7	5.3	4.2	1.6	0	2.1	2.8	3.9	5.7	8.2	9.4	12.3	24.8
MD 202 (Landover Rd)	I-495 Exit 17	19.3	15.2	13.6	12.7	10.9	9.9	8.9	7.5	6.4	3.8	2.2	0	0.7	1.9	3.6	6.2	7.3	10.2	22.7
Arena Dr	I-495 Exit 16	20.0	15.9	14.3	13.5	11.6	10.6	9.7	8.3	7.2	4.5	2.9	0.7	0	1.2	2.9	5.5	6.6	9.5	22.0
MD 214 (Central Ave)	I-495 Exit 15	21.1	17.0	15.4	14.5	12.7	11.7	10.7	9.3	8.3	5.6	4.0	1.8	1.1	0	1.7	4.3	5.4	8.3	20.8
Ritchie-Marlboro Rd	I-495 Exit 13	22.8	18.7	17.1	16.3	14.4	13.4	12.5	11.1	10.0	7.3	5.7	3.5	2.8	1.7	0	2.6	3.7	6.6	19.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	25.4	21.3	19.7	18.9	17.0	16.0	15.1	13.7	12.6	9.9	8.3	6.1	5.4	4.3	2.6	0	1.1	4.0	16.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	26.8	22.6	21.1	20.2	18.4	17.3	16.4	15.0	13.9	11.2	9.7	7.5	6.7	5.7	3.9	1.4	0	2.9	15.4
MD 5 (Branch Ave)	I-495 Exit 7	28.9	24.8	23.3	22.4	20.6	19.5	18.6	17.2	16.1	13.4	11.9	9.7	8.9	7.9	6.1	3.5	2.2	0	12.5
MD 414 (St Barnabas Rd)	I-495 Exit 4	32.0	27.9	26.3	25.4	23.6	22.6	21.6	20.2	19.1	16.5	14.9	12.7	12.0	10.9	9.2	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 10 - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.4	5.1	6.7	9.3	12.6	14.4	10.4	12.2	26.2	25.0	24.2	22.0	20.5	16.8	N/A	14.6	15.0	17.2
Shady Grove Rd	I-270 Exit 8	0.9	0	2.3	4.0	5.6	8.2	11.6	13.4	9.3	11.2	25.1	23.9	23.2	21.0	19.5	15.8	N/A	13.5	13.9	16.2
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.9	2.0	0	1.7	3.3	5.9	9.2	11.1	7.0	8.9	22.8	21.6	20.9	18.7	17.2	13.5	N/A	11.2	11.6	13.9
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.9	0.9	0	1.6	4.2	7.5	9.3	5.3	7.1	21.1	19.9	19.1	16.9	15.5	11.8	N/A	9.5	9.9	12.2
Montrose Rd	I-270 Exit 4	5.0	4.1	2.1	1.3	0	2.6	6.0	7.8	3.7	5.6	19.5	18.3	17.6	15.4	13.9	10.2	N/A	7.9	8.3	10.6
Split	I-270	6.3	5.4	3.4	2.5	1.3	0	3.3	5.2	1.1	3.0	16.9	15.7	15.0	12.8	11.3	7.6	N/A	5.3	5.7	8.0
Westlake Terrace	I-270 W Spur	7.2	6.2	4.3	3.4	2.1	0.8	0	1.8	N/A	N/A	13.6	12.4	11.6	9.4	7.9	4.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.5	6.6	4.6	3.8	2.5	1.2	0.4	0	N/A	N/A	11.8	10.6	9.8	7.6	6.1	2.4	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.9	5.9	4.0	3.1	1.8	0.6	N/A	N/A	0	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.2	4.6	6.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.6	4.6	3.8	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	2.7	5.0
VA 193 (Georgetown Pike)	I-495 Exit 44	16.1	15.2	13.2	12.4	11.1	9.8	9.0	8.6	N/A	N/A	0	2.6	4.1	6.0	6.3	7.8	9.8	10.6	11.0	13.3
George Washington Memorial Pkwy	I-495 Exit 43	13.6	12.6	10.7	9.8	8.5	7.2	6.4	6.0	N/A	N/A	1.2	0	1.6	3.4	3.7	5.2	7.2	8.1	8.4	10.7
Clara Barton Pkwy	I-495 Exit 41	12.0	11.1	9.1	8.2	7.0	5.7	4.9	4.5	N/A	N/A	2.0	0.8	0	1.9	2.2	3.6	5.7	6.5	6.9	9.2
Cabin John Pkwy	I-495 Exit 40	10.1	9.2	7.2	6.4	5.1	3.8	3.0	2.6	N/A	N/A	4.2	3.0	2.2	0	0.3	1.8	3.8	4.6	5.0	7.3
MD 190 (River Rd)	I-495 Exit 39	9.8	8.9	6.9	6.1	4.8	3.5	2.7	2.3	N/A	N/A	5.6	4.4	3.7	1.5	0	1.5	3.5	4.3	4.7	7.0
I-270 West Spur	I-495 Exit 38	8.4	7.4	5.5	4.6	3.3	2.0	1.2	0.8	N/A	N/A	9.3	8.1	7.4	5.2	3.7	0	2.0	2.9	3.2	5.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21.4	20.2	19.4	17.2	15.7	12.0	0	0.8	1.2	3.5
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	25.8	24.6	23.8	21.6	20.2	16.5	4.4	0	0.4	2.7
MD 355 (Rockville Pike)	I-495 Exit 34	9.7	8.8	6.9	6.0	4.7	3.4	N/A	N/A	2.9	2.2	26.7	25.5	24.7	22.5	21.0	17.3	5.3	0.9	0	2.3
MD 185 (Connecticut Ave)	I-495 Exit 33	11.7	10.8	8.8	7.9	6.7	5.4	N/A	N/A	4.8	4.2	28.6	27.4	26.7	24.5	23.0	19.3	7.2	2.8	2.0	0
MD 97 (Georgia Ave)	I-495 Exit 31	15.9	15.0	13.0	12.1	10.9	9.6	N/A	N/A	9.0	8.4	32.8	31.6	30.8	28.6	27.2	23.5	11.4	7.0	6.1	4.2
US 29 (Colesville Rd)	I-495 Exit 30	15.8	14.9	12.9	12.0	10.8	9.5	N/A	N/A	8.9	8.2	32.7	31.5	30.7	28.5	27.1	23.4	11.3	6.9	6.0	4.1
MD 193 (University Blvd E)	I-495 Exit 29	18.9	18.0	16.0	15.1	13.8	12.6	N/A	N/A	12.0	11.3	35.8	34.6	33.8	31.6	30.1	26.4	14.4	10.0	9.1	7.2
MD 650 (New Hampshire Ave)	I-495 Exit 28	21.2	20.3	18.3	17.4	16.2	14.9	N/A	N/A	14.3	13.6	38.1	36.9	36.1	33.9	32.5	28.8	16.7	12.3	11.4	9.5
I-95	I-495 Exit 27	22.3	21.4	19.4	18.5	17.2	16.0	N/A	N/A	15.4	14.7	39.2	38.0	37.2	35.0	33.5	29.8	17.8	13.4	12.5	10.6
US 1 (Baltimore Ave)	I-495 Exit 25	23.3	22.4	20.4	19.5	18.3	17.0	N/A	N/A	16.4	15.8	40.2	39.0	38.3	36.1	34.6	30.9	18.8	14.4	13.6	11.6
Greenbelt Metro Station	I-495 Exit 24	24.3	23.3	21.4	20.5	19.2	17.9	N/A	N/A	17.4	16.7	41.2	40.0	39.2	37.0	35.5	31.8	19.8	15.4	14.5	12.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	25.6	24.7	22.7	21.9	20.6	19.3	N/A	N/A	18.8	18.1	42.6	41.4	40.6	38.4	36.9	33.2	21.2	16.8	15.9	13.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	26.7	25.8	23.8	23.0	21.7	20.4	N/A	N/A	19.9	19.2	43.6	42.4	41.7	39.5	38.0	34.3	22.3	17.8	17.0	15.0
MD 450 (Annapolis Rd)	I-495 Exit 20	29.4	28.5	26.5	25.6	24.4	23.1	N/A	N/A	22.5	21.9	46.3	45.1	44.4	42.2	40.7	37.0	24.9	20.5	19.7	17.7
US 50 (John Hanson Hwy)	I-495 Exit 19	31.0	30.1	28.1	27.2	26.0	24.7	N/A	N/A	24.1	23.4	47.9	46.7	45.9	43.7	42.3	38.5	26.5	22.1	21.2	19.3
MD 202 (Landover Rd)	I-495 Exit 17	33.2	32.2	30.3	29.4	28.1	26.8	N/A	N/A	26.3	25.6	50.1	48.9	48.1	45.9	44.4	40.7	28.7	24.3	23.4	21.4
Arena Dr	I-495 Exit 16	33.9	33.0	31.0	30.1	28.8	27.6	N/A	N/A	27.0	26.3	50.8	49.6	48.8	46.6	45.2	41.4	29.4	25.0	24.1	22.2
MD 214 (Central Ave)	I-495 Exit 15	34.9	34.0	32.0	31.2	29.9	28.6	N/A	N/A	28.1	27.4	51.9	50.7	49.9	47.7	46.2	42.5	30.5	26.1	25.2	23.2
Ritchie-Marlboro Rd	I-495 Exit 13	36.7	35.7	33.8	32.9	31.6	30.3	N/A	N/A	29.8	29.1	53.6	52.4	51.6	49.4	47.9	44.2	32.2	27.8	26.9	25.0
MD 4 (Pennsylvania Ave)	I-495 Exit 11	39.3	38.3	36.4	35.5	34.2	32.9	N/A	N/A	32.4	31.7	56.2	55.0	54.2	52.0	50.5	46.8	34.8	30.4	29.5	27.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	40.6	39.7	37.7	36.8	35.6	34.3	N/A	N/A	33.7	33.1	57.5	56.3	55.6	53.4	51.9	48.2	36.1	31.7	30.9	28.9
MD 5 (Branch Ave)	I-495 Exit 7	42.8	41.9	39.9	39.0	37.8	36.5	N/A	N/A	35.9	35.3	59.7	58.5	57.7	55.5	54.1	50.4	38.3	33.9	33.0	31.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	45.8	44.9	42.9	42.1	40.8	39.5	N/A	N/A	39.0	38.3	62.7	61.5	60.8	58.6	57.1	53.4	41.4	36.9	36.1	34.1

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	21.3	22.8	23.5	25.5	27.1	28.2	29.3	30.9	31.9	34.3	35.8	37.9	38.6	39.8	41.5	44.1	45.2	48.2	61.5
Shady Grove Rd	20.2	21.7	22.4	24.5	26.1	27.2	28.3	29.8	30.8	33.3	34.8	36.9	37.5	38.7	40.4	43.0	44.1	47.2	60.4
MD 28 (W Montgomery Ave)	17.9	19.4	20.1	22.2	23.8	24.8	25.9	27.5	28.5	31.0	32.4	34.5	35.2	36.4	38.1	40.7	41.8	44.8	58.1
MD 189 (Falls Rd)	16.2	17.7	18.4	20.5	22.0	23.1	24.2	25.8	26.8	29.3	30.7	32.8	33.5	34.7	36.4	39.0	40.1	43.1	56.4
Montrose Rd	14.6	16.1	16.8	18.9	20.5	21.6	22.6	24.2	25.2	27.7	29.2	31.3	31.9	33.1	34.8	37.4	38.5	41.5	54.8
Split	12.0	13.5	14.2	16.3	17.9	18.9	20.0	21.6	22.6	25.1	26.5	28.6	29.3	30.5	32.2	34.8	35.9	38.9	52.2
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	10.9	12.4	13.1	15.2	16.8	17.8	18.9	20.5	21.5	24.0	25.4	27.5	28.2	29.4	31.1	33.7	34.8	37.8	51.1
MD 187 (Old Georgetown Rd)	9.1	10.5	11.2	13.3	14.9	16.0	17.1	18.7	19.7	22.1	23.6	25.7	26.4	27.5	29.3	31.8	33.0	36.0	49.2
VA 193 (Georgetown Pike)	17.3	18.8	19.5	21.6	23.2	24.2	25.3	26.9	27.9	30.4	31.9	33.9	34.6	35.8	37.5	40.1	41.2	44.2	57.5
George Washington Memorial Pkwy	14.8	16.2	17.0	19.0	20.6	21.7	22.8	24.4	25.4	27.8	29.3	31.4	32.1	33.2	35.0	37.6	38.7	41.7	54.9
Clara Barton Pkwy	13.2	14.7	15.4	17.5	19.1	20.1	21.2	22.8	23.8	26.3	27.7	29.8	30.5	31.7	33.4	36.0	37.1	40.1	53.4
Cabin John Pkwy	11.4	12.8	13.5	15.6	17.2	18.3	19.4	21.0	22.0	24.4	25.9	28.0	28.6	29.8	31.6	34.1	35.3	38.3	51.5
MD 190 (River Rd)	11.0	12.5	13.2	15.3	16.9	17.9	19.0	20.6	21.6	24.1	25.6	27.6	28.3	29.5	31.2	33.8	34.9	37.9	51.2
I-270 West Spur	9.6	11.0	11.8	13.8	15.4	16.5	17.6	19.2	20.2	22.6	24.1	26.2	26.9	28.0	29.8	32.4	33.5	36.5	49.7
MD 187 (Old Georgetown Rd)	7.5	9.0	9.7	11.8	13.4	14.4	15.5	17.1	18.1	20.6	22.0	24.1	24.8	26.0	27.7	30.3	31.4	34.4	47.7
I-270 East Spur	6.7	8.2	8.9	11.0	12.6	13.6	14.7	16.3	17.3	19.8	21.2	23.3	24.0	25.2	26.9	29.5	30.6	33.6	46.9
MD 355 (Rockville Pike)	6.3	7.8	8.5	10.6	12.2	13.3	14.3	15.9	16.9	19.4	20.9	23.0	23.6	24.8	26.5	29.1	30.2	33.2	46.5
MD 185 (Connecticut Ave)	4.1	5.5	6.2	8.3	9.9	11.0	12.1	13.6	14.7	17.1	18.6	20.7	21.3	22.5	24.3	26.8	27.9	31.0	44.2
MD 97 (Georgia Ave)	0	1.5	2.2	4.3	5.8	6.9	8.0	9.6	10.6	13.0	14.5	16.6	17.3	18.5	20.2	22.8	23.9	26.9	40.2
US 29 (Colesville Rd)	1.9	0	0.7	2.8	4.4	5.4	6.5	8.1	9.1	11.6	13.1	15.1	15.8	17.0	18.7	21.3	22.4	25.4	38.7
MD 193 (University Blvd E)	5.0	0.9	0	2.1	3.7	4.7	5.8	7.4	8.4	10.9	12.3	14.4	15.1	16.3	18.0	20.6	21.7	24.7	38.0
MD 650 (New Hampshire Ave)	7.3	3.2	1.7	0	1.6	2.7	3.8	5.3	6.4	8.8	10.3	12.4	13.0	14.2	15.9	18.5	19.6	22.7	35.9
I-95	8.4	4.3	2.7	1.8	0	1.1	2.2	3.8	4.8	7.2	8.7	10.8	11.5	12.6	14.4	16.9	18.1	21.1	34.3
US 1 (Baltimore Ave)	9.4	5.3	3.8	2.9	1.0	0	1.1	2.7	3.7	6.1	7.6	9.7	10.4	11.6	13.3	15.9	17.0	20.0	33.3
Greenbelt Metro Station	10.4	6.3	4.7	3.8	2.0	0.9	0	1.6	2.6	5.0	6.5	8.6	9.3	10.5	12.2	14.8	15.9	18.9	32.2
MD 201 (Kenilworth Ave)	11.7	7.7	6.1	5.2	3.4	2.3	1.4	0	1.0	3.5	4.9	7.0	7.7	8.9	10.6	13.2	14.3	17.3	30.6
MD 295 (Baltimore-Washington Pkwy)	12.8	8.7	7.2	6.3	4.5	3.4	2.5	1.1	0	2.4	3.9	6.0	6.7	7.9	9.6	12.2	13.3	16.3	29.6
MD 450 (Annapolis Rd)	15.5	11.4	9.9	9.0	7.1	6.1	5.2	3.8	2.7	0	1.5	3.6	4.2	5.4	7.2	9.7	10.9	13.9	27.1
US 50 (John Hanson Hwy)	17.1	13.0	11.4	10.5	8.7	7.7	6.7	5.3	4.2	1.6	0	2.1	2.8	3.9	5.7	8.3	9.4	12.4	25.7
MD 202 (Landover Rd)	19.3	15.2	13.6	12.7	10.9	9.8	8.9	7.5	6.4	3.7	2.2	0	0.7	1.9	3.6	6.2	7.3	10.3	23.6
Arena Dr	20.0	15.9	14.3	13.4	11.6	10.6	9.6	8.2	7.1	4.5	2.9	0.7	0	1.2	2.9	5.5	6.6	9.6	22.9
MD 214 (Central Ave)	21.0	17.0	15.4	14.5	12.7	11.6	10.7	9.3	8.2	5.5	4.0	1.8	1.1	0	1.7	4.3	5.4	8.4	21.7
Ritchie-Marlboro Rd	22.8	18.7	17.1	16.2	14.4	13.3	12.4	11.0	9.9	7.3	5.7	3.5	2.8	1.7	0	2.6	3.7	6.7	20.0
MD 4 (Pennsylvania Ave)	25.4	21.3	19.7	18.8	17.0	15.9	15.0	13.6	12.5	9.9	8.3	6.1	5.4	4.3	2.6	0	1.1	4.1	17.4
MD 337 (Suitland Pkwy)	26.7	22.6	21.1	20.2	18.3	17.3	16.4	15.0	13.9	11.2	9.6	7.5	6.7	5.7	4.0	1.4	0	3.0	16.3
MD 5 (Branch Ave)	28.9	24.8	23.3	22.4	20.5	19.5	18.5	17.2	16.1	13.4	11.8	9.6	8.9	7.9	6.1	3.5	2.2	0	13.3
MD 414 (St Barnabas Rd)	31.9	27.8	26.3	25.4	23.6	22.5	21.6	20.2	19.1	16.4	14.9	12.7	12.0	10.9	9.2	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 13B - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	1.1	3.4	4.6	6.0	7.7	8.5	9.0	8.1	8.9	19.6	18.4	17.6	15.3	13.9	9.9	N/A	10.5	10.9	13.1
Shady Grove Rd	I-270 Exit 8	0	2.3	3.6	5.0	6.6	7.5	8.0	7.1	7.8	18.5	17.3	16.5	14.3	12.8	8.9	N/A	9.5	9.8	12.0
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.0	0	1.3	2.6	4.3	5.2	5.7	4.8	5.5	16.2	15.0	14.2	12.0	10.5	6.6	N/A	7.1	7.5	9.7
MD 189 (Falls Rd)	I-270 Exit 5	2.9	0.9	0	1.4	3.0	3.9	4.4	3.5	4.3	14.9	13.7	13.0	10.7	9.2	5.3	N/A	5.9	6.3	8.5
Montrose Rd	I-270 Exit 4	4.1	2.1	1.3	0	1.7	2.5	3.0	2.1	2.9	13.6	12.4	11.6	9.3	7.9	3.9	N/A	4.5	4.9	7.1
Split	I-270	5.4	3.4	2.5	1.3	0	0.9	1.4	0.5	1.2	11.9	10.7	9.9	7.7	6.2	2.3	N/A	2.8	3.2	5.4
Westlake Terrace	I-270 W Spur	6.2	4.2	3.4	2.1	0.8	0	0.5	N/A	N/A	11.0	9.9	9.1	6.8	5.4	1.4	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	6.6	4.6	3.8	2.5	1.2	0.4	0	N/A	N/A	10.5	9.3	8.6	6.3	4.8	0.9	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.0	4.0	3.1	1.8	0.6	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.4	2.8	5.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	6.6	4.6	3.8	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6	2.0	4.2
VA 193 (Georgetown Pike)	I-495 Exit 44	17.8	15.8	14.9	13.7	12.4	11.6	11.2	N/A	N/A	0	4.6	6.7	8.5	8.9	10.3	12.4	13.3	13.7	15.9
George Washington Memorial Pkwy	I-495 Exit 43	13.1	11.2	10.3	9.0	7.7	6.9	6.5	N/A	N/A	1.2	0	2.0	3.9	4.2	5.7	7.8	8.7	9.0	11.3
Clara Barton Pkwy	I-495 Exit 41	11.1	9.1	8.3	7.0	5.7	4.9	4.5	N/A	N/A	2.0	0.8	0	1.9	2.2	3.7	5.8	6.6	7.0	9.2
Cabin John Pkwy	I-495 Exit 40	9.3	7.3	6.4	5.1	3.9	3.0	2.6	N/A	N/A	4.2	3.0	2.3	0	0.3	1.8	3.9	4.8	5.2	7.4
MD 190 (River Rd)	I-495 Exit 39	8.9	6.9	6.1	4.8	3.5	2.7	2.3	N/A	N/A	5.7	4.5	3.7	1.5	0	1.5	3.6	4.4	4.8	7.0
I-270 West Spur	I-495 Exit 38	7.5	5.5	4.6	3.3	2.1	1.2	0.8	N/A	N/A	9.7	8.5	7.7	5.4	4.0	0	2.1	3.0	3.4	5.6
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.2	17.0	16.2	13.9	12.5	8.5	0	0.9	1.2	3.5
I-270 East Spur	I-495 Exit 35	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	25.1	23.9	23.2	20.9	19.4	15.5	7.0	0	0.4	2.6
MD 355 (Rockville Pike)	I-495 Exit 34	10.8	8.8	7.9	6.7	5.4	N/A	N/A	4.8	4.2	27.9	26.7	26.0	23.7	22.2	18.3	9.8	2.8	0	2.2
MD 185 (Connecticut Ave)	I-495 Exit 33	16.8	14.8	13.9	12.6	11.4	N/A	N/A	10.8	10.1	33.9	32.7	31.9	29.7	28.2	24.2	15.7	8.8	6.0	0
MD 97 (Georgia Ave)	I-495 Exit 31	23.5	21.5	20.6	19.4	18.1	N/A	N/A	17.5	16.9	40.6	39.4	38.7	36.4	34.9	31.0	22.5	15.5	12.7	6.7
US 29 (Colesville Rd)	I-495 Exit 30	26.0	24.0	23.1	21.9	20.6	N/A	N/A	20.0	19.4	43.1	41.9	41.2	38.9	37.4	33.5	25.0	18.0	15.2	9.2
MD 193 (University Blvd E)	I-495 Exit 29	29.7	27.7	26.9	25.6	24.3	N/A	N/A	23.8	23.1	46.9	45.7	44.9	42.6	41.2	37.2	28.7	21.7	18.9	13.0
MD 650 (New Hampshire Ave)	I-495 Exit 28	32.4	30.4	29.5	28.3	27.0	N/A	N/A	26.4	25.8	49.5	48.3	47.6	45.3	43.8	39.9	31.4	24.4	21.6	15.6
I-95	I-495 Exit 27	33.5	31.5	30.6	29.3	28.1	N/A	N/A	27.5	26.8	50.6	49.4	48.6	46.4	44.9	41.0	32.4	25.5	22.7	16.7
US 1 (Baltimore Ave)	I-495 Exit 25	34.5	32.5	31.6	30.4	29.1	N/A	N/A	28.5	27.9	51.6	50.4	49.7	47.4	45.9	42.0	33.5	26.5	23.7	17.7
Greenbelt Metro Station	I-495 Exit 24	35.4	33.4	32.6	31.3	30.0	N/A	N/A	29.5	28.8	52.6	51.4	50.6	48.4	46.9	42.9	34.4	27.4	24.7	18.7
MD 201 (Kenilworth Ave)	I-495 Exit 23	36.8	34.8	34.0	32.7	31.4	N/A	N/A	30.9	30.2	54.0	52.8	52.0	49.8	48.3	44.3	35.8	28.8	26.1	20.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	37.9	36.0	35.1	33.8	32.5	N/A	N/A	32.0	31.3	55.1	53.9	53.1	50.9	49.4	45.4	36.9	29.9	27.2	21.2
MD 450 (Annapolis Rd)	I-495 Exit 20	40.2	39.3	38.1	36.8	N/A	N/A	36.2	35.6	59.3	58.1	57.4	55.1	53.6	49.7	41.2	34.2	31.4	25.4
US 50 (John Hanson Hwy)	I-495 Exit 19	42.3	41.5	40.2	38.9	N/A	N/A	38.4	37.7	61.5	60.3	59.5	57.3	55.8	51.8	43.3	36.3	33.6	27.6
MD 202 (Landover Rd)	I-495 Exit 17	44.3	42.2	41.5	40.2	38.9	N/A	N/A	38.4	37.7	61.5	60.3	59.5	57.3	55.8	51.8	43.3	36.3	33.6	27.6
Arena Dr	I-495 Exit 16	45.1	43.1	42.2	40.9	39.7	N/A	N/A	39.1	38.4	62.2	61.0	60.2	58.0	56.5	52.6	44.0	37.1	34.3	28.3
MD 214 (Central Ave)	I-495 Exit 15	46.1	44.1	43.3	42.0	40.7	N/A	N/A	40.2	39.5	63.3	62.1	61.3	59.1	57.6	53.6	45.1	38.1	35.4	29.4
Ritchie-Marlboro Rd	I-495 Exit 13	47.9	45.9	45.0	43.7	42.5	N/A	N/A	41.9	41.2	65.0	63.8	63.0	60.8	59.3	55.4	46.8	39.9	37.1	31.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	50.5	48.5	47.6	46.3	45.1	N/A	N/A	44.5	43.8	67.6	66.4	65.6	63.4	61.9	58.0	49.4	42.5	39.7	33.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	51.8	49.8	48.9	47.7	46.4	N/A	N/A	45.9	45.2	69.0	67.8	67.0	64.7	63.3	59.3	50.8	43.8	41.0	35.1
MD 5 (Branch Ave)	I-495 Exit 7	54.0	52.0	51.1	49.9	48.6	N/A	N/A	48.0	47.4	71.1	69.9	69.2	66.9	65.4	61.5	53.0	46.0	43.2	37.2
MD 414 (St Barnabas Rd)	I-495 Exit 4	57.0	55.0	54.2	52.9	51.6	N/A	N/A	51.1	50.4	74.2	73.0	72.2	69.9	68.5	64.5	56.0	49.0	46.2	40.3

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	17.1	18.6	19.3	21.3	22.9	23.9	24.9	26.5	27.5	29.9	31.4	33.5	34.2	35.3	37.1	39.7	40.9	43.4	54.4
Shady Grove Rd	I-270 Exit 8	16.0	17.5	18.2	20.2	21.8	22.9	23.9	25.5	26.5	28.9	30.3	32.4	33.1	34.3	36.0	38.7	39.8	42.3	53.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	13.7	15.2	15.9	17.9	19.5	20.6	21.6	23.1	24.1	26.6	28.0	30.1	30.8	32.0	33.7	36.4	37.5	40.0	51.0
MD 189 (Falls Rd)	I-270 Exit 5	12.5	13.9	14.7	16.7	18.2	19.3	20.3	21.9	22.9	25.3	26.8	28.8	29.5	30.7	32.4	35.1	36.2	38.7	49.7
Montrose Rd	I-270 Exit 4	11.1	12.6	13.3	15.3	16.9	17.9	18.9	20.5	21.5	23.9	25.4	27.5	28.1	29.3	31.1	33.7	34.8	37.4	48.4
Split	I-270	9.4	10.9	11.6	13.6	15.2	16.3	17.3	18.8	19.8	22.3	23.7	25.8	26.5	27.7	29.4	32.1	33.2	35.7	46.7
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	9.0	10.4	11.1	13.2	14.7	15.8	16.8	18.4	19.4	21.8	23.3	25.3	26.0	27.2	28.9	31.6	32.7	35.2	46.2
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.2	9.7	10.4	12.4	14.0	15.0	16.0	17.6	18.6	21.1	22.5	24.6	25.3	26.4	28.2	30.8	32.0	34.5	45.5
VA 193 (Georgetown Pike)	I-495 Exit 44	19.9	21.4	22.1	24.1	25.7	26.7	27.7	29.3	30.3	32.7	34.2	36.3	36.9	38.1	39.9	42.5	43.6	46.2	57.2
George Washington Memorial Pkwy	I-495 Exit 43	15.2	16.7	17.4	19.4	21.0	22.1	23.1	24.7	25.7	28.1	29.5	31.6	32.3	33.5	35.2	37.9	39.0	41.5	52.5
Clara Barton Pkwy	I-495 Exit 41	13.2	14.7	15.4	17.4	19.0	20.1	21.1	22.6	23.6	26.1	27.5	29.6	30.3	31.5	33.2	35.9	37.0	39.5	50.5
Cabin John Pkwy	I-495 Exit 40	11.4	12.8	13.5	15.6	17.1	18.2	19.2	20.8	21.8	24.2	25.7	27.7	28.4	29.6	31.3	34.0	35.1	37.6	48.6
MD 190 (River Rd)	I-495 Exit 39	11.0	12.5	13.2	15.2	16.8	17.9	18.9	20.5	21.5	23.9	25.3	27.4	28.1	29.3	31.0	33.7	34.8	37.3	48.3
I-270 West Spur	I-495 Exit 38	9.6	11.0	11.8	13.8	15.3	16.4	17.4	19.0	20.0	22.4	23.9	25.9	26.6	27.8	29.5	32.2	33.3	35.8	46.8
MD 187 (Old Georgetown Rd)	I-495 Exit 36	7.4	8.9	9.6	11.6	13.2	14.3	15.3	16.9	17.9	20.3	21.7	23.8	24.5	25.7	27.4	30.1	31.2	33.7	44.7
I-270 East Spur	I-495 Exit 35	6.6	8.1	8.8	10.8	12.4	13.4	14.4	16.0	17.0	19.4	20.9	23.0	23.6	24.8	26.6	29.2	30.3	32.9	43.9
MD 355 (Rockville Pike)	I-495 Exit 34	6.2	7.7	8.4	10.4	12.0	13.0	14.0	15.6	16.6	19.1	20.5	22.6	23.3	24.4	26.2	28.8	30.0	32.5	43.5
MD 185 (Connecticut Ave)	I-495 Exit 33	4.0	5.5	6.2	8.2	9.8	10.8	11.8	13.4	14.4	16.8	18.3	20.4	21.0	22.2	24.0	26.6	27.7	30.3	41.3
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.5	2.2	4.2	5.8	6.8	7.8	9.4	10.4	12.9	14.3	16.4	17.1	18.2	20.0	22.6	23.8	26.3	37.3
US 29 (Colesville Rd)	I-495 Exit 30	2.5	0	0.7	2.7	4.3	5.4	6.4	7.9	8.9	11.4	12.8	14.9	15.6	16.8	18.5	21.2	22.3	24.8	35.8
MD 193 (University Blvd E)	I-495 Exit 29	6.2	0.9	0	2.0	3.6	4.7	5.7	7.2	8.2	10.7	12.1	14.2	14.9	16.1	17.8	20.5	21.6	24.1	35.1
MD 650 (New Hampshire Ave)	I-495 Exit 28	8.9	3.5	1.7	0	1.6	2.6	3.6	5.2	6.2	8.7	10.1	12.2	12.9	14.0	15.8	18.4	19.6	22.1	33.1
I-95	I-495 Exit 27	9.9	4.6	2.7	1.8	0	1.1	2.1	3.6	4.6	7.1	8.5	10.6	11.3	12.5	14.2	16.9	18.0	20.5	31.5
US 1 (Baltimore Ave)	I-495 Exit 25	11.0	5.6	3.8	2.9	1.0	0	1.0	2.6	3.6	6.0	7.5	9.5	10.2	11.4	13.1	15.8	16.9	19.4	30.4
Greenbelt Metro Station	I-495 Exit 24	11.9	6.6	4.7	3.8	2.0	0.9	0	1.6	2.6	5.0	6.5	8.5	9.2	10.4	12.1	14.8	15.9	18.4	29.4
MD 201 (Kenilworth Ave)	I-495 Exit 23	13.3	8.0	6.1	5.2	3.4	2.3	1.4	0	1.0	3.4	4.9	7.0	7.6	8.8	10.6	13.2	14.3	16.9	27.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	14.4	9.1	7.2	6.3	4.5	3.4	2.5	1.1	0	2.4	3.9	6.0	6.6	7.8	9.6	12.2	13.3	15.9	26.9
MD 450 (Annapolis Rd)	I-495 Exit 20	17.1	11.7	9.9	9.0	7.1	6.1	5.2	3.8	2.7	0	1.4	3.5	4.2	5.4	7.1	9.8	10.9	13.4	24.4
US 50 (John Hanson Hwy)	I-495 Exit 19	18.6	13.3	11.4	10.5	8.7	7.7	6.7	5.3	4.2	1.6	0	2.1	2.8	3.9	5.7	8.3	9.5	12.0	23.0
MD 202 (Landover Rd)	I-495 Exit 17	20.8	15.5	13.6	12.7	10.9	9.8	8.9	7.5	6.4	3.7	2.2	0	0.7	1.9	3.6	6.3	7.4	9.9	20.9
Arena Dr	I-495 Exit 16	21.5	16.2	14.3	13.4	11.6	10.6	9.6	8.2	7.1	4.5	2.9	0.7	0	1.2	2.9	5.6	6.7	9.2	20.2
MD 214 (Central Ave)	I-495 Exit 15	22.6	17.3	15.4	14.5	12.7	11.6	10.7	9.3	8.2	5.5	4.0	1.8	1.1	0	1.7	4.4	5.5	8.0	19.0
Ritchie-Marlboro Rd	I-495 Exit 13	24.3	19.0	17.1	16.2	14.4	13.4	12.4	11.0	9.9	7.3	5.7	3.5	2.8	1.7	0	2.7	3.8	6.3	17.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	26.9	21.6	19.7	18.8	17.0	16.0	15.0	13.6	12.5	9.9	8.3	6.1	5.4	4.3	2.6	0	1.1	3.6	14.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	28.3	22.9	21.1	20.2	18.3	17.3	16.4	15.0	13.9	11.2	9.6	7.5	6.7	5.7	4.0	1.3	0	2.5	13.5
MD 5 (Branch Ave)	I-495 Exit 7	30.5	25.1	23.2	22.4	20.5	19.5	18.6	17.2	16.1	13.4	11.8	9.7	8.9	7.9	6.1	3.5	2.2	0	11.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	33.5	28.2	26.3	25.4	23.6	22.5	21.6	20.2	19.1	16.4	14.8	12.7	12.0	10.9	9.2	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 13C - GP Lane (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.7	7.1	10.4	14.7	17.7	19.4	16.0	16.9	30.9	29.7	28.9	26.7	25.4	21.7	N/A	18.8	19.1	21.3
Shady Grove Rd	I-270 Exit 8	0.9	0	2.6	6.0	9.4	13.6	16.7	18.3	15.0	15.8	29.8	28.6	27.9	25.7	24.3	20.7	N/A	17.7	18.1	20.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.9	2.0	0	3.4	6.7	11.0	14.1	15.7	12.3	13.2	27.2	26.0	25.2	23.1	21.7	18.1	N/A	15.1	15.5	17.6
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.9	0.9	0	3.4	7.6	10.7	12.3	8.9	9.8	23.8	22.6	21.9	19.7	18.3	14.7	N/A	11.7	12.1	14.3
Montrose Rd	I-270 Exit 4	5.0	4.1	2.1	1.3	0	4.2	7.3	9.0	5.6	6.5	20.5	19.3	18.5	16.3	14.9	11.3	N/A	8.4	8.7	10.9
Split	I-270	6.3	5.4	3.4	2.5	1.3	0	3.1	4.7	1.3	2.2	16.2	15.0	14.3	12.1	10.7	7.1	N/A	4.1	4.5	6.6
Westlake Terrace	I-270 W Spur	7.2	6.2	4.3	3.4	2.1	0.8	0	1.7	N/A	N/A	13.1	11.9	11.2	9.0	7.6	4.0	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.6	6.6	4.7	3.8	2.5	1.2	0.4	0	N/A	N/A	11.5	10.3	9.5	7.3	6.0	2.4	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.9	6.0	4.0	3.1	1.8	0.6	N/A	N/A	0	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.8	3.1	5.3
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.6	4.6	3.8	2.5	1.2	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.9	2.3	4.4
VA 193 (Georgetown Pike)	I-495 Exit 44	17.6	16.7	14.7	13.9	12.6	11.3	10.5	10.1	N/A	N/A	0	3.8	5.6	7.5	7.8	9.3	11.3	12.1	12.4	14.6
George Washington Memorial Pkwy	I-495 Exit 43	13.8	12.9	10.9	10.0	8.8	7.5	6.6	6.2	N/A	N/A	1.2	0	1.7	3.6	4.0	5.4	7.4	8.2	8.6	10.8
Clara Barton Pkwy	I-495 Exit 41	12.1	11.1	9.2	8.3	7.0	5.7	4.9	4.5	N/A	N/A	2.0	0.8	0	1.9	2.2	3.7	5.7	6.5	6.9	9.0
Cabin John Pkwy	I-495 Exit 40	10.2	9.2	7.3	6.4	5.1	3.8	3.0	2.6	N/A	N/A	4.1	2.9	2.2	0	0.3	1.8	3.8	4.6	5.0	7.1
MD 190 (River Rd)	I-495 Exit 39	9.8	8.9	6.9	6.1	4.8	3.5	2.7	2.3	N/A	N/A	5.5	4.3	3.6	1.4	0	1.5	3.5	4.3	4.6	6.8
I-270 West Spur	I-495 Exit 38	8.4	7.5	5.5	4.6	3.3	2.1	1.2	0.8	N/A	N/A	9.1	7.9	7.2	5.0	3.6	0	2.0	2.8	3.2	5.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.6	21.4	20.6	18.5	17.1	13.5	0	0.8	1.2	3.3
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	30.7	29.5	28.7	26.5	25.2	21.6	8.1	0	0.4	2.5
MD 355 (Rockville Pike)	I-495 Exit 34	11.1	10.2	8.2	7.3	6.0	4.8	N/A	N/A	4.2	3.5	32.9	31.7	30.9	28.7	27.4	23.7	10.3	2.2	0	2.2
MD 185 (Connecticut Ave)	I-495 Exit 33	15.5	14.6	12.7	11.8	10.5	9.2	N/A	N/A	8.7	8.0	37.3	36.1	35.4	33.2	31.8	28.2	14.7	6.7	4.5	0
MD 97 (Georgia Ave)	I-495 Exit 31	20.8	19.9	17.9	17.0	15.7	14.5	N/A	N/A	13.9	13.2	42.6	41.4	40.6	38.4	37.0	33.4	20.0	11.9	9.7	5.2
US 29 (Colesville Rd)	I-495 Exit 30	23.0	22.1	20.1	19.2	18.0	16.7	N/A	N/A	16.1	15.4	44.8	43.6	42.8	40.6	39.3	35.6	22.2	14.1	11.9	7.4
MD 193 (University Blvd E)	I-495 Exit 29	26.2	25.2	23.3	22.4	21.1	19.9	N/A	N/A	19.3	18.6	48.0	46.8	46.0	43.8	42.4	38.8	25.4	17.3	15.1	10.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	28.7	27.8	25.8	25.0	23.7	22.4	N/A	N/A	21.9	21.2	50.5	49.3	48.6	46.4	45.0	41.4	27.9	19.9	17.7	13.2
I-95	I-495 Exit 27	29.9	28.9	27.0	26.1	24.8	23.6	N/A	N/A	23.0	22.3	51.7	50.5	49.7	47.5	46.1	42.5	29.1	21.0	18.8	14.3
US 1 (Baltimore Ave)	I-495 Exit 25	30.9	30.0	28.0	27.1	25.9	24.6	N/A	N/A	24.0	23.4	52.7	51.5	50.7	48.6	47.2	43.6	30.1	22.0	19.8	15.4
Greenbelt Metro Station	I-495 Exit 24	31.8	30.9	28.9	28.1	26.8	25.5	N/A	N/A	25.0	24.3	53.6	52.4	51.7	49.5	48.1	44.5	31.0	23.0	20.8	16.3
MD 201 (Kenilworth Ave)	I-495 Exit 23	33.2	32.3	30.3	29.5	28.2	26.9	N/A	N/A	26.4	25.7	55.0	53.8	53.1	50.9	49.5	45.9	32.4	24.3	22.2	17.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	34.3	33.4	31.4	30.6	29.3	28.0	N/A	N/A	27.5	26.8	56.1	54.9	54.2	52.0	50.6	47.0	33.5	25.4	23.3	18.8
MD 450 (Annapolis Rd)	I-495 Exit 20	37.0	36.1	34.1	33.2	32.0	30.7	N/A	N/A	30.2	29.5	58.8	57.6	56.8	54.7	53.3	49.7	36.2	28.1	25.9	21.5
US 50 (John Hanson Hwy)	I-495 Exit 19	38.6	37.7	35.7	34.8	33.6	32.3	N/A	N/A	31.7	31.1	60.4	59.2	58.4	56.2	54.9	51.3	37.8	29.7	27.5	23.0
MD 202 (Landover Rd)	I-495 Exit 17	40.8	39.9	37.9	37.0	35.8	34.5	N/A	N/A	33.9	33.2	62.6	61.4	60.6	58.4	57.1	53.4	40.0	31.9	29.7	25.2
Arena Dr	I-495 Exit 16	41.5	40.6	38.6	37.7	36.5	35.2	N/A	N/A	34.7	34.0	63.3	62.1	61.3	59.2	57.8	54.2	40.7	32.6	30.4	26.0
MD 214 (Central Ave)	I-495 Exit 15	42.6	41.7	39.7	38.8	37.6	36.3	N/A	N/A	35.7	35.1	64.4	63.2	62.4	60.2	58.9	55.3	41.8	33.7	31.5	27.1
Ritchie-Marlboro Rd	I-495 Exit 13	44.3	43.4	41.4	40.6	39.3	38.0	N/A	N/A	37.5	36.8	66.1	64.9	64.2	62.0	60.6	57.0	43.5	35.4	33.3	28.8
MD 4 (Pennsylvania Ave)	I-495 Exit 11	46.9	46.0	44.0	43.2	41.9	40.6	N/A	N/A	40.1	39.4	68.7	67.5	66.8	64.6	63.2	59.6	46.1	38.0	35.9	31.4
MD 337 (Suitland Pkwy)	I-495 Exit 9	48.3	47.4	45.4	44.5	43.3	42.0	N/A	N/A	41.4	40.8	70.1	68.9	68.1	65.9	64.6	61.0	47.5	39.4	37.2	32.7
MD 5 (Branch Ave)	I-495 Exit 7	50.5	49.6	47.6	46.7	45.4	44.2	N/A	N/A	43.6	42.9	72.3	71.1	70.3	68.1	66.7	63.1	49.7	41.6	39.4	34.9
MD 414 (St Barnabas Rd)	I-495 Exit 4	53.5	52.6	50.6	49.7	48.5	47.2	N/A	N/A	46.6	46.0	75.3	74.1	73.3	71.1	69.8	66.2	52.7	44.6	42.4	38.0

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	25.2	26.7	27.4	29.5	31.1	32.1	33.1	34.7	35.7	38.1	39.5	41.6	42.3	43.5	45.3	47.9	49.0	51.4	63.4
Shady Grove Rd	24.2	25.7	26.4	28.5	30.0	31.1	32.1	33.7	34.7	37.1	38.5	40.6	41.3	42.5	44.2	46.8	47.9	50.3	62.3
MD 28 (W Montgomery Ave)	21.6	23.0	23.7	25.8	27.4	28.5	29.4	31.0	32.0	34.4	35.9	38.0	38.7	39.8	41.6	44.2	45.3	47.7	59.7
MD 189 (Falls Rd)	18.2	19.7	20.4	22.5	24.0	25.1	26.0	27.6	28.6	31.1	32.5	34.6	35.3	36.5	38.2	40.8	41.9	44.3	56.3
Montrose Rd	14.8	16.3	17.0	19.1	20.7	21.7	22.7	24.3	25.3	27.7	29.1	31.2	31.9	33.1	34.9	37.4	38.6	41.0	53.0
Split	10.6	12.1	12.8	14.9	16.4	17.5	18.4	20.0	21.0	23.5	24.9	27.0	27.7	28.9	30.6	33.2	34.3	36.7	48.7
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	9.2	10.7	11.4	13.5	15.1	16.1	17.1	18.7	19.7	22.1	23.5	25.6	26.3	27.5	29.3	31.9	33.0	35.4	47.4
MD 187 (Old Georgetown Rd)	8.4	9.8	10.5	12.6	14.2	15.3	16.2	17.8	18.8	21.2	22.7	24.8	25.5	26.6	28.4	31.0	32.1	34.5	46.5
VA 193 (Georgetown Pike)	18.5	20.0	20.7	22.8	24.4	25.4	26.4	28.0	29.0	31.4	32.8	34.9	35.6	36.8	38.6	41.1	42.3	44.7	56.7
George Washington Memorial Pkwy	14.7	16.2	16.9	19.0	20.5	21.6	22.5	24.1	25.1	27.6	29.0	31.1	31.8	33.0	34.7	37.3	38.4	40.8	52.8
Clara Barton Pkwy	12.9	14.4	15.1	17.2	18.8	19.9	20.8	22.4	23.4	25.8	27.3	29.3	30.0	31.2	33.0	35.6	36.7	39.1	51.1
Cabin John Pkwy	11.0	12.5	13.2	15.3	16.9	17.9	18.9	20.5	21.5	23.9	25.4	27.4	28.1	29.3	31.1	33.7	34.8	37.2	49.2
MD 190 (River Rd)	10.7	12.2	12.9	15.0	16.6	17.6	18.6	20.2	21.2	23.6	25.0	27.1	27.8	29.0	30.7	33.3	34.5	36.8	48.9
I-270 West Spur	9.3	10.7	11.4	13.5	15.1	16.2	17.1	18.7	19.7	22.1	23.6	25.7	26.4	27.5	29.3	31.9	33.0	35.4	47.4
MD 187 (Old Georgetown Rd)	7.3	8.7	9.4	11.5	13.1	14.2	15.1	16.7	17.7	20.1	21.6	23.7	24.4	25.5	27.3	29.9	31.0	33.4	45.4
I-270 East Spur	6.5	7.9	8.6	10.7	12.3	13.4	14.3	15.9	16.9	19.3	20.8	22.9	23.6	24.7	26.5	29.1	30.2	32.6	44.6
MD 355 (Rockville Pike)	6.1	7.6	8.3	10.4	11.9	13.0	14.0	15.5	16.6	19.0	20.4	22.5	23.2	24.4	26.1	28.7	29.8	32.2	44.2
MD 185 (Connecticut Ave)	3.9	5.4	6.1	8.2	9.8	10.8	11.8	13.4	14.4	16.8	18.2	20.3	21.0	22.2	24.0	26.6	27.7	30.1	42.1
MD 97 (Georgia Ave)	0	1.5	2.2	4.3	5.8	6.9	7.9	9.5	10.5	12.9	14.3	16.4	17.1	18.3	20.0	22.6	23.7	26.1	38.1
US 29 (Colesville Rd)	2.7	0	0.7	2.8	4.4	5.4	6.4	8.0	9.0	11.4	12.8	14.9	15.6	16.8	18.6	21.1	22.3	24.7	36.7
MD 193 (University Blvd E)	5.8	0.9	0	2.1	3.7	4.7	5.7	7.3	8.3	10.7	12.1	14.2	14.9	16.1	17.9	20.4	21.6	23.9	36.0
MD 650 (New Hampshire Ave)	8.4	3.5	1.7	0	1.6	2.6	3.6	5.2	6.2	8.6	10.0	12.1	12.8	14.0	15.8	18.3	19.5	21.9	33.9
I-95	9.5	4.6	2.8	1.8	0	1.1	2.0	3.6	4.6	7.0	8.5	10.6	11.2	12.4	14.2	16.8	17.9	20.3	32.3
US 1 (Baltimore Ave)	10.6	5.7	3.8	2.9	1.0	0	1.0	2.6	3.6	6.0	7.4	9.5	10.2	11.4	13.1	15.7	16.8	19.2	31.2
Greenbelt Metro Station	11.5	6.6	4.8	3.8	2.0	0.9	0	1.6	2.6	5.0	6.4	8.5	9.2	10.4	12.2	14.8	15.9	18.3	30.3
MD 201 (Kenilworth Ave)	12.9	8.0	6.1	5.2	3.4	2.3	1.4	0	1.0	3.4	4.8	6.9	7.6	8.8	10.6	13.2	14.3	16.7	28.7
MD 295 (Baltimore-Washington Pkwy)	14.0	9.1	7.2	6.3	4.5	3.4	2.5	1.1	0	2.4	3.8	5.9	6.6	7.8	9.6	12.2	13.3	15.7	27.7
MD 450 (Annapolis Rd)	16.7	11.8	9.9	9.0	7.2	6.1	5.2	3.8	2.7	0	1.4	3.5	4.2	5.4	7.1	9.7	10.9	13.2	25.3
US 50 (John Hanson Hwy)	18.3	13.3	11.5	10.6	8.7	7.7	6.7	5.4	4.3	1.6	0	2.1	2.8	4.0	5.7	8.3	9.4	11.8	23.8
MD 202 (Landover Rd)	20.5	15.5	13.7	12.8	10.9	9.9	8.9	7.5	6.4	3.8	2.2	0	0.7	1.9	3.6	6.2	7.3	9.7	21.7
Arena Dr	21.2	16.3	14.4	13.5	11.7	10.6	9.7	8.3	7.2	4.5	2.9	0.7	0	1.2	2.9	5.5	6.6	9.0	21.1
MD 214 (Central Ave)	22.3	17.3	15.5	14.6	12.7	11.7	10.8	9.4	8.3	5.6	4.0	1.8	1.1	0	1.7	4.3	5.5	7.8	19.9
Ritchie-Marlboro Rd	24.0	19.1	17.2	16.3	14.5	13.4	12.5	11.1	10.0	7.3	5.7	3.5	2.8	1.7	0	2.6	3.7	6.1	18.1
MD 4 (Pennsylvania Ave)	26.6	21.7	19.8	18.9	17.1	16.0	15.1	13.7	12.6	9.9	8.3	6.2	5.4	4.3	2.6	0	1.1	3.5	15.5
MD 337 (Suitland Pkwy)	28.0	23.0	21.2	20.3	18.4	17.4	16.4	15.1	14.0	11.3	9.7	7.5	6.8	5.7	4.0	1.4	0	2.4	14.4
MD 5 (Branch Ave)	30.1	25.2	23.4	22.4	20.6	19.6	18.6	17.2	16.1	13.5	11.9	9.7	9.0	7.9	6.1	3.5	2.2	0	12.0
MD 414 (St Barnabas Rd)	33.2	28.2	26.4	25.5	23.6	22.6	21.7	20.3	19.2	16.5	14.9	12.7	12.0	10.9	9.2	6.6	5.2	3.0	0

Travel Time Matrix - Alternative 5 - ETL (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.8	4.9	6.1	7.0	7.4	6.6	7.4	13.0	12.0	11.4	9.9	9.4	8.1	N/A	8.7	9.1	10.6
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.9	4.0	5.2	6.1	6.5	5.7	6.5	12.1	11.1	10.5	9.0	8.5	7.3	N/A	7.9	8.2	9.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.8	1.9	0	1.0	2.0	3.3	4.1	4.6	3.8	4.6	10.2	9.2	8.5	7.1	6.6	5.3	N/A	5.9	6.3	7.8
MD 189 (Falls Rd)	I-270 Exit 5	3.6	2.7	0.8	0	1.1	2.3	3.2	3.6	2.9	3.6	9.2	8.2	7.6	6.1	5.6	4.4	N/A	5.0	5.3	6.8
Montrose Rd	I-270 Exit 4	4.8	3.9	2.1	1.2	0	1.2	2.1	2.6	1.8	2.5	8.2	7.2	6.5	5.1	4.6	3.3	N/A	3.9	4.3	5.7
Split	I-270	6.1	5.2	3.3	2.5	1.2	0	0.9	1.3	0.5	1.3	6.9	5.9	5.3	3.8	3.3	2.1	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	6.9	6.1	4.2	3.3	2.1	0.9	0	0.5	N/A	N/A	6.1	5.1	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.3	6.4	4.6	3.7	2.5	1.3	0.4	0	N/A	N/A	5.6	4.6	4.0	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.7	5.8	3.9	3.1	1.9	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	4.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.3	6.5	4.6	3.8	2.5	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.4	12.6	10.7	9.8	8.6	7.4	6.5	6.1	N/A	N/A	0	1.3	2.1	3.7	4.0	5.3	7.1	7.9	8.3	9.8
George Washington Memorial Pkwy	I-495 Exit 43	12.1	11.2	9.4	8.5	7.3	6.1	5.2	4.8	N/A	N/A	1.0	0	0.8	2.4	2.7	4.0	5.8	6.6	7.0	8.4
Clara Barton Pkwy	I-495 Exit 41	11.4	10.5	8.6	7.8	6.5	5.3	4.4	4.0	N/A	N/A	1.7	0.7	0	1.6	1.9	3.3	5.1	5.8	6.2	7.7
Cabin John Pkwy	I-495 Exit 40	9.7	8.8	7.0	6.1	4.9	3.7	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.4	4.2	4.6	6.0
MD 190 (River Rd)	I-495 Exit 39	9.4	8.5	6.7	5.8	4.6	3.4	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.1	3.9	4.3	5.7
I-270 West Spur	I-495 Exit 38	8.1	7.2	5.3	4.5	3.3	2.0	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.8	2.6	3.0	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.4	2.9	1.6	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.6	7.8	5.9	5.1	3.8	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.8	4.3	3.8	2.5	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	8.9	8.1	6.2	5.3	4.1	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.1	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.3	9.5	7.6	6.7	5.5	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.5	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.6	11.7	9.9	9.0	7.8	6.5	N/A	N/A	5.9	5.3	11.4	10.4	9.7	8.3	7.8	6.5	4.9	4.0	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	13.5	12.6	10.7	9.9	8.7	7.4	N/A	N/A	6.8	6.2	12.3	11.3	10.6	9.2	8.7	7.4	5.8	4.8	4.6	3.2
MD 193 (University Blvd E)	I-495 Exit 29	14.8	13.9	12.0	11.2	10.0	8.7	N/A	N/A	8.1	7.4	13.5	12.5	11.9	10.5	9.9	8.7	7.0	6.1	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.8	15.9	14.0	13.2	12.0	10.7	N/A	N/A	10.1	9.4	15.6	14.6	13.9	12.5	12.0	10.7	9.0	8.1	7.9	6.5
I-95	I-495 Exit 27	17.7	16.9	15.0	14.1	12.9	11.7	N/A	N/A	11.1	10.4	16.5	15.5	14.9	13.4	12.9	11.6	10.0	9.1	8.8	7.4
US 1 (Baltimore Ave)	I-495 Exit 25	18.7	17.8	15.9	15.1	13.9	12.6	N/A	N/A	12.0	11.3	17.5	16.5	15.8	14.4	13.9	12.6	10.9	10.0	9.8	8.3
Greenbelt Metro Station	I-495 Exit 24	19.5	18.7	16.8	16.0	14.7	13.5	N/A	N/A	12.9	12.2	18.3	17.3	16.7	15.2	14.7	13.4	11.8	10.9	10.6	9.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.8	19.9	18.0	17.2	15.9	14.7	N/A	N/A	14.1	13.4	19.5	18.5	17.9	16.4	15.9	14.7	13.0	12.1	11.8	10.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.7	20.8	18.9	18.1	16.9	15.6	N/A	N/A	15.0	14.3	20.5	19.5	18.8	17.4	16.9	15.6	13.9	13.0	12.8	11.3
MD 450 (Annapolis Rd)	I-495 Exit 20	24.1	23.2	21.3	20.5	19.3	18.0	N/A	N/A	17.4	16.8	22.9	21.9	21.2	19.8	19.3	18.0	16.4	15.4	15.2	13.8
US 50 (John Hanson Hwy)	I-495 Exit 19	25.5	24.7	22.8	22.0	20.7	19.5	N/A	N/A	18.9	18.2	24.3	23.3	22.7	21.2	20.7	19.4	17.8	16.9	16.6	15.2
MD 202 (Landover Rd)	I-495 Exit 17	27.5	26.6	24.8	23.9	22.7	21.5	N/A	N/A	20.8	20.2	26.3	25.3	24.6	23.2	22.7	21.4	19.8	18.9	18.6	17.2
Arena Dr	I-495 Exit 16	28.2	27.3	25.4	24.6	23.4	22.1	N/A	N/A	21.5	20.8	27.0	26.0	25.3	23.9	23.4	22.1	20.4	19.5	19.3	17.8
MD 214 (Central Ave)	I-495 Exit 15	29.2	28.3	26.4	25.6	24.3	23.1	N/A	N/A	22.5	21.8	27.9	26.9	26.3	24.9	24.3	23.1	21.4	20.5	20.2	18.8
Ritchie-Marlboro Rd	I-495 Exit 13	30.7	29.9	28.0	27.1	25.9	24.7	N/A	N/A	24.0	23.4	29.5	28.5	27.8	26.4	25.9	24.6	23.0	22.1	21.8	20.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.0	32.2	30.3	29.5	28.2	27.0	N/A	N/A	26.4	25.7	31.8	30.8	30.2	28.7	28.2	26.9	25.3	24.4	24.1	22.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.2	33.3	31.5	30.6	29.4	28.2	N/A	N/A	27.5	26.9	33.0	32.0	31.3	29.9	29.4	28.1	26.5	25.6	25.3	23.9
MD 5 (Branch Ave)	I-495 Exit 7	36.1	35.2	33.3	32.5	31.2	30.0	N/A	N/A	29.4	28.7	34.8	33.8	33.2	31.7	31.2	30.0	28.3	27.4	27.1	25.7
MD 414 (St Barnabas Rd)	I-495 Exit 4	38.9	38.1	36.2	35.4	34.1	32.9	N/A	N/A	32.3	31.6	37.7	36.7	36.1	34.6	34.1	32.8	31.2	30.3	30.0	28.6

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.7	14.1	14.9	16.5	18.1	19.1	19.8	21.2	22.0	24.2	25.4	27.3	27.9	29.0	30.6	32.9	34.0	35.9	44.0
Shady Grove Rd	I-270 Exit 8	11.8	13.3	14.0	15.6	17.2	18.2	18.9	20.3	21.1	23.3	24.6	26.4	27.1	28.1	29.8	32.0	33.1	35.1	43.1
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.9	11.3	12.1	13.7	15.2	16.2	17.0	18.3	19.2	21.4	22.6	24.5	25.1	26.2	27.8	30.1	31.1	33.1	41.2
MD 189 (Falls Rd)	I-270 Exit 5	9.0	10.4	11.1	12.7	14.3	15.3	16.0	17.4	18.2	20.4	21.7	23.6	24.2	25.3	26.9	29.1	30.2	32.2	40.2
Montrose Rd	I-270 Exit 4	7.9	9.3	10.0	11.7	13.2	14.2	14.9	16.3	17.2	19.3	20.6	22.5	23.1	24.2	25.8	28.0	29.1	31.1	39.2
Split	I-270	6.6	8.1	8.8	10.4	12.0	13.0	13.7	15.1	15.9	18.1	19.4	21.2	21.9	22.9	24.6	26.8	27.9	29.9	37.9
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.2	9.9	11.4	12.4	13.2	14.5	15.4	17.5	18.8	20.7	21.3	22.4	24.0	26.2	27.3	29.3	37.4
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.4	6.8	7.5	9.1	10.7	11.7	12.4	13.8	14.6	16.8	18.1	20.0	20.6	21.7	23.3	25.5	26.6	28.6	36.6
VA 193 (Georgetown Pike)	I-495 Exit 44	11.9	13.3	14.0	15.7	17.2	18.2	19.0	20.3	21.2	23.3	24.6	26.5	27.1	28.2	29.8	32.0	33.1	35.1	43.2
George Washington Memorial Pkwy	I-495 Exit 43	10.6	12.0	12.7	14.4	15.9	16.9	17.6	19.0	19.9	22.0	23.3	25.2	25.8	26.9	28.5	30.7	31.8	33.8	41.9
Clara Barton Pkwy	I-495 Exit 41	9.8	11.2	12.0	13.6	15.1	16.1	16.9	18.3	19.1	21.3	22.5	24.4	25.0	26.1	27.7	30.0	31.0	33.0	41.1
Cabin John Pkwy	I-495 Exit 40	8.2	9.6	10.3	12.0	13.5	14.5	15.2	16.6	17.5	19.6	20.9	22.8	23.4	24.5	26.1	28.3	29.4	31.4	39.5
MD 190 (River Rd)	I-495 Exit 39	7.9	9.3	10.0	11.7	13.2	14.2	14.9	16.3	17.2	19.3	20.6	22.5	23.1	24.2	25.8	28.0	29.1	31.1	39.2
I-270 West Spur	I-495 Exit 38	6.6	8.0	8.7	10.4	11.9	12.9	13.6	15.0	15.9	18.0	19.3	21.2	21.8	22.9	24.5	26.7	27.8	29.8	37.8
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.8	6.2	6.9	8.5	10.1	11.1	11.8	13.2	14.0	16.2	17.5	19.4	20.0	21.1	22.7	24.9	26.0	28.0	36.0
I-270 East Spur	I-495 Exit 35	4.0	5.4	6.1	7.8	9.3	10.3	11.0	12.4	13.3	15.4	16.7	18.6	19.2	20.3	21.9	24.1	25.2	27.2	35.3
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.8	7.4	8.9	9.9	10.7	12.0	12.9	15.1	16.3	18.2	18.8	19.9	21.5	23.8	24.8	26.8	34.9
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.5	4.3	5.9	7.5	8.5	9.2	10.6	11.4	13.6	14.9	16.7	17.4	18.4	20.1	22.3	23.4	25.4	33.4
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	3.8	5.3	6.3	7.1	8.4	9.3	11.4	12.7	14.6	15.2	16.3	17.9	20.1	21.2	23.2	31.3
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.4	3.9	4.9	5.6	7.0	7.9	10.0	11.3	13.2	13.8	14.9	16.5	18.7	19.8	21.8	29.9
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	1.6	3.2	4.2	4.9	6.3	7.1	9.3	10.6	12.5	13.1	14.2	15.8	18.0	19.1	21.1	29.1
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	1.5	2.5	3.3	4.6	5.5	7.7	8.9	10.8	11.4	12.5	14.1	16.4	17.4	19.4	27.5
I-95	I-495 Exit 27	5.7	3.7	2.3	1.6	0	1.0	1.7	3.1	4.0	6.1	7.4	9.3	9.9	11.0	12.6	14.8	15.9	17.9	26.0
US 1 (Baltimore Ave)	I-495 Exit 25	6.6	4.6	3.3	2.6	1.0	0	0.7	2.1	3.0	5.1	6.4	8.3	8.9	10.0	11.6	13.8	14.9	16.9	25.0
Greenbelt Metro Station	I-495 Exit 24	7.5	5.5	4.2	3.4	1.8	0.9	0	1.4	2.2	4.4	5.7	7.5	8.2	9.2	10.9	13.1	14.2	16.2	24.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.7	6.7	5.4	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.2	6.8	7.9	9.5	11.7	12.8	14.8	22.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.6	7.6	6.3	5.6	4.0	3.0	2.1	0.9	0	2.2	3.4	5.3	5.9	7.0	8.6	10.9	11.9	13.9	22.0
MD 450 (Annapolis Rd)	I-495 Exit 20	12.0	10.0	8.7	8.0	6.4	5.4	4.5	3.3	2.4	0	1.3	3.2	3.8	4.9	6.5	8.7	9.8	11.8	19.8
US 50 (John Hanson Hwy)	I-495 Exit 19	13.5	11.5	10.2	9.4	7.8	6.9	6.0	4.8	3.9	1.5	0	1.9	2.5	3.6	5.2	7.4	8.5	10.5	18.6
MD 202 (Landover Rd)	I-495 Exit 17	15.5	13.5	12.1	11.4	9.8	8.8	8.0	6.8	5.8	3.4	2.0	0	0.6	1.7	3.3	5.5	6.6	8.6	16.7
Arena Dr	I-495 Exit 16	16.1	14.1	12.8	12.1	10.5	9.5	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.7	4.9	6.0	8.0	16.1
MD 214 (Central Ave)	I-495 Exit 15	17.1	15.1	13.8	13.0	11.4	10.5	9.6	8.4	7.5	5.1	3.6	1.6	1.0	0	1.6	3.8	4.9	6.9	15.0
Ritchie-Marlboro Rd	I-495 Exit 13	18.7	16.7	15.3	14.6	13.0	12.0	11.2	10.0	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	13.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	21.0	19.0	17.7	16.9	15.3	14.4	13.5	12.3	11.4	9.0	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	11.1
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.1	20.2	18.8	18.1	16.5	15.5	14.7	13.5	12.5	10.1	8.7	6.7	6.0	5.0	3.5	1.2	0	2.0	10.1
MD 5 (Branch Ave)	I-495 Exit 7	24.0	22.0	20.7	19.9	18.3	17.4	16.5	15.3	14.4	12.0	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	8.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.9	24.9	23.6	22.8	21.2	20.3	19.4	18.2	17.3	14.9	13.4	11.4	10.8	9.8	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Alternative 8 - ETL (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.8	4.9	6.1	7.0	7.4	6.6	7.4	13.0	12.0	11.3	9.9	9.4	8.1	N/A	8.8	9.1	10.6
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.9	4.0	5.2	6.1	6.5	5.8	6.5	12.1	11.1	10.5	9.0	8.5	7.3	N/A	7.9	8.2	9.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.9	0	1.0	2.0	3.3	4.1	4.6	3.8	4.6	10.2	9.2	8.5	7.1	6.6	5.3	N/A	6.0	6.3	7.8
MD 189 (Falls Rd)	I-270 Exit 5	3.6	2.7	0.8	0	1.1	2.3	3.2	3.6	2.9	3.6	9.2	8.2	7.5	6.1	5.6	4.3	N/A	5.0	5.3	6.8
Montrose Rd	I-270 Exit 4	4.8	3.9	2.1	1.2	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.5	5.1	4.6	3.3	N/A	3.9	4.3	5.7
Split	I-270	6.0	5.2	3.3	2.5	1.2	0	0.9	1.3	0.6	1.3	6.9	5.9	5.2	3.8	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	6.9	6.0	4.2	3.3	2.1	0.9	0	0.5	N/A	N/A	6.0	5.0	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.3	6.4	4.5	3.7	2.5	1.3	0.4	0	N/A	N/A	5.6	4.6	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.6	5.8	3.9	3.1	1.9	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.3	6.4	4.6	3.7	2.5	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.2	12.3	10.5	9.7	8.4	7.2	6.3	5.9	N/A	N/A	0	1.2	1.9	3.5	3.8	5.2	7.0	7.7	8.1	9.5
George Washington Memorial Pkwy	I-495 Exit 43	12.0	11.1	9.3	8.5	7.2	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.3	2.6	3.9	5.8	6.5	6.9	8.3
Clara Barton Pkwy	I-495 Exit 41	11.3	10.4	8.6	7.7	6.5	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.1	5.8	6.2	7.6
Cabin John Pkwy	I-495 Exit 40	9.7	8.8	6.9	6.1	4.9	3.7	2.8	2.4	N/A	N/A	3.1	2.0	1.4	0	0.3	1.6	3.4	4.2	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	9.4	8.5	6.7	5.8	4.6	3.4	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.1	3.9	4.2	5.7
I-270 West Spur	I-495 Exit 38	8.1	7.2	5.3	4.5	3.3	2.0	1.2	0.8	N/A	N/A	4.8	3.8	3.2	1.8	1.3	0	1.8	2.6	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.8	3.4	2.9	1.6	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.6	7.7	5.9	5.1	3.8	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.7	4.3	3.8	2.5	0.9	0	0.3	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	8.9	8.0	6.2	5.3	4.1	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.0	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.3	9.4	7.6	6.7	5.5	4.3	N/A	N/A	3.6	3.0	9.0	8.0	7.4	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.5	11.7	9.8	9.0	7.7	6.5	N/A	N/A	5.9	5.2	11.3	10.3	9.6	8.2	7.7	6.4	4.8	3.9	3.6	2.2
US 29 (Colesville Rd)	I-495 Exit 30	13.4	12.5	10.6	9.8	8.6	7.4	N/A	N/A	6.7	6.1	12.1	11.1	10.5	9.1	8.6	7.3	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	14.7	13.8	11.9	11.1	9.9	8.6	N/A	N/A	8.0	7.4	13.4	12.4	11.8	10.4	9.9	8.6	7.0	6.0	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.6	15.8	13.9	13.1	11.8	10.6	N/A	N/A	10.0	9.3	15.4	14.4	13.7	12.3	11.8	10.5	8.9	8.0	7.7	6.3
I-95	I-495 Exit 27	17.5	16.7	14.8	14.0	12.8	11.5	N/A	N/A	10.9	10.2	16.3	15.3	14.7	13.3	12.7	11.5	9.8	8.9	8.6	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	18.5	17.6	15.8	14.9	13.7	12.5	N/A	N/A	11.9	11.2	17.3	16.2	15.6	14.2	13.7	12.4	10.8	9.9	9.6	8.2
Greenbelt Metro Station	I-495 Exit 24	19.3	18.5	16.6	15.8	14.6	13.3	N/A	N/A	12.7	12.0	18.1	17.1	16.5	15.1	14.6	13.3	11.6	10.7	10.5	9.1
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.6	19.7	17.8	17.0	15.8	14.5	N/A	N/A	13.9	13.3	19.3	18.3	17.7	16.3	15.8	14.5	12.8	11.9	11.7	10.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.5	20.6	18.7	17.9	16.7	15.4	N/A	N/A	14.8	14.2	20.2	19.2	18.6	17.2	16.7	15.4	13.8	12.9	12.6	11.2
MD 450 (Annapolis Rd)	I-495 Exit 20	23.9	23.0	21.1	20.3	19.1	17.8	N/A	N/A	17.2	16.6	22.6	21.6	21.0	19.6	19.1	17.8	16.2	15.3	15.0	13.6
US 50 (John Hanson Hwy)	I-495 Exit 19	25.3	24.4	22.6	21.7	20.5	19.3	N/A	N/A	18.7	18.0	24.1	23.1	22.4	21.0	20.5	19.2	17.6	16.7	16.4	15.0
MD 202 (Landover Rd)	I-495 Exit 17	27.3	26.4	24.5	23.7	22.5	21.2	N/A	N/A	20.6	20.0	26.0	25.0	24.4	23.0	22.5	21.2	19.6	18.7	18.4	17.0
Arena Dr	I-495 Exit 16	27.9	27.1	25.2	24.4	23.1	21.9	N/A	N/A	21.3	20.6	26.7	25.7	25.0	23.6	23.1	21.8	20.2	19.3	19.0	17.6
MD 214 (Central Ave)	I-495 Exit 15	28.9	28.0	26.2	25.3	24.1	22.9	N/A	N/A	22.3	21.6	27.7	26.7	26.0	24.6	24.1	22.8	21.2	20.3	20.0	18.6
Ritchie-Marlboro Rd	I-495 Exit 13	30.5	29.6	27.7	26.9	25.7	24.4	N/A	N/A	23.8	23.2	29.2	28.2	27.6	26.2	25.7	24.4	22.8	21.8	21.6	20.2
MD 4 (Pennsylvania Ave)	I-495 Exit 11	32.8	31.9	30.1	29.2	28.0	26.8	N/A	N/A	26.1	25.5	31.5	30.5	29.9	28.5	28.0	26.7	25.1	24.2	23.9	22.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	33.9	33.1	31.2	30.4	29.2	27.9	N/A	N/A	27.3	26.6	32.7	31.7	31.1	29.7	29.1	27.9	26.2	25.3	25.0	23.7
MD 5 (Branch Ave)	I-495 Exit 7	35.8	34.9	33.1	32.2	31.0	29.8	N/A	N/A	29.1	28.5	34.5	33.5	32.9	31.5	31.0	29.7	28.1	27.2	26.9	25.5
MD 414 (St Barnabas Rd)	I-495 Exit 4	38.7	37.8	35.9	35.1	33.9	32.6	N/A	N/A	32.0	31.4	37.4	36.4	35.8	34.4	33.9	32.6	31.0	30.1	29.8	28.4

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.7	14.1	14.8	16.5	18.4	19.4	20.1	21.5	22.3	24.5	25.7	27.6	28.2	29.3	31.1	33.3	34.3	36.4	44.5
Shady Grove Rd	I-270 Exit 8	11.8	13.3	14.0	15.6	17.5	18.5	19.3	20.6	21.4	23.6	24.9	26.7	27.3	28.4	30.2	32.4	33.5	35.5	43.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.9	11.3	12.0	13.7	15.6	16.6	17.3	18.7	19.5	21.6	22.9	24.8	25.4	26.5	28.2	30.5	31.5	33.6	41.6
MD 189 (Falls Rd)	I-270 Exit 5	8.9	10.4	11.1	12.7	14.6	15.6	16.3	17.7	18.5	20.7	21.9	23.8	24.4	25.5	27.3	29.5	30.6	32.6	40.7
Montrose Rd	I-270 Exit 4	7.8	9.3	10.0	11.6	13.6	14.5	15.3	16.6	17.5	19.6	20.9	22.7	23.4	24.4	26.2	28.4	29.5	31.5	39.6
Split	I-270	6.6	8.1	8.8	10.4	12.3	13.3	14.0	15.4	16.2	18.4	19.6	21.5	22.1	23.2	25.0	27.2	28.3	30.3	38.4
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.2	9.8	11.8	12.7	13.5	14.8	15.7	17.8	19.1	21.0	21.6	22.7	24.4	26.6	27.7	29.7	37.8
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.8	7.4	9.1	11.0	12.0	12.7	14.1	14.9	17.1	18.3	20.2	20.8	21.9	23.7	25.9	27.0	29.0	37.1
VA 193 (Georgetown Pike)	I-495 Exit 44	11.6	13.1	13.8	15.4	17.4	18.3	19.1	20.4	21.3	23.4	24.7	26.5	27.2	28.2	30.0	32.2	33.3	35.3	43.4
George Washington Memorial Pkwy	I-495 Exit 43	10.4	11.9	12.6	14.2	16.1	17.1	17.9	19.2	20.1	22.2	23.5	25.3	26.0	27.0	28.8	31.0	32.1	34.1	42.2
Clara Barton Pkwy	I-495 Exit 41	9.7	11.2	11.9	13.5	15.4	16.4	17.2	18.5	19.3	21.5	22.8	24.6	25.3	26.3	28.1	30.3	31.4	33.4	41.5
Cabin John Pkwy	I-495 Exit 40	8.1	9.5	10.2	11.9	13.8	14.8	15.5	16.9	17.7	19.9	21.1	23.0	23.6	24.7	26.5	28.7	29.7	31.8	39.9
MD 190 (River Rd)	I-495 Exit 39	7.8	9.2	9.9	11.6	13.5	14.5	15.2	16.6	17.4	19.6	20.8	22.7	23.3	24.4	26.2	28.4	29.4	31.5	39.6
I-270 West Spur	I-495 Exit 38	6.5	7.9	8.6	10.3	12.2	13.2	13.9	15.3	16.1	18.2	19.5	21.4	22.0	23.1	24.8	27.1	28.1	30.2	38.2
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.1	6.8	8.5	10.4	11.4	12.1	13.5	14.3	16.4	17.7	19.6	20.2	21.3	23.0	25.3	26.3	28.3	36.4
I-270 East Spur	I-495 Exit 35	3.9	5.4	6.1	7.7	9.6	10.6	11.4	12.7	13.5	15.7	17.0	18.8	19.4	20.5	22.3	24.5	25.6	27.6	35.7
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.7	7.4	9.3	10.3	11.0	12.3	13.2	15.3	16.6	18.5	19.1	20.2	21.9	24.1	25.2	27.2	35.3
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.6	4.2	5.9	7.8	8.8	9.5	10.9	11.7	13.9	15.1	17.0	17.6	18.7	20.5	22.7	23.8	25.8	33.9
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	3.8	5.7	6.7	7.4	8.8	9.6	11.7	13.0	14.9	15.5	16.6	18.3	20.6	21.6	23.7	31.8
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.3	4.3	5.2	6.0	7.3	8.2	10.3	11.6	13.5	14.1	15.2	16.9	19.1	20.2	22.2	30.3
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	1.6	3.6	4.6	5.3	6.6	7.5	9.6	10.9	12.8	13.4	14.5	16.2	18.4	19.5	21.5	29.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.6	2.7	1.4	0	1.9	2.9	3.7	5.0	5.8	8.0	9.3	11.1	11.7	12.8	14.6	16.8	17.9	19.9	28.0
I-95	I-495 Exit 27	5.5	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.6	14.9	15.9	18.0	26.0
US 1 (Baltimore Ave)	I-495 Exit 25	6.5	4.5	3.2	2.5	0.9	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.7	13.9	15.0	17.0	25.1
Greenbelt Metro Station	I-495 Exit 24	7.3	5.4	4.1	3.4	1.8	0.9	0	1.3	2.2	4.3	5.6	7.5	8.1	9.2	10.9	13.1	14.2	16.2	24.3
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.5	6.6	5.3	4.6	3.0	2.1	1.2	0	0.8	3.0	4.3	6.1	6.7	7.8	9.6	11.8	12.9	14.9	23.0
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.5	7.5	6.2	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	11.0	12.0	14.0	22.1
MD 450 (Annapolis Rd)	I-495 Exit 20	11.9	9.9	8.6	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.6	8.8	9.9	11.9	20.0
US 50 (John Hanson Hwy)	I-495 Exit 19	13.3	11.3	10.1	9.3	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.6	10.6	18.7
MD 202 (Landover Rd)	I-495 Exit 17	15.3	13.3	12.0	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.5	5.7	6.7	8.8	16.9
Arena Dr	I-495 Exit 16	15.9	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.1	6.1	8.1	16.2
MD 214 (Central Ave)	I-495 Exit 15	16.9	14.9	13.7	12.9	11.4	10.4	9.6	8.4	7.4	5.0	3.6	1.6	1.0	0	1.8	4.0	5.0	7.1	15.2
Ritchie-Marlboro Rd	I-495 Exit 13	18.5	16.5	15.2	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	13.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.8	18.8	17.5	16.8	15.2	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	11.2
MD 337 (Suitland Pkwy)	I-495 Exit 9	21.9	20.0	18.7	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.6	6.7	6.0	5.0	3.5	1.2	0	2.0	10.1
MD 5 (Branch Ave)	I-495 Exit 7	23.8	21.8	20.5	19.8	18.2	17.3	16.4	15.2	14.3	11.9	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	8.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.7	24.7	23.4	22.7	21.1	20.2	19.3	18.1	17.2	14.8	13.4	11.4	10.7	9.8	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Alternative 9 - ETL (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.8	6.0	6.9	7.3	6.6	7.3	13.0	11.9	11.3	9.9	9.3	8.1	N/A	8.7	9.0	10.5
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.9	4.0	5.2	6.0	6.5	5.7	6.4	12.1	11.1	10.4	9.0	8.5	7.2	N/A	7.8	8.2	9.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.8	1.9	0	1.0	2.0	3.2	4.1	4.6	3.8	4.5	10.2	9.2	8.5	7.1	6.6	5.3	N/A	5.9	6.2	7.7
MD 189 (Falls Rd)	I-270 Exit 5	3.6	2.8	0.8	0	1.1	2.3	3.1	3.6	2.8	3.6	9.2	8.2	7.6	6.1	5.6	4.3	N/A	4.9	5.3	6.8
Montrose Rd	I-270 Exit 4	4.8	4.0	2.0	1.2	0	1.2	2.1	2.5	1.7	2.5	8.1	7.1	6.5	5.1	4.5	3.2	N/A	3.9	4.2	5.7
Split	I-270	6.1	5.2	3.3	2.5	1.2	0	0.9	1.3	0.5	1.3	6.9	5.9	5.3	3.9	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	6.9	6.1	4.1	3.3	2.1	0.9	0	0.4	N/A	N/A	6.1	5.1	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.3	6.4	4.5	3.7	2.5	1.2	0.4	0	N/A	N/A	5.6	4.6	4.0	2.6	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.7	5.8	3.9	3.1	1.9	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.3	6.5	4.6	3.7	2.5	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.3	12.4	10.5	9.7	8.4	7.2	6.3	6.0	N/A	N/A	0	1.2	1.9	3.6	3.9	5.2	7.0	7.7	8.1	9.6
George Washington Memorial Pkwy	I-495 Exit 43	12.0	11.2	9.2	8.4	7.2	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.3	2.6	3.9	5.7	6.5	6.8	8.3
Clara Barton Pkwy	I-495 Exit 41	11.3	10.5	8.5	7.7	6.5	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.0	5.8	6.1	7.6
Cabin John Pkwy	I-495 Exit 40	9.7	8.8	6.9	6.1	4.9	3.6	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.4	4.1	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	9.4	8.5	6.6	5.8	4.6	3.3	2.5	2.1	N/A	N/A	3.6	2.6	2.0	0.5	0	1.3	3.1	3.9	4.2	5.7
I-270 West Spur	I-495 Exit 38	8.1	7.2	5.3	4.5	3.3	2.0	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.8	2.5	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	2.9	1.6	0	0.7	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.6	7.8	5.9	5.0	3.8	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.8	4.4	3.8	2.5	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	8.9	8.1	6.1	5.3	4.1	2.9	N/A	N/A	2.2	1.6	7.7	6.7	6.1	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.3	9.5	7.5	6.7	5.5	4.3	N/A	N/A	3.6	3.0	9.1	8.1	7.4	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.6	11.7	9.8	9.0	7.7	6.5	N/A	N/A	5.9	5.2	11.3	10.3	9.7	8.3	7.7	6.5	4.8	3.9	3.6	2.3
US 29 (Colesville Rd)	I-495 Exit 30	13.4	12.6	10.7	9.8	8.6	7.4	N/A	N/A	6.8	6.1	12.2	11.2	10.6	9.2	8.6	7.3	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	14.9	14.0	12.1	11.2	10.0	8.8	N/A	N/A	8.2	7.5	13.6	12.6	12.0	10.6	10.0	8.7	7.1	6.2	5.9	4.5
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.7	15.9	13.9	13.1	11.9	10.7	N/A	N/A	10.0	9.4	15.5	14.5	13.8	12.4	11.9	10.6	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	17.8	16.9	15.0	14.2	12.9	11.7	N/A	N/A	11.1	10.4	16.5	15.5	14.9	13.5	12.9	11.6	10.0	9.1	8.8	7.4
US 1 (Baltimore Ave)	I-495 Exit 25	18.7	17.9	15.9	15.1	13.9	12.6	N/A	N/A	12.0	11.4	17.5	16.5	15.8	14.4	13.9	12.6	11.0	10.1	9.8	8.4
Greenbelt Metro Station	I-495 Exit 24	19.6	18.7	16.8	16.0	14.7	13.5	N/A	N/A	12.9	12.2	18.4	17.3	16.7	15.3	14.7	13.5	11.8	10.9	10.6	9.3
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.8	19.9	18.0	17.2	15.9	14.7	N/A	N/A	14.1	13.4	19.6	18.5	17.9	16.5	15.9	14.7	13.0	12.1	11.8	10.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.7	20.8	18.9	18.1	16.9	15.6	N/A	N/A	15.0	14.3	20.5	19.5	18.8	17.4	16.9	15.6	13.9	13.0	12.8	11.4
MD 450 (Annapolis Rd)	I-495 Exit 20	24.1	23.2	21.3	20.5	19.3	18.0	N/A	N/A	17.4	16.7	22.9	21.9	21.2	19.8	19.3	18.0	16.3	15.4	15.2	13.8
US 50 (John Hanson Hwy)	I-495 Exit 19	25.5	24.7	22.7	21.9	20.7	19.5	N/A	N/A	18.8	18.2	24.3	23.3	22.6	21.2	20.7	19.4	17.8	16.9	16.6	15.2
MD 202 (Landover Rd)	I-495 Exit 17	27.5	26.6	24.7	23.9	22.7	21.4	N/A	N/A	20.8	20.1	26.3	25.3	24.6	23.2	22.7	21.4	19.7	18.8	18.6	17.2
Arena Dr	I-495 Exit 16	28.1	27.3	25.4	24.5	23.3	22.1	N/A	N/A	21.5	20.8	26.9	25.9	25.3	23.9	23.3	22.0	20.4	19.5	19.2	17.8
MD 214 (Central Ave)	I-495 Exit 15	29.1	28.3	26.3	25.5	24.3	23.1	N/A	N/A	22.4	21.8	27.9	26.9	26.2	24.8	24.3	23.0	21.4	20.5	20.2	18.8
Ritchie-Marlboro Rd	I-495 Exit 13	30.7	29.8	27.9	27.1	25.8	24.6	N/A	N/A	24.0	23.3	29.4	28.4	27.8	26.4	25.8	24.6	22.9	22.0	21.7	20.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.0	32.1	30.2	29.4	28.2	26.9	N/A	N/A	26.3	25.6	31.8	30.8	30.1	28.7	28.2	26.9	25.2	24.3	24.1	22.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.1	33.3	31.4	30.5	29.3	28.1	N/A	N/A	27.5	26.8	32.9	31.9	31.3	29.9	29.3	28.0	26.4	25.5	25.2	23.8
MD 5 (Branch Ave)	I-495 Exit 7	36.0	35.1	33.2	32.4	31.1	29.9	N/A	N/A	29.3	28.6	34.7	33.7	33.1	31.7	31.1	29.9	28.2	27.3	27.0	25.6
MD 414 (St Barnabas Rd)	I-495 Exit 4	38.9	38.0	36.1	35.2	34.0	32.8	N/A	N/A	32.2	31.5	37.6	36.6	36.0	34.6	34.0	32.7	31.1	30.2	29.9	28.5

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.6	14.0	14.7	16.3	17.9	18.9	19.6	21.0	21.8	23.9	25.2	27.1	27.7	28.8	30.5	32.8	33.8	35.8	43.7
Shady Grove Rd	I-270 Exit 8	11.7	13.2	13.8	15.5	17.1	18.0	18.8	20.1	20.9	23.1	24.3	26.2	26.8	27.9	29.7	31.9	33.0	34.9	42.8
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.8	11.2	11.9	13.6	15.1	16.1	16.8	18.2	19.0	21.2	22.4	24.3	24.9	26.0	27.8	30.0	31.0	33.0	40.9
MD 189 (Falls Rd)	I-270 Exit 5	8.9	10.3	11.0	12.6	14.2	15.2	15.9	17.2	18.1	20.2	21.5	23.3	24.0	25.0	26.8	29.0	30.1	32.1	39.9
Montrose Rd	I-270 Exit 4	7.8	9.2	9.9	11.5	13.1	14.1	14.8	16.1	17.0	19.1	20.4	22.3	22.9	23.9	25.7	27.9	29.0	31.0	38.9
Split	I-270	6.6	8.0	8.7	10.3	11.9	12.9	13.6	14.9	15.8	17.9	19.2	21.1	21.7	22.7	24.5	26.7	27.8	29.8	37.6
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.0	7.5	8.1	9.8	11.4	12.3	13.1	14.4	15.2	17.4	18.6	20.5	21.1	22.2	24.0	26.2	27.3	29.2	37.1
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.7	7.4	9.0	10.6	11.6	12.3	13.7	14.5	16.6	17.9	19.8	20.4	21.5	23.2	25.4	26.5	28.5	36.4
VA 193 (Georgetown Pike)	I-495 Exit 44	11.7	13.1	13.8	15.4	17.0	17.9	18.7	20.0	20.9	23.0	24.3	26.1	26.7	27.8	29.6	31.8	32.9	34.9	42.7
George Washington Memorial Pkwy	I-495 Exit 43	10.4	11.8	12.5	14.2	15.7	16.7	17.4	18.8	19.6	21.8	23.0	24.9	25.5	26.6	28.3	30.6	31.6	33.6	41.5
Clara Barton Pkwy	I-495 Exit 41	9.7	11.1	11.8	13.5	15.0	16.0	16.7	18.1	18.9	21.1	22.3	24.2	24.8	25.9	27.6	29.9	30.9	32.9	40.8
Cabin John Pkwy	I-495 Exit 40	8.1	9.5	10.2	11.8	13.4	14.4	15.1	16.4	17.3	19.4	20.7	22.6	23.2	24.2	26.0	28.2	29.3	31.3	39.1
MD 190 (River Rd)	I-495 Exit 39	7.8	9.2	9.9	11.5	13.1	14.1	14.8	16.1	17.0	19.1	20.4	22.3	22.9	23.9	25.7	27.9	29.0	31.0	38.9
I-270 West Spur	I-495 Exit 38	6.5	7.9	8.6	10.2	11.8	12.8	13.5	14.8	15.7	17.8	19.1	20.9	21.6	22.6	24.4	26.6	27.7	29.7	37.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.1	6.8	8.4	10.0	11.0	11.7	13.0	13.9	16.0	17.3	19.2	19.8	20.8	22.6	24.8	25.9	27.9	35.7
I-270 East Spur	I-495 Exit 35	3.9	5.3	6.0	7.7	9.2	10.2	11.0	12.3	13.1	15.3	16.5	18.4	19.0	20.1	21.9	24.1	25.1	27.1	35.0
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.7	7.3	8.9	9.9	10.6	11.9	12.8	14.9	16.2	18.0	18.7	19.7	21.5	23.7	24.8	26.8	34.6
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.5	4.2	5.9	7.4	8.4	9.1	10.5	11.3	13.4	14.7	16.6	17.2	18.3	20.0	22.3	23.3	25.3	33.2
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	3.7	5.3	6.3	7.0	8.4	9.2	11.3	12.6	14.5	15.1	16.2	17.9	20.1	21.2	23.2	31.1
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.3	3.9	4.9	5.6	6.9	7.8	9.9	11.2	13.1	13.7	14.7	16.5	18.7	19.8	21.8	29.7
MD 193 (University Blvd E)	I-495 Exit 29	2.8	0.8	0	1.6	3.2	4.2	4.9	6.3	7.1	9.2	10.5	12.4	13.0	14.1	15.8	18.0	19.1	21.1	29.0
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	1.6	2.5	3.3	4.6	5.5	7.6	8.9	10.7	11.3	12.4	14.2	16.4	17.5	19.5	27.3
I-95	I-495 Exit 27	5.7	3.7	2.4	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.8	12.6	14.8	15.9	17.9	25.8
US 1 (Baltimore Ave)	I-495 Exit 25	6.7	4.7	3.4	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.9	14.9	16.9	24.8
Greenbelt Metro Station	I-495 Exit 24	7.5	5.6	4.2	3.4	1.8	0.9	0	1.3	2.2	4.3	5.6	7.5	8.1	9.1	10.9	13.1	14.2	16.2	24.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.7	6.8	5.4	4.6	3.0	2.1	1.2	0	0.8	3.0	4.2	6.1	6.7	7.8	9.6	11.8	12.9	14.8	22.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.6	7.7	6.4	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	12.0	14.0	21.9
MD 450 (Annapolis Rd)	I-495 Exit 20	12.0	10.1	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.7	4.8	6.6	8.8	9.9	11.9	19.7
US 50 (John Hanson Hwy)	I-495 Exit 19	13.5	11.5	10.2	9.3	7.8	6.8	5.9	4.7	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.6	10.6	18.5
MD 202 (Landover Rd)	I-495 Exit 17	15.4	13.5	12.2	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.5	5.7	6.7	8.7	16.6
Arena Dr	I-495 Exit 16	16.1	14.1	12.8	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.1	6.1	8.1	16.0
MD 214 (Central Ave)	I-495 Exit 15	17.1	15.1	13.8	12.9	11.4	10.4	9.5	8.3	7.4	5.0	3.6	1.6	1.0	0	1.8	4.0	5.1	7.0	14.9
Ritchie-Marlboro Rd	I-495 Exit 13	18.6	16.7	15.3	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.1	3.2	2.5	1.6	0	2.2	3.3	5.3	13.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.9	19.0	17.6	16.8	15.2	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.8	3.9	2.3	0	1.1	3.1	10.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.1	20.1	18.8	18.0	16.4	15.4	14.6	13.4	12.5	10.1	8.6	6.7	6.0	5.0	3.5	1.2	0	2.0	9.8
MD 5 (Branch Ave)	I-495 Exit 7	23.9	22.0	20.6	19.8	18.2	17.3	16.4	15.2	14.3	11.9	10.4	8.5	7.8	6.9	5.3	3.0	1.8	0	7.9
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.8	24.8	23.5	22.7	21.1	20.1	19.3	18.1	17.2	14.8	13.3	11.4	10.7	9.7	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Alternative 10 - ETL (AM Peak)

Unit: Minute

From \ To		I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.8	6.0	6.9	7.3	6.5	7.3	12.9	11.9	11.2	9.8	9.3	8.0	N/A	8.7	9.0	10.5
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.9	3.9	5.1	6.0	6.4	5.7	6.4	12.0	11.0	10.4	9.0	8.5	7.2	N/A	7.8	8.1	9.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.9	0	1.0	2.0	3.2	4.1	4.5	3.8	4.5	10.1	9.1	8.5	7.1	6.5	5.3	N/A	5.9	6.2	7.7
MD 189 (Falls Rd)	I-270 Exit 5	3.5	2.7	0.8	0	1.1	2.3	3.1	3.6	2.8	3.6	9.2	8.2	7.5	6.1	5.6	4.3	N/A	4.9	5.3	6.8
Montrose Rd	I-270 Exit 4	4.7	3.9	2.0	1.2	0	1.2	2.1	2.5	1.7	2.5	8.1	7.1	6.4	5.0	4.5	3.2	N/A	3.8	4.2	5.7
Split	I-270	6.0	5.1	3.3	2.4	1.2	0	0.9	1.3	0.5	1.3	6.9	5.9	5.2	3.8	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	6.8	6.0	4.1	3.3	2.1	0.9	0	0.4	N/A	N/A	6.0	5.0	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.2	6.3	4.5	3.7	2.5	1.2	0.4	0	N/A	N/A	5.6	4.6	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.6	5.7	3.9	3.0	1.8	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.2	6.4	4.5	3.7	2.5	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.2	12.4	10.5	9.7	8.5	7.3	6.4	6.0	N/A	N/A	0	1.3	2.0	3.7	4.0	5.3	7.1	7.8	8.2	9.6
George Washington Memorial Pkwy	I-495 Exit 43	11.9	11.1	9.2	8.4	7.2	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.3	2.6	4.0	5.8	6.5	6.9	8.3
Clara Barton Pkwy	I-495 Exit 41	11.2	10.4	8.5	7.7	6.5	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.0	5.8	6.2	7.6
Cabin John Pkwy	I-495 Exit 40	9.6	8.7	6.9	6.1	4.9	3.6	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.4	4.2	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	9.3	8.4	6.6	5.8	4.6	3.3	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.1	3.9	4.2	5.7
I-270 West Spur	I-495 Exit 38	8.0	7.1	5.3	4.5	3.2	2.0	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.8	2.6	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.8	3.4	2.9	1.6	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.5	7.7	5.8	5.0	3.8	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.7	4.3	3.8	2.5	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	8.8	8.0	6.1	5.3	4.1	2.8	N/A	N/A	2.2	1.6	7.7	6.7	6.0	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.2	9.3	7.5	6.7	5.5	4.2	N/A	N/A	3.6	3.0	9.1	8.1	7.4	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.5	11.6	9.7	8.9	7.7	6.5	N/A	N/A	5.9	5.2	11.3	10.3	9.7	8.3	7.8	6.5	4.8	3.9	3.6	2.2
US 29 (Colesville Rd)	I-495 Exit 30	13.3	12.5	10.6	9.8	8.6	7.4	N/A	N/A	6.7	6.1	12.2	11.2	10.5	9.1	8.6	7.3	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	14.6	13.8	11.9	11.1	9.9	8.7	N/A	N/A	8.1	7.4	13.5	12.5	11.9	10.5	9.9	8.7	7.0	6.1	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.6	15.7	13.9	13.1	11.8	10.6	N/A	N/A	10.0	9.3	15.5	14.4	13.8	12.4	11.9	10.6	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	17.5	16.7	14.8	14.0	12.8	11.6	N/A	N/A	11.0	10.3	16.4	15.4	14.8	13.4	12.8	11.6	9.9	9.0	8.7	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	18.5	17.6	15.8	15.0	13.8	12.5	N/A	N/A	11.9	11.3	17.4	16.4	15.7	14.3	13.8	12.5	10.9	10.0	9.7	8.3
Greenbelt Metro Station	I-495 Exit 24	19.4	18.5	16.6	15.8	14.6	13.4	N/A	N/A	12.8	12.1	18.2	17.2	16.6	15.2	14.7	13.4	11.7	10.8	10.5	9.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.6	19.7	17.8	17.0	15.8	14.6	N/A	N/A	14.0	13.3	19.4	18.4	17.8	16.4	15.9	14.6	12.9	12.0	11.7	10.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.5	20.6	18.8	17.9	16.7	15.5	N/A	N/A	14.9	14.2	20.3	19.3	18.7	17.3	16.8	15.5	13.8	12.9	12.7	11.3
MD 450 (Annapolis Rd)	I-495 Exit 20	23.9	23.0	21.2	20.3	19.1	17.9	N/A	N/A	17.3	16.6	22.7	21.7	21.1	19.7	19.2	17.9	16.2	15.3	15.1	13.7
US 50 (John Hanson Hwy)	I-495 Exit 19	25.3	24.4	22.6	21.8	20.6	19.3	N/A	N/A	18.7	18.1	24.2	23.2	22.5	21.1	20.6	19.3	17.7	16.8	16.5	15.1
MD 202 (Landover Rd)	I-495 Exit 17	27.3	26.4	24.6	23.7	22.5	21.3	N/A	N/A	20.7	20.0	26.1	25.1	24.5	23.1	22.6	21.3	19.6	18.7	18.5	17.1
Arena Dr	I-495 Exit 16	27.9	27.1	25.2	24.4	23.2	22.0	N/A	N/A	21.3	20.7	26.8	25.8	25.1	23.7	23.2	21.9	20.3	19.4	19.1	17.7
MD 214 (Central Ave)	I-495 Exit 15	28.9	28.0	26.2	25.4	24.2	22.9	N/A	N/A	22.3	21.7	27.8	26.8	26.1	24.7	24.2	22.9	21.3	20.4	20.1	18.7
Ritchie-Marlboro Rd	I-495 Exit 13	30.4	29.6	27.7	26.9	25.7	24.5	N/A	N/A	23.9	23.2	29.3	28.3	27.7	26.3	25.7	24.5	22.8	21.9	21.6	20.2
MD 4 (Pennsylvania Ave)	I-495 Exit 11	32.8	31.9	30.1	29.2	28.0	26.8	N/A	N/A	26.2	25.5	31.6	30.6	30.0	28.6	28.1	26.8	25.1	24.2	23.9	22.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	33.9	33.1	31.2	30.4	29.2	28.0	N/A	N/A	27.3	26.7	32.8	31.8	31.1	29.7	29.2	27.9	26.3	25.4	25.1	23.7
MD 5 (Branch Ave)	I-495 Exit 7	35.7	34.9	33.0	32.2	31.0	29.8	N/A	N/A	29.2	28.5	34.6	33.6	33.0	31.6	31.0	29.8	28.1	27.2	26.9	25.5
MD 414 (St Barnabas Rd)	I-495 Exit 4	38.6	37.8	35.9	35.1	33.9	32.7	N/A	N/A	32.1	31.4	37.5	36.5	35.8	34.4	33.9	32.6	31.0	30.1	29.8	28.4

Unit: Minute

From \ To		I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.6	14.0	14.7	16.4	18.6	19.6	20.3	21.7	22.5	24.6	25.9	27.8	28.4	29.5	31.6	33.8	34.9	36.9	45.2
Shady Grove Rd	I-270 Exit 8	11.7	13.1	13.8	15.5	17.7	18.7	19.5	20.8	21.6	23.8	25.0	26.9	27.5	28.6	30.7	33.0	34.0	36.0	44.4
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.8	11.2	11.9	13.6	15.8	16.8	17.5	18.9	19.7	21.9	23.1	25.0	25.6	26.7	28.8	31.1	32.1	34.1	42.5
MD 189 (Falls Rd)	I-270 Exit 5	8.9	10.3	11.0	12.6	14.9	15.9	16.6	17.9	18.8	20.9	22.2	24.0	24.7	25.7	27.9	30.1	31.2	33.2	41.5
Montrose Rd	I-270 Exit 4	7.8	9.2	9.9	11.6	13.8	14.8	15.5	16.9	17.7	19.8	21.1	23.0	23.6	24.7	26.8	29.0	30.1	32.1	40.4
Split	I-270	6.6	8.0	8.7	10.4	12.6	13.6	14.3	15.7	16.5	18.6	19.9	21.8	22.4	23.5	25.6	27.8	28.9	30.9	39.2
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.2	9.8	12.1	13.0	13.8	15.1	16.0	18.1	19.4	21.2	21.8	22.9	25.1	27.3	28.4	30.3	38.7
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.7	7.4	9.1	11.3	12.3	13.0	14.4	15.2	17.4	18.6	20.5	21.1	22.2	24.3	26.5	27.6	29.6	38.0
VA 193 (Georgetown Pike)	I-495 Exit 44	11.8	13.2	13.9	15.5	17.8	18.8	19.5	20.8	21.7	23.8	25.1	26.9	27.6	28.6	30.8	33.0	34.1	36.1	44.4
George Washington Memorial Pkwy	I-495 Exit 43	10.4	11.9	12.6	14.2	16.5	17.4	18.2	19.5	20.4	22.5	23.8	25.6	26.2	27.3	29.5	31.7	32.8	34.7	43.1
Clara Barton Pkwy	I-495 Exit 41	9.7	11.2	11.8	13.5	15.8	16.7	17.5	18.8	19.7	21.8	23.0	24.9	25.5	26.6	28.8	31.0	32.0	34.0	42.4
Cabin John Pkwy	I-495 Exit 40	8.1	9.5	10.2	11.9	14.1	15.1	15.8	17.2	18.0	20.1	21.4	23.3	23.9	25.0	27.1	29.3	30.4	32.4	40.8
MD 190 (River Rd)	I-495 Exit 39	7.8	9.2	9.9	11.6	13.8	14.8	15.5	16.9	17.7	19.9	21.1	23.0	23.6	24.7	26.8	29.0	30.1	32.1	40.5
I-270 West Spur	I-495 Exit 38	6.5	7.9	8.6	10.3	12.5	13.5	14.2	15.6	16.4	18.5	19.8	21.7	22.3	23.4	25.5	27.7	28.8	30.8	39.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.1	6.8	8.5	10.7	11.7	12.4	13.8	14.6	16.7	18.0	19.9	20.5	21.6	23.7	25.9	27.0	29.0	37.3
I-270 East Spur	I-495 Exit 35	3.9	5.4	6.1	7.7	10.0	10.9	11.7	13.0	13.9	16.0	17.3	19.1	19.7	20.8	23.0	25.2	26.2	28.2	36.6
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.7	7.4	9.6	10.6	11.3	12.7	13.5	15.6	16.9	18.8	19.4	20.5	22.6	24.8	25.9	27.9	36.2
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.5	4.2	5.9	8.1	9.1	9.8	11.2	12.0	14.2	15.4	17.3	17.9	19.0	21.1	23.4	24.4	26.4	34.8
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	3.8	6.0	7.0	7.7	9.1	9.9	12.0	13.3	15.2	15.8	16.9	19.0	21.2	22.3	24.3	32.7
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.4	4.6	5.6	6.3	7.6	8.5	10.6	11.9	13.8	14.4	15.4	17.6	19.8	20.9	22.9	31.2
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.8	0	1.7	3.9	4.9	5.6	7.0	7.8	9.9	11.2	13.1	13.7	14.8	16.9	19.1	20.2	22.2	30.5
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	2.2	3.2	4.0	5.3	6.1	8.3	9.5	11.4	12.0	13.1	15.2	17.5	18.5	20.5	28.9
I-95	I-495 Exit 27	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.8	13.0	15.2	16.3	18.3	26.6
US 1 (Baltimore Ave)	I-495 Exit 25	6.6	4.6	3.3	2.5	0.9	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	12.0	14.2	15.3	17.3	25.7
Greenbelt Metro Station	I-495 Exit 24	7.4	5.5	4.2	3.4	1.8	0.9	0	1.3	2.2	4.3	5.6	7.4	8.1	9.1	11.3	13.5	14.6	16.6	24.9
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.6	6.7	5.4	4.6	3.0	2.1	1.2	0	0.8	3.0	4.2	6.1	6.7	7.8	9.9	12.2	13.2	15.2	23.6
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.5	7.6	6.3	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	9.1	11.3	12.4	14.4	22.7
MD 450 (Annapolis Rd)	I-495 Exit 20	11.9	10.0	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.7	4.8	7.0	9.2	10.3	12.3	20.6
US 50 (John Hanson Hwy)	I-495 Exit 19	13.4	11.4	10.1	9.3	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.7	7.9	9.0	11.0	19.3
MD 202 (Landover Rd)	I-495 Exit 17	15.3	13.4	12.1	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.8	6.1	7.1	9.1	17.5
Arena Dr	I-495 Exit 16	16.0	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	3.2	5.4	6.5	8.5	16.9
MD 214 (Central Ave)	I-495 Exit 15	17.0	15.0	13.7	12.9	11.4	10.4	9.5	8.3	7.4	5.0	3.6	1.6	1.0	0	2.2	4.4	5.4	7.4	15.8
Ritchie-Marlboro Rd	I-495 Exit 13	18.5	16.5	15.2	14.5	12.9	11.9	11.1	9.9	9.0	6.6	5.1	3.2	2.5	1.5	0	2.2	3.3	5.3	13.6
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.8	18.9	17.6	16.8	15.2	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.8	3.9	2.3	0	1.1	3.1	11.4
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.0	20.0	18.7	17.9	16.4	15.4	14.6	13.4	12.4	10.1	8.6	6.6	6.0	5.0	3.5	1.2	0	2.0	10.3
MD 5 (Branch Ave)	I-495 Exit 7	23.8	21.9	20.6	19.8	18.2	17.3	16.4	15.2	14.3	11.9	10.4	8.5	7.8	6.8	5.3	3.0	1.8	0	8.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.7	24.7	23.4	22.7	21.1	20.1	19.3	18.1	17.2	14.8	13.3	11.4	10.7	9.7	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Alternative 13B - ETL (AM Peak)

Unit: Minute

From	To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.8	6.1	7.0	7.4	6.7	7.4	13.0	12.0	11.4	9.9	9.4	8.1	N/A	8.8	9.2	10.6
Shady Grove Rd	I-270 Exit 8	N/A	0	1.9	2.9	4.0	5.2	6.1	6.5	5.8	6.5	12.1	11.1	10.5	9.1	8.5	7.3	N/A	7.9	8.3	9.8
MD 28 (W Montgomery Ave)	I-270 Exit 6	N/A	N/A	0	1.0	2.0	3.3	4.2	4.6	3.9	4.6	10.2	9.2	8.6	7.2	6.6	5.3	N/A	6.0	6.4	7.8
MD 189 (Falls Rd)	I-270 Exit 5	N/A	N/A	N/A	0	1.1	2.3	3.2	3.7	2.9	3.7	9.3	8.3	7.6	6.2	5.7	4.4	N/A	5.1	5.4	6.9
Montrose Rd	I-270 Exit 4	N/A	N/A	N/A	N/A	0	1.2	2.1	2.6	1.8	2.6	8.2	7.2	6.5	5.1	4.6	3.3	N/A	4.0	4.3	5.8
Split	I-270	N/A	N/A	N/A	N/A	N/A	0	0.9	1.3	0.6	1.3	6.9	5.9	5.3	3.9	3.3	2.1	N/A	2.7	3.1	4.6
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	0	0.4	N/A	N/A	6.1	5.0	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	5.6	4.6	4.0	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	4.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.6	12.7	10.7	9.8	8.5	7.3	6.4	6.0	N/A	N/A	0	1.3	2.0	3.6	3.9	5.2	7.0	7.7	8.1	9.6
George Washington Memorial Pkwy	I-495 Exit 43	12.3	11.4	9.4	8.5	7.3	6.0	5.2	4.8	N/A	N/A	1.0	0	0.7	2.3	2.6	3.9	5.7	6.5	6.8	8.3
Clara Barton Pkwy	I-495 Exit 41	11.6	10.7	8.7	7.8	6.6	5.3	4.5	4.1	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.0	5.8	6.1	7.6
Cabin John Pkwy	I-495 Exit 40	10.0	9.1	7.1	6.2	4.9	3.7	2.8	2.4	N/A	N/A	3.1	2.0	1.4	0	0.3	1.6	3.4	4.1	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	9.7	8.8	6.8	5.9	4.6	3.4	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.1	3.9	4.2	5.7
I-270 West Spur	I-495 Exit 38	8.4	7.5	5.5	4.6	3.3	2.1	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.8	2.6	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	2.9	1.6	0	0.7	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	7.4	6.4	5.8	4.4	3.8	2.5	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.2	8.3	6.3	5.4	4.2	2.9	N/A	N/A	2.3	1.7	7.7	6.7	6.1	4.7	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.6	9.7	7.7	6.8	5.5	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.4	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.8	11.9	9.9	9.1	7.8	6.5	N/A	N/A	6.0	5.3	11.3	10.3	9.7	8.3	7.7	6.5	4.8	3.9	3.6	2.2
US 29 (Colesville Rd)	I-495 Exit 30	13.7	12.8	10.8	9.9	8.6	7.4	N/A	N/A	6.8	6.1	12.2	11.2	10.5	9.1	8.6	7.3	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	15.0	14.1	12.1	11.2	10.0	8.7	N/A	N/A	8.1	7.5	13.5	12.5	11.9	10.5	9.9	8.6	7.0	6.1	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	17.0	16.0	14.0	13.2	11.9	10.6	N/A	N/A	10.1	9.4	15.5	14.5	13.8	12.4	11.9	10.6	9.0	8.0	7.8	6.4
I-95	I-495 Exit 27	17.9	17.0	15.0	14.1	12.9	11.6	N/A	N/A	11.0	10.4	16.4	15.4	14.8	13.4	12.8	11.5	9.9	9.0	8.7	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	18.9	17.9	15.9	15.1	13.8	12.5	N/A	N/A	12.0	11.3	17.4	16.4	15.7	14.3	13.8	12.5	10.8	9.9	9.6	8.3
Greenbelt Metro Station	I-495 Exit 24	19.7	18.8	16.8	15.9	14.7	13.4	N/A	N/A	12.8	12.2	18.2	17.2	16.6	15.2	14.6	13.3	11.7	10.8	10.5	9.1
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.9	20.0	18.0	17.1	15.9	14.6	N/A	N/A	14.0	13.4	19.4	18.4	17.8	16.4	15.8	14.5	12.9	12.0	11.7	10.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.8	20.9	18.9	18.0	16.8	15.5	N/A	N/A	15.0	14.3	20.3	19.3	18.7	17.3	16.7	15.4	13.8	12.9	12.6	11.2
MD 450 (Annapolis Rd)	I-495 Exit 20	24.2	23.3	21.3	20.4	19.2	17.9	N/A	N/A	17.4	16.7	22.7	21.7	21.1	19.7	19.1	17.8	16.2	15.3	15.0	13.6
US 50 (John Hanson Hwy)	I-495 Exit 19	25.7	24.8	22.8	21.9	20.6	19.3	N/A	N/A	18.8	18.1	24.2	23.2	22.5	21.1	20.6	19.3	17.7	16.7	16.5	15.1
MD 202 (Landover Rd)	I-495 Exit 17	27.6	26.7	24.7	23.8	22.6	21.3	N/A	N/A	20.8	20.1	26.1	25.1	24.5	23.1	22.5	21.2	19.6	18.7	18.4	17.0
Arena Dr	I-495 Exit 16	28.3	27.4	25.4	24.5	23.2	22.0	N/A	N/A	21.4	20.7	26.8	25.8	25.1	23.7	23.2	21.9	20.3	19.4	19.1	17.7
MD 214 (Central Ave)	I-495 Exit 15	29.3	28.3	26.4	25.5	24.2	22.9	N/A	N/A	22.4	21.7	27.8	26.8	26.1	24.7	24.2	22.9	21.3	20.3	20.1	18.7
Ritchie-Marlboro Rd	I-495 Exit 13	30.8	29.9	27.9	27.0	25.8	24.5	N/A	N/A	23.9	23.3	29.3	28.3	27.7	26.3	25.7	24.4	22.8	21.9	21.6	20.2
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.1	32.2	30.2	29.3	28.1	26.8	N/A	N/A	26.3	25.6	31.6	30.6	30.0	28.6	28.0	26.8	25.1	24.2	23.9	22.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.3	33.4	31.4	30.5	29.2	28.0	N/A	N/A	27.4	26.7	32.8	31.8	31.1	29.7	29.2	27.9	26.3	25.4	25.1	23.7
MD 5 (Branch Ave)	I-495 Exit 7	36.1	35.2	33.2	32.3	31.1	29.8	N/A	N/A	29.2	28.6	34.6	33.6	33.0	31.6	31.0	29.7	28.1	27.2	26.9	25.5
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.0	38.1	36.1	35.2	34.0	32.7	N/A	N/A	32.1	31.5	37.5	36.5	35.9	34.5	33.9	32.6	31.0	30.1	29.8	28.4

Unit: Minute

From	To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.7	14.2	14.9	16.5	18.4	19.4	20.1	21.4	22.3	24.4	25.7	27.6	28.2	29.2	30.9	33.2	34.2	36.2	43.8
Shady Grove Rd	I-270 Exit 8	11.9	13.3	14.0	15.6	17.5	18.5	19.2	20.6	21.4	23.6	24.8	26.7	27.3	28.4	30.1	32.3	33.4	35.3	42.9
MD 28 (W Montgomery Ave)	I-270 Exit 6	10.0	11.4	12.1	13.7	15.6	16.6	17.3	18.7	19.5	21.6	22.9	24.8	25.4	26.5	28.2	30.4	31.4	33.4	41.0
MD 189 (Falls Rd)	I-270 Exit 5	9.0	10.4	11.1	12.8	14.7	15.6	16.4	17.7	18.6	20.7	21.9	23.8	24.4	25.5	27.2	29.4	30.5	32.5	40.0
Montrose Rd	I-270 Exit 4	7.9	9.3	10.0	11.7	13.6	14.5	15.3	16.6	17.5	19.6	20.9	22.7	23.3	24.4	26.1	28.3	29.4	31.4	38.9
Split	I-270	6.7	8.1	8.8	10.4	12.3	13.3	14.0	15.4	16.2	18.4	19.6	21.5	22.1	23.2	24.9	27.1	28.2	30.1	37.7
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.2	9.8	11.7	12.7	13.4	14.8	15.6	17.8	19.0	20.9	21.5	22.6	24.3	26.5	27.6	29.6	37.1
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.8	7.4	9.1	11.0	12.0	12.7	14.0	14.9	17.0	18.3	20.1	20.8	21.8	23.5	25.7	26.8	28.8	36.4
VA 193 (Georgetown Pike)	I-495 Exit 44	11.7	13.1	13.8	15.4	17.3	18.3	19.0	20.4	21.2	23.4	24.6	26.5	27.1	28.2	29.9	32.1	33.2	35.2	42.7
George Washington Memorial Pkwy	I-495 Exit 43	10.4	11.8	12.5	14.2	16.1	17.0	17.8	19.1	20.0	22.1	23.4	25.2	25.8	26.9	28.6	30.8	31.9	33.9	41.4
Clara Barton Pkwy	I-495 Exit 41	9.7	11.1	11.8	13.5	15.4	16.3	17.1	18.4	19.3	21.4	22.7	24.5	25.1	26.2	27.9	30.1	31.2	33.2	40.7
Cabin John Pkwy	I-495 Exit 40	8.1	9.5	10.2	11.8	13.7	14.7	15.4	16.8	17.6	19.8	21.0	22.9	23.5	24.6	26.3	28.5	29.6	31.6	39.1
MD 190 (River Rd)	I-495 Exit 39	7.8	9.2	9.9	11.6	13.4	14.4	15.2	16.5	17.3	19.5	20.7	22.6	23.2	24.3	26.0	28.2	29.3	31.3	38.8
I-270 West Spur	I-495 Exit 38	6.5	7.9	8.6	10.3	12.1	13.1	13.9	15.2	16.0	18.2	19.4	21.3	21.9	23.0	24.7	26.9	28.0	30.0	37.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.1	6.8	8.5	10.3	11.3	12.1	13.4	14.2	16.4	17.6	19.5	20.1	21.2	22.9	25.1	26.2	28.2	35.7
I-270 East Spur	I-495 Exit 35	3.9	5.4	6.1	7.7	9.6	10.6	11.3	12.6	13.5	15.6	16.9	18.8	19.4	20.4	22.1	24.4	25.4	27.4	35.0
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.7	7.3	9.2	10.2	10.9	12.3	13.1	15.3	16.5	18.4	19.0	20.1	21.8	24.0	25.1	27.1	34.6
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.5	4.2	5.9	7.8	8.7	9.5	10.8	11.7	13.8	15.1	16.9	17.5	18.6	20.3	22.5	23.6	25.6	33.1
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	3.8	5.7	6.6	7.4	8.7	9.6	11.7	12.9	14.8	15.4	16.5	18.2	20.4	21.5	23.5	31.0
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.3	4.2	5.2	5.9	7.3	8.1	10.3	11.5	13.4	14.0	15.1	16.8	19.0	20.1	22.0	29.6
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	1.6	3.5	4.5	5.2	6.6	7.4	9.6	10.8	12.7	13.3	14.4	16.1	18.3	19.4	21.4	28.9
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.6	2.7	1.4	0	1.9	2.9	3.6	4.9	5.8	7.9	9.2	11.1	11.7	12.7	14.4	16.7	17.7	19.7	27.3
I-95	I-495 Exit 27	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.5	14.8	15.8	17.8	25.4
US 1 (Baltimore Ave)	I-495 Exit 25	6.5	4.6	3.3	2.5	0.9	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.8	14.9	16.8	24.4
Greenbelt Metro Station	I-495 Exit 24	7.4	5.4	4.1	3.4	1.8	0.9	0	1.3	2.2	4.3	5.6	7.5	8.1	9.1	10.8	13.1	14.1	16.1	23.7
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.6	6.6	5.3	4.6	3.0	2.1	1.2	0	0.8	3.0	4.2	6.1	6.7	7.8	9.5	11.7	12.8	14.8	22.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.5	7.5	6.3	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	11.9	13.9	21.5
MD 450 (Annapolis Rd)	I-495 Exit 20	11.9	9.9	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.7	4.8	6.5	8.7	9.8	11.8	19.3
US 50 (John Hanson Hwy)	I-495 Exit 19	13.3	11.4	10.1	9.3	7.8	6.8	6.0	4.8	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.5	10.5	18.1
MD 202 (Landover Rd)	I-495 Exit 17	15.3	13.3	12.1	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.4	5.6	6.7	8.7	16.2
Arena Dr	I-495 Exit 16	16.0	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.0	6.1	8.0	15.6
MD 214 (Central Ave)	I-495 Exit 15	16.9	15.0	13.7	12.9	11.4	10.4	9.6	8.3	7.4	5.0	3.6	1.6	1.0	0	1.7	3.9	5.0	7.0	14.5
Ritchie-Marlboro Rd	I-495 Exit 13	18.5	16.5	15.2	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.1	3.2	2.5	1.6	0	2.2	3.3	5.3	12.8
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.8	18.8	17.6	16.8	15.2	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.8	3.9	2.3	0	1.1	3.1	10.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.0	20.0	18.7	18.0	16.4	15.4	14.6	13.4	12.5	10.1	8.6	6.7	6.0	5.0	3.5	1.2	0	2.0	9.5
MD 5 (Branch Ave)	I-495 Exit 7	23.8	21.8	20.5	19.8	18.2	17.3	16.4	15.2	14.3	11.9	10.5	8.5	7.8	6.9	5.3	3.0	1.8	0	7.6
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.7	24.7	23.4	22.7	21.1	20.2	19.3	18.1	17.2	14.8	13.3	11.4	10.7	9.7	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Alternative 13C - ETL (AM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.8	6.0	6.9	7.4	6.6	7.4	13.0	12.0	11.3	9.9	9.4	8.1	N/A	8.7	9.1	10.6
Shady Grove Rd	I-270 Exit 8	N/A	0	1.9	2.9	4.0	5.2	6.0	6.5	5.7	6.5	12.1	11.1	10.4	9.0	8.5	7.2	N/A	7.9	8.2	9.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	N/A	N/A	0	1.0	2.0	3.3	4.1	4.6	3.8	4.6	10.2	9.2	8.5	7.1	6.6	5.3	N/A	6.0	6.3	7.8
MD 189 (Falls Rd)	I-270 Exit 5	N/A	N/A	N/A	0	1.1	2.3	3.2	3.6	2.9	3.6	9.2	8.2	7.6	6.2	5.6	4.3	N/A	5.0	5.4	6.8
Montrose Rd	I-270 Exit 4	N/A	N/A	N/A	N/A	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.5	5.1	4.5	3.3	N/A	3.9	4.3	5.8
Split	I-270	N/A	N/A	N/A	N/A	N/A	0	0.9	1.3	0.6	1.3	6.9	5.9	5.3	3.9	3.3	2.0	N/A	2.7	3.1	4.5
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	0	0.4	N/A	N/A	6.1	5.0	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	5.6	4.6	4.0	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	4.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	15.3	14.3	12.4	11.5	10.2	8.9	8.1	7.7	N/A	N/A	0	2.9	3.6	5.3	5.6	6.9	8.7	9.4	9.8	11.3
George Washington Memorial Pkwy	I-495 Exit 43	12.3	11.4	9.4	8.6	7.3	6.0	5.2	4.8	N/A	N/A	1.0	0	0.7	2.4	2.7	4.0	5.8	6.5	6.9	8.3
Clara Barton Pkwy	I-495 Exit 41	11.6	10.7	8.7	7.8	6.6	5.3	4.5	4.1	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.0	5.8	6.2	7.6
Cabin John Pkwy	I-495 Exit 40	10.0	9.1	7.1	6.2	4.9	3.7	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.4	4.2	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	9.7	8.8	6.8	5.9	4.6	3.4	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.1	3.9	4.2	5.7
I-270 West Spur	I-495 Exit 38	8.4	7.5	5.5	4.6	3.3	2.1	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.8	2.6	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	2.9	1.6	0	0.7	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.9	8.0	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.4	7.4	6.4	5.8	4.4	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.2	8.3	6.3	5.4	4.1	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.1	4.7	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.6	9.7	7.7	6.8	5.5	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.5	6.1	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.8	11.9	9.9	9.0	7.8	6.5	N/A	N/A	5.9	5.3	11.4	10.4	9.7	8.3	7.8	6.5	4.8	3.9	3.6	2.2
US 29 (Colesville Rd)	I-495 Exit 30	13.7	12.8	10.8	9.9	8.6	7.4	N/A	N/A	6.8	6.1	12.2	11.2	10.6	9.2	8.6	7.3	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	15.0	14.1	12.1	11.2	10.0	8.7	N/A	N/A	8.1	7.5	13.6	12.6	11.9	10.5	10.0	8.7	7.0	6.1	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.9	16.0	14.0	13.2	11.9	10.6	N/A	N/A	10.1	9.4	15.5	14.5	13.8	12.4	11.9	10.6	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	17.9	17.0	15.0	14.1	12.9	11.6	N/A	N/A	11.0	10.4	16.5	15.5	14.8	13.4	12.9	11.6	9.9	9.0	8.7	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	18.9	17.9	16.0	15.1	13.8	12.5	N/A	N/A	12.0	11.3	17.4	16.4	15.8	14.3	13.8	12.5	10.9	10.0	9.7	8.3
Greenbelt Metro Station	I-495 Exit 24	19.7	18.8	16.8	15.9	14.7	13.4	N/A	N/A	12.8	12.2	18.3	17.3	16.6	15.2	14.7	13.4	11.7	10.8	10.5	9.1
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.9	20.0	18.0	17.1	15.9	14.6	N/A	N/A	14.0	13.4	19.5	18.5	17.8	16.4	15.9	14.6	12.9	12.0	11.7	10.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.8	20.9	18.9	18.1	16.8	15.5	N/A	N/A	15.0	14.3	20.4	19.4	18.7	17.3	16.8	15.5	13.9	12.9	12.7	11.3
MD 450 (Annapolis Rd)	I-495 Exit 20	24.2	23.3	21.3	20.5	19.2	17.9	N/A	N/A	17.4	16.7	22.8	21.8	21.1	19.7	19.2	17.9	16.3	15.3	15.1	13.7
US 50 (John Hanson Hwy)	I-495 Exit 19	25.7	24.8	22.8	21.9	20.6	19.4	N/A	N/A	18.8	18.1	24.2	23.2	22.6	21.2	20.6	19.3	17.7	16.8	16.5	15.1
MD 202 (Landover Rd)	I-495 Exit 17	27.6	26.7	24.7	23.9	22.6	21.3	N/A	N/A	20.8	20.1	26.2	25.2	24.5	23.1	22.6	21.3	19.7	18.7	18.5	17.1
Arena Dr	I-495 Exit 16	28.3	27.4	25.4	24.5	23.3	22.0	N/A	N/A	21.4	20.8	26.9	25.8	25.2	23.8	23.3	22.0	20.3	19.4	19.1	17.7
MD 214 (Central Ave)	I-495 Exit 15	29.3	28.4	26.4	25.5	24.2	23.0	N/A	N/A	22.4	21.7	27.8	26.8	26.2	24.8	24.2	22.9	21.3	20.4	20.1	18.7
Ritchie-Marlboro Rd	I-495 Exit 13	30.8	29.9	27.9	27.1	25.8	24.5	N/A	N/A	24.0	23.3	29.4	28.4	27.7	26.3	25.8	24.5	22.9	21.9	21.7	20.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.1	32.2	30.3	29.4	28.1	26.8	N/A	N/A	26.3	25.6	31.7	30.7	30.1	28.6	28.1	26.8	25.2	24.3	24.0	22.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.3	33.4	31.4	30.5	29.3	28.0	N/A	N/A	27.4	26.8	32.9	31.9	31.2	29.8	29.3	28.0	26.3	25.4	25.1	23.7
MD 5 (Branch Ave)	I-495 Exit 7	36.1	35.2	33.2	32.4	31.1	29.8	N/A	N/A	29.3	28.6	34.7	33.7	33.0	31.6	31.1	29.8	28.2	27.3	27.0	25.6
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.0	38.1	36.1	35.3	34.0	32.7	N/A	N/A	32.2	31.5	37.6	36.6	35.9	34.5	34.0	32.7	31.1	30.1	29.9	28.5

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.7	14.1	14.8	16.8	19.3	20.3	21.0	22.4	23.2	25.4	26.6	28.5	29.1	30.2	31.9	34.2	35.2	37.2	45.5
Shady Grove Rd	I-270 Exit 8	11.8	13.3	14.0	15.9	18.5	19.4	20.2	21.5	22.4	24.5	25.8	27.6	28.2	29.3	31.1	33.3	34.4	36.4	44.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.9	11.3	12.0	14.0	16.5	17.5	18.3	19.6	20.4	22.6	23.8	25.7	26.3	27.4	29.2	31.4	32.4	34.4	42.7
MD 189 (Falls Rd)	I-270 Exit 5	9.0	10.4	11.1	13.1	15.6	16.6	17.3	18.6	19.5	21.6	22.9	24.8	25.4	26.4	28.2	30.4	31.5	33.5	41.7
Montrose Rd	I-270 Exit 4	7.9	9.3	10.0	12.0	14.5	15.5	16.2	17.6	18.4	20.5	21.8	23.7	24.3	25.4	27.1	29.3	30.4	32.4	40.6
Split	I-270	6.6	8.1	8.8	10.8	13.3	14.3	15.0	16.3	17.2	19.3	20.6	22.5	23.1	24.1	25.9	28.1	29.2	31.2	39.4
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.2	10.2	12.7	13.7	14.4	15.8	16.6	18.8	20.0	21.9	22.5	23.6	25.3	27.5	28.6	30.6	38.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.8	7.5	9.4	12.0	12.9	13.7	15.0	15.9	18.0	19.3	21.1	21.8	22.8	24.6	26.8	27.9	29.9	38.1
VA 193 (Georgetown Pike)	I-495 Exit 44	13.4	14.8	15.5	17.5	20.0	21.0	21.7	23.1	23.9	26.1	27.3	29.2	29.8	30.9	32.6	34.9	35.9	37.9	46.2
George Washington Memorial Pkwy	I-495 Exit 43	10.5	11.9	12.6	14.6	17.1	18.1	18.8	20.2	21.0	23.1	24.4	26.3	26.9	28.0	29.7	31.9	33.0	35.0	43.2
Clara Barton Pkwy	I-495 Exit 41	9.7	11.2	11.9	13.8	16.4	17.4	18.1	19.4	20.3	22.4	23.7	25.5	26.2	27.2	29.0	31.2	32.3	34.3	42.5
Cabin John Pkwy	I-495 Exit 40	8.1	9.5	10.2	12.2	14.7	15.7	16.4	17.8	18.6	20.8	22.0	23.9	24.5	25.6	27.4	29.6	30.6	32.6	40.9
MD 190 (River Rd)	I-495 Exit 39	7.8	9.3	9.9	11.9	14.4	15.4	16.2	17.5	18.3	20.5	21.7	23.6	24.2	25.3	27.1	29.3	30.3	32.3	40.6
I-270 West Spur	I-495 Exit 38	6.5	7.9	8.6	10.6	13.1	14.1	14.9	16.2	17.0	19.2	20.4	22.3	22.9	24.0	25.8	28.0	29.0	31.0	39.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.1	6.8	8.8	11.3	12.3	13.0	14.4	15.2	17.4	18.6	20.5	21.1	22.2	23.9	26.2	27.2	29.2	37.5
I-270 East Spur	I-495 Exit 35	3.9	5.4	6.1	8.1	10.6	11.6	12.3	13.6	14.5	16.6	17.9	19.8	20.4	21.4	23.2	25.4	26.5	28.5	36.7
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.7	7.7	10.2	11.2	11.9	13.3	14.1	16.3	17.5	19.4	20.0	21.1	22.8	25.1	26.1	28.1	36.4
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.6	4.3	6.2	8.7	9.7	10.5	11.8	12.7	14.8	16.1	17.9	18.5	19.6	21.4	23.6	24.7	26.7	34.9
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.1	4.1	6.6	7.6	8.3	9.7	10.5	12.7	13.9	15.8	16.4	17.5	19.2	21.5	22.5	24.5	32.8
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.7	5.2	6.2	6.9	8.2	9.1	11.2	12.5	14.4	15.0	16.1	17.8	20.0	21.1	23.1	31.3
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	2.0	4.5	5.5	6.2	7.6	8.4	10.5	11.8	13.7	14.3	15.4	17.1	19.3	20.4	22.4	30.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	2.5	3.5	4.2	5.6	6.4	8.6	9.8	11.7	12.3	13.4	15.1	17.4	18.4	20.4	28.7
I-95	I-495 Exit 27	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.6	14.8	15.9	17.9	26.1
US 1 (Baltimore Ave)	I-495 Exit 25	6.6	4.6	3.3	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.9	14.9	16.9	25.2
Greenbelt Metro Station	I-495 Exit 24	7.4	5.5	4.2	3.4	1.8	0.9	0	1.3	2.2	4.3	5.6	7.5	8.1	9.2	10.9	13.1	14.2	16.2	24.4
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.6	6.7	5.4	4.6	3.0	2.1	1.2	0	0.8	3.0	4.2	6.1	6.7	7.8	9.6	11.8	12.8	14.8	23.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.5	7.6	6.3	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	12.0	14.0	22.2
MD 450 (Annapolis Rd)	I-495 Exit 20	11.9	10.0	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.6	8.8	9.9	11.9	20.1
US 50 (John Hanson Hwy)	I-495 Exit 19	13.4	11.4	10.1	9.4	7.8	6.8	6.0	4.8	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.6	10.6	18.8
MD 202 (Landover Rd)	I-495 Exit 17	15.3	13.4	12.1	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.4	5.7	6.7	8.7	17.0
Arena Dr	I-495 Exit 16	16.0	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.0	6.1	8.1	16.3
MD 214 (Central Ave)	I-495 Exit 15	17.0	15.0	13.7	13.0	11.4	10.4	9.6	8.4	7.4	5.0	3.6	1.6	1.0	0	1.8	4.0	5.0	7.0	15.3
Ritchie-Marlboro Rd	I-495 Exit 13	18.5	16.6	15.3	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	13.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.9	18.9	17.6	16.8	15.2	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	11.3
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.0	20.0	18.7	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.6	6.7	6.0	5.0	3.5	1.2	0	2.0	10.2
MD 5 (Branch Ave)	I-495 Exit 7	23.9	21.9	20.6	19.8	18.2	17.3	16.4	15.2	14.3	11.9	10.5	8.5	7.8	6.9	5.3	3.0	1.8	0	8.2
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.7	24.8	23.5	22.7	21.1	20.2	19.3	18.1	17.2	14.8	13.4	11.4	10.7	9.8	8.2	5.9	4.7	2.9	0

Travel Time Matrix - Existing Condition (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.9	3.9	5.0	6.4	7.2	7.7	6.9	7.7	25.1	21.2	20.2	16.8	14.7	9.7	N/A	10.3	12.1	19.3
Shady Grove Rd	I-270 Exit 8	2.1	0	2.0	3.0	4.1	5.6	6.3	6.8	6.0	6.8	24.2	20.3	19.3	15.9	13.9	8.8	N/A	9.4	11.2	18.4
MD 28 (W Montgomery Ave)	I-270 Exit 6	4.3	2.3	0	1.0	2.1	3.5	4.3	4.8	4.0	4.8	22.2	18.3	17.3	13.9	11.8	6.8	N/A	7.4	9.1	16.3
MD 189 (Falls Rd)	I-270 Exit 5	5.3	3.3	1.0	0	1.1	2.5	3.3	3.8	3.0	3.8	21.2	17.3	16.3	12.9	10.8	5.8	N/A	6.4	8.2	15.4
Montrose Rd	I-270 Exit 4	6.9	4.8	2.6	1.6	0	1.4	2.2	2.7	1.9	2.7	20.1	16.2	15.2	11.8	9.7	4.7	N/A	5.3	7.1	14.3
Split	I-270	8.6	6.5	4.3	3.3	1.7	0	0.8	1.3	0.5	1.3	18.6	14.8	13.7	10.4	8.3	3.2	N/A	3.8	5.6	12.8
Westlake Terrace	I-270 W Spur	10.3	8.3	6.0	5.0	3.4	1.7	0	0.5	N/A	N/A	17.9	14.0	13.0	9.6	7.5	2.5	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	11.7	9.6	7.3	6.3	4.8	3.0	1.3	0	N/A	N/A	17.4	13.5	12.5	9.1	7.0	2.0	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	9.8	7.8	5.5	4.5	2.9	1.2	N/A	N/A	0	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4	5.2	12.4
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	10.6	8.5	6.2	5.2	3.7	2.0	N/A	N/A	0.8	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.6	4.4	11.6
VA 193 (Georgetown Pike)	I-495 Exit 44	34.5	32.4	30.1	29.1	27.5	25.8	24.1	22.8	N/A	N/A	0	7.4	10.0	17.1	18.3	21.3	24.0	26.6	28.4	35.5
George Washington Memorial Pkwy	I-495 Exit 43	27.1	25.0	22.8	21.7	20.2	18.5	16.7	15.4	N/A	N/A	3.9	0	2.7	9.7	11.0	14.0	16.7	19.2	21.0	28.2
Clara Barton Pkwy	I-495 Exit 41	24.4	22.4	20.1	19.1	17.5	15.8	14.1	12.8	N/A	N/A	4.9	1.0	0	7.1	8.3	11.3	14.0	16.6	18.3	25.5
Cabin John Pkwy	I-495 Exit 40	17.4	15.3	13.0	12.0	10.5	8.8	7.0	5.7	N/A	N/A	8.3	4.4	3.4	0	1.3	4.3	7.0	9.5	11.3	18.5
MD 190 (River Rd)	I-495 Exit 39	16.1	14.0	11.8	10.8	9.2	7.5	5.8	4.4	N/A	N/A	10.3	6.5	5.5	2.1	0	3.0	5.7	8.2	10.0	17.2
I-270 West Spur	I-495 Exit 38	13.1	11.0	8.8	7.8	6.2	4.5	2.8	1.4	N/A	N/A	15.4	11.5	10.5	7.1	5.1	0	2.7	5.2	7.0	14.2
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.4	14.6	13.5	10.1	8.1	3.0	0	2.5	4.3	11.5
I-270 East Spur	I-495 Exit 35	12.0	10.0	7.7	6.7	5.1	3.4	N/A	N/A	2.2	1.5	19.5	15.6	14.6	11.2	9.1	4.1	1.1	0	1.8	9.0
MD 355 (Rockville Pike)	I-495 Exit 34	12.3	10.3	8.0	7.0	5.4	3.7	N/A	N/A	2.5	1.8	19.8	15.9	14.9	11.5	9.4	4.4	1.4	0.3	0	7.2
MD 185 (Connecticut Ave)	I-495 Exit 33	14.1	12.0	9.8	8.8	7.2	5.5	N/A	N/A	4.3	3.5	21.5	17.7	16.6	13.2	11.2	6.1	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	16.8	14.7	12.4	11.4	9.8	8.1	N/A	N/A	6.9	6.2	24.2	20.3	19.3	15.9	13.8	8.8	5.8	4.7	4.4	2.7
US 29 (Colesville Rd)	I-495 Exit 30	17.9	15.9	13.6	12.6	11.0	9.3	N/A	N/A	8.1	7.3	25.4	21.5	20.5	17.1	15.0	10.0	7.0	5.9	5.6	3.8
MD 193 (University Blvd E)	I-495 Exit 29	19.4	17.3	15.1	14.1	12.5	10.8	N/A	N/A	9.6	8.8	26.8	23.0	21.9	18.5	16.5	11.4	8.4	7.4	7.0	5.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	21.8	19.7	17.5	16.5	14.9	13.2	N/A	N/A	12.0	11.2	29.3	25.4	24.4	21.0	18.9	13.9	10.8	9.8	9.5	7.7
I-95	I-495 Exit 27	22.8	20.8	18.5	17.5	15.9	14.2	N/A	N/A	13.0	12.3	30.3	26.4	25.4	22.0	19.9	14.9	11.9	10.8	10.5	8.8
US 1 (Baltimore Ave)	I-495 Exit 25	23.9	21.8	19.6	18.5	17.0	15.3	N/A	N/A	14.1	13.3	31.3	27.5	26.4	23.0	21.0	15.9	12.9	11.8	11.5	9.8
Greenbelt Metro Station	I-495 Exit 24	25.1	23.1	20.8	19.8	18.2	16.5	N/A	N/A	15.3	14.6	32.6	28.7	27.7	24.3	22.2	17.2	14.2	13.1	12.8	11.1
MD 201 (Kenilworth Ave)	I-495 Exit 23	28.0	26.0	23.7	22.7	21.1	19.4	N/A	N/A	18.2	17.5	35.5	31.6	30.6	27.2	25.1	20.1	17.1	16.0	15.7	13.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	31.6	29.5	27.3	26.3	24.7	23.0	N/A	N/A	21.8	21.0	39.0	35.2	34.2	30.8	28.7	23.6	20.6	19.6	19.3	17.5
MD 450 (Annapolis Rd)	I-495 Exit 20	37.2	35.1	32.9	31.9	30.3	28.6	N/A	N/A	27.4	26.6	44.6	40.8	39.8	36.4	34.3	29.2	26.2	25.2	24.9	23.1
US 50 (John Hanson Hwy)	I-495 Exit 19	38.8	36.7	34.5	33.5	31.9	30.2	N/A	N/A	29.0	28.2	46.2	42.4	41.3	38.0	35.9	30.8	27.8	26.8	26.5	24.7
MD 202 (Landover Rd)	I-495 Exit 17	44.8	42.7	40.4	39.4	37.9	36.1	N/A	N/A	34.9	34.2	52.2	48.3	47.3	43.9	41.9	36.8	33.8	32.7	32.4	30.7
Arena Dr	I-495 Exit 16	47.7	45.6	43.4	42.3	40.8	39.1	N/A	N/A	37.9	37.1	55.1	51.3	50.2	46.8	44.8	39.7	36.7	35.6	35.3	33.6
MD 214 (Central Ave)	I-495 Exit 15	52.3	50.2	48.0	47.0	45.4	43.7	N/A	N/A	42.5	41.7	59.7	55.9	54.9	51.5	49.4	44.3	41.3	40.3	40.0	38.2
Ritchie-Marlboro Rd	I-495 Exit 13	55.8	53.8	51.5	50.5	48.9	47.2	N/A	N/A	46.0	45.3	63.3	59.4	58.4	55.0	52.9	47.9	44.9	43.8	43.5	41.8
MD 4 (Pennsylvania Ave)	I-495 Exit 11	58.7	56.6	54.3	53.3	51.7	50.0	N/A	N/A	48.8	48.1	66.1	62.2	61.2	57.8	55.7	50.7	47.7	46.6	46.3	44.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	61.7	59.6	57.4	56.4	54.8	53.1	N/A	N/A	51.9	51.1	69.1	65.3	64.3	60.9	58.8	53.7	50.7	49.7	49.4	47.6
MD 5 (Branch Ave)	I-495 Exit 7	65.8	63.7	61.5	60.5	58.9	57.2	N/A	N/A	56.0	55.2	73.2	69.4	68.4	65.0	62.9	57.8	54.8	53.8	53.5	51.7
MD 414 (St Barnabas Rd)	I-495 Exit 4	68.9	66.8	64.5	63.5	62.0	60.2	N/A	N/A	59.0	58.3	76.3	72.4	71.4	68.0	66.0	60.9	57.9	56.8	56.5	54.8

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	26.0	29.2	31.9	35.0	36.9	40.6	42.0	43.7	44.9	49.1	54.3	59.6	61.3	62.7	64.7	67.5	68.8	70.8	73.2
Shady Grove Rd	I-270 Exit 8	25.1	28.3	31.0	34.2	36.1	39.7	41.1	42.8	44.0	48.2	53.4	58.7	60.5	61.9	63.9	66.6	67.9	69.9	72.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	23.0	26.2	29.0	32.1	34.0	37.7	39.0	40.8	42.0	46.2	51.4	56.7	58.4	59.8	61.8	64.6	65.8	67.9	70.3
MD 189 (Falls Rd)	I-270 Exit 5	22.1	25.2	28.0	31.1	33.0	36.7	38.1	39.8	41.0	45.2	50.4	55.7	57.4	58.8	60.8	63.6	64.8	66.9	69.3
Montrose Rd	I-270 Exit 4	21.0	24.2	26.9	30.0	31.9	35.6	37.0	38.7	39.9	44.1	49.3	54.6	56.3	57.7	59.7	62.5	63.8	65.8	68.2
Split	I-270	19.5	22.7	25.4	28.6	30.5	34.1	35.5	37.3	38.5	42.6	47.9	53.2	54.9	56.3	58.3	61.1	62.3	64.4	66.8
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	19.1	22.3	25.0	28.1	30.0	33.7	35.1	36.8	38.0	42.2	47.4	52.7	54.4	55.8	57.8	60.6	61.9	63.9	66.3
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	18.3	21.5	24.2	27.3	29.2	32.9	34.3	36.0	37.2	41.4	46.6	51.9	53.6	55.0	57.0	59.8	61.1	63.1	65.5
VA 193 (Georgetown Pike)	I-495 Exit 44	42.3	45.4	48.2	51.3	53.2	56.9	58.2	60.0	61.2	65.4	70.6	75.9	77.6	79.0	81.0	83.8	85.0	87.1	89.5
George Washington Memorial Pkwy	I-495 Exit 43	34.9	38.1	40.8	44.0	45.9	49.5	50.9	52.6	53.8	58.0	63.2	68.5	70.3	71.7	73.7	76.4	77.7	79.7	82.1
Clara Barton Pkwy	I-495 Exit 41	32.2	35.4	38.1	41.3	43.2	46.9	48.2	50.0	51.2	55.4	60.6	65.9	67.6	69.0	71.0	73.8	75.0	77.1	79.5
Cabin John Pkwy	I-495 Exit 40	25.2	28.4	31.1	34.3	36.2	39.8	41.2	42.9	44.1	48.3	53.5	58.8	60.6	62.0	64.0	66.7	68.0	70.0	72.4
MD 190 (River Rd)	I-495 Exit 39	23.9	27.1	29.8	33.0	34.9	38.5	39.9	41.7	42.9	47.0	52.3	57.6	59.3	60.7	62.7	65.5	66.7	68.8	71.1
I-270 West Spur	I-495 Exit 38	20.9	24.1	26.8	30.0	31.9	35.5	36.9	38.6	39.9	44.0	49.3	54.6	56.3	57.7	59.7	62.5	63.7	65.8	68.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	18.2	21.4	24.1	27.3	29.2	32.8	34.2	36.0	37.2	41.3	46.6	51.9	53.6	55.0	57.0	59.8	61.0	63.1	65.4
I-270 East Spur	I-495 Exit 35	15.7	18.9	21.6	24.8	26.7	30.3	31.7	33.4	34.6	38.8	44.0	49.3	51.1	52.5	54.5	57.2	58.5	60.5	62.9
MD 355 (Rockville Pike)	I-495 Exit 34	13.9	17.1	19.8	23.0	24.9	28.5	29.9	31.6	32.8	37.0	42.2	47.6	49.3	50.7	52.7	55.4	56.7	58.7	61.1
MD 185 (Connecticut Ave)	I-495 Exit 33	6.7	9.9	12.6	15.8	17.7	21.3	22.7	24.4	25.7	29.8	35.0	40.4	42.1	43.5	45.5	48.3	49.5	51.5	53.9
MD 97 (Georgia Ave)	I-495 Exit 31	0	3.2	5.9	9.1	11.0	14.6	16.0	17.7	18.9	23.1	28.3	33.7	35.4	36.8	38.8	41.5	42.8	44.8	47.2
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	2.7	5.9	7.8	11.4	12.8	14.5	15.8	19.9	25.1	30.5	32.2	33.6	35.6	38.4	39.6	41.7	44.0
MD 193 (University Blvd E)	I-495 Exit 29	3.2	0.8	0	3.2	5.1	8.7	10.1	11.8	13.0	17.2	22.4	27.8	29.5	30.9	32.9	35.6	36.9	38.9	41.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	5.6	3.3	1.7	0	1.9	5.5	6.9	8.7	9.9	14.0	19.3	24.6	26.3	27.7	29.7	32.5	33.7	35.8	38.2
I-95	I-495 Exit 27	6.6	4.3	2.7	1.8	0	3.6	5.0	6.8	8.0	12.1	17.4	22.7	24.4	25.8	27.8	30.6	31.8	33.9	36.3
US 1 (Baltimore Ave)	I-495 Exit 25	7.6	5.3	3.7	2.9	1.0	0	1.4	3.1	4.3	8.5	13.7	19.0	20.8	22.2	24.2	26.9	28.2	30.2	32.6
Greenbelt Metro Station	I-495 Exit 24	8.9	6.6	5.0	4.1	2.3	1.3	0	1.7	3.0	7.1	12.3	17.7	19.4	20.8	22.8	25.6	26.8	28.8	31.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	11.8	9.5	7.9	7.0	5.2	4.2	2.9	0	1.2	5.4	10.6	15.9	17.6	19.0	21.0	23.8	25.1	27.1	29.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	15.4	13.0	11.5	10.6	8.8	7.7	6.5	3.6	0	4.2	9.4	14.7	16.4	17.8	19.8	22.6	23.8	25.9	28.3
MD 450 (Annapolis Rd)	I-495 Exit 20	21.0	18.6	17.1	16.2	14.4	13.3	12.1	9.2	5.6	0	5.2	10.5	12.3	13.7	15.7	18.4	19.7	21.7	24.1
US 50 (John Hanson Hwy)	I-495 Exit 19	22.6	20.2	18.7	17.8	16.0	14.9	13.7	10.8	7.2	1.6	0	5.3	7.0	8.4	10.4	13.2	14.5	16.5	18.9
MD 202 (Landover Rd)	I-495 Exit 17	28.5	26.2	24.6	23.8	21.9	20.9	19.6	16.7	13.2	7.6	6.0	0	1.7	3.1	5.1	7.9	9.1	11.2	13.6
Arena Dr	I-495 Exit 16	31.4	29.1	27.5	26.7	24.8	23.8	22.5	19.6	16.1	10.5	8.9	2.9	0	1.4	3.4	6.2	7.4	9.5	11.9
MD 214 (Central Ave)	I-495 Exit 15	36.1	33.7	32.2	31.3	29.5	28.4	27.2	24.3	20.7	15.1	13.5	7.5	4.6	0	2.0	4.8	6.0	8.1	10.5
Ritchie-Marlboro Rd	I-495 Exit 13	39.6	37.3	35.7	34.8	33.0	32.0	30.7	27.8	24.2	18.6	17.0	11.1	8.2	3.5	0	2.8	4.0	6.1	8.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	42.4	40.1	38.5	37.6	35.8	34.8	33.5	30.6	27.0	21.4	19.9	13.9	11.0	6.3	2.8	0	1.2	3.3	5.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	45.5	43.1	41.6	40.7	38.9	37.8	36.6	33.7	30.1	24.5	22.9	16.9	14.0	9.4	5.9	3.1	0	2.1	4.4
MD 5 (Branch Ave)	I-495 Exit 7	49.6	47.2	45.7	44.8	43.0	41.9	40.7	37.8	34.2	28.6	27.0	21.0	18.1	13.5	10.0	7.2	4.1	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	52.6	50.3	48.7	47.9	46.0	45.0	43.7	40.8	37.3	31.7	30.1	24.1	21.2	16.6	13.0	10.2	7.2	3.1	0

Travel Time Matrix - 2040 No Build (PM Peak)

Unit: Minute

From	To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.9	3.9	5.2	8.4	9.1	9.6	13.5	26.7	23.8	22.7	21.9	17.9	15.6	10.4	N/A	49.2	53.1	67.1
Shady Grove Rd	I-270 Exit 8	1.0	0	2.0	3.0	4.3	7.5	8.3	8.7	12.6	25.9	22.9	21.8	21.0	17.0	14.8	9.5	N/A	48.3	52.2	66.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.3	2.2	0	1.0	2.3	5.4	6.2	6.7	10.6	23.8	20.9	19.7	19.0	14.9	12.7	7.5	N/A	46.3	50.2	64.2
MD 189 (Falls Rd)	I-270 Exit 5	4.3	3.3	1.0	0	1.3	4.4	5.2	5.7	9.6	22.8	19.9	18.7	18.0	13.9	11.7	6.5	N/A	45.3	49.2	63.2
Montrose Rd	I-270 Exit 4	5.8	4.7	2.5	1.5	0	3.2	3.9	4.4	8.3	21.5	18.6	17.5	16.7	12.7	10.4	5.2	N/A	44.0	47.9	61.9
Split	I-270	7.3	6.3	4.0	3.0	1.5	0	0.8	1.2	5.2	18.4	15.5	14.3	13.5	9.5	7.3	2.1	N/A	40.9	44.7	58.8
Westlake Terrace	I-270 W Spur	8.3	7.2	5.0	4.0	2.5	1.0	0	0.5	N/A	N/A	14.7	13.5	12.7	8.7	6.5	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	8.7	7.7	5.5	4.4	3.0	1.4	0.5	0	N/A	N/A	14.2	13.0	12.3	8.2	6.0	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.0	6.9	4.7	3.7	2.2	0.7	N/A	N/A	0	13.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35.7	39.6	53.6
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.7	7.7	5.4	4.4	3.0	1.4	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.5	26.3	40.4
VA 193 (Georgetown Pike)	I-495 Exit 44	41.9	40.8	38.6	37.6	36.1	34.6	33.6	33.1	N/A	N/A	0	11.5	15.8	24.6	26.5	32.2	56.8	66.7	70.6	84.6
George Washington Memorial Pkwy	I-495 Exit 43	30.3	29.3	27.1	26.0	24.6	23.0	22.0	21.6	N/A	N/A	1.2	0	4.3	13.1	15.0	20.7	45.3	55.2	59.1	73.1
Clara Barton Pkwy	I-495 Exit 41	26.1	25.0	22.8	21.8	20.3	18.8	17.8	17.3	N/A	N/A	1.9	0.8	0	8.9	10.7	16.4	41.0	50.9	54.8	68.8
Cabin John Pkwy	I-495 Exit 40	17.2	16.2	13.9	12.9	11.4	9.9	8.9	8.5	N/A	N/A	6.0	4.8	4.0	0	1.8	7.5	32.1	42.1	45.9	60.0
MD 190 (River Rd)	I-495 Exit 39	15.4	14.3	12.1	11.1	9.6	8.1	7.1	6.6	N/A	N/A	8.2	7.0	6.2	2.2	0	5.7	30.3	40.2	44.1	58.1
I-270 West Spur	I-495 Exit 38	9.7	8.6	6.4	5.4	3.9	2.4	1.4	0.9	N/A	N/A	13.4	12.2	11.5	7.4	5.2	0	24.6	34.5	38.4	52.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25.0	23.8	23.0	19.0	16.8	11.6	0	9.9	13.8	27.8
I-270 East Spur	I-495 Exit 35	10.2	9.2	6.9	5.9	4.4	2.9	N/A	N/A	2.2	1.5	33.2	32.0	31.2	27.2	25.0	19.8	8.2	0	3.9	17.9
MD 355 (Rockville Pike)	I-495 Exit 34	12.5	11.5	9.3	8.3	6.8	5.3	N/A	N/A	4.6	3.8	35.5	34.3	33.6	29.5	27.3	22.1	10.5	2.4	0	14.0
MD 185 (Connecticut Ave)	I-495 Exit 33	18.2	17.2	15.0	13.9	12.5	10.9	N/A	N/A	10.3	9.5	41.2	40.0	39.3	35.2	33.0	27.8	16.2	8.0	5.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	25.9	24.9	22.7	21.6	20.2	18.6	N/A	N/A	17.9	17.2	48.9	47.7	47.0	42.9	40.7	35.5	23.9	15.7	13.4	7.7
US 29 (Colesville Rd)	I-495 Exit 30	30.2	29.2	26.9	25.9	24.4	22.9	N/A	N/A	22.2	21.5	53.1	52.0	51.2	47.2	45.0	39.8	28.2	20.0	17.6	11.9
MD 193 (University Blvd E)	I-495 Exit 29	34.0	33.0	30.8	29.8	28.3	26.7	N/A	N/A	26.1	25.3	57.0	55.8	55.1	51.0	48.8	43.6	32.0	23.9	21.5	15.8
MD 650 (New Hampshire Ave)	I-495 Exit 28	38.2	37.2	35.0	34.0	32.5	31.0	N/A	N/A	30.3	29.5	61.2	60.0	59.3	55.2	53.0	47.8	36.2	28.1	25.7	20.0
I-95	I-495 Exit 27	39.8	38.8	36.6	35.6	34.1	32.6	N/A	N/A	31.9	31.1	62.8	61.6	60.9	56.9	54.6	49.4	37.8	29.7	27.3	21.6
US 1 (Baltimore Ave)	I-495 Exit 25	40.9	39.9	37.6	36.6	35.1	33.6	N/A	N/A	32.9	32.2	63.9	62.7	61.9	57.9	55.7	50.5	38.9	30.7	28.3	22.7
Greenbelt Metro Station	I-495 Exit 24	42.3	41.2	39.0	38.0	36.5	35.0	N/A	N/A	34.3	33.6	65.2	64.1	63.3	59.3	57.1	51.9	40.3	32.1	29.7	24.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	46.2	45.2	42.9	41.9	40.4	38.9	N/A	N/A	38.2	37.5	69.2	68.0	67.2	63.2	61.0	55.8	44.2	36.0	33.6	28.0
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	50.6	49.6	47.4	46.3	44.9	43.3	N/A	N/A	42.7	41.9	73.6	72.4	71.7	67.6	65.4	60.2	48.6	40.4	38.1	32.4
MD 450 (Annapolis Rd)	I-495 Exit 20	61.2	60.2	58.0	56.9	55.5	53.9	N/A	N/A	53.2	52.5	84.2	83.0	82.2	78.2	76.0	70.8	59.2	51.0	48.7	43.0
US 50 (John Hanson Hwy)	I-495 Exit 19	65.5	64.5	62.3	61.3	59.8	58.3	N/A	N/A	57.6	56.8	88.5	87.3	86.6	82.5	80.3	75.1	63.5	55.4	53.0	47.3
MD 202 (Landover Rd)	I-495 Exit 17	71.5	70.5	68.3	67.3	65.8	64.3	N/A	N/A	63.6	62.8	94.5	93.3	92.6	88.5	86.3	81.1	69.5	61.4	59.0	53.3
Arena Dr	I-495 Exit 16	74.4	73.4	71.1	70.1	68.6	67.1	N/A	N/A	66.4	65.7	97.4	96.2	95.4	91.4	89.2	84.0	72.4	64.2	61.8	56.2
MD 214 (Central Ave)	I-495 Exit 15	78.7	77.7	75.4	74.4	72.9	71.4	N/A	N/A	70.7	70.0	101.7	100.5	99.7	95.7	93.5	88.3	76.7	68.5	66.2	60.5
Ritchie-Marlboro Rd	I-495 Exit 13	83.4	82.4	80.1	79.1	77.6	76.1	N/A	N/A	75.4	74.7	106.4	105.2	104.4	100.4	98.2	93.0	81.4	73.2	70.8	65.2
MD 4 (Pennsylvania Ave)	I-495 Exit 11	88.1	87.1	84.8	83.8	82.3	80.8	N/A	N/A	80.1	79.4	111.1	109.9	109.1	105.1	102.9	97.7	86.1	77.9	75.6	69.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	91.3	90.3	88.0	87.0	85.5	84.0	N/A	N/A	83.3	82.6	114.3	113.1	112.3	108.3	106.1	100.9	89.3	81.1	78.7	73.1
MD 5 (Branch Ave)	I-495 Exit 7	98.0	97.0	94.8	93.7	92.3	90.7	N/A	N/A	90.1	89.3	121.0	119.8	119.1	115.0	112.8	107.6	96.0	87.8	85.5	79.8
MD 414 (St Barnabas Rd)	I-495 Exit 4	102.5	101.5	99.2	98.2	96.7	95.2	N/A	N/A	94.5	93.8	125.5	124.3	123.5	119.5	117.3	112.1	100.5	92.3	89.9	84.3

Unit: Minute

From	To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	81.0	87.8	91.5	95.5	97.5	101.0	102.4	104.1	105.6	110.9	117.1	123.6	125.7	128.1	130.3	133.0	134.2	136.3	138.7
Shady Grove Rd	I-270 Exit 8	80.1	86.9	90.6	94.6	96.6	100.1	101.5	103.2	104.8	110.0	116.2	122.7	124.8	127.2	129.4	132.1	133.3	135.4	137.8
MD 28 (W Montgomery Ave)	I-270 Exit 6	78.1	84.8	88.6	92.6	94.6	98.0	99.5	101.2	102.7	108.0	114.2	120.7	122.8	125.2	127.3	130.0	131.3	133.3	135.7
MD 189 (Falls Rd)	I-270 Exit 5	77.1	83.9	87.6	91.6	93.6	97.0	98.5	100.2	101.7	107.0	113.2	119.7	121.8	124.2	126.3	129.1	130.3	132.3	134.7
Montrose Rd	I-270 Exit 4	75.8	82.6	86.3	90.3	92.3	95.8	97.2	98.9	100.4	105.7	111.9	118.4	120.5	122.9	125.1	127.8	129.0	131.1	133.5
Split	I-270	72.6	79.4	83.1	87.1	89.1	92.6	94.1	95.8	97.3	102.5	108.7	115.3	117.3	119.7	121.9	124.6	125.8	127.9	130.3
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	67.5	74.2	78.0	82.0	84.0	87.4	88.9	90.6	92.1	97.4	103.6	110.1	112.2	114.6	116.7	119.5	120.7	122.7	125.1
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	54.2	61.0	64.8	68.7	70.7	74.2	75.7	77.4	78.9	84.1	90.4	96.9	99.0	101.4	103.5	106.2	107.5	109.5	111.9
VA 193 (Georgetown Pike)	I-495 Exit 44	98.5	105.3	109.0	113.0	115.0	118.4	119.9	121.6	123.1	128.4	134.6	141.1	143.2	145.6	147.7	150.5	151.7	153.7	156.1
George Washington Memorial Pkwy	I-495 Exit 43	86.9	93.7	97.5	101.5	103.4	106.9	108.4	110.1	111.6	116.8	123.1	129.6	131.7	134.1	136.2	138.9	140.2	142.2	144.6
Clara Barton Pkwy	I-495 Exit 41	82.7	89.5	93.2	97.2	99.2	102.6	104.1	105.8	107.3	112.6	118.8	125.3	127.4	129.8	131.9	134.7	135.9	137.9	140.3
Cabin John Pkwy	I-495 Exit 40	73.8	80.6	84.4	88.3	90.3	93.8	95.3	97.0	98.5	103.7	109.9	116.5	118.5	120.9	123.1	125.8	127.0	129.1	131.5
MD 190 (River Rd)	I-495 Exit 39	72.0	78.8	82.5	86.5	88.5	92.0	93.4	95.1	96.6	101.9	108.1	114.6	116.7	119.1	121.2	124.0	125.2	127.3	129.6
I-270 West Spur	I-495 Exit 38	66.3	73.1	76.8	80.8	82.8	86.3	87.7	89.4	90.9	96.2	102.4	108.9	111.0	113.4	115.6	118.3	119.5	121.6	124.0
MD 187 (Old Georgetown Rd)	I-495 Exit 36	41.7	48.5	52.2	56.2	58.2	61.7	63.1	64.8	66.3	71.6	77.8	84.3	86.4	88.8	91.0	93.7	94.9	97.0	99.4
I-270 East Spur	I-495 Exit 35	31.7	38.5	42.3	46.3	48.3	51.7	53.2	54.9	56.4	61.6	67.9	74.4	76.5	78.9	81.0	83.7	85.0	87.0	89.4
MD 355 (Rockville Pike)	I-495 Exit 34	27.9	34.7	38.4	42.4	44.4	47.9	49.3	51.0	52.5	57.8	64.0	70.5	72.6	75.0	77.2	79.9	81.1	83.2	85.6
MD 185 (Connecticut Ave)	I-495 Exit 33	13.8	20.6	24.4	28.4	30.4	33.8	35.3	37.0	38.5	43.7	50.0	56.5	58.6	61.0	63.1	65.8	67.1	69.1	71.5
MD 97 (Georgia Ave)	I-495 Exit 31	0	6.8	10.5	14.5	16.5	20.0	21.4	23.2	24.7	29.9	36.1	42.6	44.7	47.1	49.3	52.0	53.2	55.3	57.7
US 29 (Colesville Rd)	I-495 Exit 30	4.6	0	3.7	7.7	9.7	13.2	14.7	16.4	17.9	23.1	29.3	35.9	37.9	40.3	42.5	45.2	46.4	48.5	50.9
MD 193 (University Blvd E)	I-495 Exit 29	8.5	2.4	0	4.0	6.0	9.4	10.9	12.6	14.1	19.4	25.6	32.1	34.2	36.6	38.7	41.5	42.7	44.7	47.1
MD 650 (New Hampshire Ave)	I-495 Exit 28	12.7	6.6	2.5	0	2.0	5.5	6.9	8.6	10.1	15.4	21.6	28.1	30.2	32.6	34.8	37.5	38.7	40.8	43.2
I-95	I-495 Exit 27	14.3	8.2	4.1	1.8	0	3.5	4.9	6.6	8.2	13.4	19.6	26.1	28.2	30.6	32.8	35.5	36.7	38.8	41.2
US 1 (Baltimore Ave)	I-495 Exit 25	15.3	9.3	5.1	2.9	1.0	0	1.5	3.2	4.7	9.9	16.1	22.7	24.7	27.1	29.3	32.0	33.3	35.3	37.7
Greenbelt Metro Station	I-495 Exit 24	16.7	10.7	6.5	4.3	2.4	1.4	0	1.7	3.2	8.4	14.7	21.2	23.3	25.7	27.8	30.5	31.8	33.8	36.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.6	14.6	10.4	8.2	6.3	5.3	3.9	0	1.5	6.7	13.0	19.5	21.6	24.0	26.1	28.8	30.1	32.1	34.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	25.1	19.0	14.9	12.6	10.8	9.7	8.4	4.4	0	5.2	11.5	18.0	20.1	22.5	24.6	27.3	28.6	30.6	33.0
MD 450 (Annapolis Rd)	I-495 Exit 20	35.7	29.6	25.5	23.2	21.4	20.3	18.9	15.0	10.6	0	6.2	12.8	14.8	17.2	19.4	22.1	23.3	25.4	27.8
US 50 (John Hanson Hwy)	I-495 Exit 19	40.0	33.9	29.8	27.5	25.7	24.7	23.3	19.4	14.9	4.3	0	6.5	8.6	11.0	13.1	15.9	17.1	19.2	21.5
MD 202 (Landover Rd)	I-495 Exit 17	46.0	39.9	35.8	33.5	31.7	30.7	29.3	25.4	20.9	10.3	6.0	0	2.1	4.5	6.6	9.3	10.6	12.6	15.0
Arena Dr	I-495 Exit 16	48.8	42.8	38.6	36.4	34.5	33.5	32.1	28.2	23.8	13.2	8.8	2.9	0	2.4	4.6	7.3	8.5	10.6	13.0
MD 214 (Central Ave)	I-495 Exit 15	53.1	47.1	42.9	40.7	38.9	37.8	36.4	32.5	28.1	17.5	13.2	7.2	4.3	0	2.2	4.9	6.1	8.2	10.6
Ritchie-Marlboro Rd	I-495 Exit 13	57.8	51.8	47.6	45.4	43.5	42.5	41.1	37.2	32.8	22.2	17.8	11.8	9.0	4.7	0	2.7	4.0	6.0	8.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	62.5	56.5	52.3	50.1	48.2	47.2	45.8	41.9	37.5	26.9	22.5	16.6	13.7	9.4	4.7	0	1.2	3.3	5.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	65.7	59.7	55.5	53.3	51.4	50.4	49.0	45.1	40.7	30.1	25.7	19.7	16.9	12.6	7.9	3.2	0	2.1	4.4
MD 5 (Branch Ave)	I-495 Exit 7	72.5	66.4	62.3	60.0	58.2	57.1	55.8	51.8	47.4	36.8	32.5	26.5	23.6	19.3	14.6	9.9	6.7	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	76.9	70.9	66.7	64.5	62.6	61.6	60.2	56.3	51.9	41.3	36.9	30.9	28.1	23.8	19.1	14.4	11.2	4.5	0

Travel Time Matrix - Alternative 5 - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	3.3	6.4	16.2	36.5	37.3	37.8	43.5	54.5	46.2	45.0	44.2	41.2	40.3	38.6	N/A	68.6	71.6	79.8
Shady Grove Rd	I-270 Exit 8	2.1	0	2.4	5.5	15.3	35.6	36.4	36.9	42.6	53.6	45.3	44.1	43.3	40.3	39.4	37.7	N/A	67.7	70.7	78.9
MD 28 (W Montgomery Ave)	I-270 Exit 6	5.1	2.9	0	3.2	12.9	33.3	34.1	34.5	40.2	51.2	42.9	41.7	40.9	37.9	37.0	35.3	N/A	65.4	68.3	76.5
MD 189 (Falls Rd)	I-270 Exit 5	6.1	4.0	1.0	0	9.7	30.1	30.9	31.4	37.0	48.0	39.7	38.5	37.8	34.8	33.8	32.2	N/A	62.2	65.1	73.4
Montrose Rd	I-270 Exit 4	7.6	5.5	2.5	1.5	0	20.3	21.1	21.6	27.3	38.3	30.0	28.8	28.0	25.0	24.1	22.4	N/A	52.5	55.4	63.6
Split	I-270	9.1	7.0	4.1	3.0	1.5	0	0.8	1.3	6.9	17.9	9.6	8.4	7.7	4.7	3.7	2.1	N/A	32.1	35.0	43.3
Westlake Terrace	I-270 W Spur	10.1	8.0	5.0	4.0	2.5	1.0	0	0.5	N/A	N/A	8.8	7.6	6.9	3.9	2.9	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	10.6	8.4	5.5	4.5	3.0	1.4	0.5	0	N/A	N/A	8.3	7.2	6.4	3.4	2.5	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	9.8	7.6	4.7	3.7	2.2	0.6	N/A	N/A	0	11.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25.2	28.1	36.3
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	10.5	8.3	5.4	4.4	2.9	1.4	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.2	17.1	25.3
VA 193 (Georgetown Pike)	I-495 Exit 44	27.4	25.2	22.3	21.3	19.8	18.2	17.3	16.8	N/A	N/A	0	1.5	3.2	10.8	12.3	15.7	28.8	34.0	36.9	45.1
George Washington Memorial Pkwy	I-495 Exit 43	25.9	23.8	20.8	19.8	18.3	16.8	15.8	15.3	N/A	N/A	1.2	0	1.7	9.3	10.8	14.2	27.3	32.5	35.4	43.7
Clara Barton Pkwy	I-495 Exit 41	24.2	22.1	19.1	18.1	16.6	15.1	14.1	13.6	N/A	N/A	2.0	0.8	0	7.6	9.1	12.5	25.6	30.8	33.7	42.0
Cabin John Pkwy	I-495 Exit 40	16.6	14.4	11.5	10.5	9.0	7.4	6.5	6.0	N/A	N/A	5.0	3.8	3.0	0	1.5	4.9	18.0	23.2	26.1	34.3
MD 190 (River Rd)	I-495 Exit 39	15.1	13.0	10.0	9.0	7.5	6.0	5.0	4.5	N/A	N/A	5.9	4.7	3.9	0.9	0	3.5	16.5	21.7	24.7	32.9
I-270 West Spur	I-495 Exit 38	11.7	9.5	6.6	5.6	4.1	2.5	1.6	1.1	N/A	N/A	7.5	6.4	5.6	2.6	1.7	0	13.1	18.3	21.2	29.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.5	8.4	7.6	4.6	3.7	2.0	0	5.2	8.1	16.3
I-270 East Spur	I-495 Exit 35	12.0	9.8	6.9	5.9	4.4	2.9	N/A	N/A	2.2	1.5	10.6	9.4	8.7	5.7	4.7	3.1	1.1	0	2.9	11.2
MD 355 (Rockville Pike)	I-495 Exit 34	12.3	10.1	7.2	6.2	4.7	3.2	N/A	N/A	2.5	1.8	10.9	9.7	9.0	6.0	5.0	3.4	1.4	0.3	0	8.2
MD 185 (Connecticut Ave)	I-495 Exit 33	14.0	11.9	8.9	7.9	6.4	4.9	N/A	N/A	4.2	3.5	12.6	11.4	10.7	7.7	6.7	5.1	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	16.8	14.6	11.7	10.7	9.2	7.7	N/A	N/A	7.0	6.3	15.4	14.2	13.5	10.5	9.5	7.9	5.9	4.8	4.5	2.8
US 29 (Colesville Rd)	I-495 Exit 30	17.8	15.7	12.7	11.7	10.2	8.7	N/A	N/A	8.1	7.3	16.5	15.3	14.5	11.5	10.6	8.9	6.9	5.8	5.5	3.8
MD 193 (University Blvd E)	I-495 Exit 29	19.8	17.7	14.7	13.7	12.2	10.7	N/A	N/A	10.1	9.3	18.4	17.3	16.5	13.5	12.6	10.9	8.9	7.8	7.5	5.8
MD 650 (New Hampshire Ave)	I-495 Exit 28	22.2	20.0	17.1	16.1	14.6	13.0	N/A	N/A	12.4	11.7	20.8	19.6	18.8	15.8	14.9	13.2	11.2	10.2	9.9	8.2
I-95	I-495 Exit 27	23.3	21.2	18.2	17.2	15.7	14.2	N/A	N/A	13.5	12.8	21.9	20.7	20.0	17.0	16.0	14.4	12.4	11.3	11.0	9.3
US 1 (Baltimore Ave)	I-495 Exit 25	24.4	22.2	19.3	18.2	16.8	15.2	N/A	N/A	14.6	13.9	23.0	21.8	21.0	18.0	17.1	15.4	13.4	12.4	12.1	10.3
Greenbelt Metro Station	I-495 Exit 24	25.6	23.4	20.5	19.5	18.0	16.5	N/A	N/A	15.8	15.1	24.2	23.0	22.3	19.3	18.3	16.7	14.7	13.6	13.3	11.6
MD 201 (Kenilworth Ave)	I-495 Exit 23	28.7	26.5	23.6	22.6	21.1	19.6	N/A	N/A	18.9	18.2	27.3	26.1	25.4	22.4	21.4	19.8	17.8	16.7	16.4	14.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	29.9	27.8	24.8	23.8	22.3	20.8	N/A	N/A	20.2	19.4	28.5	27.4	26.6	23.6	22.7	21.0	19.0	17.9	17.6	15.9
MD 450 (Annapolis Rd)	I-495 Exit 20	32.6	30.5	27.5	26.5	25.0	23.5	N/A	N/A	22.9	22.1	31.2	30.1	29.3	26.3	25.4	23.7	21.7	20.6	20.3	18.6
US 50 (John Hanson Hwy)	I-495 Exit 19	34.2	32.1	29.2	28.1	26.6	25.1	N/A	N/A	24.5	23.8	32.9	31.7	30.9	27.9	27.0	25.3	23.3	22.3	21.9	20.2
MD 202 (Landover Rd)	I-495 Exit 17	36.6	34.5	31.5	30.5	29.0	27.5	N/A	N/A	26.9	26.1	35.2	34.0	33.3	30.3	29.4	27.7	25.7	24.6	24.3	22.6
Arena Dr	I-495 Exit 16	37.4	35.3	32.3	31.3	29.8	28.3	N/A	N/A	27.7	26.9	36.0	34.8	34.1	31.1	30.1	28.5	26.5	25.4	25.1	23.4
MD 214 (Central Ave)	I-495 Exit 15	38.6	36.4	33.5	32.5	31.0	29.5	N/A	N/A	28.8	28.1	37.2	36.0	35.3	32.3	31.3	29.7	27.7	26.6	26.3	24.6
Ritchie-Marlboro Rd	I-495 Exit 13	40.5	38.3	35.4	34.4	32.9	31.4	N/A	N/A	30.7	30.0	39.1	37.9	37.2	34.2	33.2	31.6	29.6	28.5	28.2	26.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	43.3	41.2	38.2	37.2	35.7	34.2	N/A	N/A	33.5	32.8	41.9	40.7	40.0	37.0	36.0	34.4	32.4	31.3	31.0	29.3
MD 337 (Suitland Pkwy)	I-495 Exit 9	45.6	43.5	40.5	39.5	38.0	36.5	N/A	N/A	35.9	35.1	44.2	43.0	42.3	39.3	38.4	36.7	34.7	33.6	33.3	31.6
MD 5 (Branch Ave)	I-495 Exit 7	48.1	46.0	43.0	42.0	40.5	39.0	N/A	N/A	38.4	37.6	46.7	45.6	44.8	41.8	40.9	39.2	37.2	36.1	35.8	34.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	51.2	49.0	46.1	45.1	43.6	42.0	N/A	N/A	41.4	40.7	49.8	48.6	47.8	44.8	43.9	42.2	40.2	39.2	38.9	37.2

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	87.2	91.8	94.6	97.7	99.5	100.7	101.6	103.3	104.4	107.0	108.6	111.0	111.8	113.1	115.1	117.8	119.0	121.1	123.5
Shady Grove Rd	I-270 Exit 8	86.3	90.9	93.7	96.8	98.6	99.8	100.7	102.4	103.5	106.1	107.7	110.1	110.9	112.2	114.2	116.9	118.1	120.2	122.5
MD 28 (W Montgomery Ave)	I-270 Exit 6	84.0	88.5	91.3	94.4	96.2	97.4	98.3	100.0	101.1	103.7	105.3	107.7	108.5	109.8	111.8	114.5	115.7	117.8	120.2
MD 189 (Falls Rd)	I-270 Exit 5	80.8	85.4	88.2	91.2	93.1	94.2	95.2	96.8	97.9	100.6	102.2	104.6	105.3	106.7	108.6	111.3	112.6	114.6	117.0
Montrose Rd	I-270 Exit 4	71.1	75.6	78.4	81.5	83.3	84.5	85.4	87.1	88.2	90.8	92.4	94.8	95.6	96.9	98.9	101.6	102.8	104.9	107.3
Split	I-270	50.7	55.3	58.1	61.1	63.0	64.1	65.1	66.7	67.8	70.5	72.1	74.5	75.2	76.6	78.5	81.3	82.5	84.5	86.9
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	43.8	48.3	51.1	54.2	56.0	57.2	58.1	59.8	60.9	63.5	65.1	67.5	68.3	69.6	71.6	74.3	75.6	77.6	80.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	32.8	37.3	40.1	43.2	45.0	46.2	47.1	48.8	49.9	52.5	54.1	56.5	57.3	58.6	60.6	63.3	64.6	66.6	69.0
VA 193 (Georgetown Pike)	I-495 Exit 44	52.6	57.1	60.0	63.0	64.8	66.0	67.0	68.6	69.7	72.4	73.9	76.3	77.1	78.5	80.4	83.1	84.4	86.4	88.8
George Washington Memorial Pkwy	I-495 Exit 43	51.1	55.7	58.5	61.5	63.4	64.5	65.5	67.1	68.2	70.9	72.5	74.9	75.6	77.0	78.9	81.7	82.9	84.9	87.3
Clara Barton Pkwy	I-495 Exit 41	49.4	54.0	56.8	59.8	61.7	62.8	63.8	65.4	66.5	69.2	70.8	73.2	73.9	75.3	77.2	80.0	81.2	83.2	85.6
Cabin John Pkwy	I-495 Exit 40	41.8	46.3	49.2	52.2	54.0	55.2	56.2	57.8	58.9	61.6	63.1	65.5	66.3	67.7	69.6	72.3	73.6	75.6	78.0
MD 190 (River Rd)	I-495 Exit 39	40.3	44.9	47.7	50.8	52.6	53.7	54.7	56.4	57.5	60.1	61.7	64.1	64.9	66.2	68.2	70.9	72.1	74.1	76.5
I-270 West Spur	I-495 Exit 38	36.9	41.4	44.2	47.3	49.1	50.3	51.2	52.9	54.0	56.6	58.2	60.6	61.4	62.7	64.7	67.4	68.6	70.7	73.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	23.8	28.3	31.2	34.2	36.0	37.2	38.1	39.8	40.9	43.6	45.1	47.5	48.3	49.7	51.6	54.3	55.6	57.6	60.0
I-270 East Spur	I-495 Exit 35	18.6	23.2	26.0	29.0	30.9	32.0	33.0	34.6	35.7	38.4	40.0	42.4	43.1	44.5	46.4	49.1	50.4	52.4	54.8
MD 355 (Rockville Pike)	I-495 Exit 34	15.7	20.2	23.0	26.1	27.9	29.1	30.0	31.7	32.8	35.5	37.0	39.4	40.2	41.6	43.5	46.2	47.5	49.5	51.9
MD 185 (Connecticut Ave)	I-495 Exit 33	7.4	12.0	14.8	17.9	19.7	20.9	21.8	23.5	24.6	27.2	28.8	31.2	32.0	33.3	35.3	38.0	39.2	41.3	43.7
MD 97 (Georgia Ave)	I-495 Exit 31	0	4.6	7.4	10.4	12.3	13.4	14.4	16.0	17.1	19.8	21.4	23.8	24.5	25.9	27.8	30.5	31.8	33.8	36.2
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	2.8	5.9	7.7	8.9	9.8	11.5	12.6	15.2	16.8	19.2	20.0	21.3	23.3	26.0	27.2	29.2	31.6
MD 193 (University Blvd E)	I-495 Exit 29	3.7	1.3	0	3.1	4.9	6.0	7.0	8.7	9.8	12.4	14.0	16.4	17.2	18.5	20.5	23.2	24.4	26.4	28.8
MD 650 (New Hampshire Ave)	I-495 Exit 28	6.0	3.6	2.0	0	1.8	3.0	3.9	5.6	6.7	9.3	10.9	13.3	14.1	15.4	17.4	20.1	21.4	23.4	25.8
I-95	I-495 Exit 27	7.2	4.7	3.1	1.8	0	1.2	2.1	3.8	4.9	7.5	9.1	11.5	12.3	13.6	15.6	18.3	19.5	21.6	23.9
US 1 (Baltimore Ave)	I-495 Exit 25	8.2	5.8	4.2	2.9	1.1	0	1.0	2.6	3.7	6.4	7.9	10.3	11.1	12.5	14.4	17.1	18.4	20.4	22.8
Greenbelt Metro Station	I-495 Exit 24	9.5	7.0	5.4	4.1	2.3	1.2	0	1.7	2.8	5.4	7.0	9.4	10.2	11.5	13.5	16.2	17.4	19.4	21.8
MD 201 (Kenilworth Ave)	I-495 Exit 23	12.6	10.1	8.5	7.2	5.4	4.3	3.1	0	1.1	3.7	5.3	7.7	8.5	9.8	11.8	14.5	15.8	17.8	20.2
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	13.8	11.4	9.8	8.5	6.6	5.6	4.3	1.2	0	2.7	4.2	6.6	7.4	8.7	10.7	13.4	14.7	16.7	19.1
MD 450 (Annapolis Rd)	I-495 Exit 20	16.5	14.1	12.5	11.2	9.3	8.3	7.0	3.9	2.7	0	1.6	4.0	4.8	6.1	8.0	10.8	12.0	14.0	16.4
US 50 (John Hanson Hwy)	I-495 Exit 19	18.1	15.7	14.1	12.8	10.9	9.9	8.7	5.5	4.3	1.6	0	2.4	3.2	4.5	6.5	9.2	10.4	12.4	14.8
MD 202 (Landover Rd)	I-495 Exit 17	20.5	18.0	16.5	15.2	13.3	12.3	11.0	7.9	6.7	4.0	2.4	0	0.8	2.1	4.1	6.8	8.0	10.1	12.4
Arena Dr	I-495 Exit 16	21.3	18.8	17.2	16.0	14.1	13.1	11.8	8.7	7.5	4.8	3.2	0.8	0	1.3	3.3	6.0	7.2	9.3	11.7
MD 214 (Central Ave)	I-495 Exit 15	22.5	20.0	18.4	17.1	15.3	14.2	13.0	9.9	8.7	6.0	4.4	2.0	1.2	0	1.9	4.7	5.9	7.9	10.3
Ritchie-Marlboro Rd	I-495 Exit 13	24.4	21.9	20.3	19.0	17.2	16.1	14.9	11.8	10.6	7.9	6.3	3.9	3.1	1.9	0	2.7	4.0	6.0	8.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	27.2	24.7	23.1	21.8	20.0	18.9	17.7	14.6	13.4	10.7	9.1	6.7	5.9	4.7	2.8	0	1.2	3.3	5.7
MD 337 (Suitland Pkwy)	I-495 Exit 9	29.5	27.0	25.5	24.2	22.3	21.3	20.0	16.9	15.7	13.0	11.4	9.0	8.2	7.0	5.1	2.3	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	32.0	29.6	28.0	26.7	24.8	23.8	22.5	19.4	18.2	15.5	13.9	11.5	10.7	9.5	7.6	4.8	2.5	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	35.0	32.6	31.0	29.7	27.9	26.8	25.6	22.5	21.2	18.6	16.9	14.6	13.8	12.6	10.7	7.9	5.6	3.1	0

Travel Time Matrix - Alternative 8 - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	3.0	4.1	7.1	18.0	18.8	19.3	25.5	38.1	25.9	24.7	24.0	22.2	21.6	20.1	N/A	51.2	53.3	59.5
Shady Grove Rd	I-270 Exit 8	1.1	0	2.1	3.2	6.2	17.1	17.9	18.4	24.6	37.2	25.0	23.8	23.1	21.3	20.7	19.2	N/A	50.3	52.4	58.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.4	2.3	0	1.1	4.1	15.0	15.8	16.3	22.5	35.1	22.9	21.7	20.9	19.2	18.6	17.1	N/A	48.2	50.3	56.5
MD 189 (Falls Rd)	I-270 Exit 5	4.4	3.3	1.0	0	3.0	13.9	14.7	15.2	21.4	34.0	21.8	20.6	19.9	18.1	17.5	16.0	N/A	47.1	49.2	55.4
Montrose Rd	I-270 Exit 4	5.9	4.8	2.5	1.5	0	10.9	11.8	12.2	18.4	31.1	18.8	17.6	16.9	15.1	14.6	13.0	N/A	44.1	46.2	52.4
Split	I-270	7.4	6.3	4.0	3.0	1.5	0	0.8	1.3	7.5	20.1	7.9	6.7	5.9	4.2	3.6	2.1	N/A	33.2	35.3	41.5
Westlake Terrace	I-270 W Spur	8.4	7.3	5.0	4.0	2.5	1.0	0	0.5	N/A	N/A	7.1	5.9	5.1	3.4	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	8.8	7.7	5.5	4.4	3.0	1.4	0.5	0	N/A	N/A	6.6	5.4	4.6	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.0	6.9	4.7	3.6	2.2	0.6	N/A	N/A	0	12.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25.7	27.8	34.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.8	7.7	5.4	4.4	2.9	1.4	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13.0	15.2	21.4
VA 193 (Georgetown Pike)	I-495 Exit 44	36.0	34.9	32.6	31.6	30.1	28.6	27.6	27.1	N/A	N/A	0	3.8	6.7	16.5	18.6	26.2	40.6	44.5	46.6	52.8
George Washington Memorial Pkwy	I-495 Exit 43	32.2	31.1	28.9	27.8	26.3	24.8	23.8	23.4	N/A	N/A	1.2	0	2.9	12.8	14.9	22.5	36.9	40.7	42.9	49.0
Clara Barton Pkwy	I-495 Exit 41	29.3	28.2	25.9	24.9	23.4	21.9	20.9	20.5	N/A	N/A	1.9	0.8	0	9.9	12.0	19.5	33.9	37.8	39.9	46.1
Cabin John Pkwy	I-495 Exit 40	19.4	18.3	16.1	15.0	13.6	12.0	11.1	10.6	N/A	N/A	3.7	2.5	1.8	0	2.1	9.7	24.1	27.9	30.1	36.3
MD 190 (River Rd)	I-495 Exit 39	17.3	16.2	14.0	12.9	11.5	9.9	9.0	8.5	N/A	N/A	4.3	3.1	2.3	0.6	0	7.6	22.0	25.8	28.0	34.2
I-270 West Spur	I-495 Exit 38	9.7	8.6	6.4	5.4	3.9	2.3	1.4	0.9	N/A	N/A	5.8	4.6	3.8	2.1	1.5	0	14.4	18.3	20.4	26.6
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.8	6.6	5.8	4.1	3.5	2.0	0	3.9	6.0	12.2
I-270 East Spur	I-495 Exit 35	10.2	9.1	6.9	5.8	4.3	2.8	N/A	N/A	2.2	1.5	8.8	7.7	6.9	5.1	4.6	3.1	1.1	0	2.1	8.3
MD 355 (Rockville Pike)	I-495 Exit 34	10.5	9.4	7.2	6.1	4.7	3.1	N/A	N/A	2.5	1.8	9.1	8.0	7.2	5.4	4.9	3.4	1.4	0.3	0	6.2
MD 185 (Connecticut Ave)	I-495 Exit 33	12.2	11.1	8.9	7.9	6.4	4.8	N/A	N/A	4.2	3.5	10.9	9.7	8.9	7.2	6.6	5.1	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	15.0	13.9	11.6	10.6	9.1	7.6	N/A	N/A	6.9	6.2	13.6	12.4	11.6	9.9	9.3	7.8	5.8	4.7	4.4	2.7
US 29 (Colesville Rd)	I-495 Exit 30	16.1	15.0	12.7	11.7	10.2	8.7	N/A	N/A	8.0	7.3	14.7	13.5	12.7	11.0	10.4	8.9	6.9	5.8	5.5	3.8
MD 193 (University Blvd E)	I-495 Exit 29	17.8	16.7	14.4	13.4	11.9	10.4	N/A	N/A	9.7	9.0	16.4	15.2	14.4	12.7	12.1	10.6	8.6	7.6	7.3	5.5
MD 650 (New Hampshire Ave)	I-495 Exit 28	20.0	18.9	16.7	15.6	14.2	12.6	N/A	N/A	12.0	11.3	18.7	17.5	16.7	14.9	14.4	12.9	10.9	9.8	9.5	7.8
I-95	I-495 Exit 27	21.2	20.1	17.9	16.8	15.4	13.8	N/A	N/A	13.2	12.5	19.9	18.7	17.9	16.1	15.6	14.1	12.1	11.0	10.7	9.0
US 1 (Baltimore Ave)	I-495 Exit 25	22.3	21.2	18.9	17.9	16.4	14.9	N/A	N/A	14.2	13.5	20.9	19.7	19.0	17.2	16.6	15.1	13.1	12.1	11.8	10.0
Greenbelt Metro Station	I-495 Exit 24	23.2	22.1	19.9	18.9	17.4	15.8	N/A	N/A	15.2	14.5	21.9	20.7	19.9	18.2	17.6	16.1	14.1	13.0	12.7	11.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	24.7	23.6	21.4	20.3	18.9	17.3	N/A	N/A	16.7	16.0	23.3	22.2	21.4	19.6	19.1	17.6	15.6	14.5	14.2	12.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	25.8	24.7	22.5	21.4	20.0	18.4	N/A	N/A	17.8	17.1	24.5	23.3	22.5	20.8	20.2	18.7	16.7	15.6	15.3	13.6
MD 450 (Annapolis Rd)	I-495 Exit 20	28.5	27.4	25.2	24.1	22.7	21.1	N/A	N/A	20.5	19.8	27.1	26.0	25.2	23.4	22.9	21.4	19.4	18.3	18.0	16.3
US 50 (John Hanson Hwy)	I-495 Exit 19	30.1	29.0	26.8	25.8	24.3	22.7	N/A	N/A	22.1	21.4	28.8	27.6	26.8	25.1	24.5	23.0	21.0	19.9	19.6	17.9
MD 202 (Landover Rd)	I-495 Exit 17	32.5	31.4	29.1	28.1	26.6	25.1	N/A	N/A	24.5	23.7	31.1	29.9	29.2	27.4	26.9	25.3	23.4	22.3	22.0	20.3
Arena Dr	I-495 Exit 16	33.3	32.2	29.9	28.9	27.4	25.9	N/A	N/A	25.3	24.5	31.9	30.7	30.0	28.2	27.7	26.1	24.1	23.1	22.8	21.1
MD 214 (Central Ave)	I-495 Exit 15	34.5	33.4	31.1	30.1	28.6	27.1	N/A	N/A	26.5	25.7	33.1	31.9	31.2	29.4	28.9	27.3	25.4	24.3	24.0	22.3
Ritchie-Marlboro Rd	I-495 Exit 13	36.4	35.3	33.0	32.0	30.5	29.0	N/A	N/A	28.3	27.6	35.0	33.8	33.0	31.3	30.7	29.2	27.2	26.2	25.9	24.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	39.2	38.1	35.8	34.8	33.3	31.8	N/A	N/A	31.1	30.4	37.8	36.6	35.9	34.1	33.5	32.0	30.0	29.0	28.7	26.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	41.1	40.0	37.7	36.7	35.2	33.7	N/A	N/A	33.0	32.3	39.7	38.5	37.7	36.0	35.4	33.9	31.9	30.9	30.5	28.8
MD 5 (Branch Ave)	I-495 Exit 7	43.3	42.2	39.9	38.9	37.4	35.9	N/A	N/A	35.3	34.5	41.9	40.7	40.0	38.2	37.7	36.1	34.1	33.1	32.8	31.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	46.3	45.3	43.0	42.0	40.5	39.0	N/A	N/A	38.3	37.6	45.0	43.8	43.0	41.3	40.7	39.2	37.2	36.1	35.8	34.1

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	65.4	69.2	71.6	74.4	76.3	77.4	78.4	80.0	81.1	83.7	85.2	87.5	88.2	89.6	91.5	94.2	95.4	97.4	99.8
Shady Grove Rd	64.5	68.3	70.7	73.5	75.4	76.5	77.5	79.1	80.2	82.8	84.3	86.6	87.3	88.7	90.6	93.3	94.5	96.5	98.9
MD 28 (W Montgomery Ave)	62.4	66.2	68.6	71.4	73.2	74.4	75.4	77.0	78.1	80.6	82.2	84.5	85.2	86.6	88.5	91.1	92.4	94.4	96.8
MD 189 (Falls Rd)	61.3	65.1	67.5	70.3	72.2	73.3	74.3	75.9	77.0	79.6	81.1	83.4	84.1	85.5	87.4	90.1	91.3	93.3	95.7
Montrose Rd	58.3	62.1	64.6	67.3	69.2	70.3	71.3	72.9	74.0	76.6	78.1	80.4	81.2	82.5	84.4	87.1	88.3	90.3	92.7
Split	47.4	51.2	53.6	56.4	58.2	59.4	60.4	62.0	63.1	65.6	67.2	69.5	70.2	71.5	73.5	76.1	77.4	79.4	81.7
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	39.9	43.7	46.2	48.9	50.8	51.9	52.9	54.5	55.6	58.2	59.7	62.0	62.8	64.1	66.0	68.7	69.9	71.9	74.3
MD 187 (Old Georgetown Rd)	27.3	31.0	33.5	36.3	38.1	39.3	40.2	41.8	42.9	45.5	47.1	49.3	50.1	51.4	53.3	56.0	57.2	59.2	61.6
VA 193 (Georgetown Pike)	58.7	62.5	64.9	67.7	69.6	70.7	71.7	73.3	74.4	77.0	78.5	80.8	81.5	82.9	84.8	87.5	88.7	90.7	93.1
George Washington Memorial Pkwy	54.9	58.7	61.2	64.0	65.8	67.0	67.9	69.5	70.6	73.2	74.7	77.0	77.8	79.1	81.0	83.7	84.9	86.9	89.3
Clara Barton Pkwy	52.0	55.8	58.3	61.0	62.9	64.0	65.0	66.6	67.7	70.3	71.8	74.1	74.8	76.2	78.1	80.8	82.0	84.0	86.4
Cabin John Pkwy	42.2	45.9	48.4	51.2	53.0	54.2	55.1	56.8	57.8	60.4	62.0	64.2	65.0	66.3	68.2	70.9	72.1	74.1	76.5
MD 190 (River Rd)	40.1	43.8	46.3	49.1	50.9	52.1	53.0	54.6	55.7	58.3	59.9	62.1	62.9	64.2	66.1	68.8	70.0	72.0	74.4
I-270 West Spur	32.5	36.3	38.7	41.5	43.3	44.5	45.4	47.1	48.2	50.7	52.3	54.6	55.3	56.6	58.6	61.2	62.5	64.5	66.8
MD 187 (Old Georgetown Rd)	18.1	21.9	24.3	27.1	28.9	30.1	31.1	32.7	33.8	36.3	37.9	40.2	40.9	42.2	44.2	46.8	48.1	50.1	52.5
I-270 East Spur	14.2	18.0	20.5	23.2	25.1	26.2	27.2	28.8	29.9	32.5	34.0	36.3	37.1	38.4	40.3	43.0	44.2	46.2	48.6
MD 355 (Rockville Pike)	12.1	15.9	18.3	21.1	22.9	24.1	25.1	26.7	27.8	30.3	31.9	34.2	34.9	36.2	38.2	40.8	42.1	44.1	46.5
MD 185 (Connecticut Ave)	5.9	9.7	12.1	14.9	16.8	17.9	18.9	20.5	21.6	24.2	25.7	28.0	28.7	30.1	32.0	34.7	35.9	37.9	40.3
MD 97 (Georgia Ave)	0	3.8	6.2	9.0	10.9	12.0	13.0	14.6	15.7	18.3	19.8	22.1	22.8	24.2	26.1	28.7	30.0	32.0	34.4
US 29 (Colesville Rd)	1.7	0	2.5	5.2	7.1	8.2	9.2	10.8	11.9	14.5	16.0	18.3	19.1	20.4	22.3	25.0	26.2	28.2	30.6
MD 193 (University Blvd E)	3.4	1.0	0	2.8	4.6	5.8	6.7	8.3	9.4	12.0	13.6	15.8	16.6	17.9	19.8	22.5	23.7	25.7	28.1
MD 650 (New Hampshire Ave)	5.7	3.3	1.7	0	1.8	3.0	4.0	5.6	6.7	9.2	10.8	13.1	13.8	15.1	17.1	19.7	21.0	23.0	25.3
I-95	6.9	4.5	2.9	1.8	0	1.2	2.1	3.7	4.8	7.4	8.9	11.2	12.0	13.3	15.2	17.9	19.1	21.1	23.5
US 1 (Baltimore Ave)	7.9	5.5	3.9	2.9	1.1	0	1.0	2.6	3.7	6.2	7.8	10.1	10.8	12.1	14.1	16.7	18.0	20.0	22.3
Greenbelt Metro Station	8.9	6.5	4.9	3.9	2.0	1.0	0	1.6	2.7	5.3	6.8	9.1	9.9	11.2	13.1	15.8	17.0	19.0	21.4
MD 201 (Kenilworth Ave)	10.4	8.0	6.4	5.3	3.5	2.4	1.5	0	1.1	3.7	5.2	7.5	8.2	9.6	11.5	14.2	15.4	17.4	19.8
MD 295 (Baltimore-Washington Pkwy)	11.5	9.1	7.5	6.5	4.6	3.6	2.6	1.1	0	2.6	4.1	6.4	7.2	8.5	10.4	13.1	14.3	16.3	18.7
MD 450 (Annapolis Rd)	14.2	11.8	10.2	9.1	7.3	6.2	5.3	3.8	2.7	0	1.5	3.8	4.6	5.9	7.8	10.5	11.7	13.7	16.1
US 50 (John Hanson Hwy)	15.8	13.4	11.8	10.8	8.9	7.9	6.9	5.4	4.3	1.6	0	2.3	3.0	4.4	6.3	8.9	10.2	12.2	14.6
MD 202 (Landover Rd)	18.1	15.8	14.2	13.1	11.3	10.2	9.3	7.8	6.7	4.0	2.4	0	0.7	2.1	4.0	6.7	7.9	9.9	12.3
Arena Dr	18.9	16.6	15.0	13.9	12.1	11.0	10.1	8.6	7.5	4.8	3.2	0.8	0	1.3	3.3	5.9	7.1	9.1	11.5
MD 214 (Central Ave)	20.1	17.8	16.2	15.1	13.3	12.2	11.3	9.8	8.7	6.0	4.4	2.0	1.2	0	1.9	4.6	5.8	7.8	10.2
Ritchie-Marlboro Rd	22.0	19.6	18.0	17.0	15.1	14.1	13.1	11.6	10.5	7.8	6.2	3.9	3.1	1.9	0	2.7	3.9	5.9	8.3
MD 4 (Pennsylvania Ave)	24.8	22.4	20.8	19.8	17.9	16.9	15.9	14.5	13.3	10.7	9.0	6.7	5.9	4.7	2.8	0	1.2	3.2	5.6
MD 337 (Suitland Pkwy)	26.7	24.3	22.7	21.7	19.8	18.8	17.8	16.3	15.2	12.5	10.9	8.6	7.8	6.6	4.7	1.9	0	2.0	4.4
MD 5 (Branch Ave)	28.9	26.5	25.0	23.9	22.1	21.0	20.0	18.6	17.5	14.8	13.1	10.8	10.0	8.8	6.9	4.1	2.2	0	2.4
MD 414 (St Barnabas Rd)	32.0	29.6	28.0	27.0	25.1	24.1	23.1	21.6	20.5	17.8	16.2	13.8	13.1	11.9	10.0	7.2	5.3	3.1	0

Travel Time Matrix - Alternative 9 - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	3.0	4.1	5.5	11.1	11.9	12.4	15.7	22.7	19.0	17.8	17.0	15.3	14.7	13.2	N/A	32.0	34.2	40.3
Shady Grove Rd	I-270 Exit 8	1.8	0	2.1	3.2	4.6	10.2	11.0	11.5	14.8	21.8	18.1	16.9	16.1	14.4	13.8	12.3	N/A	31.1	33.3	39.4
MD 28 (W Montgomery Ave)	I-270 Exit 6	4.2	2.3	0	1.1	2.4	8.1	8.9	9.4	12.7	19.7	16.0	14.8	14.0	12.3	11.7	10.2	N/A	29.0	31.1	37.3
MD 189 (Falls Rd)	I-270 Exit 5	5.2	3.4	1.0	0	1.4	7.0	7.8	8.3	11.6	18.7	14.9	13.7	12.9	11.2	10.6	9.1	N/A	27.9	30.1	36.2
Montrose Rd	I-270 Exit 4	6.7	4.8	2.5	1.5	0	5.7	6.4	6.9	10.2	17.3	13.5	12.3	11.6	9.8	9.3	7.7	N/A	26.5	28.7	34.8
Split	I-270	8.2	6.4	4.0	3.0	1.5	0	0.8	1.3	4.6	11.6	7.9	6.7	5.9	4.2	3.6	2.1	N/A	20.9	23.0	29.2
Westlake Terrace	I-270 W Spur	9.2	7.4	5.0	4.0	2.5	1.0	0	0.5	N/A	N/A	7.1	5.9	5.1	3.4	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	9.6	7.8	5.5	4.5	3.0	1.4	0.5	0	N/A	N/A	6.6	5.4	4.6	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.8	7.0	4.7	3.6	2.2	0.6	N/A	N/A	0	7.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.3	18.5	24.6
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	9.5	7.7	5.4	4.4	2.9	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.2	11.4	17.6
VA 193 (Georgetown Pike)	I-495 Exit 44	25.9	24.0	21.7	20.7	19.2	17.7	16.7	16.2	N/A	N/A	0	1.3	2.2	7.2	8.8	15.3	27.6	31.5	33.6	39.8
George Washington Memorial Pkwy	I-495 Exit 43	24.6	22.7	20.4	19.4	17.9	16.4	15.4	14.9	N/A	N/A	1.2	0	0.9	5.9	7.5	14.0	26.3	30.2	32.3	38.5
Clara Barton Pkwy	I-495 Exit 41	23.7	21.8	19.5	18.5	17.0	15.5	14.5	14.0	N/A	N/A	1.9	0.8	0	5.0	6.6	13.1	25.4	29.3	31.4	37.6
Cabin John Pkwy	I-495 Exit 40	18.6	16.8	14.5	13.5	12.0	10.4	9.5	9.0	N/A	N/A	3.7	2.5	1.8	0	1.6	8.1	20.4	24.2	26.4	32.6
MD 190 (River Rd)	I-495 Exit 39	17.0	15.2	12.9	11.8	10.4	8.8	7.8	7.4	N/A	N/A	4.3	3.1	2.3	0.6	0	6.5	18.8	22.6	24.8	30.9
I-270 West Spur	I-495 Exit 38	10.6	8.7	6.4	5.4	3.9	2.4	1.4	0.9	N/A	N/A	5.8	4.6	3.9	2.1	1.5	0	12.3	16.2	18.3	24.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.9	6.7	6.0	4.2	3.6	2.1	0	3.8	6.0	12.2
I-270 East Spur	I-495 Exit 35	11.1	9.3	7.0	5.9	4.5	2.9	N/A	N/A	2.3	1.6	9.0	7.8	7.0	5.3	4.7	3.2	1.1	0	2.2	8.3
MD 355 (Rockville Pike)	I-495 Exit 34	11.4	9.6	7.3	6.3	4.8	3.2	N/A	N/A	2.6	1.9	9.3	8.1	7.3	5.6	5.0	3.5	1.4	0.3	0	6.1
MD 185 (Connecticut Ave)	I-495 Exit 33	13.2	11.3	9.0	8.0	6.5	5.0	N/A	N/A	4.3	3.6	11.0	9.8	9.1	7.3	6.7	5.2	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	15.9	14.1	11.7	10.7	9.2	7.7	N/A	N/A	7.1	6.3	13.7	12.5	11.8	10.0	9.5	7.9	5.8	4.7	4.4	2.7
US 29 (Colesville Rd)	I-495 Exit 30	17.0	15.2	12.8	11.8	10.3	8.8	N/A	N/A	8.2	7.4	14.8	13.6	12.9	11.1	10.6	9.0	6.9	5.9	5.5	3.8
MD 193 (University Blvd E)	I-495 Exit 29	18.7	16.9	14.5	13.5	12.0	10.5	N/A	N/A	9.9	9.1	16.5	15.3	14.6	12.8	12.3	10.7	8.6	7.6	7.3	5.5
MD 650 (New Hampshire Ave)	I-495 Exit 28	20.9	19.1	16.8	15.8	14.3	12.7	N/A	N/A	12.1	11.4	18.8	17.6	16.8	15.1	14.5	13.0	10.9	9.8	9.5	7.8
I-95	I-495 Exit 27	22.1	20.3	18.0	17.0	15.5	13.9	N/A	N/A	13.3	12.6	20.0	18.8	18.0	16.3	15.7	14.2	12.1	11.0	10.7	9.0
US 1 (Baltimore Ave)	I-495 Exit 25	23.2	21.4	19.0	18.0	16.5	15.0	N/A	N/A	14.4	13.6	21.0	19.8	19.1	17.3	16.8	15.2	13.1	12.1	11.8	10.0
Greenbelt Metro Station	I-495 Exit 24	24.1	22.3	20.0	19.0	17.5	15.9	N/A	N/A	15.3	14.6	22.0	20.8	20.0	18.3	17.7	16.2	14.1	13.0	12.7	11.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	25.6	23.8	21.4	20.4	18.9	17.4	N/A	N/A	16.8	16.1	23.4	22.3	21.5	19.7	19.2	17.6	15.5	14.5	14.2	12.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	26.7	24.9	22.5	21.5	20.0	18.5	N/A	N/A	17.9	17.1	24.5	23.4	22.6	20.8	20.3	18.7	16.6	15.6	15.3	13.5
MD 450 (Annapolis Rd)	I-495 Exit 20	29.4	27.6	25.2	24.2	22.7	21.2	N/A	N/A	20.6	19.8	27.2	26.0	25.3	23.5	23.0	21.4	19.3	18.3	18.0	16.2
US 50 (John Hanson Hwy)	I-495 Exit 19	31.0	29.2	26.9	25.8	24.4	22.8	N/A	N/A	22.2	21.5	28.9	27.7	26.9	25.2	24.6	23.1	21.0	19.9	19.6	17.9
MD 202 (Landover Rd)	I-495 Exit 17	33.4	31.6	29.2	28.2	26.7	25.2	N/A	N/A	24.6	23.8	31.2	30.0	29.3	27.5	27.0	25.4	23.3	22.3	21.9	20.2
Arena Dr	I-495 Exit 16	34.2	32.3	30.0	29.0	27.5	26.0	N/A	N/A	25.4	24.6	32.0	30.8	30.1	28.3	27.8	26.2	24.1	23.0	22.7	21.0
MD 214 (Central Ave)	I-495 Exit 15	35.3	33.5	31.2	30.2	28.7	27.1	N/A	N/A	26.5	25.8	33.2	32.0	31.2	29.5	28.9	27.4	25.3	24.2	23.9	22.2
Ritchie-Marlboro Rd	I-495 Exit 13	37.2	35.4	33.1	32.0	30.6	29.0	N/A	N/A	28.4	27.7	35.1	33.9	33.1	31.4	30.8	29.3	27.2	26.1	25.8	24.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	40.0	38.2	35.9	34.8	33.4	31.8	N/A	N/A	31.2	30.5	37.9	36.7	35.9	34.2	33.6	32.1	30.0	28.9	28.6	26.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	41.9	40.1	37.8	36.8	35.3	33.7	N/A	N/A	33.1	32.4	39.8	38.6	37.8	36.1	35.5	34.0	31.9	30.8	30.5	28.8
MD 5 (Branch Ave)	I-495 Exit 7	44.2	42.3	40.0	39.0	37.5	36.0	N/A	N/A	35.3	34.6	42.0	40.8	40.1	38.3	37.7	36.2	34.1	33.0	32.7	31.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	47.2	45.4	43.1	42.0	40.6	39.0	N/A	N/A	38.4	37.7	45.1	43.9	43.1	41.4	40.8	39.3	37.2	36.1	35.8	34.1

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	46.2	50.0	52.5	55.3	57.1	58.3	59.2	60.9	62.0	64.6	66.1	68.4	69.2	70.6	72.5	75.2	76.4	78.4	80.8
Shady Grove Rd	I-270 Exit 8	45.3	49.1	51.6	54.4	56.2	57.4	58.3	60.0	61.1	63.7	65.2	67.5	68.3	69.6	71.6	74.3	75.5	77.5	79.9
MD 28 (W Montgomery Ave)	I-270 Exit 6	43.2	47.0	49.5	52.3	54.1	55.2	56.2	57.9	58.9	61.5	63.1	65.4	66.2	67.5	69.5	72.1	73.4	75.4	77.8
MD 189 (Falls Rd)	I-270 Exit 5	42.1	45.9	48.4	51.2	53.0	54.2	55.1	56.8	57.9	60.5	62.0	64.3	65.1	66.5	68.4	71.1	72.3	74.3	76.7
Montrose Rd	I-270 Exit 4	40.8	44.6	47.1	49.8	51.7	52.8	53.8	55.4	56.5	59.1	60.7	63.0	63.7	65.1	67.0	69.7	70.9	72.9	75.3
Split	I-270	35.1	38.9	41.4	44.2	46.0	47.1	48.1	49.8	50.8	53.4	55.0	57.3	58.1	59.4	61.4	64.0	65.3	67.3	69.6
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	30.5	34.3	36.8	39.6	41.4	42.6	43.5	45.2	46.3	48.9	50.4	52.7	53.5	54.9	56.8	59.5	60.7	62.7	65.1
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	23.5	27.3	29.8	32.5	34.4	35.5	36.5	38.1	39.2	41.8	43.4	45.7	46.4	47.8	49.7	52.4	53.6	55.6	58.0
VA 193 (Georgetown Pike)	I-495 Exit 44	45.7	49.5	52.0	54.8	56.6	57.8	58.7	60.4	61.4	64.0	65.6	67.9	68.7	70.0	72.0	74.6	75.9	77.9	80.3
George Washington Memorial Pkwy	I-495 Exit 43	44.4	48.2	50.7	53.5	55.3	56.5	57.4	59.1	60.1	62.7	64.3	66.6	67.4	68.7	70.7	73.3	74.6	76.6	79.0
Clara Barton Pkwy	I-495 Exit 41	43.5	47.3	49.8	52.6	54.4	55.6	56.5	58.2	59.2	61.9	63.4	65.7	66.5	67.8	69.8	72.4	73.7	75.7	78.1
Cabin John Pkwy	I-495 Exit 40	38.5	42.3	44.8	47.5	49.4	50.5	51.5	53.1	54.2	56.8	58.4	60.7	61.4	62.8	64.7	67.4	68.6	70.6	73.0
MD 190 (River Rd)	I-495 Exit 39	36.9	40.7	43.2	45.9	47.8	48.9	49.9	51.5	52.6	55.2	56.8	59.1	59.8	61.2	63.1	65.8	67.0	69.0	71.4
I-270 West Spur	I-495 Exit 38	30.4	34.2	36.7	39.5	41.3	42.5	43.4	45.1	46.1	48.8	50.3	52.6	53.4	54.7	56.7	59.3	60.6	62.6	65.0
MD 187 (Old Georgetown Rd)	I-495 Exit 36	18.1	21.9	24.4	27.1	29.0	30.1	31.1	32.7	33.8	36.4	38.0	40.3	41.1	42.4	44.3	47.0	48.2	50.2	52.6
I-270 East Spur	I-495 Exit 35	14.2	18.0	20.5	23.3	25.1	26.3	27.3	28.9	30.0	32.6	34.2	36.5	37.2	38.6	40.5	43.2	44.4	46.4	48.8
MD 355 (Rockville Pike)	I-495 Exit 34	12.1	15.9	18.4	21.1	23.0	24.1	25.1	26.7	27.8	30.4	32.0	34.3	35.0	36.4	38.3	41.0	42.2	44.2	46.6
MD 185 (Connecticut Ave)	I-495 Exit 33	5.9	9.7	12.2	15.0	16.8	18.0	18.9	20.6	21.7	24.3	25.8	28.1	28.9	30.3	32.2	34.9	36.1	38.1	40.5
MD 97 (Georgia Ave)	I-495 Exit 31	0	3.8	6.3	9.1	10.9	12.1	13.0	14.7	15.7	18.3	19.9	22.2	23.0	24.3	26.3	28.9	30.2	32.2	34.6
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	2.5	5.3	7.1	8.2	9.2	10.9	11.9	14.5	16.1	18.4	19.2	20.5	22.5	25.1	26.4	28.4	30.7
MD 193 (University Blvd E)	I-495 Exit 29	3.4	1.0	0	2.8	4.6	5.8	6.7	8.4	9.4	12.1	13.6	15.9	16.7	18.0	20.0	22.6	23.9	25.9	28.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	5.6	3.3	1.7	0	1.8	3.0	3.9	5.6	6.7	9.3	10.8	13.2	13.9	15.3	17.2	19.9	21.1	23.1	25.5
I-95	I-495 Exit 27	6.8	4.5	2.9	1.8	0	1.2	2.1	3.8	4.8	7.4	9.0	11.3	12.1	13.4	15.4	18.0	19.3	21.3	23.7
US 1 (Baltimore Ave)	I-495 Exit 25	7.9	5.5	3.9	2.9	1.1	0	1.0	2.6	3.7	6.3	7.9	10.2	10.9	12.3	14.2	16.9	18.1	20.1	22.5
Greenbelt Metro Station	I-495 Exit 24	8.9	6.5	4.9	3.9	2.0	1.0	0	1.6	2.7	5.3	6.9	9.2	10.0	11.3	13.2	15.9	17.1	19.1	21.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	10.3	7.9	6.4	5.3	3.5	2.4	1.5	0	1.1	3.7	5.3	7.6	8.3	9.7	11.6	14.3	15.5	17.5	19.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	11.4	9.0	7.5	6.4	4.6	3.5	2.6	1.1	0	2.6	4.2	6.5	7.2	8.6	10.5	13.2	14.4	16.4	18.8
MD 450 (Annapolis Rd)	I-495 Exit 20	14.1	11.7	10.1	9.1	7.3	6.2	5.3	3.8	2.7	0	1.6	3.9	4.6	6.0	7.9	10.6	11.8	13.8	16.2
US 50 (John Hanson Hwy)	I-495 Exit 19	15.7	13.4	11.8	10.7	8.9	7.8	6.9	5.4	4.3	1.6	0	2.3	3.1	4.4	6.4	9.0	10.3	12.2	14.6
MD 202 (Landover Rd)	I-495 Exit 17	18.1	15.7	14.1	13.1	11.2	10.2	9.2	7.8	6.7	4.0	2.4	0	0.8	2.1	4.0	6.7	7.9	9.9	12.3
Arena Dr	I-495 Exit 16	18.9	16.5	14.9	13.9	12.0	11.0	10.0	8.6	7.5	4.8	3.1	0.8	0	1.4	3.3	6.0	7.2	9.2	11.6
MD 214 (Central Ave)	I-495 Exit 15	20.1	17.7	16.1	15.1	13.2	12.2	11.2	9.7	8.7	6.0	4.3	2.0	1.2	0	1.9	4.6	5.8	7.8	10.2
Ritchie-Marlboro Rd	I-495 Exit 13	21.9	19.6	18.0	16.9	15.1	14.0	13.1	11.6	10.5	7.8	6.2	3.8	3.1	1.9	0	2.7	3.9	5.9	8.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	24.7	22.4	20.8	19.7	17.9	16.8	15.9	14.4	13.3	10.6	9.0	6.6	5.9	4.7	2.8	0	1.2	3.2	5.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	26.6	24.3	22.7	21.6	19.8	18.8	17.8	16.3	15.2	12.5	10.9	8.6	7.8	6.6	4.7	1.9	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	28.9	26.5	24.9	23.9	22.0	21.0	20.0	18.6	17.5	14.8	13.1	10.8	10.0	8.8	6.9	4.1	2.2	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	31.9	29.6	28.0	26.9	25.1	24.0	23.1	21.6	20.5	17.8	16.2	13.8	13.1	11.9	10.0	7.2	5.3	3.1	0

Travel Time Matrix - Alternative 10 - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.1	4.3	6.1	10.7	11.4	11.9	16.3	27.8	18.5	17.3	16.5	14.8	14.2	12.7	N/A	40.5	42.6	48.3
Shady Grove Rd	I-270 Exit 8	2.1	0	2.2	3.3	5.1	9.7	10.5	11.0	15.4	26.8	17.5	16.3	15.6	13.8	13.3	11.8	N/A	39.5	41.6	47.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	7.7	5.6	0	1.1	3.0	7.5	8.3	8.8	13.2	24.6	15.3	14.1	13.4	11.7	11.1	9.6	N/A	37.4	39.4	45.1
MD 189 (Falls Rd)	I-270 Exit 5	9.2	7.1	1.5	0	1.8	6.4	7.2	7.7	12.0	23.5	14.2	13.0	12.3	10.5	10.0	8.4	N/A	36.2	38.3	44.0
Montrose Rd	I-270 Exit 4	10.9	8.8	3.3	1.7	0	4.6	5.4	5.8	10.2	21.7	12.4	11.2	10.4	8.7	8.2	6.6	N/A	34.4	36.5	42.2
Split	I-270	12.5	10.4	4.8	3.3	1.6	0	0.8	1.3	5.7	17.1	7.8	6.6	5.9	4.1	3.6	2.1	N/A	29.8	31.9	37.6
Westlake Terrace	I-270 W Spur	13.5	11.4	5.8	4.3	2.6	1.0	0	0.5	N/A	N/A	7.0	5.8	5.1	3.3	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	14.0	11.9	6.3	4.8	3.1	1.5	0.5	0	N/A	N/A	6.5	5.3	4.6	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	13.1	11.0	5.4	3.9	2.2	0.6	N/A	N/A	0	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24.2	26.2	31.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	13.8	11.7	6.2	4.6	2.9	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.7	14.8	20.5
VA 193 (Georgetown Pike)	I-495 Exit 44	21.8	19.7	14.2	12.6	10.9	9.3	8.3	7.8	N/A	N/A	0	1.3	2.1	4.0	4.4	6.8	9.7	13.3	15.3	21.0
George Washington Memorial Pkwy	I-495 Exit 43	20.5	18.4	12.9	11.3	9.6	8.0	7.0	6.5	N/A	N/A	1.2	0	0.8	2.7	3.1	5.5	8.4	12.0	14.0	19.7
Clara Barton Pkwy	I-495 Exit 41	19.7	17.6	12.0	10.5	8.8	7.2	6.2	5.7	N/A	N/A	1.9	0.8	0	1.9	2.3	4.7	7.6	11.2	13.2	18.9
Cabin John Pkwy	I-495 Exit 40	17.8	15.7	10.1	8.6	6.9	5.3	4.3	3.8	N/A	N/A	3.7	2.5	1.7	0	0.4	2.8	5.7	9.3	11.3	17.0
MD 190 (River Rd)	I-495 Exit 39	17.4	15.3	9.7	8.2	6.5	4.9	3.9	3.4	N/A	N/A	4.2	3.0	2.3	0.6	0	2.4	5.3	8.8	10.9	16.6
I-270 West Spur	I-495 Exit 38	15.0	12.9	7.3	5.8	4.1	2.5	1.5	1.0	N/A	N/A	5.7	4.6	3.8	2.1	1.5	0	2.9	6.4	8.5	14.2
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.7	6.5	5.8	4.1	3.5	2.0	0	3.5	5.6	11.3
I-270 East Spur	I-495 Exit 35	15.6	13.5	7.9	6.4	4.7	3.1	N/A	N/A	2.5	1.7	8.8	7.6	6.8	5.1	4.6	3.0	1.1	0	2.1	7.7
MD 355 (Rockville Pike)	I-495 Exit 34	15.9	13.8	8.2	6.7	5.0	3.4	N/A	N/A	2.8	2.0	9.1	7.9	7.1	5.4	4.9	3.3	1.4	0.3	0	5.7
MD 185 (Connecticut Ave)	I-495 Exit 33	18.4	16.3	10.7	9.2	7.5	5.9	N/A	N/A	5.3	4.6	11.6	10.4	9.6	7.9	7.4	5.8	3.9	2.8	2.5	0
MD 97 (Georgia Ave)	I-495 Exit 31	23.2	21.1	15.5	14.0	12.3	10.7	N/A	N/A	10.1	9.3	16.4	15.2	14.4	12.7	12.2	10.6	8.7	7.6	7.3	4.8
US 29 (Colesville Rd)	I-495 Exit 30	24.7	22.6	17.0	15.5	13.8	12.2	N/A	N/A	11.6	10.8	17.9	16.7	15.9	14.2	13.7	12.1	10.2	9.1	8.8	6.3
MD 193 (University Blvd E)	I-495 Exit 29	26.8	24.7	19.1	17.6	15.8	14.3	N/A	N/A	13.7	12.9	20.0	18.8	18.0	16.3	15.7	14.2	12.2	11.2	10.9	8.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	29.0	26.9	21.4	19.8	18.1	16.5	N/A	N/A	15.9	15.2	22.2	21.0	20.3	18.6	18.0	16.5	14.5	13.4	13.1	10.6
I-95	I-495 Exit 27	30.2	28.1	22.6	21.0	19.3	17.7	N/A	N/A	17.1	16.4	23.4	22.2	21.5	19.8	19.2	17.7	15.7	14.6	14.3	11.8
US 1 (Baltimore Ave)	I-495 Exit 25	31.3	29.2	23.6	22.1	20.3	18.8	N/A	N/A	18.2	17.4	24.5	23.3	22.5	20.8	20.3	18.7	16.7	15.7	15.4	12.9
Greenbelt Metro Station	I-495 Exit 24	32.2	30.2	24.6	23.1	21.3	19.8	N/A	N/A	19.1	18.4	25.4	24.3	23.5	21.8	21.2	19.7	17.7	16.7	16.4	13.9
MD 201 (Kenilworth Ave)	I-495 Exit 23	33.7	31.6	26.1	24.5	22.8	21.2	N/A	N/A	20.6	19.9	26.9	25.7	25.0	23.3	22.7	21.2	19.2	18.1	17.8	15.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	34.8	32.7	27.2	25.6	23.9	22.3	N/A	N/A	21.7	21.0	28.0	26.8	26.1	24.4	23.8	22.3	20.3	19.2	18.9	16.4
MD 450 (Annapolis Rd)	I-495 Exit 20	37.5	35.4	29.9	28.3	26.6	25.0	N/A	N/A	24.4	23.7	30.7	29.5	28.8	27.1	26.5	25.0	23.0	21.9	21.6	19.1
US 50 (John Hanson Hwy)	I-495 Exit 19	39.2	37.1	31.5	30.0	28.2	26.7	N/A	N/A	26.1	25.3	32.4	31.2	30.4	28.7	28.2	26.6	24.6	23.6	23.3	20.8
MD 202 (Landover Rd)	I-495 Exit 17	41.5	39.4	33.9	32.3	30.6	29.0	N/A	N/A	28.4	27.7	34.7	33.5	32.8	31.1	30.5	29.0	27.0	25.9	25.6	23.1
Arena Dr	I-495 Exit 16	42.3	40.2	34.7	33.1	31.4	29.8	N/A	N/A	29.2	28.5	35.5	34.3	33.6	31.9	31.3	29.8	27.8	26.7	26.4	23.9
MD 214 (Central Ave)	I-495 Exit 15	43.5	41.4	35.9	34.3	32.6	31.0	N/A	N/A	30.4	29.7	36.7	35.5	34.8	33.1	32.5	31.0	29.0	27.9	27.6	25.1
Ritchie-Marlboro Rd	I-495 Exit 13	45.4	43.3	37.7	36.2	34.5	32.9	N/A	N/A	32.3	31.6	38.6	37.4	36.6	34.9	34.4	32.8	30.9	29.8	29.5	27.0
MD 4 (Pennsylvania Ave)	I-495 Exit 11	48.2	46.1	40.5	39.0	37.3	35.7	N/A	N/A	35.1	34.4	41.4	40.2	39.5	37.7	37.2	35.7	33.7	32.6	32.3	29.8
MD 337 (Suitland Pkwy)	I-495 Exit 9	50.0	47.9	42.3	40.8	39.1	37.5	N/A	N/A	36.9	36.2	43.2	42.0	41.3	39.5	39.0	37.5	35.5	34.4	34.1	31.6
MD 5 (Branch Ave)	I-495 Exit 7	52.2	50.2	44.6	43.0	41.3	39.7	N/A	N/A	39.1	38.4	45.4	44.3	43.5	41.8	41.2	39.7	37.7	36.7	36.4	33.9
MD 414 (St Barnabas Rd)	I-495 Exit 4	55.3	53.2	47.6	46.1	44.4	42.8	N/A	N/A	42.2	41.5	48.5	47.3	46.6	44.8	44.3	42.8	40.8	39.7	39.4	36.9

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	53.7	57.2	59.5	62.2	64.0	65.2	66.2	67.8	68.9	71.5	73.1	75.4	76.1	77.5	79.4	82.1	83.3	85.3	87.7
Shady Grove Rd	I-270 Exit 8	52.8	56.2	58.5	61.2	63.1	64.2	65.2	66.9	68.0	70.6	72.1	74.4	75.2	76.5	78.5	81.1	82.4	84.4	86.8
MD 28 (W Montgomery Ave)	I-270 Exit 6	50.6	54.0	56.3	59.1	60.9	62.0	63.0	64.7	65.8	68.4	70.0	72.2	73.0	74.3	76.3	79.0	80.2	82.2	84.6
MD 189 (Falls Rd)	I-270 Exit 5	49.5	52.9	55.2	57.9	59.8	60.9	61.9	63.5	64.6	67.2	68.8	71.1	71.9	73.2	75.1	77.8	79.0	81.0	83.4
Montrose Rd	I-270 Exit 4	47.6	51.1	53.4	56.1	57.9	59.1	60.1	61.7	62.8	65.4	67.0	69.3	70.0	71.4	73.3	76.0	77.2	79.2	81.6
Split	I-270	43.1	46.5	48.8	51.5	53.4	54.5	55.5	57.1	58.2	60.9	62.4	64.7	65.5	66.8	68.7	71.4	72.7	74.6	77.0
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	37.4	40.9	43.2	45.9	47.7	48.9	49.9	51.5	52.6	55.2	56.8	59.1	59.8	61.2	63.1	65.8	67.0	69.0	71.4
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	26.0	29.4	31.7	34.4	36.3	37.4	38.4	40.0	41.1	43.7	45.3	47.6	48.4	49.7	51.6	54.3	55.5	57.5	59.9
VA 193 (Georgetown Pike)	I-495 Exit 44	26.5	29.9	32.2	35.0	36.8	37.9	38.9	40.6	41.7	44.3	45.9	48.1	48.9	50.2	52.2	54.9	56.1	58.1	60.5
George Washington Memorial Pkwy	I-495 Exit 43	25.2	28.6	30.9	33.7	35.5	36.6	37.6	39.3	40.4	43.0	44.6	46.8	47.6	49.0	50.9	53.6	54.8	56.8	59.2
Clara Barton Pkwy	I-495 Exit 41	24.4	27.8	30.1	32.8	34.7	35.8	36.8	38.5	39.6	42.2	43.7	46.0	46.8	48.1	50.1	52.7	54.0	56.0	58.4
Cabin John Pkwy	I-495 Exit 40	22.5	25.9	28.2	30.9	32.8	33.9	34.9	36.6	37.7	40.3	41.8	44.1	44.9	46.2	48.2	50.8	52.1	54.1	56.5
MD 190 (River Rd)	I-495 Exit 39	22.1	25.5	27.8	30.5	32.4	33.5	34.5	36.1	37.2	39.8	41.4	43.7	44.5	45.8	47.7	50.4	51.6	53.6	56.0
I-270 West Spur	I-495 Exit 38	19.7	23.1	25.4	28.1	30.0	31.1	32.1	33.8	34.9	37.5	39.0	41.3	42.1	43.4	45.3	48.0	49.3	51.3	53.6
MD 187 (Old Georgetown Rd)	I-495 Exit 36	16.8	20.2	22.5	25.2	27.1	28.2	29.2	30.9	32.0	34.6	36.1	38.4	39.2	40.5	42.5	45.1	46.4	48.4	50.8
I-270 East Spur	I-495 Exit 35	13.2	16.7	19.0	21.7	23.5	24.7	25.7	27.3	28.4	31.0	32.6	34.9	35.6	37.0	38.9	41.6	42.8	44.8	47.2
MD 355 (Rockville Pike)	I-495 Exit 34	11.2	14.6	16.9	19.6	21.5	22.6	23.6	25.2	26.3	28.9	30.5	32.8	33.6	34.9	36.8	39.5	40.8	42.7	45.1
MD 185 (Connecticut Ave)	I-495 Exit 33	5.5	8.9	11.2	13.9	15.8	16.9	17.9	19.6	20.7	23.3	24.8	27.1	27.9	29.2	31.2	33.8	35.1	37.1	39.5
MD 97 (Georgia Ave)	I-495 Exit 31	0	3.4	5.7	8.5	10.3	11.5	12.5	14.1	15.2	17.8	19.4	21.7	22.4	23.8	25.7	28.4	29.6	31.6	34.0
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	2.3	5.0	6.9	8.0	9.0	10.6	11.7	14.3	15.9	18.2	19.0	20.3	22.2	24.9	26.1	28.1	30.5
MD 193 (University Blvd E)	I-495 Exit 29	3.8	1.0	0	2.7	4.6	5.7	6.7	8.3	9.4	12.0	13.6	15.9	16.7	18.0	19.9	22.6	23.8	25.8	28.2
MD 650 (New Hampshire Ave)	I-495 Exit 28	6.1	3.3	1.7	0	1.8	3.0	4.0	5.6	6.7	9.3	10.9	13.2	13.9	15.3	17.2	19.9	21.1	23.1	25.5
I-95	I-495 Exit 27	7.2	4.5	2.9	1.8	0	1.2	2.2	3.8	4.9	7.5	9.1	11.4	12.1	13.5	15.4	18.1	19.3	21.3	23.7
US 1 (Baltimore Ave)	I-495 Exit 25	8.3	5.5	3.9	2.9	1.1	0	1.0	2.6	3.7	6.3	7.9	10.2	11.0	12.3	14.2	16.9	18.1	20.1	22.5
Greenbelt Metro Station	I-495 Exit 24	9.3	6.5	4.9	3.9	2.0	1.0	0	1.6	2.7	5.3	6.9	9.2	10.0	11.3	13.2	15.9	17.1	19.1	21.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	10.7	8.0	6.4	5.3	3.5	2.5	1.5	0	1.1	3.7	5.3	7.6	8.3	9.7	11.6	14.3	15.5	17.5	19.9
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	11.8	9.1	7.5	6.5	4.6	3.6	2.6	1.1	0	2.6	4.2	6.5	7.2	8.6	10.5	13.2	14.4	16.4	18.8
MD 450 (Annapolis Rd)	I-495 Exit 20	14.5	11.8	10.2	9.1	7.3	6.3	5.3	3.8	2.7	0	1.6	3.9	4.6	6.0	7.9	10.6	11.8	13.8	16.2
US 50 (John Hanson Hwy)	I-495 Exit 19	16.2	13.4	11.8	10.8	9.0	7.9	6.9	5.4	4.3	1.6	0	2.3	3.0	4.4	6.3	9.0	10.2	12.2	14.6
MD 202 (Landover Rd)	I-495 Exit 17	18.5	15.8	14.2	13.2	11.3	10.3	9.3	7.8	6.7	4.0	2.4	0	0.8	2.1	4.0	6.7	7.9	9.9	12.3
Arena Dr	I-495 Exit 16	19.3	16.6	15.0	13.9	12.1	11.1	10.1	8.6	7.5	4.8	3.2	0.8	0	1.4	3.3	6.0	7.2	9.2	11.6
MD 214 (Central Ave)	I-495 Exit 15	20.5	17.8	16.2	15.1	13.3	12.2	11.3	9.8	8.7	6.0	4.3	2.0	1.2	0	1.9	4.6	5.8	7.8	10.2
Ritchie-Marlboro Rd	I-495 Exit 13	22.4	19.6	18.0	17.0	15.2	14.1	13.1	11.7	10.6	7.9	6.2	3.9	3.1	1.9	0	2.7	3.9	5.9	8.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	25.2	22.4	20.9	19.8	18.0	16.9	15.9	14.5	13.4	10.7	9.0	6.7	5.9	4.7	2.8	0	1.2	3.2	5.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	27.0	24.3	22.7	21.6	19.8	18.7	17.8	16.3	15.2	12.5	10.8	8.5	7.7	6.5	4.6	1.8	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	29.3	26.5	24.9	23.9	22.0	21.0	20.0	18.5	17.4	14.7	13.1	10.7	9.9	8.7	6.8	4.0	2.2	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	32.3	29.5	28.0	26.9	25.1	24.0	23.0	21.6	20.5	17.8	16.1	13.8	13.0	11.8	9.9	7.1	5.3	3.1	0

Travel Time Matrix - Alternative 13B - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	3.1	5.5	11.8	24.9	25.7	26.2	30.7	39.3	32.7	31.6	30.8	29.1	28.5	27.0	N/A	50.1	52.6	59.6
Shady Grove Rd	I-270 Exit 8	1.5	0	2.2	4.6	10.9	24.0	24.8	25.3	29.7	38.4	31.8	30.6	29.9	28.2	27.6	26.1	N/A	49.2	51.7	58.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.8	2.3	0	2.4	8.7	21.8	22.6	23.1	27.6	36.2	29.6	28.5	27.7	26.0	25.4	23.9	N/A	47.0	49.5	56.5
MD 189 (Falls Rd)	I-270 Exit 5	4.9	3.3	1.0	0	6.3	19.4	20.2	20.7	25.2	33.9	27.3	26.1	25.3	23.6	23.0	21.5	N/A	44.7	47.2	54.1
Montrose Rd	I-270 Exit 4	6.3	4.8	2.5	1.5	0	13.1	13.9	14.4	18.9	27.6	20.9	19.8	19.0	17.3	16.7	15.2	N/A	38.3	40.9	47.8
Split	I-270	7.9	6.3	4.0	3.0	1.5	0	0.8	1.3	5.7	14.4	7.8	6.6	5.9	4.2	3.6	2.1	N/A	25.2	27.7	34.7
Westlake Terrace	I-270 W Spur	8.8	7.3	5.0	4.0	2.5	1.0	0	0.5	N/A	N/A	7.0	5.8	5.1	3.4	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	9.3	7.8	5.5	4.5	3.0	1.4	0.5	0	N/A	N/A	6.5	5.4	4.6	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.5	7.0	4.7	3.6	2.1	0.6	N/A	N/A	0	8.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19.5	22.0	28.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	9.2	7.7	5.4	4.4	2.9	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.8	13.3	20.2
VA 193 (Georgetown Pike)	I-495 Exit 44	19.5	17.9	15.6	14.6	13.1	11.6	10.6	10.2	N/A	N/A	0	1.3	2.1	4.3	5.0	9.2	23.3	27.9	30.4	37.4
George Washington Memorial Pkwy	I-495 Exit 43	18.2	16.6	14.3	13.3	11.8	10.3	9.3	8.9	N/A	N/A	1.2	0	0.8	3.0	3.7	7.9	22.0	26.6	29.1	36.1
Clara Barton Pkwy	I-495 Exit 41	17.4	15.8	13.5	12.5	11.0	9.5	8.5	8.0	N/A	N/A	1.9	0.8	0	2.2	2.9	7.1	21.2	25.8	28.3	35.3
Cabin John Pkwy	I-495 Exit 40	15.2	13.6	11.4	10.3	8.8	7.3	6.3	5.9	N/A	N/A	3.7	2.5	1.7	0	0.7	4.9	19.1	23.6	26.1	33.1
MD 190 (River Rd)	I-495 Exit 39	14.5	12.9	10.6	9.6	8.1	6.6	5.6	5.2	N/A	N/A	4.2	3.0	2.3	0.6	0	4.2	18.3	22.9	25.4	32.4
I-270 West Spur	I-495 Exit 38	10.2	8.7	6.4	5.4	3.9	2.4	1.4	0.9	N/A	N/A	5.8	4.6	3.8	2.1	1.5	0	14.1	18.7	21.2	28.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.8	6.6	5.8	4.1	3.5	2.0	0	4.6	7.1	14.0
I-270 East Spur	I-495 Exit 35	10.7	9.2	6.9	5.9	4.4	2.8	N/A	N/A	2.2	1.5	8.8	7.6	6.9	5.2	4.6	3.1	1.1	0	2.5	9.5
MD 355 (Rockville Pike)	I-495 Exit 34	11.0	9.5	7.2	6.2	4.7	3.1	N/A	N/A	2.5	1.8	9.1	7.9	7.2	5.5	4.9	3.4	1.4	0.3	0	6.9
MD 185 (Connecticut Ave)	I-495 Exit 33	12.7	11.2	8.9	7.9	6.4	4.8	N/A	N/A	4.2	3.5	10.8	9.6	8.9	7.2	6.6	5.1	3.1	2.0	1.7	0
MD 97 (Georgia Ave)	I-495 Exit 31	15.4	13.9	11.6	10.6	9.1	7.6	N/A	N/A	6.9	6.2	13.5	12.4	11.6	9.9	9.3	7.8	5.8	4.7	4.4	2.7
US 29 (Colesville Rd)	I-495 Exit 30	16.5	15.0	12.7	11.6	10.2	8.6	N/A	N/A	8.0	7.3	14.6	13.4	12.7	10.9	10.4	8.9	6.8	5.8	5.5	3.8
MD 193 (University Blvd E)	I-495 Exit 29	18.3	16.8	14.5	13.5	12.0	10.4	N/A	N/A	9.8	9.1	16.4	15.2	14.5	12.7	12.2	10.7	8.7	7.6	7.3	5.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	20.5	18.9	16.6	15.6	14.1	12.6	N/A	N/A	12.0	11.2	18.6	17.4	16.6	14.9	14.4	12.8	10.8	9.7	9.4	7.7
I-95	I-495 Exit 27	21.8	20.2	17.9	16.9	15.4	13.9	N/A	N/A	13.3	12.5	19.9	18.7	17.9	16.2	15.6	14.1	12.1	11.0	10.7	9.0
US 1 (Baltimore Ave)	I-495 Exit 25	22.8	21.3	19.0	18.0	16.5	14.9	N/A	N/A	14.3	13.6	20.9	19.7	19.0	17.2	16.7	15.2	13.2	12.1	11.8	10.1
Greenbelt Metro Station	I-495 Exit 24	23.8	22.2	19.9	18.9	17.4	15.9	N/A	N/A	15.3	14.5	21.9	20.7	19.9	18.2	17.6	16.1	14.1	13.0	12.7	11.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	25.2	23.7	21.4	20.4	18.9	17.3	N/A	N/A	16.7	16.0	23.3	22.1	21.4	19.7	19.1	17.6	15.6	14.5	14.2	12.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	26.3	24.8	22.5	21.5	20.0	18.4	N/A	N/A	17.8	17.1	24.4	23.2	22.5	20.8	20.2	18.7	16.7	15.6	15.3	13.6
MD 450 (Annapolis Rd)	I-495 Exit 20	29.0	27.5	25.2	24.2	22.7	21.1	N/A	N/A	20.5	19.8	27.1	25.9	25.2	23.5	22.9	21.4	19.4	18.3	18.0	16.3
US 50 (John Hanson Hwy)	I-495 Exit 19	30.6	29.1	26.8	25.8	24.3	22.8	N/A	N/A	22.2	21.4	28.8	27.6	26.8	25.1	24.5	23.0	21.0	19.9	19.6	17.9
MD 202 (Landover Rd)	I-495 Exit 17	33.0	31.5	29.2	28.2	26.7	25.1	N/A	N/A	24.5	23.8	31.1	29.9	29.2	27.4	26.9	25.4	23.4	22.3	22.0	20.3
Arena Dr	I-495 Exit 16	33.8	32.3	30.0	28.9	27.5	25.9	N/A	N/A	25.3	24.6	31.9	30.7	30.0	28.2	27.7	26.2	24.1	23.1	22.8	21.1
MD 214 (Central Ave)	I-495 Exit 15	35.0	33.4	31.2	30.1	28.6	27.1	N/A	N/A	26.5	25.8	33.1	31.9	31.2	29.4	28.9	27.3	25.3	24.3	24.0	22.3
Ritchie-Marlboro Rd	I-495 Exit 13	36.9	35.3	33.0	32.0	30.5	29.0	N/A	N/A	28.4	27.6	35.0	33.8	33.0	31.3	30.7	29.2	27.2	26.1	25.8	24.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	39.7	38.1	35.8	34.8	33.3	31.8	N/A	N/A	31.2	30.4	37.8	36.6	35.8	34.1	33.5	32.0	30.0	28.9	28.6	26.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	41.6	40.1	37.8	36.8	35.3	33.7	N/A	N/A	33.1	32.4	39.7	38.5	37.8	36.1	35.5	34.0	32.0	30.9	30.6	28.9
MD 5 (Branch Ave)	I-495 Exit 7	43.8	42.3	40.0	39.0	37.5	36.0	N/A	N/A	35.4	34.6	41.9	40.8	40.0	38.3	37.7	36.2	34.2	33.1	32.8	31.1
MD 414 (St Barnabas Rd)	I-495 Exit 4	46.9	45.4	43.1	42.0	40.6	39.0	N/A	N/A	38.4	37.7	45.0	43.8	43.1	41.3	40.8	39.3	37.2	36.2	35.9	34.2

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	65.7	68.8	69.6	71.8	73.6	74.7	75.7	77.3	78.4	81.0	82.6	84.9	85.6	87.0	88.9	91.6	92.8	94.8	97.2
Shady Grove Rd	I-270 Exit 8	64.8	67.9	68.7	70.9	72.7	73.8	74.8	76.4	77.5	80.1	81.7	84.0	84.7	86.1	88.0	90.7	91.9	93.9	96.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	62.6	65.7	66.5	68.7	70.5	71.6	72.6	74.2	75.3	77.9	79.5	81.8	82.5	83.9	85.8	88.5	89.7	91.7	94.1
MD 189 (Falls Rd)	I-270 Exit 5	60.2	63.3	64.1	66.3	68.1	69.3	70.2	71.9	73.0	75.6	77.1	79.4	80.2	81.5	83.4	86.1	87.3	89.3	91.7
Montrose Rd	I-270 Exit 4	53.9	57.0	57.8	60.0	61.8	62.9	63.9	65.5	66.6	69.2	70.8	73.1	73.8	75.2	77.1	79.8	81.0	83.0	85.4
Split	I-270	40.8	43.9	44.7	46.8	48.7	49.8	50.8	52.4	53.5	56.1	57.7	60.0	60.7	62.0	64.0	66.6	67.9	69.9	72.3
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	35.1	38.1	38.9	41.1	42.9	44.1	45.0	46.7	47.8	50.4	52.0	54.2	55.0	56.3	58.2	60.9	62.1	64.1	66.5
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	26.4	29.4	30.2	32.4	34.2	35.4	36.4	38.0	39.1	41.7	43.3	45.5	46.3	47.6	49.5	52.2	53.4	55.4	57.8
VA 193 (Georgetown Pike)	I-495 Exit 44	43.5	46.5	47.3	49.5	51.4	52.5	53.5	55.1	56.2	58.8	60.4	62.7	63.4	64.7	66.7	69.3	70.6	72.6	74.9
George Washington Memorial Pkwy	I-495 Exit 43	42.2	45.2	46.0	48.2	50.1	51.2	52.2	53.8	54.9	57.5	59.1	61.4	62.1	63.4	65.4	68.0	69.3	71.3	73.6
Clara Barton Pkwy	I-495 Exit 41	41.4	44.4	45.2	47.4	49.3	50.4	51.4	53.0	54.1	56.7	58.3	60.5	61.3	62.6	64.6	67.2	68.5	70.4	72.8
Cabin John Pkwy	I-495 Exit 40	39.2	42.3	43.1	45.3	47.1	48.2	49.2	50.8	51.9	54.5	56.1	58.4	59.1	60.5	62.4	65.1	66.3	68.3	70.7
MD 190 (River Rd)	I-495 Exit 39	38.5	41.6	42.3	44.5	46.4	47.5	48.5	50.1	51.2	53.8	55.4	57.7	58.4	59.7	61.7	64.3	65.6	67.6	70.0
I-270 West Spur	I-495 Exit 38	34.3	37.3	38.1	40.3	42.1	43.3	44.2	45.9	47.0	49.6	51.2	53.4	54.2	55.5	57.4	60.1	61.3	63.3	65.7
MD 187 (Old Georgetown Rd)	I-495 Exit 36	20.1	23.2	24.0	26.2	28.0	29.2	30.1	31.8	32.9	35.5	37.0	39.3	40.1	41.4	43.3	46.0	47.2	49.2	51.6
I-270 East Spur	I-495 Exit 35	15.6	18.6	19.4	21.6	23.4	24.6	25.6	27.2	28.3	30.9	32.5	34.7	35.5	36.8	38.7	41.4	42.6	44.6	47.0
MD 355 (Rockville Pike)	I-495 Exit 34	13.1	16.1	16.9	19.1	20.9	22.1	23.1	24.7	25.8	28.4	30.0	32.2	33.0	34.3	36.2	38.9	40.1	42.1	44.5
MD 185 (Connecticut Ave)	I-495 Exit 33	6.1	9.2	10.0	12.2	14.0	15.2	16.1	17.7	18.8	21.4	23.0	25.3	26.0	27.4	29.3	32.0	33.2	35.2	37.6
MD 97 (Georgia Ave)	I-495 Exit 31	0	3.1	3.9	6.0	7.9	9.0	10.0	11.6	12.7	15.3	16.9	19.2	19.9	21.3	23.2	25.9	27.1	29.1	31.5
US 29 (Colesville Rd)	I-495 Exit 30	1.7	0	0.8	3.0	4.8	6.0	6.9	8.6	9.7	12.3	13.8	16.1	16.9	18.2	20.1	22.8	24.0	26.0	28.4
MD 193 (University Blvd E)	I-495 Exit 29	3.5	1.1	0	2.2	4.0	5.2	6.1	7.8	8.9	11.5	13.0	15.3	16.1	17.4	19.3	22.0	23.2	25.2	27.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	5.6	3.3	1.7	0	1.8	3.0	3.9	5.6	6.7	9.3	10.8	13.1	13.9	15.2	17.1	19.8	21.0	23.0	25.4
I-95	I-495 Exit 27	6.9	4.6	3.0	1.8	0	1.2	2.1	3.8	4.8	7.5	9.0	11.3	12.0	13.4	15.3	18.0	19.2	21.2	23.6
US 1 (Baltimore Ave)	I-495 Exit 25	8.0	5.6	4.0	2.9	1.1	0	1.0	2.6	3.7	6.3	7.9	10.1	10.9	12.2	14.1	16.8	18.0	20.0	22.4
Greenbelt Metro Station	I-495 Exit 24	8.9	6.6	5.0	3.9	2.0	1.0	0	1.6	2.7	5.3	6.9	9.2	9.9	11.3	13.2	15.9	17.1	19.1	21.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	10.4	8.0	6.4	5.3	3.5	2.4	1.5	0	1.1	3.7	5.3	7.5	8.3	9.6	11.5	14.2	15.4	17.4	19.8
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	11.5	9.1	7.5	6.4	4.6	3.5	2.6	1.1	0	2.6	4.2	6.4	7.2	8.5	10.5	13.1	14.4	16.3	18.7
MD 450 (Annapolis Rd)	I-495 Exit 20	14.2	11.8	10.2	9.1	7.3	6.2	5.2	3.8	2.7	0	1.6	3.8	4.6	5.9	7.8	10.5	11.7	13.7	16.1
US 50 (John Hanson Hwy)	I-495 Exit 19	15.8	13.4	11.9	10.7	8.9	7.8	6.9	5.4	4.3	1.6	0	2.3	3.0	4.4	6.3	9.0	10.2	12.2	14.6
MD 202 (Landover Rd)	I-495 Exit 17	18.2	15.8	14.2	13.1	11.3	10.2	9.2	7.8	6.7	4.0	2.4	0	0.7	2.1	4.0	6.7	7.9	9.9	12.3
Arena Dr	I-495 Exit 16	19.0	16.6	15.0	13.9	12.0	11.0	10.0	8.6	7.5	4.8	3.2	0.8	0	1.3	3.3	5.9	7.2	9.2	11.5
MD 214 (Central Ave)	I-495 Exit 15	20.2	17.8	16.2	15.1	13.2	12.2	11.2	9.8	8.7	6.0	4.3	2.0	1.2	0	1.9	4.6	5.8	7.8	10.2
Ritchie-Marlboro Rd	I-495 Exit 13	22.0	19.7	18.1	16.9	15.1	14.1	13.1	11.6	10.5	7.8	6.2	3.8	3.1	1.9	0	2.7	3.9	5.9	8.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	24.8	22.5	20.9	19.8	17.9	16.9	15.9	14.4	13.3	10.6	9.0	6.7	5.9	4.7	2.8	0	1.2	3.2	5.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	26.8	24.4	22.8	21.7	19.9	18.8	17.8	16.4	15.3	12.6	11.0	8.6	7.8	6.6	4.8	2.0	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	29.0	26.6	25.1	23.9	22.1	21.0	20.1	18.6	17.5	14.8	13.2	10.8	10.0	8.9	7.0	4.2	2.2	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	32.1	29.7	28.1	27.0	25.1	24.1	23.1	21.7	20.6	17.9	16.3	13.9	13.1	11.9	10.0	7.2	5.3	3.1	0

Travel Time Matrix - Alternative 13C - GP Lane (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.1	4.3	6.0	11.6	12.4	12.8	17.6	28.5	19.4	18.2	17.4	15.7	15.2	13.6	N/A	41.1	43.4	49.7
Shady Grove Rd	I-270 Exit 8	1.8	0	2.2	3.3	5.0	10.6	11.4	11.9	16.6	27.5	18.4	17.2	16.5	14.7	14.2	12.7	N/A	40.1	42.4	48.8
MD 28 (W Montgomery Ave)	I-270 Exit 6	4.4	2.7	0	1.1	2.9	8.4	9.2	9.7	14.5	25.3	16.2	15.0	14.3	12.6	12.0	10.5	N/A	37.9	40.2	46.6
MD 189 (Falls Rd)	I-270 Exit 5	5.5	3.7	1.1	0	1.7	7.3	8.1	8.6	13.3	24.2	15.1	13.9	13.1	11.4	10.9	9.4	N/A	36.8	39.1	45.5
Montrose Rd	I-270 Exit 4	7.0	5.2	2.5	1.5	0	5.6	6.4	6.9	11.6	22.5	13.4	12.2	11.4	9.7	9.2	7.6	N/A	35.1	37.4	43.7
Split	I-270	8.5	6.8	4.1	3.0	1.5	0	0.8	1.3	6.0	16.9	7.8	6.6	5.8	4.1	3.6	2.1	N/A	29.5	31.8	38.2
Westlake Terrace	I-270 W Spur	9.5	7.8	5.1	4.0	2.5	1.0	0	0.5	N/A	N/A	7.0	5.8	5.1	3.3	2.8	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	10.0	8.3	5.6	4.5	3.0	1.5	0.5	0	N/A	N/A	6.5	5.3	4.6	2.9	2.3	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	9.1	7.4	4.7	3.6	2.2	0.6	N/A	N/A	0	10.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23.5	25.8	32.1
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	9.9	8.1	5.4	4.4	2.9	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.6	14.9	21.3
VA 193 (Georgetown Pike)	I-495 Exit 44	20.2	18.4	15.7	14.7	13.2	11.7	10.6	10.2	N/A	N/A	0	1.3	2.1	4.6	6.1	9.1	11.2	12.5	14.8	21.1
George Washington Memorial Pkwy	I-495 Exit 43	18.9	17.1	14.5	13.4	11.9	10.4	9.4	8.9	N/A	N/A	1.2	0	0.8	3.3	4.8	7.8	10.0	11.2	13.5	19.9
Clara Barton Pkwy	I-495 Exit 41	18.1	16.3	13.6	12.6	11.1	9.6	8.6	8.1	N/A	N/A	1.9	0.8	0	2.5	4.0	7.0	9.1	10.4	12.7	19.1
Cabin John Pkwy	I-495 Exit 40	15.6	13.8	11.2	10.1	8.6	7.1	6.1	5.6	N/A	N/A	3.6	2.5	1.7	0	1.5	4.6	6.7	7.9	10.2	16.6
MD 190 (River Rd)	I-495 Exit 39	14.1	12.4	9.7	8.6	7.1	5.6	4.6	4.1	N/A	N/A	4.2	3.0	2.3	0.5	0	3.1	5.2	6.4	8.7	15.1
I-270 West Spur	I-495 Exit 38	11.0	9.3	6.6	5.5	4.1	2.5	1.5	1.0	N/A	N/A	5.7	4.5	3.8	2.1	1.5	0	2.1	3.3	5.6	12.0
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.7	6.5	5.7	4.0	3.5	2.0	0	1.2	3.5	9.9
I-270 East Spur	I-495 Exit 35	11.8	10.1	7.4	6.4	4.9	3.3	N/A	N/A	2.7	2.0	8.7	7.6	6.8	5.1	4.5	3.0	1.1	0	2.3	8.7
MD 355 (Rockville Pike)	I-495 Exit 34	12.1	10.4	7.7	6.7	5.2	3.6	N/A	N/A	3.0	2.3	9.0	7.9	7.1	5.4	4.8	3.3	1.4	0.3	0	6.4
MD 185 (Connecticut Ave)	I-495 Exit 33	14.8	13.0	10.3	9.3	7.8	6.3	N/A	N/A	5.6	4.9	11.7	10.5	9.7	8.0	7.5	6.0	4.0	2.9	2.6	0
MD 97 (Georgia Ave)	I-495 Exit 31	18.6	16.8	14.1	13.1	11.6	10.1	N/A	N/A	9.4	8.7	15.5	14.3	13.5	11.8	11.3	9.8	7.8	6.7	6.4	3.8
US 29 (Colesville Rd)	I-495 Exit 30	20.5	18.8	16.1	15.0	13.6	12.0	N/A	N/A	11.4	10.7	17.4	16.2	15.5	13.8	13.2	11.7	9.7	8.7	8.4	5.8
MD 193 (University Blvd E)	I-495 Exit 29	22.3	20.6	17.9	16.8	15.3	13.8	N/A	N/A	13.2	12.4	19.2	18.0	17.3	15.6	15.0	13.5	11.5	10.5	10.2	7.5
MD 650 (New Hampshire Ave)	I-495 Exit 28	24.5	22.8	20.1	19.0	17.5	16.0	N/A	N/A	15.4	14.6	21.4	20.2	19.5	17.8	17.2	15.7	13.7	12.7	12.4	9.7
I-95	I-495 Exit 27	25.8	24.0	21.3	20.3	18.8	17.3	N/A	N/A	16.6	15.9	22.7	21.5	20.7	19.0	18.5	17.0	15.0	13.9	13.6	11.0
US 1 (Baltimore Ave)	I-495 Exit 25	26.8	25.1	22.4	21.3	19.8	18.3	N/A	N/A	17.7	17.0	23.7	22.5	21.8	20.1	19.5	18.0	16.0	15.0	14.7	12.1
Greenbelt Metro Station	I-495 Exit 24	27.8	26.0	23.4	22.3	20.8	19.3	N/A	N/A	18.6	17.9	24.7	23.5	22.7	21.0	20.5	19.0	17.0	15.9	15.6	13.0
MD 201 (Kenilworth Ave)	I-495 Exit 23	29.2	27.5	24.8	23.7	22.3	20.7	N/A	N/A	20.1	19.4	26.1	24.9	24.2	22.5	21.9	20.4	18.4	17.4	17.1	14.5
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	30.3	28.6	25.9	24.8	23.4	21.8	N/A	N/A	21.2	20.5	27.2	26.0	25.3	23.6	23.0	21.5	19.5	18.5	18.2	15.6
MD 450 (Annapolis Rd)	I-495 Exit 20	33.0	31.3	28.6	27.5	26.0	24.5	N/A	N/A	23.9	23.2	29.9	28.7	28.0	26.3	25.7	24.2	22.2	21.2	20.9	18.3
US 50 (John Hanson Hwy)	I-495 Exit 19	34.6	32.9	30.2	29.2	27.7	26.1	N/A	N/A	25.5	24.8	31.5	30.4	29.6	27.9	27.3	25.8	23.9	22.8	22.5	19.9
MD 202 (Landover Rd)	I-495 Exit 17	37.0	35.3	32.6	31.5	30.0	28.5	N/A	N/A	27.9	27.1	33.9	32.7	32.0	30.3	29.7	28.2	26.2	25.2	24.9	22.2
Arena Dr	I-495 Exit 16	37.8	36.0	33.4	32.3	30.8	29.3	N/A	N/A	28.7	27.9	34.7	33.5	32.8	31.0	30.5	29.0	27.0	26.0	25.7	23.0
MD 214 (Central Ave)	I-495 Exit 15	39.0	37.2	34.6	33.5	32.0	30.5	N/A	N/A	29.9	29.1	35.9	34.7	33.9	32.2	31.7	30.2	28.2	27.1	26.8	24.2
Ritchie-Marlboro Rd	I-495 Exit 13	40.8	39.1	36.4	35.4	33.9	32.3	N/A	N/A	31.7	31.0	37.7	36.6	35.8	34.1	33.5	32.0	30.1	29.0	28.7	26.1
MD 4 (Pennsylvania Ave)	I-495 Exit 11	43.7	41.9	39.2	38.2	36.7	35.1	N/A	N/A	34.5	33.8	40.5	39.4	38.6	36.9	36.4	34.8	32.9	31.8	31.5	28.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	45.6	43.8	41.1	40.1	38.6	37.1	N/A	N/A	36.4	35.7	42.5	41.3	40.5	38.8	38.3	36.8	34.8	33.7	33.4	30.8
MD 5 (Branch Ave)	I-495 Exit 7	47.8	46.0	43.4	42.3	40.8	39.3	N/A	N/A	38.7	37.9	44.7	43.5	42.8	41.0	40.5	39.0	37.0	35.9	35.6	33.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	50.9	49.1	46.4	45.4	43.9	42.3	N/A	N/A	41.7	41.0	47.7	46.6	45.8	44.1	43.6	42.0	40.1	39.0	38.7	36.1

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	55.8	59.8	62.2	65.0	66.8	67.9	68.9	70.5	71.6	74.2	75.9	78.2	78.9	80.3	82.2	84.9	86.1	88.1	90.5
Shady Grove Rd	54.9	58.8	61.3	64.0	65.8	67.0	67.9	69.6	70.7	73.3	74.9	77.2	78.0	79.3	81.3	83.9	85.2	87.2	89.5
MD 28 (W Montgomery Ave)	52.7	56.6	59.1	61.8	63.7	64.8	65.8	67.4	68.5	71.1	72.7	75.0	75.8	77.2	79.1	81.8	83.0	85.0	87.4
MD 189 (Falls Rd)	51.5	55.5	58.0	60.7	62.5	63.7	64.6	66.3	67.4	70.0	71.6	73.9	74.6	76.0	77.9	80.6	81.8	83.8	86.2
Montrose Rd	49.8	53.8	56.2	59.0	60.8	61.9	62.9	64.5	65.6	68.3	69.9	72.2	72.9	74.3	76.2	78.9	80.1	82.1	84.5
Split	44.2	48.2	50.7	53.4	55.2	56.4	57.3	59.0	60.1	62.7	64.3	66.6	67.4	68.7	70.6	73.3	74.5	76.5	78.9
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	38.2	42.2	44.6	47.4	49.2	50.3	51.3	52.9	54.0	56.6	58.3	60.6	61.3	62.7	64.6	67.3	68.5	70.5	72.9
MD 187 (Old Georgetown Rd)	27.4	31.3	33.8	36.5	38.3	39.5	40.4	42.1	43.2	45.8	47.4	49.7	50.5	51.8	53.8	56.4	57.7	59.7	62.0
VA 193 (Georgetown Pike)	27.2	31.2	33.6	36.4	38.2	39.3	40.3	41.9	43.0	45.6	47.3	49.6	50.3	51.7	53.6	56.3	57.5	59.5	61.9
George Washington Memorial Pkwy	25.9	29.9	32.3	35.1	36.9	38.1	39.0	40.6	41.8	44.4	46.0	48.3	49.0	50.4	52.3	55.0	56.2	58.2	60.6
Clara Barton Pkwy	25.1	29.1	31.5	34.3	36.1	37.3	38.2	39.8	41.0	43.6	45.2	47.5	48.2	49.6	51.5	54.2	55.4	57.4	59.8
Cabin John Pkwy	22.7	26.6	29.1	31.8	33.6	34.8	35.7	37.4	38.5	41.1	42.7	45.0	45.8	47.1	49.1	51.7	53.0	54.9	57.3
MD 190 (River Rd)	21.2	25.1	27.6	30.3	32.1	33.3	34.2	35.9	37.0	39.6	41.2	43.5	44.3	45.6	47.6	50.2	51.5	53.5	55.8
I-270 West Spur	18.1	22.0	24.5	27.2	29.1	30.2	31.2	32.8	33.9	36.5	38.1	40.4	41.2	42.6	44.5	47.2	48.4	50.4	52.8
MD 187 (Old Georgetown Rd)	16.0	19.9	22.4	25.1	26.9	28.1	29.1	30.7	31.8	34.4	36.0	38.3	39.1	40.4	42.4	45.1	46.3	48.3	50.7
I-270 East Spur	14.8	18.7	21.2	23.9	25.7	26.9	27.8	29.5	30.6	33.2	34.8	37.1	37.9	39.2	41.1	43.8	45.0	47.0	49.4
MD 355 (Rockville Pike)	12.5	16.4	18.9	21.6	23.4	24.6	25.5	27.2	28.3	30.9	32.5	34.8	35.6	36.9	38.9	41.5	42.8	44.7	47.1
MD 185 (Connecticut Ave)	6.1	10.0	12.5	15.2	17.0	18.2	19.2	20.8	21.9	24.5	26.1	28.4	29.2	30.5	32.5	35.1	36.4	38.4	40.8
MD 97 (Georgia Ave)	0	3.9	6.4	9.1	11.0	12.1	13.1	14.7	15.8	18.4	20.0	22.4	23.1	24.5	26.4	29.1	30.3	32.3	34.7
US 29 (Colesville Rd)	1.7	0	2.5	5.2	7.0	8.2	9.1	10.8	11.9	14.5	16.1	18.4	19.2	20.5	22.5	25.1	26.4	28.3	30.7
MD 193 (University Blvd E)	3.5	1.1	0	2.7	4.6	5.7	6.7	8.3	9.4	12.0	13.6	15.9	16.7	18.1	20.0	22.7	23.9	25.9	28.3
MD 650 (New Hampshire Ave)	5.7	3.3	1.7	0	1.8	3.0	3.9	5.6	6.7	9.3	10.9	13.2	14.0	15.3	17.3	19.9	21.2	23.2	25.6
I-95	6.9	4.5	3.0	1.8	0	1.2	2.1	3.7	4.9	7.5	9.1	11.4	12.1	13.5	15.4	18.1	19.3	21.3	23.7
US 1 (Baltimore Ave)	8.0	5.6	4.0	2.9	1.1	0	1.0	2.6	3.7	6.3	7.9	10.2	11.0	12.3	14.3	17.0	18.2	20.2	22.6
Greenbelt Metro Station	8.9	6.6	5.0	3.9	2.0	1.0	0	1.6	2.7	5.4	7.0	9.3	10.0	11.4	13.3	16.0	17.2	19.2	21.6
MD 201 (Kenilworth Ave)	10.4	8.0	6.4	5.3	3.5	2.4	1.4	0	1.1	3.7	5.3	7.6	8.4	9.8	11.7	14.4	15.6	17.6	20.0
MD 295 (Baltimore-Washington Pkwy)	11.5	9.1	7.5	6.4	4.6	3.5	2.5	1.1	0	2.6	4.2	6.5	7.3	8.6	10.6	13.3	14.5	16.5	18.9
MD 450 (Annapolis Rd)	14.2	11.8	10.2	9.1	7.2	6.2	5.2	3.8	2.7	0	1.6	3.9	4.7	6.0	8.0	10.6	11.9	13.9	16.3
US 50 (John Hanson Hwy)	15.8	13.4	11.8	10.7	8.9	7.8	6.9	5.4	4.3	1.6	0	2.3	3.1	4.4	6.4	9.0	10.3	12.2	14.6
MD 202 (Landover Rd)	18.2	15.8	14.2	13.1	11.2	10.2	9.2	7.8	6.7	4.0	2.4	0	0.8	2.1	4.0	6.7	7.9	9.9	12.3
Arena Dr	19.0	16.6	15.0	13.9	12.0	11.0	10.0	8.6	7.5	4.8	3.2	0.8	0	1.4	3.3	6.0	7.2	9.2	11.6
MD 214 (Central Ave)	20.1	17.8	16.2	15.1	13.2	12.2	11.2	9.8	8.7	6.0	4.3	2.0	1.2	0	1.9	4.6	5.8	7.8	10.2
Ritchie-Marlboro Rd	22.0	19.6	18.0	16.9	15.1	14.0	13.1	11.6	10.5	7.8	6.2	3.8	3.1	1.9	0	2.7	3.9	5.9	8.3
MD 4 (Pennsylvania Ave)	24.8	22.4	20.8	19.7	17.9	16.8	15.9	14.4	13.3	10.6	9.0	6.6	5.9	4.7	2.8	0	1.2	3.2	5.6
MD 337 (Suitland Pkwy)	26.7	24.3	22.8	21.6	19.8	18.7	17.8	16.3	15.2	12.5	10.9	8.6	7.8	6.6	4.7	1.9	0	2.0	4.4
MD 5 (Branch Ave)	29.0	26.6	25.0	23.9	22.0	21.0	20.0	18.6	17.5	14.8	13.1	10.8	10.0	8.8	6.9	4.1	2.2	0	2.4
MD 414 (St Barnabas Rd)	32.0	29.6	28.0	26.9	25.1	24.0	23.1	21.6	20.5	17.8	16.2	13.8	13.1	11.9	10.0	7.2	5.3	3.1	0

Travel Time Matrix - Alternative 5 - ETL (PM Peak)

Unit: Minute

From	To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.8	4.8	6.0	6.9	7.4	6.6	7.3	12.9	11.9	11.3	9.9	9.4	8.1	N/A	8.7	9.1	10.5
Shady Grove Rd	I-270 Exit 8	1.1	0	1.9	2.9	3.9	5.2	6.0	6.5	5.7	6.4	12.1	11.1	10.4	9.0	8.5	7.2	N/A	7.8	8.2	9.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.0	1.9	0	1.0	2.0	3.2	4.1	4.5	3.8	4.5	10.1	9.1	8.5	7.0	6.6	5.3	N/A	5.9	6.3	7.7
MD 189 (Falls Rd)	I-270 Exit 5	3.8	2.7	0.8	0	1.1	2.3	3.1	3.6	2.8	3.6	9.2	8.2	7.5	6.1	5.6	4.3	N/A	4.9	5.3	6.8
Montrose Rd	I-270 Exit 4	5.1	4.0	2.1	1.3	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.5	5.0	4.5	3.3	N/A	3.9	4.3	5.7
Split	I-270	6.4	5.3	3.4	2.6	1.3	0	0.9	1.3	0.5	1.3	6.9	5.9	5.2	3.8	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	7.3	6.2	4.3	3.5	2.2	0.9	0	0.5	N/A	N/A	6.0	5.0	4.4	3.0	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.7	6.6	4.7	3.8	2.5	1.3	0.4	0	N/A	N/A	5.6	4.6	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.1	5.9	4.0	3.2	1.9	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	4.0
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.7	6.6	4.7	3.9	2.6	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.7	12.6	10.7	9.9	8.6	7.3	6.4	6.0	N/A	N/A	0	1.2	1.9	3.6	3.9	5.2	7.1	7.8	8.2	9.7
George Washington Memorial Pkwy	I-495 Exit 43	12.5	11.4	9.5	8.7	7.4	6.1	5.2	4.8	N/A	N/A	1.0	0	0.7	2.4	2.7	4.0	5.9	6.7	7.0	8.5
Clara Barton Pkwy	I-495 Exit 41	11.8	10.7	8.8	8.0	6.7	5.4	4.5	4.1	N/A	N/A	1.6	0.6	0	1.7	2.0	3.3	5.2	5.9	6.3	7.8
Cabin John Pkwy	I-495 Exit 40	10.1	9.0	7.1	6.3	5.0	3.7	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.5	4.2	4.6	6.1
MD 190 (River Rd)	I-495 Exit 39	9.8	8.7	6.8	6.0	4.7	3.4	2.5	2.1	N/A	N/A	3.6	2.6	1.9	0.5	0	1.3	3.2	4.0	4.3	5.8
I-270 West Spur	I-495 Exit 38	8.5	7.4	5.5	4.7	3.4	2.1	1.2	0.8	N/A	N/A	4.9	3.9	3.2	1.8	1.3	0	1.9	2.6	3.0	4.5
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	3.0	1.7	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	9.0	7.9	6.0	5.2	3.9	2.6	N/A	N/A	2.0	1.3	7.5	6.4	5.8	4.4	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.3	8.2	6.3	5.5	4.2	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.1	4.7	4.2	2.9	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.7	9.6	7.7	6.9	5.6	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.5	6.1	5.6	4.3	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	13.0	11.9	10.0	9.1	7.8	6.6	N/A	N/A	5.9	5.3	11.4	10.4	9.8	8.3	7.8	6.5	4.9	4.0	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	13.8	12.7	10.8	10.0	8.7	7.4	N/A	N/A	6.8	6.1	12.3	11.3	10.6	9.2	8.7	7.4	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	15.1	14.0	12.1	11.3	10.0	8.7	N/A	N/A	8.1	7.4	13.6	12.6	11.9	10.5	10.0	8.7	7.0	6.1	5.8	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	17.1	16.0	14.1	13.3	12.0	10.7	N/A	N/A	10.1	9.4	15.6	14.5	13.9	12.5	12.0	10.7	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	18.1	16.9	15.1	14.2	12.9	11.6	N/A	N/A	11.0	10.4	16.5	15.5	14.9	13.4	12.9	11.6	10.0	9.0	8.8	7.4
US 1 (Baltimore Ave)	I-495 Exit 25	19.0	17.9	16.0	15.2	13.9	12.6	N/A	N/A	12.0	11.3	17.5	16.5	15.8	14.4	13.9	12.6	10.9	10.0	9.7	8.3
Greenbelt Metro Station	I-495 Exit 24	19.9	18.8	16.9	16.1	14.8	13.5	N/A	N/A	12.9	12.2	18.3	17.3	16.7	15.3	14.8	13.5	11.8	10.9	10.6	9.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	21.1	20.0	18.1	17.3	16.0	14.7	N/A	N/A	14.1	13.4	19.6	18.6	17.9	16.5	16.0	14.7	13.0	12.1	11.8	10.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	22.1	20.9	19.1	18.2	16.9	15.6	N/A	N/A	15.0	14.4	20.5	19.5	18.9	17.4	16.9	15.6	14.0	13.0	12.8	11.4
MD 450 (Annapolis Rd)	I-495 Exit 20	24.5	23.4	21.5	20.6	19.3	18.1	N/A	N/A	17.4	16.8	22.9	21.9	21.3	19.8	19.3	18.0	16.4	15.5	15.2	13.8
US 50 (John Hanson Hwy)	I-495 Exit 19	25.9	24.8	22.9	22.1	20.8	19.5	N/A	N/A	18.9	18.2	24.4	23.4	22.7	21.3	20.8	19.5	17.8	16.9	16.6	15.2
MD 202 (Landover Rd)	I-495 Exit 17	27.9	26.8	24.9	24.1	22.8	21.5	N/A	N/A	20.9	20.2	26.3	25.3	24.7	23.3	22.8	21.5	19.8	18.9	18.6	17.2
Arena Dr	I-495 Exit 16	28.6	27.5	25.6	24.7	23.4	22.2	N/A	N/A	21.5	20.9	27.0	26.0	25.4	23.9	23.4	22.1	20.5	19.6	19.3	17.9
MD 214 (Central Ave)	I-495 Exit 15	29.6	28.4	26.6	25.7	24.4	23.1	N/A	N/A	22.5	21.9	28.0	27.0	26.4	24.9	24.4	23.1	21.5	20.5	20.3	18.9
Ritchie-Marlboro Rd	I-495 Exit 13	31.1	30.0	28.1	27.3	26.0	24.7	N/A	N/A	24.1	23.4	29.6	28.6	27.9	26.5	26.0	24.7	23.0	22.1	21.8	20.4
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.5	32.4	30.5	29.6	28.3	27.1	N/A	N/A	26.4	25.8	31.9	30.9	30.3	28.8	28.3	27.0	25.4	24.5	24.2	22.8
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.7	33.5	31.6	30.8	29.5	28.2	N/A	N/A	27.6	26.9	33.1	32.1	31.4	30.0	29.5	28.2	26.5	25.6	25.3	23.9
MD 5 (Branch Ave)	I-495 Exit 7	36.5	35.4	33.5	32.7	31.4	30.1	N/A	N/A	29.5	28.8	35.0	34.0	33.3	31.9	31.4	30.1	28.4	27.5	27.2	25.8
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.4	38.3	36.4	35.6	34.3	33.0	N/A	N/A	32.4	31.7	37.9	36.9	36.2	34.8	34.3	33.0	31.3	30.4	30.1	28.7

Unit: Minute

From	To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.7	14.1	14.8	16.5	18.0	19.0	19.7	21.1	22.0	24.2	25.5	27.4	28.0	29.1	30.7	33.0	34.0	36.0	38.4
Shady Grove Rd	I-270 Exit 8	11.8	13.2	14.0	15.6	17.1	18.1	18.9	20.3	21.1	23.3	24.6	26.5	27.1	28.2	29.8	32.1	33.2	35.2	37.5
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.9	11.3	12.0	13.7	15.2	16.2	16.9	18.3	19.2	21.4	22.7	24.6	25.2	26.3	27.9	30.1	31.2	33.2	35.6
MD 189 (Falls Rd)	I-270 Exit 5	8.9	10.3	11.1	12.7	14.3	15.2	16.0	17.4	18.2	20.4	21.7	23.6	24.3	25.3	27.0	29.2	30.3	32.3	34.7
Montrose Rd	I-270 Exit 4	7.9	9.3	10.0	11.7	13.2	14.2	14.9	16.3	17.2	19.4	20.7	22.6	23.2	24.3	25.9	28.1	29.2	31.2	33.6
Split	I-270	6.6	8.1	8.8	10.4	12.0	13.0	13.7	15.1	16.0	18.2	19.4	21.4	22.0	23.1	24.7	26.9	28.0	30.0	32.4
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.1	7.5	8.3	9.9	11.4	12.4	13.2	14.6	15.4	17.6	18.9	20.8	21.4	22.5	24.1	26.4	27.5	29.4	31.8
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	6.8	7.5	9.2	10.7	11.7	12.4	13.8	14.7	16.9	18.1	20.1	20.7	21.8	23.4	25.6	26.7	28.7	31.1
VA 193 (Georgetown Pike)	I-495 Exit 44	11.8	13.2	14.0	15.6	17.2	18.1	18.9	20.3	21.2	23.3	24.6	26.5	27.2	28.2	29.9	32.1	33.2	35.2	37.6
George Washington Memorial Pkwy	I-495 Exit 43	10.6	12.1	12.8	14.5	16.0	17.0	17.7	19.1	20.0	22.2	23.4	25.4	26.0	27.1	28.7	30.9	32.0	34.0	36.4
Clara Barton Pkwy	I-495 Exit 41	9.9	11.3	12.1	13.7	15.2	16.2	17.0	18.4	19.2	21.4	22.7	24.6	25.2	26.3	28.0	30.2	31.3	33.3	35.7
Cabin John Pkwy	I-495 Exit 40	8.2	9.6	10.4	12.0	13.6	14.6	15.3	16.7	17.6	19.7	21.0	22.9	23.6	24.6	26.3	28.5	29.6	31.6	34.0
MD 190 (River Rd)	I-495 Exit 39	7.9	9.3	10.1	11.7	13.3	14.3	15.0	16.4	17.3	19.4	20.7	22.6	23.3	24.4	26.0	28.2	29.3	31.3	33.7
I-270 West Spur	I-495 Exit 38	6.6	8.0	8.8	10.4	11.9	12.9	13.7	15.1	15.9	18.1	19.4	21.3	21.9	23.0	24.7	26.9	28.0	30.0	32.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	6.2	6.9	8.5	10.1	11.1	11.8	13.2	14.1	16.3	17.5	19.5	20.1	21.2	22.8	25.0	26.1	28.1	30.5
I-270 East Spur	I-495 Exit 35	4.0	5.4	6.1	7.8	9.3	10.3	11.0	12.5	13.3	15.5	16.8	18.7	19.3	20.4	22.0	24.3	25.3	27.3	29.7
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	5.0	5.8	7.4	9.0	9.9	10.7	12.1	12.9	15.1	16.4	18.3	18.9	20.0	21.7	23.9	25.0	27.0	29.4
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	3.5	4.3	5.9	7.5	8.5	9.2	10.6	11.5	13.6	14.9	16.9	17.5	18.6	20.2	22.4	23.5	25.5	27.9
MD 97 (Georgia Ave)	I-495 Exit 31	0	1.4	2.2	3.8	5.3	6.3	7.1	8.5	9.3	11.5	12.8	14.7	15.3	16.4	18.1	20.3	21.4	23.4	25.7
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.4	3.9	4.9	5.7	7.1	7.9	10.1	11.4	13.3	13.9	15.0	16.6	18.9	19.9	21.9	24.3
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	1.6	3.2	4.2	4.9	6.3	7.2	9.4	10.6	12.6	13.2	14.3	15.9	18.1	19.2	21.2	23.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	1.5	2.5	3.3	4.7	5.5	7.7	9.0	10.9	11.5	12.6	14.2	16.5	17.6	19.5	21.9
I-95	I-495 Exit 27	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	4.0	6.2	7.5	9.4	10.0	11.1	12.7	14.9	16.0	18.0	20.4
US 1 (Baltimore Ave)	I-495 Exit 25	6.6	4.6	3.3	2.6	1.0	0	0.7	2.1	3.0	5.2	6.5	8.4	9.0	10.1	11.7	13.9	15.0	17.0	19.4
Greenbelt Metro Station	I-495 Exit 24	7.5	5.5	4.2	3.4	1.8	0.9	0	1.4	2.3	4.4	5.7	7.6	8.3	9.4	11.0	13.2	14.3	16.3	18.7
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.7	6.7	5.4	4.7	3.1	2.1	1.2	0	0.9	3.0	4.3	6.2	6.9	7.9	9.6	11.8	12.9	14.9	17.3
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.6	7.6	6.3	5.6	4.0	3.0	2.2	0.9	0	2.2	3.5	5.4	6.0	7.1	8.7	10.9	12.0	14.0	16.4
MD 450 (Annapolis Rd)	I-495 Exit 20	12.0	10.0	8.7	8.0	6.4	5.5	4.6	3.3	2.4	0	1.3	3.2	3.8	4.9	6.5	8.8	9.8	11.8	14.2
US 50 (John Hanson Hwy)	I-495 Exit 19	13.5	11.5	10.2	9.5	7.9	6.9	6.0	4.8	3.9	1.5	0	1.9	2.5	3.6	5.3	7.5	8.6	10.6	13.0
MD 202 (Landover Rd)	I-495 Exit 17	15.5	13.5	12.2	11.5	9.8	8.9	8.0	6.8	5.9	3.4	2.0	0	0.6	1.7	3.3	5.6	6.6	8.6	11.0
Arena Dr	I-495 Exit 16	16.1	14.1	12.8	12.1	10.5	9.6	8.7	7.4	6.5	4.1	2.6	0.7	0	1.1	2.7	4.9	6.0	8.0	10.4
MD 214 (Central Ave)	I-495 Exit 15	17.1	15.1	13.8	13.1	11.5	10.5	9.7	8.4	7.5	5.1	3.6	1.7	1.0	0	1.6	3.9	4.9	6.9	9.3
Ritchie-Marlboro Rd	I-495 Exit 13	18.7	16.7	15.4	14.7	13.1	12.1	11.2	10.0	9.1	6.7	5.2	3.2	2.6	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	I-495 Exit 11	21.0	19.1	17.7	17.0	15.4	14.5	13.6	12.3	11.4	9.0	7.5	5.6	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.2	20.2	18.9	18.2	16.6	15.6	14.8	13.5	12.6	10.2	8.7	6.7	6.1	5.1	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	24.1	22.1	20.8	20.1	18.5	17.5	16.6	15.4	14.5	12.1	10.6	8.6	8.0	7.0	5.4	3.1	1.9	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	27.0	25.0	23.7	23.0	21.4	20.4	19.5	18.3	17.4	15.0	13.5	11.5	10.9	9.9	8.3	6.0	4.8	2.9	0

Travel Time Matrix - Alternative 8 - ETL (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.8	4.8	6.0	6.9	7.4	6.6	7.3	12.9	11.9	11.2	9.8	9.3	8.1	N/A	8.7	9.1	10.5
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.9	3.9	5.2	6.0	6.5	5.7	6.5	12.0	11.0	10.4	9.0	8.5	7.2	N/A	7.8	8.2	9.7
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.9	0	1.0	2.0	3.2	4.1	4.5	3.8	4.5	10.1	9.1	8.4	7.0	6.5	5.3	N/A	5.9	6.2	7.7
MD 189 (Falls Rd)	I-270 Exit 5	3.6	2.8	0.9	0	1.1	2.3	3.1	3.6	2.8	3.6	9.1	8.1	7.5	6.1	5.6	4.3	N/A	4.9	5.3	6.8
Montrose Rd	I-270 Exit 4	5.1	4.2	2.4	1.5	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.4	5.0	4.5	3.3	N/A	3.9	4.2	5.7
Split	I-270	6.4	5.6	3.7	2.8	1.4	0	0.9	1.3	0.5	1.3	6.8	5.8	5.2	3.8	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	7.6	6.7	4.9	3.9	2.5	1.1	0	0.5	N/A	N/A	6.0	5.0	4.3	2.9	2.4	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	8.0	7.1	5.2	4.3	2.9	1.5	0.4	0	N/A	N/A	5.5	4.5	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.1	6.2	4.4	3.5	2.0	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.8	6.9	5.0	4.1	2.7	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	14.1	13.2	11.3	10.4	9.0	7.6	6.5	6.1	N/A	N/A	0	1.1	1.9	3.6	3.9	5.3	7.1	7.9	8.2	9.7
George Washington Memorial Pkwy	I-495 Exit 43	12.9	12.0	10.2	9.3	7.8	6.5	5.3	4.9	N/A	N/A	1.0	0	0.7	2.5	2.8	4.1	6.0	6.7	7.1	8.6
Clara Barton Pkwy	I-495 Exit 41	12.2	11.3	9.5	8.6	7.1	5.7	4.6	4.2	N/A	N/A	1.6	0.6	0	1.8	2.1	3.4	5.3	6.0	6.4	7.9
Cabin John Pkwy	I-495 Exit 40	10.4	9.6	7.7	6.8	5.3	4.0	2.8	2.4	N/A	N/A	3.0	2.0	1.4	0	0.3	1.6	3.5	4.3	4.6	6.1
MD 190 (River Rd)	I-495 Exit 39	10.1	9.3	7.4	6.5	5.0	3.7	2.5	2.2	N/A	N/A	3.5	2.5	1.9	0.5	0	1.3	3.2	4.0	4.3	5.8
I-270 West Spur	I-495 Exit 38	8.8	7.9	6.1	5.2	3.7	2.3	1.2	0.8	N/A	N/A	4.8	3.8	3.2	1.8	1.3	0	1.9	2.6	3.0	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.8	3.4	3.0	1.7	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	9.1	8.3	6.4	5.5	4.0	2.7	N/A	N/A	2.0	1.4	7.4	6.4	5.7	4.3	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.4	8.5	6.7	5.8	4.3	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.0	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.9	10.0	8.1	7.2	5.8	4.4	N/A	N/A	3.8	3.1	9.1	8.1	7.5	6.1	5.6	4.3	2.7	1.7	1.5	0
MD 97 (Georgia Ave)	I-495 Exit 31	13.1	12.3	10.4	9.5	8.0	6.7	N/A	N/A	6.0	5.4	11.4	10.4	9.8	8.4	7.9	6.6	4.9	4.0	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	14.0	13.1	11.3	10.4	8.9	7.5	N/A	N/A	6.9	6.2	12.3	11.3	10.6	9.2	8.7	7.5	5.8	4.9	4.6	3.1
MD 193 (University Blvd E)	I-495 Exit 29	15.3	14.4	12.5	11.6	10.2	8.8	N/A	N/A	8.2	7.5	13.5	12.5	11.9	10.5	10.0	8.7	7.1	6.2	5.9	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	17.3	16.4	14.5	13.6	12.2	10.8	N/A	N/A	10.2	9.5	15.5	14.5	13.9	12.5	12.0	10.7	9.1	8.2	7.9	6.4
I-95	I-495 Exit 27	18.2	17.3	15.5	14.6	13.1	11.8	N/A	N/A	11.1	10.4	16.5	15.5	14.8	13.4	12.9	11.7	10.0	9.1	8.8	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	19.2	18.3	16.4	15.5	14.1	12.7	N/A	N/A	12.1	11.4	17.4	16.4	15.8	14.4	13.9	12.6	10.9	10.0	9.8	8.3
Greenbelt Metro Station	I-495 Exit 24	20.0	19.2	17.3	16.4	14.9	13.6	N/A	N/A	12.9	12.3	18.3	17.3	16.6	15.2	14.8	13.5	11.8	10.9	10.6	9.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	21.2	20.4	18.5	17.6	16.1	14.8	N/A	N/A	14.1	13.5	19.5	18.5	17.9	16.5	16.0	14.7	13.0	12.1	11.8	10.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	22.1	21.3	19.4	18.5	17.0	15.7	N/A	N/A	15.1	14.4	20.4	19.4	18.8	17.4	16.9	15.6	13.9	13.0	12.8	11.3
MD 450 (Annapolis Rd)	I-495 Exit 20	24.5	23.7	21.8	20.9	19.4	18.1	N/A	N/A	17.5	16.8	22.8	21.8	21.2	19.8	19.3	18.0	16.3	15.4	15.1	13.7
US 50 (John Hanson Hwy)	I-495 Exit 19	26.0	25.1	23.2	22.3	20.9	19.5	N/A	N/A	18.9	18.2	24.2	23.2	22.6	21.2	20.7	19.4	17.8	16.9	16.6	15.1
MD 202 (Landover Rd)	I-495 Exit 17	27.9	27.1	25.2	24.3	22.9	21.5	N/A	N/A	20.9	20.2	26.2	25.2	24.6	23.2	22.7	21.4	19.7	18.8	18.6	17.1
Arena Dr	I-495 Exit 16	28.6	27.7	25.9	25.0	23.5	22.2	N/A	N/A	21.5	20.8	26.9	25.9	25.2	23.8	23.3	22.1	20.4	19.5	19.2	17.7
MD 214 (Central Ave)	I-495 Exit 15	29.6	28.7	26.9	26.0	24.5	23.1	N/A	N/A	22.5	21.8	27.9	26.8	26.2	24.8	24.3	23.0	21.4	20.5	20.2	18.7
Ritchie-Marlboro Rd	I-495 Exit 13	31.1	30.3	28.4	27.5	26.0	24.7	N/A	N/A	24.1	23.4	29.4	28.4	27.8	26.4	25.9	24.6	22.9	22.0	21.7	20.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.5	32.6	30.7	29.8	28.4	27.0	N/A	N/A	26.4	25.7	31.7	30.7	30.1	28.7	28.2	26.9	25.3	24.4	24.1	22.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.6	33.8	31.9	31.0	29.5	28.2	N/A	N/A	27.5	26.9	32.9	31.9	31.3	29.9	29.4	28.1	26.4	25.5	25.2	23.8
MD 5 (Branch Ave)	I-495 Exit 7	36.5	35.6	33.7	32.8	31.4	30.0	N/A	N/A	29.4	28.7	34.7	33.7	33.1	31.7	31.2	29.9	28.3	27.4	27.1	25.6
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.4	38.5	36.7	35.8	34.3	32.9	N/A	N/A	32.3	31.6	37.7	36.7	36.0	34.6	34.1	32.9	31.2	30.3	30.0	28.5

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	14.3	21.2	21.9	23.6	25.2	26.1	26.9	28.2	29.1	31.2	32.5	34.3	35.0	36.0	37.7	40.0	41.0	43.0	45.4
Shady Grove Rd	13.4	20.3	21.1	22.7	24.3	25.3	26.0	27.3	28.2	30.3	31.6	33.5	34.1	35.2	36.9	39.1	40.2	42.2	44.6
MD 28 (W Montgomery Ave)	11.4	18.4	19.1	20.8	22.4	23.3	24.1	25.4	26.3	28.4	29.7	31.5	32.1	33.2	34.9	37.1	38.2	40.2	42.6
MD 189 (Falls Rd)	10.5	17.4	18.2	19.8	21.4	22.4	23.1	24.5	25.3	27.4	28.7	30.6	31.2	32.3	34.0	36.2	37.3	39.3	41.7
Montrose Rd	9.4	16.4	17.1	18.8	20.4	21.3	22.1	23.4	24.3	26.4	27.7	29.5	30.1	31.2	32.9	35.1	36.2	38.2	40.6
Split	8.2	15.2	15.9	17.5	19.1	20.1	20.8	22.2	23.0	25.2	26.4	28.3	28.9	30.0	31.7	33.9	35.0	37.0	39.4
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	7.7	14.6	15.3	17.0	18.6	19.6	20.3	21.6	22.5	24.6	25.9	27.8	28.4	29.4	31.2	33.4	34.4	36.4	38.8
MD 187 (Old Georgetown Rd)	6.9	13.9	14.6	16.3	17.8	18.8	19.5	20.9	21.7	23.9	25.2	27.0	27.6	28.7	30.4	32.6	33.7	35.7	38.1
VA 193 (Georgetown Pike)	13.4	20.4	21.1	22.8	24.4	25.3	26.1	27.4	28.3	30.4	31.7	33.5	34.1	35.2	36.9	39.1	40.2	42.2	44.6
George Washington Memorial Pkwy	12.3	19.2	20.0	21.6	23.2	24.2	24.9	26.3	27.1	29.2	30.5	32.4	33.0	34.1	35.8	38.0	39.1	41.1	43.5
Clara Barton Pkwy	11.6	18.5	19.3	20.9	22.5	23.5	24.2	25.5	26.4	28.5	29.8	31.7	32.3	33.4	35.1	37.3	38.4	40.4	42.7
Cabin John Pkwy	9.8	16.8	17.5	19.1	20.7	21.7	22.4	23.8	24.6	26.8	28.0	29.9	30.5	31.6	33.3	35.5	36.6	38.6	41.0
MD 190 (River Rd)	9.5	16.5	17.2	18.8	20.4	21.4	22.1	23.5	24.3	26.5	27.7	29.6	30.2	31.3	33.0	35.2	36.3	38.3	40.7
I-270 West Spur	8.2	15.1	15.8	17.5	19.1	20.1	20.8	22.1	23.0	25.1	26.4	28.3	28.9	29.9	31.7	33.9	34.9	36.9	39.3
MD 187 (Old Georgetown Rd)	6.3	13.3	14.0	15.6	17.2	18.2	18.9	20.3	21.1	23.3	24.5	26.4	27.0	28.1	29.8	32.0	33.1	35.1	37.5
I-270 East Spur	5.6	12.5	13.2	14.9	16.5	17.4	18.2	19.5	20.4	22.5	23.8	25.6	26.3	27.3	29.0	31.2	32.3	34.3	36.7
MD 355 (Rockville Pike)	5.2	12.1	12.9	14.5	16.1	17.1	17.8	19.2	20.0	22.1	23.4	25.3	25.9	27.0	28.7	30.9	32.0	34.0	36.4
MD 185 (Connecticut Ave)	3.7	10.7	11.4	13.1	14.6	15.6	16.3	17.7	18.5	20.7	21.9	23.8	24.4	25.5	27.2	29.4	30.5	32.5	34.9
MD 97 (Georgia Ave)	0	6.9	7.7	9.3	10.9	11.9	12.6	14.0	14.8	16.9	18.2	20.1	20.7	21.8	23.5	25.7	26.8	28.8	31.2
US 29 (Colesville Rd)	1.4	0	0.7	2.4	4.0	4.9	5.7	7.0	7.9	10.0	11.3	13.1	13.7	14.8	16.5	18.7	19.8	21.8	24.2
MD 193 (University Blvd E)	2.7	0.7	0	1.6	3.2	4.2	4.9	6.3	7.1	9.3	10.5	12.4	13.0	14.1	15.8	18.0	19.1	21.1	23.5
MD 650 (New Hampshire Ave)	4.7	2.7	1.4	0	1.6	2.6	3.3	4.6	5.5	7.6	8.9	10.8	11.4	12.5	14.2	16.4	17.4	19.4	21.8
I-95	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.6	14.8	15.9	17.9	20.3
US 1 (Baltimore Ave)	6.6	4.6	3.3	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.8	14.9	16.9	19.3
Greenbelt Metro Station	7.4	5.4	4.1	3.4	1.8	0.9	0	1.4	2.2	4.3	5.6	7.5	8.1	9.2	10.9	13.1	14.2	16.2	18.6
MD 201 (Kenilworth Ave)	8.6	6.6	5.3	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.1	6.7	7.8	9.5	11.7	12.8	14.8	17.2
MD 295 (Baltimore-Washington Pkwy)	9.5	7.6	6.3	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	12.0	14.0	16.4
MD 450 (Annapolis Rd)	11.9	10.0	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.5	8.7	9.8	11.8	14.2
US 50 (John Hanson Hwy)	13.4	11.4	10.1	9.4	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.5	10.6	12.9
MD 202 (Landover Rd)	15.3	13.4	12.1	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.4	5.6	6.7	8.7	11.1
Arena Dr	16.0	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.0	6.1	8.1	10.5
MD 214 (Central Ave)	17.0	15.0	13.7	13.0	11.4	10.4	9.6	8.4	7.4	5.0	3.6	1.6	1.0	0	1.7	3.9	5.0	7.0	9.4
Ritchie-Marlboro Rd	18.5	16.6	15.3	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	20.9	18.9	17.6	16.9	15.3	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	22.0	20.0	18.7	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.7	6.7	6.0	5.0	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	23.9	21.9	20.6	19.9	18.3	17.3	16.5	15.2	14.3	11.9	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	2.4
MD 414 (St Barnabas Rd)	26.8	24.8	23.5	22.8	21.2	20.2	19.4	18.2	17.3	14.9	13.4	11.5	10.8	9.8	8.3	5.9	4.8	2.9	0

Travel Time Matrix - Alternative 9 - ETL (PM Peak)

Unit: Minute

From	To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.8	6.0	6.9	7.3	6.5	7.3	12.9	11.8	11.2	9.8	9.3	8.0	N/A	8.6	9.0	10.5
Shady Grove Rd	I-270 Exit 8	1.5	0	1.9	2.9	3.9	5.1	6.0	6.4	5.7	6.4	12.0	11.0	10.3	8.9	8.4	7.1	N/A	7.8	8.1	9.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	3.5	1.9	0	0.9	2.0	3.2	4.1	4.5	3.8	4.5	10.1	9.1	8.4	7.0	6.5	5.2	N/A	5.9	6.2	7.7
MD 189 (Falls Rd)	I-270 Exit 5	4.3	2.8	0.8	0	1.0	2.3	3.1	3.6	2.8	3.6	9.1	8.1	7.5	6.1	5.6	4.3	N/A	4.9	5.3	6.7
Montrose Rd	I-270 Exit 4	5.6	4.1	2.2	1.3	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.4	5.0	4.5	3.2	N/A	3.9	4.2	5.7
Split	I-270	6.9	5.4	3.5	2.6	1.3	0	0.9	1.3	0.5	1.3	6.9	5.9	5.2	3.8	3.3	2.0	N/A	2.7	3.0	4.5
Westlake Terrace	I-270 W Spur	7.8	6.3	4.3	3.5	2.2	0.9	0	0.4	N/A	N/A	6.0	5.0	4.4	2.9	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	8.2	6.7	4.7	3.9	2.6	1.3	0.4	0	N/A	N/A	5.6	4.5	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.6	6.0	4.1	3.3	1.9	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	8.2	6.7	4.8	3.9	2.6	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	14.1	12.5	10.6	9.8	8.5	7.1	6.3	5.9	N/A	N/A	0	1.1	1.9	3.5	3.8	5.1	7.0	7.7	8.1	9.5
George Washington Memorial Pkwy	I-495 Exit 43	12.9	11.4	9.5	8.6	7.3	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.4	2.7	4.0	5.8	6.6	6.9	8.4
Clara Barton Pkwy	I-495 Exit 41	12.2	10.7	8.8	7.9	6.6	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.7	1.9	3.3	5.1	5.8	6.2	7.7
Cabin John Pkwy	I-495 Exit 40	10.6	9.0	7.1	6.3	5.0	3.6	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.4	4.2	4.5	6.0
MD 190 (River Rd)	I-495 Exit 39	10.3	8.7	6.8	6.0	4.7	3.3	2.5	2.1	N/A	N/A	3.6	2.5	1.9	0.5	0	1.3	3.1	3.9	4.3	5.7
I-270 West Spur	I-495 Exit 38	9.0	7.4	5.5	4.7	3.4	2.0	1.2	0.8	N/A	N/A	4.9	3.8	3.2	1.8	1.3	0	1.8	2.6	2.9	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	3.0	1.7	0	0.7	1.1	2.6
I-270 East Spur	I-495 Exit 35	9.5	8.0	6.1	5.2	3.9	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.8	4.4	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.8	8.3	6.4	5.5	4.2	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.0	4.6	4.2	2.9	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	11.2	9.7	7.7	6.9	5.6	4.3	N/A	N/A	3.6	3.0	9.1	8.1	7.4	6.0	5.5	4.2	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	13.5	11.9	10.0	9.2	7.9	6.5	N/A	N/A	5.9	5.2	11.4	10.3	9.7	8.3	7.8	6.5	4.8	3.9	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	14.4	12.8	10.9	10.1	8.7	7.4	N/A	N/A	6.8	6.1	12.3	11.2	10.6	9.2	8.7	7.4	5.7	4.8	4.5	3.2
MD 193 (University Blvd E)	I-495 Exit 29	15.8	14.3	12.4	11.5	10.2	8.9	N/A	N/A	8.3	7.6	13.7	12.7	12.1	10.7	10.2	8.9	7.2	6.3	6.0	4.6
MD 650 (New Hampshire Ave)	I-495 Exit 28	17.7	16.1	14.2	13.4	12.0	10.7	N/A	N/A	10.1	9.4	15.6	14.5	13.9	12.5	12.0	10.7	9.0	8.1	7.8	6.5
I-95	I-495 Exit 27	18.8	17.2	15.3	14.5	13.2	11.8	N/A	N/A	11.2	10.5	16.7	15.7	15.0	13.6	13.1	11.8	10.1	9.2	9.0	7.6
US 1 (Baltimore Ave)	I-495 Exit 25	19.7	18.2	16.3	15.4	14.1	12.8	N/A	N/A	12.2	11.5	17.6	16.6	16.0	14.6	14.1	12.8	11.1	10.2	9.9	8.5
Greenbelt Metro Station	I-495 Exit 24	20.6	19.1	17.1	16.3	15.0	13.7	N/A	N/A	13.0	12.4	18.5	17.5	16.8	15.4	14.9	13.6	12.0	11.1	10.8	9.4
MD 201 (Kenilworth Ave)	I-495 Exit 23	21.8	20.3	18.3	17.5	16.2	14.9	N/A	N/A	14.2	13.6	19.7	18.7	18.0	16.6	16.1	14.8	13.2	12.3	12.0	10.6
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	22.7	21.2	19.3	18.4	17.1	15.8	N/A	N/A	15.2	14.5	20.6	19.6	19.0	17.5	17.1	15.8	14.1	13.2	12.9	11.5
MD 450 (Annapolis Rd)	I-495 Exit 20	25.1	23.6	21.7	20.8	19.5	18.2	N/A	N/A	17.5	16.9	23.0	22.0	21.3	19.9	19.4	18.1	16.5	15.6	15.3	13.9
US 50 (John Hanson Hwy)	I-495 Exit 19	26.5	25.0	23.1	22.3	20.9	19.6	N/A	N/A	19.0	18.3	24.4	23.4	22.8	21.4	20.9	19.6	17.9	17.0	16.7	15.3
MD 202 (Landover Rd)	I-495 Exit 17	28.5	27.0	25.1	24.2	22.9	21.6	N/A	N/A	21.0	20.3	26.4	25.4	24.8	23.3	22.9	21.6	19.9	19.0	18.7	17.3
Arena Dr	I-495 Exit 16	29.2	27.6	25.7	24.9	23.6	22.2	N/A	N/A	21.6	21.0	27.1	26.1	25.4	24.0	23.5	22.2	20.5	19.6	19.4	18.0
MD 214 (Central Ave)	I-495 Exit 15	30.2	28.6	26.7	25.9	24.5	23.2	N/A	N/A	22.6	21.9	28.1	27.0	26.4	25.0	24.5	23.2	21.5	20.6	20.3	19.0
Ritchie-Marlboro Rd	I-495 Exit 13	31.7	30.2	28.3	27.4	26.1	24.8	N/A	N/A	24.2	23.5	29.6	28.6	28.0	26.5	26.1	24.8	23.1	22.2	21.9	20.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	34.1	32.5	30.6	29.8	28.4	27.1	N/A	N/A	26.5	25.8	31.9	30.9	30.3	28.9	28.4	27.1	25.4	24.5	24.2	22.8
MD 337 (Suitland Pkwy)	I-495 Exit 9	35.2	33.7	31.8	30.9	29.6	28.3	N/A	N/A	27.7	27.0	33.1	32.1	31.4	30.0	29.6	28.3	26.6	25.7	25.4	24.0
MD 5 (Branch Ave)	I-495 Exit 7	37.1	35.5	33.6	32.8	31.4	30.1	N/A	N/A	29.5	28.8	35.0	33.9	33.3	31.9	31.4	30.1	28.4	27.5	27.2	25.9
MD 414 (St Barnabas Rd)	I-495 Exit 4	40.0	38.4	36.5	35.7	34.4	33.0	N/A	N/A	32.4	31.8	37.9	36.9	36.2	34.8	34.3	33.0	31.3	30.4	30.2	28.8

Unit: Minute

From	To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	12.6	17.7	18.4	20.2	22.8	23.8	24.6	25.9	26.8	28.9	30.2	32.0	32.6	33.7	35.4	37.7	38.7	40.7	43.1
Shady Grove Rd	I-270 Exit 8	11.7	16.9	17.6	19.3	22.0	23.0	23.7	25.0	25.9	28.0	29.3	31.2	31.8	32.9	34.6	36.8	37.9	39.9	42.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	9.8	15.0	15.7	17.4	20.1	21.0	21.8	23.1	24.0	26.1	27.4	29.2	29.9	30.9	32.7	34.9	36.0	38.0	40.4
MD 189 (Falls Rd)	I-270 Exit 5	8.9	14.0	14.7	16.5	19.1	20.1	20.8	22.2	23.0	25.2	26.4	28.3	28.9	30.0	31.7	33.9	35.0	37.0	39.4
Montrose Rd	I-270 Exit 4	7.8	13.0	13.7	15.4	18.1	19.1	19.8	21.1	22.0	24.1	25.4	27.3	27.9	28.9	30.7	32.9	34.0	36.0	38.4
Split	I-270	6.6	11.7	12.5	14.2	16.9	17.8	18.6	19.9	20.8	22.9	24.2	26.0	26.7	27.7	29.5	31.7	32.7	34.8	37.2
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.0	11.2	11.9	13.7	16.3	17.3	18.0	19.4	20.2	22.4	23.6	25.5	26.1	27.2	28.9	31.1	32.2	34.2	36.6
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	5.3	10.5	11.2	12.9	15.6	16.5	17.3	18.6	19.5	21.6	22.9	24.8	25.4	26.4	28.2	30.4	31.5	33.5	35.9
VA 193 (Georgetown Pike)	I-495 Exit 44	11.6	16.8	17.5	19.3	21.9	22.9	23.6	25.0	25.8	28.0	29.2	31.1	31.7	32.8	34.5	36.7	37.8	39.8	42.2
George Washington Memorial Pkwy	I-495 Exit 43	10.5	15.6	16.4	18.1	20.8	21.7	22.5	23.8	24.7	26.8	28.1	29.9	30.6	31.6	33.4	35.6	36.6	38.7	41.1
Clara Barton Pkwy	I-495 Exit 41	9.8	14.9	15.6	17.4	20.0	21.0	21.7	23.1	24.0	26.1	27.4	29.2	29.8	30.9	32.6	34.9	35.9	37.9	40.3
Cabin John Pkwy	I-495 Exit 40	8.1	13.3	14.0	15.7	18.4	19.4	20.1	21.4	22.3	24.4	25.7	27.6	28.2	29.3	31.0	33.2	34.3	36.3	38.7
MD 190 (River Rd)	I-495 Exit 39	7.8	13.0	13.7	15.4	18.1	19.1	19.8	21.2	22.0	24.1	25.4	27.3	27.9	29.0	30.7	32.9	34.0	36.0	38.4
I-270 West Spur	I-495 Exit 38	6.5	11.7	12.4	14.1	16.8	17.8	18.5	19.9	20.7	22.8	24.1	26.0	26.6	27.7	29.4	31.6	32.7	34.7	37.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	4.7	9.8	10.5	12.3	14.9	15.9	16.7	18.0	18.9	21.0	22.3	24.1	24.7	25.8	27.5	29.8	30.8	32.8	35.2
I-270 East Spur	I-495 Exit 35	3.9	9.1	9.8	11.6	14.2	15.2	15.9	17.3	18.1	20.2	21.5	23.4	24.0	25.1	26.8	29.0	30.1	32.1	34.5
MD 355 (Rockville Pike)	I-495 Exit 34	3.6	8.7	9.4	11.2	13.8	14.8	15.6	16.9	17.8	19.9	21.2	23.0	23.6	24.7	26.4	28.7	29.7	31.7	34.1
MD 185 (Connecticut Ave)	I-495 Exit 33	2.1	7.3	8.0	9.7	12.4	13.4	14.1	15.4	16.3	18.4	19.7	21.6	22.2	23.3	25.0	27.2	28.3	30.3	32.7
MD 97 (Georgia Ave)	I-495 Exit 31	0	5.2	5.9	7.6	10.3	11.2	12.0	13.3	14.2	16.3	17.6	19.4	20.1	21.1	22.9	25.1	26.2	28.2	30.6
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.5	5.1	6.1	6.8	8.2	9.0	11.2	12.4	14.3	14.9	16.0	17.7	19.9	21.0	23.0	25.4
MD 193 (University Blvd E)	I-495 Exit 29	2.9	0.9	0	1.7	4.4	5.4	6.1	7.5	8.3	10.4	11.7	13.6	14.2	15.3	17.0	19.2	20.3	22.3	24.7
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	2.7	3.6	4.4	5.7	6.6	8.7	10.0	11.8	12.4	13.5	15.3	17.5	18.5	20.6	23.0
I-95	I-495 Exit 27	5.8	3.9	2.5	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.6	14.8	15.9	17.9	20.3
US 1 (Baltimore Ave)	I-495 Exit 25	6.8	4.8	3.5	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.8	14.9	16.9	19.3
Greenbelt Metro Station	I-495 Exit 24	7.7	5.7	4.3	3.4	1.8	0.9	0	1.4	2.2	4.3	5.6	7.5	8.1	9.2	10.9	13.1	14.2	16.2	18.6
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.9	6.9	5.5	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.1	6.7	7.8	9.5	11.8	12.8	14.8	17.2
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.8	7.8	6.4	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	12.0	14.0	16.4
MD 450 (Annapolis Rd)	I-495 Exit 20	12.2	10.2	8.8	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.6	8.8	9.8	11.9	14.3
US 50 (John Hanson Hwy)	I-495 Exit 19	13.6	11.6	10.3	9.4	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.3	7.5	8.6	10.6	13.0
MD 202 (Landover Rd)	I-495 Exit 17	15.6	13.6	12.2	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.4	5.6	6.7	8.7	11.1
Arena Dr	I-495 Exit 16	16.2	14.3	12.9	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.0	6.1	8.1	10.5
MD 214 (Central Ave)	I-495 Exit 15	17.2	15.2	13.9	13.0	11.4	10.4	9.6	8.4	7.4	5.1	3.6	1.6	1.0	0	1.7	3.9	5.0	7.0	9.4
Ritchie-Marlboro Rd	I-495 Exit 13	18.8	16.8	15.4	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	I-495 Exit 11	21.1	19.1	17.8	16.9	15.3	14.3	13.5	12.2	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.3	20.3	18.9	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.7	6.7	6.0	5.1	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	24.1	22.1	20.8	19.9	18.3	17.3	16.5	15.3	14.3	12.0	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	27.0	25.1	23.7	22.8	21.2	20.2	19.4	18.2	17.3	14.9	13.4	11.5	10.8	9.8	8.3	5.9	4.8	2.9	0

Travel Time Matrix - Alternative 10 - ETL (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	2.8	3.7	4.7	6.0	6.8	7.3	6.5	7.2	12.8	11.8	11.2	9.8	9.3	8.0	N/A	8.6	9.0	10.4
Shady Grove Rd	I-270 Exit 8	0.9	0	1.9	2.8	3.9	5.1	6.0	6.4	5.6	6.4	12.0	11.0	10.3	8.9	8.4	7.1	N/A	7.7	8.1	9.6
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.9	0	0.9	2.0	3.2	4.1	4.5	3.7	4.5	10.1	9.1	8.4	7.0	6.5	5.2	N/A	5.8	6.2	7.7
MD 189 (Falls Rd)	I-270 Exit 5	3.6	2.7	0.8	0	1.0	2.3	3.1	3.6	2.8	3.5	9.1	8.1	7.5	6.1	5.6	4.3	N/A	4.9	5.3	6.7
Montrose Rd	I-270 Exit 4	4.9	4.0	2.2	1.3	0	1.2	2.1	2.5	1.8	2.5	8.1	7.1	6.4	5.0	4.5	3.2	N/A	3.9	4.2	5.7
Split	I-270	6.2	5.4	3.5	2.7	1.3	0	0.9	1.3	0.5	1.3	6.9	5.9	5.2	3.8	3.3	2.0	N/A	2.6	3.0	4.5
Westlake Terrace	I-270 W Spur	7.1	6.2	4.4	3.5	2.2	0.9	0	0.4	N/A	N/A	6.0	5.0	4.4	2.9	2.5	1.2	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.5	6.6	4.7	3.9	2.6	1.3	0.4	0	N/A	N/A	5.6	4.6	3.9	2.5	2.0	0.7	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.8	6.0	4.1	3.3	2.0	0.6	N/A	N/A	0	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	2.5	3.9
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.5	6.7	4.8	3.9	2.6	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	1.7	3.2
VA 193 (Georgetown Pike)	I-495 Exit 44	13.4	12.5	10.6	9.8	8.5	7.1	6.3	5.9	N/A	N/A	0	1.2	1.9	3.5	3.8	5.1	6.9	7.7	8.1	9.5
George Washington Memorial Pkwy	I-495 Exit 43	12.2	11.3	9.5	8.6	7.3	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.3	2.6	3.9	5.8	6.5	6.9	8.4
Clara Barton Pkwy	I-495 Exit 41	11.5	10.6	8.7	7.9	6.6	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.1	5.8	6.2	7.7
Cabin John Pkwy	I-495 Exit 40	9.9	9.0	7.1	6.3	5.0	3.6	2.8	2.4	N/A	N/A	3.1	2.1	1.4	0	0.3	1.6	3.5	4.2	4.6	6.0
MD 190 (River Rd)	I-495 Exit 39	9.6	8.7	6.8	6.0	4.7	3.3	2.5	2.1	N/A	N/A	3.6	2.5	1.9	0.5	0	1.3	3.2	3.9	4.3	5.7
I-270 West Spur	I-495 Exit 38	8.3	7.4	5.5	4.7	3.4	2.0	1.2	0.8	N/A	N/A	4.9	3.8	3.2	1.8	1.3	0	1.9	2.6	3.0	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	3.0	1.7	0	0.7	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.8	8.0	6.1	5.2	3.9	2.6	N/A	N/A	2.0	1.3	7.5	6.4	5.8	4.4	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	9.1	8.2	6.4	5.5	4.2	2.9	N/A	N/A	2.2	1.6	7.7	6.7	6.1	4.7	4.2	2.9	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.5	9.6	7.8	6.9	5.6	4.3	N/A	N/A	3.6	3.0	9.1	8.1	7.5	6.1	5.6	4.3	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.8	11.9	10.0	9.2	7.9	6.5	N/A	N/A	5.9	5.2	11.4	10.4	9.7	8.3	7.8	6.5	4.8	3.9	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	13.6	12.8	10.9	10.1	8.7	7.4	N/A	N/A	6.8	6.1	12.3	11.3	10.6	9.2	8.7	7.4	5.7	4.8	4.5	3.2
MD 193 (University Blvd E)	I-495 Exit 29	15.2	14.4	12.5	11.7	10.4	9.0	N/A	N/A	8.4	7.7	13.9	12.9	12.2	10.8	10.3	9.0	7.3	6.4	6.2	4.8
MD 650 (New Hampshire Ave)	I-495 Exit 28	17.0	16.1	14.2	13.4	12.1	10.7	N/A	N/A	10.1	9.4	15.6	14.6	13.9	12.5	12.0	10.7	9.0	8.1	7.9	6.5
I-95	I-495 Exit 27	18.2	17.3	15.5	14.6	13.3	12.0	N/A	N/A	11.3	10.7	16.8	15.8	15.2	13.7	13.3	12.0	10.3	9.4	9.1	7.7
US 1 (Baltimore Ave)	I-495 Exit 25	19.1	18.3	16.4	15.6	14.2	12.9	N/A	N/A	12.3	11.6	17.8	16.8	16.1	14.7	14.2	12.9	11.2	10.3	10.1	8.7
Greenbelt Metro Station	I-495 Exit 24	20.0	19.2	17.3	16.4	15.1	13.8	N/A	N/A	13.2	12.5	18.6	17.6	17.0	15.6	15.1	13.8	12.1	11.2	10.9	9.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	21.2	20.4	18.5	17.6	16.3	15.0	N/A	N/A	14.4	13.7	19.8	18.8	18.2	16.8	16.3	15.0	13.3	12.4	12.1	10.7
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	22.1	21.3	19.4	18.6	17.2	15.9	N/A	N/A	15.3	14.6	20.8	19.7	19.1	17.7	17.2	15.9	14.2	13.3	13.0	11.6
MD 450 (Annapolis Rd)	I-495 Exit 20	24.5	23.7	21.8	21.0	19.6	18.3	N/A	N/A	17.7	17.0	23.2	22.1	21.5	20.1	19.6	18.3	16.6	15.7	15.4	14.0
US 50 (John Hanson Hwy)	I-495 Exit 19	26.0	25.1	23.2	22.4	21.1	19.7	N/A	N/A	19.1	18.5	24.6	23.6	22.9	21.5	21.0	19.7	18.1	17.1	16.9	15.5
MD 202 (Landover Rd)	I-495 Exit 17	27.9	27.1	25.2	24.4	23.0	21.7	N/A	N/A	21.1	20.4	26.6	25.6	24.9	23.5	23.0	21.7	20.0	19.1	18.8	17.4
Arena Dr	I-495 Exit 16	28.6	27.7	25.9	25.0	23.7	22.4	N/A	N/A	21.7	21.1	27.2	26.2	25.6	24.2	23.7	22.4	20.7	19.8	19.5	18.1
MD 214 (Central Ave)	I-495 Exit 15	29.6	28.7	26.8	26.0	24.7	23.4	N/A	N/A	22.7	22.1	28.2	27.2	26.6	25.1	24.7	23.3	21.7	20.8	20.5	19.1
Ritchie-Marlboro Rd	I-495 Exit 13	31.1	30.3	28.4	27.6	26.2	24.9	N/A	N/A	24.3	23.6	29.8	28.8	28.1	26.7	26.2	24.9	23.2	22.3	22.0	20.6
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.5	32.6	30.7	29.9	28.6	27.2	N/A	N/A	26.6	26.0	32.1	31.1	30.4	29.0	28.5	27.2	25.6	24.6	24.4	23.0
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.6	33.8	31.9	31.1	29.7	28.4	N/A	N/A	27.8	27.1	33.3	32.2	31.6	30.2	29.7	28.4	26.7	25.8	25.5	24.1
MD 5 (Branch Ave)	I-495 Exit 7	36.5	35.6	33.7	32.9	31.6	30.2	N/A	N/A	29.6	29.0	35.1	34.1	33.4	32.0	31.5	30.2	28.6	27.7	27.4	26.0
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.4	38.5	36.7	35.8	34.5	33.2	N/A	N/A	32.5	31.9	38.0	37.0	36.4	35.0	34.5	33.2	31.5	30.6	30.3	28.9

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	14.2	22.2	22.9	25.7	29.9	30.8	31.6	32.9	33.8	35.9	37.2	39.1	39.7	40.7	42.4	44.6	45.7	47.7	50.1
Shady Grove Rd	I-270 Exit 8	13.3	21.3	22.0	24.9	29.0	30.0	30.7	32.1	32.9	35.1	36.3	38.2	38.8	39.9	41.6	43.8	44.9	46.9	49.3
MD 28 (W Montgomery Ave)	I-270 Exit 6	11.4	19.4	20.1	23.0	27.1	28.1	28.8	30.2	31.0	33.2	34.4	36.3	36.9	38.0	39.7	41.9	43.0	45.0	47.4
MD 189 (Falls Rd)	I-270 Exit 5	10.5	18.5	19.2	22.0	26.2	27.1	27.9	29.2	30.1	32.2	33.5	35.4	36.0	37.0	38.7	40.9	42.0	44.0	46.4
Montrose Rd	I-270 Exit 4	9.4	17.4	18.1	21.0	25.1	26.1	26.8	28.2	29.0	31.2	32.5	34.3	34.9	36.0	37.7	39.9	41.0	43.0	45.4
Split	I-270	8.2	16.2	16.9	19.8	23.9	24.9	25.6	27.0	27.8	30.0	31.2	33.1	33.7	34.8	36.5	38.7	39.8	41.8	44.2
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	7.7	15.7	16.4	19.2	23.4	24.4	25.1	26.4	27.3	29.4	30.7	32.6	33.2	34.2	35.9	38.2	39.2	41.2	43.6
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	6.9	15.0	15.6	18.5	22.6	23.6	24.3	25.7	26.6	28.7	30.0	31.8	32.4	33.5	35.2	37.4	38.5	40.5	42.9
VA 193 (Georgetown Pike)	I-495 Exit 44	13.3	21.3	22.0	24.8	29.0	29.9	30.7	32.0	32.9	35.0	36.3	38.2	38.8	39.8	41.5	43.7	44.8	46.8	49.2
George Washington Memorial Pkwy	I-495 Exit 43	12.1	20.1	20.8	23.7	27.8	28.8	29.5	30.9	31.7	33.9	35.1	37.0	37.6	38.7	40.4	42.6	43.7	45.7	48.1
Clara Barton Pkwy	I-495 Exit 41	11.4	19.4	20.1	23.0	27.1	28.1	28.8	30.2	31.0	33.2	34.4	36.3	36.9	38.0	39.7	41.9	43.0	45.0	47.4
Cabin John Pkwy	I-495 Exit 40	9.8	17.8	18.5	21.3	25.5	26.5	27.2	28.5	29.4	31.5	32.8	34.7	35.3	36.4	38.0	40.3	41.3	43.3	45.7
MD 190 (River Rd)	I-495 Exit 39	9.5	17.5	18.2	21.0	25.2	26.2	26.9	28.2	29.1	31.2	32.5	34.4	35.0	36.1	37.7	40.0	41.0	43.0	45.4
I-270 West Spur	I-495 Exit 38	8.2	16.2	16.9	19.7	23.9	24.9	25.6	26.9	27.8	29.9	31.2	33.1	33.7	34.8	36.4	38.7	39.7	41.7	44.1
MD 187 (Old Georgetown Rd)	I-495 Exit 36	6.3	14.3	15.0	17.9	22.0	23.0	23.7	25.1	25.9	28.1	29.3	31.2	31.8	32.9	34.6	36.8	37.9	39.9	42.3
I-270 East Spur	I-495 Exit 35	5.6	13.6	14.3	17.1	21.3	22.3	23.0	24.3	25.2	27.3	28.6	30.5	31.1	32.2	33.8	36.1	37.1	39.1	41.5
MD 355 (Rockville Pike)	I-495 Exit 34	5.2	13.2	13.9	16.8	20.9	21.9	22.6	24.0	24.8	27.0	28.2	30.1	30.7	31.8	33.5	35.7	36.8	38.8	41.2
MD 185 (Connecticut Ave)	I-495 Exit 33	3.8	11.8	12.5	15.3	19.5	20.4	21.2	22.5	23.4	25.5	26.8	28.6	29.3	30.3	32.0	34.2	35.3	37.3	39.7
MD 97 (Georgia Ave)	I-495 Exit 31	0	8.0	8.7	11.6	15.7	16.7	17.4	18.8	19.6	21.7	23.0	24.9	25.5	26.6	28.3	30.5	31.5	33.5	35.9
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	3.5	7.7	8.7	9.4	10.7	11.6	13.7	15.0	16.9	17.5	18.6	20.3	22.5	23.5	25.5	27.9
MD 193 (University Blvd E)	I-495 Exit 29	3.0	1.0	0	2.8	7.0	8.0	8.7	10.0	10.9	13.0	14.3	16.2	16.8	17.9	19.6	21.8	22.8	24.8	27.2
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.8	1.4	0	4.1	5.1	5.8	7.2	8.1	10.2	11.5	13.3	13.9	15.0	16.7	18.9	20.0	22.0	24.4
I-95	I-495 Exit 27	6.0	4.0	2.6	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.6	14.8	15.8	17.9	20.3
US 1 (Baltimore Ave)	I-495 Exit 25	6.9	4.9	3.6	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.6	13.8	14.9	16.9	19.3
Greenbelt Metro Station	I-495 Exit 24	7.8	5.8	4.4	3.4	1.8	0.9	0	1.4	2.2	4.3	5.6	7.5	8.1	9.2	10.9	13.1	14.1	16.1	18.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	9.0	7.0	5.6	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.1	6.7	7.8	9.5	11.7	12.8	14.8	17.2
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.9	7.9	6.6	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.7	10.9	11.9	13.9	16.3
MD 450 (Annapolis Rd)	I-495 Exit 20	12.3	10.3	9.0	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.5	8.7	9.8	11.8	14.2
US 50 (John Hanson Hwy)	I-495 Exit 19	13.7	11.8	10.4	9.4	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.2	7.5	8.5	10.5	12.9
MD 202 (Landover Rd)	I-495 Exit 17	15.7	13.7	12.4	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.4	5.6	6.7	8.7	11.1
Arena Dr	I-495 Exit 16	16.4	14.4	13.0	12.0	10.4	9.5	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.8	5.0	6.0	8.1	10.5
MD 214 (Central Ave)	I-495 Exit 15	17.4	15.4	14.0	13.0	11.4	10.4	9.6	8.4	7.5	5.1	3.6	1.6	1.0	0	1.7	3.9	5.0	7.0	9.4
Ritchie-Marlboro Rd	I-495 Exit 13	18.9	16.9	15.6	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	I-495 Exit 11	21.2	19.3	17.9	16.9	15.3	14.3	13.5	12.3	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.4	20.4	19.1	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.7	6.7	6.0	5.0	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	24.2	22.3	20.9	19.9	18.3	17.3	16.5	15.3	14.3	11.9	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	27.2	25.2	23.8	22.8	21.2	20.2	19.4	18.2	17.3	14.9	13.4	11.5	10.8	9.8	8.3	5.9	4.8	2.9	0

Travel Time Matrix - Alternative 13B - ETL (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	0.9	3.1	5.5	11.8	24.9	25.7	26.2	30.7	39.3	31.8	30.8	30.2	28.8	28.3	27.0	N/A	50.1	50.5	52.0
Shady Grove Rd	I-270 Exit 8	2.9	0	2.2	4.6	10.9	24.0	24.8	25.3	29.7	38.4	30.9	29.9	29.3	27.9	27.4	26.1	N/A	49.2	49.6	51.1
MD 28 (W Montgomery Ave)	I-270 Exit 6	4.8	1.9	0	2.4	8.7	21.8	22.6	23.1	27.6	36.2	28.7	27.7	27.1	25.7	25.2	23.9	N/A	47.0	47.4	48.9
MD 189 (Falls Rd)	I-270 Exit 5	5.7	2.8	0.8	0	6.3	19.4	20.2	20.7	25.2	33.9	26.3	25.3	24.7	23.3	22.8	21.5	N/A	44.7	45.0	46.5
Montrose Rd	I-270 Exit 4	6.9	4.0	2.1	1.3	0	13.1	13.9	14.4	18.9	27.6	20.0	19.0	18.4	17.0	16.5	15.2	N/A	38.3	38.7	40.2
Split	I-270	8.2	5.3	3.3	2.5	1.3	0	0.8	1.3	5.7	14.4	6.9	5.9	5.2	3.8	3.4	2.1	N/A	25.2	25.6	27.0
Westlake Terrace	I-270 W Spur	9.0	6.1	4.2	3.4	2.1	0.9	0	0.5	N/A	N/A	6.1	5.1	4.4	3.0	2.6	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	9.4	6.5	4.6	3.8	2.5	1.3	0.4	0	N/A	N/A	5.6	4.6	4.0	2.6	2.1	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	8.8	5.9	4.0	3.1	1.9	0.6	N/A	N/A	0	8.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19.5	19.8	21.3
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	9.5	6.6	4.6	3.8	2.6	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.8	11.1	12.6
VA 193 (Georgetown Pike)	I-495 Exit 44	15.3	12.5	10.5	9.7	8.4	7.2	6.3	5.9	N/A	N/A	0	1.2	1.9	3.5	3.8	5.1	7.0	7.7	8.1	9.6
George Washington Memorial Pkwy	I-495 Exit 43	14.2	11.3	9.4	8.5	7.3	6.0	5.1	4.8	N/A	N/A	1.0	0	0.7	2.3	2.6	4.0	5.8	6.6	6.9	8.4
Clara Barton Pkwy	I-495 Exit 41	13.5	10.6	8.6	7.8	6.6	5.3	4.4	4.0	N/A	N/A	1.6	0.6	0	1.6	1.9	3.3	5.1	5.9	6.2	7.7
Cabin John Pkwy	I-495 Exit 40	11.8	8.9	7.0	6.2	4.9	3.7	2.8	2.4	N/A	N/A	3.0	2.0	1.4	0	0.3	1.6	3.5	4.2	4.6	6.0
MD 190 (River Rd)	I-495 Exit 39	11.5	8.6	6.7	5.9	4.6	3.4	2.5	2.1	N/A	N/A	3.5	2.5	1.9	0.5	0	1.3	3.2	3.9	4.3	5.8
I-270 West Spur	I-495 Exit 38	10.2	7.3	5.4	4.5	3.3	2.0	1.2	0.8	N/A	N/A	4.8	3.8	3.2	1.8	1.3	0	1.9	2.6	3.0	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.8	3.4	3.0	1.7	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	10.8	7.9	6.0	5.1	3.9	2.6	N/A	N/A	2.0	1.3	7.4	6.4	5.7	4.3	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	11.1	8.2	6.2	5.4	4.2	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.0	4.6	4.1	2.8	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	12.5	9.6	7.7	6.8	5.6	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.4	6.0	5.6	4.3	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	14.8	11.9	9.9	9.1	7.8	6.6	N/A	N/A	6.0	5.3	11.3	10.3	9.7	8.3	7.8	6.5	4.9	4.0	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	15.6	12.7	10.8	10.0	8.7	7.4	N/A	N/A	6.8	6.1	12.2	11.2	10.6	9.2	8.7	7.4	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	16.9	14.1	12.1	11.3	10.0	8.8	N/A	N/A	8.1	7.5	13.5	12.5	11.9	10.5	10.0	8.7	7.0	6.1	5.9	4.4
MD 650 (New Hampshire Ave)	I-495 Exit 28	18.9	16.0	14.1	13.2	12.0	10.7	N/A	N/A	10.1	9.4	15.5	14.5	13.8	12.4	12.0	10.7	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	19.9	17.0	15.0	14.2	12.9	11.7	N/A	N/A	11.0	10.4	16.4	15.4	14.8	13.4	12.9	11.6	10.0	9.0	8.8	7.3
US 1 (Baltimore Ave)	I-495 Exit 25	20.8	17.9	16.0	15.1	13.9	12.6	N/A	N/A	12.0	11.3	17.4	16.4	15.7	14.3	13.9	12.6	10.9	10.0	9.7	8.3
Greenbelt Metro Station	I-495 Exit 24	21.7	18.8	16.8	16.0	14.8	13.5	N/A	N/A	12.9	12.2	18.3	17.2	16.6	15.2	14.7	13.4	11.8	10.9	10.6	9.2
MD 201 (Kenilworth Ave)	I-495 Exit 23	22.9	20.0	18.0	17.2	16.0	14.7	N/A	N/A	14.1	13.4	19.5	18.5	17.8	16.4	15.9	14.6	13.0	12.1	11.8	10.4
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	23.8	20.9	19.0	18.1	16.9	15.6	N/A	N/A	15.0	14.3	20.4	19.4	18.7	17.3	16.8	15.6	13.9	13.0	12.7	11.3
MD 450 (Annapolis Rd)	I-495 Exit 20	26.2	23.3	21.4	20.5	19.3	18.0	N/A	N/A	17.4	16.7	22.8	21.8	21.1	19.7	19.2	18.0	16.3	15.4	15.1	13.7
US 50 (John Hanson Hwy)	I-495 Exit 19	27.6	24.7	22.8	22.0	20.7	19.4	N/A	N/A	18.8	18.1	24.2	23.2	22.6	21.2	20.7	19.4	17.7	16.8	16.5	15.1
MD 202 (Landover Rd)	I-495 Exit 17	29.6	26.7	24.8	23.9	22.7	21.4	N/A	N/A	20.8	20.1	26.2	25.2	24.5	23.1	22.7	21.4	19.7	18.8	18.5	17.1
Arena Dr	I-495 Exit 16	30.3	27.4	25.4	24.6	23.3	22.1	N/A	N/A	21.4	20.8	26.8	25.8	25.2	23.8	23.3	22.0	20.3	19.4	19.2	17.7
MD 214 (Central Ave)	I-495 Exit 15	31.2	28.3	26.4	25.6	24.3	23.1	N/A	N/A	22.4	21.8	27.8	26.8	26.2	24.8	24.3	23.0	21.3	20.4	20.2	18.7
Ritchie-Marlboro Rd	I-495 Exit 13	32.8	29.9	28.0	27.1	25.9	24.6	N/A	N/A	24.0	23.3	29.4	28.4	27.7	26.3	25.8	24.6	22.9	22.0	21.7	20.3
MD 4 (Pennsylvania Ave)	I-495 Exit 11	35.1	32.2	30.3	29.4	28.2	26.9	N/A	N/A	26.3	25.6	31.7	30.7	30.1	28.7	28.2	26.9	25.2	24.3	24.0	22.6
MD 337 (Suitland Pkwy)	I-495 Exit 9	36.3	33.4	31.4	30.6	29.4	28.1	N/A	N/A	27.5	26.8	32.9	31.9	31.2	29.8	29.3	28.0	26.4	25.5	25.2	23.8
MD 5 (Branch Ave)	I-495 Exit 7	38.1	35.2	33.3	32.5	31.2	29.9	N/A	N/A	29.3	28.6	34.7	33.7	33.1	31.7	31.2	29.9	28.2	27.3	27.0	25.6
MD 414 (St Barnabas Rd)	I-495 Exit 4	41.0	38.1	36.2	35.4	34.1	32.9	N/A	N/A	32.2	31.6	37.6	36.6	36.0	34.6	34.1	32.8	31.1	30.2	30.0	28.5

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	I-270 Exit 9	54.4	60.8	61.5	63.1	64.6	65.6	66.3	67.7	68.5	70.6	71.9	73.8	74.4	75.5	77.1	79.3	80.4	82.4	84.8
Shady Grove Rd	I-270 Exit 8	53.5	59.9	60.6	62.2	63.7	64.7	65.4	66.8	67.6	69.7	71.0	72.9	73.5	74.6	76.2	78.4	79.5	81.5	83.9
MD 28 (W Montgomery Ave)	I-270 Exit 6	51.3	57.7	58.4	60.0	61.5	62.5	63.2	64.6	65.4	67.6	68.8	70.7	71.3	72.4	74.0	76.2	77.3	79.3	81.7
MD 189 (Falls Rd)	I-270 Exit 5	49.0	55.3	56.0	57.6	59.1	60.1	60.8	62.2	63.0	65.2	66.4	68.3	68.9	70.0	71.6	73.9	74.9	76.9	79.3
Montrose Rd	I-270 Exit 4	42.6	49.0	49.7	51.3	52.8	53.8	54.5	55.9	56.7	58.9	60.1	62.0	62.6	63.7	65.3	67.5	68.6	70.6	73.0
Split	I-270	29.5	35.9	36.5	38.2	39.7	40.7	41.4	42.8	43.6	45.7	47.0	48.9	49.5	50.6	52.2	54.4	55.5	57.5	59.9
Westlake Terrace	I-270 W Spur	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	23.8	30.1	30.8	32.4	34.0	34.9	35.7	37.0	37.9	40.0	41.3	43.1	43.7	44.8	46.5	48.7	49.8	51.8	54.2
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	15.1	21.4	22.1	23.7	25.3	26.2	27.0	28.3	29.2	31.3	32.6	34.4	35.0	36.1	37.8	40.0	41.1	43.1	45.5
VA 193 (Georgetown Pike)	I-495 Exit 44	12.0	18.4	19.1	20.7	22.2	23.2	23.9	25.3	26.1	28.2	29.5	31.4	32.0	33.1	34.7	36.9	38.0	40.0	42.4
George Washington Memorial Pkwy	I-495 Exit 43	10.9	17.2	17.9	19.5	21.1	22.0	22.8	24.1	25.0	27.1	28.4	30.2	30.8	31.9	33.6	35.8	36.8	38.8	41.2
Clara Barton Pkwy	I-495 Exit 41	10.2	16.5	17.2	18.8	20.3	21.3	22.0	23.4	24.2	26.4	27.6	29.5	30.1	31.2	32.8	35.1	36.1	38.1	40.5
Cabin John Pkwy	I-495 Exit 40	8.5	14.9	15.6	17.2	18.7	19.7	20.4	21.8	22.6	24.7	26.0	27.9	28.5	29.6	31.2	33.4	34.5	36.5	38.9
MD 190 (River Rd)	I-495 Exit 39	8.2	14.6	15.3	16.9	18.4	19.4	20.1	21.5	22.3	24.4	25.7	27.6	28.2	29.3	30.9	33.1	34.2	36.2	38.6
I-270 West Spur	I-495 Exit 38	6.9	13.2	13.9	15.6	17.1	18.1	18.8	20.1	21.0	23.1	24.4	26.2	26.9	27.9	29.6	31.8	32.9	34.9	37.3
MD 187 (Old Georgetown Rd)	I-495 Exit 36	5.1	11.4	12.1	13.7	15.2	16.2	16.9	18.3	19.1	21.3	22.5	24.4	25.0	26.1	27.7	29.9	31.0	33.0	35.4
I-270 East Spur	I-495 Exit 35	4.3	10.6	11.3	12.9	14.5	15.5	16.2	17.5	18.4	20.5	21.8	23.6	24.3	25.3	27.0	29.2	30.3	32.3	34.7
MD 355 (Rockville Pike)	I-495 Exit 34	3.9	10.3	11.0	12.6	14.1	15.1	15.8	17.2	18.0	20.2	21.4	23.3	23.9	25.0	26.6	28.8	29.9	31.9	34.3
MD 185 (Connecticut Ave)	I-495 Exit 33	2.5	8.8	9.5	11.1	12.7	13.6	14.4	15.7	16.6	18.7	20.0	21.8	22.4	23.5	25.2	27.4	28.4	30.4	32.8
MD 97 (Georgia Ave)	I-495 Exit 31	0	6.3	7.0	8.6	10.2	11.1	11.9	13.2	14.1	16.2	17.5	19.3	20.0	21.0	22.7	24.9	26.0	28.0	30.4
US 29 (Colesville Rd)	I-495 Exit 30	1.4	0	0.7	2.3	3.9	4.8	5.6	6.9	7.8	9.9	11.2	13.0	13.6	14.7	16.4	18.6	19.6	21.6	24.0
MD 193 (University Blvd E)	I-495 Exit 29	2.7	0.7	0	1.6	3.2	4.1	4.9	6.2	7.1	9.2	10.5	12.3	12.9	14.0	15.7	17.9	18.9	20.9	23.3
MD 650 (New Hampshire Ave)	I-495 Exit 28	4.7	2.7	1.4	0	1.5	2.5	3.2	4.6	5.4	7.6	8.8	10.7	11.3	12.4	14.0	16.2	17.3	19.3	21.7
I-95	I-495 Exit 27	5.6	3.6	2.3	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.5	14.7	15.8	17.8	20.2
US 1 (Baltimore Ave)	I-495 Exit 25	6.6	4.6	3.3	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.5	13.7	14.8	16.8	19.2
Greenbelt Metro Station	I-495 Exit 24	7.4	5.5	4.2	3.4	1.8	0.9	0	1.4	2.2	4.3	5.6	7.5	8.1	9.2	10.8	13.0	14.1	16.1	18.5
MD 201 (Kenilworth Ave)	I-495 Exit 23	8.6	6.7	5.4	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.1	6.7	7.8	9.5	11.7	12.7	14.7	17.1
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	9.5	7.6	6.3	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.6	10.8	11.9	13.9	16.3
MD 450 (Annapolis Rd)	I-495 Exit 20	11.9	10.0	8.7	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.7	4.8	6.5	8.7	9.8	11.8	14.2
US 50 (John Hanson Hwy)	I-495 Exit 19	13.4	11.4	10.1	9.4	7.8	6.8	5.9	4.7	3.8	1.4	0	1.9	2.5	3.5	5.2	7.4	8.5	10.5	12.9
MD 202 (Landover Rd)	I-495 Exit 17	15.4	13.4	12.1	11.3	9.7	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.3	5.6	6.6	8.6	11.0
Arena Dr	I-495 Exit 16	16.0	14.0	12.7	12.0	10.4	9.4	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.7	4.9	6.0	8.0	10.4
MD 214 (Central Ave)	I-495 Exit 15	17.0	15.0	13.7	13.0	11.4	10.4	9.6	8.4	7.4	5.0	3.6	1.6	1.0	0	1.6	3.9	4.9	6.9	9.3
Ritchie-Marlboro Rd	I-495 Exit 13	18.5	16.6	15.3	14.5	12.9	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	I-495 Exit 11	20.9	18.9	17.6	16.9	15.3	14.3	13.4	12.2	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	I-495 Exit 9	22.0	20.1	18.8	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.7	6.7	6.0	5.0	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	I-495 Exit 7	23.9	21.9	20.6	19.9	18.3	17.3	16.4	15.2	14.3	11.9	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	2.4
MD 414 (St Barnabas Rd)	I-495 Exit 4	26.8	24.8	23.5	22.8	21.2	20.2	19.4	18.2	17.2	14.8	13.4	11.4	10.8	9.8	8.2	5.9	4.8	2.9	0

Travel Time Matrix - Alternative 13C - ETL (PM Peak)

Unit: Minute

From \ To	I-270 Exit 9	I-270 Exit 8	I-270 Exit 6	I-270 Exit 5	I-270 Exit 4	I-270 Split	Westlake Terr	I-270 Exit 1	I-270 Exit 1B	I-270 Exit 1A	I-495 Exit 44	I-495 Exit 43	I-495 Exit 41	I-495 Exit 40	I-495 Exit 39	I-495 Exit 38	I-495 Exit 36	I-495 Exit 35	I-495 Exit 34	I-495 Exit 33
I-370	I-270 Exit 9	0	1.0	3.1	4.3	6.0	11.6	12.4	12.8	17.6	28.5	18.5	17.5	16.8	15.4	14.9	13.6	N/A	41.1	41.4	42.9
Shady Grove Rd	I-270 Exit 8	0.9	0	2.2	3.3	5.0	10.6	11.4	11.9	16.6	27.5	17.5	16.5	15.9	14.5	14.0	12.7	N/A	40.1	40.5	41.9
MD 28 (W Montgomery Ave)	I-270 Exit 6	2.7	1.8	0	1.1	2.9	8.4	9.2	9.7	14.5	25.3	15.4	14.3	13.7	12.3	11.8	10.5	N/A	37.9	38.3	39.8
MD 189 (Falls Rd)	I-270 Exit 5	3.5	2.7	0.8	0	1.7	7.3	8.1	8.6	13.3	24.2	14.2	13.2	12.6	11.1	10.7	9.4	N/A	36.8	37.1	38.6
Montrose Rd	I-270 Exit 4	4.7	3.9	2.0	1.2	0	5.6	6.4	6.9	11.6	22.5	12.5	11.5	10.8	9.4	8.9	7.6	N/A	35.1	35.4	36.9
Split	I-270	6.0	5.1	3.3	2.5	1.2	0	0.8	1.3	6.0	16.9	6.9	5.9	5.3	3.8	3.4	2.1	N/A	29.5	29.9	31.3
Westlake Terrace	I-270 W Spur	6.8	6.0	4.1	3.3	2.1	0.9	0	0.5	N/A	N/A	6.1	5.1	4.5	3.1	2.6	1.3	N/A	N/A	N/A	N/A
Democracy Blvd	I-270 Exit 1	7.2	6.4	4.5	3.7	2.5	1.2	0.4	0	N/A	N/A	5.6	4.6	4.0	2.6	2.1	0.8	N/A	N/A	N/A	N/A
Rockledge Dr	I-270 Exit 1B	6.6	5.8	3.9	3.1	1.9	0.6	N/A	N/A	0	10.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23.5	23.8	25.3
MD 187 (Old Georgetown Rd)	I-270 Exit 1A	7.3	6.4	4.6	3.7	2.5	1.3	N/A	N/A	0.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.6	13.0	14.4
VA 193 (Georgetown Pike)	I-495 Exit 44	13.1	12.3	10.4	9.6	8.4	7.1	6.3	5.9	N/A	N/A	0	1.2	1.9	3.5	3.8	5.1	7.0	7.7	8.1	9.5
George Washington Memorial Pkwy	I-495 Exit 43	12.0	11.1	9.3	8.4	7.2	6.0	5.1	4.7	N/A	N/A	1.0	0	0.7	2.3	2.6	4.0	5.8	6.6	6.9	8.4
Clara Barton Pkwy	I-495 Exit 41	11.2	10.4	8.5	7.7	6.5	5.3	4.4	4.0	N/A	N/A	1.7	0.6	0	1.6	1.9	3.2	5.1	5.9	6.2	7.7
Cabin John Pkwy	I-495 Exit 40	9.6	8.8	6.9	6.1	4.9	3.6	2.8	2.4	N/A	N/A	3.1	2.0	1.4	0	0.3	1.6	3.5	4.2	4.6	6.0
MD 190 (River Rd)	I-495 Exit 39	9.3	8.5	6.6	5.8	4.6	3.3	2.5	2.1	N/A	N/A	3.6	2.5	1.9	0.5	0	1.3	3.2	3.9	4.3	5.7
I-270 West Spur	I-495 Exit 38	8.0	7.1	5.3	4.5	3.3	2.0	1.2	0.8	N/A	N/A	4.8	3.8	3.2	1.8	1.3	0	1.9	2.6	3.0	4.4
MD 187 (Old Georgetown Rd)	I-495 Exit 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	5.5	4.9	3.5	3.0	1.7	0	0.8	1.1	2.6
I-270 East Spur	I-495 Exit 35	8.6	7.7	5.9	5.1	3.8	2.6	N/A	N/A	2.0	1.3	7.5	6.4	5.8	4.4	3.9	2.6	0.9	0	0.4	1.8
MD 355 (Rockville Pike)	I-495 Exit 34	8.9	8.0	6.2	5.3	4.1	2.9	N/A	N/A	2.3	1.6	7.7	6.7	6.1	4.7	4.2	2.9	1.2	0.3	0	1.5
MD 185 (Connecticut Ave)	I-495 Exit 33	10.3	9.4	7.6	6.7	5.5	4.3	N/A	N/A	3.7	3.0	9.1	8.1	7.5	6.1	5.6	4.3	2.6	1.7	1.4	0
MD 97 (Georgia Ave)	I-495 Exit 31	12.5	11.7	9.8	9.0	7.8	6.6	N/A	N/A	5.9	5.3	11.4	10.4	9.7	8.3	7.8	6.5	4.9	3.9	3.7	2.3
US 29 (Colesville Rd)	I-495 Exit 30	13.4	12.6	10.7	9.9	8.7	7.4	N/A	N/A	6.8	6.1	12.3	11.3	10.6	9.2	8.7	7.4	5.7	4.8	4.5	3.1
MD 193 (University Blvd E)	I-495 Exit 29	14.9	14.1	12.2	11.4	10.2	9.0	N/A	N/A	8.3	7.7	13.8	12.8	12.1	10.7	10.2	8.9	7.3	6.3	6.1	4.7
MD 650 (New Hampshire Ave)	I-495 Exit 28	16.7	15.9	14.0	13.2	12.0	10.7	N/A	N/A	10.1	9.4	15.6	14.6	13.9	12.5	12.0	10.7	9.0	8.1	7.8	6.4
I-95	I-495 Exit 27	17.9	17.0	15.2	14.3	13.1	11.9	N/A	N/A	11.3	10.6	16.7	15.7	15.1	13.7	13.2	11.9	10.2	9.3	9.0	7.6
US 1 (Baltimore Ave)	I-495 Exit 25	18.8	18.0	16.1	15.3	14.1	12.8	N/A	N/A	12.2	11.5	17.7	16.7	16.0	14.6	14.1	12.8	11.1	10.2	9.9	8.5
Greenbelt Metro Station	I-495 Exit 24	19.7	18.8	17.0	16.2	14.9	13.7	N/A	N/A	13.1	12.4	18.5	17.5	16.9	15.5	15.0	13.7	12.0	11.1	10.8	9.4
MD 201 (Kenilworth Ave)	I-495 Exit 23	20.9	20.0	18.2	17.4	16.1	14.9	N/A	N/A	14.3	13.6	19.7	18.7	18.1	16.7	16.2	14.9	13.2	12.3	12.0	10.6
MD 295 (Baltimore-Washington Pkwy)	I-495 Exit 22	21.8	20.9	19.1	18.3	17.1	15.8	N/A	N/A	15.2	14.5	20.7	19.6	19.0	17.6	17.1	15.8	14.1	13.2	12.9	11.5
MD 450 (Annapolis Rd)	I-495 Exit 20	24.2	23.3	21.5	20.7	19.5	18.2	N/A	N/A	17.6	16.9	23.1	22.0	21.4	20.0	19.5	18.2	16.5	15.6	15.3	13.9
US 50 (John Hanson Hwy)	I-495 Exit 19	25.6	24.8	22.9	22.1	20.9	19.7	N/A	N/A	19.0	18.4	24.5	23.5	22.8	21.4	20.9	19.6	18.0	17.0	16.8	15.4
MD 202 (Landover Rd)	I-495 Exit 17	27.6	26.8	24.9	24.1	22.9	21.6	N/A	N/A	21.0	20.3	26.5	25.5	24.8	23.4	22.9	21.6	19.9	19.0	18.7	17.3
Arena Dr	I-495 Exit 16	28.3	27.4	25.6	24.7	23.5	22.3	N/A	N/A	21.7	21.0	27.1	26.1	25.5	24.1	23.6	22.3	20.6	19.7	19.4	18.0
MD 214 (Central Ave)	I-495 Exit 15	29.3	28.4	26.6	25.7	24.5	23.3	N/A	N/A	22.7	22.0	28.1	27.1	26.5	25.0	24.6	23.3	21.6	20.7	20.4	19.0
Ritchie-Marlboro Rd	I-495 Exit 13	30.8	30.0	28.1	27.3	26.1	24.8	N/A	N/A	24.2	23.5	29.7	28.7	28.0	26.6	26.1	24.8	23.1	22.2	21.9	20.5
MD 4 (Pennsylvania Ave)	I-495 Exit 11	33.1	32.3	30.5	29.6	28.4	27.2	N/A	N/A	26.5	25.9	32.0	31.0	30.3	28.9	28.5	27.2	25.5	24.6	24.3	22.9
MD 337 (Suitland Pkwy)	I-495 Exit 9	34.3	33.5	31.6	30.8	29.6	28.3	N/A	N/A	27.7	27.0	33.2	32.1	31.5	30.1	29.6	28.3	26.6	25.7	25.4	24.0
MD 5 (Branch Ave)	I-495 Exit 7	36.2	35.3	33.5	32.6	31.4	30.2	N/A	N/A	29.6	28.9	35.0	34.0	33.4	31.9	31.5	30.2	28.5	27.6	27.3	25.9
MD 414 (St Barnabas Rd)	I-495 Exit 4	39.1	38.2	36.4	35.5	34.3	33.1	N/A	N/A	32.5	31.8	37.9	36.9	36.3	34.9	34.4	33.1	31.4	30.5	30.2	28.8

Unit: Minute

From \ To	I-495 Exit 31	I-495 Exit 30	I-495 Exit 29	I-495 Exit 28	I-495 Exit 27	I-495 Exit 25	I-495 Exit 24	I-495 Exit 23	I-495 Exit 22	I-495 Exit 20	I-495 Exit 19	I-495 Exit 17	I-495 Exit 16	I-495 Exit 15	I-495 Exit 13	I-495 Exit 11	I-495 Exit 9	I-495 Exit 7	I-495 Exit 4
I-370	45.0	49.5	50.2	52.9	57.0	58.0	58.7	60.0	60.9	63.0	64.3	66.2	66.8	67.9	69.5	71.7	72.8	74.8	77.2
Shady Grove Rd	44.1	48.5	49.3	52.0	56.0	57.0	57.7	59.1	59.9	62.1	63.3	65.2	65.8	66.9	68.5	70.8	71.8	73.8	76.2
MD 28 (W Montgomery Ave)	41.9	46.4	47.1	49.8	53.8	54.8	55.6	56.9	57.8	59.9	61.2	63.0	63.6	64.7	66.4	68.6	69.7	71.7	74.1
MD 189 (Falls Rd)	40.7	45.2	45.9	48.7	52.7	53.7	54.4	55.8	56.6	58.7	60.0	61.9	62.5	63.6	65.2	67.4	68.5	70.5	72.9
Montrose Rd	39.0	43.5	44.2	46.9	51.0	52.0	52.7	54.0	54.9	57.0	58.3	60.2	60.8	61.9	63.5	65.7	66.8	68.8	71.2
Split	33.4	37.9	38.6	41.4	45.4	46.4	47.1	48.5	49.3	51.4	52.7	54.6	55.2	56.3	57.9	60.1	61.2	63.2	65.6
Westlake Terrace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democracy Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge Dr	27.4	31.9	32.6	35.3	39.4	40.4	41.1	42.4	43.3	45.4	46.7	48.6	49.2	50.3	51.9	54.1	55.2	57.2	59.6
MD 187 (Old Georgetown Rd)	16.6	21.0	21.8	24.5	28.5	29.5	30.2	31.6	32.4	34.6	35.8	37.7	38.3	39.4	41.0	43.3	44.3	46.3	48.7
VA 193 (Georgetown Pike)	11.7	16.2	16.9	19.6	23.6	24.6	25.3	26.7	27.5	29.7	30.9	32.8	33.4	34.5	36.1	38.4	39.4	41.4	43.8
George Washington Memorial Pkwy	10.5	15.0	15.7	18.4	22.5	23.4	24.2	25.5	26.4	28.5	29.8	31.7	32.3	33.3	35.0	37.2	38.3	40.3	42.7
Clara Barton Pkwy	9.8	14.3	15.0	17.7	21.8	22.7	23.5	24.8	25.7	27.8	29.1	30.9	31.6	32.6	34.3	36.5	37.6	39.6	42.0
Cabin John Pkwy	8.2	12.6	13.4	16.1	20.1	21.1	21.8	23.2	24.0	26.2	27.4	29.3	29.9	31.0	32.6	34.9	35.9	37.9	40.3
MD 190 (River Rd)	7.9	12.4	13.1	15.8	19.8	20.8	21.5	22.9	23.7	25.9	27.1	29.0	29.6	30.7	32.3	34.6	35.6	37.6	40.0
I-270 West Spur	6.6	11.0	11.8	14.5	18.5	19.5	20.2	21.6	22.4	24.6	25.8	27.7	28.3	29.4	31.0	33.3	34.3	36.3	38.7
MD 187 (Old Georgetown Rd)	4.7	9.2	9.9	12.6	16.7	17.6	18.4	19.7	20.6	22.7	24.0	25.8	26.5	27.5	29.2	31.4	32.5	34.5	36.9
I-270 East Spur	3.9	8.4	9.1	11.9	15.9	16.9	17.6	19.0	19.8	22.0	23.2	25.1	25.7	26.8	28.4	30.6	31.7	33.7	36.1
MD 355 (Rockville Pike)	3.6	8.1	8.8	11.5	15.5	16.5	17.3	18.6	19.5	21.6	22.9	24.7	25.3	26.4	28.1	30.3	31.4	33.4	35.8
MD 185 (Connecticut Ave)	2.1	6.6	7.3	10.0	14.1	15.1	15.8	17.1	18.0	20.1	21.4	23.3	23.9	25.0	26.6	28.8	29.9	31.9	34.3
MD 97 (Georgia Ave)	0	4.5	5.2	7.9	12.0	12.9	13.7	15.0	15.9	18.0	19.3	21.1	21.8	22.8	24.5	26.7	27.8	29.8	32.2
US 29 (Colesville Rd)	1.4	0	0.7	3.4	7.5	8.5	9.2	10.5	11.4	13.5	14.8	16.7	17.3	18.4	20.0	22.2	23.3	25.3	27.7
MD 193 (University Blvd E)	2.9	0.9	0	2.7	6.8	7.7	8.5	9.8	10.7	12.8	14.1	15.9	16.6	17.6	19.3	21.5	22.6	24.6	27.0
MD 650 (New Hampshire Ave)	4.7	2.7	1.4	0	4.0	5.0	5.7	7.1	8.0	10.1	11.4	13.2	13.8	14.9	16.6	18.8	19.9	21.9	24.3
I-95	5.9	3.9	2.5	1.6	0	1.0	1.7	3.1	3.9	6.0	7.3	9.2	9.8	10.9	12.5	14.7	15.8	17.8	20.2
US 1 (Baltimore Ave)	6.8	4.8	3.5	2.5	1.0	0	0.7	2.1	2.9	5.1	6.3	8.2	8.8	9.9	11.5	13.8	14.8	16.8	19.2
Greenbelt Metro Station	7.7	5.7	4.4	3.4	1.8	0.9	0	1.4	2.2	4.3	5.6	7.5	8.1	9.2	10.8	13.0	14.1	16.1	18.5
MD 201 (Kenilworth Ave)	8.9	6.9	5.6	4.6	3.0	2.1	1.2	0	0.9	3.0	4.3	6.1	6.7	7.8	9.5	11.7	12.8	14.8	17.1
MD 295 (Baltimore-Washington Pkwy)	9.8	7.8	6.5	5.5	3.9	3.0	2.1	0.9	0	2.1	3.4	5.3	5.9	7.0	8.6	10.8	11.9	13.9	16.3
MD 450 (Annapolis Rd)	12.2	10.2	8.9	7.9	6.3	5.4	4.5	3.3	2.4	0	1.3	3.1	3.8	4.8	6.5	8.7	9.8	11.8	14.2
US 50 (John Hanson Hwy)	13.6	11.6	10.3	9.4	7.8	6.8	6.0	4.7	3.8	1.4	0	1.9	2.5	3.6	5.2	7.4	8.5	10.5	12.9
MD 202 (Landover Rd)	15.6	13.6	12.3	11.3	9.8	8.8	7.9	6.7	5.8	3.4	2.0	0	0.6	1.7	3.3	5.6	6.6	8.6	11.0
Arena Dr	16.3	14.3	13.0	12.0	10.4	9.5	8.6	7.4	6.5	4.1	2.6	0.7	0	1.1	2.7	4.9	6.0	8.0	10.4
MD 214 (Central Ave)	17.2	15.3	13.9	13.0	11.4	10.4	9.6	8.4	7.5	5.1	3.6	1.6	1.0	0	1.6	3.9	4.9	6.9	9.3
Ritchie-Marlboro Rd	18.8	16.8	15.5	14.5	13.0	12.0	11.1	9.9	9.0	6.6	5.2	3.2	2.5	1.6	0	2.2	3.3	5.3	7.7
MD 4 (Pennsylvania Ave)	21.1	19.2	17.8	16.9	15.3	14.3	13.5	12.3	11.3	8.9	7.5	5.5	4.9	3.9	2.3	0	1.1	3.1	5.5
MD 337 (Suitland Pkwy)	22.3	20.3	19.0	18.0	16.4	15.5	14.6	13.4	12.5	10.1	8.7	6.7	6.0	5.1	3.5	1.2	0	2.0	4.4
MD 5 (Branch Ave)	24.1	22.2	20.8	19.9	18.3	17.3	16.5	15.3	14.4	12.0	10.5	8.5	7.9	6.9	5.3	3.0	1.8	0	2.4
MD 414 (St Barnabas Rd)	27.1	25.1	23.7	22.8	21.2	20.3	19.4	18.2	17.3	14.9	13.4	11.5	10.8	9.8	8.3	5.9	4.8	2.9	0

Appendix F:

Existing and Future Travel Demand

Existing Travel Demand

I-495 2017 Existing Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	7530	8145	7535	7050	5695	6730	6880	6180	6820	6730	6960	5800	5780	6075	5650	5505
AMERICAN LEGION BRIDGE	8060	9490	9175	8610	7795	9115	8950	8240	8555	8475	8670	7450	8285	8635	8415	7910
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	7390	8785	8430	7940	7615	8565	7900	7320	7775	7365	7285	6465	7270	7295	7150	6855
BETWEEN MD 190 AND I-270	7210	8935	8990	8490	9025	10180	9130	8470	8580	8905	8515	7515	7575	7780	7625	6915
BETWEEN I-270 WEST AND MD 187	4090	4455	4090	4015	3640	4605	4070	4050	3720	3770	3575	2795	4250	4185	4165	3750
BETWEEN I-270 EAST AND MD 187	3850	4145	3805	3865	3475	4325	3810	3890	3590	3645	3445	2640	3990	3970	4015	3385
BETWEEN MD 355 AND MD 185	6195	8120	7435	6915	6295	7745	8235	7715	7285	7440	7055	5950	7985	7830	7975	7350
BETWEEN MD 185 AND MD 97	5735	7780	7550	6815	7545	8225	8090	8040	8280	8355	7820	6695	7800	7890	7975	7245
BETWEEN MD 97 AND US 29	5465	7445	7250	6705	8990	8525	6900	7315	8645	8665	7975	6730	7435	7780	7980	6960
BETWEEN MD US 29 AND MD 193	5420	7060	6965	6365	8085	7320	5910	6220	8160	8385	7695	6360	6780	7165	7245	6140
BETWEEN MD 193 AND MD 650	5715	7475	7465	6630	7855	6910	5595	6015	8200	8505	7975	6800	7005	7440	7765	6490
BETWEEN MD 650 AND I-95	7030	8495	7905	6995	8415	7415	6370	6630	8785	9115	8500	7455	7360	7920	8165	6930
BETWEEN US 1 AND I-95	6615	7590	7215	6535	7600	7885	7095	6665	6470	7170	6745	4995	8755	9280	8835	7530
BETWEEN GREENBELT STATION AND US 1	7180	8720	8460	7450	7895	8340	7275	6575	7660	8115	7745	6380	8175	8655	7985	6905
BETWEEN GREENBELT STATION AND MD 201	6850	8240	8085	7285	7865	8285	7220	6535	7585	7990	7640	6280	8010	8340	7450	6425
BETWEEN MD 201 AND MD 295	6420	7590	7860	7040	8390	9155	7950	7130	7550	8020	7630	6400	8140	8680	7875	6140
BETWEEN MD 295 AND MD 450	5830	6830	7245	6395	8445	9080	8045	7480	7750	8250	7795	6105	7250	7455	6845	5740
BETWEEN MD 450 AND US 50	6300	7190	7890	6960	8625	9330	8520	7895	8335	8900	8445	6835	7785	8005	7400	6205
BETWEEN US 50 AND MD 202	7195	7975	8610	7685	8035	8855	7815	7370	8555	9010	9040	7480	7845	8115	7485	6330
BETWEEN MD 202 AND ARENA DR	7100	7620	8205	7385	7800	8600	7625	7085	8180	8605	8640	7475	7825	8105	7580	6530
BETWEEN ARENA DR AND MD 214	7100	7665	8045	7305	7880	8665	7800	7060	8180	8380	8305	7310	7735	8010	7550	6490
BETWEEN MD 214 AND RITCHIE MARLBORO RD	7060	7515	7560	7055	7530	8705	7730	6770	7740	8310	8205	7135	7765	8170	7820	6750
BETWEEN RITCHIE MARLBORO AND MD 4	7190	7610	7540	7130	6645	7725	7020	6590	6320	6885	7300	6740	7760	8110	7820	6650
BETWEEN MD 4 AND FORESTVILLE RD	6805	6695	7290	6495	5860	7065	6240	5825	5770	6680	6870	6540	7435	7460	7390	6230
BETWEEN FORESTVILLE AND MD 218	6065	6080	6635	5945	5210	6010	5235	5145	5290	6185	6405	5985	6435	6360	6300	5400
BETWEEN MD 218 AND MD 5	6260	6290	6885	6185	5905	6745	5905	5530	5770	6830	6965	6420	6775	6730	6705	5770
BETWEEN MD 5 AND MD 414	6740	5475	6050	5620	4670	5525	4900	4550	4790	5710	5880	5230	6795	6720	6695	5835
BETWEEN MD 414 AND MD 210	7125	5595	6035	5465	4580	5315	4835	4440	4585	5455	5635	4835	7185	7375	7350	6395
BETWEEN MD 210 AND I-295	8265	6560	6740	5860	4400	5195	4610	4170	4765	5740	5785	4975	7330	7575	7585	6705
WOODROW WILSON BRIDGE	10145	9835	9440	7105	7480	8625	7880	6840	7105	8415	8315	7330	9135	9190	9340	8585

I-270 2017 Existing Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3160	3290	3085	2895	1575	2540	2665	2270	1990	2360	2730	2560	3960	4625	4445	3575
BETWEEN MD 80 AND MD 109	3435	3730	3375	3155	1380	2155	2320	2015	1835	2215	2535	2360	3785	4555	4540	3655
BETWEEN MD 109 AND MD 121	3875	4220	3790	3460	1445	2215	2365	2065	1935	2315	2650	2410	3835	4630	4645	3860
BETWEEN MD 121 AND MD 27	4950	5000	4460	4105	1695	2390	2505	2280	2320	2700	3130	2830	4300	5200	5280	4575
BETWEEN MD 27 AND MD 118	5870	5070	4555	4535	1695	2390	2505	2280	2780	3120	3300	3225	4300	5200	5280	4575
BETWEEN MD 118 AND MIDDLEBROOK RD	6415	5580	5185	4990	1985	2975	3450	3190	3285	3700	3905	3800	6270	6945	7025	6325
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	8235	7380	6790	6335	2330	3665	4315	3940	4190	4595	5020	4770	7555	8250	8340	7705
BETWEEN WATKINS MILL AND MD 124	8235	7380	6790	6335	2330	3665	4315	3940	4190	4595	5020	4770	7555	8250	8340	7705
BETWEEN MD 124 AND MD 117	9175	7965	7305	6555	2260	3680	4485	4155	4510	4930	5350	4995	8095	9170	9240	8600
BETWEEN MD 117 AND I-370	10840	9800	9015	8055	2770	4580	5895	5325	5795	6565	7050	6270	9840	10715	10610	9910
BETWEEN I-370 AND SHADY GROVE RD	9585	9715	8905	8330	2435	3890	5110	4865	5615	5865	6320	5910	10030	10995	10445	9960
BETWEEN SHADY GROVE RD AND MD 28	9590	9225	8310	7835	3035	4775	6460	6010	6135	6565	7305	6495	10220	10985	10465	9870
BETWEEN MD 28 AND MD 189	10255	10090	9065	8640	3455	5610	7825	7195	6915	7330	8120	7340	10565	11580	11215	10605
BETWEEN MD 189 AND MONTROSE RD	10285	10285	9295	8795	3545	5625	7895	7270	6685	7110	7720	7115	10530	11540	11455	10845
BETWEEN MONTROSE RD AND I-270 SPLIT	9345	10825	10005	9095	4220	6110	8295	7540	6690	7310	7535	6900	10460	11425	11440	10655
BETWEEN I-270 SPLIT AND MD 187	3800	5160	4735	4085	1835	2600	3935	3460	3280	3450	3475	3415	4600	5130	5150	4930
BETWEEN MD 187 AND I-495	3305	4485	3975	3595	2350	3340	4440	3845	3480	3665	3625	3370	4065	4300	4350	4465
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5545	5665	5270	5010	2385	3510	4360	4080	3410	3860	4060	3485	5860	6295	6290	5725
BETWEEN DEMOCRACY BLVD AND I-495	5385	5575	5060	4420	2750	4085	4900	4475	3325	3595	3460	3165	4860	5135	4940	4720

Ramp #	Ramp Description		Ramp Volumes									
			5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
	From	To	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)
101	I-495 WB	I-270 NB	1156	2170	2860	2525	2640	2984	3280	3101	3043	3190
102	MD 355 NB	I-270 NB	54	207	647	834	607	1205	1232	1208	1087	776
103	I-270 NB	MD 187	142	241	416	493	437	311	353	319	365	257
104	I-270 NB	Rockledge Blvd	101	275	494	638	570	161	203	203	182	118
105	Rockledge Blvd	I-270 NB	35	121	398	693	624	1282	1525	2997	2564	1299
111	I-270 NB Spur	I-270 NB	987	2049	3492	4478	4403	5997	5389	5465	5389	5693
112	I-270 NB	Montrose Rd	176	403	647	731	680	504	361	319	336	479
113	Montrose Rd EB	I-270 NB	25	53	221	398	324	402	312	271	254	193
114	I-270 NB	Montrose Rd WB	115	197	274	360	269	302	245	254	269	307
115	Montrose Rd/Tower Oaks Blvd	I-270 NB	109	241	642	937	780	1385	1548	1384	1216	927
116	I-270 NB	MD 189	81	252	512	679	652	701	682	629	706	756
117	MD 189	I-270 NB	51	151	344	621	599	855	911	1007	874	567
118	I-270 NB	MD 28 EB/Nelson St	40	86	258	399	384	328	344	364	374	278
119	MD 28 EB	I-270 NB	14	36	82	86	67	113	110	123	72	62
120	I-270 NB	MD 28 WB	75	211	378	429	415	665	619	607	504	472
121	MD 28 WB	I-270 NB	87	192	358	471	427	750	707	707	584	532
122	I-270 NB	Shady Grove Rd/Redland Blvd	514	835	1352	1846	1745	2284	2400	2327	1953	1387
123	Shady Grove Rd EB	I-270 NB	29	87	231	289	289	514	537	519	346	294
124	Shady Grove Rd WB	I-270 NB	27	68	177	285	292	584	631	699	516	401
125	I-270 NB	I-370	265	551	958	1337	1268	2450	2440	2181	2184	1932
126	I-370 EB	I-270 NB	51	145	354	451	429	600	733	990	731	627
127	I-370 WB	I-270 NB	328	805	1459	1791	1440	1491	1572	1583	1492	1137
128	I-270 NB	MD 117	237	521	919	1441	1194	1473	1477	1396	1339	1195
129	I-270 NB	MD 124 EB	158	375	692	948	909	1581	1699	1798	1719	1284
130	MD 124 EB	I-270 NB	77	179	325	364	338	536	427	427	389	389
131	MD 124 WB	I-270 NB	123	234	350	350	318	409	325	344	376	422
132	I-270 NB	Middlebrook Rd EB	62	121	236	337	319	484	420	419	496	474
133	I-270 NB	Middlebrook Rd WB	78	173	404	480	382	801	785	796	888	820
134	I-270 NB	MD 118 EB	39	90	200	331	303	417	439	401	343	307
135	I-270 NB	MD 118 WB	129	235	511	638	557	662	596	646	702	741
136	MD 118	I-270 NB	134	239	396	426	350	421	548	593	501	378
137	I-270 NB	Father Hurley Blvd/Ridge Road	113	300	495	655	654	1679	1364	1460	1614	1488
138	Father Hurley Blvd/Ridge Road EB	I-270 NB	53	152	159	162	167	169	271	306	203	183
139	Father Hurley Blvd/Ridge Road WB	I-270 NB	42	84	130	135	129	156	208	242	168	129
140	I-270 NB	MD 121	119	238	283	352	348	726	703	786	740	590
141	MD 121	I-270 NB	29	94	238	209	163	285	227	205	150	126
142	I-270 NB	MD 109	46	89	117	108	116	204	207	254	295	301
143	MD 109	I-270 NB	18	29	60	85	76	140	148	132	93	58
144	I-270 NB	MD 80	-	124	199	238	169	467	522	596	542	-
145	MD 80	I-270 NB	96	264	583	590	401	610	566	527	451	326
146	I-270 NB	Scenic View	2	5	9	14	16	19	26	23	19	13
146	Scenic View	I-270 NB	2	5	9	14	16	19	26	23	19	13
147	I-270 NB	MD 85 NB	57	115	203	248	248	345	318	309	323	274
148	I-270 NB	MD 85 SB	48	119	206	227	164	161	161	193	180	159
149	MD 85	I-270 NB	268	480	778	783	789	1443	1568	1624	1419	1141
150	I-270 NB	I-70	441	754	1013	982	1028	2336	2386	2240	1623	1461
151	I-70 WB	I-270 NB	197	455	879	848	909	1167	1227	1288	1121	773

Ramp #	Ramp Description		Ramp Volumes									
			5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
	From	To	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)
201	I-270 SB	I-70 WB	51	124	230	230	193	442	483	446	313	271
202	I-270 SB	I-70 EB	788	1173	1291	1106	955	1140	1190	1073	872	670
203	I-70 WB	I-270 SB	143	174	226	334	365	278	291	317	226	156
204	I-70 EB	I-270 SB	2035	1669	1875	1829	1463	960	1074	1143	960	732
205	I-270 SB	MD 85 SB	616	1260	1526	1456	868	826	728	798	630	476
206	I-270 SB	MD 85 NB	103	229	255	233	240	225	214	218	225	181
207	MD 85	I-270 SB	164	276	263	263	259	237	259	268	255	203
208	I-270 SB	MD 80	165	154	206	247	257	381	391	483	375	329
209	MD 80	I-270 SB	527	614	747	678	458	197	243	336	237	133
210	I-270 SB	MD 109	28	46	41	64	73	72	73	75	55	45
211	MD 109	I-270 SB	558	723	732	620	438	204	191	193	153	137
212	I-270 SB	MD 121	111	165	245	260	172	177	220	307	199	175
213	MD 121	I-270 SB	907	1204	873	767	740	402	429	573	413	308
214	I-270 SB	Father Hurley Blvd/Ridge Road	166	436	1119	1316	846	331	377	437	332	239
215	Father Hurley Blvd/Ridge Road WB	I-270 SB	731	935	678	626	791	493	514	565	514	339
216	Father Hurley Blvd/Ridge Road EB	I-270 SB	115	196	181	171	154	100	108	129	102	81
217	I-270 SB	MD 118	190	231	416	420	444	304	350	479	348	239
218	MD 118 WB	I-270 SB	141	276	357	419	322	310	329	432	299	194
219	MD 118 EB	I-270 SB	346	510	581	643	588	511	616	663	481	376
220	Middlebrook Rd	I-270 SB	919	1897	1919	1713	1415	947	922	1136	901	674
221	I-270 SB	MD 124	481	624	881	909	1053	843	871	1023	869	673
222	MD 124	I-270 SB	891	1578	1272	1228	1075	1167	1211	1409	1097	789
223	MD 117	I-270 SB	856	1655	1843	1756	1555	1303	1656	1901	1337	834
224	I-270 SB	I-370 WB	219	238	451	668	553	454	573	759	570	381
225	I-270 SB	I-370 EB	1075	1455	2044	2235	1726	1543	1923	2025	1458	906
226	I-370	I-270 SB	1117	2355	2419	2416	2162	1626	1768	1579	1401	1120
227	I-270 SB	Shady Grove Rd/Fields Rd/Omega Dr	293	644	794	1137	1002	523	505	547	460	309
228	Shady Grove Rd WB	I-270 SB	144	370	446	423	431	514	544	575	461	302
229	Shady Grove Rd EB	I-270 SB	34	123	250	300	285	393	493	599	363	211
230	I-270 SB	MD 28	156	366	367	517	751	516	483	605	502	372
231	MD 28 WB	I-270 SB	63	130	201	198	224	287	231	224	210	176
232	MD 28 EB	I-270 SB	429	1194	1568	1474	1456	1157	1194	1400	1213	747
233	I-270 SB	MD 189	209	422	564	767	937	714	793	972	765	497
234	MD 189	I-270 SB	179	532	1125	1057	749	628	554	585	524	430
235	I-270 SB	Montrose Rd WB	28	68	83	88	103	152	164	209	167	100
236	Montrose Rd WB	I-270 SB	318	602	783	829	670	806	636	624	545	522
237	I-270 SB	Montrose Rd EB	369	664	664	836	1033	763	812	959	775	492
238	Montrose Rd EB	I-270 SB	108	312	715	744	555	438	425	450	396	332
239	I-270 SB	I-270 SB Spur	2462	4308	4252	4028	4028	3524	2965	2462	2238	2294
240	I-270 SB	Rockledge Blvd/MD 187	289	750	1231	1336	1002	570	643	759	531	282
241	Rockledge Blvd	I-270 SB	23	75	121	92	111	301	360	416	295	196
242	MD 187	I-270 SB	49	152	321	328	285	385	380	378	319	289
243	I-270 SB	MD 355 SB	599	1040	1017	825	859	497	554	746	938	384
244	I-270 SB	I-495 EB	1367	2443	2635	2770	2512	2761	2873	3299	2714	2481

Ramp #	Ramp Description		Ramp Volumes									
			5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
	From	To	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)
301	I-495	Clara Barton Pkwy	367	686	716	776	822	793	1186	1463	1007	608
302	Clara Barton Pkwy EB	I-495	17	30	108	117	89	188	71	45	72	79
303	I-495	MD 190	284	662	851	905	875	480	449	655	666	576
304	Cabin John Pkwy WB	I-495	29	65	238	297	232	888	1195	1037	1001	810
305	MD 190 WB	I-495	123	416	981	1427	1235	1279	1115	1056	958	807
306	I-495	I-270 Spur NB	1074	2363	3938	5155	4868	5298	4296	4009	4367	5083
307	I-495	MD 187	202	439	644	657	435	428	376	458	489	342
308	MD 187	I-495	48	153	310	321	267	277	287	338	293	281
309	I-495	MD 355 SB	260	502	475	382	423	318	273	275	279	247
310	I-270 SB	I-495	1367	2443	2635	2770	2512	2761	2873	3299	2714	2481
311	MD 355 SB	I-495	250	575	998	1089	834	749	752	858	678	680
312	MD 355 NB	I-495	53	126	218	235	200	412	336	299	228	229
313	I-495	MD 185	296	786	1044	1014	1034	768	779	921	1004	885
314	MD 185 SB	I-495	76	134	178	234	195	346	303	270	205	133
315	MD 185 NB	I-495	131	395	827	895	709	1669	1588	1613	1585	980
316	I-495	MD 97 SB	508	938	1113	1203	890	449	505	627	708	698
317	MD 97 SB	I-495	417	661	831	767	621	725	677	636	635	577
318	I-495	MD 97 NB	91	259	335	305	318	244	266	329	440	464
319	MD 97 NB	I-495	162	311	531	497	468	650	662	629	552	401
320	I-495	US 29 SB	21	62	150	182	224	150	112	122	159	183
321	I-495	US 29 NB	138	302	779	834	734	918	929	951	1096	1094
322	US 29 NB	I-495	81	221	491	735	521	835	1058	1045	938	656
323	I-495	MD 193 EB	205	383	534	507	427	641	587	614	561	525
324	MD 193 EB	I-495	208	327	450	462	383	338	349	310	298	293
325	MD 193 WB	I-495	148	262	288	305	227	257	318	318	314	318
326	I-495	MD 650 SB	331	515	662	644	570	570	634	570	496	441
327	MD 650 SB	I-495	420	639	657	648	622	669	678	584	568	507
328	I-495	MD 650 NB	140	325	533	757	593	299	298	300	330	310
329	MD 650 NB	I-495	636	1071	856	660	437	408	418	296	430	302
330	I-495	I-95 NB/Park and Ride Lot	2017	3151	3287	3032	2623	3435	3304	3484	3523	3169
331	I-95 SB (to US 1)	I-495	160	301	549	669	426	305	372	382	326	254
332	Park and Ride Lot	I-495	64	102	114	113	116	100	98	72	35	15
333	I-95 SB	I-495	1298	2928	2921	2593	2961	2020	1253	1526	1887	2173
334	I-495	US 1 SB	222	468	714	901	784	796	796	784	761	585
335	US 1 SB	I-495	182	342	529	477	336	374	347	323	359	342
336	I-495	US 1 NB	328	351	337	370	359	415	458	467	406	342
337	US 1 NB	I-495	178	335	521	550	414	432	472	480	405	325
338	I-495	Greenbelt Metro Station	152	337	488	381	169	77	100	109	104	53
339	I-495	MD 201	335	796	1090	1132	1090	838	908	992	852	629
340	MD 201 SB	I-495	174	333	447	464	436	605	648	676	543	368
341	MD 201 NB	I-495	164	333	413	439	385	720	766	640	498	400
342	I-495	MD 295 SB	1361	1490	1501	1324	1457	1330	1380	1441	1473	1339
343	MD 295 SB	I-495	680	1113	1025	1293	1310	1539	1302	1147	1204	916
344	I-495	MD 295 NB	238	401	563	726	690	330	241	242	362	455
345	MD 295 NB	I-495	13	19	28	27	29	39	28	24	31	32
346	I-495	MD 450	249	533	751	744	561	590	544	532	664	648
347	MD 450	I-495	643	1011	1166	1200	1032	1183	1203	1192	1097	991
348	I-495	US 50 EB	494	937	1304	1386	1179	1822	2020	2007	1798	1280
349	I-495	US 50 WB	507	407	334	280	413	288	259	242	258	243
350	US 50	I-495	1471	2604	2850	2791	2612	2445	2398	2662	2323	2046
351	I-495	MD 202 WB	116	250	359	387	346	327	299	288	320	284
352	I-495	MD 202 EB	130	342	715	959	762	817	877	993	825	617
353	MD 202	I-495	136	307	440	454	367	592	609	579	562	484
354	I-495	Arena Dr	95	173	233	404	321	372	720	875	506	310
355	Arena Dr	I-495	40	79	145	145	138	241	287	313	244	178
356	I-495	MD 214 WB	315	607	767	865	639	685	604	571	576	534
357	I-495	MD 214 EB	203	253	597	681	675	529	488	642	735	626
358	MD 214	I-495	434	813	1129	1033	835	891	984	941	999	920
359	I-495	Ritchie Marlboro Rd	223	445	618	655	544	1002	1113	1076	915	705
360	Ritchie Marlboro Rd	I-495	316	643	949	785	545	698	654	600	600	469
361	I-495	MD 4 WB	507	1132	1532	870	921	800	744	778	853	848
362	MD 4 WB	I-495	685	831	914	831	548	521	512	457	320	210
363	I-495	MD 4 EB	451	851	755	597	667	910	866	805	819	744
364	MD 4 EB	I-495	264	427	523	429	408	610	593	614	610	560
365	I-495	Forestville Rd	256	510	620	635	528	477	486	521	552	430
366	Suitland Rd	I-495	118	223	197	207	216	472	674	581	409	242
367	I-495	MD 5 SB/MD 535	734	1527	2416	2211	1927	2328	2423	2510	2520	2313
368	MD 5 NB/MD 535	I-495	1698	1749	1068	887	877	1067	1080	1030	886	709
369	MD 5 SB	I-495	59	100	157	150	106	197	202	246	229	142
370	I-495	MD 414 (St. Barnabas Rd)/Alice Ave	98	278	448	414	318	306	300	348	364	314
371	MD 414 (St. Barnabas Rd) NB	I-495	446	614	410	303	303	341	284	313	236	231
372	I-495	MD 414 (St. Barnabas Rd) SB	267	308	404	473	453	655	692	705	701	506
373	MD 414 (St. Barnabas Rd) SB	I-495	348	550	513	469	312	420	455	498	438	345
374	I-495	MD 210	291	711	441	436	537	488	549	602	536	420
375	MD 210 NB (Loop Ramp)	I-495	1096	1430	1042	962	855	588	655	655	574	481
376	MD 210 SB	I-495	137	331	216	207	234	256	282	309	278	198
377	MD 210 NB (Flyover Ramp)	I-495	241	473	563	392	221	282	372	352	277	241
378	I-495	I-295 NB	1044	786	352	442	722	389	330	318	346	355
379	National Harbor Blvd WB	I-495	364	1055	1052	1159	545	714	1004	992	690	628
380	I-495	National Harbor Blvd EB	99	88	62	104	213	306	310	276	321	373
381	I-295 SB	I-495	461	719	1150	1079	893	2158	1998	1708	1889	1525

Ramp #	Ramp Description		Ramp Volumes									
			5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
	From	To	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)	Volume (vph)
401	I-495	I-295 NB/National Harbor Blvd SB	393	507	703	725	812	1732	1797	1860	2148	1939
402	I-495	MD 210 SB/Harborview Ave	139	238	352	314	342	1078	732	932	870	749
403	I-295 SB/National Harbor Blvd NB	I-495	173	361	600	628	544	1667	1738	1536	1570	1257
404	I-495	MD 414 (Oxon Hill Rd)	132	243	294	324	314	821	923	933	973	771
405	MD 414 (Oxon Hill Rd)	I-495	574	580	706	741	854	903	845	820	832	690
406	I-495	MD 414 (St. Barnabas Rd)	55	98	156	209	215	370	373	482	347	271
407	MD 414 (St. Barnabas Rd) SB	I-495	116	180	274	251	235	194	185	211	222	219
408	I-495	MD 414 (St. Barnabas Rd) NB	196	427	481	542	403	494	688	697	595	376
409	MD 414 (St. Barnabas Rd) NB	I-495	220	450	726	597	560	597	661	680	560	413
410	I-495	MD 5 EB	305	646	825	789	754	1453	1561	1525	1471	1130
411	MD 5 EB	I-495	220	373	432	396	381	525	497	510	526	454
412	I-495	MD 5 WB	92	260	423	418	299	282	302	350	291	273
413	MD 5 WB	I-495	1551	1787	1818	1713	1536	1192	1056	1049	1161	1193
414	I-495	MD 337	268	568	809	514	313	356	387	488	413	241
415	MD 337	I-495	266	664	1034	913	789	1004	1107	1093	838	663
416	I-495	MD 4 EB	359	504	491	482	506	838	796	750	705	580
417	MD 4 EB	I-495	361	570	687	528	535	852	815	835	779	666
418	I-495	MD 4 WB	251	355	711	651	551	627	546	626	674	618
419	MD 4 WB	I-495	713	991	1039	979	810	773	798	701	556	399
420	I-495	Ritchie Marlboro Rd	320	471	663	721	643	687	793	819	772	699
421	Ritchie Marlboro Rd	I-495	477	987	1419	987	676	599	599	499	488	355
422	I-495	MD 214	285	561	978	1006	962	1183	1313	1348	1218	920
423	MD 214 EB	I-495	336	491	625	593	572	766	760	657	478	383
424	MD 214 WB	I-495	287	525	606	457	404	329	273	263	335	322
425	I-495	Arena Dr	194	381	499	703	601	625	661	704	741	612
426	Arena Dr	I-495	30	93	169	188	182	231	241	268	268	198
427	I-495	MD 202	386	732	1080	1213	824	979	1101	1218	1002	711
428	MD 202 EB	I-495	132	171	176	222	138	231	195	149	144	180
429	MD 202	I-495	497	890	1239	1188	1003	1176	1288	1279	987	822
430	I-495	US 50 EB	543	851	1031	1078	1120	1811	1884	1653	1524	1170
431	I-495	US 50 WB	836	958	967	866	934	709	668	757	827	668
432	US 50	I-495	1495	2393	2664	2500	2449	2426	2307	2295	1962	1655
433	I-495	MD 450 EB	208	533	752	784	702	808	929	963	785	774
434	I-495	MD 450 WB	84	191	202	283	257	325	330	307	408	331
435	MD 450	I-495	620	792	894	731	586	788	812	860	716	655
436	I-495	MD 295 NB/MD 193 EB	1204	1619	1515	1547	1626	1187	1181	1132	1407	1261
437	MD 295	I-495	707	995	1187	1126	893	1364	1279	1055	1176	1225
438	I-495	MD 295 SB	16	23	27	37	52	50	42	37	44	58
439	MD 295 SB	I-495	424	566	608	536	477	636	739	749	587	439
440	I-495	MD 201	683	1093	1486	1572	1162	991	991	1059	974	666
441	MD 201 NB	I-495	482	691	603	519	483	935	1061	1078	835	600
442	MD 201 SB	I-495	76	118	135	126	131	179	207	279	191	125
443	I-495	Greenbelt Metro Station	12	30	58	55	39	167	321	548	489	207
444	I-495	US 1	277	651	1150	1080	720	789	845	859	831	679
445	US 1 NB	I-495	92	260	423	418	299	282	302	350	291	273
446	US 1 SB	I-495	207	347	347	380	389	595	595	546	521	438
447	I-495	I-95 NB/Park and Ride Lot	1046	2364	3711	3825	2683	4050	4391	4481	3886	3334
448	Park and Ride Lot	I-495	49	61	97	89	95	67	50	34	14	10
449	I-95 SB	I-495	2600	3093	2286	1928	1614	2959	3093	3093	2600	2197
450	I-495	MD 650 NB	307	540	635	689	703	713	773	850	733	604
451	MD 650 NB	I-495	326	262	319	236	224	500	476	557	487	444
452	I-495	MD 650 SB	363	660	663	750	650	870	916	879	900	737
453	MD 650 SB	I-495	190	317	415	330	395	552	629	692	478	302
454	I-495	MD 193 WB	203	360	350	390	405	679	764	846	826	716
455	MD 193 WB	I-495	525	740	597	565	438	509	478	366	366	366
456	US 29 NB	I-495	9	41	104	226	331	185	212	258	241	214
457	I-495	US 29 SB	210	403	377	352	517	414	379	409	461	424
458	US 29 SB	I-495	551	1266	1475	1265	1277	879	794	882	941	703
459	I-495	MD 97	472	435	287	365	596	889	1145	1264	1056	804
460	MD 97 NB	I-495	214	470	1041	1285	873	923	896	865	911	693
461	MD 97 SB	I-495	266	544	918	1060	722	471	390	320	335	364
462	I-495	MD 185	1160	1765	1452	1512	1596	877	1015	1109	1020	694
463	MD 185 NB	I-495	78	235	653	975	683	843	771	789	717	542
464	MD 185 SB	I-495	280	540	721	724	588	429	384	320	306	279
465	I-495	MD 355 NB	522	723	838	832	904	836	990	1061	839	662
466	I-495	I-270 NB	1156	2170	2860	2525	2640	2984	3280	3101	3043	3190
467	MD 355 NB	I-495	88	199	389	402	341	486	324	268	203	231
468	I-495	MD 187	124	327	467	497	432	342	490	546	409	264
469	MD 187	I-495	112	223	406	492	417	515	588	575	461	335
470	I-270 Spur SB	I-495	3017	4988	4926	4434	4495	4003	2833	2217	2155	2771
471	MD 190 WB	I-495	90	250	423	653	532	626	597	554	615	470
472	I-495	MD 190	364	832	1125	1004	978	810	679	773	937	669
473	MD 190 EB	I-495	107	459	705	630	556	289	251	246	219	150
474	I-495	Cabin John Pkwy	902	1523	925	1042	1335	246	152	141	152	363
475	I-495	Clara Barton Pkwy WB	180	183	162	101	114	58	34	27	72	57
476	Clara Barton Pkwy	I-495	85	264	695	1304	1049	1092	1401	1317	945	432

2025 No-Build Travel Demand

I-495 2025 No-Build Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	7930	8445	7900	7485	5695	6730	6880	6180	7150	6980	7215	6165	6045	6285	5865	5800
AMERICAN LEGION BRIDGE	8060	9490	9175	8610	7795	9115	8950	8240	8920	8760	8965	7850	8650	8945	8735	8300
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	7785	9055	8765	8350	8050	8850	8145	7695	8065	7565	7475	6745	7555	7510	7375	7160
BETWEEN MD 190 AND I-270	7585	9200	9310	8890	9480	10490	9380	8855	8925	9155	8740	7825	7845	7985	7835	7195
BETWEEN I-270 WEST AND MD 187	4350	4555	4195	4230	3920	4705	4150	4295	3905	3850	3635	2930	4375	4275	4225	3855
BETWEEN I-270 EAST AND MD 187	4100	4230	3900	4065	3755	4430	3890	4135	3770	3720	3495	2765	4105	4055	4070	3480
BETWEEN MD 355 AND MD 185	6530	8305	7615	7210	6635	7920	8420	8105	7560	7615	7200	6165	8170	7980	8130	7545
BETWEEN MD 185 AND MD 97	6060	7930	7710	7085	7800	8400	8360	8375	8550	8520	7950	6900	7960	8020	8145	7415
BETWEEN MD 97 AND US 29	5635	7550	7365	6890	9190	8650	7130	7525	8905	8815	8085	6915	7600	7890	8120	7100
BETWEEN MD US 29 AND MD 193	5515	7145	7065	6530	8235	7385	6005	6365	8450	8515	7780	6525	6905	7260	7335	6250
BETWEEN MD 193 AND MD 650	5855	7575	7585	6810	8000	6965	5680	6160	8545	8700	8070	6980	7145	7570	7850	6610
BETWEEN MD 650 AND I-95	7175	8610	8035	7205	8575	7480	6445	6785	9140	9275	8605	7635	7500	8055	8255	7060
BETWEEN US 1 AND I-95	6775	7745	7385	6800	7750	7995	7215	6855	6450	7200	6820	5105	8960	9480	8945	7705
BETWEEN GREENBELT STATION AND US 1	7475	8895	8655	7780	8130	8480	7370	6765	7665	8160	7835	6515	8365	8835	8080	7060
BETWEEN GREENBELT STATION AND MD 201	7125	8530	8315	7455	8230	8640	7495	6860	7675	8140	7810	6505	8700	9350	8605	6900
BETWEEN MD 201 AND MD 295	6635	7750	8025	7275	8540	9315	8105	7345	7560	8075	7725	6545	8295	8845	8020	6330
BETWEEN MD 295 AND MD 450	6020	6960	7380	6600	8585	9230	8190	7690	7755	8290	7870	6225	7380	7585	6960	5910
BETWEEN MD 450 AND US 50	6460	7325	8040	7150	8760	9480	8670	8115	8340	8945	8530	6970	7930	8165	7510	6370
BETWEEN US 50 AND MD 202	7380	8125	8770	7885	8220	8990	7935	7575	8550	9035	9125	7620	8000	8280	7600	6490
BETWEEN MD 202 AND ARENA DR	7270	7780	8375	7600	7930	8760	7775	7280	8180	8635	8735	7635	7990	8290	7720	6700
BETWEEN ARENA DR AND MD 214	7265	7840	8230	7535	8020	8870	7995	7345	8200	8430	8420	7485	7915	8210	7710	6675
BETWEEN MD 214 AND RITCHIE MARLBORO RD	7245	7710	7755	7295	7695	8930	7935	7060	7765	8380	8340	7330	7965	8400	8015	6980
BETWEEN RITCHIE MARLBORO AND MD 4	7380	7820	7740	7380	6790	7920	7195	6770	6320	6945	7440	6930	7965	8345	8020	6870
BETWEEN MD 4 AND FORESTVILLE RD	6975	6885	7490	6730	6030	7240	6385	5975	5755	6740	7000	6730	7645	7685	7590	6435
BETWEEN FORESTVILLE AND MD 218	6215	6255	6820	6165	5310	6125	5325	5250	5260	6235	6525	6160	6595	6530	6455	5550
BETWEEN MD 218 AND MD 5	6415	6470	7075	6410	6050	6910	6040	5660	5755	6900	7100	6610	6965	6925	6885	5940
BETWEEN MD 5 AND MD 414	6900	5635	6225	5835	4790	5675	5025	4665	4755	5755	5995	5395	7025	6935	6900	6020
BETWEEN MD 414 AND MD 210	7320	5780	6230	5690	4715	5470	4970	4565	4560	5505	5755	4995	7440	7625	7595	6615
BETWEEN MD 210 AND I-295	8490	6770	6950	6090	4525	5345	4735	4285	4740	5795	5905	5135	7565	7820	7830	6915
WOODROW WILSON BRIDGE	10480	10210	9760	7465	7755	8940	8165	7090	7195	8605	8560	7605	9470	9525	9680	8900

I-270 2025 No-Build Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3325	3450	3215	3035	1670	2675	2805	2405	2075	2480	2850	2710	4170	4865	4650	3760
BETWEEN MD 80 AND MD 109	3615	3905	3520	3305	1440	2250	2425	2105	1910	2310	2645	2495	3970	4780	4740	3835
BETWEEN MD 109 AND MD 121	4100	4435	3975	3660	1515	2320	2470	2160	2015	2420	2765	2545	4035	4870	4855	4060
BETWEEN MD 121 AND MD 27	5195	5260	4685	4360	1815	2510	2635	2410	2445	2835	3285	3020	4540	5495	5555	4840
BETWEEN MD 27 AND MD 118	6110	5310	4770	4790	1815	2510	2635	2410	2935	3280	3460	3425	4540	5495	5555	4840
BETWEEN MD 118 AND MIDDLEBROOK RD	6660	5830	5420	5260	2120	3110	3615	3355	3460	3885	4085	4010	6590	7310	7380	6670
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	8550	7705	7100	6670	2345	3500	3915	3580	4405	4825	5250	5025	8415	9015	8860	8255
BETWEEN WATKINS MILL AND MD 124	7710	6695	5830	5445	2330	3785	4440	4060	3750	4170	4685	4435	8240	8770	8910	8260
BETWEEN MD 124 AND MD 117	9385	8210	7490	6825	2375	3880	4780	4435	4695	5130	5630	5235	8825	9695	9825	9155
BETWEEN MD 117 AND I-370	11100	10100	9250	8370	2900	4805	6235	5640	6020	6810	7375	6550	10065	11020	10990	10270
BETWEEN I-370 AND SHADY GROVE RD	9900	10080	9185	8650	2555	4100	5420	5170	5845	6090	6620	6180	10370	11405	10880	10385
BETWEEN SHADY GROVE RD AND MD 28	9900	9590	8590	8150	3175	5025	6835	6370	6410	6825	7655	6825	10590	11425	10930	10310
BETWEEN MD 28 AND MD 189	10615	10500	9410	9005	3625	5900	8260	7610	7235	7635	8515	7720	10970	12065	11730	11095
BETWEEN MD 189 AND MONTROSE RD	10630	10675	9625	9145	3705	5880	8295	7655	6970	7380	8070	7460	10925	11975	11920	11290
BETWEEN MONTROSE RD AND I-270 SPLIT	9690	11220	10355	9430	4395	6365	8680	7915	6955	7565	7850	7215	10830	11815	11855	11055
BETWEEN I-270 SPLIT AND MD 187	3945	5320	4885	4240	1895	2685	4075	3630	3385	3560	3585	3520	4745	5280	5320	5090
BETWEEN MD 187 AND I-495	3425	4610	4085	3720	2420	3435	4575	4015	3580	3770	3725	3470	4190	4420	4490	4610
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5745	5900	5470	5195	2500	3680	4605	4285	3575	4010	4265	3695	6085	6540	6540	5965
BETWEEN DEMOCRACY BLVD AND I-495	5560	5785	5230	4560	2865	4250	5115	4660	3470	3710	3610	3340	5020	5305	5105	4895

2040 No-Build Travel Demand

I-495 2040 No-Build Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	8680	9005	8580	8300	5695	6730	6880	6180	7765	7445	7700	6850	6540	6675	6265	6360
AMERICAN LEGION BRIDGE	8060	9490	9175	8610	7795	9115	8950	8240	9605	9295	9520	8605	9330	9530	9330	9030
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	8520	9560	9400	9120	8865	9385	8605	8405	8610	7945	7835	7275	8085	7910	7800	7735
BETWEEN MD 190 AND I-270	8290	9690	9910	9635	10335	11075	9855	9575	9565	9630	9165	8410	8345	8365	8235	7720
BETWEEN I-270 WEST AND MD 187	4835	4740	4395	4635	4440	4895	4300	4750	4245	4005	3745	3185	4605	4440	4340	4055
BETWEEN I-270 EAST AND MD 187	4565	4395	4075	4445	4275	4620	4045	4590	4105	3860	3595	3005	4325	4210	4180	3665
BETWEEN MD 355 AND MD 185	7160	8645	7955	7765	7275	8245	8765	8840	8080	7940	7465	6575	8520	8265	8420	7910
BETWEEN MD 185 AND MD 97	6665	8205	8010	7595	8285	8730	8870	9000	9060	8830	8190	7290	8265	8265	8470	7735
BETWEEN MD 97 AND US 29	5955	7745	7585	7235	9565	8885	7565	7920	9390	9100	8290	7265	7915	8090	8380	7365
BETWEEN MD US 29 AND MD 193	5695	7305	7250	6840	8510	7505	6185	6640	8995	8755	7945	6830	7135	7440	7500	6455
BETWEEN MD 193 AND MD 650	6115	7765	7810	7150	8265	7065	5845	6425	9195	9065	8250	7315	7405	7815	8015	6840
BETWEEN MD 650 AND I-95	7445	8825	8280	7595	8880	7605	6585	7075	9800	9575	8800	7975	7765	8310	8420	7300
BETWEEN US 1 AND I-95	7080	8035	7705	7295	8030	8195	7440	7210	6410	7260	6960	5305	9340	9850	9145	8030
BETWEEN GREENBELT STATION AND US 1	8025	9225	9020	8400	8285	8555	7495	7035	7680	8240	8010	6765	8715	9170	8255	7350
BETWEEN GREENBELT STATION AND MD 201	7560	8735	8565	7965	8350	8715	7605	7110	7620	8140	7905	6680	8490	8840	7910	7020
BETWEEN MD 201 AND MD 295	7035	8045	8330	7715	8825	9620	8390	7745	7580	8175	7900	6810	8590	9155	8295	6680
BETWEEN MD 295 AND MD 450	6380	7205	7635	6985	8850	9510	8460	8090	7760	8360	8015	6455	7620	7825	7170	6225
BETWEEN MD 450 AND US 50	6765	7580	8315	7505	9015	9755	8950	8525	8355	9025	8690	7230	8195	8460	7710	6685
BETWEEN US 50 AND MD 202	7725	8410	9070	8265	8560	9250	8165	7965	8540	9085	9280	7885	8285	8595	7815	6795
BETWEEN MD 202 AND ARENA DR	7585	8080	8695	8000	8170	9065	8060	7640	8175	8690	8910	7930	8300	8635	7985	7020
BETWEEN ARENA DR AND MD 214	7580	8175	8575	7960	8280	9260	8355	7885	8235	8520	8640	7820	8250	8585	8005	7020
BETWEEN MD 214 AND RITCHIE MARLBORO RD	7590	8080	8120	7750	8010	9355	8325	7605	7810	8510	8595	7700	8340	8830	8380	7405
BETWEEN RITCHIE MARLBORO AND MD 4	7735	8210	8115	7850	7055	8285	7520	7110	6315	7060	7700	7290	8355	8780	8400	7285
BETWEEN MD 4 AND FORESTVILLE RD	7300	7240	7870	7170	6345	7565	6650	6260	5720	6855	7240	7085	8035	8100	7965	6825
BETWEEN FORESTVILLE AND MD 218	6500	6580	7165	6575	5495	6345	5500	5445	5205	6325	6745	6490	6900	6845	6745	5825
BETWEEN MD 218 AND MD 5	6710	6805	7435	6835	6320	7215	6295	5905	5725	7025	7355	6960	7325	7290	7225	6260
BETWEEN MD 5 AND MD 414	7200	5940	6555	6245	5020	5950	5265	4885	4690	5835	6210	5705	7455	7335	7290	6370
BETWEEN MD 414 AND MD 210	7685	6125	6595	6115	4965	5765	5230	4805	4515	5595	5980	5300	7925	8095	8055	7030
BETWEEN MD 210 AND I-295	8910	7170	7345	6520	4760	5620	4970	4505	4700	5900	6130	5440	8005	8285	8285	7305
WOODROW WILSON BRIDGE	11105	10910	10360	8145	8265	9530	8705	7560	7370	8955	9020	8125	10095	10155	10320	9485

I-270 2040 No-Build Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3640	3750	3465	3300	1855	2935	3070	2660	2230	2700	3070	2990	4565	5315	5035	4105
BETWEEN MD 80 AND MD 109	3955	4240	3795	3590	1555	2430	2615	2270	2045	2490	2845	2745	4315	5195	5120	4170
BETWEEN MD 109 AND MD 121	4520	4835	4325	4035	1640	2510	2670	2335	2170	2615	2985	2805	4410	5325	5255	4440
BETWEEN MD 121 AND MD 27	5650	5745	5110	4835	2045	2730	2880	2655	2685	3095	3570	3375	4990	6045	6065	5330
BETWEEN MD 27 AND MD 118	6565	5760	5180	5270	2045	2730	2880	2655	3225	3585	3760	3795	4990	6045	6065	5330
BETWEEN MD 118 AND MIDDLEBROOK RD	7120	6305	5865	5760	2380	3365	3920	3660	3790	4230	4420	4405	7195	8000	8040	7310
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9145	8320	7675	7300	2800	4140	4890	4495	4815	5255	5675	5500	8650	9480	9535	8875
BETWEEN WATKINS MILL AND MD 124	7895	7045	6450	6100	2655	4255	5215	4790	3905	4325	4785	4625	8075	8995	9315	8625
BETWEEN MD 124 AND MD 117	9775	8670	7835	7335	2590	4250	5340	4960	5035	5500	6150	5685	8605	9900	10210	9510
BETWEEN MD 117 AND I-370	11585	10665	9695	8965	3145	5230	6875	6235	6440	7275	7990	7070	10480	11585	11705	10940
BETWEEN I-370 AND SHADY GROVE RD	10485	10770	9710	9250	2775	4490	5995	5735	6275	6510	7185	6690	11010	12170	11700	11185
BETWEEN SHADY GROVE RD AND MD 28	10480	10270	9120	8735	3440	5495	7540	7050	6920	7315	8305	7445	11285	12250	11795	11135
BETWEEN MD 28 AND MD 189	11290	11265	10060	9685	3945	6440	9080	8390	7835	8210	9260	8435	11735	12975	12695	12020
BETWEEN MD 189 AND MONTROSE RD	11280	11405	10250	9805	4010	6360	9050	8375	7510	7890	8725	8100	11660	12790	12795	12130
BETWEEN MONTROSE RD AND I-270 SPLIT	10330	11960	11005	10060	4725	6850	9405	8620	7455	8045	8445	7810	11525	12550	12640	11805
BETWEEN I-270 SPLIT AND MD 187	4210	5625	5160	4525	2005	2845	4340	3945	3575	3760	3790	3720	5015	5555	5635	5390
BETWEEN MD 187 AND I-495	3650	4850	4295	3960	2550	3610	4830	4330	3765	3960	3915	3655	4430	4645	4755	4875
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6120	6335	5845	5535	2720	4005	5065	4675	3880	4285	4655	4090	6510	6995	7005	6415
BETWEEN DEMOCRACY BLVD AND I-495	5895	6180	5555	4825	3085	4555	5515	5000	3740	3925	3895	3665	5320	5625	5420	5225

2040 Alt 5 Travel Demand

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	9640	9960	9460	9155	7670	8435	8425	8250	5880	6240	6570	5820	7860	7845	7340	7570
AMERICAN LEGION BRIDGE	9715	11175	11365	10965	10020	11080	10890	10495	9025	9495	9830	8835	10265	10375	10155	9935
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	9055	10185	10440	10130	9840	10415	9555	9330	8210	8250	8185	7575	8975	8780	8660	8585
BETWEEN MD 190 AND I-270	8495	9970	10630	10335	11190	11970	10635	10330	10260	10330	9835	9025	9045	9080	8945	8390
BETWEEN I-270 WEST AND MD 187	5790	5850	5375	5655	5480	6045	5310	5865	4590	4430	4280	3570	5435	5240	5125	4785
BETWEEN I-270 EAST AND MD 187	5520	5505	5055	5465	5295	5835	5230	5670	4720	4540	4360	3575	5360	5215	5185	4545
BETWEEN MD 355 AND MD 185	8375	10110	9305	9080	8490	9635	10235	10325	9450	9285	8730	7690	9205	9490	9800	9225
BETWEEN MD 185 AND MD 97	7840	9680	9290	8945	9495	10135	10240	10505	10580	10325	9580	8525	8910	9490	9850	9025
BETWEEN MD 97 AND US 29	7065	9165	8750	8535	8935	8760	8410	8970	10945	10630	9675	8475	8660	9390	9790	8615
BETWEEN MD US 29 AND MD 193	6935	8890	8530	8280	8070	7495	6945	7665	10710	10420	9410	8115	8150	8850	8990	7795
BETWEEN MD 193 AND MD 650	7210	9160	8975	8475	7750	6985	6515	7450	10825	10660	9660	8590	8560	9215	9450	8100
BETWEEN MD 650 AND I-95	8670	10255	9480	8950	8820	7825	7340	8095	11410	11140	10200	9265	9035	9665	9790	8525
BETWEEN US 1 AND I-95	7325	8325	7945	7505	7710	7605	7420	7425	7840	8035	7370	5805	9770	10300	9550	8425
BETWEEN GREENBELT STATION AND US 1	8615	9925	9605	8975	8165	8235	7755	7430	9515	9355	8750	7575	9415	9900	8910	7965
BETWEEN GREENBELT STATION AND MD 201	8145	9430	9145	8585	8230	8450	7920	7510	9455	9255	8645	7490	9195	9570	8565	7630
BETWEEN MD 201 AND MD 295	7615	8735	8905	8330	8720	9400	8750	8180	9420	9295	8645	7640	9060	9255	8085	7205
BETWEEN MD 295 AND MD 450	7145	8045	8395	7805	8990	9550	9080	8790	9940	9375	8585	7320	8280	8240	7280	7040
BETWEEN MD 450 AND US 50	7500	8380	9020	8290	8825	9485	9255	9075	10165	9670	8970	8055	8795	8825	7775	7450
BETWEEN US 50 AND MD 202	8685	9385	10000	9250	8720	9285	8635	8780	10280	9605	9595	8915	9040	9120	8020	7695
BETWEEN MD 202 AND ARENA DR	8530	9035	9590	8955	8575	9275	8670	8555	9675	8935	9185	8965	8815	8965	8055	7795
BETWEEN ARENA DR AND MD 214	8585	9230	9600	9005	8860	9780	9170	8910	9755	8860	9000	8965	8875	9025	8185	7900
BETWEEN MD 214 AND RITCHIE MARLBORO RD	8595	9135	9145	8805	8610	9915	9145	8655	9300	8880	8985	8860	9160	9525	8960	8350
BETWEEN RITCHIE MARLBORO AND MD 4	8415	9070	8945	8675	7690	8920	8110	7945	8310	8355	8715	8435	9030	9310	8835	8075
BETWEEN MD 4 AND FORESTVILLE RD	8075	8445	8935	8190	6850	8220	7215	6985	7625	8100	8175	8180	8740	8795	8475	7575
BETWEEN FORESTVILLE AND MD 218	7310	7715	8160	7535	5935	6930	5995	6090	7075	7540	7655	7550	7635	7475	7290	6570
BETWEEN MD 218 AND MD 5	7510	7925	8410	7775	6720	7750	6745	6525	7555	8210	8220	7965	8090	7875	7700	6940
BETWEEN MD 5 AND MD 414	7205	5975	6610	6350	4940	6000	5280	5035	5945	6395	6415	6090	7660	7530	7485	6570
BETWEEN MD 414 AND MD 210	7690	6130	6605	6160	5030	5925	5280	4975	5750	6130	6160	5655	8135	8300	8265	7245
BETWEEN MD 210 AND I-295	8925	7180	7355	6560	4700	5625	4860	4525	5750	6235	6105	5610	7985	8255	8270	7305
WOODROW WILSON BRIDGE	11120	10915	10360	8165	8155	9485	8545	7540	8340	9220	8935	8230	9960	10025	10195	9385

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3865	3695	3415	3255	1825	2895	3025	2620	2195	2660	3030	2950	4495	5235	4955	4040
BETWEEN MD 80 AND MD 109	3895	4175	3735	3535	1530	2390	2575	2235	2010	2450	2805	2705	4245	5115	5040	4105
BETWEEN MD 109 AND MD 121	4455	4765	4265	3980	1615	2470	2630	2300	2135	2575	2945	2765	4340	5245	5175	4375
BETWEEN MD 121 AND MD 27	5585	5675	5050	4775	2020	2695	2840	2620	2650	3055	3530	3335	4920	5965	5985	5265
BETWEEN MD 27 AND MD 118	6500	5650	5080	5170	2020	2695	2840	2620	3170	3520	3695	3735	4920	5965	5985	5265
BETWEEN MD 118 AND MIDDLEBROOK RD	7055	6195	5765	5660	2340	3310	3855	3600	3735	4165	4355	4345	7065	7865	7900	7190
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9030	8210	7525	7200	2760	4085	4825	4435	4760	5190	5610	5440	8520	9345	9395	8755
BETWEEN WATKINS MILL AND MD 124	8130	7135	6300	6000	2615	4195	5145	4730	3850	4260	4720	4565	7945	8860	9175	8505
BETWEEN MD 124 AND MD 117	9660	8560	7685	7240	2530	4150	5215	4845	4980	5435	6085	5625	8405	9680	9990	9295
BETWEEN MD 117 AND I-370	11430	10435	9450	8780	3085	5130	6745	6115	6315	7120	7830	6930	9980	11365	11485	10725
BETWEEN I-370 AND SHADY GROVE RD	10315	10595	9550	9100	2735	4425	5905	5650	6265	6435	7030	6555	10830	11975	11510	11005
BETWEEN SHADY GROVE RD AND MD 28	10115	9895	8785	8415	3310	5290	7260	6790	6750	7070	7950	7145	10865	11795	11355	10720
BETWEEN MD 28 AND MD 189	10630	10770	9615	9260	3785	6175	8705	8050	7665	7905	8760	8000	11625	12830	12560	11910
BETWEEN MD 189 AND MONTROSE RD	10700	10985	9875	9440	3870	6140	8735	8080	7415	7665	8325	7745	11440	12535	12540	11895
BETWEEN MONTROSE RD AND I-270 SPLIT	9930	11490	10580	9665	4540	6580	9040	8280	7545	7950	8115	7530	11140	12145	12240	11420
BETWEEN I-270 SPLIT AND MD 187	4010	5360	4915	4310	1910	2710	4135	3755	3870	3915	3790	3765	4775	5290	5365	5135
BETWEEN MD 187 AND I-495	3455	4600	4065	3750	2370	3400	4585	4110	4030	4085	3885	3680	4205	4410	4515	4625
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	5925	6110	5625	5325	2630	3870	4905	4525	3655	4010	4295	3735	6365	6855	6875	6285
BETWEEN DEMOCRACY BLVD AND I-495	5710	5925	5325	4465	2705	4120	5255	4680	3610	3840	3820	3605	5670	5900	5555	5455

2040 Alt 8 Travel Demand

I-495 2040 Alt 8 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	10645	10995	10450	10110	8560	9360	9355	9195	8110	8625	8970	8010	8330	8385	7850	8090
AMERICAN LEGION BRIDGE	10735	12350	12560	12115	11000	12165	11960	11525	9970	10495	10865	9765	11270	11390	11150	10905
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	10150	11470	11770	11370	11015	11670	10700	10500	9255	9295	9230	8540	10050	9830	9695	9615
BETWEEN MD 190 AND I-270	10035	11820	12680	12215	12955	14205	12490	12270	12120	12240	11665	10715	10775	10760	10630	10010
BETWEEN I-270 WEST AND MD 187	6545	6700	6335	6445	6480	7155	6140	6785	5915	5860	5355	4705	6465	6285	6175	5825
BETWEEN I-270 EAST AND MD 187	6305	6540	6195	6395	6325	7180	6350	6820	5980	5885	5400	4665	6370	6255	6295	5675
BETWEEN MD 355 AND MD 185	9650	11760	10780	10520	9700	10975	11735	11940	10620	10815	10170	8860	10800	11235	11495	10815
BETWEEN MD 185 AND MD 97	9090	11260	10795	10310	10590	11370	11800	12045	11600	11700	10890	9575	10575	11260	11570	10665
BETWEEN MD 97 AND US 29	8275	10700	10280	9855	9965	9985	10035	10515	11885	11925	10940	9500	10290	11100	11440	10230
BETWEEN MD US 29 AND MD 193	8225	10460	10115	9435	9090	8570	8315	8795	11465	11640	10625	8955	9725	10560	10640	9280
BETWEEN MD 193 AND MD 650	8430	10670	10440	9565	8625	7945	7780	8495	11485	11710	10710	9260	9910	10615	10840	9320
BETWEEN MD 650 AND I-95	9755	11705	10850	9965	9330	8595	8405	8930	12060	12180	11235	9900	10325	11020	11155	9695
BETWEEN US 1 AND I-95	7800	8800	8285	8035	7825	7680	7965	7730	7935	8290	7705	5845	10225	10660	10055	8750
BETWEEN GREENBELT STATION AND US 1	9060	10440	10030	9505	8310	8360	8350	7820	9610	9685	9155	7695	9895	10275	9435	8345
BETWEEN GREENBELT STATION AND MD 201	8765	10070	9685	9170	8485	8635	8570	8000	9735	9740	9210	7760	9790	10060	9210	8125
BETWEEN MD 201 AND MD 295	8445	9580	9670	9130	9205	9820	9615	8885	9805	9895	9305	7980	9805	9910	8895	7860
BETWEEN MD 295 AND MD 450	8090	9080	9205	8575	9670	10210	10085	9565	10265	9965	9285	7750	9125	9050	8215	7835
BETWEEN MD 450 AND US 50	8530	9520	9960	9160	9605	10235	10385	9945	10690	10435	9835	8610	9825	9815	8885	8425
BETWEEN US 50 AND MD 202	9825	10640	11005	10190	9665	10125	9830	9715	10740	10345	10415	9420	10135	10170	9170	8710
BETWEEN MD 202 AND ARENA DR	9795	10400	10755	10015	9660	10290	10045	9620	10360	9915	10255	9680	10025	10145	9345	8910
BETWEEN ARENA DR AND MD 214	9760	10510	10640	9975	9910	10715	10435	9930	10355	9775	10010	9590	10000	10120	9395	8935
BETWEEN MD 214 AND RITCHIE MARLBORO RD	9755	10375	10120	9735	9620	10790	10335	9630	9905	9710	9930	9420	10175	10480	10005	9255
BETWEEN RITCHIE MARLBORO AND MD 4	9300	10055	9540	9425	8480	9570	8950	8755	8685	8890	9385	8800	9630	9840	9565	8635
BETWEEN MD 4 AND FORESTVILLE RD	8700	9130	9305	8715	7445	8635	7855	7615	8015	8615	8860	8540	9125	9135	9010	7965
BETWEEN FORESTVILLE AND MD 218	7975	8415	8560	8090	6570	7390	6665	6765	7480	8060	8325	7900	8050	7880	7855	6980
BETWEEN MD 218 AND MD 5	8135	8575	8770	8295	7305	8190	7365	7115	7865	8895	9095	8560	8520	8305	8280	7365
BETWEEN MD 5 AND MD 414	7255	6065	6440	6365	5050	6025	5505	5170	5805	6315	6550	5950	7990	7810	7830	6805
BETWEEN MD 414 AND MD 210	7690	6210	6360	6080	5040	5830	5385	5015	5520	6405	6645	5865	8350	8455	8465	7350
BETWEEN MD 210 AND I-295	8965	7230	7150	6475	4665	5520	4955	4580	5385	5895	6010	5230	8045	8230	8275	7300
WOODROW WILSON BRIDGE	11160	11025	10160	8090	8205	9465	8725	7665	8045	8940	8890	7905	10130	10005	10220	9425

I-270 2040 Alt 8 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3685	3850	3560	3390	1860	2940	3075	2665	2270	2745	3115	3030	4630	5370	5085	4150
BETWEEN MD 80 AND MD 109	4050	4340	3890	3680	1560	2435	2620	2275	2080	2530	2885	2780	4375	5245	5165	4210
BETWEEN MD 109 AND MD 121	4625	4945	4430	4135	1650	2520	2680	2345	2210	2655	3030	2840	4480	5385	5310	4490
BETWEEN MD 121 AND MD 27	5750	5900	5255	4980	2090	2780	2930	2705	2770	3185	3670	3465	5125	6180	6195	5455
BETWEEN MD 27 AND MD 118	6665	5840	5325	5415	2090	2780	2930	2705	3310	3675	3860	3885	5125	6180	6195	5455
BETWEEN MD 118 AND MIDDLEBROOK RD	7225	6345	5970	5915	2430	3425	3980	3720	3885	4330	4535	4505	7345	8150	8190	7450
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9275	8380	7795	7470	2855	4210	4965	4565	4920	5365	5800	5610	8820	9650	9705	9040
BETWEEN WATKINS MILL AND MD 124	8050	7130	6595	6295	2725	4350	5330	4900	4030	4455	4930	4755	8305	9235	9550	8850
BETWEEN MD 124 AND MD 117	9970	8795	8020	7565	2670	4365	5485	5095	5190	5660	6330	5845	8875	10190	10495	9780
BETWEEN MD 117 AND I-370	11815	10835	9990	9295	3255	5395	7090	6435	6685	7545	8285	7330	10545	11980	12095	11310
BETWEEN I-370 AND SHADY GROVE RD	11170	11475	10350	9865	2960	4770	6365	6090	6905	7155	7875	7340	11750	12945	12480	11940
BETWEEN SHADY GROVE RD AND MD 28	11270	11125	9910	9490	3730	5945	8175	7620	7720	8140	9200	8265	12230	13240	12805	12070
BETWEEN MD 28 AND MD 189	12200	12390	11100	10670	4370	7080	10005	9245	8840	9250	10395	9485	13330	14620	14370	13640
BETWEEN MD 189 AND MONTROSE RD	12215	12560	11315	10770	4465	7040	10065	9270	8475	8890	9795	9105	13045	14220	14260	13540
BETWEEN MONTROSE RD AND I-270 SPLIT	11485	13305	12220	11095	5330	7630	10610	9690	8525	9215	9640	8915	12920	13950	14100	13165
BETWEEN I-270 SPLIT AND MD 187	4840	6170	5610	5135	2290	3205	4955	4500	4005	4210	4245	4165	5725	6340	6430	6150
BETWEEN MD 187 AND I-495	4260	5500	4860	4625	2865	3790	5640	5050	4260	4480	4440	4140	5155	5480	5580	5645
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6645	7135	6610	5960	3040	4425	5655	5190	4520	5005	5395	4750	7195	7610	7670	7015
BETWEEN DEMOCRACY BLVD AND I-495	6475	7050	6350	5485	3490	5120	6345	5770	4310	4475	4455	4185	6205	6380	6310	6010

2040 Alt 9 Travel Demand

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	10340	10910	10390	10025	8240	9280	9700	9515	5570	6180	6460	5795	8640	8600	8055	8285
AMERICAN LEGION BRIDGE	10365	12065	12280	11740	10750	11915	11910	11425	9605	10175	10545	9450	11020	11140	10900	10610
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	9810	11215	11495	11020	10550	11255	10675	10375	8910	9035	9015	8260	9875	9680	9530	9390
BETWEEN MD 190 AND I-270	9805	11595	12155	11785	12310	13275	11980	11700	11270	11425	10930	9930	10560	10480	10270	9770
BETWEEN I-270 WEST AND MD 187	6775	7090	6725	6850	6550	7240	6545	6970	6180	5990	5690	4880	6970	6710	6530	6250
BETWEEN I-270 EAST AND MD 187	6580	6830	6405	6735	6415	7125	6555	6860	6105	5880	5580	4725	6680	6525	6460	5800
BETWEEN MD 355 AND MD 185	9740	11845	10925	10560	9710	11250	11670	11665	10595	10525	10055	8770	10820	11225	11440	10650
BETWEEN MD 185 AND MD 97	9175	11310	10900	10310	10600	11640	11720	11760	11620	11470	10825	9515	10605	11270	11530	10515
BETWEEN MD 97 AND US 29	8325	10785	10415	9895	9945	10235	9920	10200	11940	11730	10915	9475	10340	11140	11430	10120
BETWEEN MD US 29 AND MD 193	8180	10400	10115	9410	9095	8875	8360	8660	11560	11475	10590	8940	9720	10535	10610	9145
BETWEEN MD 193 AND MD 650	8405	10645	10450	9530	8670	8275	7850	8325	11575	11595	10745	9280	9920	10590	10725	9170
BETWEEN MD 650 AND I-95	9705	11665	10860	9930	9355	8910	8470	8800	12145	12065	11265	9910	10330	10990	11025	9535
BETWEEN US 1 AND I-95	7595	8500	8030	7775	7775	7880	7920	7555	7845	8075	7465	5700	10175	10765	9980	8775
BETWEEN GREENBELT STATION AND US 1	8950	10275	9930	9355	8330	8655	8340	7605	9550	9550	8980	7645	9860	10395	9355	8390
BETWEEN GREENBELT STATION AND MD 201	8590	9845	9525	8970	8510	8940	8560	7780	9625	9540	8970	7650	9755	10175	9125	8165
BETWEEN MD 201 AND MD 295	8145	9225	9390	8810	9165	9975	9475	8550	9625	9615	9005	7820	9695	9960	8765	7850
BETWEEN MD 295 AND MD 450	7770	8630	8985	8380	9600	10265	9950	9310	10175	9750	9010	7595	9040	9125	8140	7845
BETWEEN MD 450 AND US 50	8215	9070	9745	8970	9530	10295	10250	9690	10590	10225	9555	8435	9745	9895	8815	8425
BETWEEN US 50 AND MD 202	9525	10250	10800	10025	9605	10215	9720	9485	10680	10155	10155	9280	10115	10255	9125	8680
BETWEEN MD 202 AND ARENA DR	9450	10015	10565	9880	9630	10415	9980	9420	10300	9705	9985	9545	10020	10240	9305	8890
BETWEEN ARENA DR AND MD 214	9445	10110	10445	9840	9850	10800	10350	9700	10260	9535	9715	9435	9970	10190	9325	8890
BETWEEN MD 214 AND RITCHIE MARLBORO RD	9445	10000	9940	9610	9580	10890	10260	9410	2595	9505	9650	9295	10160	10565	9935	9220
BETWEEN RITCHIE MARLBORO AND MD 4	9060	9655	9410	9275	8465	9590	8900	8535	8530	8655	9070	8620	9595	9835	9515	8600
BETWEEN MD 4 AND FORESTVILLE RD	8470	8710	9180	8570	7450	8675	7810	7405	7840	8355	8530	8345	9100	9130	8970	7925
BETWEEN FORESTVILLE AND MD 218	7750	8030	8455	7955	6550	7410	6625	6560	7325	7825	8035	7750	8080	7910	7835	6965
BETWEEN MD 218 AND MD 5	7920	8210	8675	8170	7295	8210	7305	6910	7730	8370	8520	8120	8560	8345	8265	7355
BETWEEN MD 5 AND MD 414	7245	5990	6685	6595	5095	6150	5505	5030	5700	6235	6395	5920	7975	7840	7790	6755
BETWEEN MD 414 AND MD 210	7695	6140	6625	6320	5115	5965	5405	4875	5420	5915	6050	5420	8330	8490	8430	7300
BETWEEN MD 210 AND I-295	8930	7190	7380	6705	4770	5670	4990	4435	5245	5825	5885	5220	7990	8255	8270	7245
WOODROW WILSON BRIDGE	11125	10920	10360	8300	8270	9575	8720	7500	7885	8850	8750	7880	10050	10100	10280	9400

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3735	3905	3620	3450	1885	2985	3120	2705	2290	2760	3135	3045	4750	5520	5135	4190
BETWEEN MD 80 AND MD 109	4100	4395	3950	3740	1585	2480	2665	2315	2105	2550	2910	2800	4500	5400	5220	4255
BETWEEN MD 109 AND MD 121	4665	4990	4480	4185	1670	2560	2720	2380	2230	2675	3050	2860	4595	5530	5355	4525
BETWEEN MD 121 AND MD 27	5745	5900	5265	4985	2075	2780	2930	2700	2745	3155	3635	3430	5175	6250	6165	5415
BETWEEN MD 27 AND MD 118	6660	5840	5335	5420	2075	2780	2930	2700	3285	3645	3825	3850	5175	6250	6165	5415
BETWEEN MD 118 AND MIDDLEBROOK RD	7215	6335	5970	5910	2410	3415	3970	3705	3850	4290	4485	4460	7380	8205	8140	7395
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9240	8350	7780	7450	2830	4190	4940	4540	4875	5315	5740	5555	8835	9685	9635	8960
BETWEEN WATKINS MILL AND MD 124	7990	7075	6555	6250	2685	4305	5265	4835	3965	4385	4850	4680	8260	9200	9415	8710
BETWEEN MD 124 AND MD 117	9885	8715	7955	7500	2625	4310	5400	5015	5110	5575	6230	5755	8810	10130	10335	9615
BETWEEN MD 117 AND I-370	11695	10710	9885	9195	3185	5300	6955	6305	6530	7370	8090	7155	10405	11835	11850	11065
BETWEEN I-370 AND SHADY GROVE RD	10925	11250	10070	9590	2925	4740	6290	6005	6575	6820	7490	6965	11480	12655	12045	11505
BETWEEN SHADY GROVE RD AND MD 28	10930	10755	9490	9080	3595	5755	7865	7350	7225	7625	8620	7710	11745	12730	12135	11455
BETWEEN MD 28 AND MD 189	11770	11885	10615	10100	4215	6845	9675	8890	8235	8640	9720	8840	12795	14065	13595	12945
BETWEEN MD 189 AND MONTROSE RD	11750	12010	10785	10210	4275	6760	9630	8865	7910	8310	9180	8495	12515	13680	13480	12840
BETWEEN MONTROSE RD AND I-270 SPLIT	10945	12680	11630	10505	5060	7310	10005	9105	7905	8525	8955	8170	12235	13315	13265	12310
BETWEEN I-270 SPLIT AND MD 187	4645	6210	5595	4865	2210	3180	4820	4335	3940	4155	4235	4045	5545	6245	6270	5995
BETWEEN MD 187 AND I-495	4180	5575	4865	4380	2805	4060	5365	4760	4195	4445	4435	4025	5000	5405	5455	5520
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6300	6470	6035	5640	2850	4130	5185	4770	3965	4370	4720	4125	6690	7070	6995	6315
BETWEEN DEMOCRACY BLVD AND I-495	5760	6035	5435	4730	3030	4505	5430	4935	3590	3770	3740	3520	5090	5435	5240	5050

2040 Alt 10 Travel Demand

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	10715	11240	10825	10530	8545	9610	9860	9705	5735	6335	6620	5740	8605	8635	8190	8450
AMERICAN LEGION BRIDGE	10750	12405	12735	12260	11085	12305	12100	11650	9970	10540	10910	9720	11020	11200	11055	10795
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	10035	11500	11945	11475	10810	11555	10890	10550	9215	9475	9505	8610	9870	9825	9710	9610
BETWEEN MD 190 AND I-270	10055	11900	12615	12130	12695	13785	12630	12200	11800	11955	11640	10470	10690	10890	10655	10100
BETWEEN I-270 WEST AND MD 187	6475	6650	6255	6330	5940	6795	6175	6605	5630	5575	5405	4565	6425	6410	6160	5875
BETWEEN I-270 EAST AND MD 187	6255	6330	5915	6195	5850	6660	6155	6485	5600	5470	5310	4455	6170	6160	6055	5415
BETWEEN MD 355 AND MD 185	9740	11845	10925	10560	9710	11250	11670	11665	10595	10525	10055	8770	10820	11225	11440	10650
BETWEEN MD 185 AND MD 97	9175	11310	10900	10310	10600	11640	11720	11760	11620	11470	10825	9515	10605	11270	11530	10515
BETWEEN MD 97 AND US 29	8325	10785	10415	9895	9945	10235	9920	10200	11940	11730	10915	9475	10340	11140	11430	10120
BETWEEN MD US 29 AND MD 193	8180	10400	10115	9410	9095	8875	8360	8660	11560	11475	10590	8940	9720	10535	10610	9145
BETWEEN MD 193 AND MD 650	8405	10645	10450	9530	8670	8275	7850	8325	11575	11595	10745	9280	9920	10590	10725	9170
BETWEEN MD 650 AND I-95	9705	11665	10860	9930	9355	8910	8470	8800	12145	12065	11265	9910	10330	10990	11025	9535
BETWEEN US 1 AND I-95	7595	8500	8030	7775	7775	7880	7920	7555	7845	8075	7465	5700	10175	10765	9980	8775
BETWEEN GREENBELT STATION AND US 1	8950	10275	9930	9355	8330	8655	8340	7605	9550	9550	8980	7645	9860	10395	9355	8390
BETWEEN GREENBELT STATION AND MD 201	8590	9845	9525	8970	8510	8940	8560	7780	9625	9540	8970	7650	9755	10175	9125	8165
BETWEEN MD 201 AND MD 295	8145	9225	9390	8810	9165	9975	9475	8550	9625	9615	9005	7820	9695	9960	8765	7850
BETWEEN MD 295 AND MD 450	7770	8630	8985	8380	9600	10265	9950	9310	10175	9750	9010	7595	9040	9125	8140	7845
BETWEEN MD 450 AND US 50	8215	9070	9745	8970	9530	10295	10250	9690	10590	10225	9555	8435	9745	9895	8815	8425
BETWEEN US 50 AND MD 202	9525	10250	10800	10025	9605	10215	9720	9485	10680	10155	10155	9280	10115	10255	9125	8680
BETWEEN MD 202 AND ARENA DR	9450	10015	10565	9880	9630	10415	9980	9420	10300	9705	9985	9545	10020	10240	9305	8890
BETWEEN ARENA DR AND MD 214	9445	10110	10445	9840	9850	10800	10350	9700	10260	9535	9715	9435	9970	10190	9325	8890
BETWEEN MD 214 AND RITCHIE MARLBORO RD	9445	10000	9940	9610	9580	10890	10260	9410	9820	9505	9650	9295	10160	10565	9935	9220
BETWEEN RITCHIE MARLBORO AND MD 4	9060	9655	9410	9275	8465	9590	8900	8535	8530	8655	9070	8620	9595	9835	9515	8600
BETWEEN MD 4 AND FORESTVILLE RD	8470	8710	9180	8570	7450	8675	7810	7405	7840	8355	8530	8345	9100	9130	8970	7925
BETWEEN FORESTVILLE AND MD 218	7750	8030	8455	7955	6550	7410	6625	6560	7325	7825	8035	7750	8080	7910	7835	6965
BETWEEN MD 218 AND MD 5	7920	8210	8675	8170	7295	8210	7305	6910	7730	8370	8520	8120	8560	8345	8265	7355
BETWEEN MD 5 AND MD 414	7245	5990	6685	6595	5095	6150	5505	5030	5700	6235	6395	5920	7975	7840	7790	6755
BETWEEN MD 414 AND MD 210	7695	6140	6625	6320	5115	5965	5405	4875	5420	5915	6050	5420	8330	8490	8430	7300
BETWEEN MD 210 AND I-295	8930	7190	7380	6705	4770	5670	4990	4435	5245	5825	5885	5220	7990	8255	8270	7245
WOODROW WILSON BRIDGE	11125	10920	10360	8300	8270	9575	8720	7500	7885	8850	8750	7880	10050	10100	10280	9400

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3775	3940	3655	3485	1935	3030	3165	2750	2350	2820	3195	3080	4770	5540	5180	4230
BETWEEN MD 80 AND MD 109	4140	4430	3985	3775	1635	2525	2710	2360	2165	2610	2970	2835	4520	5420	5265	4295
BETWEEN MD 109 AND MD 121	4705	5025	4515	4220	1720	2605	2765	2425	2290	2735	3110	2895	4615	5550	5400	4565
BETWEEN MD 121 AND MD 27	5785	5935	5300	5020	2125	2825	2975	2745	2805	3215	3695	3465	5195	6270	6210	5455
BETWEEN MD 27 AND MD 118	6700	5875	5370	5455	2125	2825	2975	2745	3345	3705	3885	3885	5195	6270	6210	5455
BETWEEN MD 118 AND MIDDLEBROOK RD	7255	6370	6005	5945	2460	3460	4015	3750	3910	4350	4545	4495	7400	8225	8185	7435
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9340	8450	7875	7535	2890	4260	5015	4610	4950	5390	5815	5605	8905	9755	9730	9055
BETWEEN WATKINS MILL AND MD 124	8115	7225	6700	6380	2765	4405	5375	4940	4050	4485	4950	4765	8365	9315	9570	8860
BETWEEN MD 124 AND MD 117	10095	8975	8205	7725	2730	4450	5565	5170	5280	5765	6435	5920	8990	10325	10570	9845
BETWEEN MD 117 AND I-370	11895	10960	10125	9410	3300	5460	7145	6485	6710	7560	8295	7320	10610	12060	12110	11320
BETWEEN I-370 AND SHADY GROVE RD	11640	12045	10945	10385	3330	5285	6995	6675	7305	7590	8290	7680	12390	13390	13020	12285
BETWEEN SHADY GROVE RD AND MD 28	11630	11540	10345	9860	4040	6320	8625	8065	7945	8400	9430	8445	12705	13545	13170	12300
BETWEEN MD 28 AND MD 189	12670	12820	11480	11030	4815	7500	10435	9640	8985	9455	10540	9585	13800	14955	14685	13815
BETWEEN MD 189 AND MONTROSE RD	12755	13055	11830	11270	4925	7565	10535	9740	8730	9240	10105	9340	13660	14710	14750	13880
BETWEEN MONTROSE RD AND I-270 SPLIT	12135	13955	12905	11730	5955	8375	11120	10190	8805	9515	9920	9080	13475	14450	14650	13470
BETWEEN I-270 SPLIT AND MD 187	4935	6555	5925	5295	2690	3615	5120	4680	4205	4415	4350	4210	5820	6455	6525	6260
BETWEEN MD 187 AND I-495	4480	5980	5265	4890	3300	4480	5710	5170	4555	4760	4640	4260	5295	5620	5750	5815
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	7200	7400	6980	6435	3265	4760	6000	5510	4600	5100	5570	4870	7655	7995	8125	7210
BETWEEN DEMOCRACY BLVD AND I-495	6755	6990	6455	5595	3580	5250	6360	5800	4265	4480	4495	4225	6170	6380	6235	5905

2040 Alt 13B Travel Demand

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	10095	10755	10125	9685	8255	9310	9625	9505	5815	6380	6745	6060	8305	8570	8000	8225
AMERICAN LEGION BRIDGE	10125	11875	11940	11330	10855	12005	11900	11470	9775	10425	10805	9700	10770	11140	10900	10590
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	9505	10950	11060	10535	10625	11290	10585	10350	9090	9290	9255	8510	9545	9585	9445	9285
BETWEEN MD 190 AND I-270	9430	11285	11620	11195	12375	13295	11885	11670	11435	11660	11150	10165	10210	10365	10180	9605
BETWEEN I-270 WEST AND MD 187	6660	7230	6865	6845	6595	7250	6420	6885	6285	6140	5805	5075	6780	6715	6560	6245
BETWEEN I-270 EAST AND MD 187	6565	7070	6695	6880	6585	7285	6580	6900	6360	6250	5815	5040	6500	6550	6490	5815
BETWEEN MD 355 AND MD 185	9595	11865	11075	10605	9805	11230	11430	11505	10245	10150	9490	8410	10835	11295	11455	10710
BETWEEN MD 185 AND MD 97	9040	11355	11070	10355	10660	11595	11455	11575	11290	11100	10280	9155	10640	11365	11590	10585
BETWEEN MD 97 AND US 29	8185	10815	10570	9915	9985	10170	9640	9980	11595	11325	10350	9095	10350	11210	11465	10160
BETWEEN MD US 29 AND MD 193	8065	10390	10165	9430	9085	8795	8105	8450	11290	11050	10130	8575	9700	10550	10595	9175
BETWEEN MD 193 AND MD 650	8290	10645	10510	9540	8580	8120	7570	8070	11285	11155	10280	8900	9910	10610	10730	9245
BETWEEN MD 650 AND I-95	9590	11660	10920	9940	9255	8755	8190	8545	11855	11625	10800	9530	10325	11015	11035	9610
BETWEEN US 1 AND I-95	7625	8585	8105	7880	7685	7735	7745	7390	7845	8090	7495	5700	10150	10740	9970	8760
BETWEEN GREENBELT STATION AND US 1	8980	10360	10005	9460	8220	8510	8185	7445	9570	9570	9020	7655	9845	10380	9355	8385
BETWEEN GREENBELT STATION AND MD 201	8645	9945	9620	9080	8420	8815	8425	7640	9650	9565	9015	7665	9740	10160	9125	8155
BETWEEN MD 201 AND MD 295	8205	9325	9475	8920	9075	9850	9340	8410	9650	9640	9050	7835	9680	9945	8765	7840
BETWEEN MD 295 AND MD 450	7830	8720	9055	8480	9555	10150	9845	9205	10190	9795	9080	7620	9040	9140	8160	7850
BETWEEN MD 450 AND US 50	8275	9160	9815	9070	9485	10180	10145	9585	10605	10270	9625	8460	9745	9910	8835	8430
BETWEEN US 50 AND MD 202	9585	10340	10870	10125	9580	10165	9665	9465	10710	10200	10235	9305	10115	10260	9125	8685
BETWEEN MD 202 AND ARENA DR	9510	10105	10635	9980	9165	9965	9425	8940	10330	9750	10065	9570	10020	10245	9305	8895
BETWEEN ARENA DR AND MD 214	9505	10200	10515	9940	9385	10350	9795	9220	10290	9580	9795	9460	9970	10195	9325	8895
BETWEEN MD 214 AND RITCHIE MARLBORO RD	9505	10090	10010	9710	9115	10440	9705	8930	9850	9550	9730	9320	10160	10570	9935	9225
BETWEEN RITCHIE MARLBORO AND MD 4	9135	9750	9495	9380	8020	9170	8375	8085	8565	8700	9145	8650	9600	9840	9520	8605
BETWEEN MD 4 AND FORESTVILLE RD	8550	8805	9270	8675	7010	8255	7290	6965	7875	8400	8605	8375	9105	9135	8975	7930
BETWEEN FORESTVILLE AND MD 218	7830	8125	8545	8060	6110	6990	6105	6120	7360	7870	8110	7780	8085	7915	7840	6970
BETWEEN MD 218 AND MD 5	8000	8305	8765	8275	6855	7790	6785	6470	7765	8415	8595	8150	8565	8350	8270	7360
BETWEEN MD 5 AND MD 414	7345	6090	6785	6695	4630	5725	4980	4595	5740	6285	6475	5955	7975	7840	7790	6755
BETWEEN MD 414 AND MD 210	7795	6240	6725	6420	4550	5490	4880	4440	5460	5965	6130	5455	8330	8490	8430	7300
BETWEEN MD 210 AND I-295	8930	7290	7480	6805	4205	5195	4465	4000	5285	5875	5965	5255	7990	8255	8270	7245
WOODROW WILSON BRIDGE	11125	11020	10460	8400	7705	9100	8195	7065	7925	8900	8830	7915	10050	10100	10280	9400

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3770	3935	3640	3480	1855	2930	3065	2650	2195	2665	3035	2955	4740	5500	5135	4195
BETWEEN MD 80 AND MD 109	4135	4425	3970	3770	1555	2425	2610	2260	2010	2455	2810	2710	4490	5380	5220	4260
BETWEEN MD 109 AND MD 121	4700	5020	4500	4215	1640	2505	2665	2325	2135	2580	2950	2770	4585	5510	5355	4530
BETWEEN MD 121 AND MD 27	5780	5930	5285	5015	2045	2725	2875	2645	2650	3060	3535	3340	5165	6230	6165	5420
BETWEEN MD 27 AND MD 118	6695	5870	5355	5450	2045	2725	2875	2645	3190	3550	3725	3760	5165	6230	6165	5420
BETWEEN MD 118 AND MIDDLEBROOK RD	7250	6365	5990	5940	2380	3360	3915	3650	3755	4195	4385	4370	7370	8185	8140	7400
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9275	8380	7800	7480	2800	4135	4885	4485	4780	5220	5640	5465	8825	9665	9635	8965
BETWEEN WATKINS MILL AND MD 124	8430	7365	6630	6335	2660	4245	5210	4775	3780	4195	4660	4500	8255	9185	9420	8720
BETWEEN MD 124 AND MD 117	9975	8805	8030	7585	2585	4220	5305	4915	4910	5370	6025	5560	8805	10115	10340	9625
BETWEEN MD 117 AND I-370	11785	10800	9960	9280	3135	5195	6830	6180	6305	7135	7855	6935	10400	11820	11855	11075
BETWEEN I-370 AND SHADY GROVE RD	11630	11310	10095	9640	2805	4480	5960	5705	6140	6370	7045	6550	11475	12640	12050	11515
BETWEEN SHADY GROVE RD AND MD 28	11620	10795	9485	9105	3430	5440	7450	6975	6690	7075	8060	7190	11735	12660	12085	11410
BETWEEN MD 28 AND MD 189	12450	11930	10610	10135	3880	6310	8870	8160	7505	7895	8945	8110	12745	13955	13505	12860
BETWEEN MD 189 AND MONTROSE RD	12410	12040	10795	10260	3930	6180	8750	8105	7175	7560	8400	7760	12445	13550	13370	12735
BETWEEN MONTROSE RD AND I-270 SPLIT	12480	12670	11530	10505	4585	6525	8935	8165	7075	7650	7975	7375	12095	13140	13090	12130
BETWEEN I-270 SPLIT AND MD 187	4530	6035	5455	4800	2095	2985	4575	4105	3410	3590	3620	3550	5470	6155	6175	5915
BETWEEN MD 187 AND I-495	4070	5405	4730	4325	2705	3840	5040	4515	3675	3890	3825	3540	4905	5295	5335	5420
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6325	6485	6075	5705	2490	3540	4360	4060	3665	4060	4355	3825	6625	6985	6915	6215
BETWEEN DEMOCRACY BLVD AND I-495	5780	6045	5465	4785	2770	4055	4755	4350	3430	3650	3620	3360	5150	5520	5345	5090

2040 Alt 13C Travel Demand

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	10450	10655	10020	9690	8650	9455	9470	9345	5700	5955	6300	5745	8425	8450	7860	7975
AMERICAN LEGION BRIDGE	10550	12000	12125	11695	11000	12165	11960	11580	9905	10425	10795	9700	11150	11265	11000	10715
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	9945	11095	11235	10920	10820	11575	10695	10500	9185	9275	9240	8475	9930	9710	9545	9425
BETWEEN MD 190 AND I-270	9995	11605	12205	11955	13165	14095	12620	12340	12210	12345	11780	10740	10485	10510	10315	9590
BETWEEN I-270 WEST AND MD 187	6640	6610	6235	6500	6435	7115	6305	6750	6055	5925	5440	4665	6490	6300	6115	5715
BETWEEN I-270 EAST AND MD 187	6420	6345	5990	6345	6465	7285	6580	6850	6020	5880	5400	4600	6425	6295	6215	5560
BETWEEN MD 355 AND MD 185	9690	11720	10850	10550	10050	11470	12050	11900	10550	10650	10000	8700	10900	11320	11510	10770
BETWEEN MD 185 AND MD 97	9115	11200	10830	10305	10875	11805	12030	11935	11530	11540	10725	9415	10640	11315	11555	10595
BETWEEN MD 97 AND US 29	8290	10655	10320	9865	10190	10425	10240	10370	11865	11830	10840	9395	10360	11160	11430	10185
BETWEEN MD US 29 AND MD 193	8375	10380	10185	9495	9245	9000	8610	8765	11525	11565	10595	8900	9730	10525	10590	9195
BETWEEN MD 193 AND MD 650	8600	10605	10530	9595	8875	8455	8150	8470	11570	11675	10715	9240	9970	10640	10810	9305
BETWEEN MD 650 AND I-95	9920	11645	10965	10005	9595	9125	8785	8935	12135	12150	11245	9870	10360	11020	11105	9660
BETWEEN US 1 AND I-95	7545	8380	8020	7655	7935	8100	8155	7665	7975	8295	7720	5905	10150	10650	10035	8870
BETWEEN GREENBELT STATION AND US 1	8820	10005	9730	9100	8375	8685	8445	7690	9625	9685	9155	7760	9810	10265	9425	8475
BETWEEN GREENBELT STATION AND MD 201	8550	9675	9440	8810	8545	8950	8660	7860	9770	9745	9230	7835	9700	10055	9205	8255
BETWEEN MD 201 AND MD 295	8220	9230	9430	8770	9195	10090	9655	8700	9830	9875	9335	8060	9685	9875	8870	7970
BETWEEN MD 295 AND MD 450	7870	8650	9060	8385	9660	10415	10185	9560	10345	9995	9320	7820	9035	9030	8270	7980
BETWEEN MD 450 AND US 50	8320	9095	9825	8975	9610	10450	10500	9950	10760	10470	9870	8670	9735	9795	8940	8565
BETWEEN US 50 AND MD 202	9590	10245	10890	10025	9515	10210	9850	9630	10850	10415	10525	9555	10040	10140	9235	8880
BETWEEN MD 202 AND ARENA DR	9565	10070	10660	9875	9540	10405	10105	9560	10465	9960	10340	9780	9960	10105	9420	9105
BETWEEN ARENA DR AND MD 214	9445	10110	10445	9840	9770	10805	10500	9865	10435	9805	10100	9685	9900	10055	9450	9105
BETWEEN MD 214 AND RITCHIE MARLBORO RD	9545	10060	10050	9625	9490	10895	10415	9555	9975	9755	10005	9520	10085	10415	10040	9420
BETWEEN RITCHIE MARLBORO AND MD 4	9125	9735	9515	9280	8395	9620	9085	8705	8690	8910	9455	8900	9530	9715	9635	8805
BETWEEN MD 4 AND FORESTVILLE RD	8540	8800	9275	8595	7355	8670	7990	7570	8005	8605	8905	8630	9025	8995	9075	8140
BETWEEN FORESTVILLE AND MD 218	7810	8120	8545	7980	6465	7435	6815	6745	7480	8060	8385	8010	7995	7770	7965	7190
BETWEEN MD 218 AND MD 5	7980	8300	8765	8195	7250	8255	7535	7155	7910	8640	8890	8400	8475	8205	8400	7585
BETWEEN MD 5 AND MD 414	7235	6045	6800	6655	4960	5970	5600	5280	5945	6460	6675	6135	7880	7685	7950	6975
BETWEEN MD 414 AND MD 210	7680	6190	6730	6360	4960	5790	5495	5130	5630	6105	6285	5600	8235	8325	8585	7515
BETWEEN MD 210 AND I-295	8950	7260	7455	6690	4605	5470	5090	4640	5455	6010	6095	5415	7910	8135	8400	7430
WOODROW WILSON BRIDGE	11120	10955	10410	8265	8270	9575	8720	7500	8045	8990	8910	8045	9945	9955	10385	9565

I-495 2040 Alt 5 Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3635	3800	3510	3345	1870	2955	3090	2675	2250	2725	3100	3020	4605	5365	5080	4135
BETWEEN MD 80 AND MD 109	3985	4275	3825	3620	1565	2440	2625	2280	2055	2500	2860	2760	4340	5225	5150	4190
BETWEEN MD 109 AND MD 121	4565	4885	4370	4075	1650	2525	2685	2350	2185	2630	3005	2825	4445	5375	5295	4475
BETWEEN MD 121 AND MD 27	5675	5825	5190	4905	2065	2760	2910	2685	2710	3125	3605	3410	5050	6120	6130	5390
BETWEEN MD 27 AND MD 118	6645	5815	5300	5390	2065	2760	2910	2685	3275	3640	3820	3855	5050	6120	6130	5390
BETWEEN MD 118 AND MIDDLEBROOK RD	7205	6315	5945	5885	2415	3415	3975	3710	3845	4295	4490	4475	7315	8135	8170	7420
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	9275	8375	7795	7460	2840	4200	4960	4560	4885	5340	5765	5590	8800	9650	9700	9020
BETWEEN WATKINS MILL AND MD 124	6980	7055	6600	6290	2715	4350	5330	4895	3990	4425	4890	4730	8270	9225	9545	8835
BETWEEN MD 124 AND MD 117	10065	8885	8110	7640	2665	4375	5495	5110	5185	5665	6335	5855	8885	10230	10540	9815
BETWEEN MD 117 AND I-370	11880	10895	10050	9340	3235	5380	7075	6415	6635	7495	8230	7280	10520	11975	12090	11300
BETWEEN I-370 AND SHADY GROVE RD	11575	11895	10695	10190	3010	4875	6505	6220	6475	6720	7415	6905	11975	13240	12725	12170
BETWEEN SHADY GROVE RD AND MD 28	11730	11560	10270	9835	3745	6010	8245	7695	7140	7550	8570	7680	12480	13550	13040	12315
BETWEEN MD 28 AND MD 189	12490	12660	11320	10910	4295	7000	9870	9120	8165	8555	9645	8790	13425	14785	14470	13750
BETWEEN MD 189 AND MONTROSE RD	12480	12830	11550	11050	4365	6920	9840	9110	7840	8235	9110	8455	13135	14380	14385	13660
BETWEEN MONTROSE RD AND I-270 SPLIT	11835	13675	12575	11505	5180	7520	10320	9460	7935	8550	8960	8255	13035	14205	14330	13370
BETWEEN I-270 SPLIT AND MD 187	4915	6560	6080	5330	2195	3050	4840	4355	3905	4105	4140	4060	5880	6605	6675	6345
BETWEEN MD 187 AND I-495	4440	5920	5360	4870	2720	3780	5345	4715	4180	4475	4455	4070	5275	5675	5775	5810
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6920	7115	6495	6175	2985	4470	5480	5105	4030	4445	4820	4195	7155	7600	7655	7025
BETWEEN DEMOCRACY BLVD AND I-495	6730	6980	6315	5590	3355	4995	5970	5455	3995	4210	4200	3875	6155	6420	6340	6075

Appendix G:

Existing and Future Throughputs and Percent Demand Met

Throughput and Percent Demand Met
Existing

I-495 Existing AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and George Washington Pwky	7,400	7,975	7,217	6,919	5,869	6,527	6,818	6,424
American Legion Bridge	7,966	8,297	8,155	8,023	8,104	8,808	9,243	8,600
Between Clara Barton Pkwy and Cabin John Pkwy	7,494	7,758	7,552	7,371	7,972	8,298	8,248	7,689
Between MD 190 and I-270	7,270	7,766	8,043	7,835	9,567	9,911	9,433	8,992
Between I-270 West and MD 187	4,347	4,387	3,813	3,727	3,788	4,615	3,899	4,240
Between I-270 East and MD 187	4,033	4,157	3,578	3,577	3,618	4,393	3,694	4,026
Between MD 355 and MD 185	6,119	7,662	7,079	6,970	6,572	7,824	8,171	7,951
Between MD 185 and MD 97	5,778	7,294	7,298	6,832	7,990	8,232	8,133	8,289
Between MD 97 and US 29	5,522	7,089	7,035	6,639	7,598	6,994	6,766	7,117
Between US 29 and MD 193	5,588	6,784	6,819	6,362	7,024	6,354	6,133	6,400
Between MD 193 and MD 650	5,854	7,209	7,353	6,645	7,040	6,119	5,810	6,220
Between MD 650 and I-95	7,178	8,114	7,782	7,073	8,185	6,477	6,396	6,699
Between US 1 and I-95	7,037	6,692	6,992	7,371	7,444	7,688	7,317	7,000
Between Greenbelt Station and US 1	7,821	8,024	8,113	8,588	7,745	7,964	7,420	6,903
Between Greenbelt Station and MD 201	7,516	7,507	7,796	8,371	7,683	7,882	7,274	6,834
Between MD 201 and MD 295	6,962	6,849	7,593	7,954	8,325	8,647	8,018	7,463
Between MD 295 and MD 450	6,204	6,197	7,030	7,111	8,415	8,657	8,132	7,588
Between MD 450 and US 50	6,597	6,660	7,340	7,500	8,355	8,598	8,272	7,956
Between US 50 and MD 202	7,463	7,618	8,184	8,181	7,864	7,757	7,566	7,388
Between MD 202 and Arena Dr	7,391	7,318	7,812	7,781	7,710	8,042	7,513	7,233
Between Arena Dr and MD 214	7,398	7,347	7,641	7,660	7,804	8,310	7,713	7,301
Between MD 214 and Ritchie Marlboro Rd	7,322	7,285	7,160	7,435	7,471	8,346	7,610	6,937
Between Ritchie Marlboro Rd and MD 4	7,511	7,354	7,040	7,618	6,564	7,297	6,988	6,484
Between MD 4 and Forestville Rd	6,980	6,445	6,886	6,869	5,796	6,694	6,067	5,797
Between Forestville Rd and MD 218	6,336	5,838	6,238	6,281	5,115	5,666	5,060	5,102
Between MD 218 and MD 5	6,469	6,040	6,471	6,482	5,741	6,337	5,657	5,424
Between MD 5 and MD 414	6,833	5,315	5,820	5,890	4,370	4,929	4,544	4,438
Between MD 414 and MD 210	6,839	5,420	5,966	5,630	4,617	4,984	4,823	4,544
Between MD 210 and I-295	7,810	6,659	6,952	6,254	4,416	4,877	4,576	4,339
Woodrow Wilson Bridge	9,516	9,954	9,854	7,756	7,484	8,251	7,896	7,056

I-270 Existing AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,276	3,312	3,095	2,869	1,704	2,445	2,525	2,518
Between MD 80 and MD 109	3,551	3,545	3,562	3,349	1,558	2,118	2,234	2,271
Between MD 109 and MD 121	3,982	3,975	3,960	3,853	1,622	2,172	2,273	2,358
Between MD 121 and MD 27	5,063	4,804	4,588	4,539	1,910	2,403	2,419	2,665
Between MD 27 and MD 118	5,542	4,946	5,111	4,894	2,125	2,689	2,782	3,186
Between MD 118 and Middlebrook Rd	6,032	5,470	5,856	5,284	2,351	2,984	3,341	3,989
Between Middlebrook Rd and Watkins Mill	7,842	7,182	7,313	6,909	2,832	3,643	4,165	4,908
Between Watkins Mill and MD 124	7,704	7,138	7,083	7,481	2,845	3,638	4,211	4,947
Between MD 124 and MD 117	8,281	7,461	7,432	7,999	2,884	3,960	4,757	5,310
Between MD 117 and I-370	10,030	9,279	9,028	9,786	3,071	4,280	5,234	5,816
Between I-370 and Shady Grove Rd	10,749	9,188	8,509	9,997	2,829	3,815	4,985	5,202
Between Shady Grove Rd and MD 28	10,384	8,859	8,069	9,119	3,519	4,562	6,144	6,237
Between MD 28 and MD 189	10,523	9,672	8,527	9,759	5,404	6,481	8,581	8,607
Between MD 189 and Montrose Rd	10,174	9,649	9,004	9,789	4,216	5,517	7,728	7,472
Between Montrose Rd and I-270 Split	9,593	10,064	9,809	9,608	4,977	6,161	8,427	8,038
Between I-270 Split and MD 187	3,567	4,722	4,707	4,381	1,956	2,583	4,012	3,614
Between MD 187 and I-495	2,957	3,925	3,667	3,586	2,525	3,455	4,631	4,075
Between I-270 Split and Democracy Blvd	5,849	5,428	5,277	5,037	2,984	3,561	4,419	4,309
Between Democracy Blvd and I-495	5,694	5,403	5,329	4,712	3,059	3,494	4,345	4,241

Throughput and Percent Demand Met
Existing

I-495 Existing AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	98%	98%	96%	98%	100%	97%	99%	100%
American Legion Bridge	99%	87%	89%	93%	100%	97%	100%	100%
Between Clara Barton Pkwy and Cabin John Pkwy	100%	88%	90%	93%	100%	97%	100%	100%
Between MD 190 and I-270	100%	87%	89%	92%	100%	97%	100%	100%
Between I-270 West and MD 187	100%	98%	93%	93%	100%	100%	96%	100%
Between I-270 East and MD 187	100%	100%	94%	93%	100%	100%	97%	100%
Between MD 355 and MD 185	99%	94%	95%	100%	100%	100%	99%	100%
Between MD 185 and MD 97	100%	94%	97%	100%	100%	100%	100%	100%
Between MD 97 and US 29	100%	95%	97%	99%	85%	82%	98%	97%
Between MD US 29 and MD 193	100%	96%	98%	100%	87%	87%	100%	100%
Between MD 193 and MD 650	100%	96%	98%	100%	90%	89%	100%	100%
Between MD 650 and I-95	100%	96%	98%	100%	97%	87%	100%	100%
Between US 1 and I-95	100%	88%	97%	100%	98%	98%	100%	100%
Between Greenbelt Station and US1	100%	92%	96%	100%	98%	95%	100%	100%
Between Greenbelt Station and MD 201	100%	91%	96%	100%	98%	95%	100%	100%
Between MD 201 and MD 295	100%	90%	97%	100%	99%	94%	100%	100%
Between MD 295 and MD 450	100%	91%	97%	100%	100%	95%	100%	100%
Between MD 450 and US 50	100%	93%	93%	100%	97%	92%	97%	100%
Between US 50 and MD 202	100%	96%	95%	100%	98%	88%	97%	100%
Between MD 202 and Arena Dr	100%	96%	95%	100%	99%	94%	99%	100%
Between Arena Dr and MD 214	100%	96%	95%	100%	99%	96%	99%	100%
Between MD 214 and Ritchie Marlboro Rd	100%	97%	95%	100%	99%	96%	98%	100%
Between Ritchie Marlboro Rd and MD 4	100%	97%	93%	100%	99%	94%	100%	98%
Between MD 4 and Forestville Rd	100%	96%	94%	100%	99%	95%	97%	100%
Between Forestville Rd and MD 218	100%	96%	94%	100%	98%	94%	97%	99%
Between MD 218 and MD 5	100%	96%	94%	100%	97%	94%	96%	98%
Between MD 5 and MD 414	100%	97%	96%	100%	94%	89%	93%	98%
Between MD 414 and MD 210	96%	97%	99%	100%	100%	94%	100%	100%
Between MD 210 and I-295	94%	100%	100%	100%	100%	94%	99%	100%
Woodrow Wilson Bridge	94%	100%	100%	100%	100%	96%	100%	100%

I-270 Existing AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	100%	100%	100%	99%	100%	96%	95%	100%
Between MD 80 and MD 109	100%	95%	100%	100%	100%	98%	96%	100%
Between MD 109 and MD 121	100%	94%	100%	100%	100%	98%	96%	100%
Between MD 121 and MD 27	100%	96%	100%	100%	100%	100%	97%	100%
Between MD 27 and MD 118	94%	98%	100%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	94%	98%	100%	100%	100%	100%	97%	100%
Between Middlebrook Rd and Watkins Mill	95%	97%	100%	100%	100%	99%	97%	100%
Between Watkins Mill and MD 124	94%	97%	100%	100%	100%	99%	98%	100%
Between MD 124 and MD 117	90%	94%	100%	100%	100%	100%	100%	100%
Between MD 117 and I-370	93%	95%	100%	100%	100%	93%	89%	100%
Between I-370 and Shady Grove Rd	100%	95%	96%	100%	100%	98%	98%	100%
Between Shady Grove Rd and MD 28	100%	96%	97%	100%	100%	96%	95%	100%
Between MD 28 and MD 189	100%	96%	94%	100%	100%	100%	100%	100%
Between MD 189 and Montrose Rd	99%	94%	97%	100%	100%	98%	98%	100%
Between Montrose Rd and I-270 Split	100%	93%	98%	100%	100%	100%	100%	100%
Between I-270 Split and MD 187	94%	92%	99%	100%	100%	99%	100%	100%
Between MD 187 and I-495	89%	88%	92%	100%	100%	100%	100%	100%
Between I-270 Split and Democracy Blvd	100%	96%	100%	100%	100%	100%	100%	100%
Between Democracy Blvd and I-495	100%	97%	100%	100%	100%	86%	89%	95%

<90%	>90%	100%

Throughput and Percent Demand Met
Existing

I-495 Existing PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and George Washington Pwky	7,056	6,347	5,744	6,888	5,585	5,673	5,373	5,259
American Legion Bridge	8,258	8,009	7,257	8,766	8,108	8,290	7,704	7,737
Between Clara Barton Pkwy and Cabin John Pkwy	7,541	7,005	6,360	7,594	7,125	7,014	6,372	6,634
Between MD 190 and I-270	9,007	8,642	7,969	8,679	7,750	7,466	6,791	6,656
Between I-270 West and MD 187	4,055	3,891	3,435	3,763	4,529	4,083	3,946	3,634
Between I-270 East and MD 187	3,837	3,540	3,229	3,829	4,294	3,944	3,783	3,472
Between MD 355 and MD 185	7,463	6,702	7,255	6,909	7,914	7,616	7,724	7,491
Between MD 185 and MD 97	7,517	7,214	7,203	6,681	7,643	7,639	7,715	7,517
Between MD 97 and US 29	7,925	7,520	7,320	6,562	7,155	7,453	7,613	7,239
Between US 29 and MD 193	7,691	7,165	7,303	6,198	6,460	6,741	6,812	6,414
Between MD 193 and MD 650	7,550	7,647	7,488	6,631	6,700	6,984	7,428	6,831
Between MD 650 and I-95	8,146	8,282	8,026	7,305	6,944	7,279	7,865	7,322
Between US 1 and I-95	6,782	6,660	6,705	5,724	8,197	8,456	8,434	8,217
Between Greenbelt Station and US 1	8,169	8,088	7,993	7,337	7,519	7,779	7,518	7,552
Between Greenbelt Station and MD 201	8,092	7,957	7,532	7,527	7,375	7,388	6,996	7,035
Between MD 201 and MD 295	7,878	7,950	7,292	7,449	7,452	6,976	6,641	6,892
Between MD 295 and MD 450	7,921	7,777	6,878	6,850	6,625	6,641	6,100	5,944
Between MD 450 and US 50	8,394	8,151	7,516	7,933	7,039	7,184	6,758	6,362
Between US 50 and MD 202	7,972	7,981	8,014	8,252	7,053	7,282	6,991	6,875
Between MD 202 and Arena Dr	7,578	7,647	7,936	7,852	6,970	7,256	6,910	7,127
Between Arena Dr and MD 214	7,514	7,596	7,839	7,456	7,176	7,022	6,979	7,121
Between MD 214 and Ritchie Marlboro Rd	7,159	7,589	7,821	7,361	7,901	7,272	7,379	7,375
Between Ritchie Marlboro Rd and MD 4	6,441	7,021	7,484	7,375	7,571	7,645	7,600	6,877
Between MD 4 and Forestville Rd	6,027	6,818	7,205	7,232	7,263	7,271	7,337	6,622
Between Forestville Rd and MD 218	5,607	6,327	6,770	6,681	6,406	6,217	6,230	5,522
Between MD 218 and MD 5	6,025	6,941	7,326	7,092	6,679	6,668	6,478	5,709
Between MD 5 and MD 414	4,843	5,722	6,079	5,727	6,597	6,448	6,399	5,725
Between MD 414 and MD 210	4,607	5,469	5,806	5,222	7,134	7,271	7,323	6,408
Between MD 210 and I-295	4,822	5,750	5,797	5,467	7,362	7,499	7,531	6,730
Woodrow Wilson Bridge	7,548	8,608	8,822	8,302	9,116	9,137	9,213	8,579

I-270 Existing PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,023	2,322	2,714	2,535	4,040	4,173	4,137	3,916
Between MD 80 and MD 109	1,801	2,131	2,489	2,342	4,024	4,099	4,284	4,044
Between MD 109 and MD 121	1,906	2,201	2,554	2,386	3,994	4,180	4,327	4,176
Between MD 121 and MD 27	2,268	2,575	3,028	2,883	4,438	4,909	4,940	4,612
Between MD 27 and MD 118	2,765	2,975	3,217	3,327	6,032	6,194	6,225	6,082
Between MD 118 and Middlebrook Rd	3,215	3,534	3,886	3,805	6,723	6,658	6,749	6,734
Between Middlebrook Rd and Watkins Mill	4,135	4,427	5,015	4,827	8,201	7,849	8,006	8,123
Between Watkins Mill and MD 124	4,166	4,431	5,006	4,853	8,241	7,936	8,023	8,133
Between MD 124 and MD 117	4,459	4,829	5,289	5,137	8,897	8,783	8,574	8,871
Between MD 117 and I-370	5,784	6,460	6,982	6,475	10,177	10,335	9,885	10,197
Between I-370 and Shady Grove Rd	5,608	5,888	6,197	6,214	10,680	10,543	10,043	10,171
Between Shady Grove Rd and MD 28	6,465	6,930	7,479	7,068	10,878	10,961	10,535	10,023
Between MD 28 and MD 189	7,235	7,620	8,289	7,879	11,378	11,537	11,427	10,909
Between MD 189 and Montrose Rd	6,945	7,375	7,898	7,581	11,154	11,290	11,453	11,027
Between Montrose Rd and I-270 Split	6,687	7,359	7,504	7,309	10,983	11,016	11,208	10,835
Between I-270 Split and MD 187	3,386	3,635	3,570	3,750	4,937	5,117	5,193	4,848
Between MD 187 and I-495	3,459	3,654	3,543	3,482	4,398	4,320	4,295	4,571
Between I-270 Split and Democracy Blvd	3,283	3,632	3,931	3,544	5,506	5,332	5,223	5,376
Between Democracy Blvd and I-495	3,333	3,415	3,273	3,114	5,111	4,838	4,731	5,039

Throughput and Percent Demand Met
Existing

I-495 Existing PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	94%	83%	100%	97%	93%	95%	96%
PMerican Legion Bridge	97%	95%	84%	100%	98%	96%	92%	98%
Between Clara Barton Pkwy and Cabin John Pkwy	97%	95%	87%	100%	98%	96%	89%	97%
Between MD 190 and I-270	100%	97%	94%	100%	100%	96%	89%	96%
Between I-270 West and MD 187	100%	100%	96%	100%	100%	98%	95%	97%
Between I-270 East and MD 187	100%	97%	94%	100%	100%	99%	94%	100%
Between MD 355 and MD 185	100%	90%	100%	100%	99%	97%	97%	100%
Between MD 185 and MD 97	91%	86%	92%	100%	98%	97%	97%	100%
Between MD 97 and US 29	92%	87%	92%	98%	96%	96%	95%	100%
Between MD US 29 and MD 193	94%	85%	95%	97%	95%	94%	94%	100%
Between MD 193 and MD 650	92%	90%	94%	98%	96%	94%	96%	100%
Between MD 650 and I-95	93%	91%	94%	98%	94%	92%	96%	100%
Between US 1 and I-95	100%	93%	99%	100%	94%	91%	95%	100%
Between Greenbelt Station and US1	100%	100%	100%	100%	92%	90%	94%	100%
Between Greenbelt Station and MD 201	100%	100%	99%	100%	92%	89%	94%	100%
Between MD 201 and MD 295	100%	99%	96%	100%	92%	80%	84%	100%
Between MD 295 and MD 450	100%	94%	88%	100%	91%	89%	89%	100%
Between MD 450 and US 50	100%	92%	89%	100%	90%	90%	91%	100%
Between US 50 and MD 202	93%	89%	89%	100%	90%	90%	93%	100%
Between MD 202 and Arena Dr	93%	89%	92%	100%	89%	90%	91%	100%
Between Arena Dr and MD 214	92%	91%	94%	100%	93%	88%	92%	100%
Between MD 214 and Ritchie Marlboro Rd	92%	91%	95%	100%	100%	89%	94%	100%
Between Ritchie Marlboro Rd and MD 4	100%	100%	100%	100%	98%	94%	97%	100%
Between MD 4 and Forestville Rd	100%	100%	100%	100%	98%	97%	99%	100%
Between Forestville Rd and MD 218	100%	100%	100%	100%	100%	98%	99%	100%
Between MD 218 and MD 5	100%	100%	100%	100%	99%	99%	97%	99%
Between MD 5 and MD 414	100%	100%	100%	100%	97%	96%	96%	98%
Between MD 414 and MD 210	100%	100%	100%	100%	99%	99%	100%	100%
Between MD 210 and I-295	100%	100%	100%	100%	100%	99%	99%	100%
Woodrow Wilson Bridge	100%	100%	100%	100%	100%	99%	99%	100%

I-270 Existing PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	98%	99%	99%	100%	90%	93%	100%
Between MD 80 and MD 109	98%	96%	98%	99%	100%	90%	94%	100%
Between MD 109 and MD 121	99%	95%	96%	99%	100%	90%	93%	100%
Between MD 121 and MD 27	98%	95%	97%	100%	100%	94%	94%	100%
Between MD 27 and MD 118	99%	95%	97%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	98%	96%	100%	100%	100%	96%	96%	100%
Between Middlebrook Rd and Watkins Mill	99%	96%	100%	100%	100%	95%	96%	100%
Between Watkins Mill and MD 124	99%	96%	100%	100%	100%	96%	96%	100%
Between MD 124 and MD 117	99%	98%	99%	100%	100%	96%	93%	100%
Between MD 117 and I-370	100%	98%	99%	100%	100%	96%	93%	100%
Between I-370 and Shady Grove Rd	100%	100%	98%	100%	100%	96%	96%	100%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	100%	100%	100%	100%
Between MD 28 and MD 189	100%	100%	100%	100%	100%	100%	100%	100%
Between MD 189 and Montrose Rd	100%	100%	100%	100%	100%	98%	100%	100%
Between Montrose Rd and I-270 Split	100%	100%	100%	100%	100%	96%	98%	100%
Between I-270 Split and MD 187	100%	100%	100%	100%	100%	100%	100%	98%
Between MD 187 and I-495	99%	100%	98%	100%	100%	100%	99%	100%
Between I-270 Split and Democracy Blvd	96%	94%	97%	100%	94%	85%	83%	94%
Between Democracy Blvd and I-495	100%	95%	95%	98%	100%	94%	96%	100%

<90%	>90%	100%

Throughput and Percent Demand Met
2025

I-495 2025 No-Build AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	7,801	8,399	7,497	7,401	6,242	6,505	7,003	6,316
American Legion Bridge	8,391	8,455	8,518	8,573	8,487	8,773	9,338	8,377
Between Clara Barton Pkwy and Cabin John Pkwy	7,832	7,918	7,873	7,850	8,307	8,189	8,217	7,381
Between MD 190 and I-270	7,530	7,978	8,303	8,288	10,231	10,065	9,898	8,789
Between I-270 West and MD 187	4,550	4,516	3,892	3,920	3,936	4,510	4,124	4,304
Between I-270 East and MD 187	4,224	4,248	3,712	3,765	3,757	4,440	3,711	4,111
Between MD 355 and MD 185	6,517	7,923	7,227	6,915	6,663	7,828	8,238	7,987
Between MD 185 and MD 97	6,111	7,504	7,392	6,866	7,930	8,216	8,187	8,204
Between MD 97 and US 29	5,672	7,260	7,046	6,677	7,515	6,866	6,930	6,834
Between US 29 and MD 193	5,654	6,917	6,822	6,401	6,916	6,290	6,224	6,213
Between MD 193 and MD 650	5,961	7,357	7,354	6,732	6,905	5,943	5,968	5,991
Between MD 650 and I-95	7,299	8,260	7,824	7,171	7,988	6,282	6,572	6,655
Between US 1 and I-95	7,204	6,289	7,147	7,268	7,508	7,594	7,384	7,007
Between Greenbelt Station and US 1	8,141	7,655	8,333	8,325	7,738	7,839	7,470	6,829
Between Greenbelt Station and MD 201	7,714	7,332	8,005	7,941	7,818	7,903	7,525	6,870
Between MD 201 and MD 295	7,072	6,640	7,706	7,526	8,430	8,673	8,304	7,506
Between MD 295 and MD 450	6,325	6,064	7,085	6,837	8,520	8,654	8,487	7,731
Between MD 450 and US 50	6,707	6,578	7,446	7,274	8,551	8,628	8,534	8,076
Between US 50 and MD 202	7,612	7,627	8,331	8,091	8,058	7,911	7,732	7,400
Between MD 202 and Arena Dr	7,530	7,345	7,951	7,809	7,864	8,171	7,653	7,363
Between Arena Dr and MD 214	7,513	7,404	7,760	7,703	7,930	8,453	7,842	7,442
Between MD 214 and Ritchie Marlboro Rd	7,459	7,330	7,332	7,514	7,647	8,466	7,717	7,137
Between Ritchie Marlboro Rd and MD 4	7,606	7,502	7,073	7,705	6,681	7,455	7,110	6,673
Between MD 4 and Forestville Rd	7,136	6,504	7,007	6,950	5,943	6,808	6,192	5,923
Between Forestville Rd and MD 218	6,437	5,923	6,325	6,356	5,230	5,691	5,101	5,228
Between MD 218 and MD 5	6,606	6,132	6,547	6,533	5,893	6,439	5,686	5,618
Between MD 5 and MD 414	6,954	5,478	5,923	5,953	4,469	5,037	4,489	4,643
Between MD 414 and MD 210	6,720	5,059	6,249	6,477	4,705	5,087	4,748	4,835
Between MD 210 and I-295	7,790	6,354	7,144	7,159	4,546	4,940	4,465	4,639
Woodrow Wilson Bridge	9,687	9,994	9,858	8,893	7,755	8,367	7,733	7,860

I-270 2025 No-Build AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,410	3,447	3,226	2,976	1,787	2,597	2,568	2,418
Between MD 80 and MD 109	3,733	3,670	3,739	3,464	1,659	2,193	2,222	2,052
Between MD 109 and MD 121	4,101	4,075	4,122	3,879	1,742	2,258	2,237	2,069
Between MD 121 and MD 27	5,187	5,142	4,852	4,759	2,151	2,465	2,323	2,340
Between MD 27 and MD 118	5,695	5,564	5,200	5,166	2,451	2,915	2,815	2,999
Between MD 118 and Middlebrook Rd	6,157	6,129	5,993	5,519	2,768	3,407	3,705	4,051
Between Middlebrook Rd and Watkins Mill	8,032	7,983	7,698	6,999	3,362	4,227	4,795	5,160
Between Watkins Mill and MD 124	6,814	6,563	6,270	5,570	2,780	3,694	4,307	4,663
Between MD 124 and MD 117	8,107	8,094	7,731	6,922	2,916	4,327	5,223	5,360
Between MD 117 and I-370	9,827	9,963	9,666	8,508	3,119	4,687	5,717	5,854
Between I-370 and Shady Grove Rd	10,470	9,949	9,353	8,576	2,831	3,833	5,025	5,144
Between Shady Grove Rd and MD 28	10,352	9,551	8,704	8,035	3,610	4,828	6,528	6,539
Between MD 28 and MD 189	10,818	10,530	9,388	8,724	5,413	6,718	9,118	9,040
Between MD 189 and Montrose Rd	10,706	10,482	9,563	8,798	4,362	5,738	8,112	7,873
Between Montrose Rd and I-270 Split	10,461	10,884	9,937	8,838	5,063	6,381	8,794	8,479
Between I-270 Split and MD 187	4,003	5,021	4,663	3,986	1,957	2,594	4,081	3,693
Between MD 187 and I-495	3,243	4,125	3,648	3,277	2,523	3,488	4,702	4,105
Between I-270 Split and Democracy Blvd	6,475	5,779	5,357	4,754	3,058	3,708	4,600	4,561
Between Democracy Blvd and I-495	6,267	5,786	5,338	4,458	3,148	3,618	4,534	4,512

Throughput and Percent Demand Met
2025

I-495 2025 No-Build AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	98%	99%	95%	99%	100%	97%	100%	100%
American Legion Bridge	100%	89%	93%	100%	100%	96%	100%	100%
Between Clara Barton Pkwy and Cabin John Pkwy	100%	87%	90%	94%	100%	93%	100%	96%
Between MD 190 and I-270	99%	87%	89%	93%	100%	96%	100%	99%
Between I-270 West and MD 187	100%	99%	93%	93%	100%	96%	99%	100%
Between I-270 East and MD 187	100%	100%	95%	93%	100%	100%	95%	99%
Between MD 355 and MD 185	100%	95%	95%	96%	100%	99%	98%	99%
Between MD 185 and MD 97	100%	95%	96%	97%	100%	98%	98%	98%
Between MD 97 and US 29	100%	96%	96%	97%	82%	79%	97%	91%
Between MD US 29 and MD 193	100%	97%	97%	98%	84%	85%	100%	98%
Between MD 193 and MD 650	100%	97%	97%	99%	86%	85%	100%	97%
Between MD 650 and I-95	100%	96%	97%	100%	93%	84%	100%	98%
Between US 1 and I-95	100%	81%	97%	100%	97%	95%	100%	100%
Between Greenbelt Station and US1	100%	86%	96%	100%	95%	92%	100%	100%
Between Greenbelt Station and MD 201	100%	86%	96%	100%	95%	91%	100%	100%
Between MD 201 and MD 295	100%	86%	96%	100%	99%	93%	100%	100%
Between MD 295 and MD 450	100%	87%	96%	100%	99%	94%	100%	100%
Between MD 450 and US 50	100%	90%	93%	100%	98%	91%	98%	100%
Between US 50 and MD 202	100%	94%	95%	100%	98%	88%	97%	98%
Between MD 202 and Arena Dr	100%	94%	95%	100%	99%	93%	98%	100%
Between Arena Dr and MD 214	100%	94%	94%	100%	99%	95%	98%	100%
Between MD 214 and Ritchie Marlboro Rd	100%	95%	95%	100%	99%	95%	97%	100%
Between Ritchie Marlboro Rd and MD 4	100%	96%	91%	100%	98%	94%	99%	99%
Between MD 4 and Forestville Rd	100%	94%	94%	100%	99%	94%	97%	99%
Between Forestville Rd and MD 218	100%	95%	93%	100%	98%	93%	96%	100%
Between MD 218 and MD 5	100%	95%	93%	100%	97%	93%	94%	99%
Between MD 5 and MD 414	100%	97%	95%	100%	93%	89%	89%	100%
Between MD 414 and MD 210	92%	88%	100%	100%	100%	93%	96%	100%
Between MD 210 and I-295	92%	94%	100%	100%	100%	92%	94%	100%
Woodrow Wilson Bridge	92%	98%	100%	100%	100%	94%	95%	100%

I-270 2025 No-Build AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	100%	100%	100%	98%	100%	97%	92%	100%
Between MD 80 and MD 109	100%	94%	100%	100%	100%	97%	92%	97%
Between MD 109 and MD 121	100%	92%	100%	100%	100%	97%	91%	96%
Between MD 121 and MD 27	100%	98%	100%	100%	100%	98%	88%	97%
Between MD 27 and MD 118	93%	100%	100%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	92%	100%	100%	100%	100%	100%	100%	100%
Between Middlebrook Rd and Watkins Mill	94%	100%	100%	100%	100%	100%	100%	100%
Between Watkins Mill and MD 124	88%	98%	100%	100%	100%	98%	97%	100%
Between MD 124 and MD 117	86%	99%	100%	100%	100%	100%	100%	100%
Between MD 117 and I-370	89%	99%	100%	100%	100%	98%	92%	100%
Between I-370 and Shady Grove Rd	100%	99%	100%	99%	100%	93%	93%	99%
Between Shady Grove Rd and MD 28	100%	100%	100%	99%	100%	96%	96%	100%
Between MD 28 and MD 189	100%	100%	100%	97%	100%	100%	100%	100%
Between MD 189 and Montrose Rd	100%	98%	99%	96%	100%	98%	98%	100%
Between Montrose Rd and I-270 Split	100%	97%	96%	94%	100%	100%	100%	100%
Between I-270 Split and MD 187	100%	94%	95%	94%	100%	97%	100%	100%
Between MD 187 and I-495	95%	89%	89%	88%	100%	100%	100%	100%
Between I-270 Split and Democracy Blvd	100%	98%	98%	92%	100%	100%	100%	100%
Between Democracy Blvd and I-495	100%	100%	100%	98%	100%	85%	89%	97%

<90%	>90%	100%

Throughput and Percent Demand Met
2025

I-495 2025 No-Build PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	7,007	6,268	6,961	6,275	5,790	6,046	5,514	5,580
American Legion Bridge	7,968	7,923	8,502	8,157	8,196	8,482	8,060	8,079
Between Clara Barton Pkwy and Cabin John Pkwy	7,171	7,026	7,126	7,032	7,147	7,017	6,746	6,926
Between MD 190 and I-270	8,992	9,040	8,327	8,688	7,677	7,431	7,106	6,937
Between I-270 West and MD 187	4,053	4,052	3,368	3,893	4,658	4,058	3,740	3,793
Between I-270 East and MD 187	3,826	3,427	3,194	4,068	4,434	4,095	3,646	3,421
Between MD 355 and MD 185	7,390	6,693	6,998	6,909	8,015	7,818	7,427	7,442
Between MD 185 and MD 97	7,563	7,053	7,044	6,964	7,795	7,640	7,321	7,410
Between MD 97 and US 29	7,931	7,271	7,387	6,894	7,314	7,341	7,039	7,107
Between US 29 and MD 193	7,617	7,232	7,111	6,605	6,502	6,589	6,128	6,266
Between MD 193 and MD 650	7,613	7,664	7,456	7,096	6,772	6,770	6,496	6,769
Between MD 650 and I-95	8,359	8,247	8,046	7,662	7,022	6,963	6,694	7,294
Between US 1 and I-95	6,509	6,026	5,477	5,732	8,161	8,343	8,694	8,293
Between Greenbelt Station and US 1	7,977	7,300	6,941	7,147	7,444	7,624	7,767	7,590
Between Greenbelt Station and MD 201	7,963	7,051	6,888	7,372	7,147	7,160	7,287	7,346
Between MD 201 and MD 295	7,746	6,905	6,918	7,541	7,189	6,623	6,858	7,069
Between MD 295 and MD 450	7,776	6,849	6,790	7,207	6,725	6,089	5,834	6,675
Between MD 450 and US 50	7,959	7,625	7,770	7,826	7,221	6,879	6,232	7,357
Between US 50 and MD 202	7,806	7,752	8,186	7,748	7,194	7,309	6,449	6,821
Between MD 202 and Arena Dr	7,478	7,547	7,927	7,548	6,999	7,304	6,758	6,798
Between Arena Dr and MD 214	7,495	7,540	7,636	7,406	7,110	7,232	6,703	6,796
Between MD 214 and Ritchie Marlboro Rd	7,190	7,529	7,586	7,421	7,869	7,166	6,954	6,987
Between Ritchie Marlboro Rd and MD 4	6,431	6,855	7,399	7,080	7,706	7,897	7,810	7,256
Between MD 4 and Forestville Rd	6,058	6,655	7,191	7,008	7,326	7,367	7,265	6,940
Between Forestville Rd and MD 218	5,619	6,181	6,762	6,477	6,391	6,256	6,118	5,841
Between MD 218 and MD 5	6,065	6,802	7,320	6,906	6,807	6,609	6,493	5,970
Between MD 5 and MD 414	4,819	5,659	6,097	5,656	6,726	6,352	6,426	5,836
Between MD 414 and MD 210	4,599	5,463	5,811	5,242	7,265	7,165	7,330	6,519
Between MD 210 and I-295	4,770	5,700	5,849	5,515	7,390	7,389	7,477	6,822
Woodrow Wilson Bridge	7,678	8,657	8,914	8,681	9,361	9,125	9,228	8,901

I-270 2025 No-Build PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,097	2,428	2,756	2,671	4,334	4,358	4,166	3,946
Between MD 80 and MD 109	1,884	2,222	2,526	2,469	4,218	4,216	4,193	4,021
Between MD 109 and MD 121	1,991	2,276	2,645	2,494	4,254	4,250	4,227	4,227
Between MD 121 and MD 27	2,441	2,676	3,130	2,894	5,244	4,641	4,863	4,917
Between MD 27 and MD 118	2,957	3,114	3,344	3,410	6,552	5,495	5,685	6,120
Between MD 118 and Middlebrook Rd	3,416	3,689	4,020	3,945	7,282	5,935	5,958	6,516
Between Middlebrook Rd and Watkins Mill	4,378	4,647	5,186	4,974	8,584	7,175	6,956	7,778
Between Watkins Mill and MD 124	3,191	3,481	4,041	3,919	7,462	6,877	6,095	6,620
Between MD 124 and MD 117	4,635	4,839	5,431	5,151	9,090	9,441	7,318	7,484
Between MD 117 and I-370	5,985	6,529	7,218	6,523	10,470	11,188	8,098	8,374
Between I-370 and Shady Grove Rd	5,835	5,946	6,239	5,862	10,726	11,353	9,010	7,589
Between Shady Grove Rd and MD 28	6,436	6,707	6,983	6,159	10,922	11,433	10,601	7,065
Between MD 28 and MD 189	7,254	7,549	7,987	7,167	11,389	11,974	11,591	7,731
Between MD 189 and Montrose Rd	6,933	7,222	7,585	6,945	11,345	11,883	11,642	7,765
Between Montrose Rd and I-270 Split	6,714	7,274	7,294	6,595	11,073	11,620	11,383	8,431
Between I-270 Split and MD 187	3,323	3,606	3,420	3,322	4,919	5,302	5,027	3,999
Between MD 187 and I-495	3,448	3,595	3,287	3,126	4,375	4,501	4,231	4,148
Between I-270 Split and Democracy Blvd	3,344	3,626	3,846	3,240	5,555	5,705	5,530	4,721
Between Democracy Blvd and I-495	3,380	3,425	3,390	3,039	5,095	5,157	4,853	4,918

Throughput and Percent Demand Met
2025

I-495 2025 No-Build PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	98%	90%	96%	100%	96%	96%	94%	96%
PMerican Legion Bridge	89%	90%	95%	100%	95%	95%	92%	97%
Between Clara Barton Pkwy and Cabin John Pkwy	89%	93%	95%	100%	95%	93%	91%	97%
Between MD 190 and I-270	100%	99%	95%	100%	98%	93%	91%	96%
Between I-270 West and MD 187	100%	100%	93%	100%	100%	95%	89%	98%
Between I-270 East and MD 187	100%	92%	91%	100%	100%	100%	90%	98%
Between MD 355 and MD 185	98%	88%	97%	100%	98%	98%	91%	99%
Between MD 185 and MD 97	88%	83%	89%	100%	98%	95%	90%	100%
Between MD 97 and US 29	89%	82%	91%	100%	96%	93%	87%	100%
Between MD US 29 and MD 193	90%	85%	91%	100%	94%	91%	84%	100%
Between MD 193 and MD 650	89%	88%	92%	100%	95%	89%	83%	100%
Between MD 650 and I-95	91%	89%	94%	100%	94%	86%	81%	100%
Between US 1 and I-95	100%	84%	80%	100%	91%	88%	97%	100%
Between Greenbelt Station and US1	100%	89%	89%	100%	89%	86%	96%	100%
Between Greenbelt Station and MD 201	100%	87%	88%	100%	82%	77%	85%	100%
Between MD 201 and MD 295	100%	86%	90%	100%	87%	75%	86%	100%
Between MD 295 and MD 450	100%	83%	86%	100%	91%	80%	84%	100%
Between MD 450 and US 50	95%	85%	91%	100%	91%	84%	83%	100%
Between US 50 and MD 202	91%	86%	90%	100%	90%	88%	85%	100%
Between MD 202 and Arena Dr	91%	87%	91%	99%	88%	88%	88%	100%
Between Arena Dr and MD 214	91%	89%	91%	99%	90%	88%	87%	100%
Between MD 214 and Ritchie Marlboro Rd	93%	90%	91%	100%	99%	85%	87%	100%
Between Ritchie Marlboro Rd and MD 4	100%	99%	99%	100%	97%	95%	97%	100%
Between MD 4 and Forestville Rd	100%	99%	100%	100%	96%	96%	96%	100%
Between Forestville Rd and MD 218	100%	99%	100%	100%	97%	96%	95%	100%
Between MD 218 and MD 5	100%	99%	100%	100%	98%	95%	94%	100%
Between MD 5 and MD 414	100%	98%	100%	100%	96%	92%	93%	97%
Between MD 414 and MD 210	100%	99%	100%	100%	98%	94%	97%	99%
Between MD 210 and I-295	100%	98%	99%	100%	98%	94%	95%	99%
Woodrow Wilson Bridge	100%	100%	100%	100%	99%	96%	95%	100%

I-270 2025 No-Build PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	98%	97%	99%	100%	90%	90%	100%
Between MD 80 and MD 109	99%	96%	96%	99%	100%	88%	88%	100%
Between MD 109 and MD 121	99%	94%	96%	98%	100%	87%	87%	100%
Between MD 121 and MD 27	100%	94%	95%	96%	100%	84%	88%	100%
Between MD 27 and MD 118	100%	95%	97%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	99%	95%	98%	98%	100%	81%	81%	98%
Between Middlebrook Rd and Watkins Mill	99%	96%	99%	99%	100%	80%	79%	94%
Between Watkins Mill and MD 124	85%	83%	86%	88%	91%	78%	68%	80%
Between MD 124 and MD 117	99%	94%	96%	98%	100%	97%	74%	82%
Between MD 117 and I-370	99%	96%	98%	100%	100%	100%	74%	82%
Between I-370 and Shady Grove Rd	100%	98%	94%	95%	100%	100%	83%	73%
Between Shady Grove Rd and MD 28	100%	98%	91%	90%	100%	100%	97%	69%
Between MD 28 and MD 189	100%	99%	94%	93%	100%	100%	100%	82%
Between MD 189 and Montrose Rd	99%	98%	94%	93%	100%	99%	98%	69%
Between Montrose Rd and I-270 Split	97%	96%	93%	91%	100%	98%	96%	76%
Between I-270 Split and MD 187	98%	100%	95%	94%	100%	100%	94%	79%
Between MD 187 and I-495	96%	95%	88%	90%	100%	100%	94%	90%
Between I-270 Split and Democracy Blvd	94%	90%	90%	88%	91%	87%	85%	79%
Between Democracy Blvd and I-495	97%	92%	94%	91%	100%	97%	95%	100%

<90%	>90%	100%

Throughput and Percent Demand Met
2040

I-495 2040 No-Build AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	8,536	7,991	7,592	7,484	6,493	6,737	7,079	7,137
American Legion Bridge	8,532	8,421	8,572	8,619	8,633	8,984	9,369	9,323
Between Clara Barton Pkwy and Cabin John Pkwy	7,919	7,816	7,853	7,871	8,411	8,213	8,146	8,171
Between MD 190 and I-270	7,628	7,985	8,333	8,358	10,108	10,034	9,717	9,670
Between I-270 West and MD 187	4,648	4,436	3,842	3,991	3,788	3,903	4,383	4,768
Between I-270 East and MD 187	4,354	4,223	3,630	3,859	3,973	3,566	3,820	4,552
Between MD 355 and MD 185	6,792	7,906	7,087	7,280	7,105	6,284	7,685	8,656
Between MD 185 and MD 97	6,403	7,354	7,307	7,296	8,100	7,034	7,282	8,195
Between MD 97 and US 29	5,760	6,801	6,696	6,861	7,515	6,058	6,129	6,916
Between US 29 and MD 193	5,584	6,518	6,586	6,516	6,987	5,475	5,531	6,186
Between MD 193 and MD 650	5,974	6,904	7,129	6,851	6,729	5,449	5,170	5,925
Between MD 650 and I-95	7,307	7,852	7,683	7,300	7,787	6,058	5,378	6,566
Between US 1 and I-95	7,066	6,081	4,945	7,025	7,674	7,790	7,633	7,390
Between Greenbelt Station and US 1	8,196	7,715	6,200	8,178	7,899	7,965	7,637	7,156
Between Greenbelt Station and MD 201	7,673	7,382	6,007	7,738	7,911	8,010	7,655	7,225
Between MD 201 and MD 295	7,016	6,752	6,112	7,390	8,470	8,798	8,408	7,906
Between MD 295 and MD 450	6,289	6,134	5,902	6,762	8,545	8,657	8,504	8,172
Between MD 450 and US 50	6,712	6,599	6,518	7,215	8,435	8,590	8,569	8,524
Between US 50 and MD 202	7,754	7,756	7,802	8,113	7,891	7,692	7,707	7,850
Between MD 202 and Arena Dr	7,657	7,551	7,543	7,879	7,829	7,620	7,646	7,595
Between Arena Dr and MD 214	7,650	7,625	7,478	7,811	8,097	7,862	7,880	7,634
Between MD 214 and Ritchie Marlboro Rd	7,658	7,618	7,233	7,703	7,902	8,169	7,220	7,310
Between Ritchie Marlboro Rd and MD 4	7,790	7,532	7,123	7,843	6,881	7,505	6,394	6,774
Between MD 4 and Forestville Rd	7,163	6,684	6,938	7,344	6,165	6,787	5,019	5,904
Between Forestville Rd and MD 218	6,465	6,074	6,058	6,969	5,321	5,561	3,852	5,127
Between MD 218 and MD 5	6,605	6,296	6,010	7,452	6,088	6,310	4,312	5,554
Between MD 5 and MD 414	7,008	4,729	5,012	7,103	4,619	4,947	4,568	4,722
Between MD 414 and MD 210	6,201	4,842	5,485	7,243	4,889	4,982	4,794	4,959
Between MD 210 and I-295	7,255	6,320	6,689	7,777	4,710	4,777	4,479	4,638
Woodrow Wilson Bridge	9,642	10,081	9,976	9,426	8,128	7,918	7,704	7,907

I-270 2040 No-Build AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,339	3,196	3,103	3,376	1,989	2,818	3,018	2,895
Between MD 80 and MD 109	3,637	3,686	3,685	3,723	1,747	2,403	2,554	2,491
Between MD 109 and MD 121	4,101	4,120	4,107	4,151	1,836	2,514	2,592	2,527
Between MD 121 and MD 27	5,029	5,184	5,021	5,302	2,402	2,840	2,867	2,872
Between MD 27 and MD 118	5,682	5,427	5,474	5,717	2,661	3,202	3,289	3,342
Between MD 118 and Middlebrook Rd	6,146	5,999	6,100	6,189	2,901	3,594	3,988	4,117
Between Middlebrook Rd and Watkins Mill	8,115	7,920	8,069	7,827	3,484	4,334	4,984	5,040
Between Watkins Mill and MD 124	6,712	6,429	6,644	6,306	2,890	3,670	4,473	4,490
Between MD 124 and MD 117	8,154	8,009	7,982	7,920	3,060	4,293	5,409	5,296
Between MD 117 and I-370	10,022	9,995	9,887	9,644	3,296	4,684	5,923	5,809
Between I-370 and Shady Grove Rd	10,729	9,971	8,854	9,432	2,916	3,846	5,291	5,563
Between Shady Grove Rd and MD 28	10,648	9,623	8,257	8,748	3,726	4,806	6,809	7,070
Between MD 28 and MD 189	11,122	10,794	8,842	9,663	5,486	6,379	9,289	9,532
Between MD 189 and Montrose Rd	10,980	10,557	9,142	9,786	4,518	5,609	8,371	8,354
Between Montrose Rd and I-270 Split	10,908	10,983	9,481	9,626	5,111	6,104	8,821	8,819
Between I-270 Split and MD 187	4,159	4,976	4,374	4,273	2,008	2,233	4,031	3,957
Between MD 187 and I-495	3,379	4,117	3,428	3,567	2,564	2,895	4,603	4,332
Between I-270 Split and Democracy Blvd	6,740	6,032	5,122	5,240	3,054	3,780	4,671	4,632
Between Democracy Blvd and I-495	6,501	6,035	5,125	4,867	3,099	3,686	4,617	4,547

Throughput and Percent Demand Met
2040

I-495 2040 No-Build AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	98%	89%	88%	90%	100%	100%	100%	100%
American Legion Bridge	100%	89%	93%	100%	100%	99%	100%	100%
Between Clara Barton Pkwy and Cabin John Pkwy	93%	82%	84%	86%	95%	88%	95%	97%
Between MD 190 and I-270	92%	82%	84%	87%	98%	91%	99%	100%
Between I-270 West and MD 187	96%	94%	87%	86%	85%	80%	100%	100%
Between I-270 East and MD 187	95%	96%	89%	87%	93%	77%	94%	99%
Between MD 355 and MD 185	95%	91%	89%	94%	98%	76%	88%	98%
Between MD 185 and MD 97	96%	90%	91%	96%	98%	81%	82%	91%
Between MD 97 and US 29	97%	88%	88%	95%	79%	68%	81%	87%
Between MD US 29 and MD 193	98%	89%	91%	95%	82%	73%	89%	93%
Between MD 193 and MD 650	98%	89%	91%	96%	81%	77%	88%	92%
Between MD 650 and I-95	98%	89%	93%	96%	88%	80%	82%	93%
Between US 1 and I-95	100%	76%	64%	96%	96%	95%	100%	100%
Between Greenbelt Station and US1	100%	84%	69%	97%	95%	93%	100%	100%
Between Greenbelt Station and MD 201	100%	85%	70%	97%	95%	92%	100%	100%
Between MD 201 and MD 295	100%	84%	73%	96%	96%	91%	100%	100%
Between MD 295 and MD 450	99%	85%	77%	97%	97%	91%	100%	100%
Between MD 450 and US 50	99%	87%	78%	96%	94%	88%	96%	100%
Between US 50 and MD 202	100%	92%	86%	98%	92%	83%	94%	99%
Between MD 202 and Arena Dr	100%	93%	87%	98%	96%	84%	95%	99%
Between Arena Dr and MD 214	100%	93%	87%	98%	98%	85%	94%	97%
Between MD 214 and Ritchie Marlboro Rd	100%	94%	89%	99%	99%	87%	87%	96%
Between Ritchie Marlboro Rd and MD 4	100%	92%	88%	100%	98%	91%	85%	95%
Between MD 4 and Forestville Rd	98%	92%	88%	100%	97%	90%	75%	94%
Between Forestville Rd and MD 218	99%	92%	85%	100%	97%	88%	70%	94%
Between MD 218 and MD 5	98%	93%	81%	100%	96%	87%	68%	94%
Between MD 5 and MD 414	97%	80%	76%	100%	92%	83%	87%	97%
Between MD 414 and MD 210	81%	79%	83%	100%	98%	86%	92%	100%
Between MD 210 and I-295	81%	88%	91%	100%	99%	85%	90%	100%
Woodrow Wilson Bridge	87%	92%	96%	100%	98%	83%	89%	100%

I-270 2040 No-Build AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	92%	85%	90%	100%	100%	96%	98%	100%
Between MD 80 and MD 109	92%	87%	97%	100%	100%	99%	98%	100%
Between MD 109 and MD 121	91%	85%	95%	100%	100%	100%	97%	100%
Between MD 121 and MD 27	89%	90%	98%	100%	100%	100%	100%	100%
Between MD 27 and MD 118	87%	94%	100%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	86%	95%	100%	100%	100%	100%	100%	100%
Between Middlebrook Rd and Watkins Mill	89%	95%	100%	100%	100%	100%	100%	100%
Between Watkins Mill and MD 124	85%	91%	100%	100%	100%	86%	86%	94%
Between MD 124 and MD 117	83%	92%	100%	100%	100%	100%	100%	100%
Between MD 117 and I-370	87%	94%	100%	100%	100%	90%	86%	93%
Between I-370 and Shady Grove Rd	100%	93%	91%	100%	100%	86%	88%	97%
Between Shady Grove Rd and MD 28	100%	94%	91%	100%	100%	87%	90%	100%
Between MD 28 and MD 189	99%	96%	88%	100%	100%	99%	100%	100%
Between MD 189 and Montrose Rd	97%	93%	89%	100%	100%	88%	92%	100%
Between Montrose Rd and I-270 Split	100%	92%	86%	96%	100%	89%	94%	100%
Between I-270 Split and MD 187	99%	88%	85%	94%	100%	78%	93%	100%
Between MD 187 and I-495	93%	85%	80%	90%	100%	80%	95%	100%
Between I-270 Split and Democracy Blvd	100%	95%	88%	95%	100%	94%	92%	99%
Between Democracy Blvd and I-495	100%	98%	92%	100%	100%	81%	84%	91%

<90%	>90%	100%

Throughput and Percent Demand Met
2040

I-495 2040 No-Build PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	6,345	5,736	2,590	5,452	5,885	6,274	5,691	5,841
American Legion Bridge	7,554	6,741	3,375	6,972	8,244	8,680	8,254	8,353
Between Clara Barton Pkwy and Cabin John Pkwy	6,938	5,781	3,067	5,871	7,042	6,999	6,843	7,028
Between MD 190 and I-270	8,987	6,576	5,540	8,375	7,258	7,299	7,090	6,853
Between I-270 West and MD 187	4,071	2,320	2,804	3,601	4,126	3,633	3,611	3,581
Between I-270 East and MD 187	3,548	1,932	2,928	3,369	4,247	3,396	3,420	3,309
Between MD 355 and MD 185	6,917	4,892	6,674	6,689	8,023	6,633	6,700	7,057
Between MD 185 and MD 97	7,086	4,984	6,942	5,792	7,803	6,902	6,590	6,637
Between MD 97 and US 29	7,370	5,502	7,019	4,857	7,445	6,855	6,402	6,552
Between US 29 and MD 193	6,705	6,146	7,167	4,217	6,718	6,059	5,331	5,536
Between MD 193 and MD 650	6,819	7,124	7,546	4,589	6,976	6,985	5,188	5,721
Between MD 650 and I-95	7,340	8,073	7,838	5,338	7,213	7,347	5,728	5,829
Between US 1 and I-95	5,905	6,358	5,325	3,311	8,393	8,427	8,754	8,384
Between Greenbelt Station and US 1	7,692	7,708	6,429	5,207	7,683	7,628	7,749	7,687
Between Greenbelt Station and MD 201	7,630	7,596	6,101	5,750	7,375	7,081	7,279	7,386
Between MD 201 and MD 295	7,480	7,637	6,025	6,554	7,385	6,636	6,611	7,086
Between MD 295 and MD 450	7,646	7,290	5,868	6,791	6,823	6,051	5,863	6,496
Between MD 450 and US 50	8,213	7,478	6,889	7,597	7,291	6,903	6,226	6,967
Between US 50 and MD 202	7,935	7,546	7,153	7,817	7,117	7,367	6,675	6,573
Between MD 202 and Arena Dr	7,424	7,222	7,020	7,500	6,871	7,314	6,808	6,652
Between Arena Dr and MD 214	7,494	7,088	7,129	7,288	6,925	7,246	6,905	6,613
Between MD 214 and Ritchie Marlboro Rd	7,228	7,030	7,411	7,312	7,556	7,241	7,071	6,862
Between Ritchie Marlboro Rd and MD 4	6,433	6,611	7,029	7,114	7,766	7,845	7,856	7,170
Between MD 4 and Forestville Rd	6,021	6,577	6,931	7,039	7,261	7,339	7,131	6,844
Between Forestville Rd and MD 218	5,539	6,111	6,487	6,545	6,148	6,193	5,958	5,802
Between MD 218 and MD 5	6,019	6,758	7,095	6,972	6,573	6,550	6,337	6,312
Between MD 5 and MD 414	4,731	5,595	5,963	5,727	6,791	6,466	6,487	5,943
Between MD 414 and MD 210	4,565	5,395	5,746	5,312	7,314	7,296	7,474	6,528
Between MD 210 and I-295	4,748	5,715	5,766	5,550	7,366	7,453	7,553	6,694
Woodrow Wilson Bridge	7,557	8,654	8,849	8,678	9,365	9,076	9,203	8,698

I-270 2040 No-Build PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,209	2,558	2,823	2,839	4,329	4,356	4,275	4,182
Between MD 80 and MD 109	1,971	2,293	2,596	2,667	4,235	4,207	4,165	3,996
Between MD 109 and MD 121	2,120	2,382	2,708	2,686	4,265	4,245	4,199	4,210
Between MD 121 and MD 27	2,618	2,840	3,370	3,235	5,222	4,708	4,845	4,948
Between MD 27 and MD 118	3,221	3,406	3,559	3,717	6,727	5,667	5,609	6,212
Between MD 118 and Middlebrook Rd	3,708	4,067	4,240	4,257	7,531	6,115	5,879	6,606
Between Middlebrook Rd and Watkins Mill	4,699	5,129	5,488	5,343	9,162	7,213	6,863	8,144
Between Watkins Mill and MD 124	3,301	3,646	4,149	4,087	8,193	6,865	5,763	7,027
Between MD 124 and MD 117	4,840	5,031	5,658	5,418	9,409	9,045	6,247	7,972
Between MD 117 and I-370	6,272	6,801	7,516	6,858	10,695	10,740	6,830	9,047
Between I-370 and Shady Grove Rd	6,157	6,202	6,172	6,287	11,083	10,975	7,722	8,674
Between Shady Grove Rd and MD 28	6,832	7,039	6,808	6,770	11,266	10,927	9,625	7,938
Between MD 28 and MD 189	7,749	7,959	8,011	7,838	11,986	11,473	10,359	8,458
Between MD 189 and Montrose Rd	7,365	7,587	7,593	7,467	11,730	11,004	10,122	8,449
Between Montrose Rd and I-270 Split	7,108	7,651	7,316	6,950	11,401	10,321	9,462	8,350
Between I-270 Split and MD 187	3,413	3,422	3,650	3,393	5,114	4,827	4,522	3,907
Between MD 187 and I-495	3,519	2,779	3,429	3,489	4,525	3,999	4,065	4,149
Between I-270 Split and Democracy Blvd	3,652	3,895	3,943	3,504	5,675	4,800	4,124	4,681
Between Democracy Blvd and I-495	3,596	3,625	3,435	3,287	5,059	3,824	3,202	4,729

Throughput and Percent Demand Met
2040

I-495 2040 No-Build PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	82%	77%	34%	80%	90%	94%	91%	92%
PMerican Legion Bridge	79%	73%	35%	81%	88%	91%	88%	93%
Between Clara Barton Pkwy and Cabin John Pkwy	81%	73%	39%	81%	87%	88%	88%	91%
Between MD 190 and I-270	94%	68%	60%	100%	87%	87%	86%	89%
Between I-270 West and MD 187	96%	58%	75%	100%	90%	82%	83%	88%
Between I-270 East and MD 187	86%	50%	81%	100%	98%	81%	82%	90%
Between MD 355 and MD 185	86%	62%	89%	100%	94%	80%	80%	89%
Between MD 185 and MD 97	78%	56%	85%	79%	94%	84%	78%	86%
Between MD 97 and US 29	78%	60%	85%	67%	94%	85%	76%	89%
Between MD US 29 and MD 193	75%	70%	90%	62%	94%	81%	71%	86%
Between MD 193 and MD 650	74%	79%	91%	63%	94%	89%	65%	84%
Between MD 650 and I-95	75%	84%	89%	67%	93%	88%	68%	80%
Between US 1 and I-95	92%	88%	77%	62%	90%	86%	96%	100%
Between Greenbelt Station and US1	100%	94%	80%	77%	88%	83%	94%	100%
Between Greenbelt Station and MD 201	100%	93%	77%	86%	87%	80%	92%	100%
Between MD 201 and MD 295	99%	93%	76%	96%	86%	72%	80%	100%
Between MD 295 and MD 450	99%	87%	73%	100%	90%	77%	82%	100%
Between MD 450 and US 50	98%	83%	79%	100%	89%	82%	81%	100%
Between US 50 and MD 202	93%	83%	77%	99%	86%	86%	85%	97%
Between MD 202 and Arena Dr	91%	83%	79%	95%	83%	85%	85%	95%
Between Arena Dr and MD 214	91%	83%	83%	93%	84%	84%	86%	94%
Between MD 214 and Ritchie Marlboro Rd	93%	83%	86%	95%	91%	82%	84%	93%
Between Ritchie Marlboro Rd and MD 4	100%	94%	91%	98%	93%	89%	94%	98%
Between MD 4 and Forestville Rd	100%	96%	96%	99%	90%	91%	90%	100%
Between Forestville Rd and MD 218	100%	97%	96%	100%	89%	90%	88%	100%
Between MD 218 and MD 5	100%	96%	96%	100%	90%	90%	88%	100%
Between MD 5 and MD 414	100%	96%	96%	100%	91%	88%	89%	93%
Between MD 414 and MD 210	100%	96%	96%	100%	92%	90%	93%	93%
Between MD 210 and I-295	100%	97%	94%	100%	92%	90%	91%	92%
Woodrow Wilson Bridge	100%	97%	98%	100%	93%	89%	89%	92%

I-270 2040 No-Build PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	99%	95%	92%	95%	95%	82%	85%	100%
Between MD 80 and MD 109	96%	92%	91%	97%	98%	81%	81%	96%
Between MD 109 and MD 121	98%	91%	91%	96%	97%	80%	80%	95%
Between MD 121 and MD 27	98%	92%	94%	96%	100%	78%	80%	93%
Between MD 27 and MD 118	100%	95%	95%	98%	100%	94%	92%	100%
Between MD 118 and Middlebrook Rd	98%	96%	96%	97%	100%	76%	73%	90%
Between Middlebrook Rd and Watkins Mill	98%	98%	97%	97%	100%	76%	72%	92%
Between Watkins Mill and MD 124	85%	84%	87%	88%	100%	76%	62%	81%
Between MD 124 and MD 117	96%	91%	92%	95%	100%	91%	61%	84%
Between MD 117 and I-370	97%	93%	94%	97%	100%	93%	58%	83%
Between I-370 and Shady Grove Rd	98%	95%	86%	94%	100%	90%	66%	78%
Between Shady Grove Rd and MD 28	99%	96%	82%	91%	100%	89%	82%	71%
Between MD 28 and MD 189	99%	97%	87%	93%	100%	88%	82%	70%
Between MD 189 and Montrose Rd	98%	96%	87%	92%	100%	86%	79%	70%
Between Montrose Rd and I-270 Split	95%	95%	87%	89%	99%	82%	75%	71%
Between I-270 Split and MD 187	95%	91%	96%	91%	100%	87%	80%	72%
Between MD 187 and I-495	93%	70%	88%	95%	100%	86%	85%	85%
Between I-270 Split and Democracy Blvd	94%	91%	85%	86%	87%	69%	59%	73%
Between Democracy Blvd and I-495	96%	92%	88%	90%	95%	68%	59%	91%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 5

I-495 2040 Alternative 5 AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	9,168	9,081	8,520	8,533	7,489	8,044	8,581	8,608
American Legion Bridge	9,136	9,920	9,773	9,795	9,767	10,193	10,835	10,788
Between Clara Barton Pkwy and Cabin John Pkwy	7,804	8,414	8,363	8,263	9,527	9,471	9,444	9,557
Between MD 190 and I-270	7,629	8,933	9,210	8,991	10,734	10,794	10,555	10,235
Between I-270 West and MD 187	5,263	5,345	4,647	4,874	4,594	4,480	4,696	5,621
Between I-270 East and MD 187	5,027	4,908	4,332	4,065	5,039	4,530	4,515	5,159
Between MD 355 and MD 185	8,185	9,426	8,280	6,745	8,297	8,052	8,551	9,376
Between MD 185 and MD 97	7,822	9,147	7,389	7,258	9,288	9,081	8,141	9,316
Between MD 97 and US 29	6,956	8,434	6,740	6,640	8,512	7,897	7,502	8,467
Between US 29 and MD 193	6,897	8,160	7,030	6,636	7,654	6,841	6,312	7,310
Between MD 193 and MD 650	7,206	7,828	7,542	7,288	7,138	6,333	5,954	6,751
Between MD 650 and I-95	8,586	8,866	8,484	7,986	8,308	7,111	6,581	7,407
Between US 1 and I-95	7,223	6,865	6,459	7,143	7,460	7,092	7,022	7,176
Between Greenbelt Station and US 1	8,555	8,214	8,368	8,651	7,824	7,450	7,292	6,970
Between Greenbelt Station and MD 201	8,307	8,001	8,034	8,306	7,792	7,312	7,465	7,138
Between MD 201 and MD 295	7,693	7,499	8,045	8,012	8,200	8,200	8,245	7,841
Between MD 295 and MD 450	7,137	7,123	7,878	7,677	8,318	8,188	8,555	8,355
Between MD 450 and US 50	7,472	7,486	8,438	8,262	8,169	8,038	8,627	8,574
Between US 50 and MD 202	8,578	8,769	9,512	9,336	7,835	7,325	7,788	8,248
Between MD 202 and Arena Dr	8,413	8,536	9,053	9,013	7,853	7,342	7,772	8,476
Between Arena Dr and MD 214	8,465	8,690	9,132	9,031	8,085	7,643	8,395	8,560
Between MD 214 and Ritchie Marlboro Rd	8,598	8,682	8,883	8,933	7,827	7,412	8,267	8,252
Between Ritchie Marlboro Rd and MD 4	8,016	8,081	7,884	8,426	7,613	6,977	7,977	8,059
Between MD 4 and Forestville Rd	7,662	7,680	8,079	8,026	6,670	6,189	6,986	7,249
Between Forestville Rd and MD 218	6,954	7,009	7,389	7,360	5,744	4,892	5,739	6,376
Between MD 218 and MD 5	7,091	7,228	7,613	7,520	6,366	5,561	6,342	6,790
Between MD 5 and MD 414	6,432	5,953	6,213	6,325	4,904	5,205	5,003	5,462
Between MD 414 and MD 210	5,747	6,018	6,146	6,767	5,033	5,041	4,968	5,250
Between MD 210 and I-295	7,165	6,782	6,904	7,372	4,698	4,757	4,630	4,706
Woodrow Wilson Bridge	9,543	10,045	10,009	9,322	8,151	8,111	8,023	7,947

I-270 2040 Alternative 5 AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,253	3,154	3,260	3,422	1,799	2,699	2,909	2,718
Between MD 80 and MD 109	3,591	3,674	3,696	3,791	1,579	2,235	2,454	2,334
Between MD 109 and MD 121	4,073	4,149	4,107	4,098	1,652	2,334	2,544	2,351
Between MD 121 and MD 27	5,193	5,352	4,958	4,948	2,055	2,530	2,761	2,639
Between MD 27 and MD 118	5,612	5,513	5,220	5,476	2,239	2,775	3,080	3,003
Between MD 118 and Middlebrook Rd	6,158	6,001	5,831	5,971	2,355	3,087	3,673	3,620
Between Middlebrook Rd and Watkins Mill	8,114	7,888	7,707	7,626	2,754	3,810	4,590	4,404
Between Watkins Mill and MD 124	7,416	6,899	6,387	6,362	2,602	3,898	4,867	4,653
Between MD 124 and MD 117	8,905	8,320	7,723	7,612	2,463	3,837	4,838	4,763
Between MD 117 and I-370	10,740	10,191	9,553	9,196	2,997	4,744	6,171	6,037
Between I-370 and Shady Grove Rd	12,066	11,071	9,806	9,379	2,637	4,031	5,403	5,459
Between Shady Grove Rd and MD 28	11,754	10,951	9,182	8,793	3,301	5,062	7,075	6,950
Between MD 28 and MD 189	11,789	11,766	9,844	9,494	3,688	5,575	7,931	7,653
Between MD 189 and Montrose Rd	11,759	11,792	10,444	9,533	3,774	5,539	7,992	7,690
Between Montrose Rd and I-270 Split	11,766	12,194	11,295	9,784	4,425	5,778	8,052	7,777
Between I-270 Split and MD 187	4,764	5,713	5,299	4,385	1,965	2,358	3,646	3,607
Between MD 187 and I-495	3,961	4,787	4,379	3,875	2,379	2,929	4,086	3,893
Between I-270 Split and Democracy Blvd	6,968	6,400	6,115	5,403	2,474	3,477	4,515	4,151
Between Democracy Blvd and I-495	6,613	6,170	5,696	4,539	2,509	3,690	4,707	4,181

Throughput and Percent Demand Met
2040 Alt 5

I-495 2040 Alternative 5 AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	95%	91%	90%	93%	98%	95%	100%	100%
American Legion Bridge	94%	89%	86%	89%	97%	92%	99%	100%
Between Clara Barton Pkwy and Cabin John Pkwy	86%	83%	80%	82%	97%	91%	99%	100%
Between MD 190 and I-270	90%	90%	87%	87%	96%	90%	99%	99%
Between I-270 West and MD 187	91%	91%	86%	86%	84%	74%	88%	96%
Between I-270 East and MD 187	91%	89%	86%	74%	95%	78%	86%	91%
Between MD 355 and MD 185	98%	93%	89%	74%	98%	84%	84%	91%
Between MD 185 and MD 97	100%	94%	80%	81%	98%	90%	80%	89%
Between MD 97 and US 29	98%	92%	77%	78%	95%	90%	89%	94%
Between MD US 29 and MD 193	99%	92%	82%	80%	95%	91%	91%	95%
Between MD 193 and MD 650	100%	85%	84%	86%	92%	91%	91%	91%
Between MD 650 and I-95	99%	86%	89%	89%	94%	91%	90%	92%
Between US 1 and I-95	99%	82%	81%	95%	97%	93%	95%	97%
Between Greenbelt Station and US1	99%	83%	87%	96%	96%	90%	94%	94%
Between Greenbelt Station and MD 201	100%	85%	88%	97%	95%	87%	94%	95%
Between MD 201 and MD 295	100%	86%	90%	96%	94%	87%	94%	96%
Between MD 295 and MD 450	100%	89%	94%	98%	93%	86%	94%	95%
Between MD 450 and US 50	100%	89%	94%	100%	93%	85%	93%	94%
Between US 50 and MD 202	99%	93%	95%	100%	90%	79%	90%	94%
Between MD 202 and Arena Dr	99%	94%	94%	100%	92%	79%	90%	99%
Between Arena Dr and MD 214	99%	94%	95%	100%	91%	78%	92%	96%
Between MD 214 and Ritchie Marlboro Rd	100%	95%	97%	100%	91%	75%	90%	95%
Between Ritchie Marlboro Rd and MD 4	95%	89%	88%	97%	99%	78%	98%	100%
Between MD 4 and Forestville Rd	95%	91%	90%	98%	97%	75%	97%	100%
Between Forestville Rd and MD 218	95%	91%	91%	98%	97%	71%	96%	100%
Between MD 218 and MD 5	94%	91%	91%	97%	95%	72%	94%	100%
Between MD 5 and MD 414	89%	100%	94%	100%	99%	87%	95%	100%
Between MD 414 and MD 210	75%	98%	93%	100%	100%	85%	94%	100%
Between MD 210 and I-295	80%	94%	94%	100%	100%	85%	95%	100%
Woodrow Wilson Bridge	86%	92%	97%	100%	100%	86%	94%	100%

I-270 2040 Alternative 5 AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	84%	85%	95%	100%	99%	93%	96%	100%
Between MD 80 and MD 109	92%	88%	99%	100%	100%	94%	95%	100%
Between MD 109 and MD 121	91%	87%	96%	100%	100%	94%	97%	100%
Between MD 121 and MD 27	93%	94%	98%	100%	100%	94%	97%	100%
Between MD 27 and MD 118	86%	98%	100%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	87%	97%	100%	100%	100%	93%	95%	100%
Between Middlebrook Rd and Watkins Mill	90%	96%	100%	100%	100%	93%	95%	99%
Between Watkins Mill and MD 124	91%	97%	100%	100%	83%	76%	78%	80%
Between MD 124 and MD 117	92%	97%	100%	100%	65%	60%	60%	61%
Between MD 117 and I-370	94%	98%	100%	100%	62%	57%	54%	58%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	83%	77%	77%	82%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	98%	94%	96%	100%
Between MD 28 and MD 189	100%	100%	100%	100%	93%	81%	82%	87%
Between MD 189 and Montrose Rd	100%	100%	100%	100%	88%	79%	79%	84%
Between Montrose Rd and I-270 Split	100%	100%	100%	100%	97%	88%	89%	94%
Between I-270 Split and MD 187	100%	100%	100%	100%	100%	87%	88%	96%
Between MD 187 and I-495	100%	100%	100%	100%	100%	86%	89%	95%
Between I-270 Split and Democracy Blvd	100%	100%	100%	100%	94%	90%	92%	92%
Between Democracy Blvd and I-495	100%	100%	100%	100%	93%	90%	90%	89%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 5

I-495 2040 Alternative 5 PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	7,344	7,733	7,395	5,073	7,648	7,553	6,543	5,688
American Legion Bridge	9,103	9,213	9,035	5,696	9,609	9,563	8,599	7,105
Between Clara Barton Pkwy and Cabin John Pkwy	7,406	6,791	6,616	4,248	8,432	7,920	7,241	5,786
Between MD 190 and I-270	9,785	9,511	8,919	6,679	8,808	7,698	7,328	5,359
Between I-270 West and MD 187	4,362	4,123	3,716	2,786	5,353	5,130	4,718	2,940
Between I-270 East and MD 187	4,093	3,877	3,805	3,509	5,287	5,109	4,660	2,574
Between MD 355 and MD 185	7,375	7,055	6,711	6,498	9,240	9,107	8,798	4,746
Between MD 185 and MD 97	8,895	8,271	7,837	6,690	8,800	9,034	8,602	5,513
Between MD 97 and US 29	9,064	8,829	7,911	6,387	8,577	8,929	8,313	6,410
Between US 29 and MD 193	9,167	8,841	8,282	6,441	8,007	8,443	7,450	6,435
Between MD 193 and MD 650	9,419	9,172	8,744	7,335	8,469	8,969	7,893	6,903
Between MD 650 and I-95	10,004	9,796	9,119	7,892	8,887	9,305	9,016	7,269
Between US 1 and I-95	7,150	7,390	6,954	3,944	9,414	9,845	9,626	8,396
Between Greenbelt Station and US 1	8,695	8,623	8,238	5,540	9,047	9,437	9,028	7,880
Between Greenbelt Station and MD 201	8,713	8,631	8,221	5,744	8,873	8,979	8,484	7,528
Between MD 201 and MD 295	8,721	8,749	8,335	6,173	8,803	8,698	7,933	7,113
Between MD 295 and MD 450	9,151	8,915	8,469	6,480	7,968	7,798	7,066	6,878
Between MD 450 and US 50	9,388	9,189	8,987	7,281	8,332	8,285	7,365	7,114
Between US 50 and MD 202	9,715	9,304	9,633	8,450	8,480	8,302	7,486	7,355
Between MD 202 and Arena Dr	9,163	8,705	9,222	8,537	8,621	8,470	7,675	7,847
Between Arena Dr and MD 214	9,357	8,583	9,023	8,635	8,658	8,463	7,977	7,964
Between MD 214 and Ritchie Marlboro Rd	9,038	8,621	9,020	8,684	9,025	8,859	8,726	8,373
Between Ritchie Marlboro Rd and MD 4	8,105	8,086	8,561	8,339	8,812	8,624	8,502	8,031
Between MD 4 and Forestville Rd	7,421	7,791	8,204	8,177	8,400	8,204	8,021	7,506
Between Forestville Rd and MD 218	6,880	7,235	7,701	7,569	7,298	6,921	6,754	6,380
Between MD 218 and MD 5	7,345	7,930	8,323	8,032	7,702	7,202	7,109	6,727
Between MD 5 and MD 414	5,708	6,053	6,324	5,994	7,472	7,164	7,146	6,508
Between MD 414 and MD 210	5,421	5,714	5,936	5,449	7,584	7,483	7,627	6,969
Between MD 210 and I-295	5,363	5,763	5,874	5,392	7,414	7,471	7,574	7,034
Woodrow Wilson Bridge	8,187	8,674	8,875	8,494	9,343	9,052	9,261	9,009

I-270 2040 Alternative 5 PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,191	2,494	2,777	2,887	4,337	4,318	4,145	3,935
Between MD 80 and MD 109	1,985	2,258	2,602	2,653	4,121	4,140	4,175	3,996
Between MD 109 and MD 121	2,124	2,349	2,695	2,716	4,255	4,176	4,183	4,231
Between MD 121 and MD 27	2,619	2,786	3,295	3,298	5,167	4,713	4,696	5,078
Between MD 27 and MD 118	3,195	3,304	3,472	3,703	6,337	5,522	5,222	6,076
Between MD 118 and Middlebrook Rd	3,701	3,931	4,188	4,270	6,774	5,685	5,187	6,229
Between Middlebrook Rd and Watkins Mill	4,718	4,940	5,474	5,350	7,799	6,569	5,931	7,144
Between Watkins Mill and MD 124	3,746	3,720	4,091	4,280	7,823	6,570	5,377	6,725
Between MD 124 and MD 117	4,891	4,937	5,406	5,382	8,273	7,023	5,155	7,252
Between MD 117 and I-370	6,266	6,546	7,196	6,739	9,911	8,448	5,804	8,353
Between I-370 and Shady Grove Rd	6,263	6,166	4,888	4,759	11,012	10,808	4,893	8,333
Between Shady Grove Rd and MD 28	6,965	6,945	3,855	4,798	10,922	11,064	5,536	8,381
Between MD 28 and MD 189	7,590	6,874	3,914	5,149	11,812	11,992	5,490	9,116
Between MD 189 and Montrose Rd	7,369	5,306	3,973	4,707	11,650	11,748	6,618	8,578
Between Montrose Rd and I-270 Split	7,342	4,713	4,723	4,623	11,169	11,372	8,128	7,824
Between I-270 Split and MD 187	3,149	2,170	2,265	2,319	4,832	4,948	3,443	2,833
Between MD 187 and I-495	3,055	2,511	2,520	2,380	4,291	4,214	3,675	1,987
Between I-270 Split and Democracy Blvd	3,502	2,381	2,551	2,253	6,319	6,452	5,895	4,472
Between Democracy Blvd and I-495	3,465	2,599	2,567	2,340	5,587	5,465	5,069	4,045

Throughput and Percent Demand Met
2040 Alt 5

I-495 2040 Alternative 5 PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	100%	100%	87%	97%	96%	89%	75%
PMerican Legion Bridge	100%	97%	92%	64%	94%	92%	85%	72%
Between Clara Barton Pkwy and Cabin John Pkwy	90%	82%	81%	56%	94%	90%	84%	67%
Between MD 190 and I-270	95%	92%	91%	74%	97%	85%	82%	64%
Between I-270 West and MD 187	95%	93%	87%	78%	98%	98%	92%	61%
Between I-270 East and MD 187	87%	85%	87%	98%	99%	98%	90%	57%
Between MD 355 and MD 185	78%	76%	77%	84%	100%	96%	90%	51%
Between MD 185 and MD 97	84%	80%	82%	78%	99%	95%	87%	61%
Between MD 97 and US 29	83%	83%	82%	75%	99%	95%	85%	74%
Between MD US 29 and MD 193	86%	85%	88%	79%	98%	95%	83%	83%
Between MD 193 and MD 650	87%	86%	91%	85%	99%	97%	84%	85%
Between MD 650 and I-95	88%	88%	89%	85%	98%	96%	92%	85%
Between US 1 and I-95	91%	92%	94%	68%	96%	96%	100%	100%
Between Greenbelt Station and US1	91%	92%	94%	73%	96%	95%	100%	99%
Between Greenbelt Station and MD 201	92%	93%	95%	77%	96%	94%	99%	99%
Between MD 201 and MD 295	93%	94%	96%	81%	97%	94%	98%	99%
Between MD 295 and MD 450	92%	95%	99%	89%	96%	95%	97%	98%
Between MD 450 and US 50	92%	95%	100%	90%	95%	94%	95%	95%
Between US 50 and MD 202	95%	97%	100%	95%	94%	91%	93%	96%
Between MD 202 and Arena Dr	95%	97%	100%	95%	98%	94%	95%	100%
Between Arena Dr and MD 214	96%	97%	100%	96%	98%	94%	97%	100%
Between MD 214 and Ritchie Marlboro Rd	97%	97%	100%	98%	99%	93%	97%	100%
Between Ritchie Marlboro Rd and MD 4	98%	97%	98%	99%	98%	93%	96%	99%
Between MD 4 and Forestville Rd	97%	96%	100%	100%	96%	93%	95%	99%
Between Forestville Rd and MD 218	97%	96%	100%	100%	96%	93%	93%	97%
Between MD 218 and MD 5	97%	97%	100%	100%	95%	91%	92%	97%
Between MD 5 and MD 414	96%	95%	99%	98%	98%	95%	95%	99%
Between MD 414 and MD 210	94%	93%	96%	96%	93%	90%	92%	96%
Between MD 210 and I-295	93%	92%	96%	96%	93%	91%	92%	96%
Woodrow Wilson Bridge	98%	94%	99%	100%	94%	90%	91%	96%

I-270 2040 Alternative 5 PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	92%	98%	96%	82%	84%	97%
Between MD 80 and MD 109	99%	92%	93%	98%	97%	81%	83%	97%
Between MD 109 and MD 121	99%	91%	92%	98%	98%	80%	81%	97%
Between MD 121 and MD 27	99%	91%	93%	99%	100%	79%	78%	96%
Between MD 27 and MD 118	100%	94%	94%	99%	100%	93%	87%	100%
Between MD 118 and Middlebrook Rd	99%	94%	96%	98%	96%	72%	66%	87%
Between Middlebrook Rd and Watkins Mill	99%	95%	98%	98%	92%	70%	63%	82%
Between Watkins Mill and MD 124	97%	87%	87%	94%	87%	65%	55%	71%
Between MD 124 and MD 117	98%	91%	89%	96%	72%	51%	39%	54%
Between MD 117 and I-370	99%	92%	92%	97%	65%	47%	36%	52%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	100%	83%	46%	73%
Between Shady Grove Rd and MD 28	100%	100%	95%	100%	100%	94%	44%	79%
Between MD 28 and MD 189	100%	100%	79%	100%	100%	93%	45%	75%
Between MD 189 and Montrose Rd	100%	100%	85%	100%	100%	94%	53%	72%
Between Montrose Rd and I-270 Split	97%	59%	58%	61%	100%	94%	68%	68%
Between I-270 Split and MD 187	81%	55%	60%	62%	100%	94%	64%	55%
Between MD 187 and I-495	76%	61%	65%	65%	100%	96%	81%	43%
Between I-270 Split and Democracy Blvd	96%	59%	59%	60%	99%	94%	86%	71%
Between Democracy Blvd and I-495	96%	68%	67%	65%	99%	93%	91%	74%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 8

I-495 2040 Alternative 8 AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	9,841	10,281	9,922	9,809	8,404	8,588	9,323	8,888
American Legion Bridge	10,650	11,508	11,128	11,077	10,662	10,732	11,426	10,907
Between Clara Barton Pkwy and Cabin John Pkwy	9,112	9,519	9,405	9,369	10,616	10,042	10,152	9,711
Between MD 190 and I-270	10,038	10,959	10,871	10,768	13,148	12,792	12,942	11,878
Between I-270 West and MD 187	6,724	6,356	5,532	5,781	6,360	5,322	6,279	6,415
Between I-270 East and MD 187	6,052	6,145	5,495	5,698	6,603	5,674	5,939	6,527
Between MD 355 and MD 185	9,277	11,185	10,292	8,713	10,089	9,348	10,003	11,500
Between MD 185 and MD 97	8,825	10,780	9,781	8,914	10,847	10,342	9,419	11,138
Between MD 97 and US 29	8,026	9,903	8,920	8,192	10,317	8,985	9,090	10,132
Between US 29 and MD 193	8,068	9,667	8,737	8,075	9,001	8,357	7,963	8,700
Between MD 193 and MD 650	8,318	9,683	9,308	8,497	8,374	7,712	7,351	8,257
Between MD 650 and I-95	9,642	10,626	10,035	9,062	9,155	8,368	7,980	8,782
Between US 1 and I-95	7,813	8,042	7,585	7,297	7,541	7,563	7,772	8,038
Between Greenbelt Station and US 1	8,990	9,578	9,285	8,640	8,075	8,176	8,101	8,134
Between Greenbelt Station and MD 201	8,668	9,427	9,307	8,648	8,346	8,120	7,985	8,106
Between MD 201 and MD 295	8,282	8,969	9,391	8,552	9,010	9,162	8,763	8,972
Between MD 295 and MD 450	7,933	9,608	9,935	8,260	9,433	9,587	9,195	9,546
Between MD 450 and US 50	8,367	9,023	10,179	9,260	9,428	9,541	9,523	9,767
Between US 50 and MD 202	9,644	10,205	11,153	10,426	9,342	9,216	8,575	9,499
Between MD 202 and Arena Dr	9,535	10,041	10,777	10,157	9,299	9,264	8,300	9,954
Between Arena Dr and MD 214	9,553	10,170	10,609	10,113	9,532	9,611	8,939	10,046
Between MD 214 and Ritchie Marlboro Rd	9,614	10,039	10,089	9,890	9,249	9,432	9,339	8,964
Between Ritchie Marlboro Rd and MD 4	9,125	9,510	9,250	9,452	8,349	9,011	8,571	8,597
Between MD 4 and Forestville Rd	8,373	8,508	9,187	8,759	7,513	8,141	7,613	7,702
Between Forestville Rd and MD 218	7,690	7,848	8,426	8,137	6,618	6,906	6,404	6,875
Between MD 218 and MD 5	7,793	8,010	8,582	8,312	7,384	7,630	7,125	7,244
Between MD 5 and MD 414	7,348	6,018	6,359	7,194	5,788	5,916	5,826	5,959
Between MD 414 and MD 210	6,418	6,141	6,310	6,860	5,081	5,182	5,162	5,295
Between MD 210 and I-295	7,593	6,705	6,870	7,365	4,675	4,806	4,649	4,677
Woodrow Wilson Bridge	9,641	10,087	10,028	9,289	8,190	8,018	7,956	8,031

I-270 2040 Alternative 8 AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,650	3,166	3,156	3,376	1,919	2,781	3,192	2,601
Between MD 80 and MD 109	3,614	3,549	3,711	3,723	1,665	2,323	2,814	2,124
Between MD 109 and MD 121	4,092	4,068	4,102	4,116	1,738	2,447	2,869	2,131
Between MD 121 and MD 27	5,070	5,089	5,215	4,537	2,149	2,708	3,081	2,292
Between MD 27 and MD 118	5,443	5,574	5,330	4,638	2,365	2,951	3,295	2,430
Between MD 118 and Middlebrook Rd	6,077	6,025	5,848	5,218	2,424	3,157	3,643	2,525
Between Middlebrook Rd and Watkins Mill	8,041	7,944	7,715	6,828	2,858	3,859	4,430	3,025
Between Watkins Mill and MD 124	7,431	6,967	6,149	5,712	2,712	3,981	4,614	3,025
Between MD 124 and MD 117	8,950	8,332	7,325	6,814	2,646	3,978	4,460	2,741
Between MD 117 and I-370	10,891	9,966	8,450	7,910	3,181	4,961	5,611	3,326
Between I-370 and Shady Grove Rd	12,562	11,156	9,464	7,724	2,970	4,415	5,459	3,169
Between Shady Grove Rd and MD 28	12,960	11,637	9,886	8,203	3,836	5,695	7,497	5,773
Between MD 28 and MD 189	13,162	12,652	10,681	9,116	4,497	6,571	8,709	7,665
Between MD 189 and Montrose Rd	13,057	12,977	11,092	9,364	4,620	6,579	8,769	8,750
Between Montrose Rd and I-270 Split	13,309	13,933	12,251	9,977	5,504	7,029	9,070	9,122
Between I-270 Split and MD 187	5,615	6,420	5,615	3,931	2,545	2,976	4,159	4,482
Between MD 187 and I-495	4,566	5,188	4,828	3,178	2,973	3,264	4,932	4,999
Between I-270 Split and Democracy Blvd	7,690	7,385	6,772	5,513	2,980	4,109	4,989	4,688
Between Democracy Blvd and I-495	7,375	7,214	6,514	5,059	3,487	4,726	5,528	5,141

Throughput and Percent Demand Met
2040 Alt 8

I-495 2040 Alternative 8 AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	92%	94%	95%	97%	98%	92%	100%	97%
American Legion Bridge	99%	93%	89%	91%	97%	88%	96%	95%
Between Clara Barton Pkwy and Cabin John Pkwy	90%	83%	80%	82%	96%	86%	95%	92%
Between MD 190 and I-270	100%	93%	86%	88%	100%	90%	100%	97%
Between I-270 West and MD 187	100%	95%	87%	90%	98%	74%	100%	95%
Between I-270 East and MD 187	96%	94%	89%	89%	100%	79%	94%	96%
Between MD 355 and MD 185	96%	95%	95%	83%	100%	85%	85%	96%
Between MD 185 and MD 97	97%	96%	91%	86%	100%	91%	80%	92%
Between MD 97 and US 29	97%	93%	87%	83%	100%	90%	91%	96%
Between MD US 29 and MD 193	98%	92%	86%	86%	99%	98%	96%	99%
Between MD 193 and MD 650	99%	91%	89%	89%	97%	97%	94%	97%
Between MD 650 and I-95	99%	91%	92%	91%	98%	97%	95%	98%
Between US 1 and I-95	100%	91%	92%	91%	96%	98%	98%	100%
Between Greenbelt Station and US1	99%	92%	93%	91%	97%	98%	97%	100%
Between Greenbelt Station and MD 201	99%	94%	96%	94%	98%	94%	93%	100%
Between MD 201 and MD 295	98%	94%	97%	94%	98%	93%	91%	100%
Between MD 295 and MD 450	98%	95%	100%	96%	98%	94%	91%	100%
Between MD 450 and US 50	98%	95%	100%	100%	98%	93%	92%	98%
Between US 50 and MD 202	98%	96%	100%	100%	97%	91%	87%	98%
Between MD 202 and Arena Dr	97%	97%	100%	100%	96%	90%	83%	100%
Between Arena Dr and MD 214	98%	97%	100%	100%	96%	90%	86%	100%
Between MD 214 and Ritchie Marlboro Rd	99%	97%	100%	100%	96%	87%	90%	93%
Between Ritchie Marlboro Rd and MD 4	98%	95%	97%	100%	98%	94%	96%	98%
Between MD 4 and Forestville Rd	96%	93%	99%	100%	100%	94%	97%	100%
Between Forestville Rd and MD 218	96%	93%	98%	100%	100%	93%	96%	100%
Between MD 218 and MD 5	96%	93%	98%	100%	100%	93%	97%	100%
Between MD 5 and MD 414	100%	99%	99%	100%	100%	98%	100%	100%
Between MD 414 and MD 210	83%	99%	99%	100%	100%	89%	96%	100%
Between MD 210 and I-295	85%	93%	96%	100%	100%	87%	94%	100%
Woodrow Wilson Bridge	86%	91%	99%	100%	100%	85%	91%	100%

I-270 2040 Alternative 8 AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	99%	82%	89%	100%	100%	95%	100%	98%
Between MD 80 and MD 109	89%	82%	95%	100%	100%	95%	100%	93%
Between MD 109 and MD 121	88%	82%	93%	100%	100%	97%	100%	91%
Between MD 121 and MD 27	88%	86%	99%	91%	100%	97%	100%	85%
Between MD 27 and MD 118	82%	95%	100%	86%	100%	100%	100%	90%
Between MD 118 and Middlebrook Rd	84%	95%	98%	88%	100%	92%	92%	68%
Between Middlebrook Rd and Watkins Mill	87%	95%	99%	91%	100%	92%	89%	66%
Between Watkins Mill and MD 124	92%	98%	93%	91%	83%	75%	72%	52%
Between MD 124 and MD 117	90%	95%	91%	90%	66%	60%	54%	36%
Between MD 117 and I-370	92%	92%	85%	85%	64%	57%	50%	33%
Between I-370 and Shady Grove Rd	100%	97%	91%	78%	95%	83%	78%	47%
Between Shady Grove Rd and MD 28	100%	100%	100%	86%	100%	94%	90%	78%
Between MD 28 and MD 189	100%	100%	96%	85%	99%	84%	79%	83%
Between MD 189 and Montrose Rd	100%	100%	98%	87%	97%	84%	78%	86%
Between Montrose Rd and I-270 Split	100%	100%	100%	90%	100%	92%	85%	94%
Between I-270 Split and MD 187	100%	100%	100%	77%	100%	93%	84%	100%
Between MD 187 and I-495	100%	94%	99%	69%	100%	86%	87%	99%
Between I-270 Split and Democracy Blvd	100%	100%	100%	93%	98%	93%	88%	90%
Between Democracy Blvd and I-495	100%	100%	100%	92%	100%	92%	87%	89%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 8

I-495 2040 Alternative 8 PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	8,156	8,074	6,557	6,574	8,231	7,750	6,780	5,187
American Legion Bridge	9,860	9,230	8,112	7,754	10,234	9,587	8,918	6,068
Between Clara Barton Pkwy and Cabin John Pkwy	8,176	6,878	6,087	5,631	9,276	8,212	7,740	4,836
Between MD 190 and I-270	10,802	9,770	9,160	6,922	9,512	8,590	7,923	5,661
Between I-270 West and MD 187	6,363	6,024	5,602	4,116	5,825	5,717	5,126	3,703
Between I-270 East and MD 187	5,958	6,165	5,666	4,434	5,846	5,815	5,476	3,421
Between MD 355 and MD 185	9,779	9,998	9,246	7,491	11,001	11,035	10,789	7,512
Between MD 185 and MD 97	11,170	10,885	10,232	8,649	10,599	10,955	10,801	9,233
Between MD 97 and US 29	11,397	10,632	10,484	8,901	10,340	10,817	10,819	10,042
Between US 29 and MD 193	10,752	10,334	10,222	8,531	9,562	10,130	10,093	9,098
Between MD 193 and MD 650	10,772	10,526	10,435	9,113	9,861	10,217	10,356	8,953
Between MD 650 and I-95	11,362	11,075	10,903	9,901	10,259	10,449	10,639	9,321
Between US 1 and I-95	7,410	7,455	7,276	5,726	9,886	10,073	9,712	8,403
Between Greenbelt Station and US 1	8,730	8,785	8,608	7,373	9,569	9,603	9,059	7,932
Between Greenbelt Station and MD 201	8,883	8,910	8,658	7,503	9,427	9,324	8,790	7,692
Between MD 201 and MD 295	8,874	9,044	8,732	7,611	9,375	9,167	8,447	7,438
Between MD 295 and MD 450	9,402	9,220	8,997	7,607	8,571	8,530	7,670	7,441
Between MD 450 and US 50	9,793	9,752	9,624	8,455	9,105	9,119	8,120	7,787
Between US 50 and MD 202	10,065	9,864	10,214	9,378	9,283	9,286	8,270	7,886
Between MD 202 and Arena Dr	9,742	9,460	10,069	9,600	9,554	9,594	8,447	8,377
Between Arena Dr and MD 214	9,776	9,295	9,769	9,543	9,442	9,522	8,810	8,401
Between MD 214 and Ritchie Marlboro Rd	9,510	9,245	9,669	9,495	9,734	9,718	9,338	9,071
Between Ritchie Marlboro Rd and MD 4	8,125	8,216	8,898	8,743	9,281	9,222	8,993	8,423
Between MD 4 and Forestville Rd	7,479	7,994	8,458	8,505	8,661	8,484	8,389	7,647
Between Forestville Rd and MD 218	6,992	7,513	7,955	7,926	7,615	7,309	7,200	6,711
Between MD 218 and MD 5	7,380	8,081	8,516	8,277	8,001	7,665	7,586	7,035
Between MD 5 and MD 414	5,498	6,003	6,458	6,076	8,162	7,865	7,801	6,940
Between MD 414 and MD 210	5,052	5,532	5,910	5,370	7,701	7,778	7,779	6,993
Between MD 210 and I-295	4,779	5,257	5,666	5,099	7,314	7,584	7,624	6,937
Woodrow Wilson Bridge	7,693	8,377	8,697	8,072	9,271	9,293	9,340	9,030

I-270 2040 Alternative 8 PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,298	2,567	2,901	2,968	4,366	4,341	4,245	3,971
Between MD 80 and MD 109	2,037	2,317	2,668	2,738	4,161	4,211	4,168	3,997
Between MD 109 and MD 121	2,195	2,413	2,774	2,825	4,250	4,210	4,218	4,222
Between MD 121 and MD 27	2,574	2,897	3,302	3,435	4,854	4,164	4,418	5,048
Between MD 27 and MD 118	3,098	3,511	3,560	3,847	6,153	4,582	4,966	6,353
Between MD 118 and Middlebrook Rd	3,651	4,129	4,305	4,424	7,018	5,066	4,791	6,790
Between Middlebrook Rd and Watkins Mill	4,699	5,132	5,611	5,476	8,669	6,304	5,686	8,634
Between Watkins Mill and MD 124	3,915	3,921	4,234	4,402	8,108	7,160	4,938	7,771
Between MD 124 and MD 117	5,085	5,183	5,576	5,502	8,676	7,881	4,620	7,922
Between MD 117 and I-370	6,609	6,981	7,455	7,140	10,376	9,790	5,099	9,277
Between I-370 and Shady Grove Rd	6,352	6,157	6,350	6,465	11,607	11,540	5,467	7,509
Between Shady Grove Rd and MD 28	7,872	7,462	7,295	6,026	11,662	11,680	6,622	7,243
Between MD 28 and MD 189	8,654	8,394	6,650	6,349	12,687	12,739	7,127	7,637
Between MD 189 and Montrose Rd	8,355	7,543	5,518	5,895	12,280	12,249	8,514	6,609
Between Montrose Rd and I-270 Split	8,318	6,404	6,133	5,842	12,076	12,128	10,798	5,124
Between I-270 Split and MD 187	3,744	3,164	2,976	2,712	6,575	6,788	6,428	3,344
Between MD 187 and I-495	3,257	3,191	2,872	2,595	5,774	5,720	5,600	3,592
Between I-270 Split and Democracy Blvd	3,930	3,034	3,118	2,847	5,455	5,388	5,094	2,272
Between Democracy Blvd and I-495	3,673	2,866	2,720	2,366	4,248	3,871	3,639	2,372

Throughput and Percent Demand Met
2040 Alt 8

I-495 2040 Alternative 8 PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	94%	73%	82%	99%	92%	86%	64%
PMerican Legion Bridge	99%	88%	75%	79%	91%	84%	80%	56%
Between Clara Barton Pkwy and Cabin John Pkwy	88%	74%	66%	66%	92%	84%	80%	50%
Between MD 190 and I-270	89%	80%	79%	65%	88%	80%	75%	57%
Between I-270 West and MD 187	100%	100%	100%	87%	90%	91%	83%	64%
Between I-270 East and MD 187	100%	100%	100%	95%	92%	93%	87%	60%
Between MD 355 and MD 185	92%	92%	91%	85%	100%	98%	94%	69%
Between MD 185 and MD 97	96%	93%	94%	90%	100%	97%	93%	87%
Between MD 97 and US 29	96%	89%	96%	94%	100%	97%	95%	98%
Between MD US 29 and MD 193	94%	89%	96%	95%	98%	96%	95%	98%
Between MD 193 and MD 650	94%	90%	97%	98%	100%	96%	96%	96%
Between MD 650 and I-95	94%	91%	97%	100%	99%	95%	95%	96%
Between US 1 and I-95	93%	90%	94%	98%	97%	94%	97%	96%
Between Greenbelt Station and US1	91%	91%	94%	96%	97%	93%	96%	95%
Between Greenbelt Station and MD 201	91%	91%	94%	97%	96%	93%	95%	95%
Between MD 201 and MD 295	91%	91%	94%	95%	96%	93%	95%	95%
Between MD 295 and MD 450	92%	93%	97%	98%	94%	94%	93%	95%
Between MD 450 and US 50	92%	93%	98%	98%	93%	93%	91%	92%
Between US 50 and MD 202	94%	95%	98%	100%	92%	91%	90%	91%
Between MD 202 and Arena Dr	94%	95%	98%	99%	95%	95%	90%	94%
Between Arena Dr and MD 214	94%	95%	98%	100%	94%	94%	94%	94%
Between MD 214 and Ritchie Marlboro Rd	96%	95%	97%	100%	96%	93%	93%	98%
Between Ritchie Marlboro Rd and MD 4	94%	92%	95%	99%	96%	94%	94%	98%
Between MD 4 and Forestville Rd	93%	93%	95%	100%	95%	93%	93%	96%
Between Forestville Rd and MD 218	93%	93%	96%	100%	95%	93%	92%	96%
Between MD 218 and MD 5	94%	91%	94%	97%	94%	92%	92%	96%
Between MD 5 and MD 414	95%	95%	99%	100%	100%	100%	100%	100%
Between MD 414 and MD 210	92%	86%	89%	92%	92%	92%	92%	95%
Between MD 210 and I-295	89%	89%	94%	97%	91%	92%	92%	95%
Woodrow Wilson Bridge	96%	94%	98%	100%	92%	93%	91%	96%

I-270 2040 Alternative 8 PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	93%	98%	94%	81%	83%	96%
Between MD 80 and MD 109	98%	92%	92%	98%	95%	80%	81%	95%
Between MD 109 and MD 121	99%	91%	92%	99%	95%	78%	79%	94%
Between MD 121 and MD 27	93%	91%	90%	99%	95%	67%	71%	93%
Between MD 27 and MD 118	94%	96%	92%	99%	100%	74%	80%	100%
Between MD 118 and Middlebrook Rd	94%	95%	95%	98%	96%	62%	58%	91%
Between Middlebrook Rd and Watkins Mill	96%	96%	97%	98%	98%	65%	59%	96%
Between Watkins Mill and MD 124	97%	88%	86%	93%	90%	66%	50%	84%
Between MD 124 and MD 117	98%	92%	88%	94%	72%	55%	34%	65%
Between MD 117 and I-370	99%	93%	90%	97%	65%	52%	31%	59%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	97%	87%	32%	71%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	98%	91%	45%	62%
Between MD 28 and MD 189	100%	100%	100%	100%	95%	87%	50%	56%
Between MD 189 and Montrose Rd	100%	100%	100%	100%	94%	86%	60%	49%
Between Montrose Rd and I-270 Split	98%	69%	64%	66%	93%	87%	78%	38%
Between I-270 Split and MD 187	93%	75%	70%	65%	100%	100%	100%	54%
Between MD 187 and I-495	76%	71%	65%	63%	100%	100%	100%	64%
Between I-270 Split and Democracy Blvd	87%	61%	58%	60%	76%	71%	66%	32%
Between Democracy Blvd and I-495	85%	64%	61%	57%	68%	61%	58%	39%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 9

I-495 2040 Alternative 9 AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	9,842	10,544	9,785	9,721	8,342	9,068	9,302	8,897
American Legion Bridge	9,938	11,003	10,940	11,003	10,670	11,340	11,469	10,797
Between Clara Barton Pkwy and Cabin John Pkwy	8,391	9,007	8,972	9,227	10,411	10,555	10,192	9,561
Between MD 190 and I-270	9,276	10,478	10,797	10,856	12,276	12,293	11,442	10,254
Between I-270 West and MD 187	6,538	6,504	6,042	6,447	6,062	6,137	6,262	6,571
Between I-270 East and MD 187	6,200	6,248	5,733	6,287	6,285	6,095	6,133	6,327
Between MD 355 and MD 185	9,733	11,143	9,689	9,819	9,547	9,943	10,803	10,949
Between MD 185 and MD 97	9,309	10,470	9,853	10,150	10,499	10,601	10,398	10,878
Between MD 97 and US 29	8,312	9,794	9,222	9,347	9,723	9,571	8,950	9,419
Between US 29 and MD 193	8,236	9,445	8,877	8,672	8,969	8,619	8,083	8,453
Between MD 193 and MD 650	8,449	9,692	9,348	8,904	8,380	7,981	7,496	7,984
Between MD 650 and I-95	9,689	10,616	10,059	9,441	9,150	8,573	8,119	8,548
Between US 1 and I-95	7,536	7,709	7,391	7,310	7,679	7,241	7,482	7,599
Between Greenbelt Station and US 1	8,730	9,291	9,128	8,770	8,293	7,856	7,938	7,627
Between Greenbelt Station and MD 201	8,560	9,100	8,948	8,701	8,352	7,848	7,964	7,590
Between MD 201 and MD 295	8,048	8,496	8,941	8,405	8,999	8,971	8,982	8,460
Between MD 295 and MD 450	7,670	8,097	8,764	8,138	9,400	9,236	9,385	9,183
Between MD 450 and US 50	8,088	8,498	9,184	8,936	9,418	9,211	9,708	9,442
Between US 50 and MD 202	9,376	9,820	10,420	9,952	9,415	8,826	9,091	9,127
Between MD 202 and Arena Dr	9,320	9,610	10,193	9,818	9,201	8,765	9,050	8,923
Between Arena Dr and MD 214	9,355	9,717	10,049	9,743	9,430	9,004	9,359	9,173
Between MD 214 and Ritchie Marlboro Rd	9,401	9,604	9,730	9,533	9,157	8,848	9,147	8,707
Between Ritchie Marlboro Rd and MD 4	8,834	8,995	8,873	9,116	8,318	7,932	8,346	8,169
Between MD 4 and Forestville Rd	8,219	8,217	8,766	8,500	7,246	6,933	7,126	7,151
Between Forestville Rd and MD 218	7,541	7,563	8,052	7,886	6,318	5,677	5,927	6,316
Between MD 218 and MD 5	7,648	7,750	8,235	8,040	6,966	6,252	6,494	6,648
Between MD 5 and MD 414	6,719	6,093	6,467	6,502	5,317	5,596	5,283	5,588
Between MD 414 and MD 210	6,025	6,079	6,215	6,779	5,085	5,069	5,004	5,165
Between MD 210 and I-295	7,348	6,733	6,822	7,300	4,762	4,800	4,584	4,702
Woodrow Wilson Bridge	9,655	10,008	9,911	9,182	8,253	8,183	7,831	8,123

I-270 2040 Alternative 9 AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,365	3,195	3,167	3,431	1,886	2,722	2,998	2,783
Between MD 80 and MD 109	3,657	3,639	3,674	3,748	1,634	2,264	2,543	2,401
Between MD 109 and MD 121	4,095	4,105	4,108	4,121	1,722	2,346	2,663	2,389
Between MD 121 and MD 27	5,172	5,160	4,997	5,127	2,127	2,558	2,856	2,665
Between MD 27 and MD 118	5,643	5,504	5,187	5,510	2,334	2,839	3,167	3,018
Between MD 118 and Middlebrook Rd	6,132	5,975	5,766	6,014	2,435	3,149	3,762	3,606
Between Middlebrook Rd and Watkins Mill	8,082	7,880	7,619	7,662	2,850	3,862	4,675	4,381
Between Watkins Mill and MD 124	7,372	6,606	6,417	6,652	2,699	3,965	4,978	4,623
Between MD 124 and MD 117	8,723	7,960	7,778	7,950	2,590	3,927	5,022	4,760
Between MD 117 and I-370	10,445	9,606	9,250	9,469	3,127	4,814	6,413	5,965
Between I-370 and Shady Grove Rd	12,047	10,922	9,789	9,349	2,846	4,244	5,751	5,482
Between Shady Grove Rd and MD 28	12,510	11,099	9,744	7,950	3,645	5,524	7,776	7,154
Between MD 28 and MD 189	12,747	11,726	10,319	7,450	4,203	6,154	8,769	7,965
Between MD 189 and Montrose Rd	12,675	11,755	10,058	6,838	4,237	6,102	8,730	8,463
Between Montrose Rd and I-270 Split	12,877	12,463	10,706	7,489	5,015	6,510	9,055	8,752
Between I-270 Split and MD 187	5,534	6,164	5,191	3,323	2,298	2,787	4,397	4,291
Between MD 187 and I-495	4,735	5,423	4,517	3,369	2,842	3,533	5,050	4,682
Between I-270 Split and Democracy Blvd	7,317	6,309	5,601	4,207	2,710	3,782	4,725	4,502
Between Democracy Blvd and I-495	6,619	5,941	5,116	3,653	2,897	4,098	4,868	4,592

Throughput and Percent Demand Met
2040 Alt 9

I-495 2040 Alternative 9 AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	95%	97%	94%	97%	100%	98%	96%	94%
American Legion Bridge	96%	91%	89%	94%	99%	95%	96%	95%
Between Clara Barton Pkwy and Cabin John Pkwy	86%	80%	78%	84%	99%	94%	95%	92%
Between MD 190 and I-270	95%	90%	89%	92%	100%	93%	96%	88%
Between I-270 West and MD 187	97%	92%	90%	94%	93%	85%	96%	94%
Between I-270 East and MD 187	94%	91%	90%	93%	98%	86%	94%	92%
Between MD 355 and MD 185	100%	94%	89%	93%	98%	88%	93%	94%
Between MD 185 and MD 97	100%	93%	90%	98%	99%	91%	89%	93%
Between MD 97 and US 29	100%	91%	89%	94%	98%	94%	90%	92%
Between MD US 29 and MD 193	100%	91%	88%	92%	99%	97%	97%	98%
Between MD 193 and MD 650	100%	91%	89%	93%	97%	96%	95%	96%
Between MD 650 and I-95	100%	91%	93%	95%	98%	96%	96%	97%
Between US 1 and I-95	99%	91%	92%	94%	99%	92%	94%	100%
Between Greenbelt Station and US1	98%	90%	92%	94%	100%	91%	95%	100%
Between Greenbelt Station and MD 201	100%	92%	94%	97%	98%	88%	93%	98%
Between MD 201 and MD 295	99%	92%	95%	95%	98%	90%	95%	99%
Between MD 295 and MD 450	99%	94%	98%	97%	98%	90%	94%	99%
Between MD 450 and US 50	98%	94%	94%	100%	99%	89%	95%	97%
Between US 50 and MD 202	98%	96%	96%	99%	98%	86%	94%	96%
Between MD 202 and Arena Dr	99%	96%	96%	99%	96%	84%	91%	95%
Between Arena Dr and MD 214	99%	96%	96%	99%	96%	83%	90%	95%
Between MD 214 and Ritchie Marlboro Rd	100%	96%	98%	99%	96%	81%	89%	93%
Between Ritchie Marlboro Rd and MD 4	98%	93%	94%	98%	98%	83%	94%	96%
Between MD 4 and Forestville Rd	97%	94%	95%	99%	97%	80%	91%	97%
Between Forestville Rd and MD 218	97%	94%	95%	99%	96%	77%	89%	96%
Between MD 218 and MD 5	97%	94%	95%	98%	95%	76%	89%	96%
Between MD 5 and MD 414	93%	100%	97%	99%	100%	91%	96%	100%
Between MD 414 and MD 210	78%	99%	94%	100%	99%	85%	93%	100%
Between MD 210 and I-295	82%	94%	92%	100%	100%	85%	92%	100%
Woodrow Wilson Bridge	87%	92%	96%	100%	100%	85%	90%	100%

I-270 2040 Alternative 9 AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	90%	82%	87%	99%	100%	91%	96%	100%
Between MD 80 and MD 109	89%	83%	93%	100%	100%	91%	95%	100%
Between MD 109 and MD 121	88%	82%	92%	98%	100%	92%	98%	100%
Between MD 121 and MD 27	90%	87%	95%	100%	100%	92%	97%	99%
Between MD 27 and MD 118	85%	94%	97%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	85%	94%	97%	100%	100%	92%	95%	97%
Between Middlebrook Rd and Watkins Mill	87%	94%	98%	100%	100%	92%	95%	96%
Between Watkins Mill and MD 124	92%	93%	98%	100%	84%	76%	78%	78%
Between MD 124 and MD 117	88%	91%	98%	100%	67%	60%	61%	60%
Between MD 117 and I-370	89%	90%	94%	100%	64%	57%	55%	56%
Between I-370 and Shady Grove Rd	100%	97%	97%	97%	90%	79%	81%	81%
Between Shady Grove Rd and MD 28	100%	100%	100%	88%	100%	94%	97%	96%
Between MD 28 and MD 189	100%	99%	97%	74%	95%	81%	82%	87%
Between MD 189 and Montrose Rd	100%	98%	93%	67%	91%	80%	80%	86%
Between Montrose Rd and I-270 Split	100%	98%	92%	71%	99%	89%	91%	96%
Between I-270 Split and MD 187	100%	99%	93%	68%	100%	88%	91%	99%
Between MD 187 and I-495	100%	97%	93%	77%	100%	87%	94%	98%
Between I-270 Split and Democracy Blvd	100%	98%	93%	75%	95%	92%	91%	94%
Between Democracy Blvd and I-495	100%	98%	94%	77%	96%	91%	90%	93%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 9

I-495 2040 Alternative 9 PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	8,148	8,681	7,582	7,915	8,571	8,571	7,421	6,464
American Legion Bridge	9,859	10,294	8,849	9,725	10,608	10,612	9,637	7,841
Between Clara Barton Pkwy and Cabin John Pkwy	8,176	7,815	6,574	7,524	9,657	9,256	8,429	6,757
Between MD 190 and I-270	11,325	10,246	9,731	10,107	10,287	9,941	9,008	6,795
Between I-270 West and MD 187	5,990	5,474	5,144	5,104	6,855	6,630	6,251	3,666
Between I-270 East and MD 187	5,266	5,295	5,142	4,914	6,599	6,376	6,023	3,086
Between MD 355 and MD 185	9,171	9,249	8,734	8,481	10,805	10,851	10,748	5,282
Between MD 185 and MD 97	10,495	10,296	10,010	8,260	10,408	10,764	10,657	6,397
Between MD 97 and US 29	10,802	10,424	9,979	7,867	10,155	10,653	10,544	7,477
Between US 29 and MD 193	10,575	10,013	9,683	7,019	9,567	10,117	10,153	7,796
Between MD 193 and MD 650	10,547	10,278	9,858	7,586	9,881	10,203	10,343	8,873
Between MD 650 and I-95	11,139	10,862	10,380	8,463	10,264	10,450	10,614	9,297
Between US 1 and I-95	7,292	7,398	7,185	5,416	9,906	10,073	9,678	8,343
Between Greenbelt Station and US 1	8,865	8,811	8,624	7,322	9,580	9,593	9,012	7,884
Between Greenbelt Station and MD 201	8,987	8,950	8,650	7,495	9,415	9,329	8,705	7,678
Between MD 201 and MD 295	8,970	9,071	8,756	7,574	9,353	9,189	8,360	7,383
Between MD 295 and MD 450	9,478	9,268	8,998	7,577	8,577	8,518	7,589	7,400
Between MD 450 and US 50	9,891	9,790	9,586	8,460	9,115	9,115	8,002	7,765
Between US 50 and MD 202	10,164	9,904	10,202	9,376	9,304	9,284	8,112	7,835
Between MD 202 and Arena Dr	9,805	9,518	10,020	9,584	9,572	9,585	8,222	8,353
Between Arena Dr and MD 214	9,838	9,332	9,723	9,534	9,459	9,508	8,600	8,316
Between MD 214 and Ritchie Marlboro Rd	9,558	9,268	9,658	9,462	9,752	9,705	9,277	8,798
Between Ritchie Marlboro Rd and MD 4	8,162	8,223	8,861	8,745	9,274	9,226	8,975	8,436
Between MD 4 and Forestville Rd	7,478	7,989	8,440	8,484	8,661	8,505	8,341	7,680
Between Forestville Rd and MD 218	7,018	7,470	7,968	7,883	7,612	7,304	7,198	6,714
Between MD 218 and MD 5	7,423	8,053	8,496	8,258	8,000	7,662	7,593	7,033
Between MD 5 and MD 414	5,519	5,977	6,463	6,083	8,149	7,872	7,817	6,928
Between MD 414 and MD 210	5,063	5,526	5,906	5,378	7,703	7,775	7,784	6,991
Between MD 210 and I-295	4,805	5,250	5,675	5,113	7,314	7,584	7,625	6,936
Woodrow Wilson Bridge	7,704	8,334	8,782	8,016	9,271	9,293	9,340	9,030

I-270 2040 Alternative 9 PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,319	2,599	2,930	2,988	4,391	4,317	4,200	3,965
Between MD 80 and MD 109	2,076	2,361	2,697	2,769	4,142	4,176	4,140	3,989
Between MD 109 and MD 121	2,233	2,464	2,805	2,829	4,243	4,167	4,197	4,174
Between MD 121 and MD 27	2,722	2,886	3,419	3,393	5,121	4,604	4,609	5,004
Between MD 27 and MD 118	3,302	3,406	3,648	3,855	6,303	5,305	5,198	6,083
Between MD 118 and Middlebrook Rd	3,812	4,042	4,355	4,429	6,882	5,655	5,271	6,366
Between Middlebrook Rd and Watkins Mill	4,822	5,051	5,639	5,506	8,188	6,707	6,106	7,540
Between Watkins Mill and MD 124	3,911	3,830	4,240	4,393	8,129	6,807	5,607	7,032
Between MD 124 and MD 117	5,063	5,084	5,545	5,517	8,667	7,414	5,509	8,052
Between MD 117 and I-370	6,524	6,800	7,406	7,010	1,230	8,978	6,154	9,380
Between I-370 and Shady Grove Rd	6,579	6,538	6,474	6,124	11,695	11,466	5,512	9,288
Between Shady Grove Rd and MD 28	7,681	7,713	7,436	7,266	11,735	11,887	6,808	8,898
Between MD 28 and MD 189	8,135	8,283	8,057	7,120	12,710	12,879	7,218	10,075
Between MD 189 and Montrose Rd	7,871	7,939	6,768	6,687	12,381	12,560	8,111	9,126
Between Montrose Rd and I-270 Split	7,459	7,556	5,859	7,246	12,446	12,587	10,115	8,048
Between I-270 Split and MD 187	3,581	3,263	2,700	3,745	5,604	6,002	4,846	2,573
Between MD 187 and I-495	3,563	3,530	3,136	3,461	5,134	5,230	5,001	1,978
Between I-270 Split and Democracy Blvd	3,746	3,764	3,011	3,809	6,811	6,587	6,395	5,138
Between Democracy Blvd and I-495	3,422	3,304	2,690	3,102	5,187	4,846	4,813	4,925

Throughput and Percent Demand Met
2040 Alt 9

I-495 2040 Alternative 9 PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	100%	86%	99%	99%	100%	92%	78%
PMerican Legion Bridge	100%	100%	84%	100%	96%	95%	88%	74%
Between Clara Barton Pkwy and Cabin John Pkwy	92%	86%	73%	91%	98%	96%	88%	72%
Between MD 190 and I-270	100%	90%	89%	100%	97%	95%	88%	70%
Between I-270 West and MD 187	97%	91%	90%	100%	98%	99%	96%	59%
Between I-270 East and MD 187	86%	90%	92%	100%	99%	98%	93%	53%
Between MD 355 and MD 185	87%	88%	87%	97%	100%	97%	94%	50%
Between MD 185 and MD 97	90%	90%	92%	87%	98%	96%	92%	61%
Between MD 97 and US 29	90%	89%	91%	83%	98%	96%	92%	74%
Between MD US 29 and MD 193	91%	87%	91%	79%	98%	96%	96%	85%
Between MD 193 and MD 650	91%	89%	92%	82%	100%	96%	96%	97%
Between MD 650 and I-95	92%	90%	92%	85%	99%	95%	96%	98%
Between US 1 and I-95	93%	92%	96%	95%	97%	94%	97%	95%
Between Greenbelt Station and US1	93%	92%	96%	96%	97%	92%	96%	94%
Between Greenbelt Station and MD 201	93%	94%	96%	98%	97%	92%	95%	94%
Between MD 201 and MD 295	93%	94%	97%	97%	96%	92%	95%	94%
Between MD 295 and MD 450	93%	95%	100%	100%	95%	93%	93%	94%
Between MD 450 and US 50	93%	96%	100%	100%	94%	92%	91%	92%
Between US 50 and MD 202	95%	98%	100%	100%	92%	91%	89%	90%
Between MD 202 and Arena Dr	95%	98%	100%	100%	96%	94%	88%	94%
Between Arena Dr and MD 214	96%	98%	100%	100%	95%	93%	92%	94%
Between MD 214 and Ritchie Marlboro Rd	100%	98%	100%	100%	96%	92%	93%	95%
Between Ritchie Marlboro Rd and MD 4	96%	95%	98%	100%	97%	94%	94%	98%
Between MD 4 and Forestville Rd	95%	96%	99%	100%	95%	93%	93%	97%
Between Forestville Rd and MD 218	96%	95%	99%	100%	94%	92%	92%	96%
Between MD 218 and MD 5	96%	96%	100%	100%	93%	92%	92%	96%
Between MD 5 and MD 414	97%	96%	100%	100%	100%	100%	100%	100%
Between MD 414 and MD 210	93%	93%	98%	99%	92%	92%	92%	96%
Between MD 210 and I-295	92%	90%	96%	98%	92%	92%	92%	96%
Woodrow Wilson Bridge	98%	94%	100%	100%	92%	92%	91%	96%

I-270 2040 Alternative 9 PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	93%	98%	92%	78%	82%	95%
Between MD 80 and MD 109	99%	93%	93%	99%	92%	77%	79%	94%
Between MD 109 and MD 121	100%	92%	92%	99%	92%	75%	78%	92%
Between MD 121 and MD 27	99%	91%	94%	99%	99%	74%	75%	92%
Between MD 27 and MD 118	100%	93%	95%	100%	100%	85%	84%	100%
Between MD 118 and Middlebrook Rd	99%	94%	97%	99%	93%	69%	65%	86%
Between Middlebrook Rd and Watkins Mill	99%	95%	98%	99%	93%	69%	63%	84%
Between Watkins Mill and MD 124	99%	87%	87%	94%	89%	66%	54%	73%
Between MD 124 and MD 117	99%	91%	89%	96%	73%	52%	39%	57%
Between MD 117 and I-370	100%	92%	92%	98%	66%	49%	37%	54%
Between I-370 and Shady Grove Rd	100%	96%	86%	88%	99%	84%	46%	85%
Between Shady Grove Rd and MD 28	100%	100%	86%	94%	100%	96%	51%	84%
Between MD 28 and MD 189	99%	96%	83%	81%	99%	91%	54%	77%
Between MD 189 and Montrose Rd	100%	96%	74%	79%	99%	92%	60%	71%
Between Montrose Rd and I-270 Split	94%	89%	65%	89%	100%	95%	78%	65%
Between I-270 Split and MD 187	91%	79%	64%	93%	100%	96%	77%	43%
Between MD 187 and I-495	85%	79%	71%	86%	100%	97%	92%	36%
Between I-270 Split and Democracy Blvd	94%	86%	64%	92%	100%	93%	91%	81%
Between Democracy Blvd and I-495	95%	88%	72%	88%	100%	89%	92%	98%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 10

I-495 2040 Alternative 10 AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	10,231	10,877	10,032	9,719	8,449	9,195	9,242	9,505
American Legion Bridge	10,336	11,351	11,119	11,012	10,812	11,419	11,448	11,620
Between Clara Barton Pkwy and Cabin John Pkwy	8,519	9,275	9,221	9,189	10,494	10,526	10,171	10,445
Between MD 190 and I-270	9,507	10,833	10,920	10,539	12,367	12,573	11,883	11,703
Between I-270 West and MD 187	6,207	6,161	5,526	5,672	5,685	5,345	5,351	6,355
Between I-270 East and MD 187	5,940	5,896	5,065	5,609	5,632	5,805	5,314	5,901
Between MD 355 and MD 185	9,742	11,092	10,194	9,895	9,533	10,518	9,776	10,251
Between MD 185 and MD 97	9,334	10,310	10,236	9,777	10,425	10,839	10,214	10,032
Between MD 97 and US 29	8,315	9,724	9,543	8,883	9,726	9,590	8,920	9,454
Between US 29 and MD 193	8,232	9,400	9,191	8,428	8,966	8,620	8,041	8,539
Between MD 193 and MD 650	8,453	9,614	9,524	8,828	8,373	7,986	7,497	8,018
Between MD 650 and I-95	9,700	10,462	10,239	9,429	9,145	8,590	8,119	8,585
Between US 1 and I-95	7,562	7,616	7,533	7,313	7,664	7,253	7,487	7,650
Between Greenbelt Station and US 1	8,753	9,207	9,253	8,798	8,284	7,880	7,949	7,667
Between Greenbelt Station and MD 201	8,571	8,985	9,051	8,728	8,344	7,908	7,989	7,643
Between MD 201 and MD 295	8,058	8,424	9,004	8,432	8,972	9,036	9,021	8,544
Between MD 295 and MD 450	7,671	8,042	8,786	8,172	9,357	9,361	9,431	9,251
Between MD 450 and US 50	8,076	8,462	9,285	9,037	9,388	9,320	9,753	9,493
Between US 50 and MD 202	9,357	9,782	10,520	9,979	9,351	9,008	9,156	9,128
Between MD 202 and Arena Dr	9,297	9,590	10,268	9,854	9,179	8,903	9,162	8,919
Between Arena Dr and MD 214	9,323	9,693	10,129	9,805	9,389	9,167	9,439	9,193
Between MD 214 and Ritchie Marlboro Rd	9,402	9,540	9,795	9,625	9,122	9,053	9,206	8,743
Between Ritchie Marlboro Rd and MD 4	8,792	9,030	8,929	9,114	8,306	8,100	8,441	8,171
Between MD 4 and Forestville Rd	8,181	8,162	8,849	8,509	7,235	7,114	7,202	7,160
Between Forestville Rd and MD 218	7,525	7,524	8,122	7,899	6,322	5,849	6,011	6,331
Between MD 218 and MD 5	7,663	7,689	8,325	8,030	6,946	6,456	6,585	6,642
Between MD 5 and MD 414	6,882	5,884	6,470	6,628	5,315	5,603	5,286	5,580
Between MD 414 and MD 210	5,952	6,139	6,176	6,972	5,084	5,077	5,000	5,160
Between MD 210 and I-295	7,287	6,746	6,851	7,393	4,762	4,802	4,584	4,701
Woodrow Wilson Bridge	9,613	9,981	9,917	9,259	8,253	8,183	7,831	8,123

I-270 2040 Alternative 10 AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,316	3,117	3,197	3,421	1,918	2,813	3,001	2,828
Between MD 80 and MD 109	3,619	3,668	3,651	3,759	1,675	2,337	2,606	2,400
Between MD 109 and MD 121	4,081	4,145	4,109	4,111	1,745	2,431	2,683	2,407
Between MD 121 and MD 27	5,161	5,332	5,022	4,974	2,145	2,620	2,859	2,714
Between MD 27 and MD 118	5,515	5,579	5,262	5,422	2,353	2,876	3,173	3,090
Between MD 118 and Middlebrook Rd	6,099	6,056	5,888	5,934	2,457	3,199	3,776	3,647
Between Middlebrook Rd and Watkins Mill	8,085	7,931	7,782	7,804	2,860	3,950	4,696	4,448
Between Watkins Mill and MD 124	7,470	7,014	6,644	6,637	2,728	4,037	5,016	4,679
Between MD 124 and MD 117	9,056	8,496	8,173	7,991	2,641	4,020	5,090	4,903
Between MD 117 and I-370	10,850	10,094	9,956	10,070	3,165	4,932	6,541	6,158
Between I-370 and Shady Grove Rd	12,958	11,696	10,975	10,994	3,164	4,656	6,303	6,188
Between Shady Grove Rd and MD 28	13,329	11,734	10,723	9,975	3,960	5,831	8,266	7,827
Between MD 28 and MD 189	13,745	12,559	11,414	10,024	4,699	6,639	9,431	8,579
Between MD 189 and Montrose Rd	13,665	12,993	11,679	9,248	4,777	6,771	9,540	8,916
Between Montrose Rd and I-270 Split	13,864	14,094	12,610	10,155	5,816	7,314	9,498	9,203
Between I-270 Split and MD 187	5,582	6,365	5,724	4,883	2,730	2,989	4,704	4,297
Between MD 187 and I-495	4,816	5,511	5,293	4,635	3,353	3,880	5,109	4,693
Between I-270 Split and Democracy Blvd	7,892	7,743	6,812	5,739	3,109	4,353	5,296	4,943
Between Democracy Blvd and I-495	7,106	7,352	6,459	5,012	3,462	4,771	5,512	5,105

Throughput and Percent Demand Met
2040 Alt 10

I-495 2040 Alternative 10 AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	95%	97%	93%	92%	99%	96%	94%	98%
American Legion Bridge	96%	92%	87%	90%	98%	93%	95%	100%
Between Clara Barton Pkwy and Cabin John Pkwy	85%	81%	77%	80%	97%	91%	93%	99%
Between MD 190 and I-270	95%	91%	87%	87%	97%	91%	94%	96%
Between I-270 West and MD 187	96%	93%	88%	90%	96%	79%	87%	96%
Between I-270 East and MD 187	95%	93%	86%	91%	96%	87%	86%	91%
Between MD 355 and MD 185	100%	94%	93%	94%	98%	93%	84%	88%
Between MD 185 and MD 97	100%	91%	94%	95%	98%	93%	87%	85%
Between MD 97 and US 29	100%	90%	92%	90%	98%	94%	90%	93%
Between MD US 29 and MD 193	100%	90%	91%	90%	99%	97%	96%	99%
Between MD 193 and MD 650	100%	90%	91%	93%	97%	97%	96%	96%
Between MD 650 and I-95	100%	90%	94%	95%	98%	96%	96%	98%
Between US 1 and I-95	100%	90%	94%	94%	99%	92%	95%	100%
Between Greenbelt Station and US1	98%	90%	93%	94%	99%	91%	95%	100%
Between Greenbelt Station and MD 201	100%	91%	95%	97%	98%	88%	93%	98%
Between MD 201 and MD 295	99%	91%	96%	96%	98%	91%	95%	100%
Between MD 295 and MD 450	99%	93%	98%	98%	97%	91%	95%	99%
Between MD 450 and US 50	98%	93%	95%	100%	99%	91%	95%	98%
Between US 50 and MD 202	98%	95%	97%	100%	97%	88%	94%	96%
Between MD 202 and Arena Dr	98%	96%	97%	100%	95%	85%	92%	95%
Between Arena Dr and MD 214	99%	96%	97%	100%	95%	85%	91%	95%
Between MD 214 and Ritchie Marlboro Rd	100%	95%	99%	100%	95%	83%	90%	93%
Between Ritchie Marlboro Rd and MD 4	97%	94%	95%	98%	98%	84%	95%	96%
Between MD 4 and Forestville Rd	97%	94%	96%	99%	97%	82%	92%	97%
Between Forestville Rd and MD 218	97%	94%	96%	99%	97%	79%	91%	97%
Between MD 218 and MD 5	97%	94%	96%	98%	95%	79%	90%	96%
Between MD 5 and MD 414	95%	98%	97%	100%	100%	91%	96%	100%
Between MD 414 and MD 210	77%	100%	93%	100%	99%	85%	93%	100%
Between MD 210 and I-295	82%	94%	93%	100%	100%	85%	92%	100%
Woodrow Wilson Bridge	86%	91%	96%	100%	100%	85%	90%	100%

I-270 2040 Alternative 10 AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	88%	79%	87%	98%	99%	93%	95%	100%
Between MD 80 and MD 109	87%	83%	92%	100%	100%	93%	96%	100%
Between MD 109 and MD 121	87%	82%	91%	97%	100%	93%	97%	99%
Between MD 121 and MD 27	89%	90%	95%	99%	100%	93%	96%	99%
Between MD 27 and MD 118	82%	95%	98%	99%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	84%	95%	98%	100%	100%	92%	94%	97%
Between Middlebrook Rd and Watkins Mill	87%	94%	99%	100%	99%	93%	94%	96%
Between Watkins Mill and MD 124	92%	97%	99%	100%	82%	76%	77%	77%
Between MD 124 and MD 117	90%	95%	100%	100%	65%	60%	60%	60%
Between MD 117 and I-370	91%	92%	98%	100%	64%	57%	55%	56%
Between I-370 and Shady Grove Rd	100%	97%	100%	100%	89%	79%	81%	83%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	96%	91%	94%	95%
Between MD 28 and MD 189	100%	98%	99%	91%	94%	81%	83%	85%
Between MD 189 and Montrose Rd	100%	100%	99%	82%	91%	80%	81%	82%
Between Montrose Rd and I-270 Split	100%	100%	98%	87%	97%	87%	89%	90%
Between I-270 Split and MD 187	100%	97%	97%	92%	100%	83%	92%	92%
Between MD 187 and I-495	100%	92%	100%	95%	100%	87%	89%	91%
Between I-270 Split and Democracy Blvd	100%	100%	98%	89%	95%	91%	88%	90%
Between Democracy Blvd and I-495	100%	100%	100%	90%	97%	91%	87%	88%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 10

I-495 2040 Alternative 10 PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	8,193	8,743	9,326	7,606	8,558	8,455	7,024	6,642
American Legion Bridge	9,953	10,440	11,047	8,326	10,548	10,361	8,910	8,116
Between Clara Barton Pkwy and Cabin John Pkwy	8,059	8,227	8,489	5,887	9,559	9,083	7,712	6,987
Between MD 190 and I-270	11,672	11,654	11,535	7,561	10,249	10,030	8,444	7,064
Between I-270 West and MD 187	5,595	5,561	5,509	3,301	6,101	6,240	5,675	3,561
Between I-270 East and MD 187	5,442	5,542	5,402	3,352	5,897	5,999	5,451	2,989
Between MD 355 and MD 185	9,419	9,551	9,011	7,881	10,504	10,857	10,330	5,082
Between MD 185 and MD 97	10,705	10,580	10,216	7,442	10,389	10,785	10,327	5,925
Between MD 97 and US 29	10,995	10,551	10,048	7,496	10,148	10,632	10,544	6,461
Between US 29 and MD 193	10,643	10,242	10,103	7,413	9,561	10,123	10,018	6,741
Between MD 193 and MD 650	10,654	10,440	10,250	7,999	9,871	10,207	10,361	7,619
Between MD 650 and I-95	11,189	11,046	10,715	8,891	10,264	10,443	10,640	9,185
Between US 1 and I-95	7,271	7,540	7,262	5,430	9,884	10,084	9,711	8,401
Between Greenbelt Station and US 1	8,869	8,949	8,693	7,334	9,562	9,605	9,068	7,924
Between Greenbelt Station and MD 201	9,006	9,013	8,770	7,525	9,398	9,343	8,782	7,711
Between MD 201 and MD 295	8,982	9,134	8,835	7,629	9,332	9,217	8,389	7,463
Between MD 295 and MD 450	9,475	9,319	9,082	7,626	8,576	8,535	7,649	7,482
Between MD 450 and US 50	9,846	9,855	9,671	8,506	9,108	9,116	8,112	7,838
Between US 50 and MD 202	10,105	9,955	10,225	9,449	9,281	9,294	8,240	7,960
Between MD 202 and Arena Dr	9,767	9,548	10,060	9,644	9,552	9,596	8,397	8,523
Between Arena Dr and MD 214	9,791	9,372	9,735	9,613	9,441	9,528	8,743	8,542
Between MD 214 and Ritchie Marlboro Rd	9,496	9,291	9,445	9,444	9,721	9,734	9,347	9,078
Between Ritchie Marlboro Rd and MD 4	8,130	8,246	8,850	8,673	9,253	9,222	8,981	8,427
Between MD 4 and Forestville Rd	7,519	8,000	8,401	8,429	8,612	8,526	8,354	7,653
Between Forestville Rd and MD 218	7,030	7,477	7,941	7,859	7,594	7,317	7,205	6,708
Between MD 218 and MD 5	7,408	8,058	8,490	8,234	7,999	7,667	7,587	7,034
Between MD 5 and MD 414	5,508	5,992	6,444	6,051	8,118	7,905	7,797	6,943
Between MD 414 and MD 210	5,066	5,515	5,911	5,349	7,691	7,793	7,768	6,996
Between MD 210 and I-295	4,786	5,261	5,670	5,085	7,315	7,584	7,625	6,937
Woodrow Wilson Bridge	7,701	8,363	8,736	8,054	9,271	9,293	9,340	9,030

I-270 2040 Alternative 10 PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,375	2,642	2,952	3,052	4,397	4,344	4,241	3,996
Between MD 80 and MD 109	2,151	2,427	2,745	2,810	4,171	4,204	4,180	4,012
Between MD 109 and MD 121	2,240	2,570	2,836	2,863	4,237	4,256	4,186	4,178
Between MD 121 and MD 27	2,771	2,973	3,425	3,468	5,350	4,614	4,674	4,861
Between MD 27 and MD 118	3,378	3,498	3,587	3,948	6,547	5,306	5,125	5,852
Between MD 118 and Middlebrook Rd	3,884	4,137	4,279	4,532	7,199	5,793	5,005	5,973
Between Middlebrook Rd and Watkins Mill	4,919	5,158	5,603	5,618	8,604	6,963	5,756	7,075
Between Watkins Mill and MD 124	4,023	4,011	4,262	4,369	8,161	7,778	5,386	6,374
Between MD 124 and MD 117	5,283	5,329	5,696	5,558	8,737	8,509	5,289	6,831
Between MD 117 and I-370	6,734	7,041	7,572	7,091	10,232	10,198	5,890	7,651
Between I-370 and Shady Grove Rd	7,290	7,391	7,154	7,196	12,394	12,178	6,628	5,140
Between Shady Grove Rd and MD 28	8,302	8,514	7,938	6,560	12,753	12,904	7,548	4,683
Between MD 28 and MD 189	8,814	9,132	7,384	6,705	13,723	13,745	7,787	5,255
Between MD 189 and Montrose Rd	8,608	8,825	5,690	6,179	13,585	13,939	8,412	5,464
Between Montrose Rd and I-270 Split	8,558	8,315	5,503	6,873	13,419	13,979	9,970	5,549
Between I-270 Split and MD 187	4,042	3,301	2,577	3,571	5,689	6,123	4,545	1,972
Between MD 187 and I-495	3,822	3,502	3,035	3,913	5,156	5,418	4,952	1,902
Between I-270 Split and Democracy Blvd	4,493	4,140	3,138	4,000	7,741	7,919	7,102	3,927
Between Democracy Blvd and I-495	4,120	3,806	2,736	3,391	6,261	6,276	5,962	4,083

Throughput and Percent Demand Met
2040 Alt 10

I-495 2040 Alternative 10 PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	100%	100%	100%	99%	98%	86%	79%
PMerican Legion Bridge	100%	99%	100%	86%	96%	93%	81%	75%
Between Clara Barton Pkwy and Cabin John Pkwy	87%	87%	89%	68%	97%	92%	79%	73%
Between MD 190 and I-270	99%	97%	99%	72%	96%	92%	79%	70%
Between I-270 West and MD 187	99%	100%	100%	72%	95%	97%	92%	61%
Between I-270 East and MD 187	97%	100%	100%	75%	96%	97%	90%	55%
Between MD 355 and MD 185	89%	91%	90%	90%	97%	97%	90%	48%
Between MD 185 and MD 97	92%	92%	94%	78%	98%	96%	90%	56%
Between MD 97 and US 29	92%	90%	92%	79%	98%	95%	92%	64%
Between MD US 29 and MD 193	92%	89%	95%	83%	98%	96%	94%	74%
Between MD 193 and MD 650	92%	90%	95%	86%	100%	96%	97%	83%
Between MD 650 and I-95	92%	92%	95%	90%	99%	95%	97%	96%
Between US 1 and I-95	93%	93%	97%	95%	97%	94%	97%	96%
Between Greenbelt Station and US1	93%	94%	97%	96%	97%	92%	97%	94%
Between Greenbelt Station and MD 201	94%	94%	98%	98%	96%	92%	96%	94%
Between MD 201 and MD 295	93%	95%	98%	98%	96%	93%	96%	95%
Between MD 295 and MD 450	93%	96%	100%	100%	95%	94%	94%	95%
Between MD 450 and US 50	93%	96%	100%	100%	93%	92%	92%	93%
Between US 50 and MD 202	95%	98%	100%	100%	92%	91%	90%	92%
Between MD 202 and Arena Dr	95%	98%	100%	100%	95%	94%	90%	96%
Between Arena Dr and MD 214	95%	98%	100%	100%	95%	94%	94%	96%
Between MD 214 and Ritchie Marlboro Rd	97%	98%	98%	100%	96%	92%	94%	98%
Between Ritchie Marlboro Rd and MD 4	95%	95%	98%	100%	96%	94%	94%	98%
Between MD 4 and Forestville Rd	96%	96%	98%	100%	95%	93%	93%	97%
Between Forestville Rd and MD 218	96%	96%	99%	100%	94%	93%	92%	96%
Between MD 218 and MD 5	96%	96%	100%	100%	93%	92%	92%	96%
Between MD 5 and MD 414	97%	96%	100%	100%	100%	100%	100%	100%
Between MD 414 and MD 210	93%	93%	98%	99%	92%	92%	92%	96%
Between MD 210 and I-295	91%	90%	96%	97%	92%	92%	92%	96%
Woodrow Wilson Bridge	98%	94%	100%	100%	92%	92%	91%	96%

I-270 2040 Alternative 10 PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	92%	99%	92%	78%	82%	94%
Between MD 80 and MD 109	99%	93%	92%	99%	92%	78%	79%	93%
Between MD 109 and MD 121	98%	94%	91%	99%	92%	77%	78%	92%
Between MD 121 and MD 27	99%	92%	93%	100%	100%	74%	75%	89%
Between MD 27 and MD 118	100%	94%	92%	100%	100%	85%	83%	100%
Between MD 118 and Middlebrook Rd	99%	95%	94%	100%	97%	70%	61%	80%
Between Middlebrook Rd and Watkins Mill	99%	96%	96%	100%	97%	71%	59%	78%
Between Watkins Mill and MD 124	99%	89%	86%	92%	90%	71%	52%	66%
Between MD 124 and MD 117	100%	92%	89%	94%	73%	60%	38%	50%
Between MD 117 and I-370	100%	93%	91%	97%	65%	57%	35%	45%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	95%	90%	46%	51%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	100%	93%	53%	41%
Between MD 28 and MD 189	100%	100%	100%	100%	99%	92%	54%	37%
Between MD 189 and Montrose Rd	100%	100%	100%	100%	99%	95%	57%	39%
Between Montrose Rd and I-270 Split	97%	87%	55%	76%	100%	97%	70%	41%
Between I-270 Split and MD 187	96%	75%	59%	85%	98%	95%	70%	32%
Between MD 187 and I-495	84%	74%	65%	92%	97%	96%	86%	33%
Between I-270 Split and Democracy Blvd	98%	81%	56%	82%	100%	99%	87%	54%
Between Democracy Blvd and I-495	97%	85%	61%	80%	100%	98%	96%	69%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 13B

I-495 2040 Alternative 13B AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	10,011	9,767	8,930	8,755	8,549	9,286	9,645	9,031
American Legion Bridge	10,180	10,184	10,061	9,828	10,961	11,604	11,994	10,932
Between Clara Barton Pkwy and Cabin John Pkwy	8,223	8,056	7,798	7,028	10,700	10,753	10,651	9,580
Between MD 190 and I-270	9,470	10,023	10,191	7,518	12,538	12,470	11,982	10,216
Between I-270 West and MD 187	6,770	6,659	6,191	4,749	6,069	6,079	6,450	6,261
Between I-270 East and MD 187	6,393	6,326	5,667	4,137	6,421	6,014	6,061	6,140
Between MD 355 and MD 185	9,824	11,229	8,467	5,797	9,781	9,263	9,856	10,256
Between MD 185 and MD 97	9,333	10,609	7,856	6,148	10,599	10,070	9,646	10,797
Between MD 97 and US 29	8,326	9,770	7,498	6,138	9,774	9,579	8,804	9,505
Between US 29 and MD 193	8,245	9,428	7,348	5,956	8,973	8,542	7,943	8,313
Between MD 193 and MD 650	8,457	9,592	8,174	6,417	8,330	7,860	7,287	7,873
Between MD 650 and I-95	9,711	10,445	8,837	7,296	9,101	8,555	8,006	8,410
Between US 1 and I-95	7,954	7,759	6,780	6,143	7,642	7,315	7,578	7,658
Between Greenbelt Station and US 1	9,136	9,353	8,523	7,554	8,285	7,951	8,043	7,663
Between Greenbelt Station and MD 201	8,859	9,146	8,450	7,501	8,379	8,028	8,053	7,674
Between MD 201 and MD 295	8,227	8,587	8,533	7,473	9,023	9,157	9,113	8,557
Between MD 295 and MD 450	7,746	8,197	8,452	7,453	9,406	9,520	9,522	9,323
Between MD 450 and US 50	8,187	8,623	9,147	8,159	9,439	9,484	9,802	9,636
Between US 50 and MD 202	9,469	9,876	10,435	9,297	9,440	9,194	9,281	9,272
Between MD 202 and Arena Dr	9,375	9,667	10,207	9,272	9,241	9,115	9,235	9,128
Between Arena Dr and MD 214	9,362	9,771	10,086	9,267	9,415	9,411	9,548	9,397
Between MD 214 and Ritchie Marlboro Rd	9,485	9,654	9,676	9,219	9,175	9,286	9,372	8,948
Between Ritchie Marlboro Rd and MD 4	8,923	9,206	8,829	8,963	8,257	8,313	8,535	8,191
Between MD 4 and Forestville Rd	8,218	8,364	8,780	8,377	7,237	7,270	7,370	7,205
Between Forestville Rd and MD 218	7,530	7,709	8,073	7,793	6,321	6,015	6,167	6,359
Between MD 218 and MD 5	7,639	7,892	8,250	7,977	6,956	6,633	6,727	6,691
Between MD 5 and MD 414	6,926	6,028	6,474	6,469	5,309	5,701	5,456	5,684
Between MD 414 and MD 210	6,033	6,339	6,551	6,339	5,066	5,212	5,206	5,277
Between MD 210 and I-295	7,331	6,947	7,061	7,049	4,767	5,029	4,829	4,782
Woodrow Wilson Bridge	9,593	10,054	9,989	9,348	8,253	8,636	8,318	8,281

I-270 2040 Alternative 13B AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,340	3,137	3,228	3,441	1,853	2,720	2,945	2,645
Between MD 80 and MD 109	3,691	3,630	3,701	3,778	1,603	2,257	2,493	2,247
Between MD 109 and MD 121	4,157	4,109	4,138	4,133	1,673	2,363	2,555	2,294
Between MD 121 and MD 27	5,216	5,350	5,019	5,011	2,062	2,597	2,695	2,562
Between MD 27 and MD 118	5,681	5,665	5,403	5,455	2,111	2,697	2,847	2,679
Between MD 118 and Middlebrook Rd	6,243	6,141	6,187	6,017	2,125	2,837	3,171	2,993
Between Middlebrook Rd and Watkins Mill	8,202	8,071	8,013	7,661	2,437	3,354	3,831	3,531
Between Watkins Mill and MD 124	7,635	7,164	6,779	6,511	2,416	3,573	4,200	3,947
Between MD 124 and MD 117	9,142	8,593	8,133	7,770	2,412	3,662	4,377	4,063
Between MD 117 and I-370	10,979	10,589	10,052	9,501	3,087	4,766	5,862	5,423
Between I-370 and Shady Grove Rd	12,872	11,828	10,552	10,016	2,715	3,926	5,029	4,406
Between Shady Grove Rd and MD 28	13,145	11,727	10,369	9,233	3,280	4,755	6,648	5,426
Between MD 28 and MD 189	13,462	12,331	10,971	8,750	3,887	5,501	7,813	6,095
Between MD 189 and Montrose Rd	13,287	12,375	11,110	7,744	3,950	5,348	7,726	6,131
Between Montrose Rd and I-270 Split	13,213	12,826	11,614	7,073	4,696	5,480	7,815	5,697
Between I-270 Split and MD 187	5,567	6,286	5,473	2,541	2,198	2,429	4,009	3,023
Between MD 187 and I-495	4,719	5,498	4,574	2,068	2,801	3,009	4,411	3,460
Between I-270 Split and Democracy Blvd	7,631	6,572	6,185	3,922	2,510	3,081	3,876	2,648
Between Democracy Blvd and I-495	6,861	6,191	5,579	3,456	2,865	3,499	4,125	2,555

Throughput and Percent Demand Met
2040 Alt 13B

I-495 2040 Alternative 13B AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	99%	91%	88%	90%	100%	100%	100%	95%
American Legion Bridge	100%	86%	84%	87%	100%	97%	100%	95%
Between Clara Barton Pkwy and Cabin John Pkwy	87%	74%	71%	67%	100%	95%	100%	93%
Between MD 190 and I-270	100%	89%	88%	67%	100%	94%	100%	88%
Between I-270 West and MD 187	100%	92%	90%	69%	92%	84%	100%	91%
Between I-270 East and MD 187	97%	89%	85%	60%	98%	83%	92%	89%
Between MD 355 and MD 185	100%	95%	76%	55%	100%	82%	86%	89%
Between MD 185 and MD 97	100%	93%	71%	59%	99%	87%	84%	93%
Between MD 97 and US 29	100%	90%	71%	62%	98%	94%	91%	95%
Between MD US 29 and MD 193	100%	91%	72%	63%	99%	97%	98%	98%
Between MD 193 and MD 650	100%	90%	78%	67%	97%	97%	96%	98%
Between MD 650 and I-95	100%	90%	81%	73%	98%	98%	98%	98%
Between US 1 and I-95	100%	90%	84%	78%	99%	95%	98%	100%
Between Greenbelt Station and US1	100%	90%	85%	80%	100%	93%	98%	100%
Between Greenbelt Station and MD 201	100%	92%	88%	83%	100%	91%	96%	100%
Between MD 201 and MD 295	100%	92%	90%	84%	99%	93%	98%	100%
Between MD 295 and MD 450	99%	94%	93%	88%	98%	94%	97%	100%
Between MD 450 and US 50	99%	94%	93%	90%	100%	93%	97%	100%
Between US 50 and MD 202	99%	96%	96%	92%	99%	90%	96%	98%
Between MD 202 and Arena Dr	99%	96%	96%	93%	100%	91%	98%	100%
Between Arena Dr and MD 214	98%	96%	96%	93%	100%	91%	97%	100%
Between MD 214 and Ritchie Marlboro Rd	100%	96%	97%	95%	100%	89%	97%	100%
Between Ritchie Marlboro Rd and MD 4	98%	94%	93%	96%	100%	91%	100%	100%
Between MD 4 and Forestville Rd	96%	95%	95%	97%	100%	88%	100%	100%
Between Forestville Rd and MD 218	96%	95%	94%	97%	100%	86%	100%	100%
Between MD 218 and MD 5	95%	95%	94%	96%	100%	85%	99%	100%
Between MD 5 and MD 414	94%	99%	95%	97%	100%	100%	100%	100%
Between MD 414 and MD 210	77%	100%	97%	99%	100%	95%	100%	100%
Between MD 210 and I-295	82%	95%	94%	100%	100%	97%	100%	100%
Woodrow Wilson Bridge	86%	91%	95%	100%	100%	95%	100%	100%

I-270 2040 Alternative 13B AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	89%	80%	89%	99%	100%	93%	96%	100%
Between MD 80 and MD 109	89%	82%	93%	100%	100%	93%	96%	99%
Between MD 109 and MD 121	88%	82%	92%	98%	100%	94%	96%	99%
Between MD 121 and MD 27	90%	90%	95%	100%	100%	95%	94%	97%
Between MD 27 and MD 118	85%	97%	100%	100%	100%	99%	99%	100%
Between MD 118 and Middlebrook Rd	86%	96%	100%	100%	89%	84%	81%	82%
Between Middlebrook Rd and Watkins Mill	88%	96%	100%	100%	87%	81%	78%	79%
Between Watkins Mill and MD 124	91%	97%	100%	100%	69%	64%	62%	61%
Between MD 124 and MD 117	92%	98%	100%	100%	52%	49%	46%	44%
Between MD 117 and I-370	93%	98%	100%	100%	56%	51%	46%	45%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	90%	77%	77%	66%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	93%	86%	87%	76%
Between MD 28 and MD 189	100%	100%	100%	86%	96%	77%	79%	70%
Between MD 189 and Montrose Rd	100%	100%	100%	75%	89%	72%	74%	61%
Between Montrose Rd and I-270 Split	100%	100%	100%	67%	100%	84%	88%	70%
Between I-270 Split and MD 187	100%	100%	100%	53%	100%	81%	88%	74%
Between MD 187 and I-495	100%	100%	97%	48%	100%	78%	88%	77%
Between I-270 Split and Democracy Blvd	100%	100%	100%	69%	100%	87%	89%	65%
Between Democracy Blvd and I-495	100%	100%	100%	72%	100%	86%	87%	59%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 13B

I-495 2040 Alternative 13B PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	8,131	8,792	9,343	8,293	8,280	7,910	7,324	6,319
American Legion Bridge	9,829	10,393	11,044	9,861	10,279	9,642	9,469	7,733
Between Clara Barton Pkwy and Cabin John Pkwy	8,176	8,216	8,349	7,655	9,232	8,178	8,231	6,485
Between MD 190 and I-270	11,314	10,923	10,831	9,088	9,755	8,740	8,818	6,308
Between I-270 West and MD 187	6,244	5,639	5,797	4,650	6,484	6,332	6,156	4,079
Between I-270 East and MD 187	5,752	5,536	5,792	4,623	6,190	6,141	5,931	3,449
Between MD 355 and MD 185	9,145	8,650	8,983	7,257	10,472	10,505	10,561	6,051
Between MD 185 and MD 97	10,350	9,995	10,052	7,151	10,078	10,426	10,481	7,197
Between MD 97 and US 29	10,404	10,313	9,818	7,476	9,748	10,247	10,305	7,780
Between US 29 and MD 193	9,256	8,998	8,822	6,473	9,547	10,119	10,130	8,017
Between MD 193 and MD 650	9,386	9,179	8,976	6,903	9,855	10,223	10,346	9,040
Between MD 650 and I-95	10,053	9,696	9,498	7,778	10,237	10,474	10,631	9,437
Between US 1 and I-95	7,093	7,188	7,140	5,158	9,923	10,042	9,683	8,465
Between Greenbelt Station and US 1	8,655	8,610	8,583	7,026	9,556	9,624	9,017	8,027
Between Greenbelt Station and MD 201	8,799	8,711	8,675	7,221	9,384	9,368	8,717	7,813
Between MD 201 and MD 295	8,822	8,849	8,743	7,372	9,319	9,196	8,369	7,574
Between MD 295 and MD 450	9,335	9,084	9,006	7,537	8,577	8,520	7,711	7,578
Between MD 450 and US 50	9,763	9,560	9,609	8,411	9,096	9,134	8,145	7,945
Between US 50 and MD 202	10,043	9,749	10,251	9,353	9,307	9,292	8,284	8,062
Between MD 202 and Arena Dr	9,719	9,354	10,075	9,587	9,550	9,602	8,477	8,603
Between Arena Dr and MD 214	9,743	9,190	9,760	9,548	9,466	9,489	8,818	8,716
Between MD 214 and Ritchie Marlboro Rd	9,451	9,127	9,713	9,478	9,746	9,693	9,348	9,125
Between Ritchie Marlboro Rd and MD 4	8,067	8,114	8,975	8,792	9,258	9,216	9,013	8,445
Between MD 4 and Forestville Rd	7,463	7,906	8,466	8,566	8,637	8,493	8,401	7,682
Between Forestville Rd and MD 218	6,984	7,399	7,990	7,936	7,616	7,314	7,206	6,728
Between MD 218 and MD 5	7,376	7,977	8,527	8,314	8,001	7,675	7,593	7,052
Between MD 5 and MD 414	5,522	5,998	6,529	6,122	8,161	7,863	7,804	6,963
Between MD 414 and MD 210	5,089	5,521	5,990	5,442	7,706	7,773	7,783	7,000
Between MD 210 and I-295	4,823	5,268	5,748	5,188	7,315	7,584	7,626	6,935
Woodrow Wilson Bridge	7,726	8,408	8,839	8,054	9,271	9,293	9,340	9,030

I-270 2040 Alternative 13B PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,195	2,507	2,786	2,897	4,380	4,340	4,161	3,991
Between MD 80 and MD 109	1,975	2,251	2,594	2,649	4,128	4,179	4,144	4,025
Between MD 109 and MD 121	2,121	2,321	2,715	2,718	4,271	4,131	4,197	4,221
Between MD 121 and MD 27	2,611	2,788	3,285	3,331	5,147	4,608	4,655	4,939
Between MD 27 and MD 118	3,207	3,334	3,484	3,769	6,300	5,377	5,203	6,015
Between MD 118 and Middlebrook Rd	3,712	3,989	4,173	4,342	6,871	5,729	5,225	6,322
Between Middlebrook Rd and Watkins Mill	4,734	4,997	5,466	5,419	8,130	6,694	6,149	7,566
Between Watkins Mill and MD 124	3,753	3,694	4,088	4,246	8,207	6,680	5,836	6,870
Between MD 124 and MD 117	4,895	4,910	5,401	5,336	8,742	7,326	5,820	7,687
Between MD 117 and I-370	6,341	6,588	7,244	6,811	10,330	8,871	6,576	8,836
Between I-370 and Shady Grove Rd	6,166	6,121	5,728	4,530	11,837	11,287	6,004	8,136
Between Shady Grove Rd and MD 28	6,656	6,690	4,963	3,993	11,939	11,752	6,955	7,345
Between MD 28 and MD 189	7,339	6,885	5,186	4,439	12,898	12,791	7,295	8,205
Between MD 189 and Montrose Rd	7,045	5,485	5,170	3,731	12,599	12,404	8,196	7,436
Between Montrose Rd and I-270 Split	6,938	4,696	5,396	4,587	12,163	12,258	9,991	6,229
Between I-270 Split and MD 187	2,903	2,087	2,632	2,414	5,431	5,674	4,777	2,448
Between MD 187 and I-495	2,890	2,546	2,864	2,539	4,896	4,947	4,941	2,012
Between I-270 Split and Democracy Blvd	3,515	2,393	2,966	2,427	6,722	6,552	6,615	3,674
Between Democracy Blvd and I-495	3,278	2,392	2,632	2,191	5,213	5,041	5,293	4,053

Throughput and Percent Demand Met
2040 Alt 13B

I-495 2040 Alternative 13B PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	100%	100%	100%	100%	92%	92%	77%
PMerican Legion Bridge	100%	100%	100%	100%	95%	87%	87%	73%
Between Clara Barton Pkwy and Cabin John Pkwy	90%	88%	90%	90%	97%	85%	87%	70%
Between MD 190 and I-270	99%	94%	97%	89%	96%	84%	87%	66%
Between I-270 West and MD 187	99%	92%	100%	92%	96%	94%	94%	65%
Between I-270 East and MD 187	90%	89%	100%	92%	95%	94%	91%	59%
Between MD 355 and MD 185	89%	85%	95%	86%	97%	93%	92%	56%
Between MD 185 and MD 97	92%	90%	98%	78%	95%	92%	90%	68%
Between MD 97 and US 29	90%	91%	95%	82%	94%	91%	90%	77%
Between MD US 29 and MD 193	82%	81%	87%	75%	98%	96%	96%	87%
Between MD 193 and MD 650	83%	82%	87%	78%	99%	96%	96%	98%
Between MD 650 and I-95	85%	83%	88%	82%	99%	95%	96%	98%
Between US 1 and I-95	90%	89%	95%	90%	98%	94%	97%	97%
Between Greenbelt Station and US1	90%	90%	95%	92%	97%	93%	96%	96%
Between Greenbelt Station and MD 201	91%	91%	96%	94%	96%	92%	96%	96%
Between MD 201 and MD 295	91%	92%	97%	94%	96%	92%	95%	97%
Between MD 295 and MD 450	92%	93%	99%	99%	95%	93%	94%	97%
Between MD 450 and US 50	92%	93%	100%	99%	93%	92%	92%	94%
Between US 50 and MD 202	94%	96%	100%	100%	92%	91%	91%	93%
Between MD 202 and Arena Dr	94%	96%	100%	100%	95%	94%	91%	97%
Between Arena Dr and MD 214	95%	96%	100%	100%	95%	93%	95%	98%
Between MD 214 and Ritchie Marlboro Rd	96%	96%	100%	100%	96%	92%	94%	99%
Between Ritchie Marlboro Rd and MD 4	94%	93%	98%	100%	96%	94%	95%	98%
Between MD 4 and Forestville Rd	95%	94%	98%	100%	95%	93%	94%	97%
Between Forestville Rd and MD 218	95%	94%	99%	100%	94%	92%	92%	97%
Between MD 218 and MD 5	95%	95%	99%	100%	93%	92%	92%	96%
Between MD 5 and MD 414	96%	95%	100%	100%	100%	100%	100%	100%
Between MD 414 and MD 210	93%	93%	98%	100%	93%	92%	92%	96%
Between MD 210 and I-295	91%	90%	96%	99%	92%	92%	92%	96%
Woodrow Wilson Bridge	97%	94%	100%	100%	92%	92%	91%	96%

I-270 2040 Alternative 13B PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	92%	98%	92%	79%	81%	95%
Between MD 80 and MD 109	98%	92%	92%	98%	92%	78%	79%	94%
Between MD 109 and MD 121	99%	90%	92%	98%	93%	75%	78%	93%
Between MD 121 and MD 27	99%	91%	93%	100%	100%	74%	76%	91%
Between MD 27 and MD 118	100%	94%	94%	100%	100%	86%	84%	100%
Between MD 118 and Middlebrook Rd	99%	95%	95%	99%	93%	70%	64%	85%
Between Middlebrook Rd and Watkins Mill	99%	96%	97%	99%	92%	69%	64%	84%
Between Watkins Mill and MD 124	99%	88%	88%	94%	88%	65%	55%	74%
Between MD 124 and MD 117	100%	91%	90%	96%	74%	51%	41%	56%
Between MD 117 and I-370	100%	92%	92%	98%	66%	48%	39%	53%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	100%	84%	50%	71%
Between Shady Grove Rd and MD 28	100%	100%	100%	100%	100%	96%	54%	67%
Between MD 28 and MD 189	100%	100%	100%	100%	100%	91%	55%	63%
Between MD 189 and Montrose Rd	100%	100%	100%	96%	100%	92%	61%	58%
Between Montrose Rd and I-270 Split	98%	61%	68%	62%	100%	93%	78%	51%
Between I-270 Split and MD 187	85%	58%	73%	68%	99%	92%	77%	41%
Between MD 187 and I-495	79%	65%	75%	72%	100%	93%	93%	37%
Between I-270 Split and Democracy Blvd	96%	59%	68%	63%	100%	94%	96%	59%
Between Democracy Blvd and I-495	96%	66%	73%	65%	100%	91%	99%	80%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 13C

I-495 2040 Alternative 13C AM Throughputs	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	10,253	10,469	9,745	9,701	8,709	9,201	9,690	9,334
American Legion Bridge	10,347	10,899	10,808	11,041	11,016	11,543	11,844	11,234
Between Clara Barton Pkwy and Cabin John Pkwy	8,627	8,704	8,484	8,659	10,755	10,833	10,480	9,959
Between MD 190 and I-270	9,687	10,630	10,684	10,203	12,878	13,158	12,211	11,020
Between I-270 West and MD 187	6,496	6,342	5,764	5,486	5,979	5,737	5,650	6,780
Between I-270 East and MD 187	6,220	5,999	5,290	4,298	6,402	5,997	5,731	6,450
Between MD 355 and MD 185	9,825	11,129	9,489	6,695	9,825	9,595	9,789	10,910
Between MD 185 and MD 97	9,358	10,474	9,065	6,615	10,588	10,514	9,110	11,109
Between MD 97 and US 29	8,336	9,691	8,121	6,602	10,071	9,882	8,730	10,025
Between US 29 and MD 193	8,476	9,397	8,089	6,357	9,232	8,874	8,270	8,624
Between MD 193 and MD 650	8,717	9,687	8,737	6,818	8,741	8,245	7,756	8,203
Between MD 650 and I-95	9,980	10,764	9,538	7,668	9,616	8,915	8,413	8,786
Between US 1 and I-95	7,805	7,976	7,200	6,169	7,706	7,397	7,460	7,700
Between Greenbelt Station and US 1	8,704	9,128	8,492	7,208	8,312	8,041	7,960	7,885
Between Greenbelt Station and MD 201	8,547	8,899	8,438	7,477	8,396	8,084	7,974	7,586
Between MD 201 and MD 295	8,125	8,471	8,630	7,611	8,982	9,388	9,135	8,618
Between MD 295 and MD 450	7,767	8,100	8,571	7,583	9,382	9,753	9,685	9,358
Between MD 450 and US 50	8,191	8,535	9,338	8,307	9,383	9,727	9,985	9,638
Between US 50 and MD 202	9,419	9,796	10,521	9,488	9,369	9,499	9,298	9,316
Between MD 202 and Arena Dr	9,402	9,667	10,281	9,433	9,122	9,492	9,245	9,171
Between Arena Dr and MD 214	9,411	9,826	10,196	9,423	9,326	9,863	9,577	9,415
Between MD 214 and Ritchie Marlboro Rd	9,523	9,704	9,838	9,341	9,062	9,759	9,405	8,959
Between Ritchie Marlboro Rd and MD 4	8,931	9,117	8,915	8,844	8,318	9,112	8,609	8,479
Between MD 4 and Forestville Rd	8,316	8,307	8,858	8,305	7,233	8,108	7,324	7,439
Between Forestville Rd and MD 218	7,642	7,626	8,160	7,733	6,305	6,824	6,156	6,588
Between MD 218 and MD 5	7,758	7,816	8,349	7,912	6,973	7,442	6,733	6,942
Between MD 5 and MD 414	6,984	6,062	6,681	6,460	5,237	5,429	5,275	5,634
Between MD 414 and MD 210	6,231	6,060	6,338	6,813	4,981	4,979	5,031	5,221
Between MD 210 and I-295	7,450	6,711	6,977	7,253	4,615	4,683	4,646	4,641
Woodrow Wilson Bridge	9,593	9,975	9,930	9,040	8,184	7,766	7,960	8,068

I-270 2040 Alternative 13C AM Throughputs	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	3,418	3,096	3,148	3,432	1,893	2,735	2,966	2,736
Between MD 80 and MD 109	3,602	3,611	3,615	3,745	1,627	2,250	2,515	2,360
Between MD 109 and MD 121	4,045	4,059	4,074	4,113	1,701	2,355	2,607	2,390
Between MD 121 and MD 27	5,120	5,304	4,968	4,991	2,118	2,562	2,794	2,727
Between MD 27 and MD 118	5,611	5,575	5,344	5,420	2,337	2,862	3,101	3,136
Between MD 118 and Middlebrook Rd	6,189	6,074	5,903	5,968	2,461	3,169	3,689	3,722
Between Middlebrook Rd and Watkins Mill	8,138	7,978	7,739	7,783	2,873	3,898	4,585	4,536
Between Watkins Mill and MD 124	7,536	7,026	6,574	6,600	2,784	3,936	4,921	4,830
Between MD 124 and MD 117	9,134	8,581	8,022	7,960	2,697	3,929	4,995	5,109
Between MD 117 and I-370	10,921	10,267	9,617	9,909	3,250	4,865	6,354	6,370
Between I-370 and Shady Grove Rd	13,189	11,947	10,589	10,536	3,003	4,247	5,609	6,014
Between Shady Grove Rd and MD 28	13,647	12,094	10,581	9,222	3,710	5,231	7,118	7,313
Between MD 28 and MD 189	14,117	12,453	11,808	9,012	4,389	6,144	8,467	8,523
Between MD 189 and Montrose Rd	13,972	12,244	11,870	8,571	4,470	6,138	8,548	8,397
Between Montrose Rd and I-270 Split	13,852	13,217	12,989	8,343	5,306	6,480	8,772	8,391
Between I-270 Split and MD 187	5,584	6,271	6,257	3,453	2,363	2,552	4,158	4,191
Between MD 187 and I-495	4,832	5,518	5,451	3,076	2,900	3,095	4,681	4,456
Between I-270 Split and Democracy Blvd	7,737	7,271	6,712	4,196	2,978	3,973	4,731	4,202
Between Democracy Blvd and I-495	7,232	7,259	6,449	3,962	3,378	4,438	5,098	4,279

Throughput and Percent Demand Met
2040 Alt 13C

I-495 2040 Alternative 13C AM Percent Demand Met	Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between VA 193 and GW Memorial Pkwy	98%	98%	97%	100%	100%	97%	100%	100%
American Legion Bridge	98%	91%	89%	94%	100%	95%	99%	97%
Between Clara Barton Pkwy and Cabin John Pkwy	87%	78%	76%	79%	99%	94%	98%	95%
Between MD 190 and I-270	97%	92%	88%	85%	98%	93%	97%	89%
Between I-270 West and MD 187	98%	96%	92%	84%	93%	81%	90%	100%
Between I-270 East and MD 187	97%	95%	88%	68%	99%	82%	87%	94%
Between MD 355 and MD 185	100%	95%	87%	63%	98%	84%	81%	92%
Between MD 185 and MD 97	100%	94%	84%	64%	97%	89%	76%	93%
Between MD 97 and US 29	100%	91%	79%	67%	99%	95%	85%	97%
Between MD US 29 and MD 193	100%	91%	79%	67%	100%	99%	96%	98%
Between MD 193 and MD 650	100%	91%	83%	71%	98%	98%	95%	97%
Between MD 650 and I-95	100%	92%	87%	77%	100%	98%	96%	98%
Between US 1 and I-95	100%	95%	90%	81%	97%	91%	91%	100%
Between Greenbelt Station and US1	99%	91%	87%	79%	99%	93%	94%	100%
Between Greenbelt Station and MD 201	100%	92%	89%	85%	98%	90%	92%	97%
Between MD 201 and MD 295	99%	92%	92%	87%	98%	93%	95%	99%
Between MD 295 and MD 450	99%	94%	95%	90%	97%	94%	95%	98%
Between MD 450 and US 50	98%	94%	95%	93%	98%	93%	95%	97%
Between US 50 and MD 202	98%	96%	97%	95%	98%	93%	94%	97%
Between MD 202 and Arena Dr	98%	96%	96%	96%	96%	91%	91%	96%
Between Arena Dr and MD 214	100%	97%	98%	96%	95%	91%	91%	95%
Between MD 214 and Ritchie Marlboro Rd	100%	96%	98%	97%	95%	90%	90%	94%
Between Ritchie Marlboro Rd and MD 4	98%	94%	94%	95%	99%	95%	95%	97%
Between MD 4 and Forestville Rd	97%	94%	96%	97%	98%	94%	92%	98%
Between Forestville Rd and MD 218	98%	94%	95%	97%	98%	92%	90%	98%
Between MD 218 and MD 5	97%	94%	95%	97%	96%	90%	89%	97%
Between MD 5 and MD 414	97%	100%	98%	97%	100%	91%	94%	100%
Between MD 414 and MD 210	81%	98%	94%	100%	100%	86%	92%	100%
Between MD 210 and I-295	83%	92%	94%	100%	100%	86%	91%	100%
Woodrow Wilson Bridge	86%	91%	95%	100%	99%	81%	91%	100%

I-270 2040 Alternative 13C AM Percent Demand Met	Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM
Between MD 85 and MD 80	94%	81%	90%	100%	100%	93%	96%	100%
Between MD 80 and MD 109	90%	84%	95%	100%	100%	92%	96%	100%
Between MD 109 and MD 121	89%	83%	93%	100%	100%	93%	97%	100%
Between MD 121 and MD 27	90%	91%	96%	100%	100%	93%	96%	100%
Between MD 27 and MD 118	84%	96%	100%	100%	100%	100%	100%	100%
Between MD 118 and Middlebrook Rd	86%	96%	99%	100%	100%	93%	93%	100%
Between Middlebrook Rd and Watkins Mill	88%	95%	99%	100%	100%	93%	92%	99%
Between Watkins Mill and MD 124	100%	100%	100%	100%	84%	75%	75%	80%
Between MD 124 and MD 117	91%	97%	99%	100%	67%	59%	58%	63%
Between MD 117 and I-370	92%	94%	96%	100%	67%	56%	54%	59%
Between I-370 and Shady Grove Rd	100%	100%	99%	100%	94%	78%	77%	87%
Between Shady Grove Rd and MD 28	100%	100%	100%	94%	97%	85%	85%	93%
Between MD 28 and MD 189	100%	98%	100%	83%	98%	79%	79%	86%
Between MD 189 and Montrose Rd	100%	95%	100%	78%	95%	78%	76%	82%
Between Montrose Rd and I-270 Split	100%	97%	100%	73%	100%	86%	85%	88%
Between I-270 Split and MD 187	100%	96%	100%	65%	100%	84%	86%	96%
Between MD 187 and I-495	100%	93%	100%	63%	100%	82%	88%	95%
Between I-270 Split and Democracy Blvd	100%	100%	100%	68%	100%	89%	86%	82%
Between Democracy Blvd and I-495	100%	100%	100%	71%	100%	89%	85%	78%

<90%	>90%	100%

Throughput and Percent Demand Met
2040 Alt 13C

I-495 2040 Alternative 13C PM Throughputs	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	7,766	8,245	8,783	7,179	8,708	8,368	7,097	6,416
American Legion Bridge	9,707	10,112	10,700	8,251	10,733	10,176	8,767	7,623
Between Clara Barton Pkwy and Cabin John Pkwy	8,066	8,002	8,001	5,983	9,673	8,665	7,550	6,329
Between MD 190 and I-270	11,731	11,763	11,262	8,603	10,137	9,296	7,989	6,093
Between I-270 West and MD 187	5,881	5,831	5,287	3,950	6,294	6,107	5,715	3,975
Between I-270 East and MD 187	5,866	5,788	5,286	4,064	6,285	6,080	5,697	3,615
Between MD 355 and MD 185	9,547	9,133	8,964	7,691	10,762	10,664	10,584	6,328
Between MD 185 and MD 97	10,727	10,260	10,187	8,176	10,445	10,780	10,441	6,991
Between MD 97 and US 29	11,018	10,431	10,227	7,892	10,127	10,708	10,666	7,571
Between US 29 and MD 193	10,636	10,184	10,107	7,983	9,556	10,101	9,904	7,638
Between MD 193 and MD 650	10,673	10,422	10,319	8,536	9,898	10,235	10,348	8,375
Between MD 650 and I-95	11,232	11,015	10,831	9,343	10,258	10,459	10,621	9,364
Between US 1 and I-95	7,482	7,579	7,530	5,759	9,890	9,881	9,678	8,354
Between Greenbelt Station and US 1	8,961	8,955	8,870	7,627	9,550	9,433	9,008	7,905
Between Greenbelt Station and MD 201	9,134	9,166	9,002	7,875	9,357	9,207	8,752	7,709
Between MD 201 and MD 295	9,194	9,305	9,186	8,012	9,337	9,148	8,433	7,512
Between MD 295 and MD 450	9,696	9,420	9,422	8,022	8,571	8,436	7,710	7,479
Between MD 450 and US 50	10,113	9,927	10,008	8,870	9,112	9,030	8,149	7,799
Between US 50 and MD 202	10,247	10,135	10,648	9,792	9,308	9,144	8,241	7,901
Between MD 202 and Arena Dr	9,939	9,718	10,441	9,940	9,592	9,428	8,319	8,408
Between Arena Dr and MD 214	9,948	9,555	10,089	9,970	9,455	9,372	8,683	8,441
Between MD 214 and Ritchie Marlboro Rd	9,648	9,482	9,972	9,827	9,746	9,545	9,379	8,878
Between Ritchie Marlboro Rd and MD 4	8,273	8,387	9,136	9,067	9,371	9,136	9,086	8,594
Between MD 4 and Forestville Rd	7,630	8,174	8,710	8,816	8,760	8,446	8,425	7,795
Between Forestville Rd and MD 218	7,141	7,670	8,223	8,215	7,715	7,232	7,320	6,873
Between MD 218 and MD 5	7,543	8,269	8,789	8,612	8,123	7,584	7,708	7,189
Between MD 5 and MD 414	5,684	6,183	6,676	6,288	8,223	7,863	7,849	7,091
Between MD 414 and MD 210	5,214	5,661	6,056	5,392	7,812	7,732	7,813	7,143
Between MD 210 and I-295	3,315	5,448	5,828	5,198	7,383	7,575	7,585	7,065
Woodrow Wilson Bridge	7,779	8,446	8,891	8,160	9,384	9,314	9,209	9,094

I-270 2040 Alternative 13C PM Throughputs	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	2,264	2,561	2,882	2,988	4,367	4,367	4,188	3,991
Between MD 80 and MD 109	2,032	2,314	2,668	2,708	4,125	4,176	4,181	4,018
Between MD 109 and MD 121	2,174	2,398	2,708	2,871	4,212	4,236	4,214	4,236
Between MD 121 and MD 27	2,680	2,808	3,429	3,406	5,321	4,769	4,732	4,878
Between MD 27 and MD 118	3,302	3,378	3,655	3,855	6,524	5,649	5,134	6,026
Between MD 118 and Middlebrook Rd	3,797	4,082	4,303	4,464	7,190	6,056	5,119	6,108
Between Middlebrook Rd and Watkins Mill	4,844	5,107	5,600	5,560	8,635	7,158	5,896	7,140
Between Watkins Mill and MD 124	3,965	3,981	4,211	4,299	8,133	7,903	5,623	6,429
Between MD 124 and MD 117	5,192	5,258	5,615	5,436	8,693	8,526	5,629	6,763
Between MD 117 and I-370	6,684	7,012	7,516	6,951	10,263	10,003	6,405	7,675
Between I-370 and Shady Grove Rd	6,524	6,524	6,226	4,788	12,237	12,592	7,931	6,999
Between Shady Grove Rd and MD 28	7,166	7,221	6,304	3,476	12,157	12,770	9,201	7,213
Between MD 28 and MD 189	8,115	8,237	5,688	3,791	13,138	13,790	9,757	7,828
Between MD 189 and Montrose Rd	7,805	7,910	3,876	3,839	12,886	13,390	10,205	8,308
Between Montrose Rd and I-270 Split	7,680	6,562	4,268	4,122	12,937	13,410	11,137	8,438
Between I-270 Split and MD 187	3,762	2,526	2,346	1,878	5,906	6,151	5,156	2,893
Between MD 187 and I-495	3,490	2,773	3,226	2,253	5,346	5,302	5,273	2,501
Between I-270 Split and Democracy Blvd	3,858	3,065	2,305	2,004	7,055	7,268	6,987	5,383
Between Democracy Blvd and I-495	3,827	3,124	2,302	2,012	5,976	6,086	6,139	4,643

Throughput and Percent Demand Met
2040 Alt 13C

I-495 2040 Alternative 13C PM Percent Demand Met	Inner Loop				Outer Loop			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between VA 193 and GW Memorial Pkwy	100%	100%	100%	100%	100%	99%	90%	80%
PMerican Legion Bridge	98%	97%	99%	85%	96%	90%	80%	71%
Between Clara Barton Pkwy and Cabin John Pkwy	88%	86%	87%	71%	97%	89%	79%	67%
Between MD 190 and I-270	96%	95%	96%	80%	97%	88%	77%	64%
Between I-270 West and MD 187	97%	98%	97%	85%	97%	97%	93%	70%
Between I-270 East and MD 187	97%	98%	98%	88%	98%	97%	92%	65%
Between MD 355 and MD 185	90%	86%	90%	88%	99%	94%	92%	59%
Between MD 185 and MD 97	93%	89%	95%	87%	98%	95%	90%	66%
Between MD 97 and US 29	93%	88%	94%	84%	98%	96%	93%	74%
Between MD US 29 and MD 193	92%	88%	95%	90%	98%	96%	94%	83%
Between MD 193 and MD 650	92%	89%	96%	92%	99%	96%	96%	90%
Between MD 650 and I-95	93%	91%	96%	95%	99%	95%	96%	97%
Between US 1 and I-95	94%	91%	98%	98%	97%	93%	96%	94%
Between Greenbelt Station and US1	93%	92%	97%	98%	97%	92%	96%	93%
Between Greenbelt Station and MD 201	93%	94%	98%	100%	96%	92%	95%	93%
Between MD 201 and MD 295	94%	94%	98%	99%	96%	93%	95%	94%
Between MD 295 and MD 450	94%	94%	100%	100%	95%	93%	93%	94%
Between MD 450 and US 50	94%	95%	100%	100%	94%	92%	91%	91%
Between US 50 and MD 202	94%	97%	100%	100%	93%	90%	89%	89%
Between MD 202 and Arena Dr	95%	98%	100%	100%	96%	93%	88%	92%
Between Arena Dr and MD 214	95%	97%	100%	100%	96%	93%	92%	93%
Between MD 214 and Ritchie Marlboro Rd	97%	97%	100%	100%	97%	92%	93%	94%
Between Ritchie Marlboro Rd and MD 4	95%	94%	97%	100%	98%	94%	94%	98%
Between MD 4 and Forestville Rd	95%	95%	98%	100%	97%	94%	93%	96%
Between Forestville Rd and MD 218	95%	95%	98%	100%	96%	93%	92%	96%
Between MD 218 and MD 5	95%	96%	99%	100%	96%	92%	92%	95%
Between MD 5 and MD 414	96%	96%	100%	100%	100%	100%	99%	100%
Between MD 414 and MD 210	93%	93%	96%	96%	95%	93%	91%	95%
Between MD 210 and I-295	91%	91%	96%	96%	93%	93%	90%	95%
Woodrow Wilson Bridge	97%	94%	100%	100%	94%	94%	89%	95%

I-270 2040 Alternative 13C PM Percent Demand Met	Southbound				Northbound			
	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Between MD 85 and MD 80	100%	94%	93%	99%	95%	81%	82%	97%
Between MD 80 and MD 109	99%	93%	93%	98%	95%	80%	81%	96%
Between MD 109 and MD 121	99%	91%	90%	100%	95%	79%	80%	95%
Between MD 121 and MD 27	99%	90%	95%	100%	100%	78%	77%	91%
Between MD 27 and MD 118	100%	93%	96%	100%	100%	92%	84%	100%
Between MD 118 and Middlebrook Rd	99%	95%	96%	100%	98%	74%	63%	82%
Between Middlebrook Rd and Watkins Mill	99%	96%	97%	99%	98%	74%	61%	79%
Between Watkins Mill and MD 124	99%	90%	86%	91%	90%	74%	54%	66%
Between MD 124 and MD 117	100%	93%	89%	93%	73%	62%	40%	50%
Between MD 117 and I-370	100%	94%	91%	95%	65%	57%	37%	47%
Between I-370 and Shady Grove Rd	100%	100%	100%	100%	98%	87%	59%	58%
Between Shady Grove Rd and MD 28	100%	100%	100%	97%	100%	94%	66%	60%
Between MD 28 and MD 189	100%	100%	100%	86%	98%	93%	68%	57%
Between MD 189 and Montrose Rd	100%	100%	85%	91%	98%	93%	71%	61%
Between Montrose Rd and I-270 Split	97%	77%	48%	50%	99%	95%	79%	64%
Between I-270 Split and MD 187	96%	62%	57%	46%	100%	93%	77%	46%
Between MD 187 and I-495	83%	62%	72%	55%	100%	93%	91%	43%
Between I-270 Split and Democracy Blvd	96%	69%	48%	48%	99%	96%	91%	77%
Between Democracy Blvd and I-495	96%	74%	55%	52%	97%	95%	97%	76%

<90%	>90%	100%

Figure A-1: I-495 Existing 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

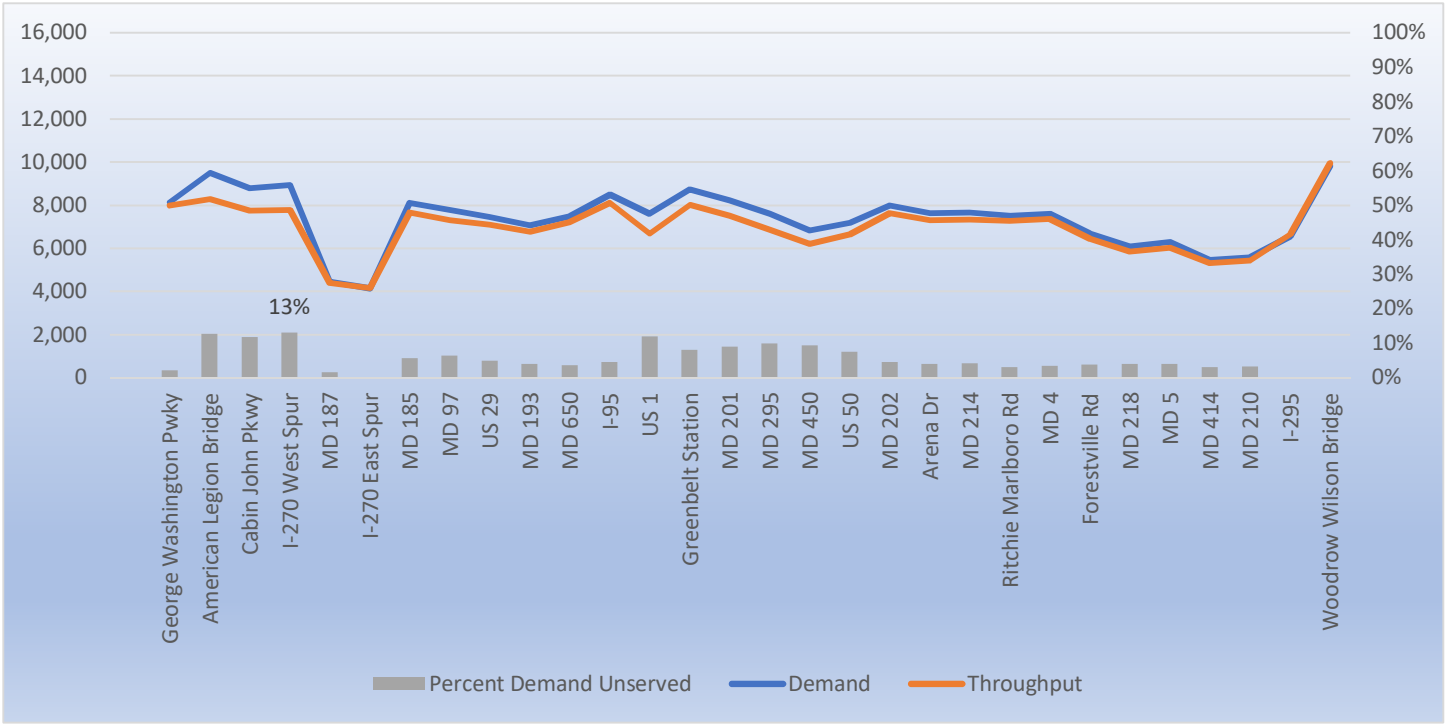


Figure A-2: I-495 Existing 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

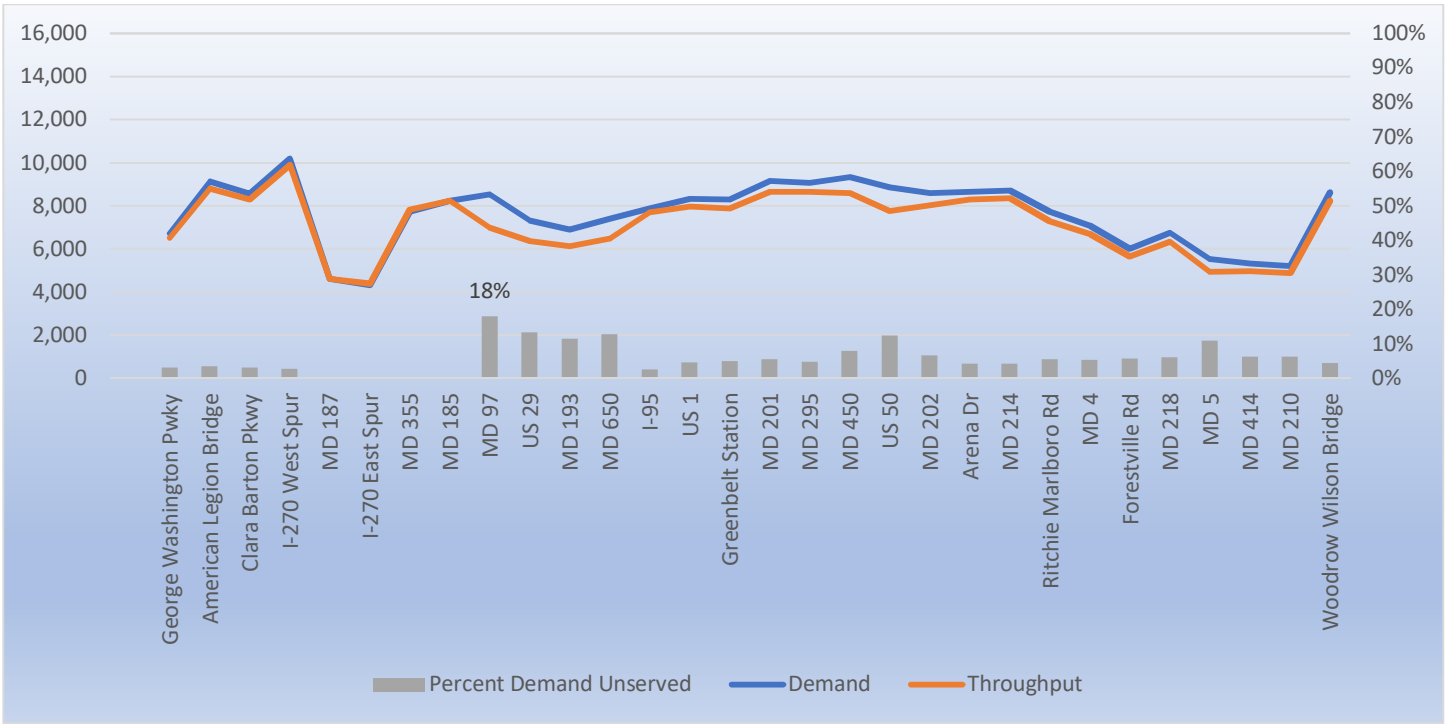


Figure A-3: I-270 Existing 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

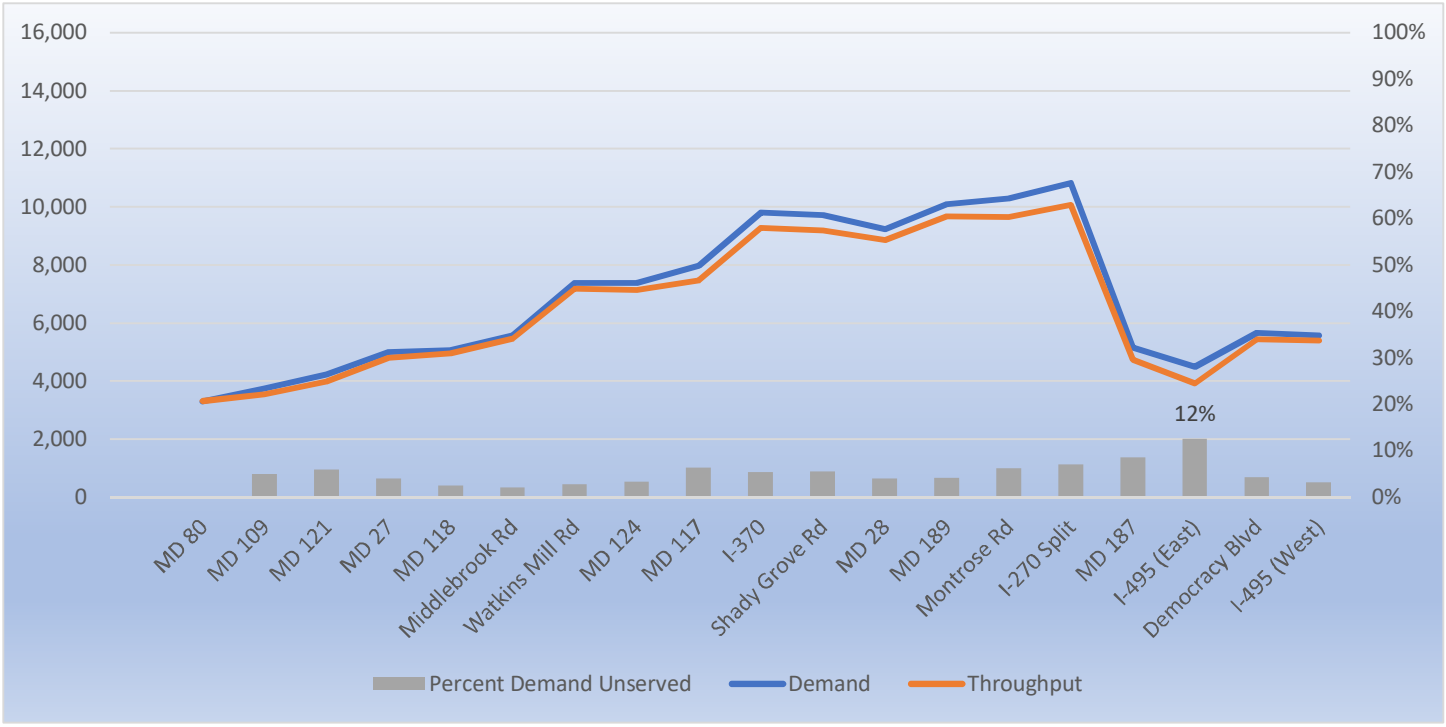


Figure A-4: I-270 Existing 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

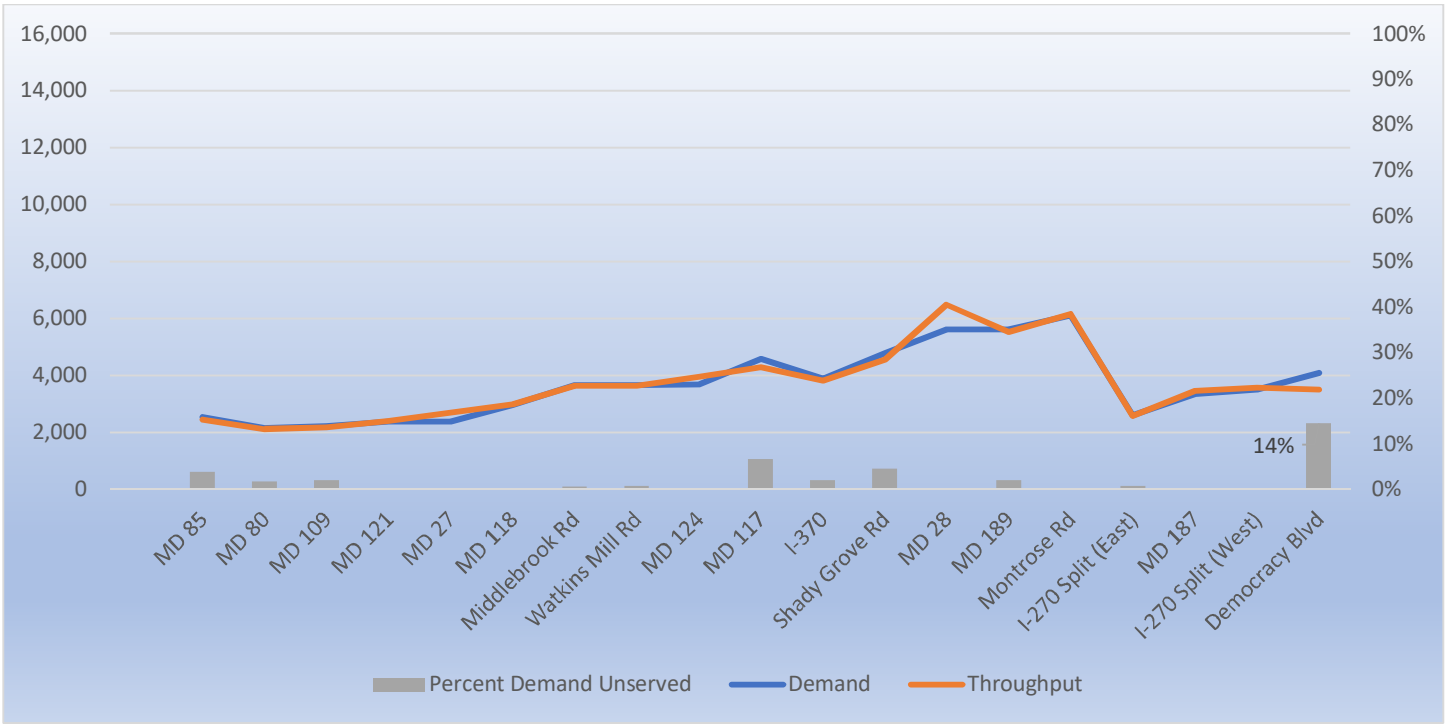


Figure A-5: I-495 Existing 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

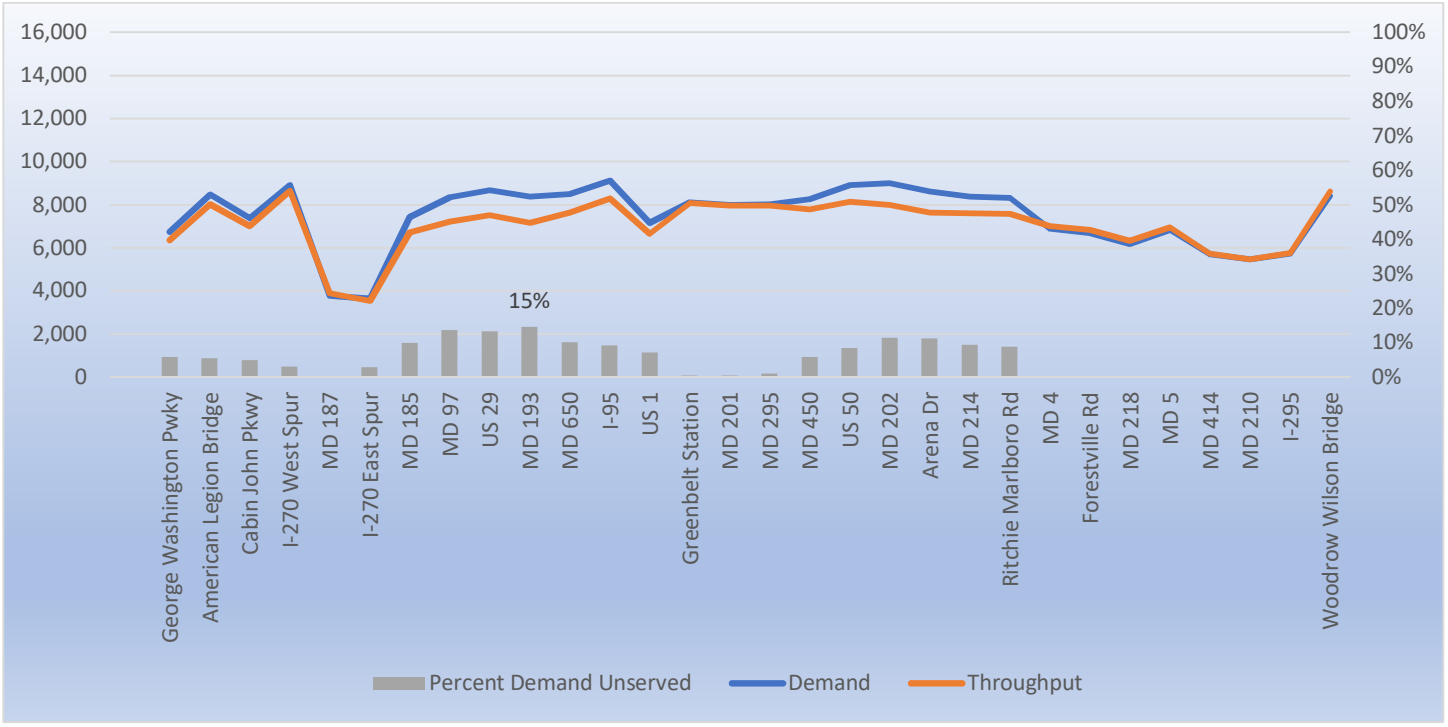


Figure A-6: I-495 Existing 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

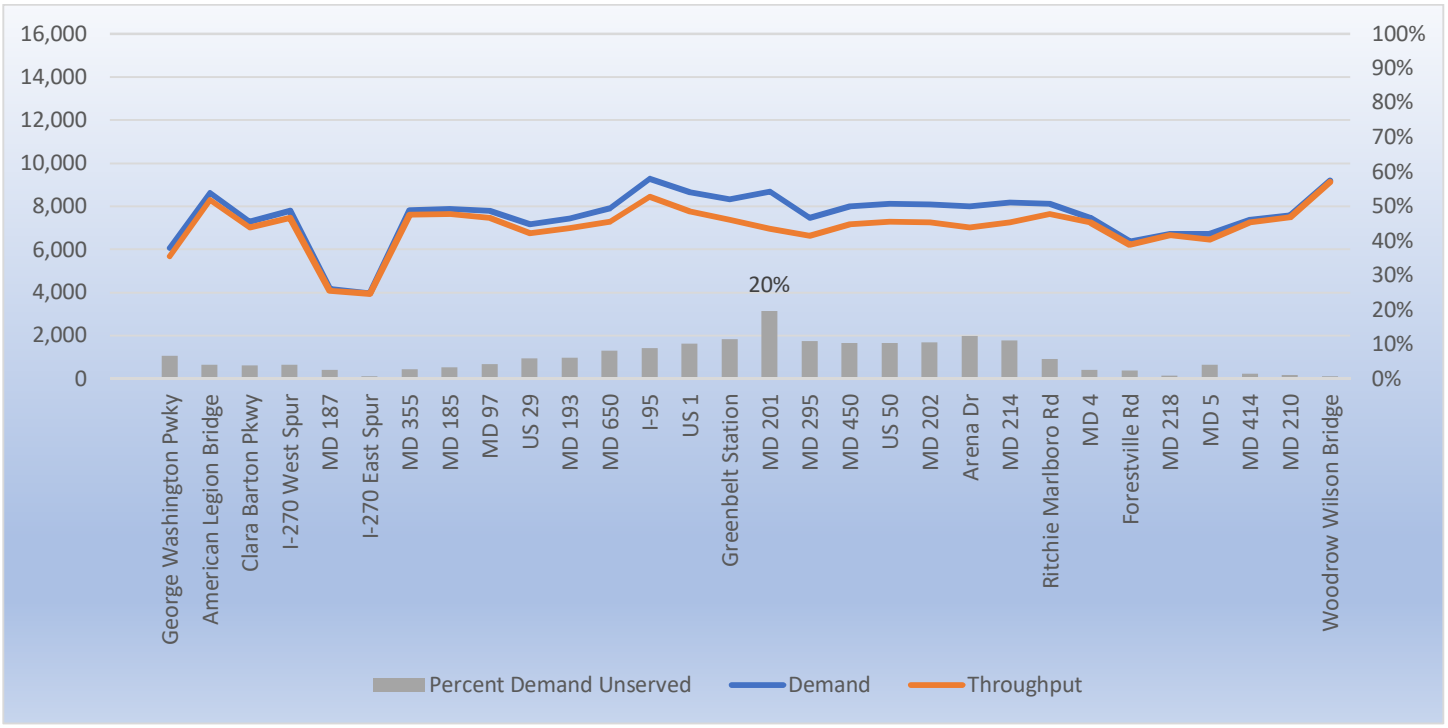


Figure A-7: I-270 Existing 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

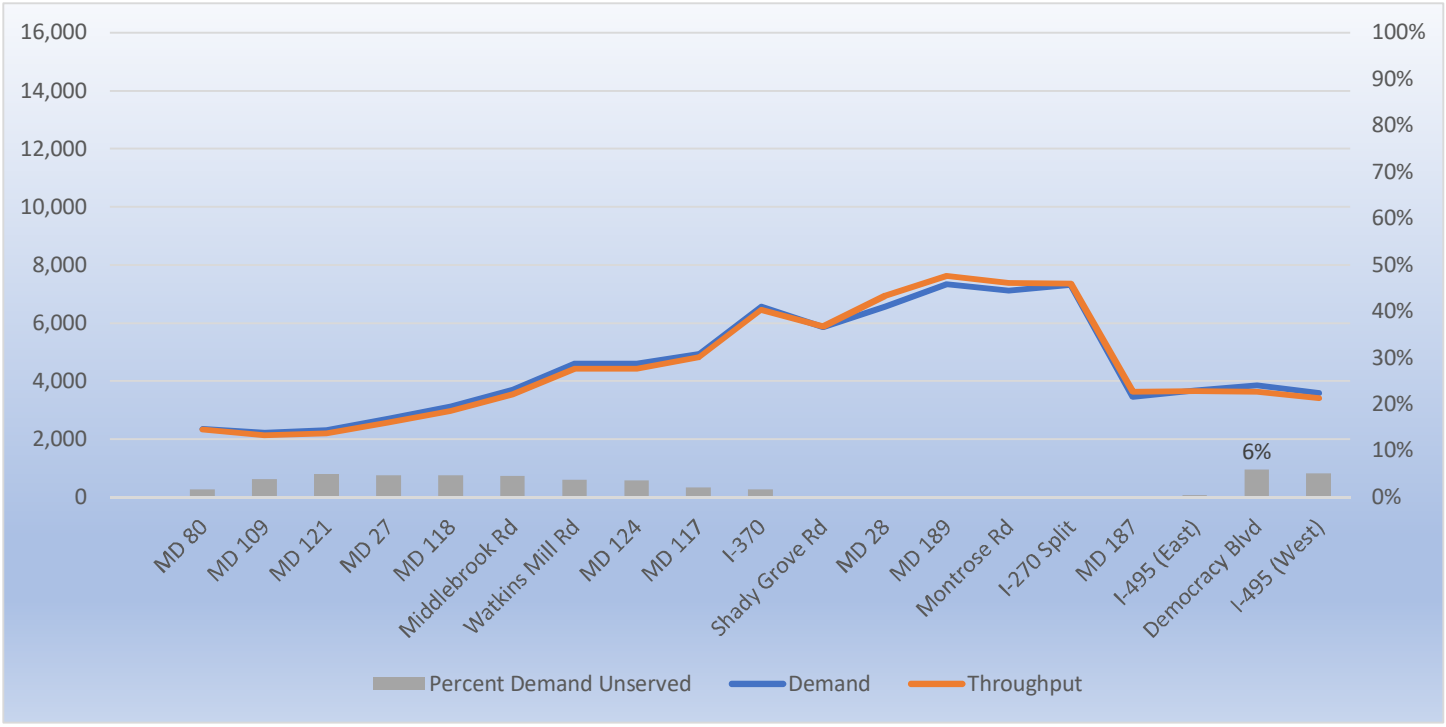


Figure A-8: I-270 Existing 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

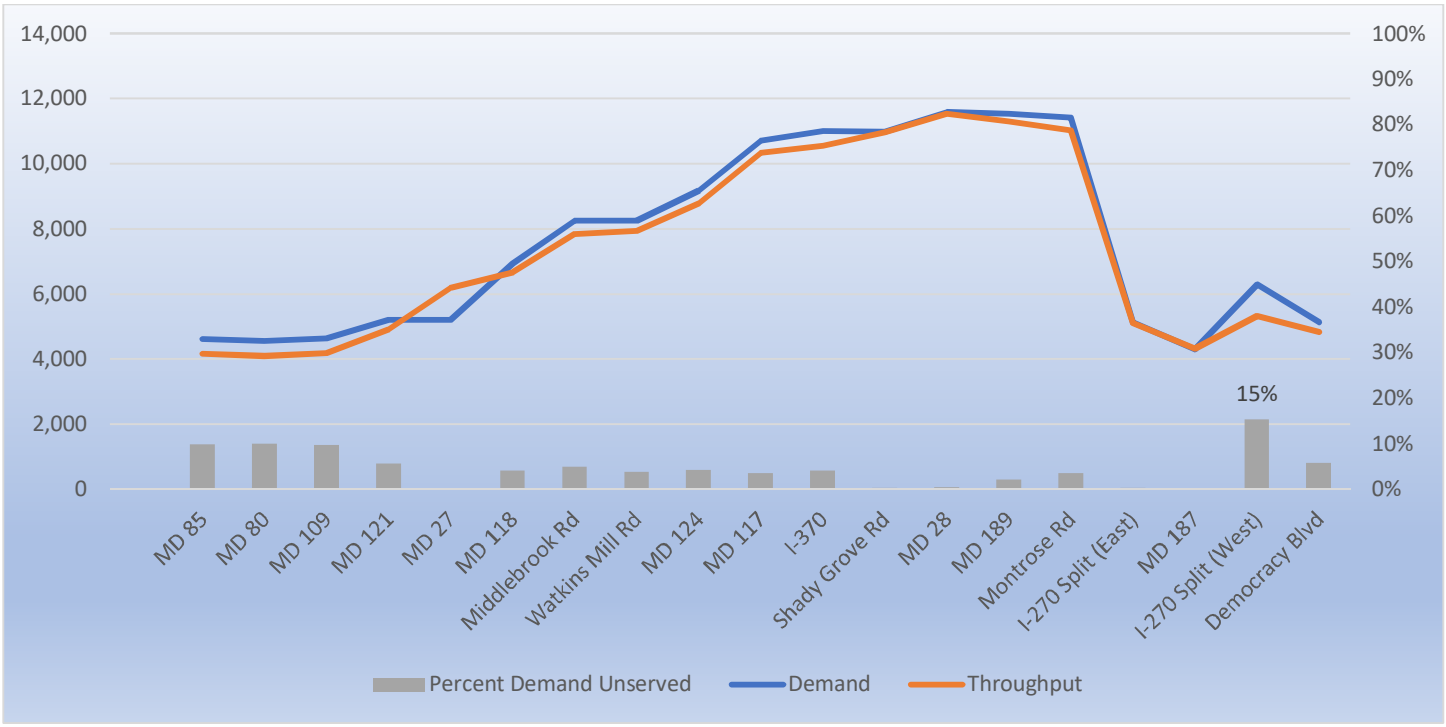


Figure B-1: I-495 2025 No Build 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

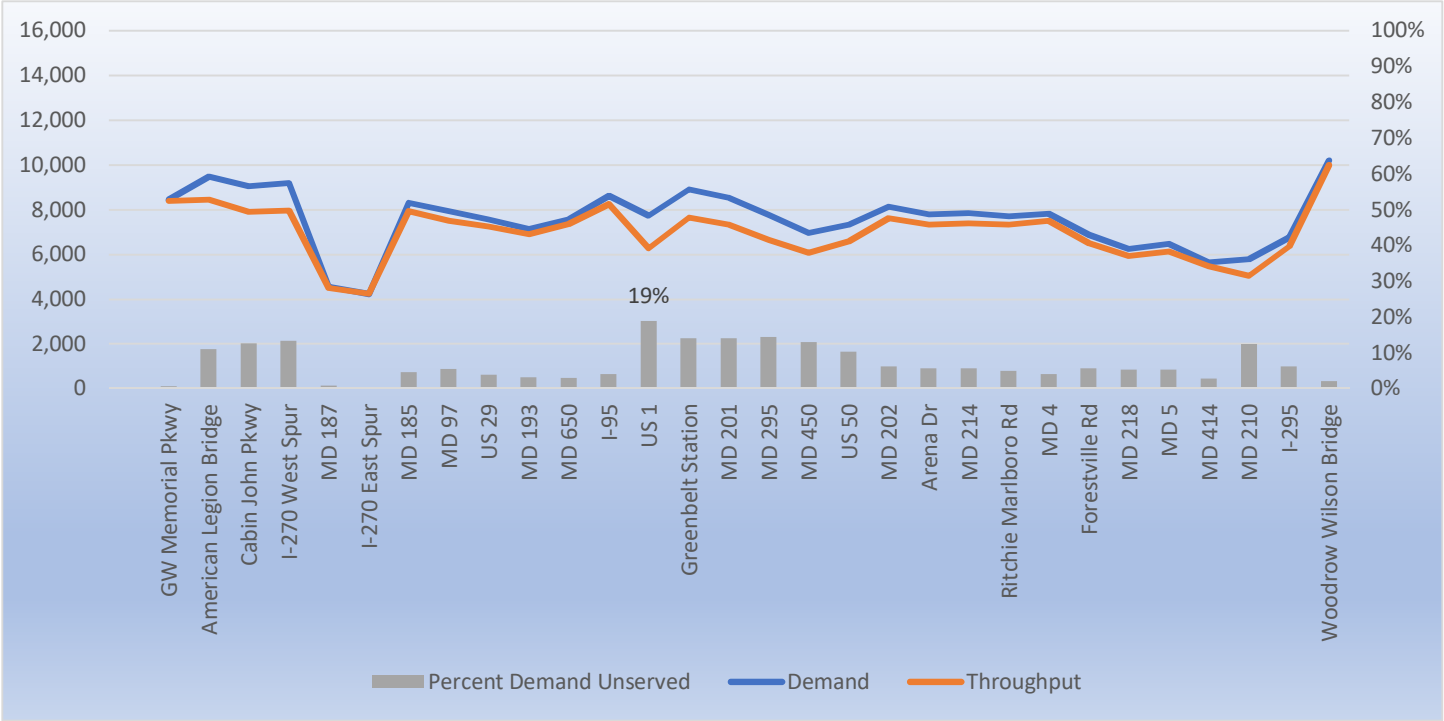


Figure B-2: I-495 2025 No Build 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

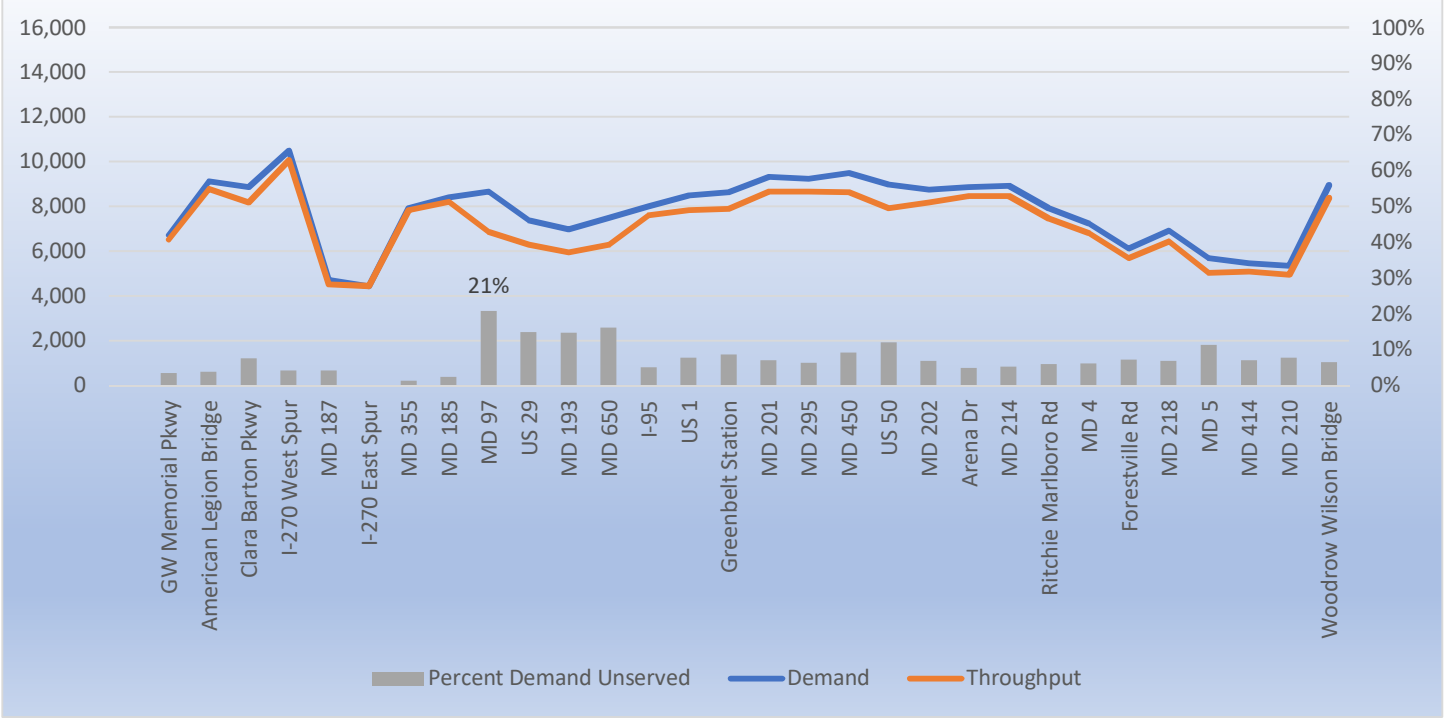


Figure B-3: I-270 2025 No Build 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

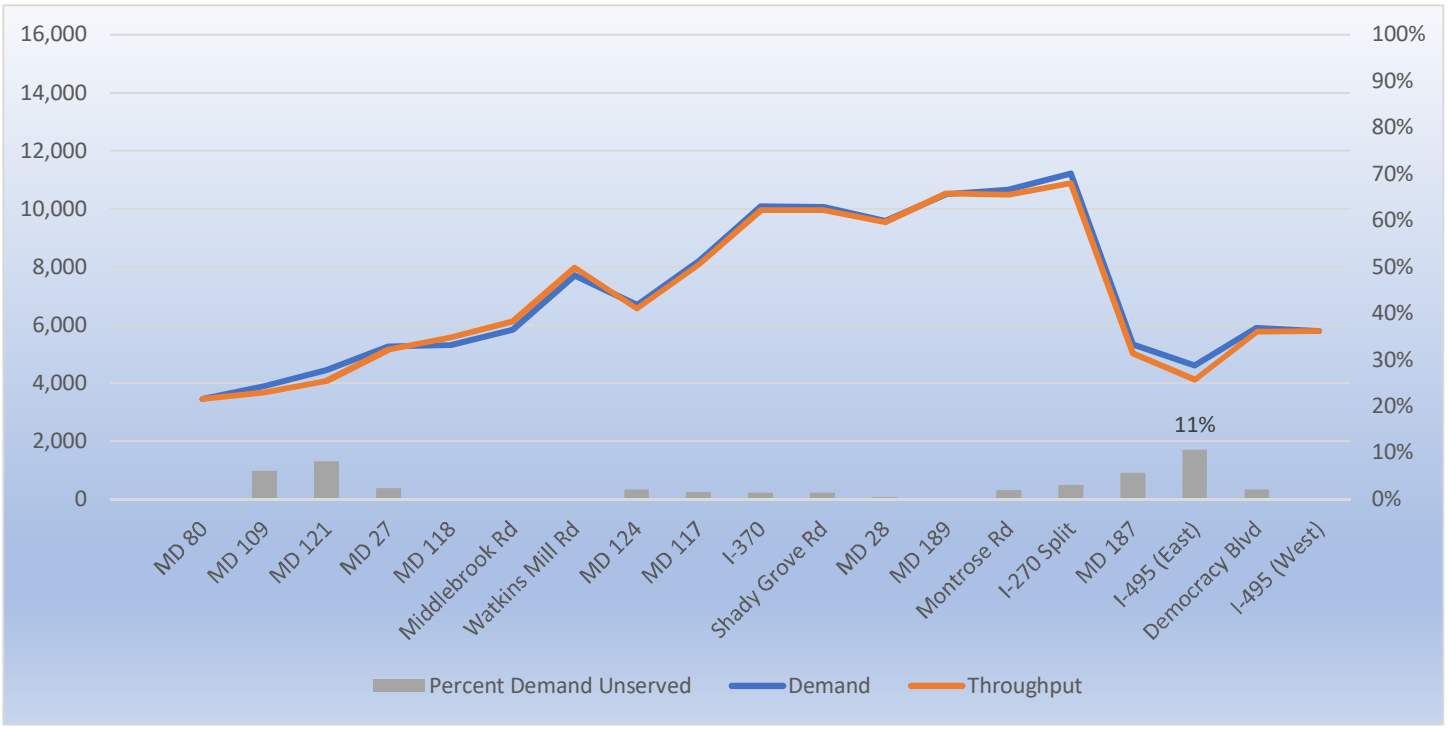


Figure B-4: I-270 2025 No Build 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

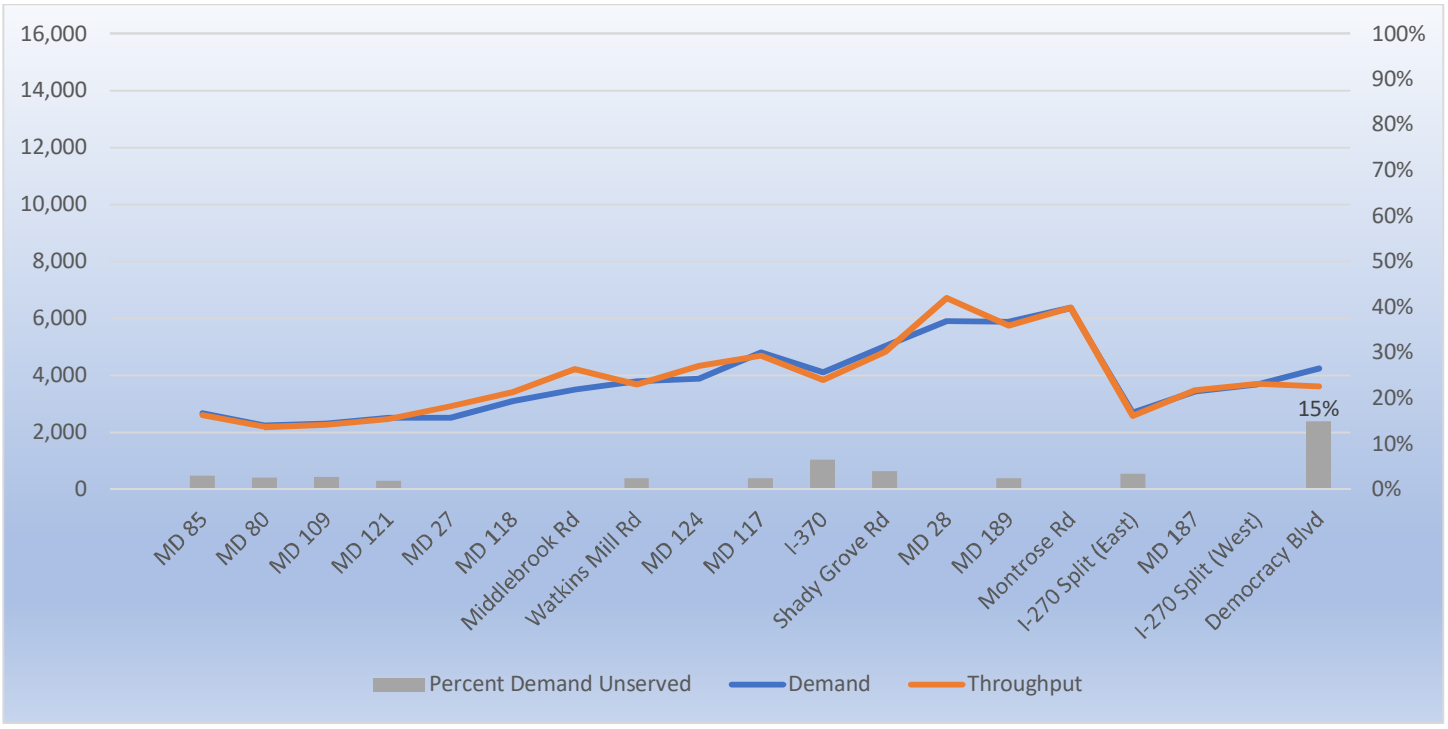


Figure B-5: I-495 2025 No Build 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

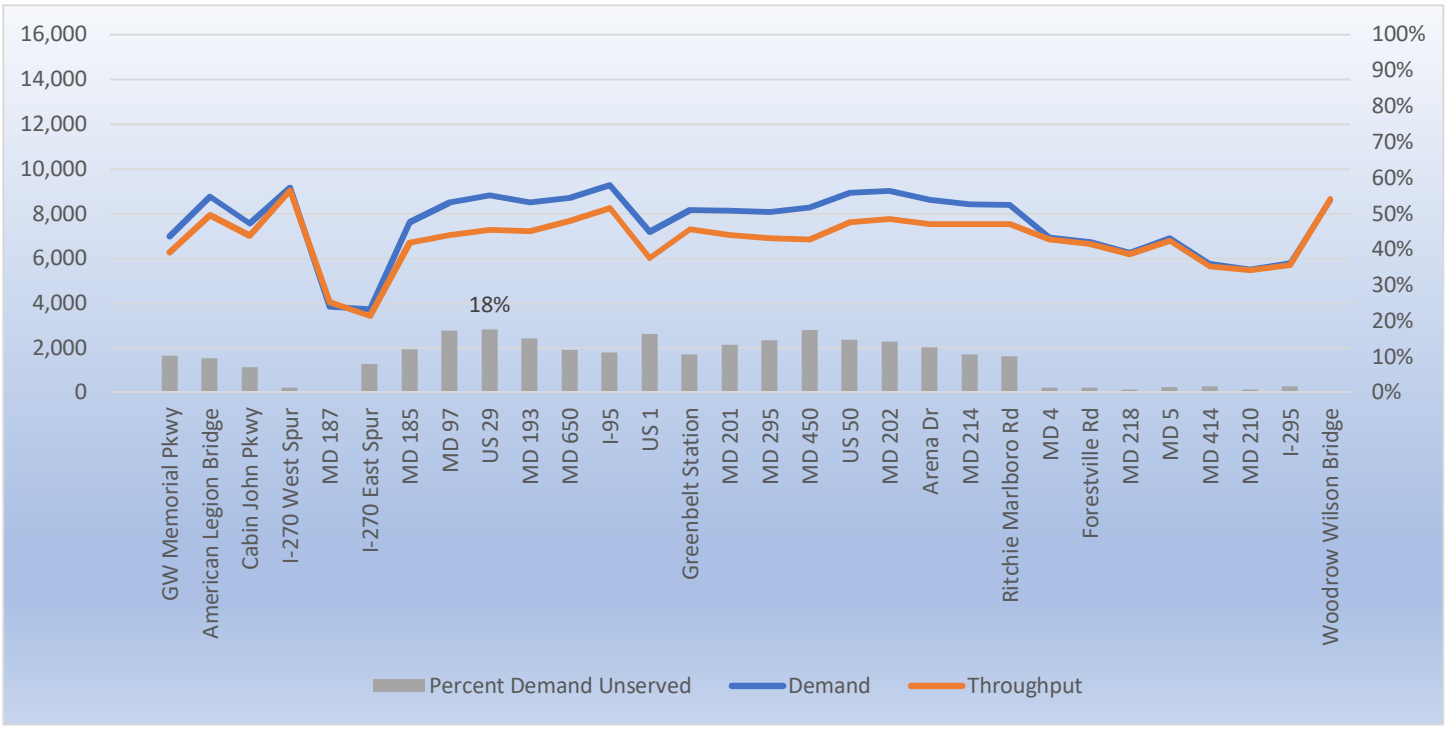


Figure B-6: I-495 2025 No Build 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

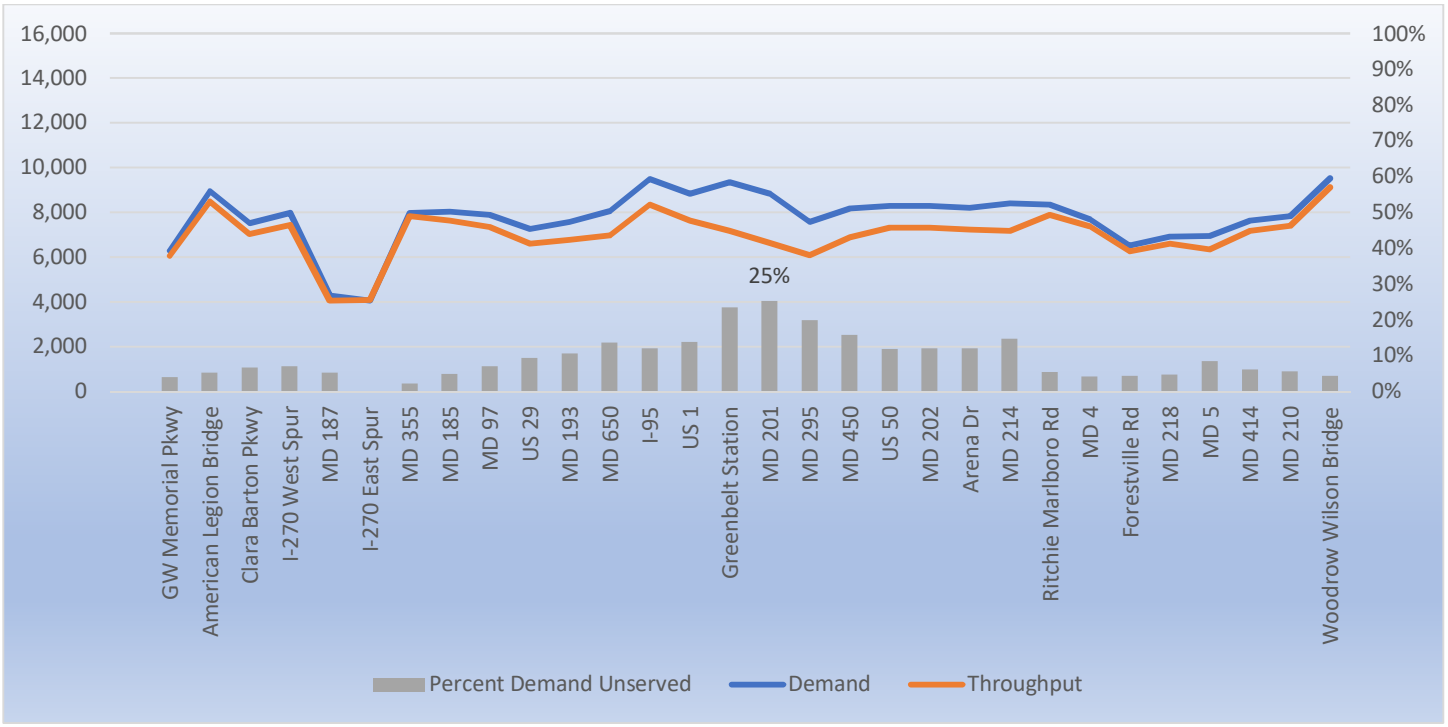


Figure B-7: I-270 2025 No Build 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

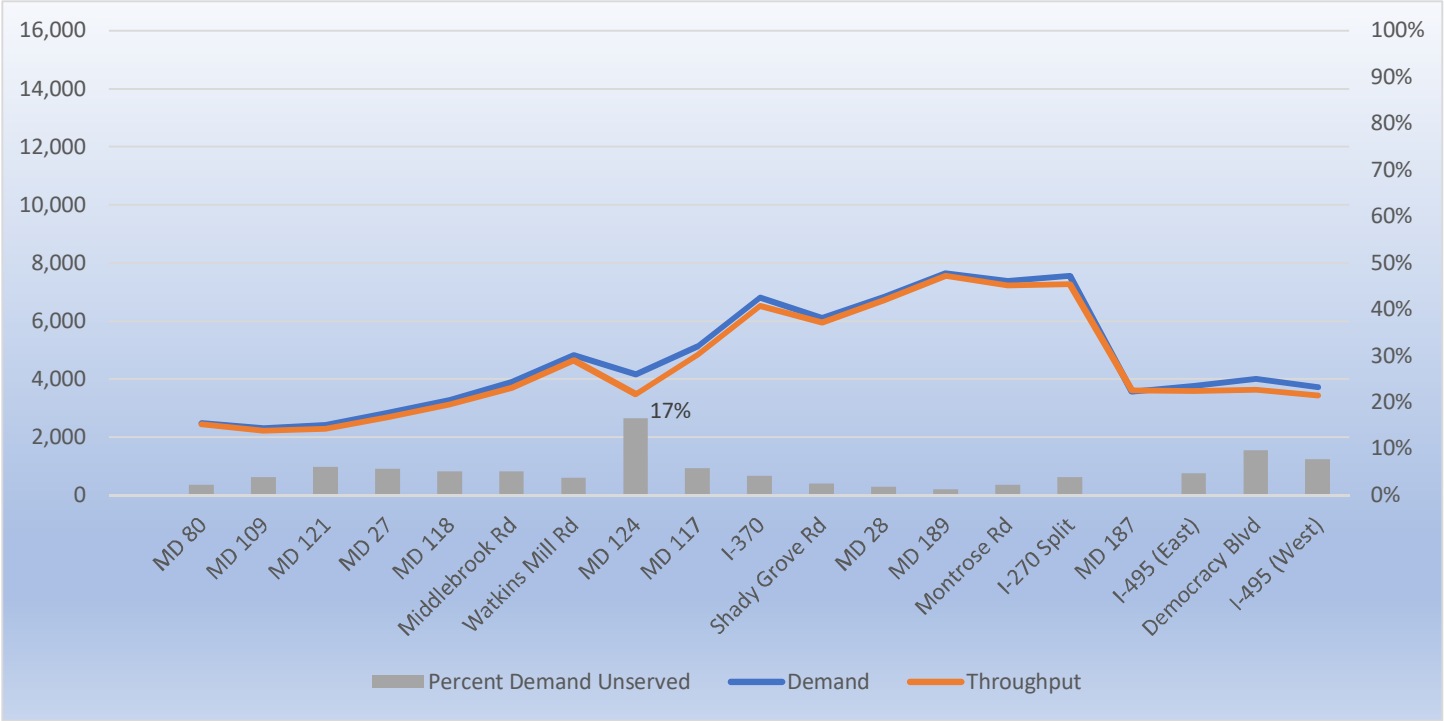


Figure B-8: I-270 2025 No Build 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

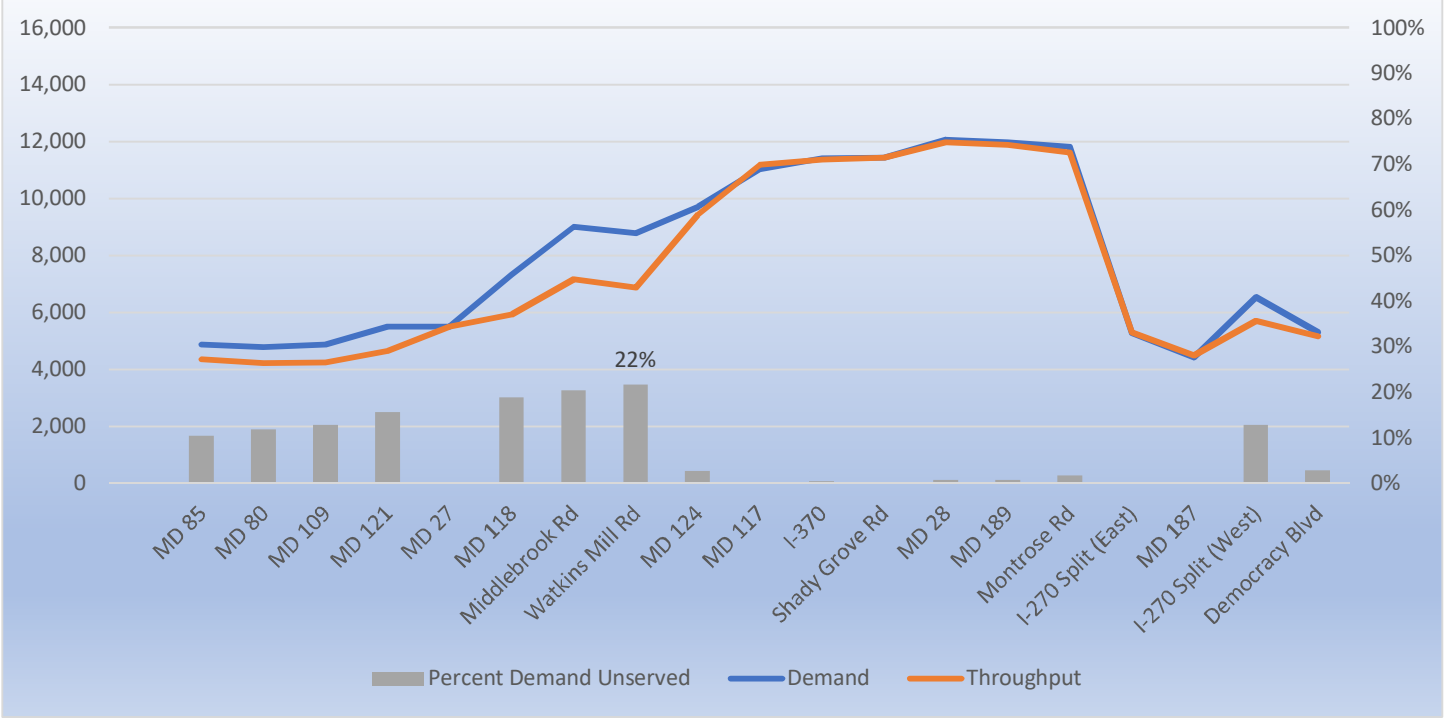


Figure C-1: I-495 2040 No Build 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

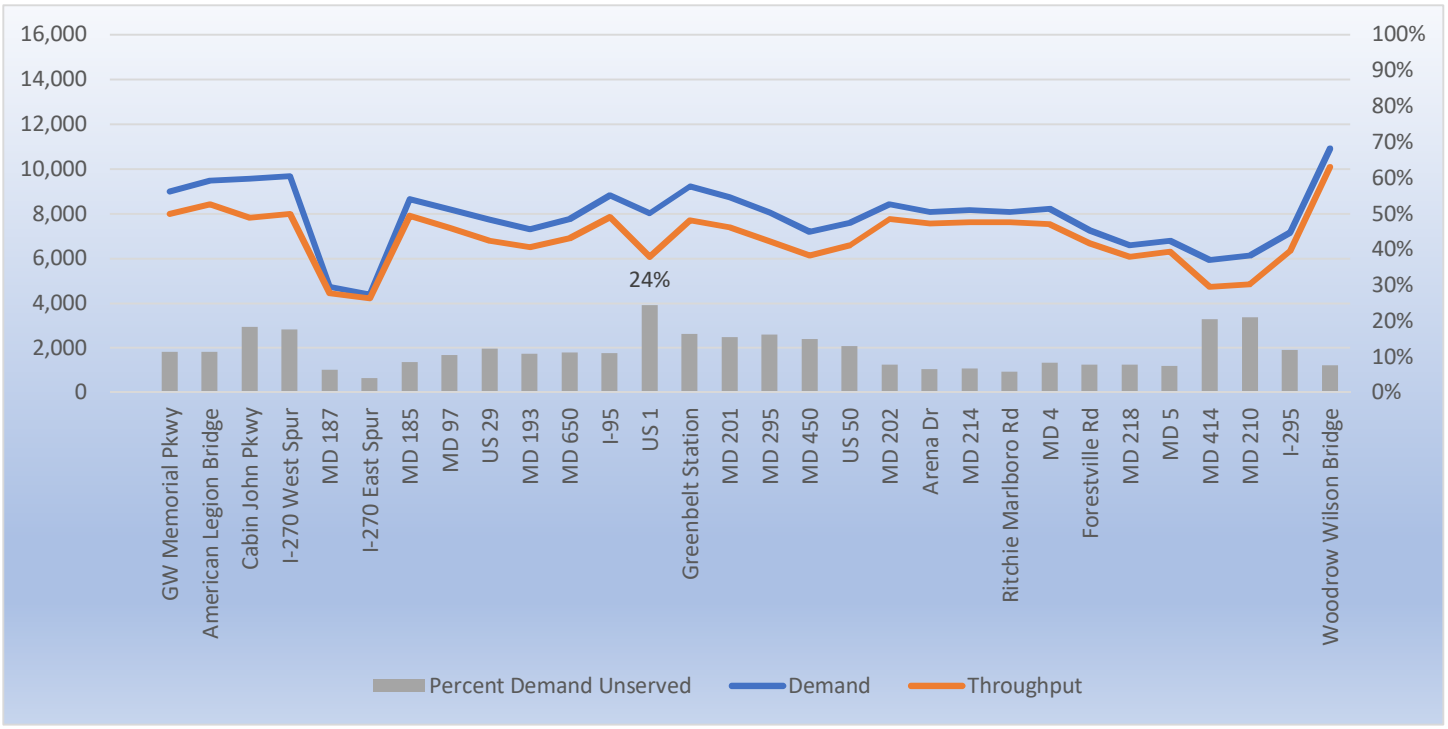


Figure C-2: I-495 2040 No Build 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

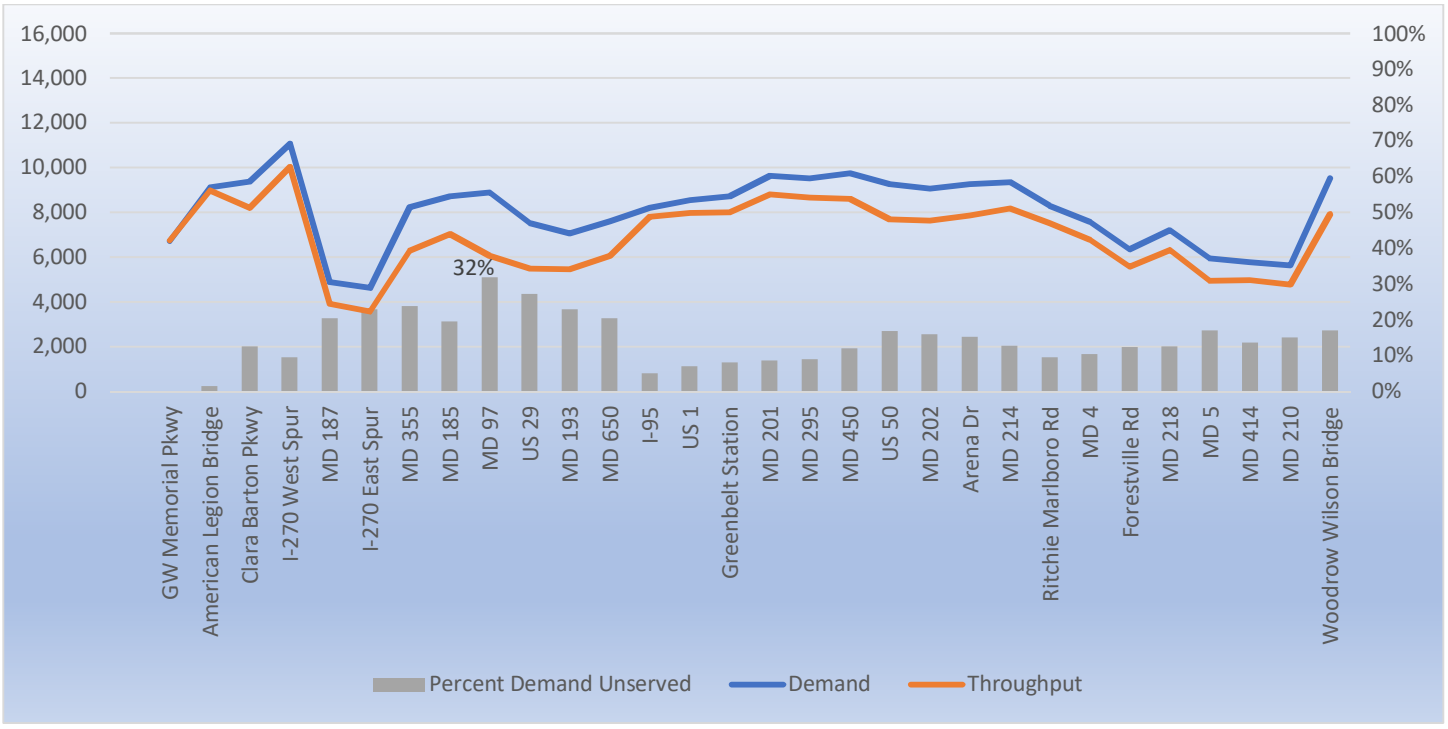


Figure C-3: I-270 2040 No Build 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

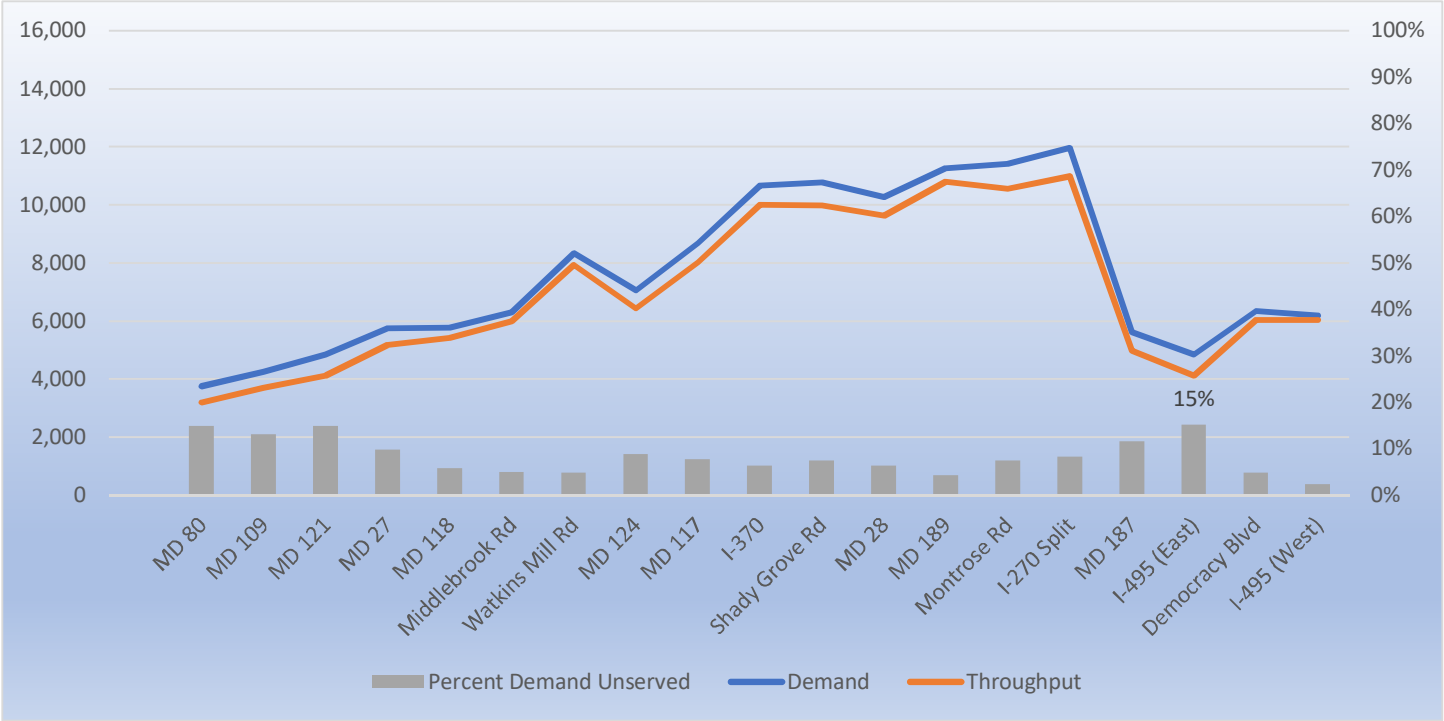


Figure C-4: I-270 2040 No Build 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

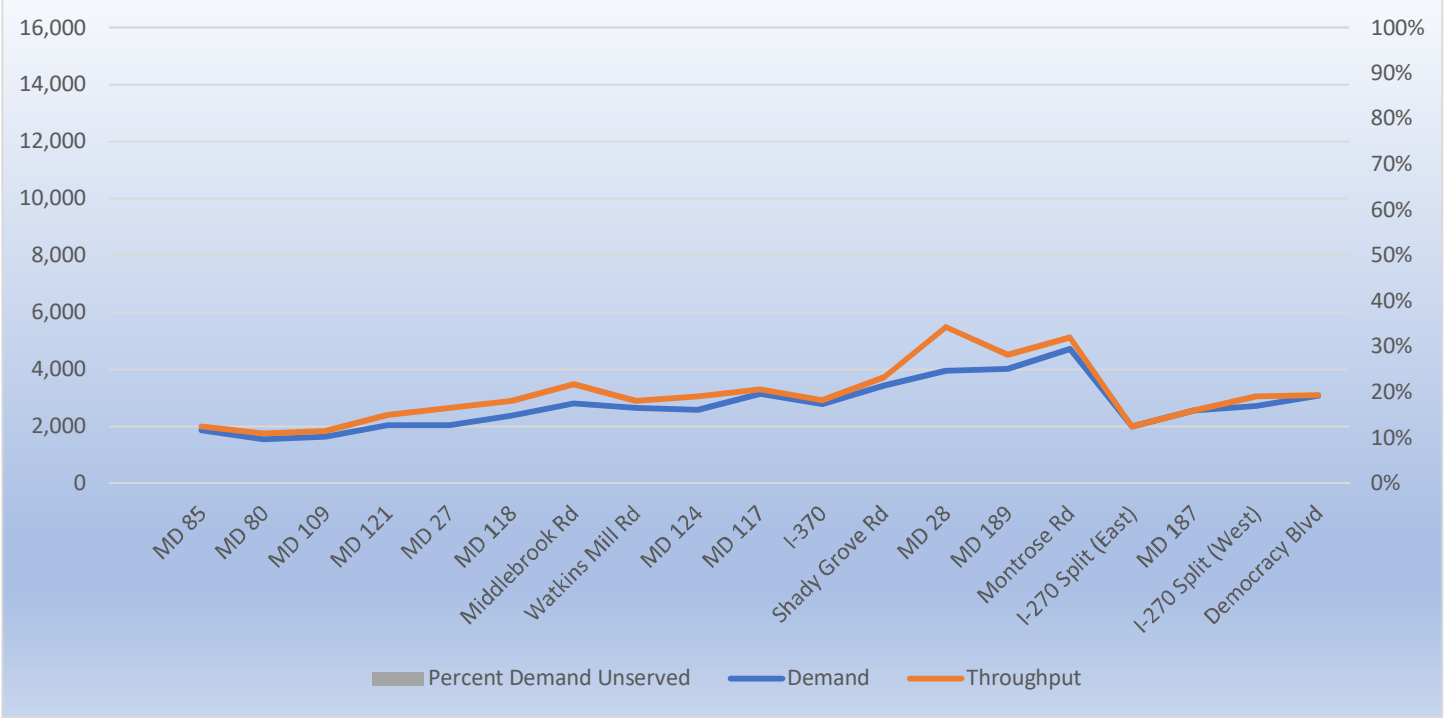


Figure C-5: I-495 2040 No Build 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

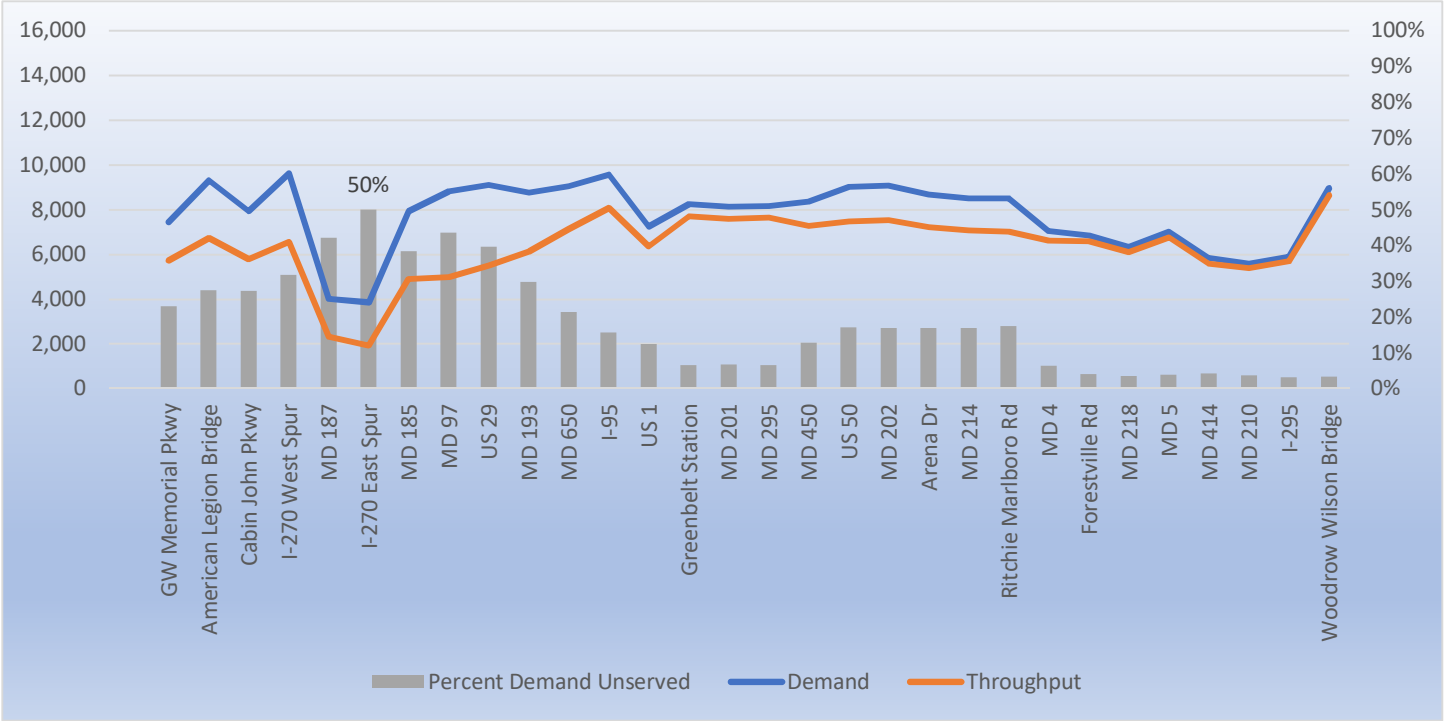


Figure C-6: I-495 2040 No Build 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

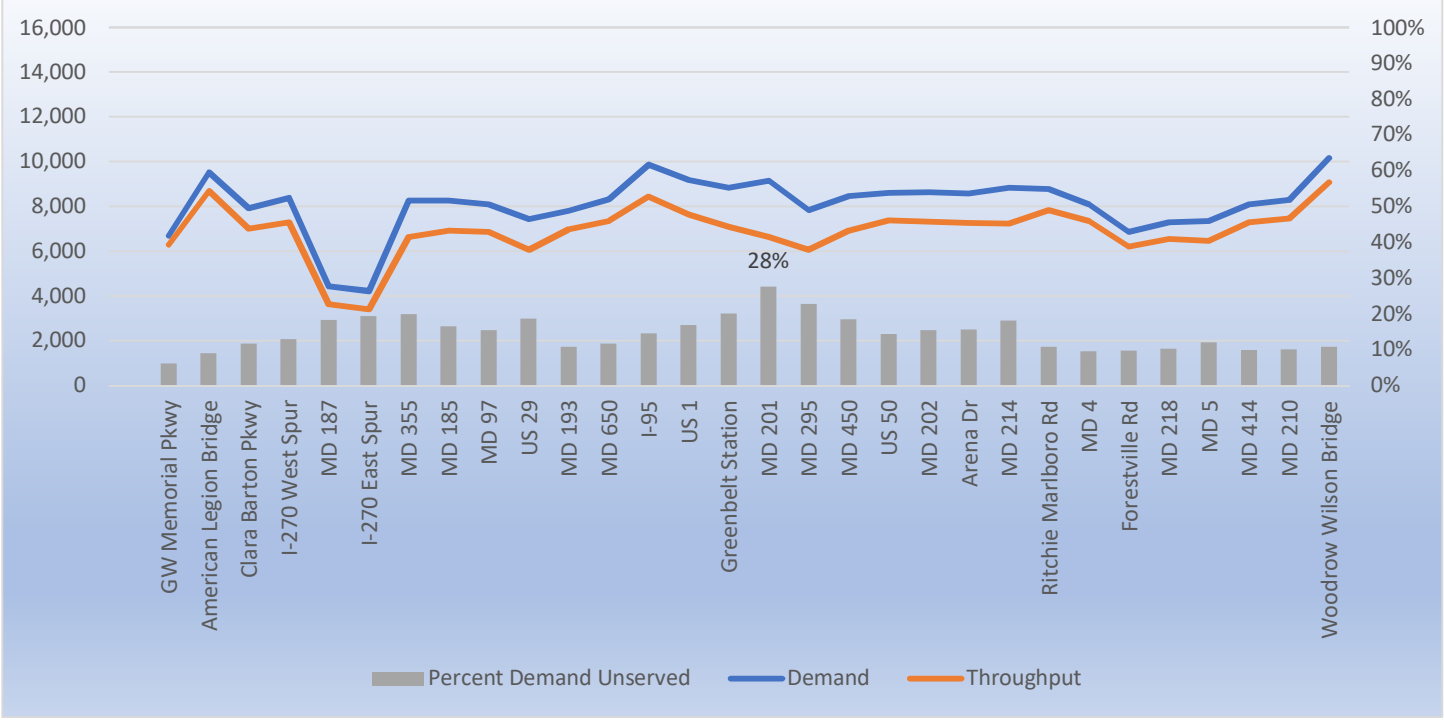


Figure C-7: I-270 2040 No Build 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

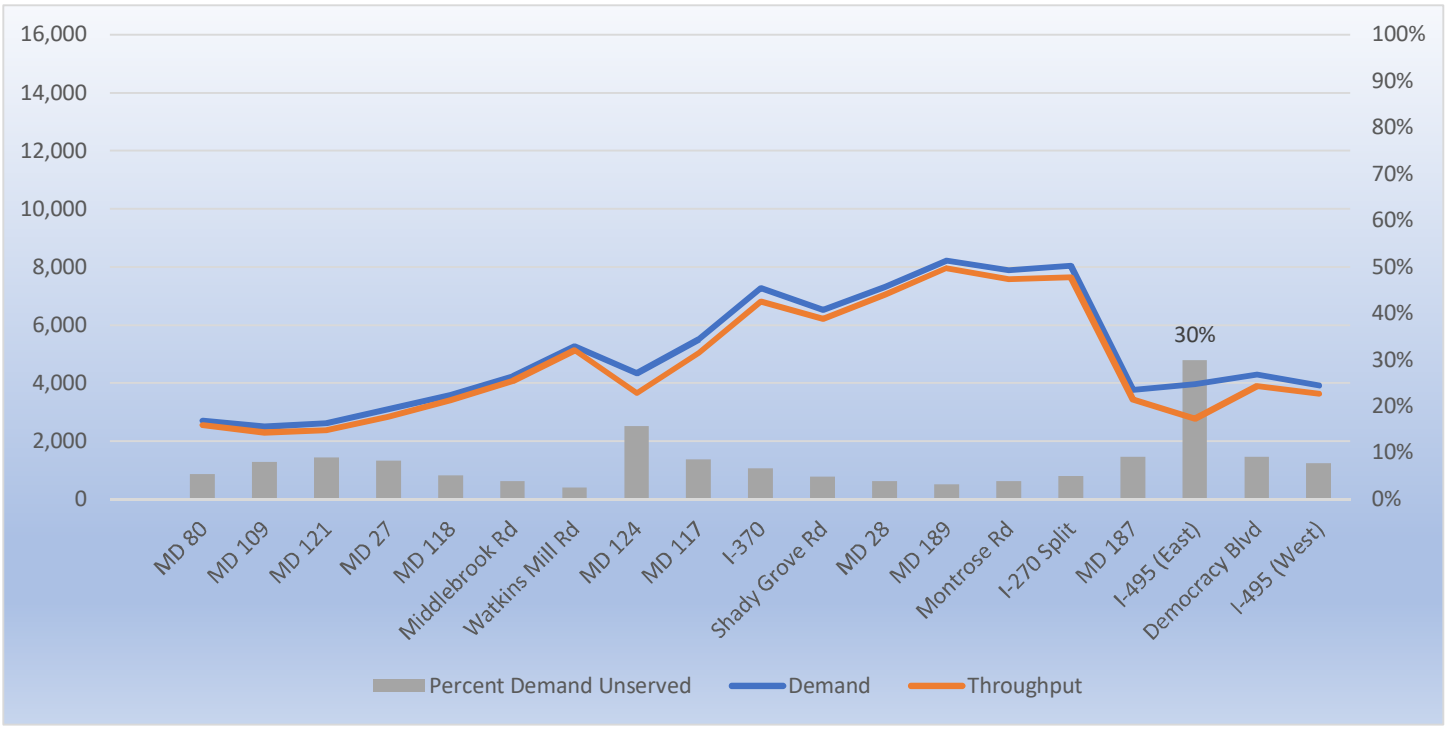


Figure C-8: I-270 2040 No Build 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

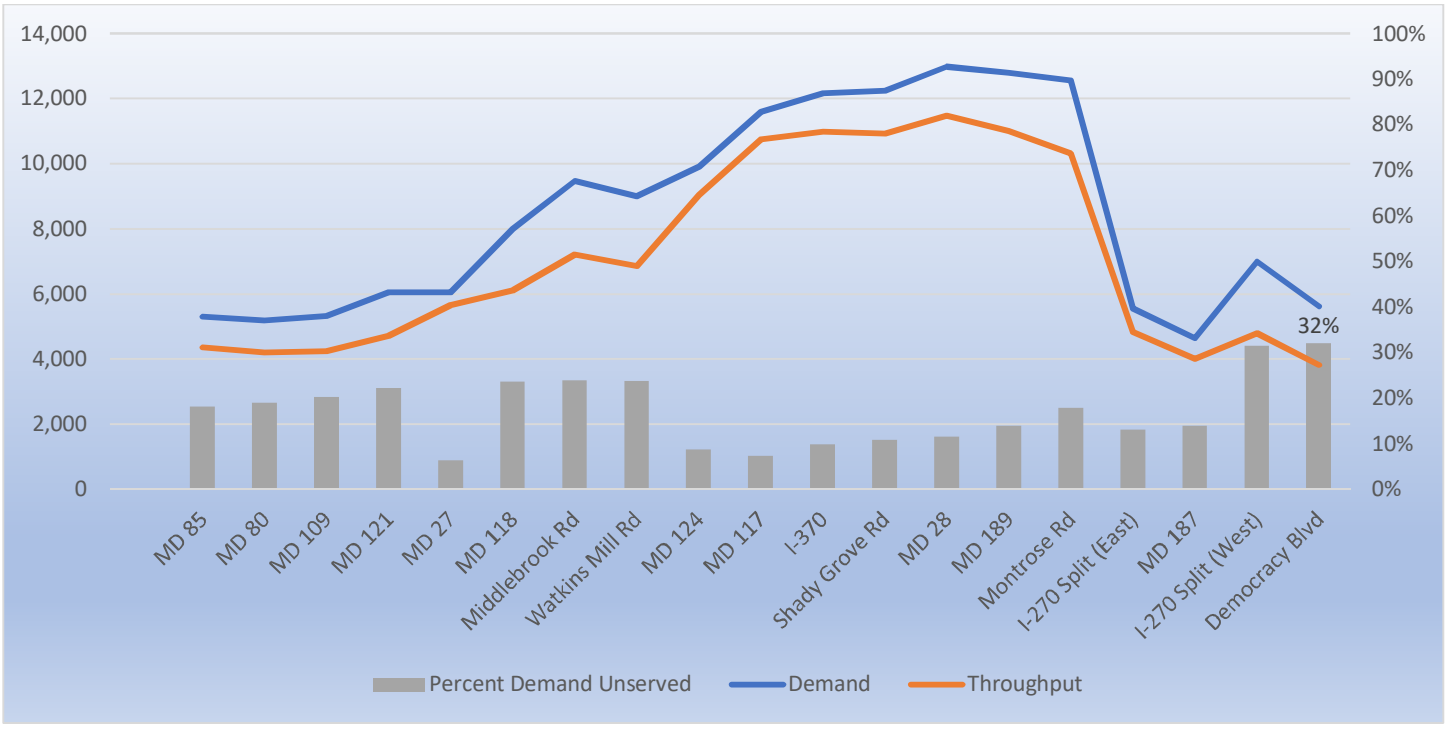


Figure D-1: I-495 2040 Alternative 5 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

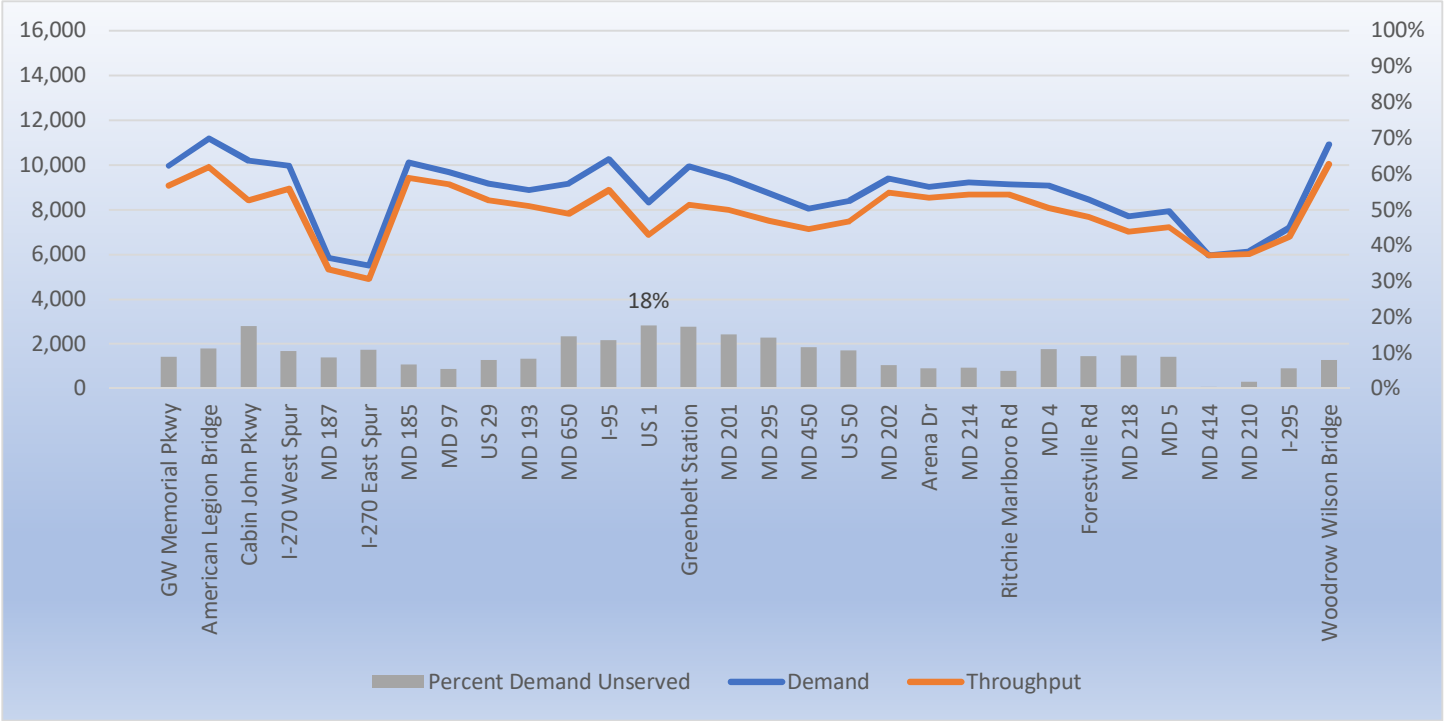


Figure D-2: I-495 2040 Alternative 5 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

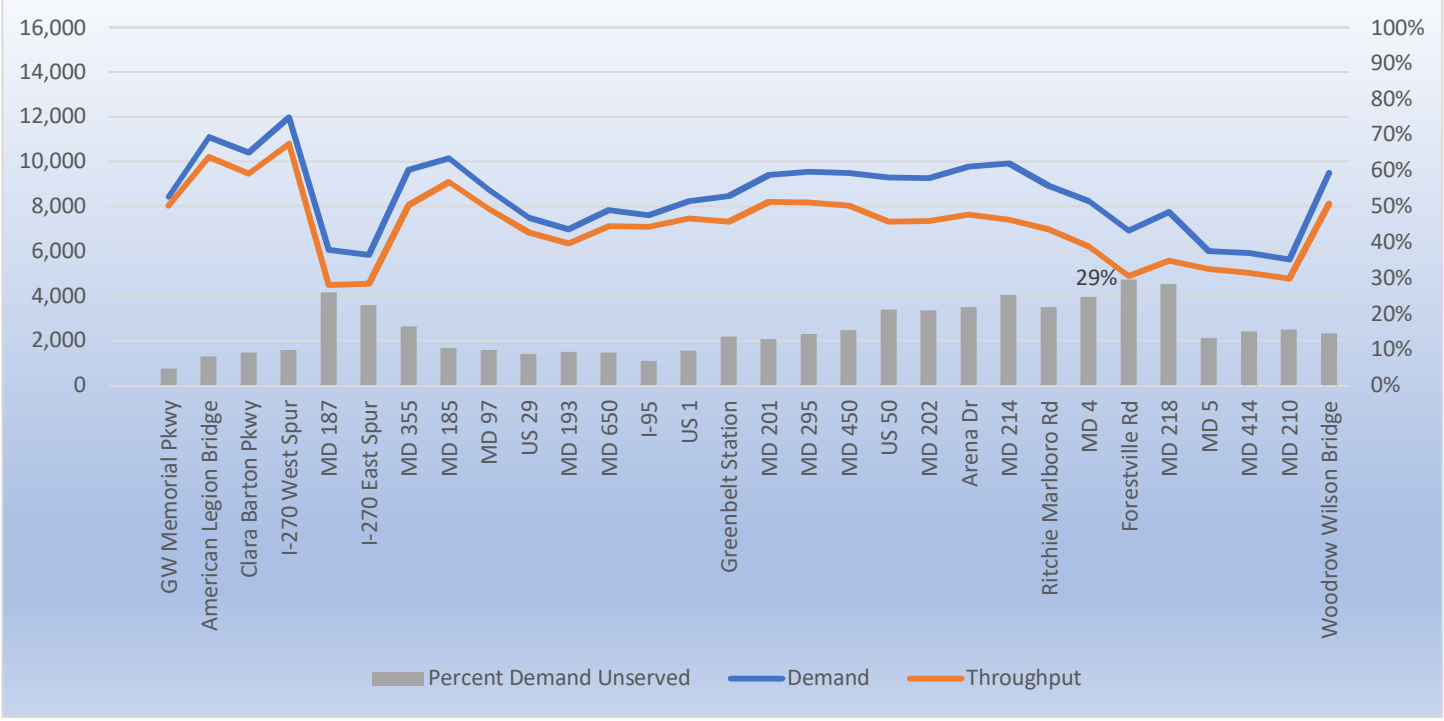


Figure D-3: I-270 2040 Alternative 5 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

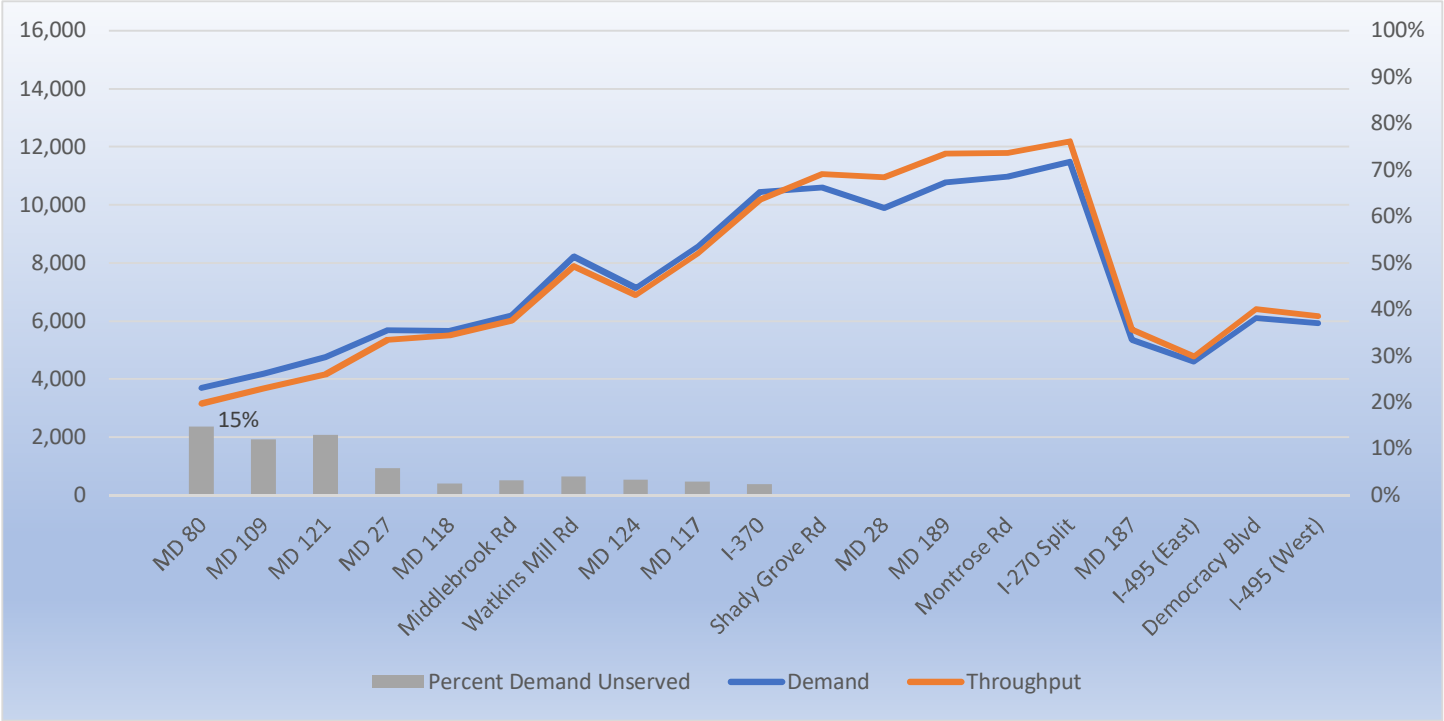


Figure D-4: I-270 2040 Alternative 5 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

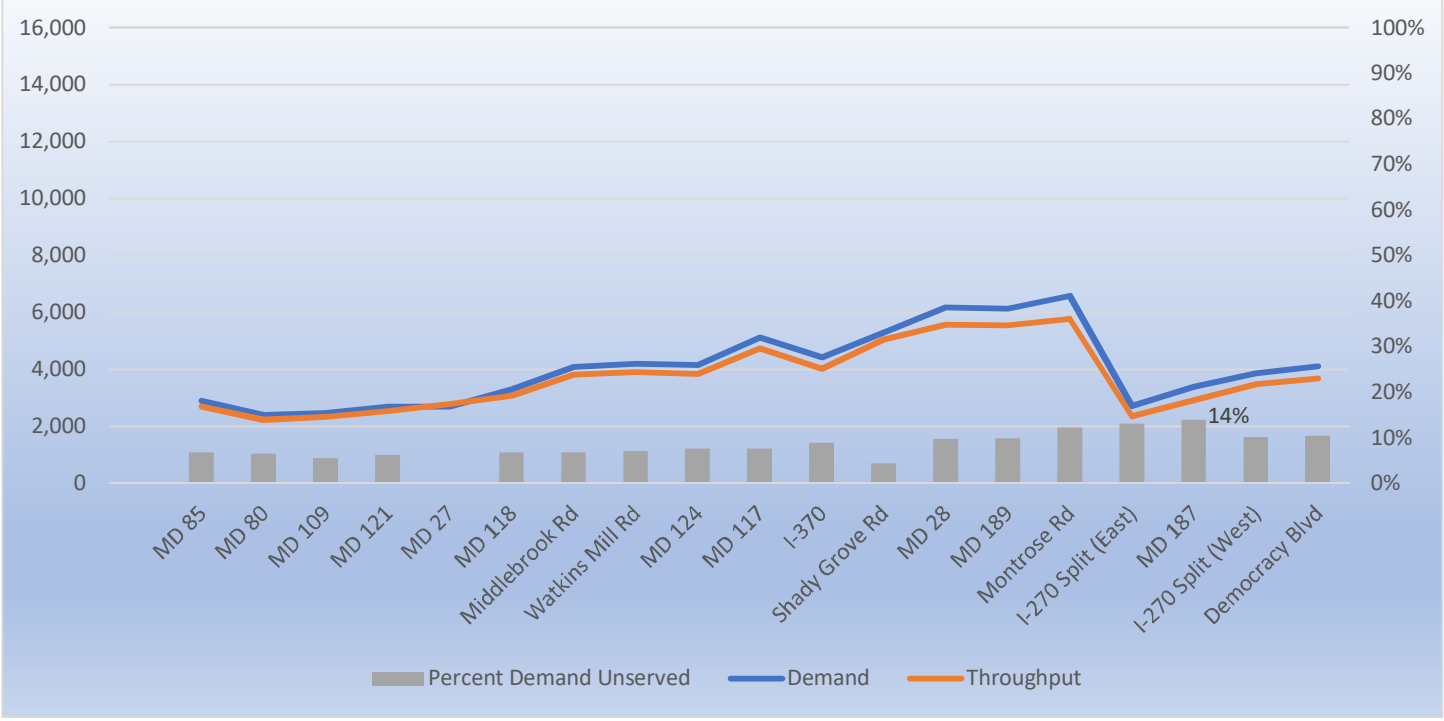


Figure D-5: I-495 2040 Alternative 5 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

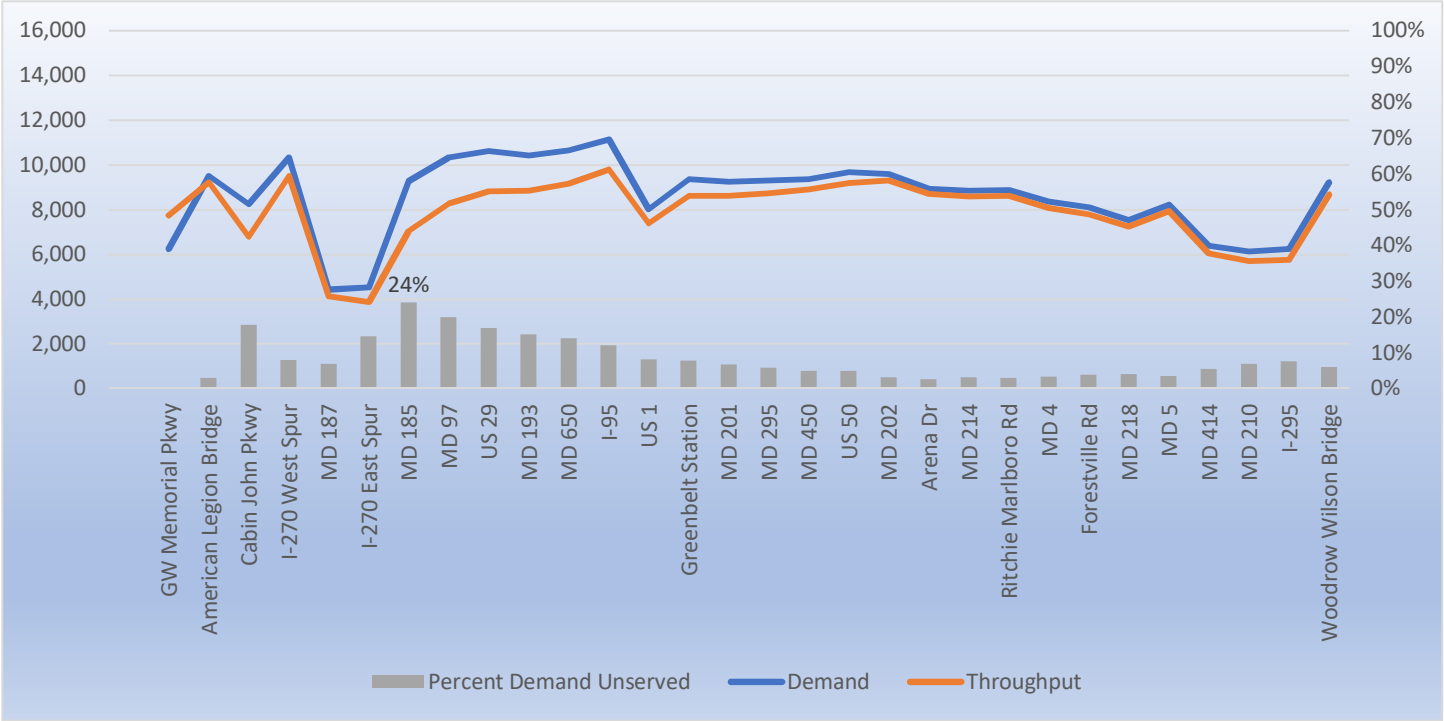


Figure D-6: I-495 2040 Alternative 5 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

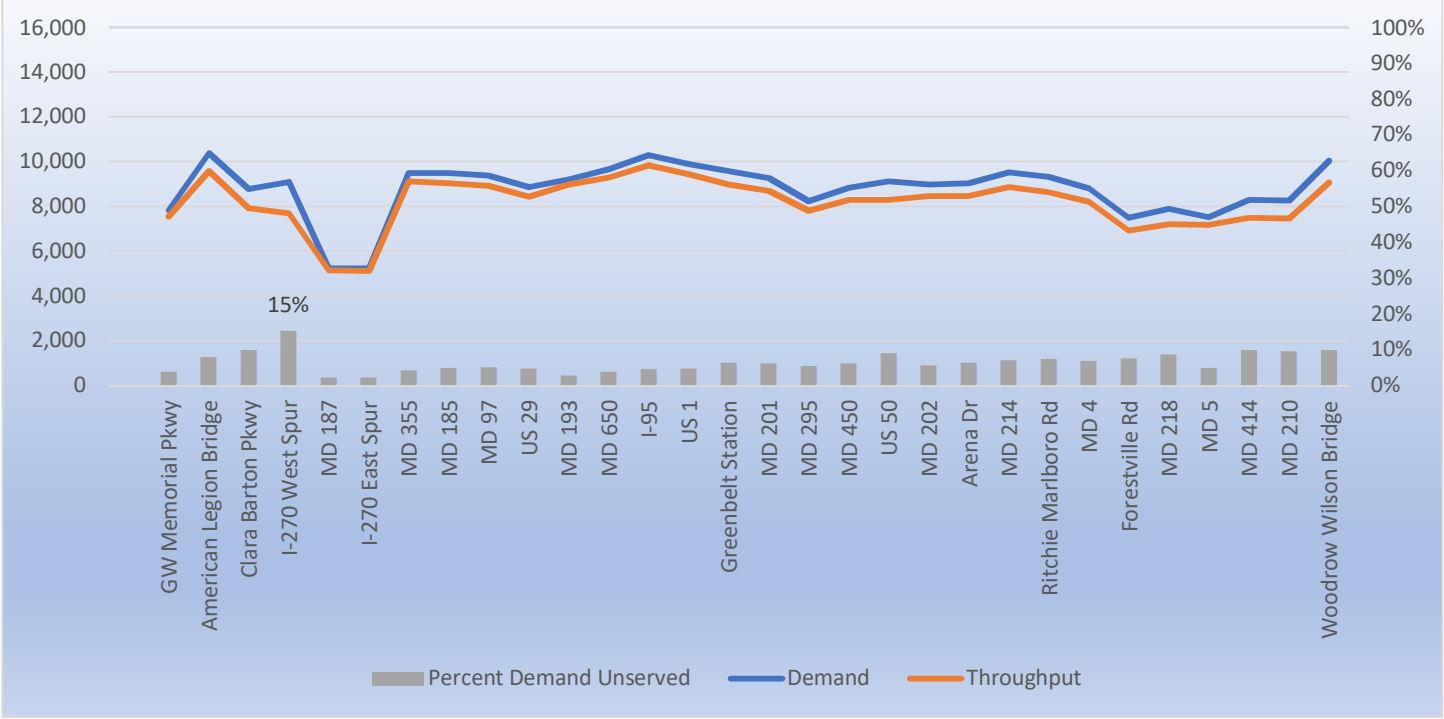


Figure D-7: I-270 2040 Alternative 5 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

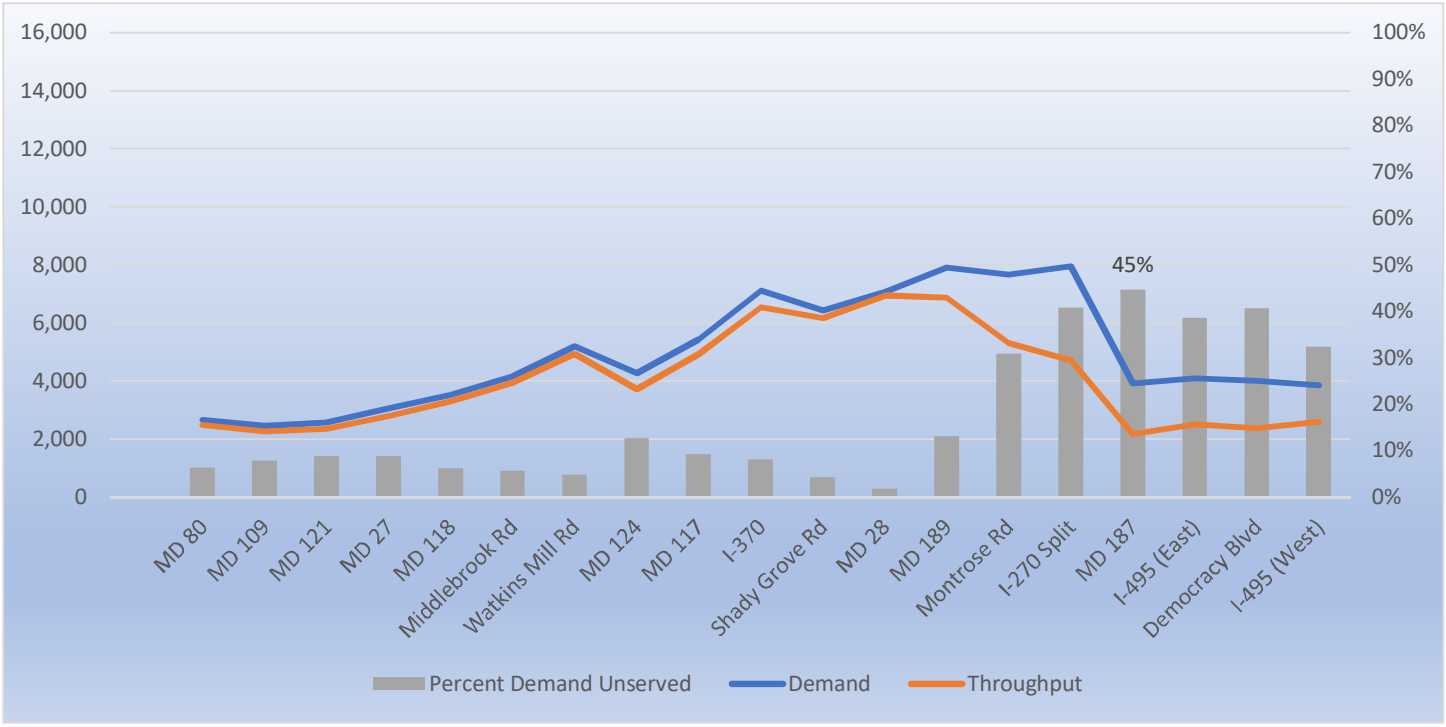


Figure D-8: I-270 2040 Alternative 5 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

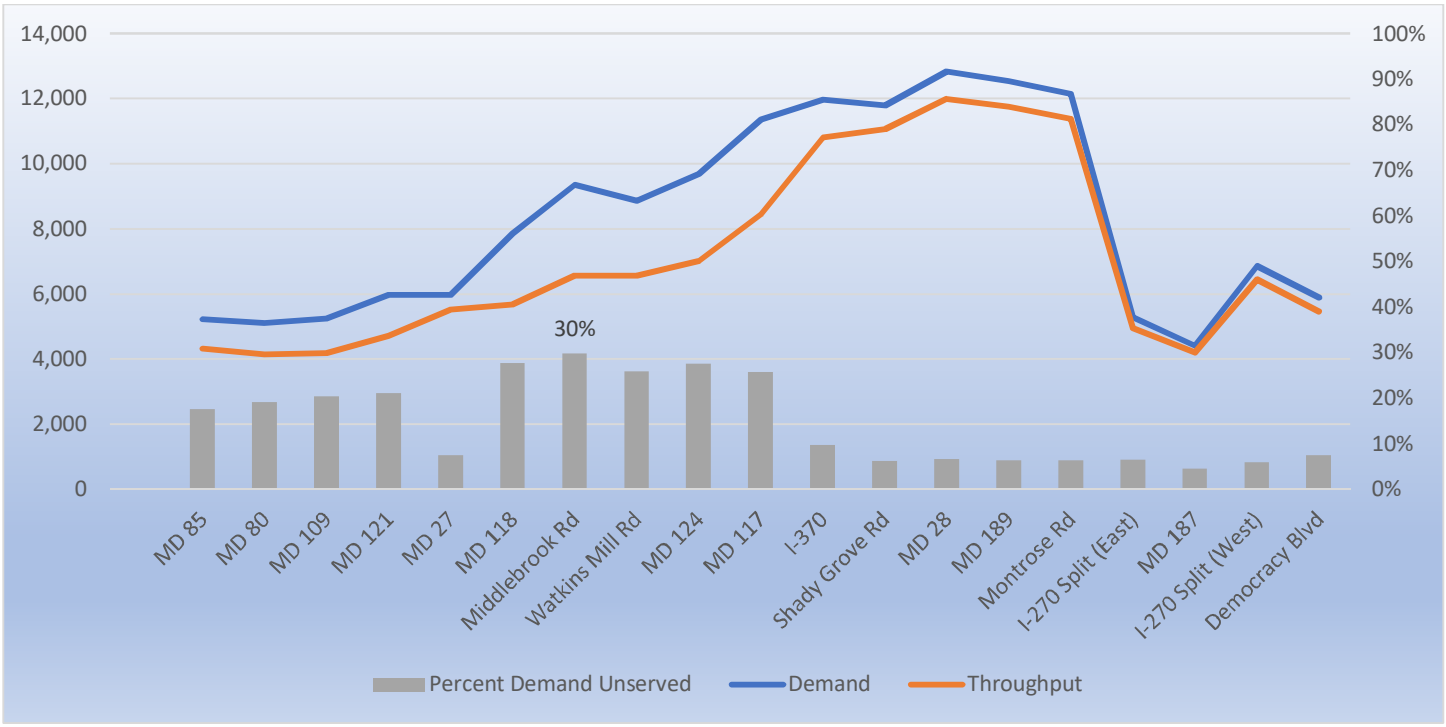


Figure E-1: I-495 2040 Alternative 8 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

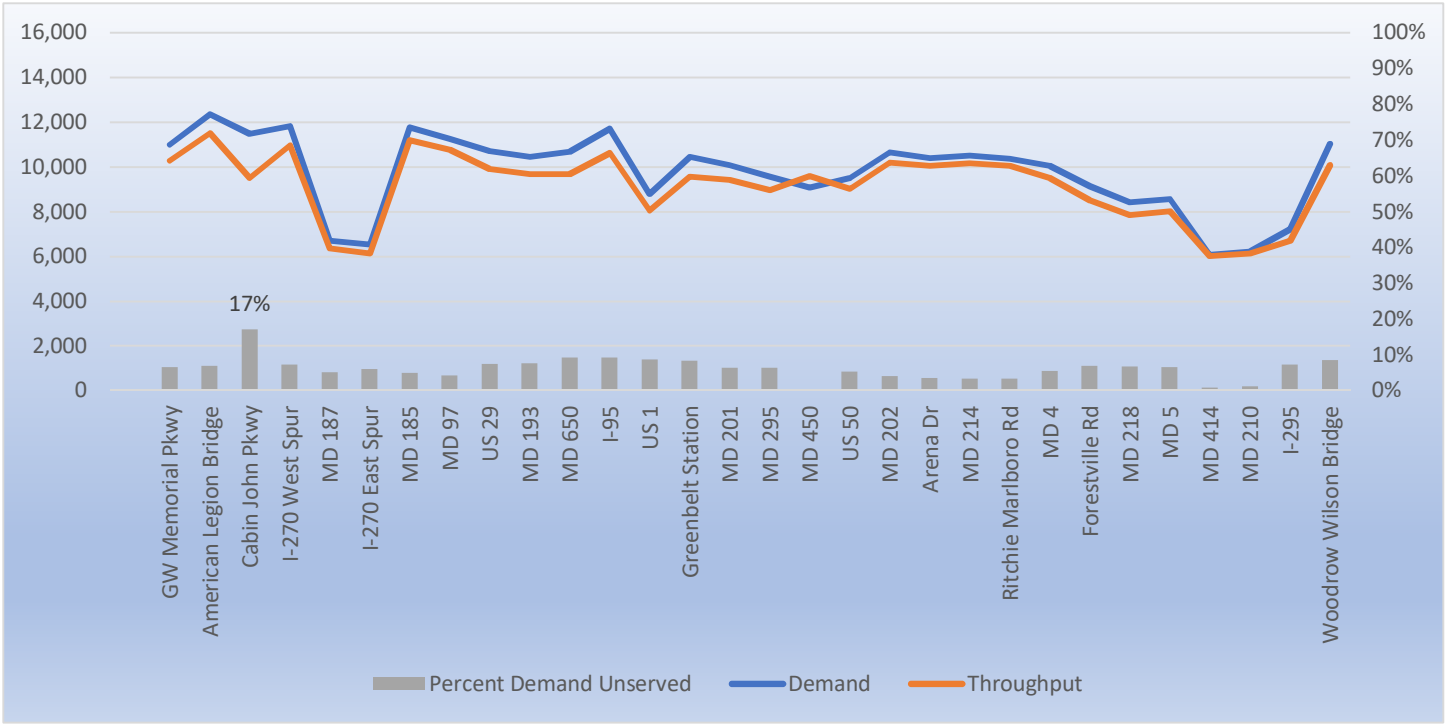


Figure E-2: I-495 2040 Alternative 8 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

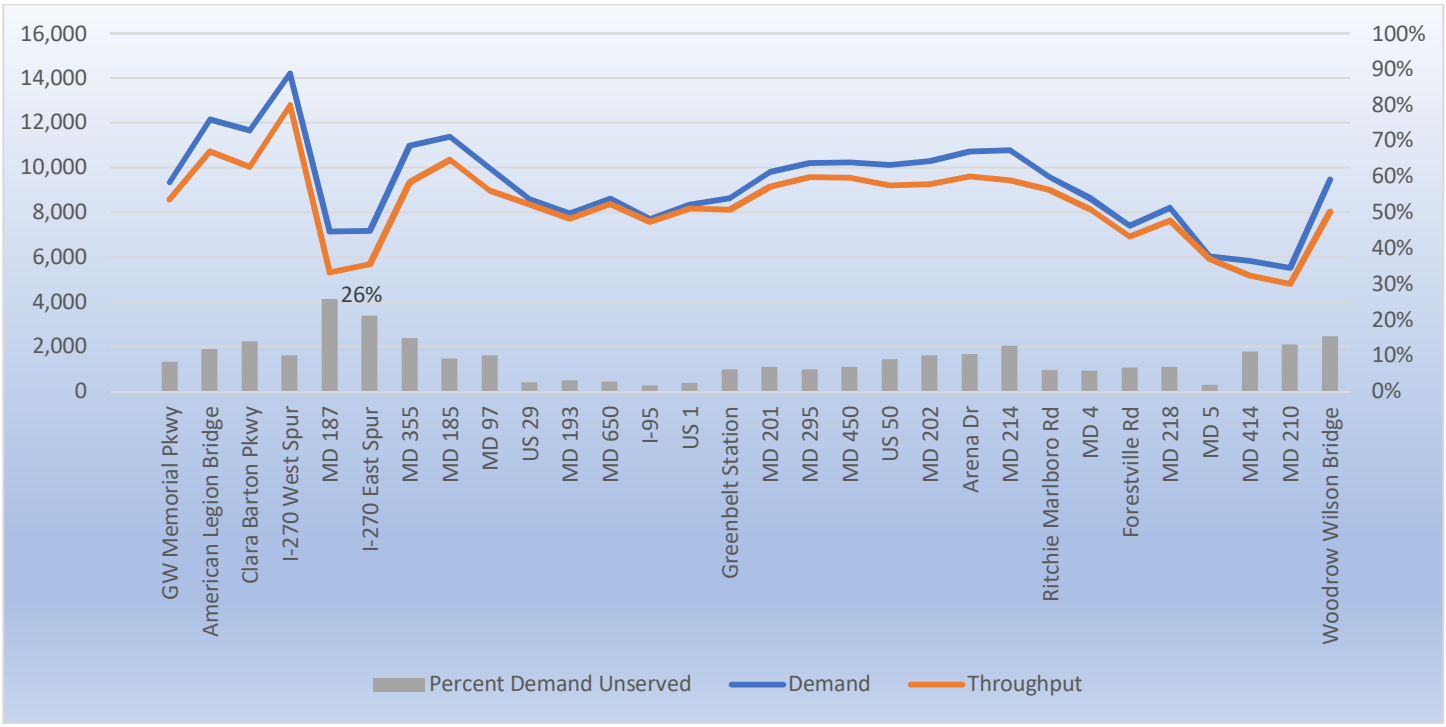


Figure E-3: I-270 2040 Alternative 8 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

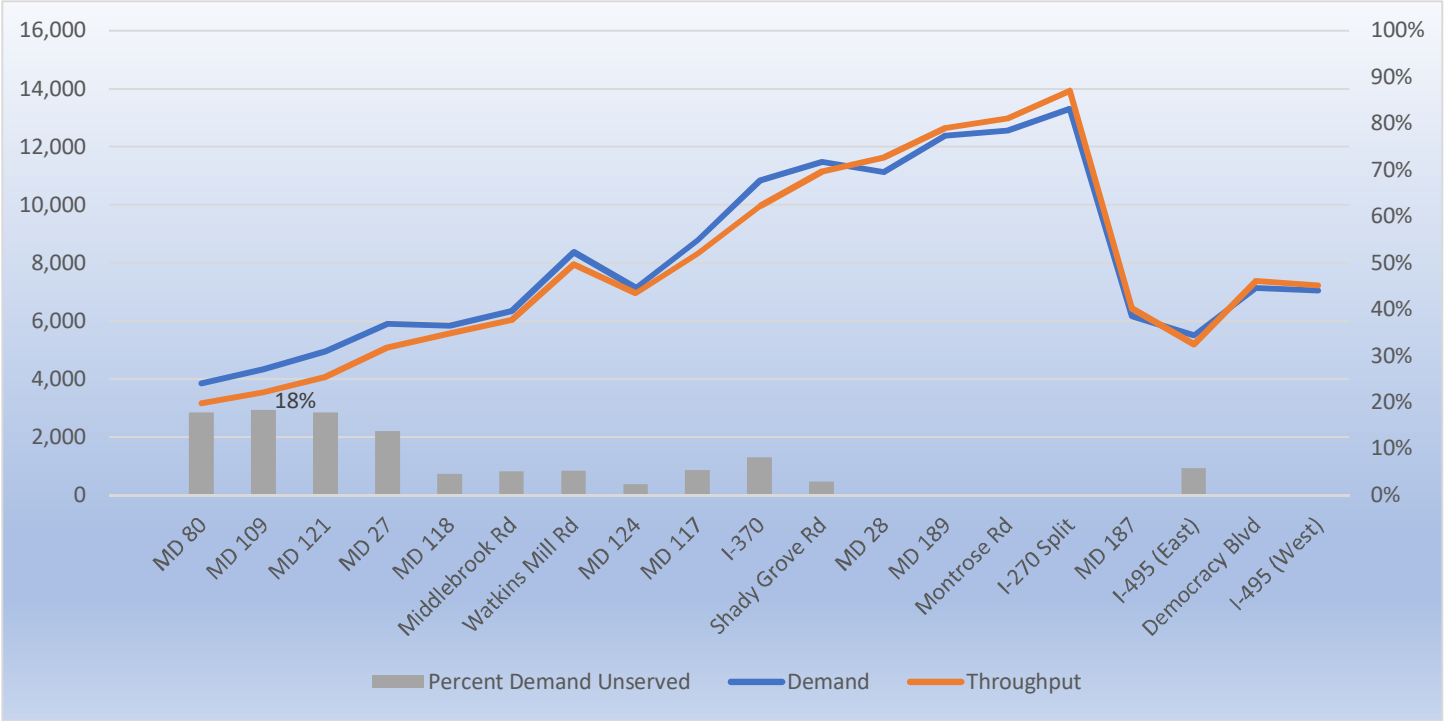


Figure E-4: I-270 2040 Alternative 8 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

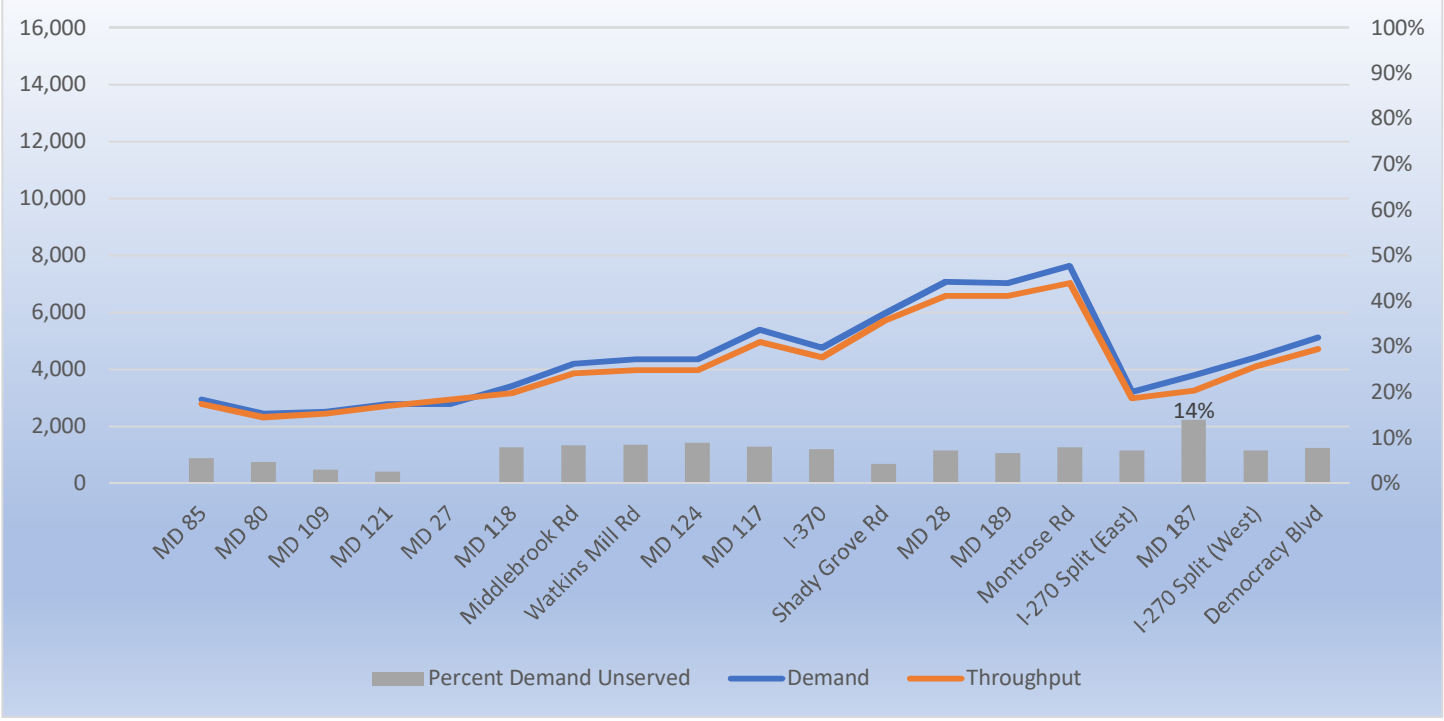


Figure E-5: I-495 2040 Alternative 8 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

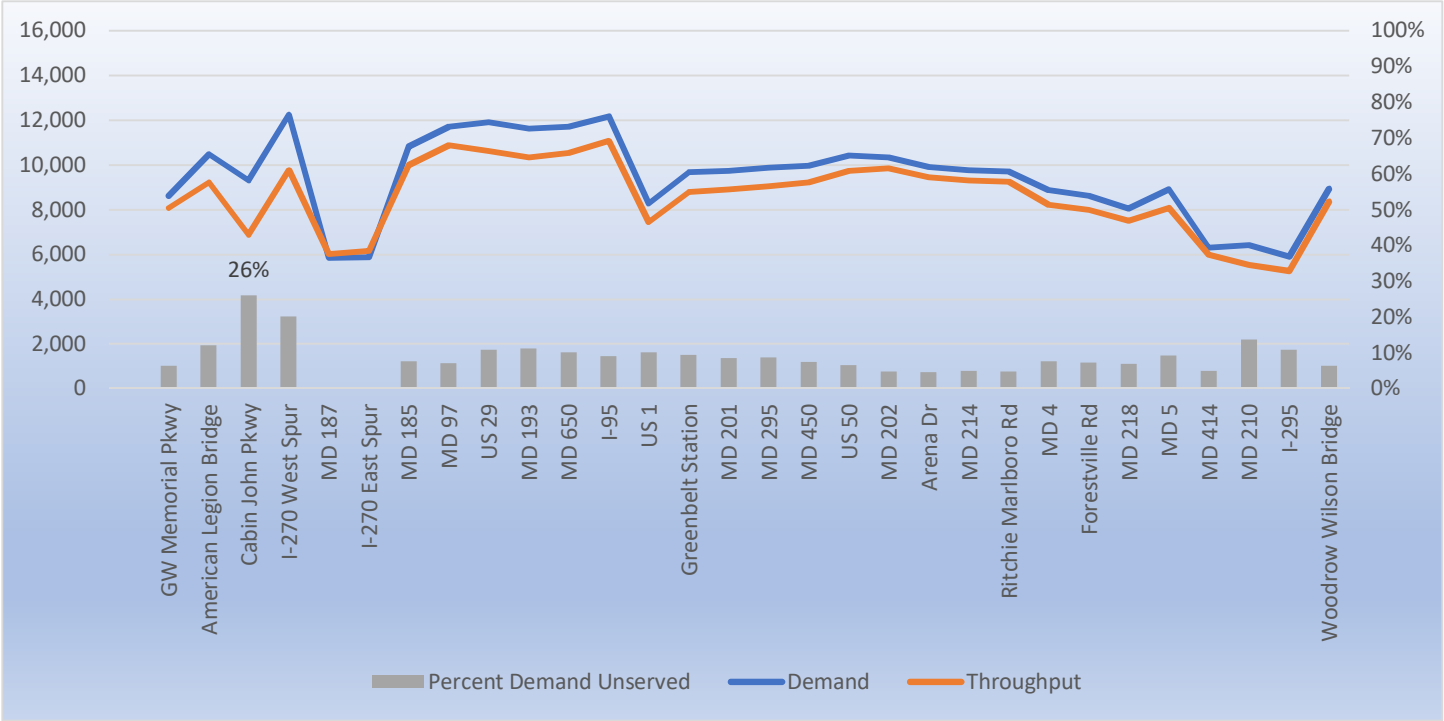


Figure E-6: I-495 2040 Alternative 8 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

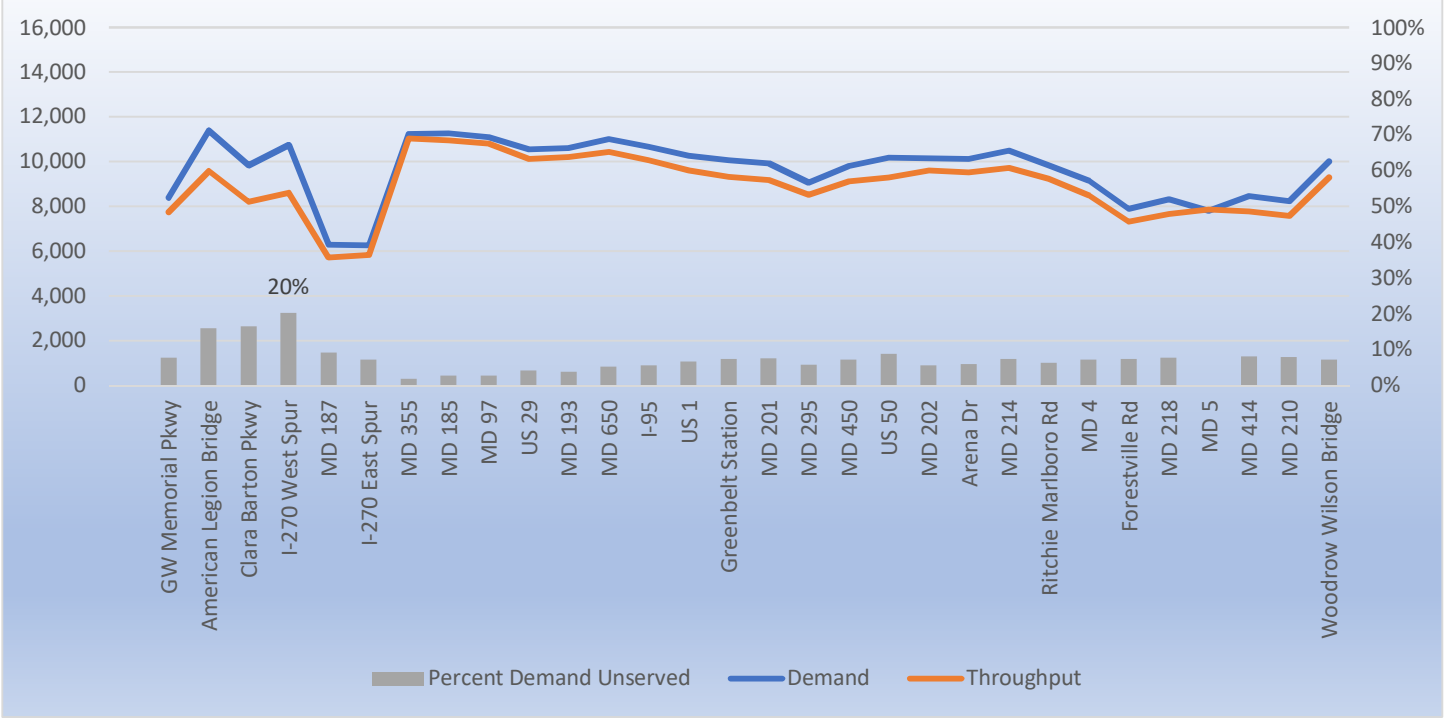


Figure E-7: I-270 2040 Alternative 8 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

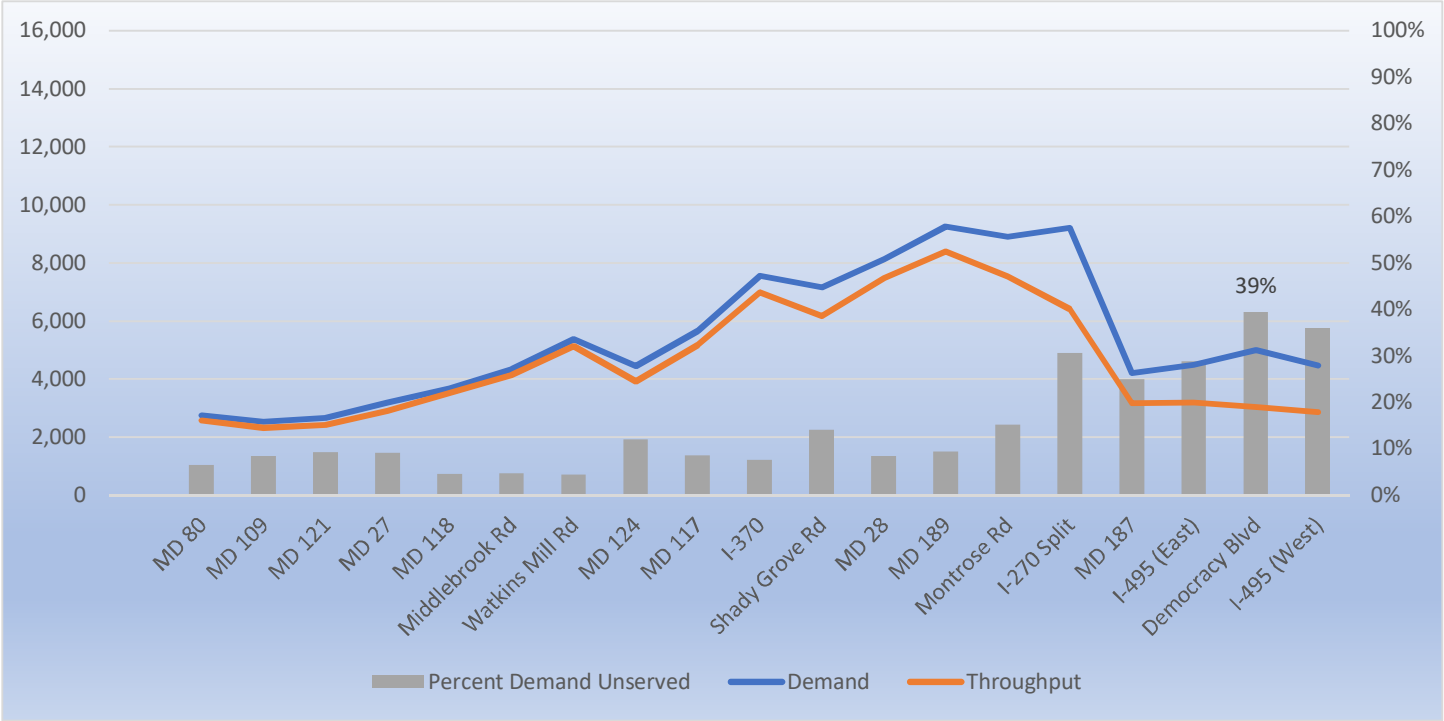


Figure E-8: I-270 2040 Alternative 8 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

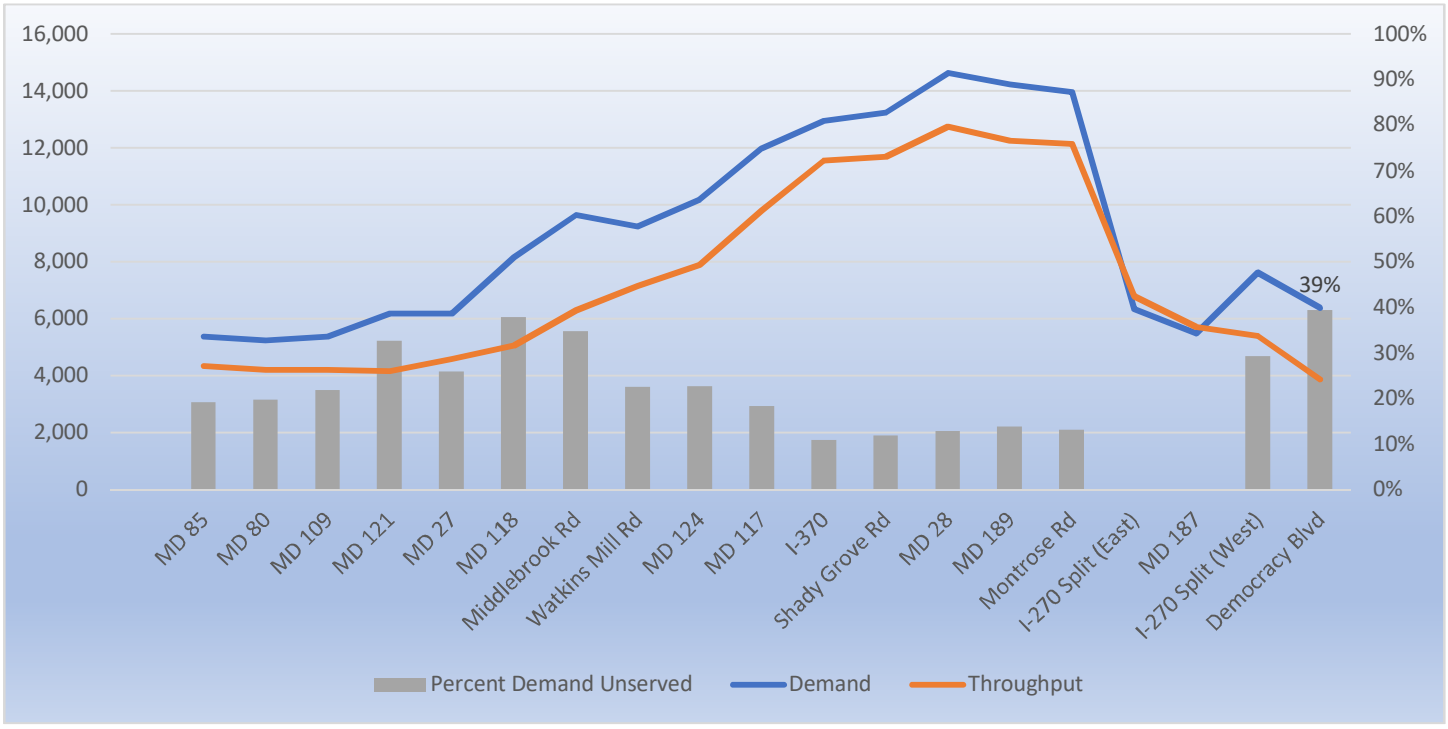


Figure F-1: I-495 2040 Alternative 9 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

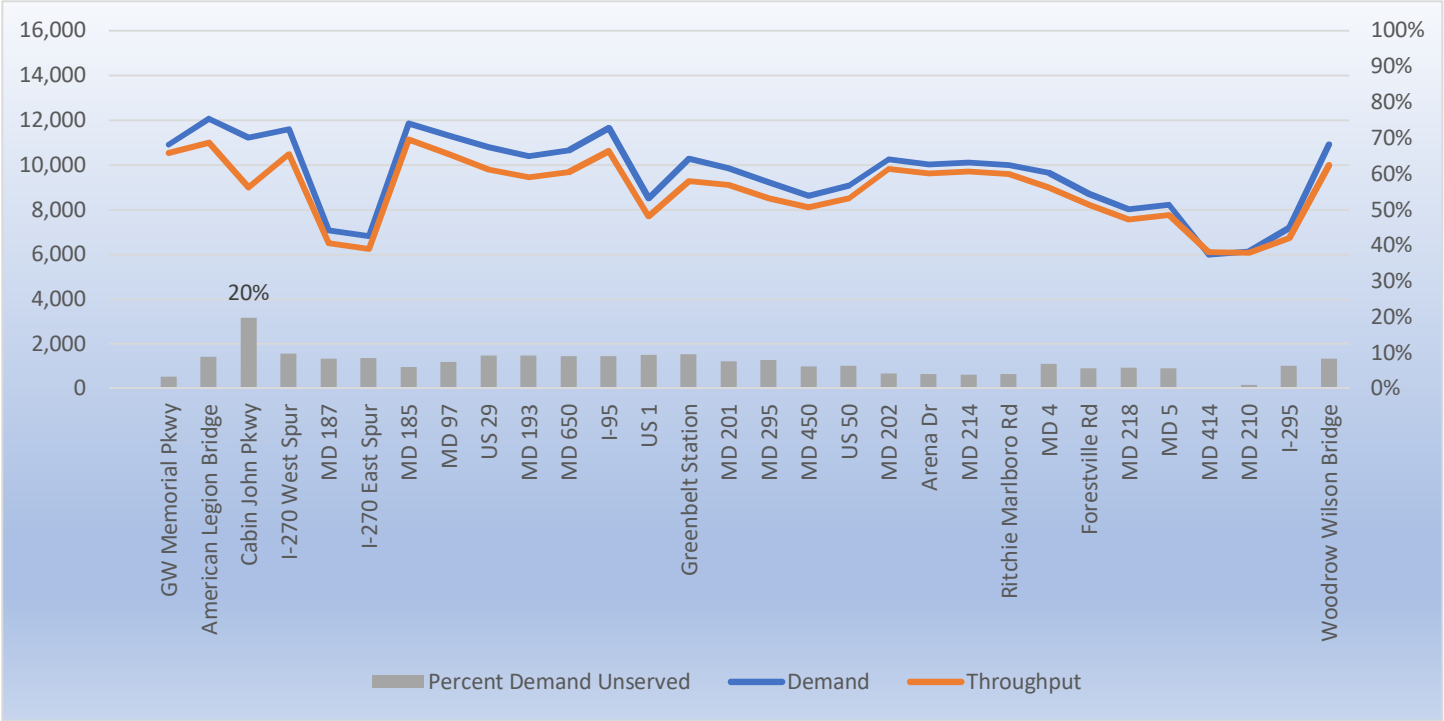


Figure F-2: I-495 2040 Alternative 9 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

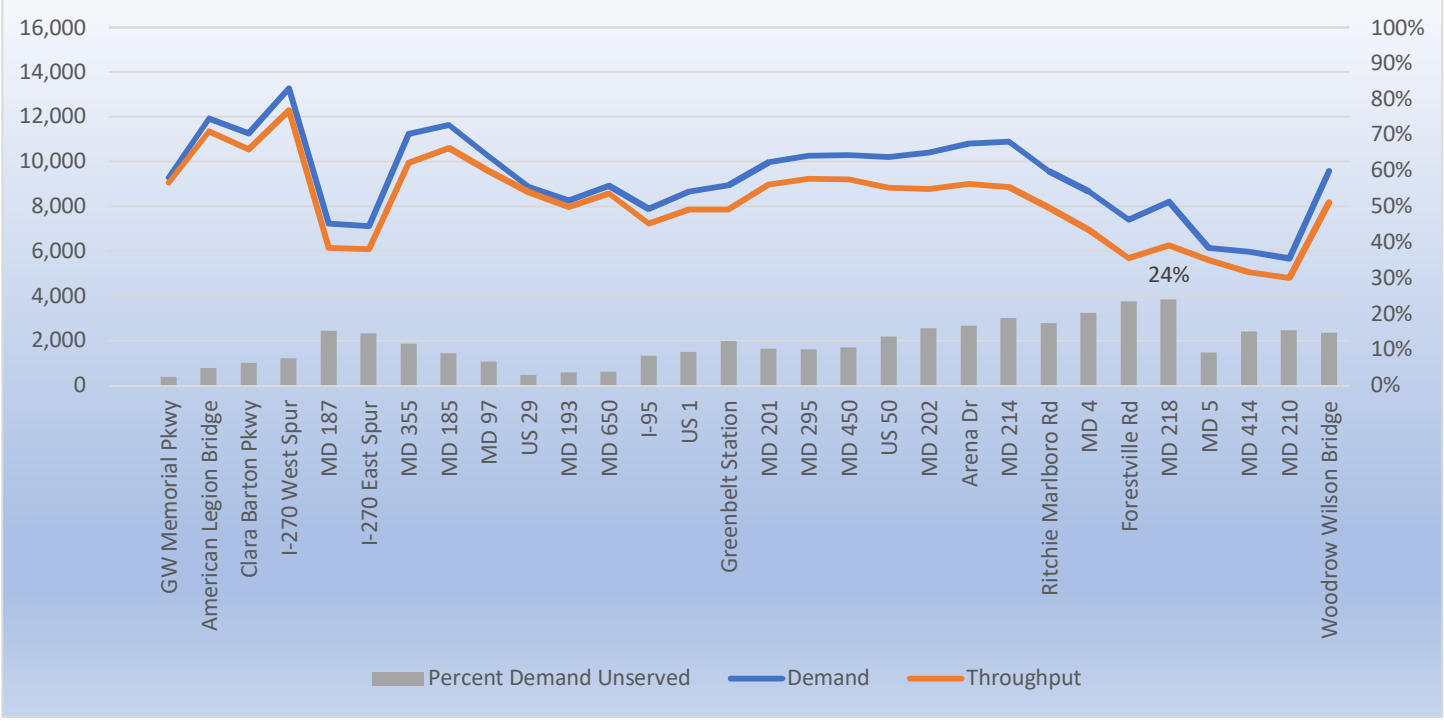


Figure F-3: I-270 2040 Alternative 9 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

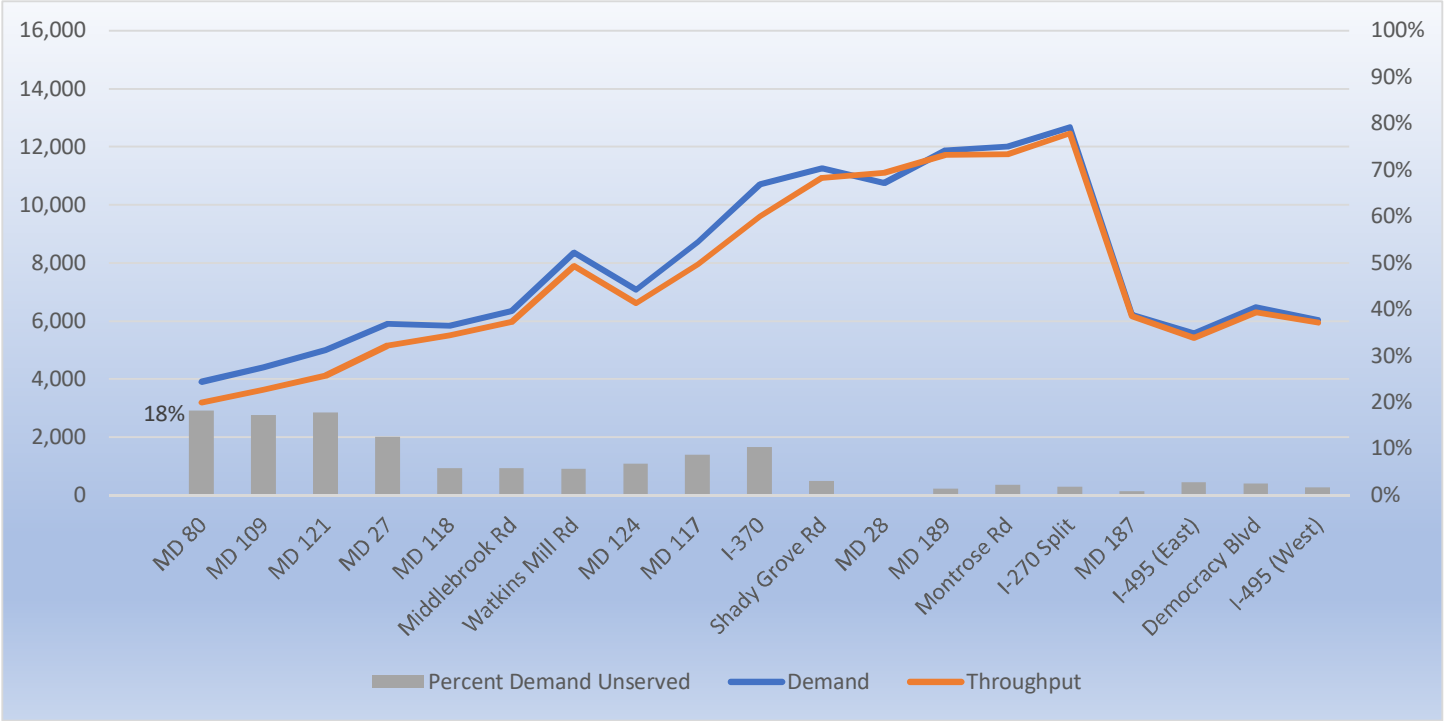


Figure F-4: I-270 2040 Alternative 9 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

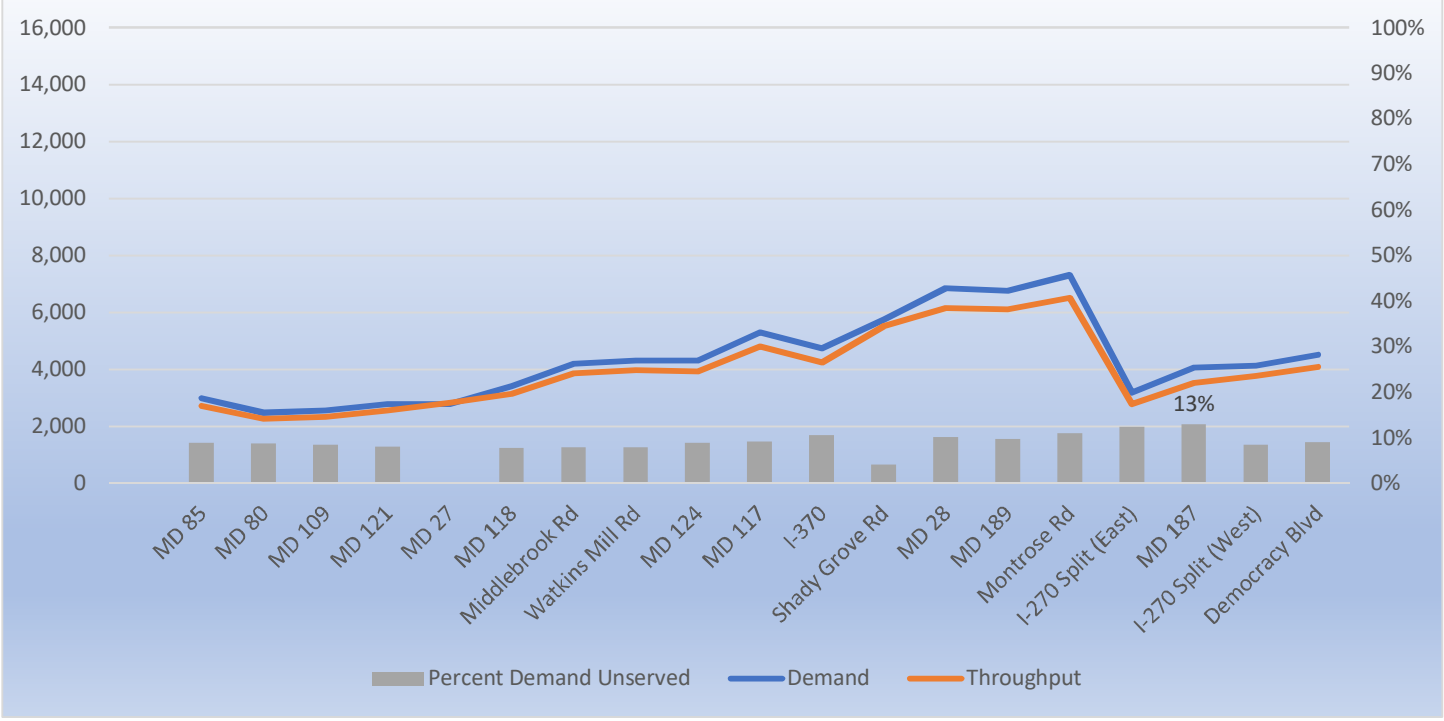


Figure F-5: I-495 2040 Alternative 9 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

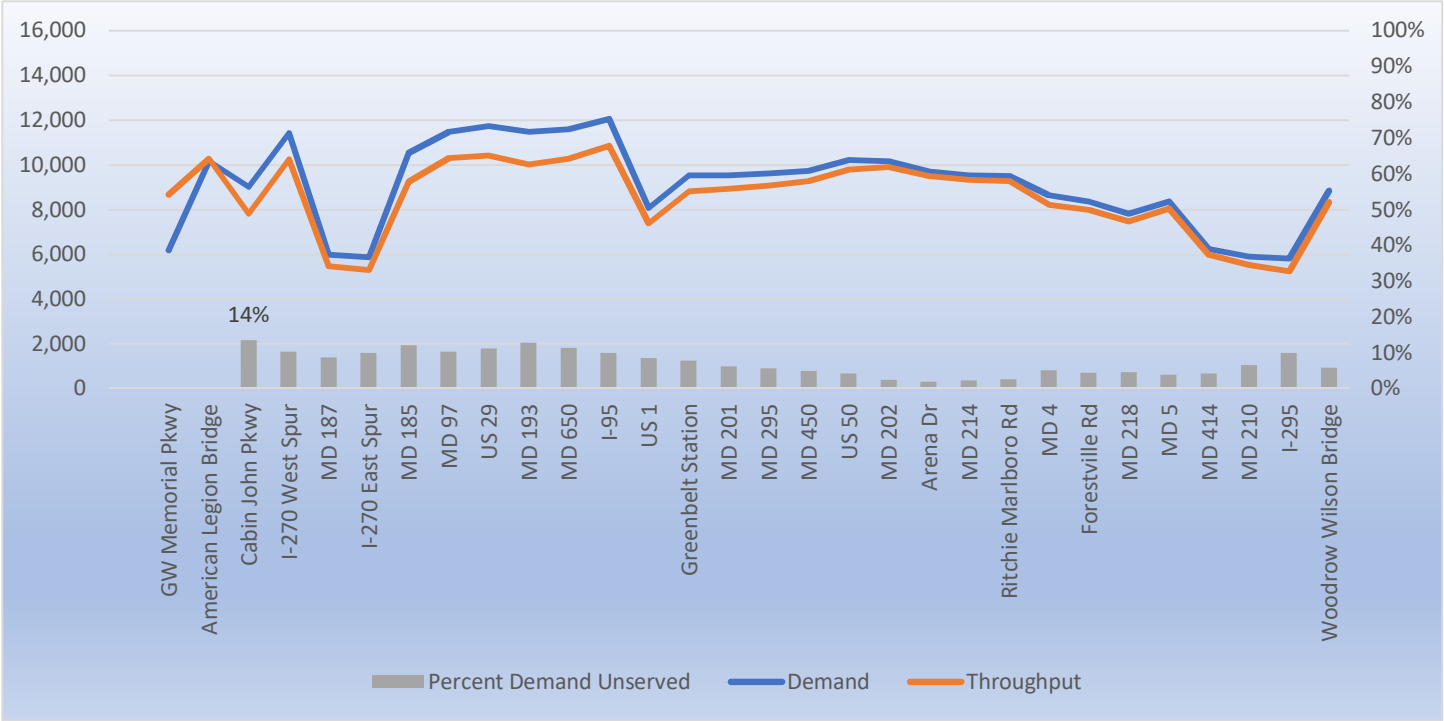


Figure F-6: I-495 2040 Alternative 9 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

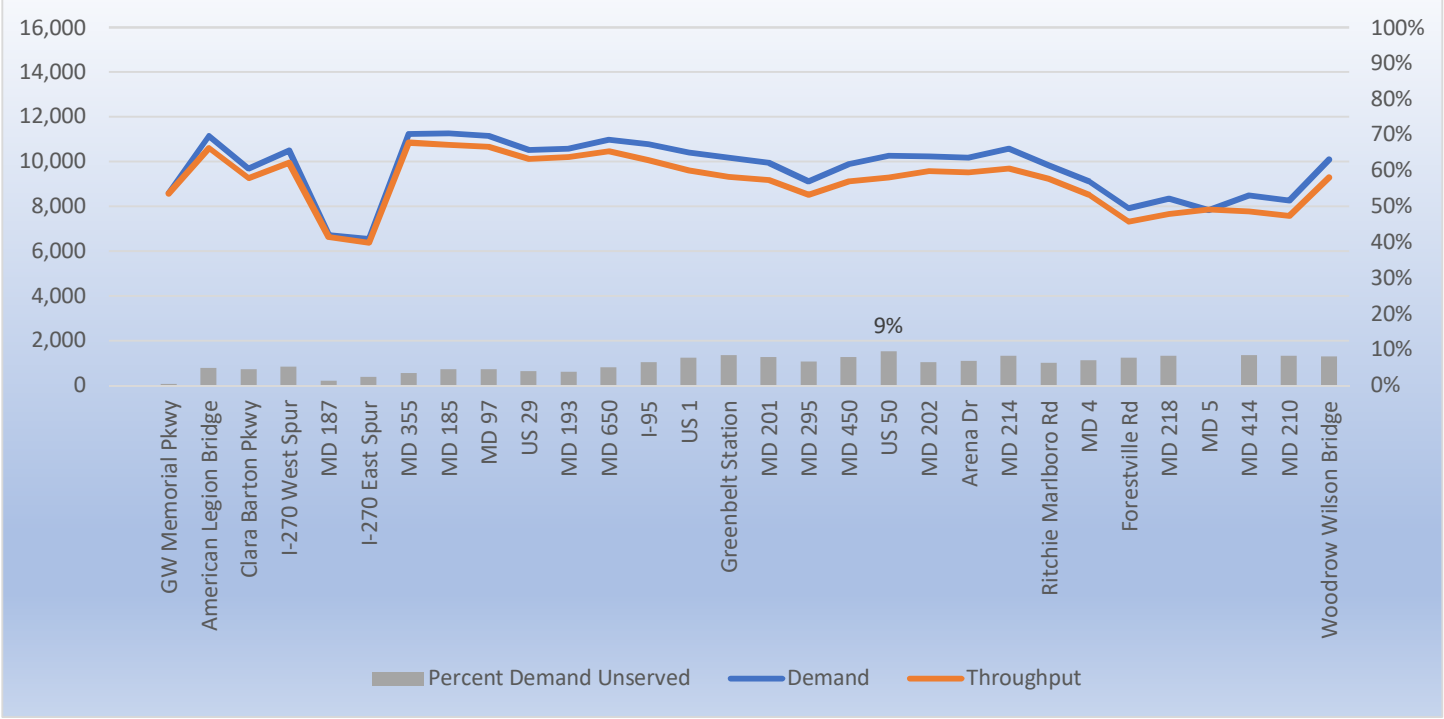


Figure F-7: I-270 2040 Alternative 9 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

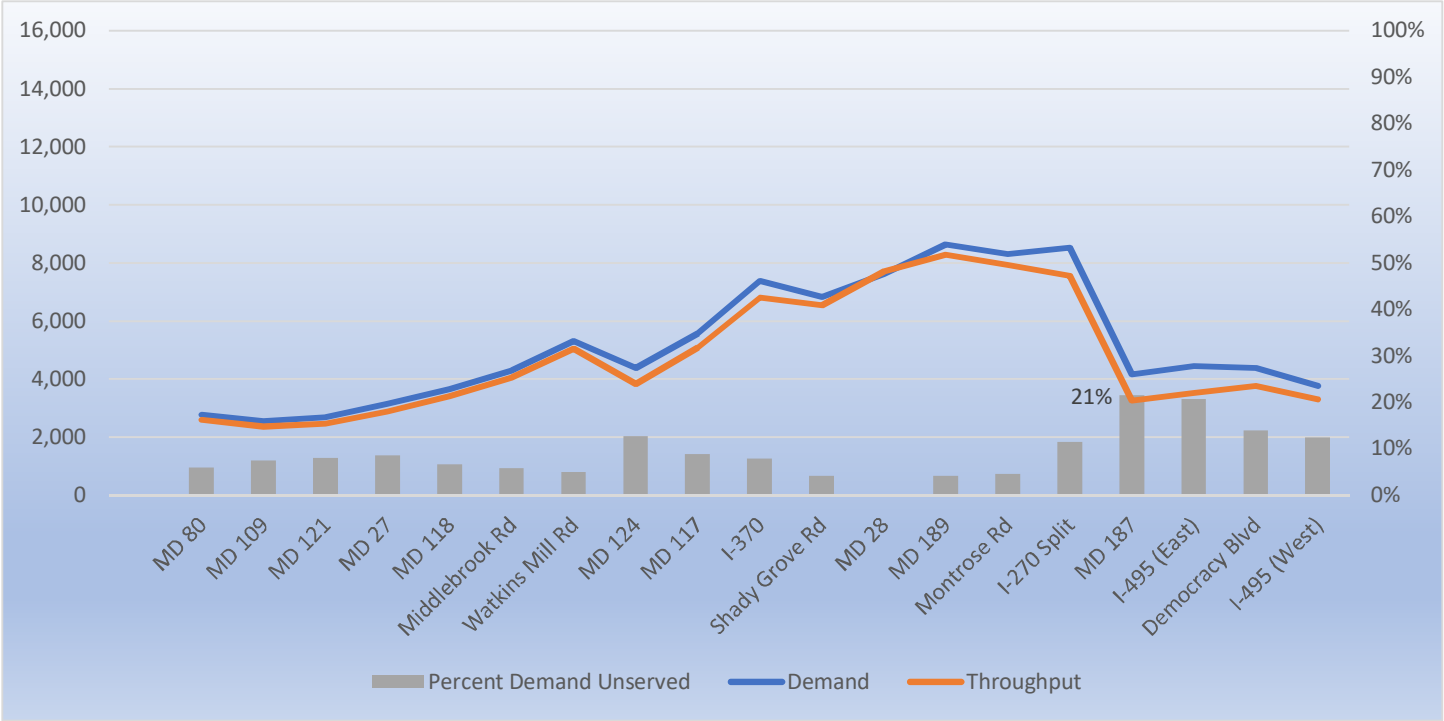


Figure F-8: I-270 2040 Alternative 9 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

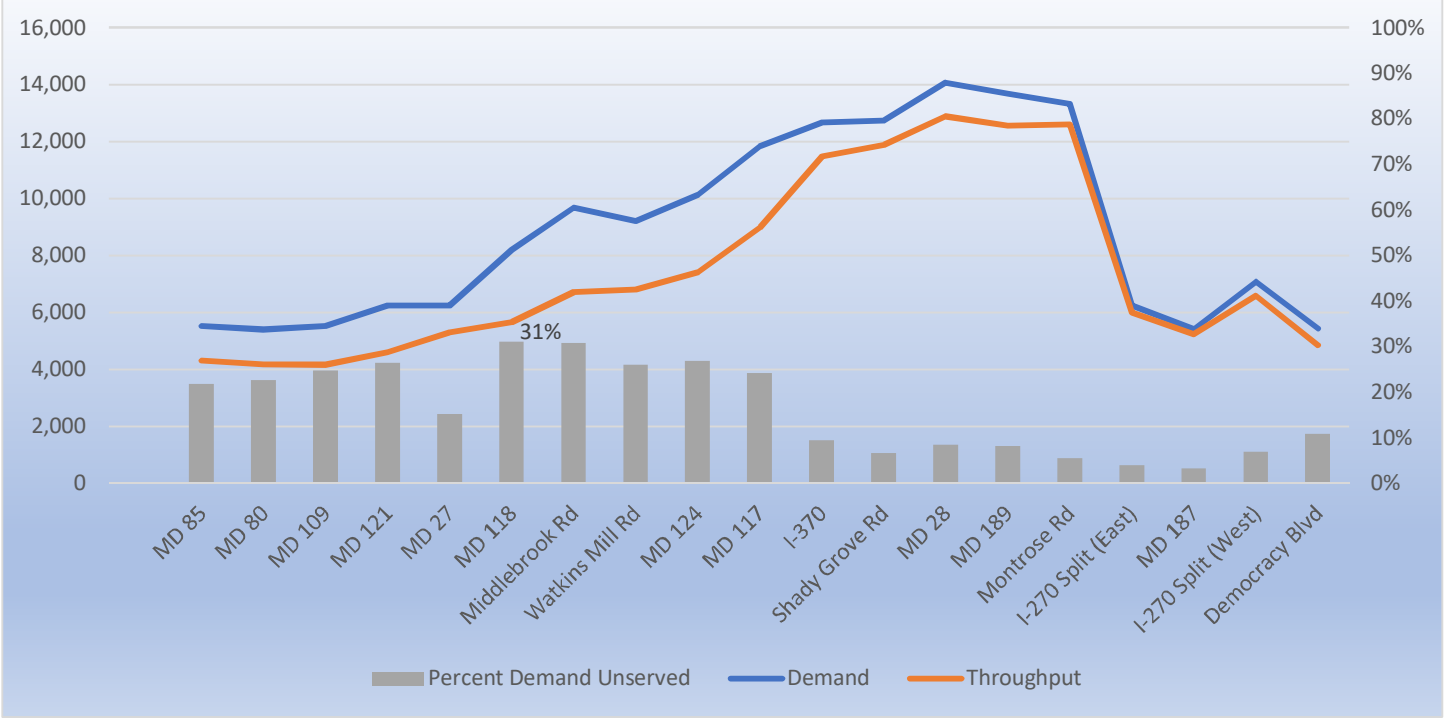


Figure G-1: I-495 2040 Alternative 10 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

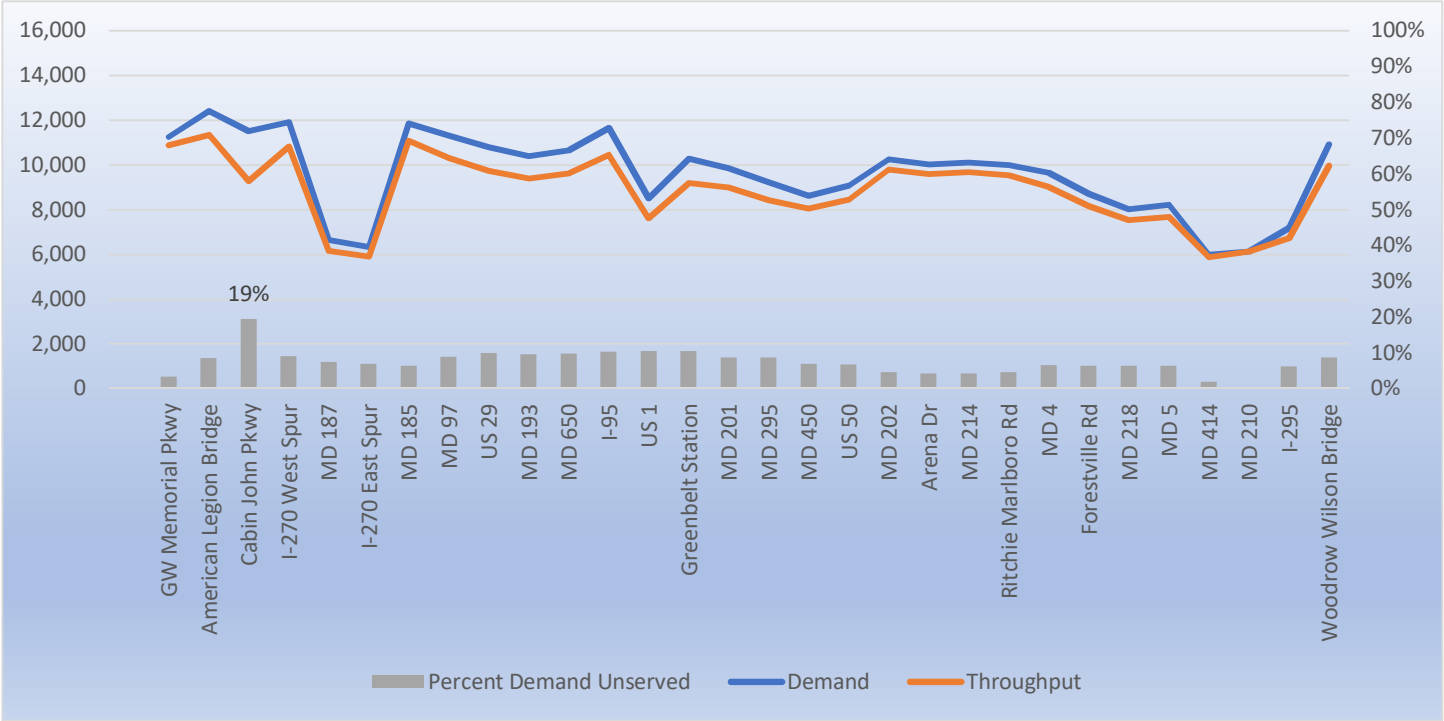


Figure G-2: I-495 2040 Alternative 10 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

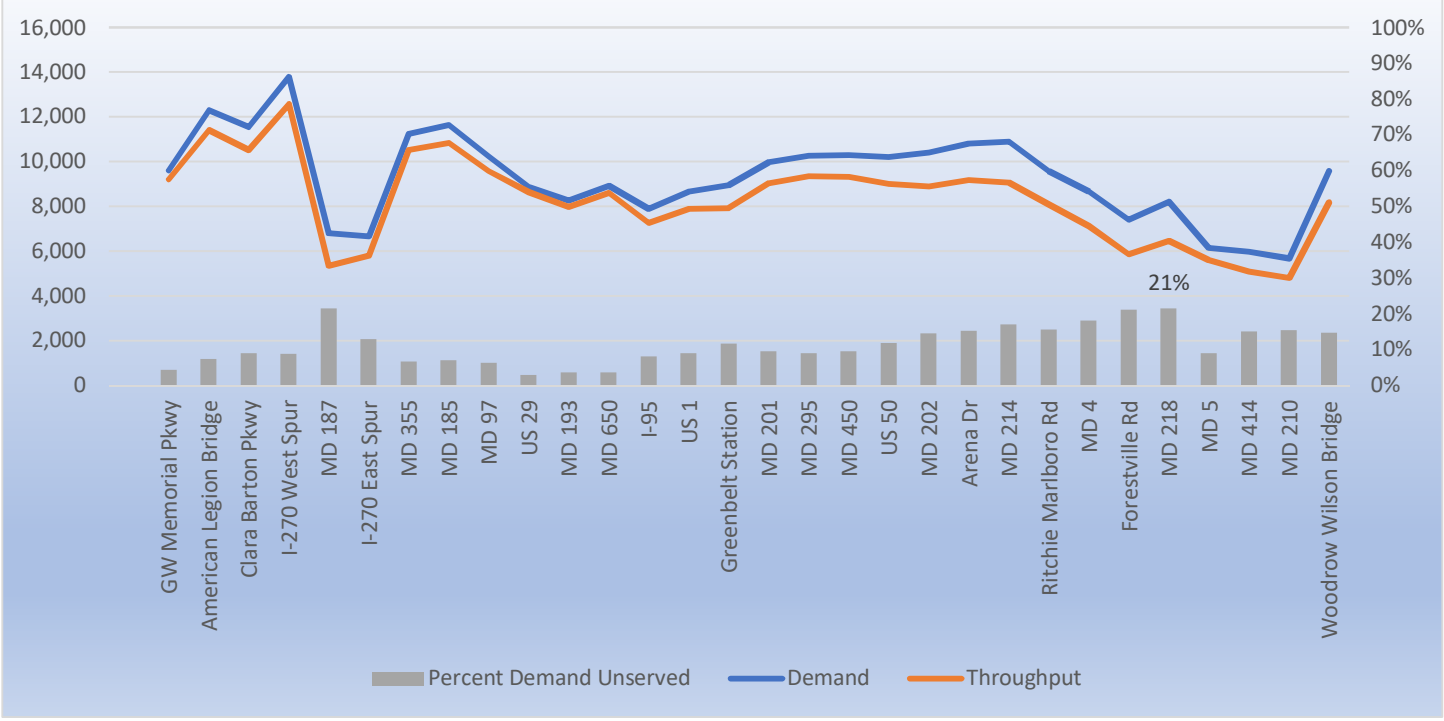


Figure G-3: I-270 2040 Alternative 10 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

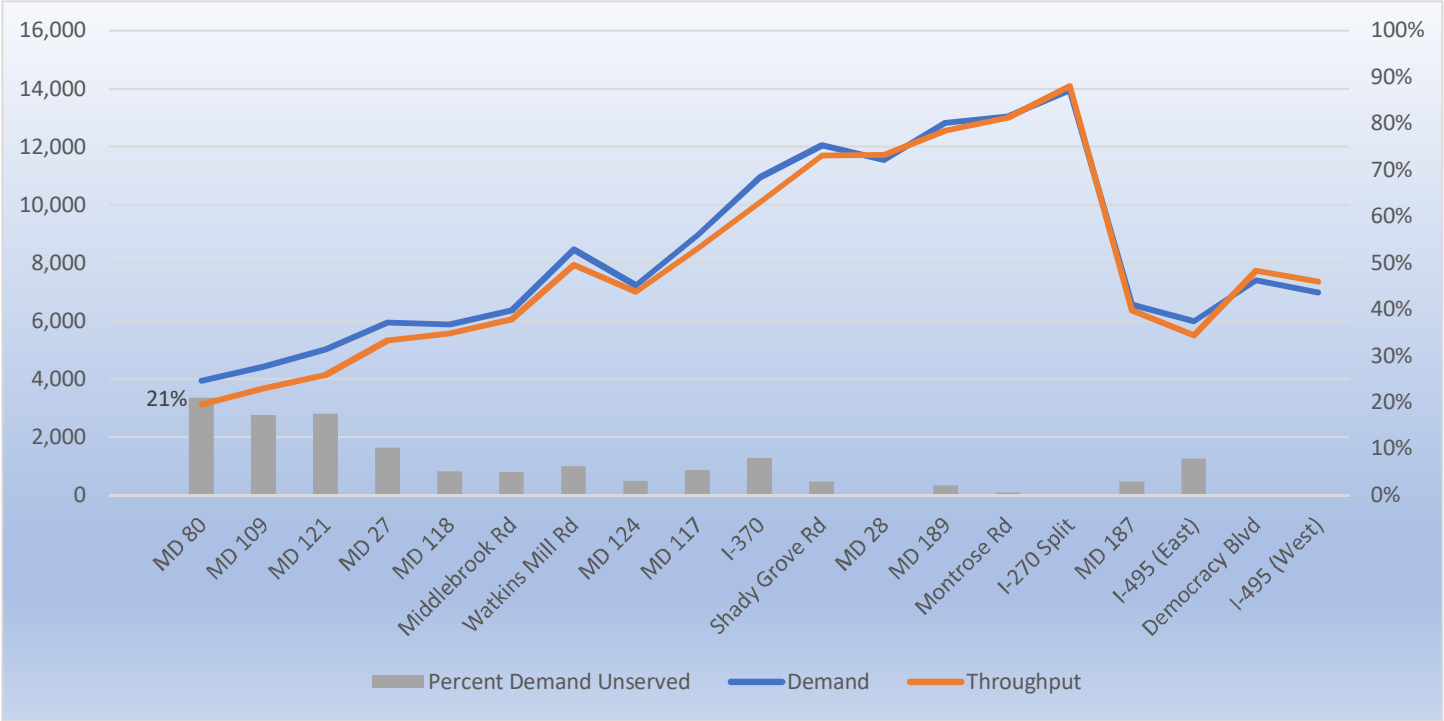


Figure G-4: I-270 2040 Alternative 10 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

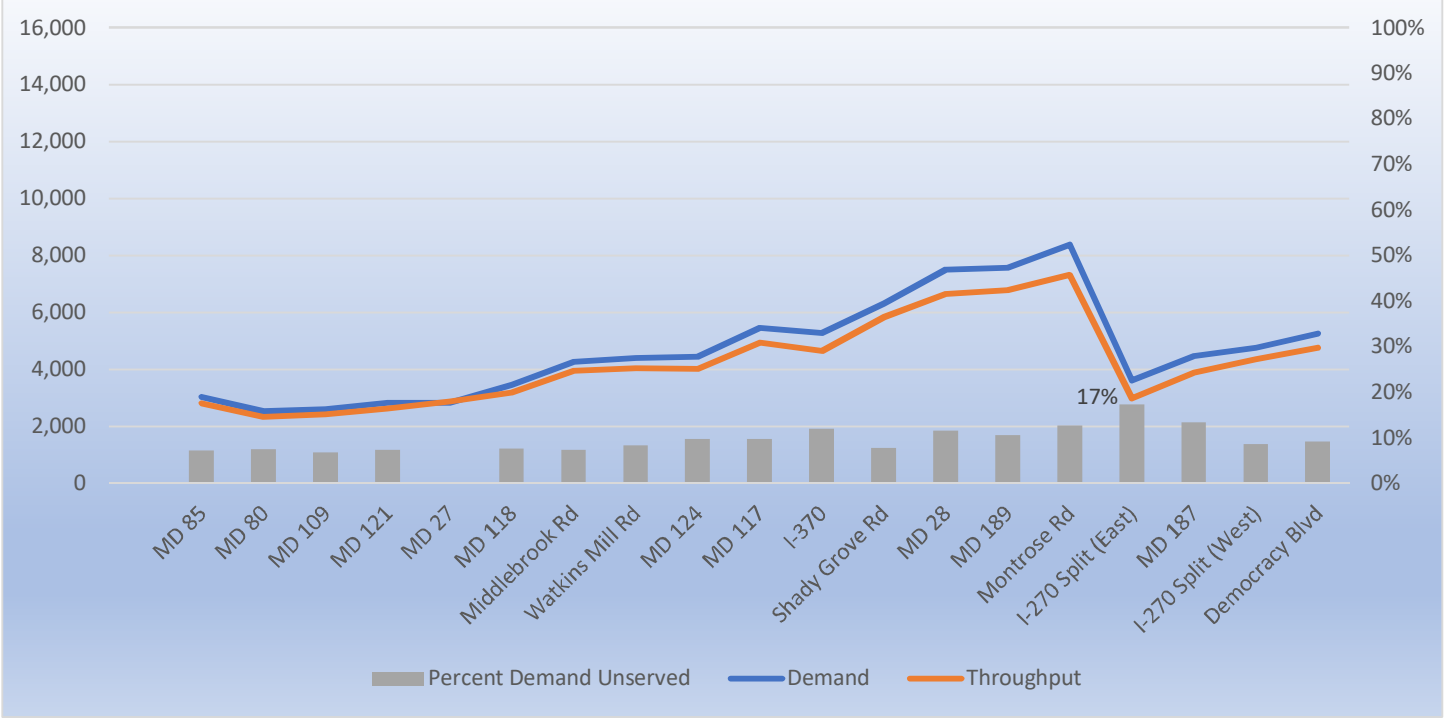


Figure G-5: I-495 2040 Alternative 10 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

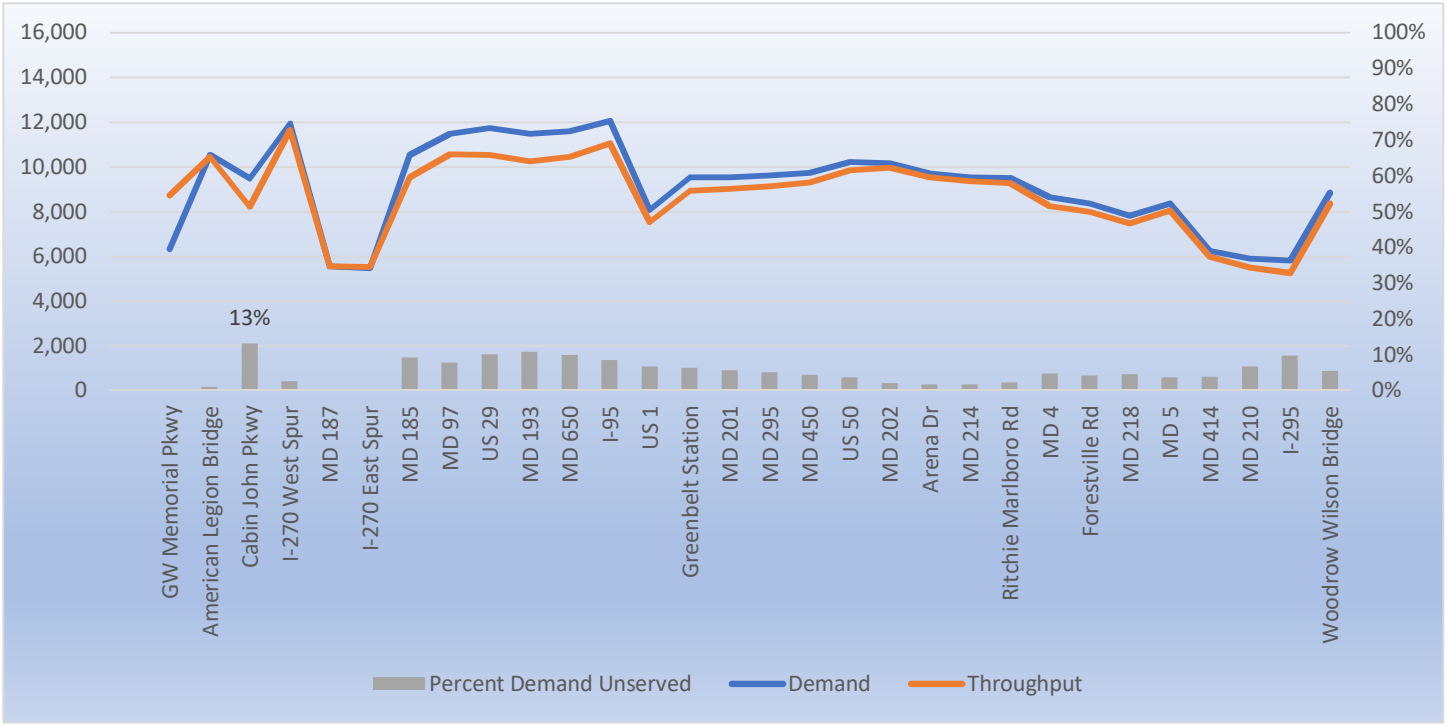


Figure G-6: I-495 2040 Alternative 10 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

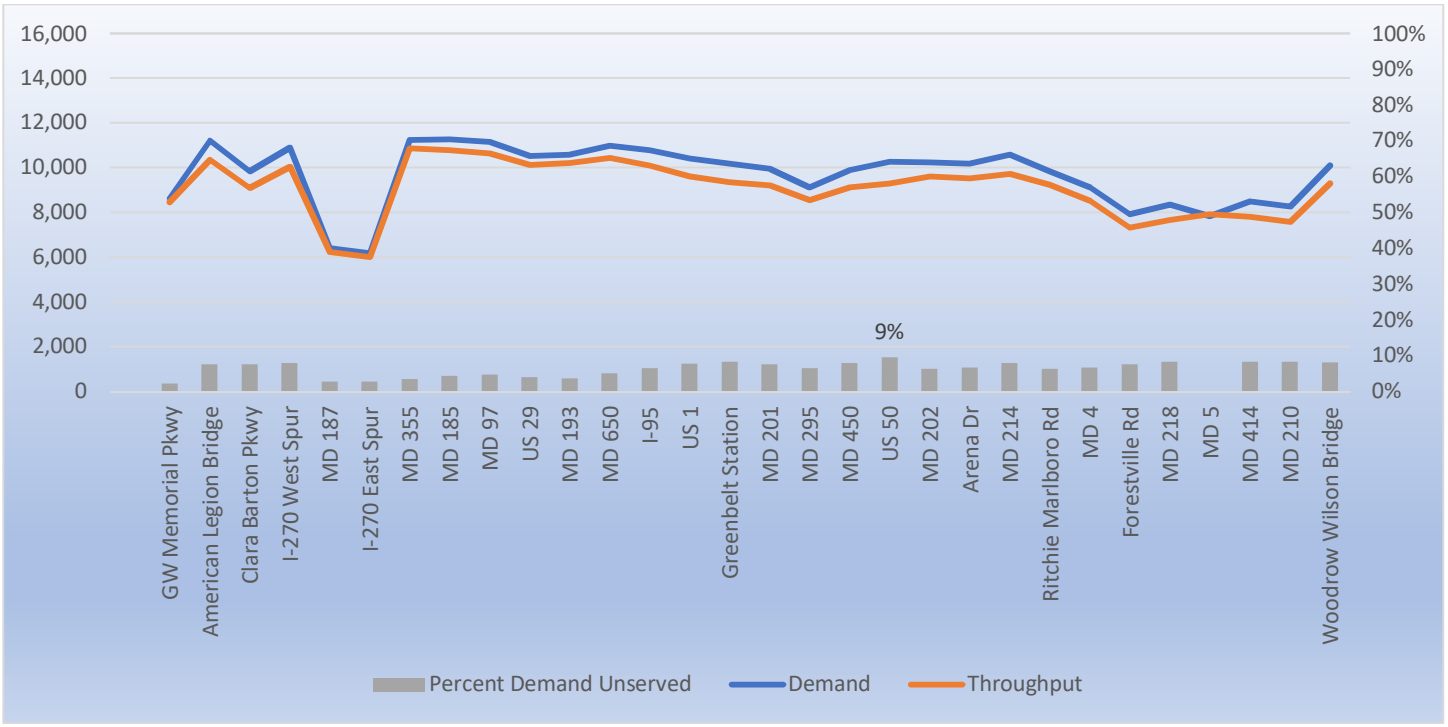


Figure G-7: I-270 2040 Alternative 10 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

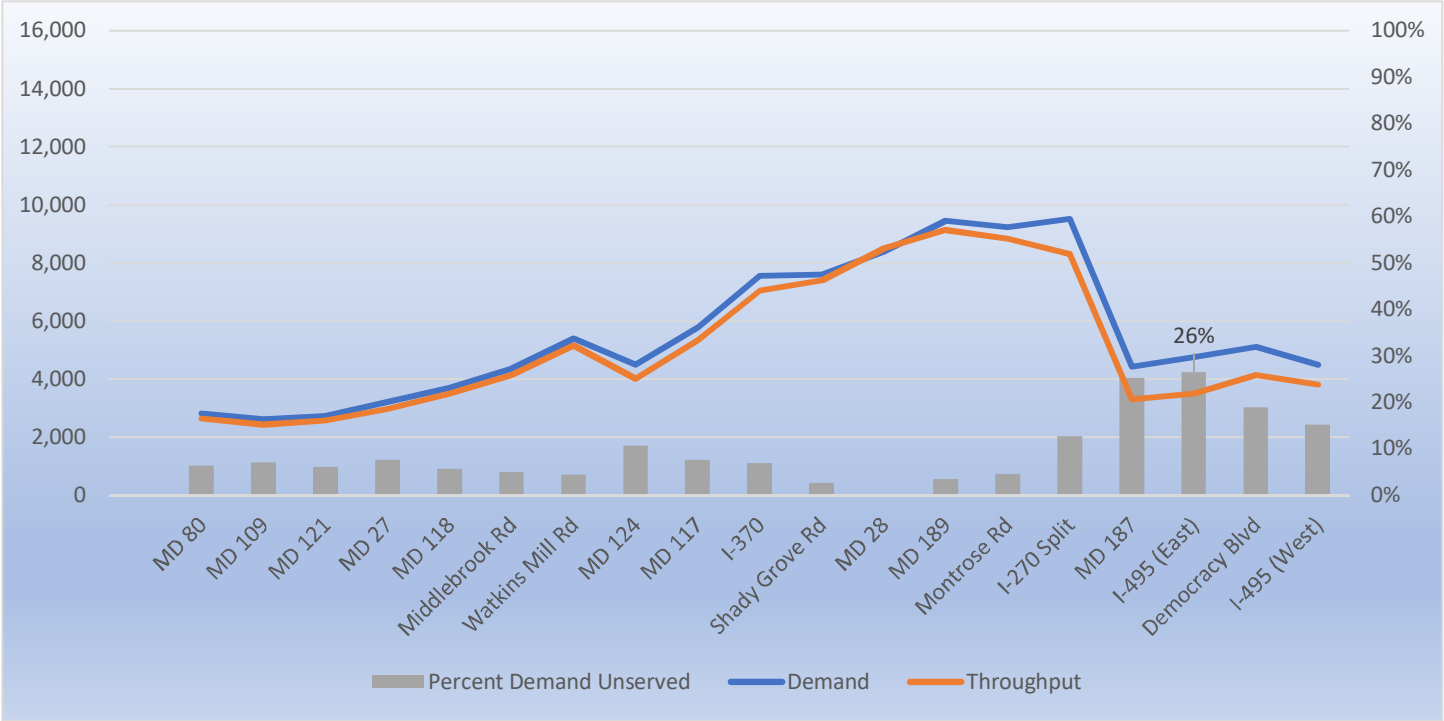


Figure G-8: I-270 2040 Alternative 10 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

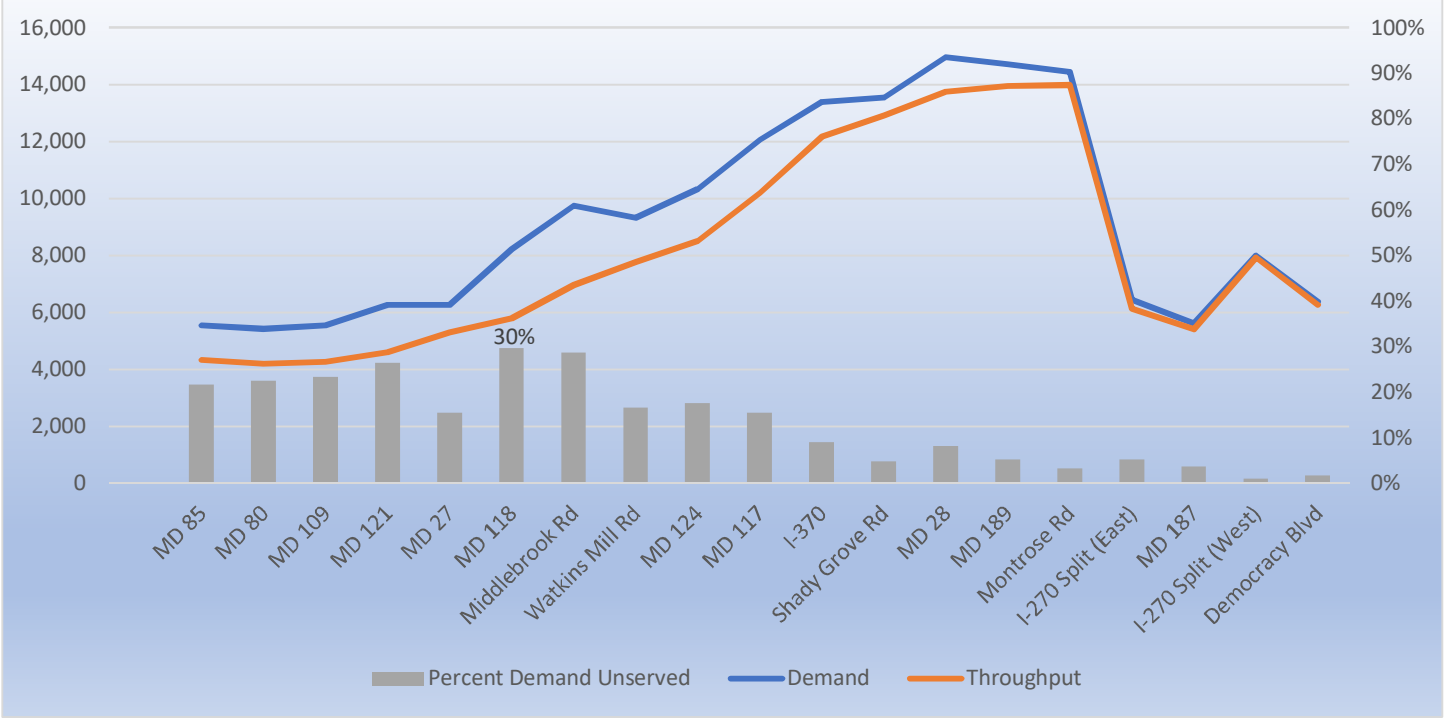


Figure H-1: I-495 2040 Alternative 13B 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

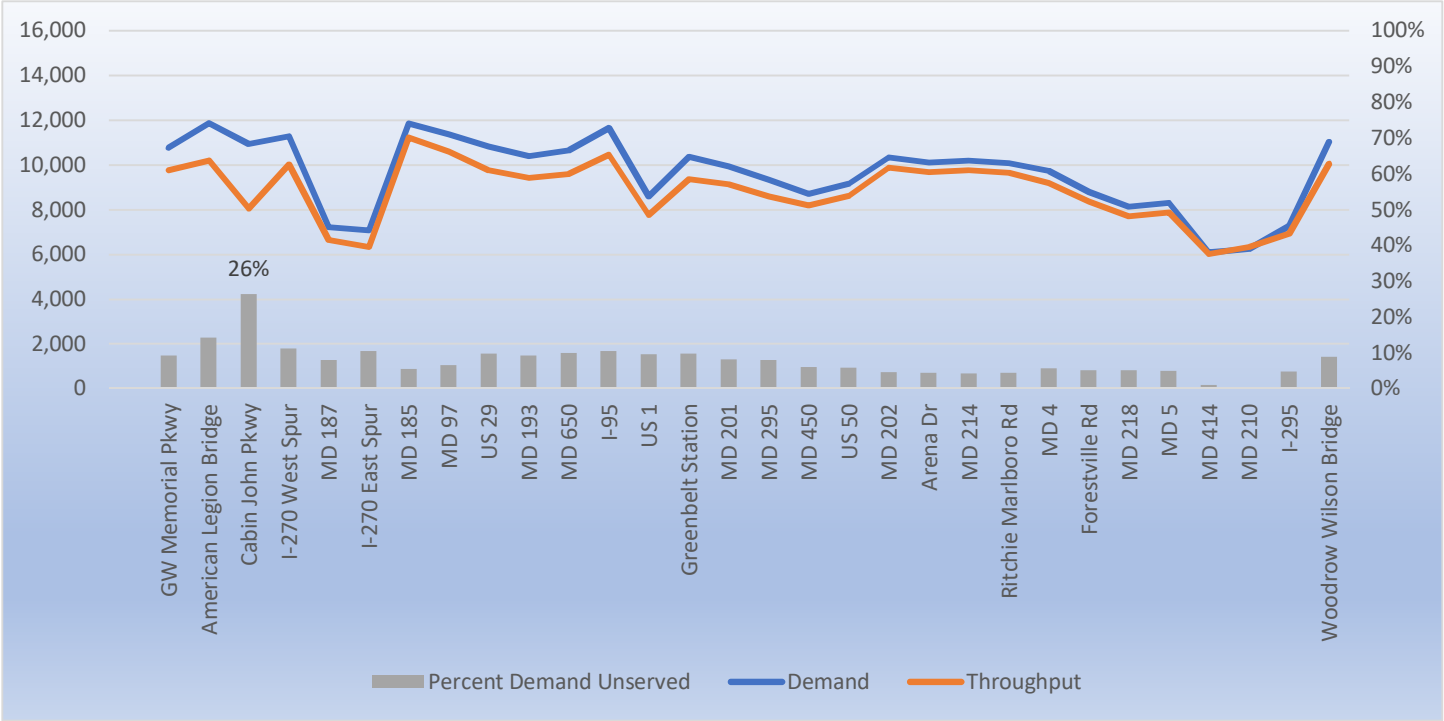


Figure H-2: I-495 2040 Alternative 13B 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

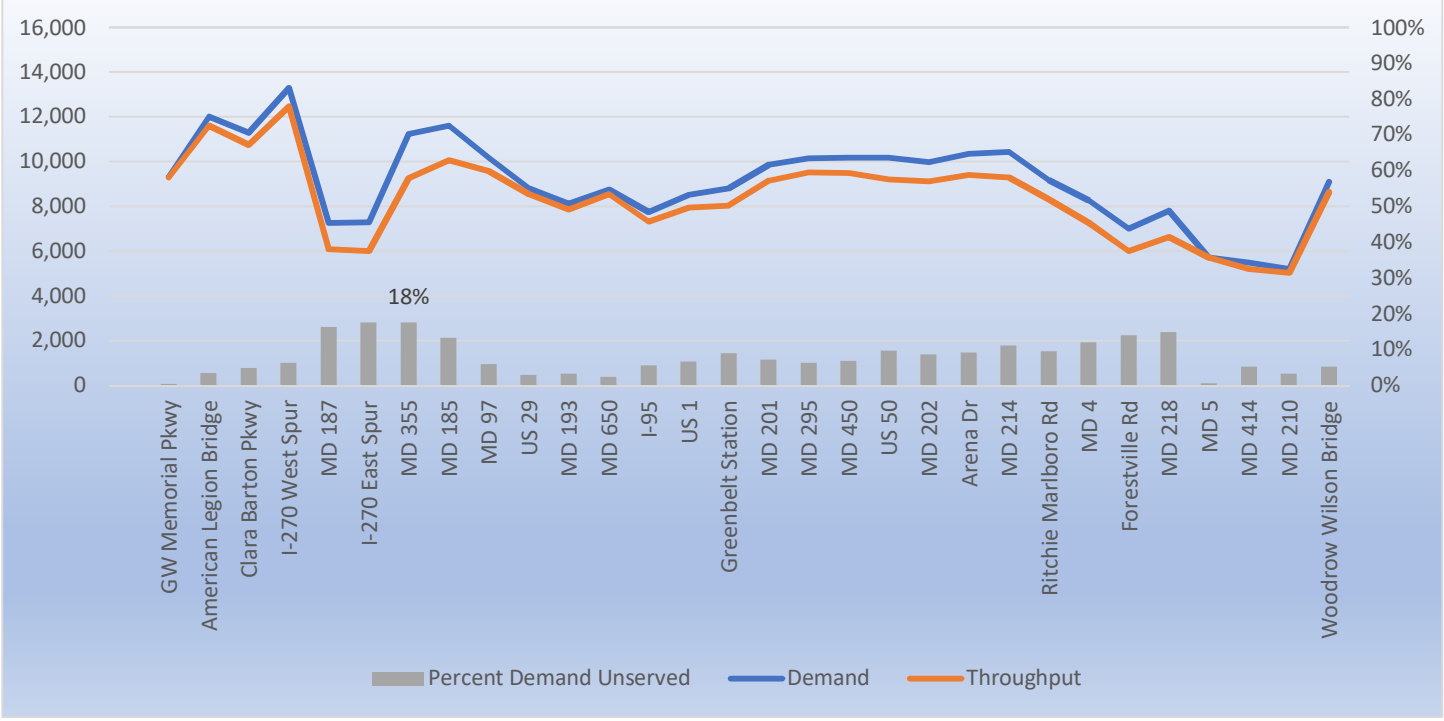


Figure H-3: I-270 2040 Alternative 13B 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

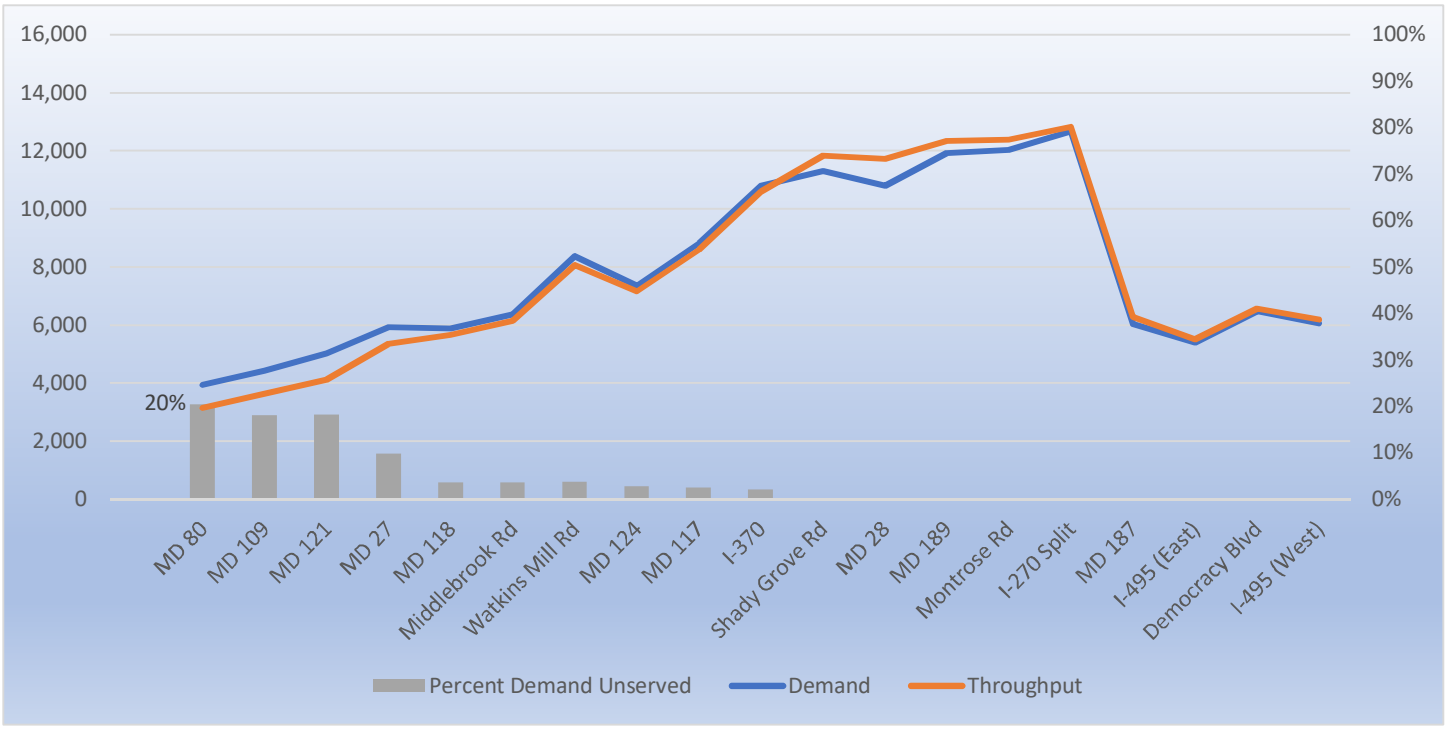


Figure H-4: I-270 2040 Alternative 13B 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

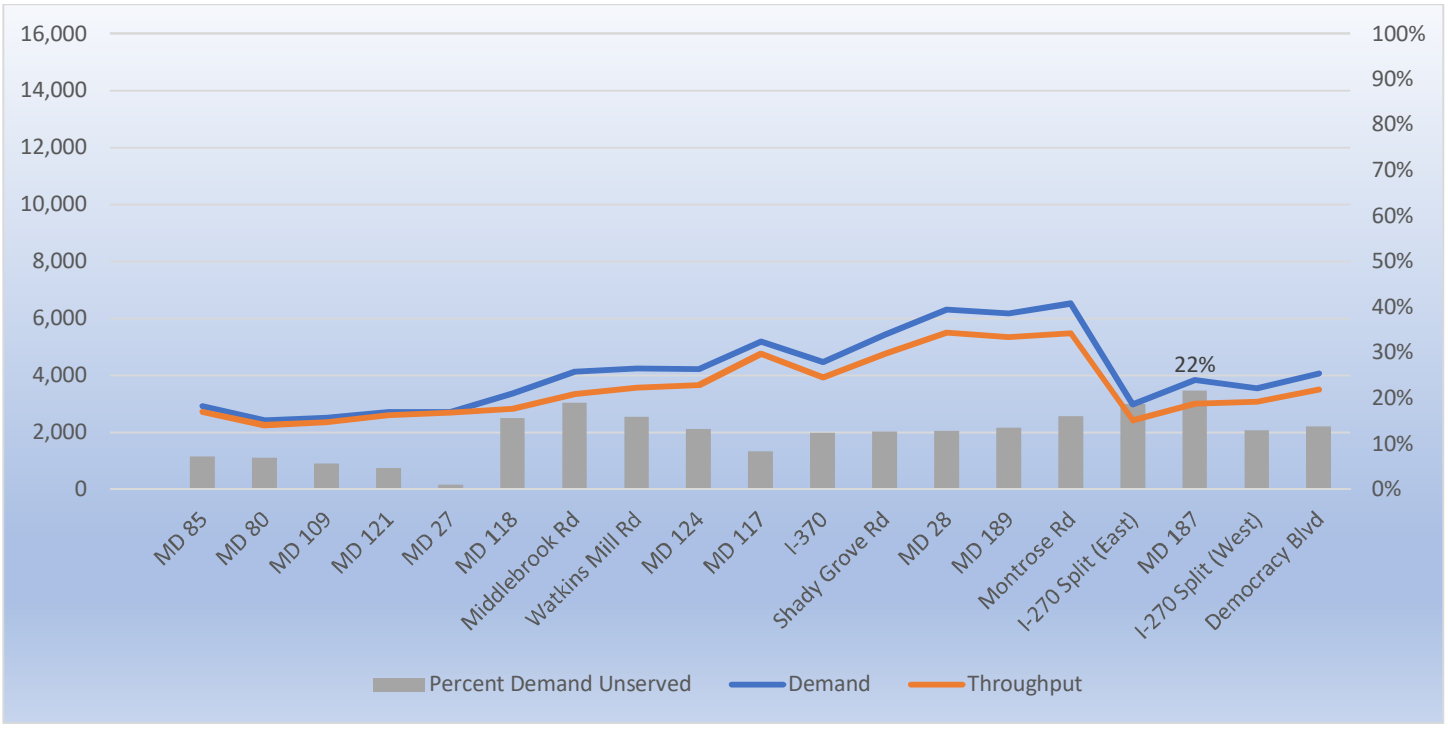


Figure H-5: I-495 2040 Alternative 13B 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

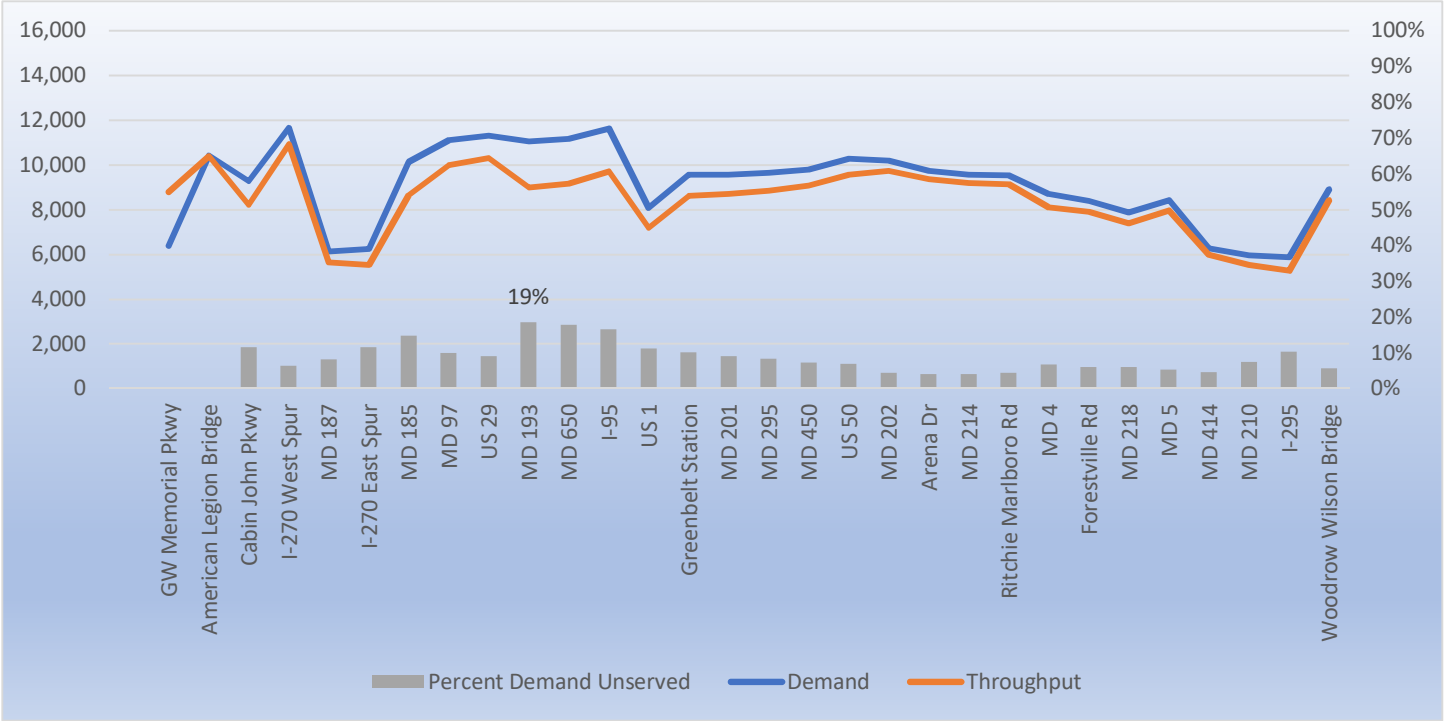


Figure H-6: I-495 2040 Alternative 13B 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

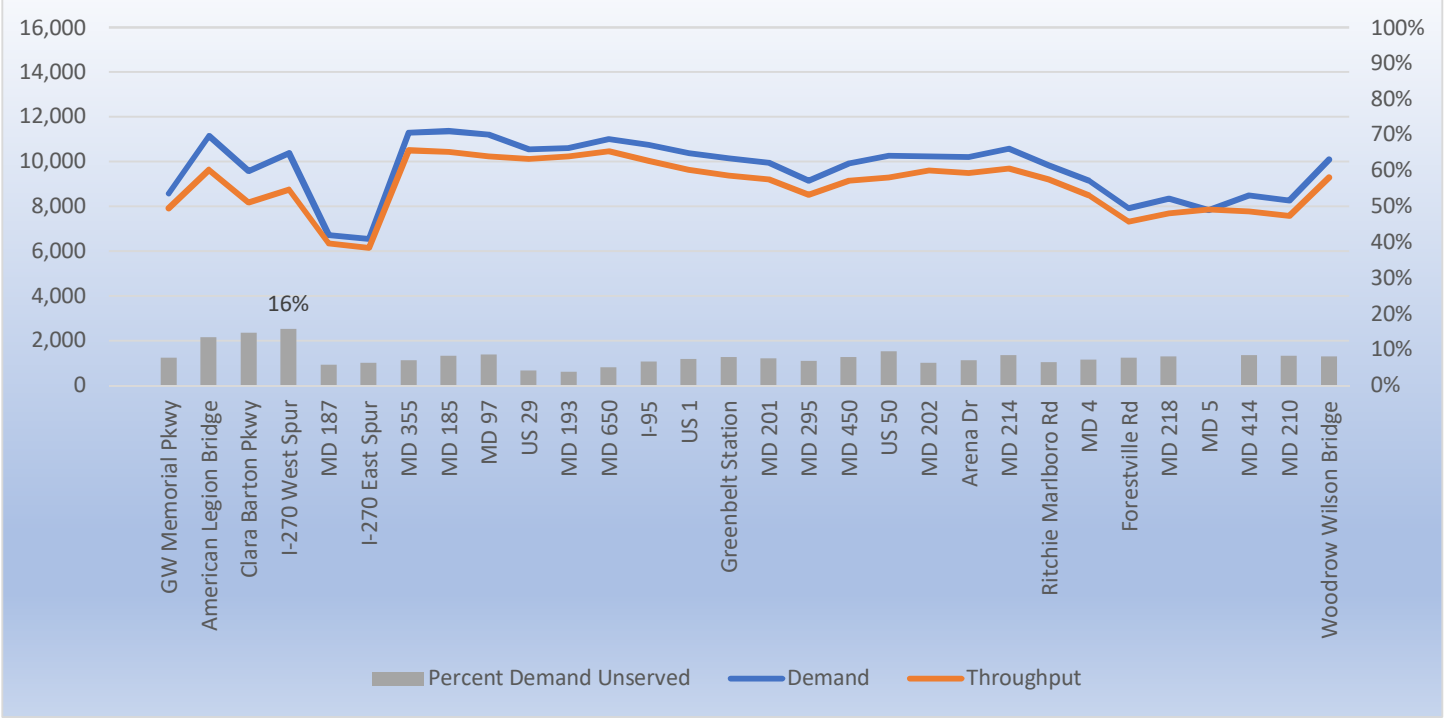


Figure H-7: I-270 2040 Alternative 13B 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

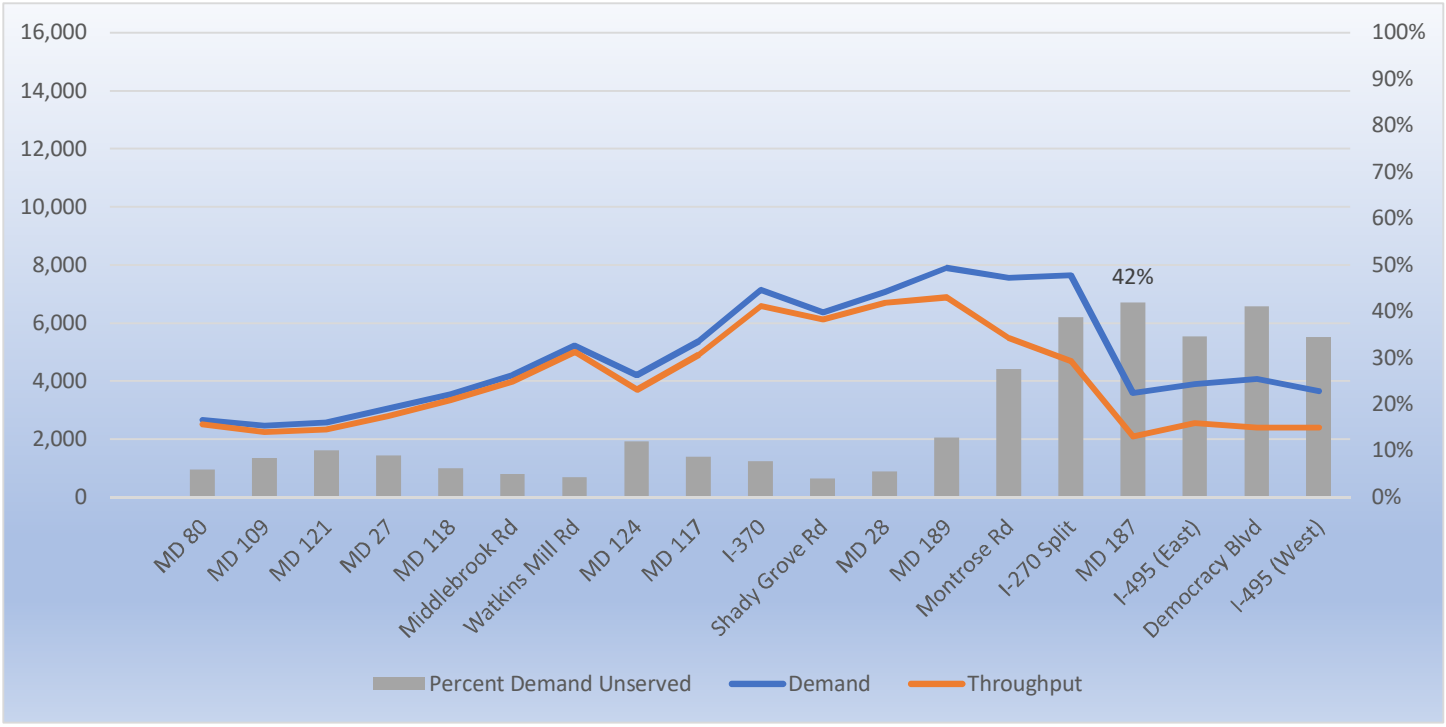


Figure H-8: I-270 2040 Alternative 13B 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved

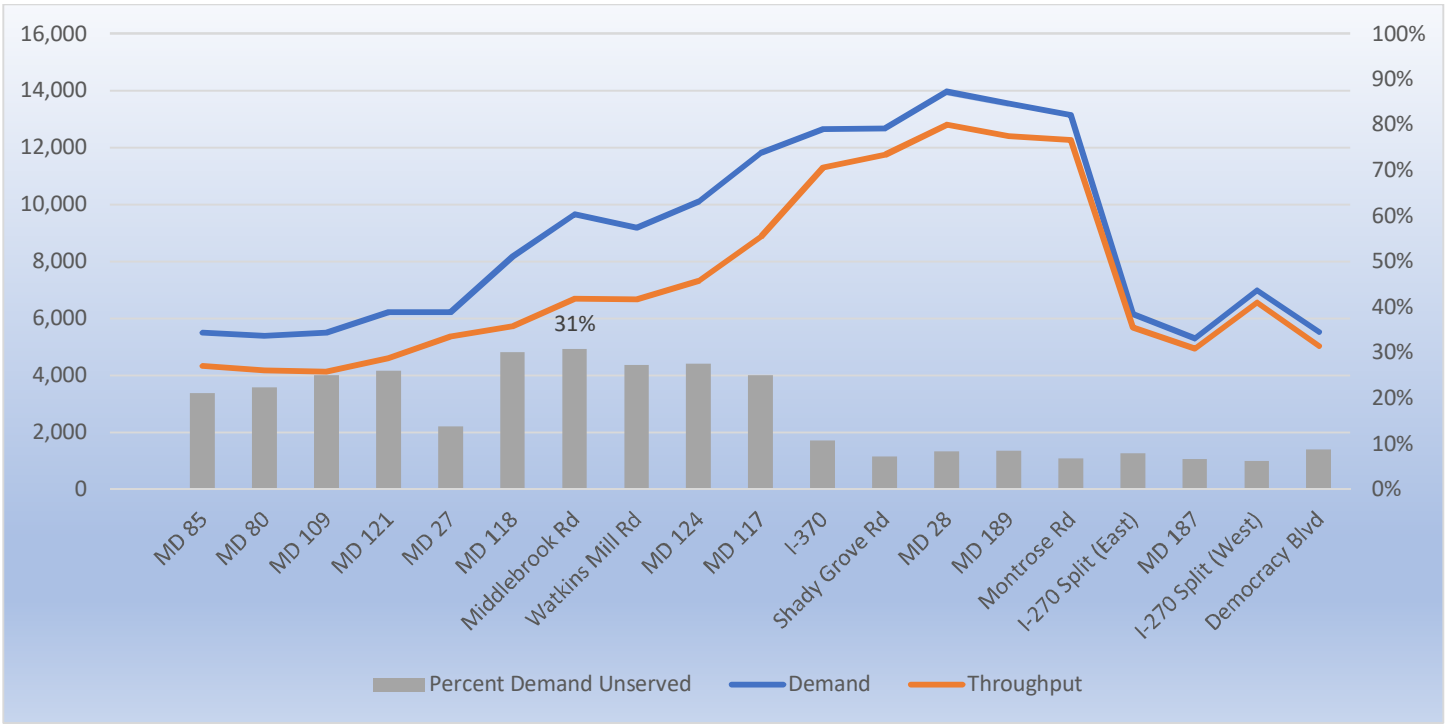


Figure I-1: I-495 2040 Alternative 13C 7-8 AM Inner Loop Demand vs. Throughput and Percent Demand Unserved

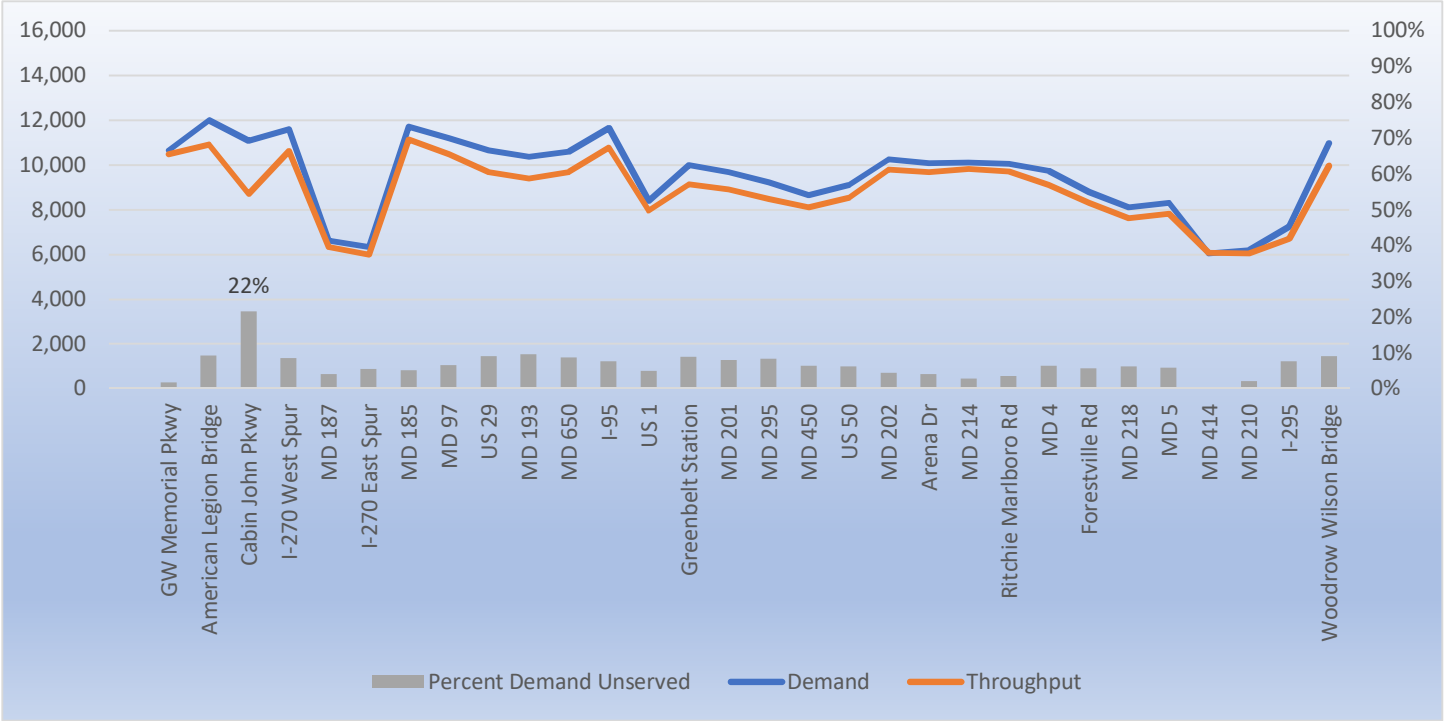


Figure I-2: I-495 2040 Alternative 13C 7-8 AM Outer Loop Demand vs. Throughput and Percent Demand Unserved

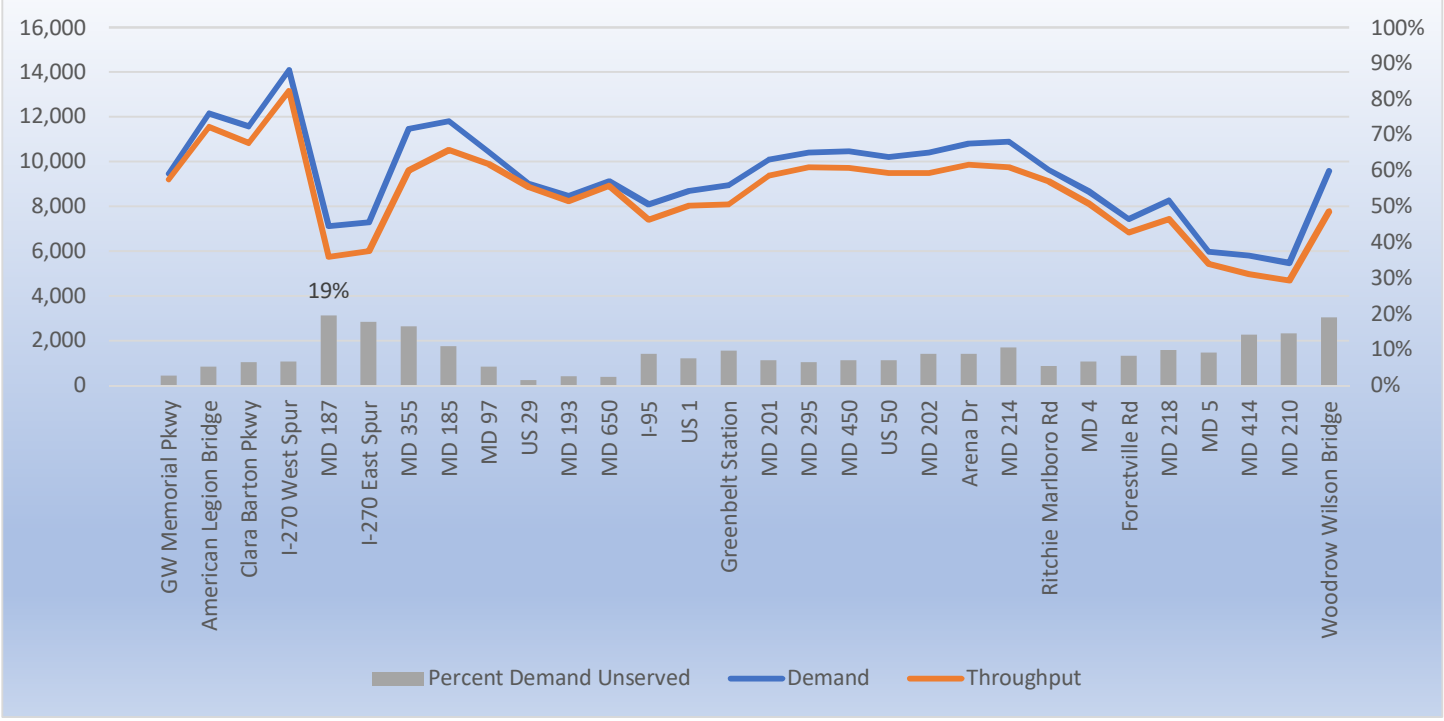


Figure I-3: I-270 2040 Alternative 13C 7-8 AM Southbound Demand vs. Throughput and Percent Demand Unserved

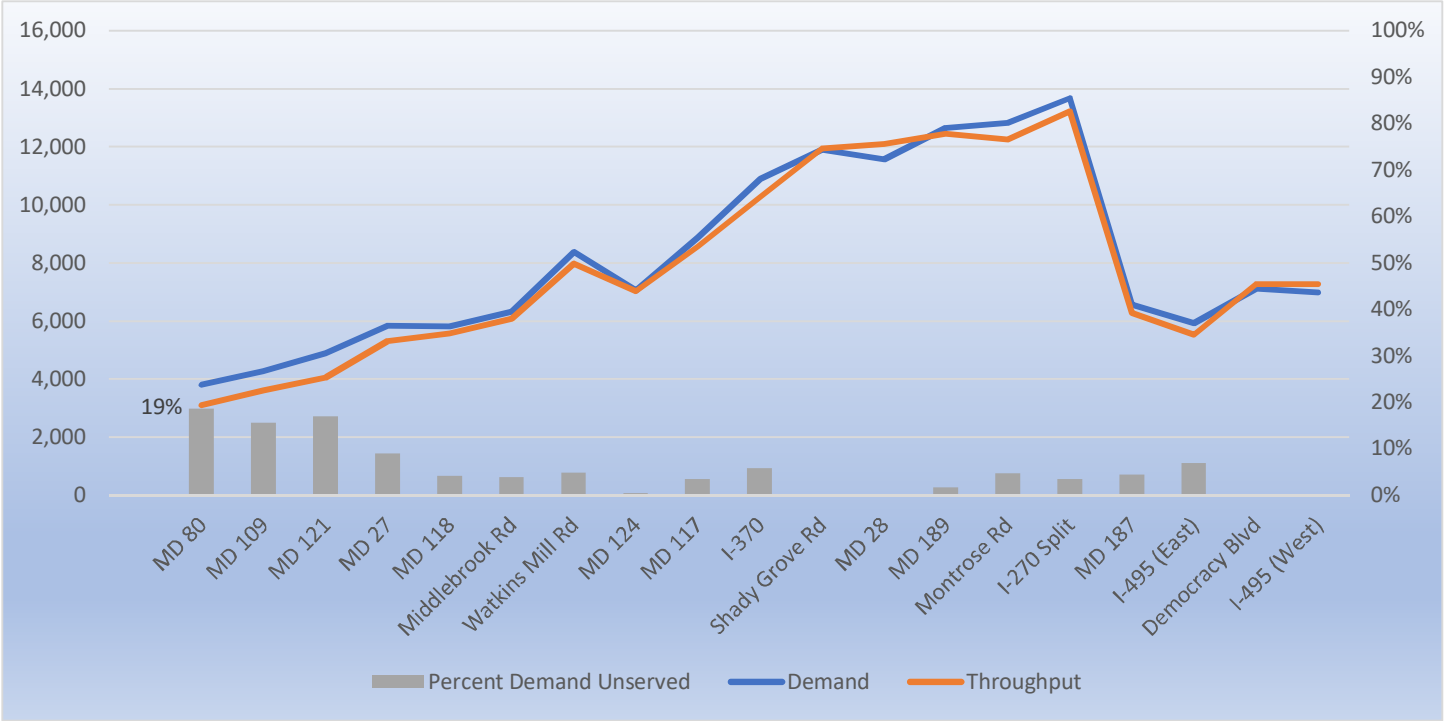


Figure I-4: I-270 2040 Alternative 13C 7-8 AM Northbound Demand vs. Throughput and Percent Demand Unserved

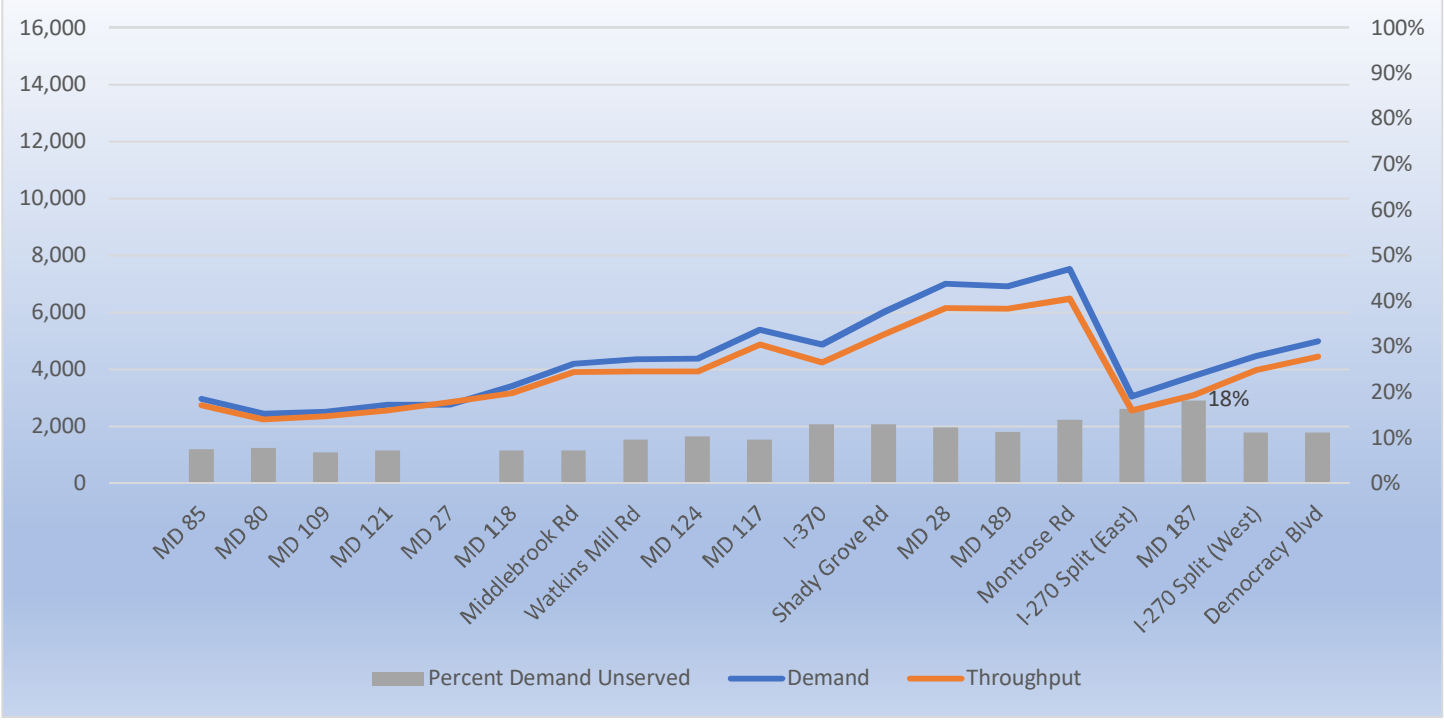


Figure I-5: I-495 2040 Alternative 13C 4-5 PM Inner Loop Demand vs. Throughput and Percent Demand Unserved

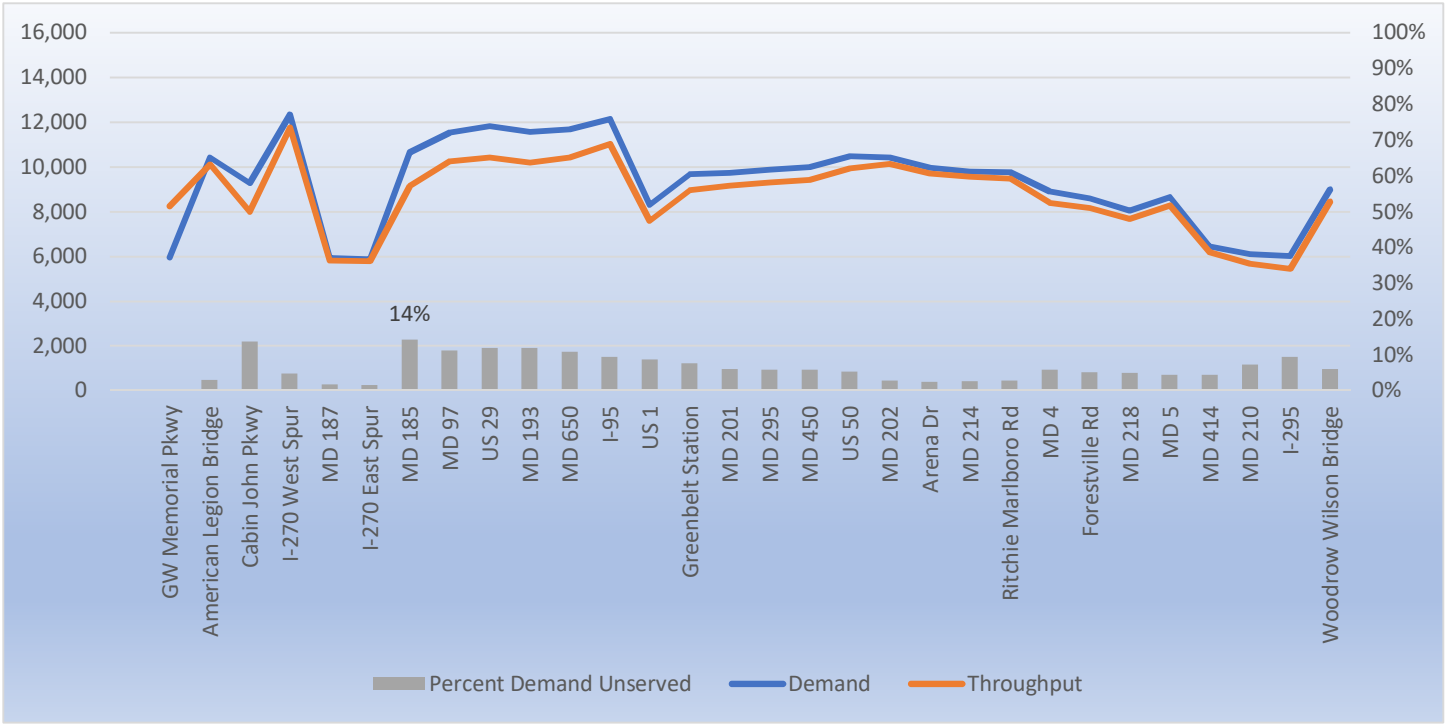


Figure I-6: I-495 2040 Alternative 13C 4-5 PM Outer Loop Demand vs. Throughput and Percent Demand Unserved

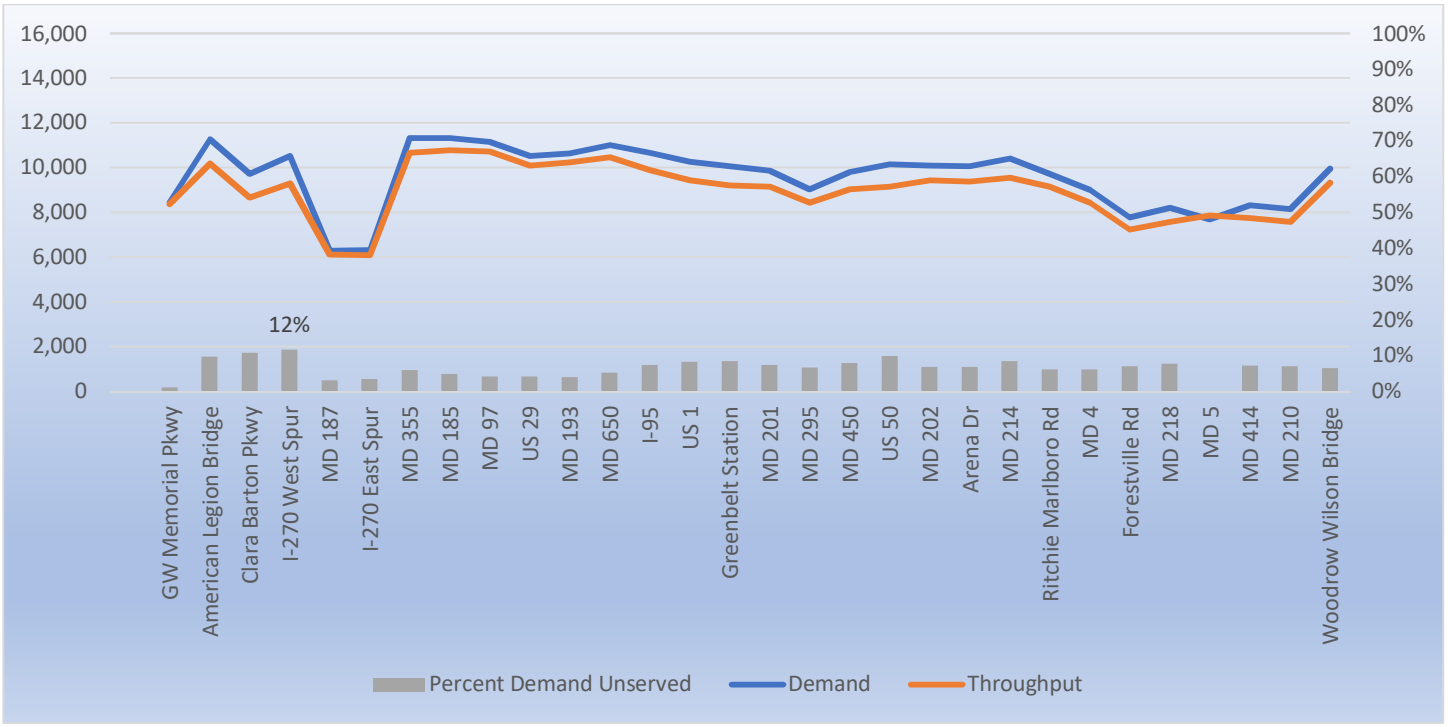


Figure I-7: I-270 2040 Alternative 13C 4-5 PM Southbound Demand vs. Throughput and Percent Demand Unserved

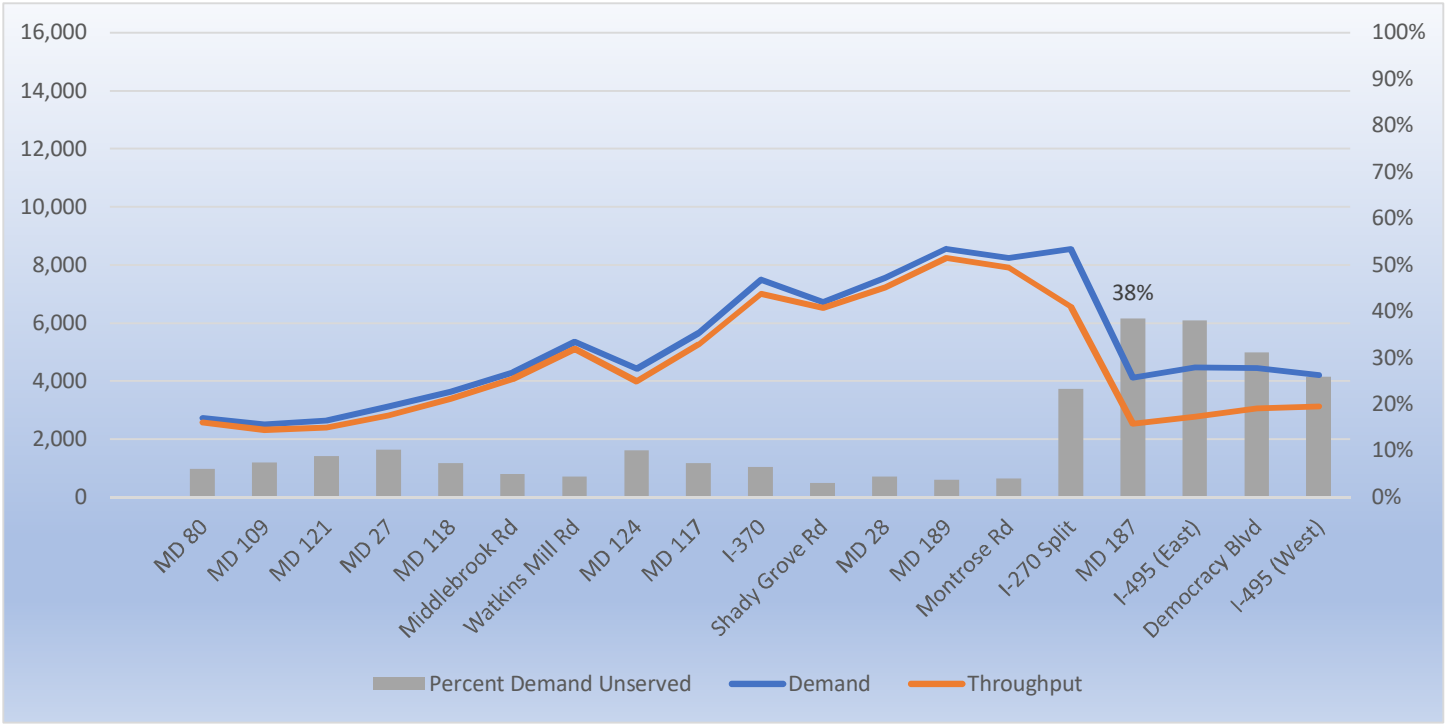
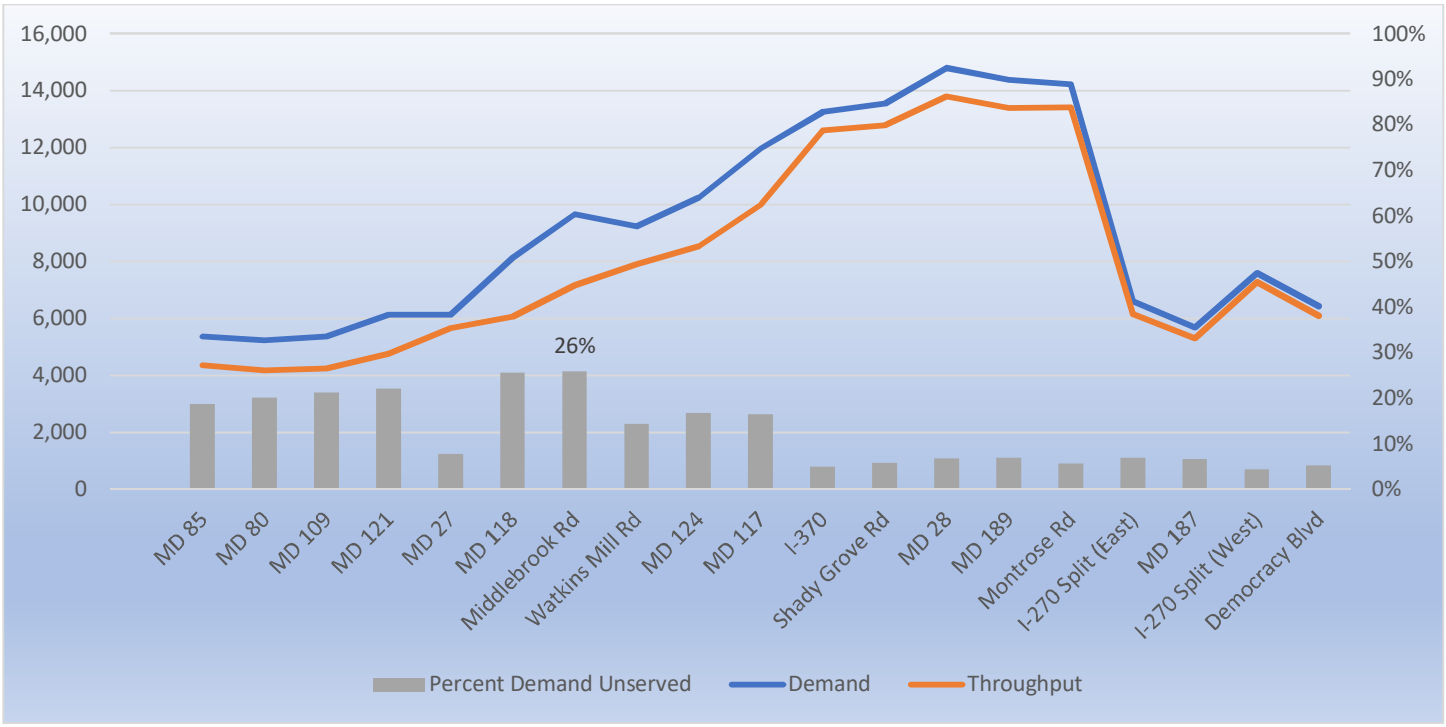


Figure I-8: I-270 2040 Alternative 13C 4-5 PM Northbound Demand vs. Throughput and Percent Demand Unserved



Appendix H:

Existing and Future Segment Level of Service

Existing AM - I-495 OL Link Evaluation Results

Existing AM — I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	26	25	26	52	56	57	58	59	58	58	58	59	59	59	59	58	59
Density	64	64	70	35	32	31	23	15	19	19	16	16	19	18	17	21	21
LOS	F	F	F	D	D	D	C	B	C	C	B	B	C	C	B	C	C
Volume	8251	8143	5395	5381	5392	5391	2642	2643	2180	2183	2812	2823	2275	4281	4982	4984	4974
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4
Length	2000	1268	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1

				Exit 4 MD 414													
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53	53	53
Density	17	20	20	17	20	19	19	23	24	24	24	24	24	24	19	20	20
LOS	B	C	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C
Volume	4938	4761	4773	5052	4614	4610	5033	4929	5072	5063	5075	5081	5080	5055	5032	4227	4218
Lanes	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	729	508
LinkID	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph): 10, 30, 40, 50, 70

	Exit 7 MD 5									Exit 9 MD 337							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	54	53	52	54	53	52	55	54	54	51	50	53	54	55	55
Density	18	20	20	24	31	29	30	31	26	26	26	26	34	31	31	28	28
LOS	B	C	C	C	D	D	D	D	C	D	D	D	D	D	D	D	D
Volume	4671	4338	4327	6399	6337	6393	6383	6380	5666	5663	5657	6686	6694	6638	6675	6200	6185
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4
Length	1080	481	657	677	798	2000	773	1493	2000	2000	1594	706	788	515	1390	726	505
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1

	Exit 11 MD 4											Exit 13 Ritchie Marlboro Rd					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	54	54	51	56	56	55	55	55	55	55	55	50	51	54	55
Density	26	29	28	27	35	33	33	33	33	33	27	31	31	33	41	38	37
LOS	D	D	D	D	E	D	D	D	D	D	D	D	D	D	E	E	E
Volume	6777	6067	6064	7304	7297	7327	7323	7335	7323	7282	7340	6928	6921	8346	8346	8327	8153
Lanes	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	449	551	554	462	1023	2000	2000	2000	933	536	940	2000	518	1353	2000	1046	208
LinkID	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	3	4	1	1	1	2	1	1	2	1

			Exit 15 MD 214					Exit 16 Arena Dr		Exit 17 MD 202							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	56	54	53	53	50	47	47	40	35	31	21	24	24	48	54	55
Density	30	31	28	36	31	33	41	33	44	50	56	63	65	64	41	36	35
LOS	D	D	D	E	D	D	E	D	E	F	F	F	F	F	E	E	E
Volume	8310	7078	7711	7679	8310	8314	7690	7712	5336	5261	5203	7889	7796	7802	7757	7785	7791
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4
Length	1288	1160	803	743	1378	1328	648	1500	2000	2000	1019	1002	499	722	2000	1520	793
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1

			Exit 19 US 50							Exit 20 MD 450							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	57	58	58	58	58	55	49	36	32	27	20	34	54	58	58	55
Density	27	30	24	26	26	26	26	35	55	49	72	86	63	40	38	37	40
LOS	D	D	C	C	C	C	C	D	F	F	F	F	F	E	E	E	E
Volume	7795	6859	6852	5965	5965	5964	8561	8598	8006	7905	7794	8745	8657	8707	8698	8703	8690
Lanes	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	705	785	562	2000	276	288	800	1391	716	276	949	1042	455	2000	2000	2000	1837
LinkID	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

					Exit 22 MD 295						Exit 23 MD 201					Exit 24 Greenbelt Metro Station	
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	53	53	51	50	51	52	51	53	49	50	54	52	53	53	58
Density	38	30	34	34	32	41	40	34	35	34	31	39	30	38	38	37	28
LOS	E	D	D	D	D	E	E	D	E	D	D	E	D	E	E	E	D
Volume	8659	8636	7137	7161	8270	8162	8190	8647	7205	7243	7641	7706	7918	7882	7912	7872	7947
Lanes	4	5	4	4	5	4	4	5	4	4	5	4	5	4	4	4	5
Length	903	595	570	541	439	501	699	1815	589	828	434	995	471	993	2000	1085	1301
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	1033	203501
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1

					Exit 25 US 1						Exit 27 I-95						
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	56	55	57	58	58	58	57	58	59	59	58	41	8	9	9	9
Density	35	36	32	30	25	22	22	23	19	18	15	19	27	134	123	124	131
LOS	D	E	D	D	C	C	C	C	C	C	B	C	D	F	F	F	F
Volume	7964	7958	6907	6883	7266	7688	7679	7682	4308	4273	4375	4413	4388	6477	6423	6372	5879
Lanes	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	1225	1250	244	973	1149	1517	673	1486	2000	355	1017	490	825	1506	839	1513	814
LinkID	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

Existing AM
I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	9	7	8	8	7	9	9	14	14	13	12	10	15	16	15	14	14	11	19	20	19	16	15	14	19	16	30	35	33	41	50	51	53
Density	132	141	139	137	145	131	140	108	106	94	123	132	104	101	104	93	108	124	93	89	88	90	87	112	103	97	105	69	60	64	50	42	33	31
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D
Volume	5852	6212	5722	5709	6114	6119	6058	6079	5997	5980	5654	6405	6354	6409	6340	6479	6162	7006	6994	7005	6995	6976	6986	6538	7458	7401	8248	8232	8324	8332	8332	8329	6639	6616
Lanes	5	6	5	5	6	5	5	4	4	5	4	5	4	4	4	5	4	5	4	4	4	4	5	4	5	4	5	4	4	4	4	4	4	4
Length	509	450	501	284	347	1136	1629	1881	1185	301	793	713	805	1020	517	277	854	787	704	2000	832	1091	449	621	594	336	957	536	2000	2000	1795	1336	311	1657
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355						Exit 36 MD 187								Exit 39 I-270 W Spur MD 190									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	51	49	49	52	52	53	53	53	49	53	53	53	52	53	53	53	52	53	53	53	51	36	34	45	51	52	53	51	35	31	30
Density	27	34	30	39	41	40	38	38	30	33	25	23	28	28	28	21	24	22	22	29	29	29	29	30	46	59	44	39	37	31	34	51	58	56
LOS	D	D	D	E	E	E	E	E	D	D	C	C	D	D	D	C	C	C	C	D	D	D	D	D	F	F	E	E	E	D	D	F	F	F
Volume	7177	7138	7868	7824	7865	7861	7868	7865	7844	6912	3955	4385	4393	4395	4382	4378	3857	3430	4627	4615	4607	4585	4594	4574	9935	9911	9895	9887	9719	9880	8527	7303	7207	8298
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	746	998	526	1257	2000	87	1045	402	1593	288	910	494	913	1192	325	2000	22	406	1085	2000	2000	2000	1657	551	935	2000	659	446	1032	1585	2000	663	1788
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	46	51	52	52	50	52	52	52	53	53	52	52	52	43	
Density	45	40	39	32	41	34	31	31	31	31	27	34	28	43	
LOS	E	E	E	D	E	D	D	D	D	D	D	D	D	E	
Volume	8269	8306	8159	8279	8117	8808	6531	6527	6517	6501	6968	7049	7301	7313	
Lanes	4	4	4	5	4	5	4	4	4	4	5	4	5	4	
Length	2000	1149	521	922	1713	1560	274	2000	2000	1223	735	1053	1414	613	
LinkID	495415	495415	1067	495416	495417	495418	11230	1069	1069	1069	1083	1084	1101	1114	
SegmentID	1	2	1	1	1	1	1	1	2	3	1	1	1	1	

Existing AM - I-495 IL Link Evaluation Results

Existing AM I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	57	50	31	23	18	15	21	20	24	45	52	55	57	56	56	56	56	57	57	57	57	57	55	57	57	54	58	57	57	56	39	56
Density	22	22	22	28	43	58	73	94	82	83	68	42	36	28	27	35	34	34	28	30	25	25	23	27	29	23	23	27	25	26	26	26	28	23
LOS	C	C	C	D	E	F	F	F	F	F	F	E	E	D	D	D	D	D	D	D	C	C	C	D	D	C	C	D	C	C	C	D	D	C
Volume	7607	7603	7604	7067	6745	7975	7793	6920	6830	6801	8297	7577	7610	7758	7770	7724	7728	7707	7684	6864	7140	7104	7923	7766	7894	7913	7922	4387	4389	4394	4404	4422	4424	3806
Lanes	6	6	6	5	5	6	6	5	4	4	5	4	4	5	5	4	4	4	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3
Length	2000	192	1499	2000	95	1500	1537	645	687	494	1975	500	706	1511	777	2000	1461	1064	400	1947	1495	621	1123	398	1764	732	1509	2000	2000	2000	1671	1173	305	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	495414	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355													Exit 33 MD 185											Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	51	50	59	60	59	60	56	53	56	58	49	54	54	59	59	59	59	52	58	60	60	60	53	55	57	59	59	59	59	59	59
Density	20	18	24	27	36	28	21	26	26	27	36	34	26	31	29	24	27	25	31	31	35	32	24	24	26	27	31	25	30	31	30	30	30	30
LOS	C	C	C	D	E	D	C	C	C	D	E	D	D	D	D	C	D	C	D	D	D	D	C	C	C	D	D	C	D	D	D	D	D	D
Volume	3508	4152	4157	4161	3639	6504	7637	7662	7663	7644	7627	7649	7648	7616	6330	6471	6453	7286	7294	7238	7287	7286	7294	7299	6181	7025	6726	7173	7089	7176	7166	7156	7039	6992
Lanes	3	4	3	3	2	4	6	5	5	5	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4
Length	21	439	659	1113	1519	1951	513	1013	1002	521	1603	252	526	658	913	228	793	1635	2000	164	2000	1786	2000	50	837	411	323	1131	452	2000	1086	1248	248	500
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	1124	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650								Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	60	61	60	60	56	56	45	54	58	59	61	60	61	60	39	51	58	58	60	61	62	60	60	60	62	57	56	42	27	38	41	42	38
Density	25	26	26	23	25	24	30	32	33	31	30	29	24	28	28	38	34	30	28	27	20	20	18	22	23	21	23	30	40	59	53	49	47	42
LOS	C	C	C	C	C	C	D	D	D	D	D	D	C	D	D	E	D	D	D	D	C	C	C	C	C	C	C	D	E	F	F	F	F	E
Volume	7020	6239	6257	6784	6129	6768	6802	7195	7209	7193	7182	7154	7131	6773	6712	7467	6940	6952	8114	8076	5002	5023	5428	5429	5384	3840	6670	6692	6686	8075	8024	8036	7940	8010
Lanes	5	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	260	499	524	1562	808	422	768	284	1222	2000	1072	1153	356	352	505	464	500	1046	1496	1493	1028	536	347	2000	140	1527	1473	2000	1605	670	846	626	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295													Exit 20 MD 450				Exit 19 US 50					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	46	49	52	50	54	53	52	49	50	53	55	54	53	54	55	55	55	55	55	54	54	53	53	55	46	50	56	55	54	57	57	56	55	54
Density	41	38	36	30	29	25	31	28	34	26	26	26	25	29	28	23	28	28	28	29	29	29	23	26	29	33	24	25	21	21	21	23	28	35
LOS	E	E	E	D	D	C	D	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	C	C	D	D	C	C	C	C	C	C	D	E
Volume	7544	7536	7507	7519	6150	6533	6498	6876	6849	6865	5717	5716	6698	6170	6140	6217	6197	6219	6221	6222	6239	6239	6101	5585	6677	6660	6649	5508	5527	4816	4835	7601	7618	7625
Lanes	4	4	4	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1603	1046	440	1150	761	810	740	938	452	520	566	554	497	516	779	711	2000	2000	2000	1629	1217	263	1109	984	561	1359	1371	213	2000	616	1434	754	2000
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

Existing AM

I-495 IL

							Exit 16						Exit 15						Exit 13										Exit 11					
							Arena Dr						MD 214						Ritchie Marlboro Rd										MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	55	55	55	55	55	54	56	57	56	57	53	56	57	57	55	57	57	56	58	58	55	56	56	53	47	39	53	58	53	55	57	58	58	59
Density	35	28	28	34	35	35	31	26	26	26	31	24	26	26	33	32	32	26	27	27	27	33	33	35	39	47	28	26	25	27	26	22	28	27
LOS	D	D	D	D	D	E	D	C	D	C	D	C	D	C	D	D	D	D	D	D	D	D	D	D	E	F	D	C	C	D	D	C	D	D
Volume	7593	7620	7648	5684	5691	5680	7067	7347	7356	7351	6669	6679	6077	7279	7285	7289	7212	7299	6335	6325	7390	7354	7362	7366	7352	7323	5910	5900	6722	5969	5993	6453	6445	6446
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1072	1492	2000	2000	2000	772	1366	456	484	565	511	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

				Exit 9									Exit 7												Exit 4									
				MD 337									MD 5												MD 414									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	63	63	63	63	61	59	60	62	55	63	62	63	63	63	63	63	63	63	63	63	48	30	21	12	13	13	12	18	17	12	9	6
Density	27	22	23	23	23	19	25	26	25	20	22	15	16	20	17	21	21	21	21	22	22	22	23	42	59	91	95	92	89	76	79	106	98	148
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	E	F	F	F	F	F	F	F	F	F	F
Volume	6422	6423	5838	5881	5864	6075	6040	6073	6058	6083	6097	3835	4876	4887	5265	5315	5360	5391	5427	5438	5445	5423	5422	5022	4934	5272	4865	4861	5375	5420	5356	2489	2514	1725
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	823	2000	727	761	1487	1134	789	706	691	807	2000	2000	2000	2000	670	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	1158	1158	1158	1158	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3						Exit 2							
	MD 210						I-295			WWB				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	8	9	12	14	16	18	45	57	58	58	56	47	57
Density	130	128	101	97	88	100	87	51	34	33	33	34	42	35
LOS	F	F	F	F	F	F	F	F	D	D	D	D	E	E
Volume	3079	3047	3654	3647	3632	3101	4643	4596	5755	5761	5766	5740	9954	9972
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Existing AM - I-270 NB Link Evaluation Results

Existing AM
I-270 NB

						Exit 1														Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur						Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	63	64	64	63	63	63	63	63	63	63	63	63	63	64	64	64	61	62	64	64	63	64	64	62	62	63	64	64	64	64	64	64	64
Density	23	20	19	14	17	13	17	14	18	14	19	18	16	16	16	13	13	13	14	13	13	13	13	11	11	11	14	11	11	11	9	9	9	9	9
LOS	C	C	C	B	B	B	B	B	C	B	C	C	B	B	B	B	B	B	B	B	B	B	B	A	A	B	B	A	A	A	A	A	A	A	A
Volume	7922	3494	3489	3474	3302	3407	3279	3561	3482	3590	3586	5702	6161	6148	6148	3426	3421	3429	3431	3250	3249	3255	3241	2739	2738	3563	3558	2757	2758	2749	3026	3023	3016	2347	
Lanes	6	3	3	4	3	4	3	4	3	4	3	5	6	6	6	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	4	
Length	1509	2000	1447	894	790	887	457	820	1170	717	1862	447	1521	1210	1533	2000	955	425	1487	2000	1344	1921	1536	1407	531	640	1405	464	2000	1696	1482	1475	1523	2000	
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	280	428	742	289	289	251	743	300	744	304	305	316	745	745	320	741	747	327	
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	

Speed Color Scale (mph)

10 30 40 50 70

			Exit 9							Exit 10		Exit 11				Watkins Mill Rd								Exit 13				Exit 15						Exit 16	
			I-370							MD 117		MD 124												Middlebrook Rd				MD 118						MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	64	63	64	64	64	63	59	62	63	64	64	64	64	62	62	63	63	63	63	63	63	63	63	64	63	63	63	63	64	63	63	64	63	64	
Density	9	8	10	10	10	10	11	13	13	12	12	12	12	12	15	14	14	14	14	14	12	13	11	12	12	9	11	12	12	11	11	11	9	12	
LOS	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	A	B	B	B	A	B	B	B	B	
Volume	2340	2547	2544	2538	2555	2556	4001	4021	4017	2973	2976	2977	2978	3638	3633	3642	3649	3654	3661	3643	3652	3342	3384	2984	2981	2963	2804	2310	2311	2689	2127	2135	2295	2275	
Lanes	4	5	4	4	4	4	6	5	5	4	4	4	4	5	4	4	4	4	4	4	5	4	5	4	4	5	4	3	3	4	3	3	4	3	
Length	1947	337	1171	633	2000	1616	531	843	1357	2000	2000	2000	1479	584	908	2000	2000	2000	402	725	763	636	672	874	1017	479	1561	1090	527	1717	520	1157	771	687	
LinkID	327	335	339	749	411	411	347	348	754	350	350	350	350	362	363	762	762	762	762	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381	
SegmentID	2	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

											Exit 18																		Exit 22								
											MD 121																		MD 109								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	63	63	64	64	64	64	64	63	63	64	61	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	63	62	63	63	63	63	63	
Density	9	13	13	13	13	13	13	13	9	10	9	9	11	12	17	17	17	17	17	17	17	17	17	17	17	17	12	16	11	17	17	17	17	17	
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Volume	2386	2403	2411	2410	2410	2398	2394	2384	2383	1850	2174	2181	2172	2190	2189	2192	2190	2195	2184	2170	2191	2176	2172	2160	2165	2157	2159	2054	2125	2118	2118	2112	2103	2100	
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000	
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771	
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4		

							Exit 26																				Exit 31								
							MD 80																				MD 85								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	63	63	63	62	62	62	59	63	60	62	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	58	63	61	63				
Density	17	17	17	17	17	17	12	15	14	20	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	13	18	13	14	11	11				
LOS	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	A				
Volume	2095	2095	2095	2097	2091	2081	2048	1866	2456	2445	2451	2448	2450	2449	2438	2420	2423	2399	2436	2434	2426	2422	2422	2412	2402	2417	2228	2191	1811	2730	2729				
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4				
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392				
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577				
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1				

Existing AM - I-270 SB Link Evaluation Results

Existing AM I-270 SB

	Exit 31 MD 85																						Exit 26 MD 80											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	54	57	56	58	58	57	58	53	53	56	56	56	55	55	50	44	36	29	24	19	18	18	17	15	14	13	24	25	26	25	25	25	25	25
Density	29	27	28	28	28	19	23	21	31	30	30	30	30	30	33	38	46	55	65	81	87	87	89	71	101	93	74	71	69	72	71	69	72	72
LOS	D	D	D	D	D	C	C	C	D	D	D	D	D	D	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4689	4661	4678	3194	3195	3178	2703	3326	3312	3337	3330	3333	3328	3330	3283	3293	3258	3189	3154	3125	3134	3138	3117	3121	2840	3534	3545	3561	3529	3548	3562	3497	3548	3561
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1261	228	654	401	1114	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 22 MD 109																						Exit 18 MD 121											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	25	25	25	24	23	23	19	37	46	45	46	47	47	46	47	47	47	46	46	52	53	52	52	51	52	53	53	53	45	27	22	21	17	12
Density	72	72	72	74	51	76	70	53	43	44	43	42	43	43	43	43	42	43	44	26	25	19	24	23	30	23	30	30	36	59	70	75	68	107
LOS	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	D	C	D	D	E	F	F	F	F	F
Volume	3561	3549	3554	3547	3535	3503	3973	3975	3983	3957	3933	3963	3973	3955	3993	4000	3982	3999	4002	4007	3997	3987	3744	4692	4693	4798	4804	4818	4812	4745	4708	4672	4675	3695
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

	Exit 16 MD 27					Exit 15 MD 118			Exit 13 Middlebrook Rd								Exit 11 Watkins Mill Rd			Exit 10 MD 124			Exit 9 MD 117							Exit 8 I-370				Shady Grove Rd
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	9	12	11	11	13	13	15	15	24	27	27	26	26	23	24	23	19	17	16	14	20	22	25	25	26	31	32	27	23	11	12	12	25	30
Density	124	120	117	109	121	96	112	93	75	67	67	69	69	77	73	77	77	82	99	106	91	85	75	75	70	58	49	63	61	110	102	99	60	50
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4480	4458	4946	4964	4604	4969	4920	5494	5470	5484	5479	7182	7192	7115	7131	7053	7138	7138	6149	7528	7461	7523	7538	9279	9310	9168	9312	6964	6964	4795	4829	6026	6040	6084
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	5	5	4	5	4	4	4	5	5	5	6	4	5	4	4	5	4	4
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	2000	527	1491	1471	1167	838	658	2000	1062	1569	1151	431	1058	1258	1263	2000	1427	1046	420	497
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	1026	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2000075	2000081	2000082	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1

	Exit 5 MD 189											Exit 4 Montrose Rd											I-270 Spur				Exit 1 Westlake Terrace	Exit 1 Democracy Blvd						I-270 W Spur/I-495
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	30	21	17	15	20	20	18	29	33	21	18	18	18	18	16	23	22	21	21	22	30	36	33	29	19	17	23	30	30	30	32	39	41	36
Density	51	59	73	78	72	72	72	57	50	65	76	77	77	77	84	71	75	76	78	76	56	47	44	56	94	103	60	55	56	37	42	46	44	46
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	F	F	F	F	F	F	E	E	F	E	F
Volume	6131	4977	5116	5689	5737	5743	6572	6586	6618	5521	5529	5533	5504	5481	6560	6556	6575	6537	6546	10064	10131	10086	10153	9909	5263	5259	5428	5029	4994	5445	5403	5413	5390	9935
Lanes	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	6	6	6	7	6	3	3	4	3	3	5	4	3	3	6
Length	1518	2000	1645	473	1022	1591	655	921	1515	2000	1237	1874	2000	1407	598	882	303	2000	1022	2000	1707	722	400	371	2000	1000	963	2000	461	522	937	2000	520	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2000124	159	194	194	2000134	2000135	728	239	239	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1

Existing PM - I-495 OL Link Evaluation Results

Existing PM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	47	23	50	55	56	58	58	58	58	56	57	58	58	56	53	58	57	58	58	57	58	58	53	53	53	53	53	52	52	52	53	53	53
Density	31	39	76	35	32	31	32	21	25	26	26	26	29	27	26	35	32	25	28	28	24	26	26	25	31	31	31	31	32	32	32	25	25	25
LOS	D	E	F	E	D	D	D	C	C	C	D	D	D	D	C	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	D	C	C	C
Volume	9137	9127	5273	5287	5280	5277	3730	3736	2955	2953	4465	4478	3339	6352	7258	7271	7259	7215	6540	6553	6750	6079	6068	6581	6448	6623	6623	6620	6612	6610	6595	6558	5260	5248
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	729	508
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337							Exit 11 MD 4													Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	53	51	46	37	26	21	18	17	18	18	41	50	51	53	53	50	51	52	52	50	52	52	53	53	53	53	41	28	20	31	31	27
Density	23	27	27	26	36	45	63	78	84	89	86	79	44	36	36	31	31	29	33	32	29	38	37	37	37	37	36	29	45	65	80	59	59	64
LOS	C	D	D	D	E	E	F	F	F	F	F	F	E	E	E	D	D	D	D	D	D	E	E	E	E	E	E	D	E	F	F	F	F	F
Volume	5916	5641	5633	6739	6668	6696	6634	6596	6217	6191	6167	7239	7271	7216	7268	6514	6496	7343	6597	6589	7662	7645	7664	7664	7675	7677	7627	7672	7282	7201	7887	7272	7220	7064
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	481	657	677	798	2000	773	1493	2000	2000	1594	706	788	515	1390	726	505	449	551	554	462	1023	2000	2000	2000	933	536	940	2000	518	1353	2000	1046	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	2	1	1	2	1

	Exit 15 MD 214					Exit 16 Arena Dr			Exit 17 MD 202											Exit 19 US 50									Exit 20 MD 450					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	19	12	12	15	13	16	19	18	14	14	14	10	15	17	24	42	48	53	57	58	58	58	58	58	53	55	57	58	57	56	57	48	29	23
Density	77	121	107	112	106	88	89	77	117	118	117	121	98	85	77	43	38	28	24	19	21	21	21	20	27	28	22	26	23	30	30	35	57	70
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	C	C	C	C	C	C	D	D	C	C	C	D	D	D	F	F
Volume	7237	5825	6615	6619	7022	7077	6731	6813	4791	4783	4767	7286	7236	7284	7282	7285	7277	7274	5604	5600	4971	4965	4937	7047	7184	6251	6173	5926	6694	6641	6693	6689	6606	6490
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1160	803	743	1378	1328	648	1500	2000	2000	1020	1002	499	722	2000	1520	793	705	785	562	2000	276	520	571	1391	716	276	949	1042	455	2000	2000	2000	1837
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201							Exit 24 Greenbelt Metro Station						Exit 25 US 1							Exit 27 I-95					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	22	16	13	13	12	17	18	14	15	16	14	21	19	23	24	29	23	29	50	55	57	57	57	58	56	58	59	58	58	58	53	53	53	53
Density	74	77	98	100	109	94	89	97	103	97	105	85	78	82	77	63	66	66	39	32	31	28	25	24	25	19	19	15	19	19	23	23	23	25
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	D	C	C	C	C	C	B	C	C	C	C	C	C
Volume	6410	6341	5267	5240	6502	6385	6396	6976	6262	6299	7086	7134	7425	7388	7414	7417	7760	7779	7774	7047	7016	7811	8456	8445	8446	4398	4352	4405	4433	4421	7279	7297	7284	6608
Lanes	4	5	4	4	5	4	4	5	4	4	5	4	5	4	4	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	595	570	541	439	501	699	1815	589	828	434	995	471	993	2000	1085	1301	1225	1250	244	973	1149	1517	673	1486	2000	355	1017	490	825	1506	839	1513	814
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	1033	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

Existing PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	53	53	52	53	51	51	52	53	53	53	52	53	53	53	52	47	46	51	53	53	53	52	52	52	49	50	50	52	53	53	53	53
Density	25	23	24	24	22	27	27	35	33	26	29	26	32	32	32	27	32	32	40	36	36	35	28	30	28	35	29	39	38	38	37	36	31	31
LOS	C	C	C	C	C	D	D	D	D	D	D	C	D	D	D	D	D	D	E	E	E	E	D	D	D	D	D	E	E	E	E	E	D	D
Volume	6570	7097	6362	6356	6963	6984	6980	6985	6960	6984	6148	6791	6741	6792	6762	7000	6642	7470	7453	7474	7465	7429	7457	6273	7223	7155	7655	7639	7693	7692	7683	7674	6522	6502
Lanes	5	6	5	5	6	5	5	4	4	5	4	5	4	4	4	5	4	5	4	4	4	4	5	4	5	4	5	4	4	4	4	4	4	4
Length	509	450	501	284	347	1136	1629	1881	1185	301	793	713	805	1020	517	277	854	787	704	2000	832	1091	449	719	500	336	957	536	2000	2000	1795	1336	311	1657
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	53	51	47	47	51	52	53	53	53	49	53	53	53	53	53	53	53	53	53	53	42	15	15	16	16	18	18	18	16	15	15	18
Density	28	35	29	37	40	41	37	37	29	32	22	20	25	25	25	19	21	19	19	26	26	26	33	93	82	92	94	84	82	70	85	98	100	80
LOS	D	D	D	E	E	E	E	E	D	D	C	C	C	C	C	C	C	C	C	C	C	C	D	F	F	F	F	F	F	F	F	F	F	F
Volume	7250	7225	7658	7616	7647	7642	7658	7651	7642	6693	3499	3940	3944	3944	3942	3940	3436	3067	4092	4083	4096	4099	4093	4053	7434	7466	7402	7427	7331	7436	6581	5947	5902	7014
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	746	998	526	1257	2000	87	1045	402	1593	288	910	494	913	1192	325	2000	22	406	1085	2000	2000	2000	1657	554	938	2000	659	446	1032	1585	2000	663	1788
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	28	27	29	41	48	42	34	17	13	12	18	18	20
Density	61	64	64	49	43	35	34	42	82	106	105	88	77	88
LOS	F	F	F	F	E	D	D	E	F	F	F	F	F	F
Volume	7010	7041	6906	7011	7008	8290	5724	5673	5560	5523	6432	6448	6984	6998
Lanes	4	4	4	5	4	5	4	4	4	4	5	4	5	4
Length	2000	1149	521	922	1713	1524	320	2000	2000	1213	735	1053	1414	613
LinkID	495415	495415	1067	495416	495417	495418	11138	1069	1069	1069	1083	1084	1101	1114
SegmentID	1	2	1	1	1	1	1	1	2	3	1	1	1	1

Existing PM - I-495 IL Link Evaluation Results

Existing PM
I-495 IL

				Exit 44				Exit 43			Bridge		Exit 41									Exit 39															Exit 36
				VA 193				GW Memorial Pkwy			American Legion		Clara Barton Pkwy									MD 190								I-270 W Spur							MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	23	14	14	10	8	7	8	10	17	19	17	16	16	12	13	17	16	16	15	13	15	14	19	21	24	40	41	52	55	54	54	53	38	22			
Density	43	67	67	107	119	143	132	130	90	81	93	109	109	119	105	101	109	110	92	119	105	106	77	81	74	37	36	25	24	24	24	24	25	52			
LOS	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	C	C	C	C	C	C	F			
Volume	5915	5774	5774	5358	5043	6347	6360	6219	6171	6211	8009	6877	6903	7005	6951	6929	6940	6948	6935	6322	7643	7582	8854	8642	8778	8790	8758	3891	3915	3915	3909	3910	3894	3404			
Lanes	6	6	6	5	5	6	6	5	4	4	5	4	4	5	5	4	4	4	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3			
Length	435	1499	1499	2000	95	1500	1537	645	687	494	1975	500	706	1511	777	2000	1461	1064	400	1947	1495	621	1123	398	1764	732	1509	2000	2000	2000	1671	1173	305	2000			
LinkID	1100	1037	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	495414	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270			
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1			

Speed Color Scale (mph)

10 30 40 50 70

					Exit 34											Exit 33										Exit 31												
					MD 355											MD 185										MD 97												
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	15	15	16	17	16	12	12	14	13	13	14	15	14	13	12	11	13	13	20	21	23	23	21	21	18	16	19	19	22	36	36	34	31	28			
Density	69	59	76	70	100	115	91	97	102	102	107	103	88	92	113	105	111	110	88	87	79	78	68	69	89	93	95	82	87	53	52	55	60	65			
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
Volume	3066	3594	3540	3457	3126	5712	6611	6702	6756	6700	6009	6012	6018	6031	5447	5716	5688	7214	7214	7161	7208	7179	7152	7139	6604	7315	7070	7611	7520	7568	7552	7532	7343	7266			
Lanes	3	4	3	3	2	4	6	5	5	5	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4			
Length	21	439	659	1113	1519	1951	513	1013	1002	522	1603	252	526	658	913	228	793	1635	2000	164	2000	1786	2000	50	837	411	323	1131	452	2000	1086	1248	248	500			
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	1124	1125	1990014	495307			
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1			

	Exit 30					Exit 29										Exit 28							Exit 27						Exit 25								
	US 29					MD 193										MD 650							I-95						US 1								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	25	19	17	14	16	15	19	18	24	28	38	46	45	42	37	27	29	40	53	53	53	53	52	53	52	39	19	15	15	18	29	39	46	48			
Density	58	82	94	103	103	93	94	86	79	67	50	41	33	43	48	58	64	46	31	31	25	25	22	27	27	32	69	109	111	89	71	52	44	34			
LOS	F	F	F	F	F	F	F	F	F	F	F	E	D	E	F	F	F	F	D	D	C	C	C	D	D	D	F	F	F	F	F	F	E	D			
Volume	7273	6262	6254	7165	6555	7101	7155	7604	7647	7633	7629	7614	7608	7172	7129	7830	7456	7467	8282	8259	5271	5295	5648	5643	5596	3774	6659	6660	6683	8092	8088	8122	8027	8107			
Lanes	5	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5			
Length	260	499	524	1562	808	422	768	284	1222	2000	1072	1153	356	352	505	464	500	1046	1496	1493	1028	536	347	2000	140	1527	1473	2000	1605	671	846	626	481	1017			
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314			
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1			

	Exit 24					Exit 23							Exit 22											Exit 20						Exit 19								
	Greenbelt Metro Station					MD 201							MD 295											MD 450						US 50								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	48	48	48	51	51	50	46	34	41	50	51	50	48	46	48	48	39	36	33	33	31	28	25	23	26	33	20	13	13	13	13	16	22	33			
Density	42	42	41	32	32	29	40	46	49	32	33	34	34	42	40	32	50	55	59	58	63	68	59	77	64	62	80	120	98	115	110	85	73	61			
LOS	E	E	E	D	D	D	E	F	F	D	D	D	D	E	E	D	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
Volume	7987	7992	7957	7986	6594	7259	7234	7956	7950	7963	6821	6835	8235	7759	7723	7819	7777	7781	7724	7701	7665	7558	7383	7071	8211	8151	8120	6159	6206	5747	5754	7989	7981	7942			
Lanes	4	4	4	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4			
Length	2000	1603	1046	440	1150	761	810	740	938	452	520	566	554	497	516	779	711	2000	2000	2000	1629	1217	263	1180	915	561	1359	1371	213	2000	616	1434	754	2000			
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311			
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1			

Existing PM

I-495 IL

							Exit 16 Arena Dr					Exit 15 MD 214				Exit 13 Ritchie Marlboro Rd											Exit 11 MD 4								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	32	29	24	20	20	20	29	49	49	48	46	50	50	45	48	49	49	52	52	52	51	51	51	49	50	48	51	52	50	51	52	51	51	52	
Density	61	54	65	97	96	96	61	31	31	32	38	28	32	34	39	39	38	29	28	28	28	34	35	36	35	37	30	30	28	30	30	27	33	33	
LOS	F	F	F	F	F	F	F	D	D	D	E	D	D	D	E	E	E	D	D	D	D	D	D	E	E	E	D	D	D	D	D	D	D	D	
Volume	7874	7904	7928	5742	5775	5769	7140	7596	7606	7600	6987	6985	6411	7587	7589	7576	7479	7555	5890	5868	7050	7021	7058	7058	7040	7044	6250	6243	6954	6095	6115	6835	6818	6812	
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1072	1492	2000	2000	2000	772	1366	456	484	565	511	527	1147	344	1293	
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153	
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1	
			Exit 9 MD 337										Exit 7 MD 5													Exit 4 MD 414										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	
Speed	52	52	61	63	63	62	60	56	57	61	63	63	62	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	62	62	60	62	63	63	
Density	33	26	26	25	25	23	29	31	31	23	22	17	18	22	18	23	23	23	23	23	23	23	18	21	21	19	20	20	18	22	22	28	18	21	
LOS	D	D	C	C	C	C	D	D	D	C	C	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	D	C	C	
Volume	6793	6797	6327	6347	6320	6966	6941	6986	6960	6961	6953	4389	5424	5447	5683	5722	5742	5739	5728	5730	5730	5695	5681	5422	5375	5733	5040	5027	5458	5469	5368	3476	3491	2709	
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2	
Length	896	625	2000	2000	770	663	823	2000	727	761	1487	1134	789	706	691	807	2000	2000	2000	2000	670	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386	
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	1158	1158	1158	1158	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305	
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	1	2	1	1	1	

	Exit 3 MD 210						Exit 2 I-295		WWB					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	54	38	28	24	21	45	49	53	53	53	56	57
Density	14	19	18	34	44	68	77	49	44	41	40	40	31	31
LOS	B	C	B	D	E	F	F	F	E	E	E	E	D	D
Volume	3386	3361	3826	3791	3753	3333	4740	4403	6414	6423	6413	6360	8608	8624
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Existing PM - I-270 NB Link Evaluation Results

Existing PM
I-270 NB

		Exit 1																	Exit 4				Exit 5					Exit 6								Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28								Shady Grove Rd
Direction of Travel		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed		41	37	36	27	22	14	22	23	30	30	36	34	47	52	52	51	52	53	37	49	53	53	52	52	53	49	50	53	52	52	53	53	51	35
Density		36	44	45	44	65	80	68	58	59	49	55	59	39	36	35	39	38	37	53	39	36	36	37	33	33	35	42	37	37	37	32	32	34	46
LOS		E	E	F	E	F	F	F	F	F	F	F	F	E	E	E	E	E	E	F	E	E	E	E	D	D	D	E	E	E	E	D	D	D	F
Volume		8758	4838	4833	4777	4290	4547	4496	5332	5299	5946	5953	9950	11016	11026	11029	7854	7843	7853	7868	7611	7595	7611	7612	6986	6986	8442	8443	7684	7690	7686	8510	8511	8501	6389
Lanes		6	3	3	4	3	4	3	4	3	4	3	5	6	6	6	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	4
Length		1509	2000	1447	894	790	887	457	820	1170	716	1849	447	1521	1210	1533	2000	955	425	1487	2000	1344	1921	1536	1407	531	640	1405	464	2000	1696	1482	1475	1523	2000
LinkID		1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	280	428	742	289	289	251	743	300	744	304	305	316	745	745	320	741	747	327
SegmentID		1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Exit 9				Exit 10		Exit 11							Exit 13					Exit 15								Exit 16							
		I-370				MD 117		MD 124				Watkins Mill Rd			Middlebrook Rd					MD 118								MD 27							
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed		22	14	18	18	19	19	16	20	21	19	20	20	20	19	37	40	36	35	33	32	25	20	17	21	25	34	35	39	47	48	48	48	48	47
Density		73	93	90	89	88	86	83	80	78	87	84	84	83	82	53	50	55	57	60	61	62	94	89	78	66	39	45	48	40	32	31	31	25	33
LOS		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	F	F	E	D	D	D	C	D
Volume		6324	6532	6540	6538	6562	6535	7987	8012	8015	6702	6722	6680	6633	7936	7934	7965	7940	7912	7901	7849	7873	7370	7460	6658	6657	6627	6306	5682	5680	6194	4432	4455	4730	4692
Lanes		4	5	4	4	4	4	6	5	5	4	4	4	4	5	4	4	4	4	4	4	5	4	5	4	4	5	4	3	3	4	3	3	4	3
Length		1947	337	1171	633	2000	1610	531	843	1357	2000	2000	2000	1479	584	908	2000	2000	2000	402	725	763	636	665	872	1017	479	1561	1090	527	1717	520	1157	771	687
LinkID		327	335	339	749	411	411	347	348	754	350	350	350	350	362	363	762	762	762	762	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID		2	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		Exit 18																										Exit 22								
		MD 121																										MD 109								
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed		47	46	47	45	41	36	33	32	29	24	22	20	23	31	45	49	50	50	50	50	50	50	50	50	52	52	53	53	52	51	52	52	52	52
Density		26	35	35	36	40	45	49	50	41	55	49	52	62	45	47	42	41	41	41	41	42	41	41	41	40	40	26	37	26	40	39	39	39	39
LOS		C	E	E	E	E	F	F	F	E	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	E	E	C	E	D	E	E	E	E	E
Volume		4876	4909	4927	4920	4904	4863	4840	4803	4784	3999	4253	4231	4180	4191	4171	4175	4168	4179	4170	4144	4179	4153	4154	4167	4178	4160	4162	3980	4108	4099	4112	4108	4110	4113
Lanes		4	3	3	3	3	3	3	3	4	3	4	4	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length		457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID		383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID		1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		Exit 26																										Exit 31					
		MD 80																										MD 85					
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed		52	52	52	52	52	51	51	52	47	46	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	53	53	52	53	53	53			
Density		39	39	39	39	39	40	27	34	29	46	41	40	40	40	40	40	40	39	40	40	40	40	40	40	40	26	36	24	33	24	24			
LOS		E	E	E	E	E	E	D	D	D	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	E	C	D	C	C			
Volume		4108	4109	4105	4111	4108	4091	4041	3569	4187	4173	4184	4186	4180	4180	4179	4160	4168	4127	4185	4188	4185	4178	4170	4169	4146	4159	3847	3795	3524	5088	5091			
Lanes		2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4			
Length		1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392			
LinkID		771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577			
SegmentID		5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1			

Existing PM - I-270 SB Link Evaluation Results

Exit 31 — MD 85 — Exit 26 — MD 80

Existing PM I-270 SB																																			
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	58	59	58	56	59	55	59	62	63	63	63	63	63	63	62	61	61	60	59	58	57	55	60	59	57	58	58	59	59	58	58	58	
Density	18	18	18	20	20	14	15	14	20	19	18	18	18	18	18	18	19	19	19	19	19	20	20	14	16	12	19	18	18	18	18	18	18	18	
LOS	B	B	B	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	B	C	B	C	C	
Volume	3075	3062	3072	2317	2321	2305	1796	2338	2322	2328	2324	2332	2328	2324	2296	2322	2321	2313	2311	2301	2293	2293	2294	2295	1874	2122	2131	2125	2104	2112	2113	2068	2106	2117	
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1261	228	654	401	1114	1849	565	2000	2000	57	2000	2000	
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453	
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2	

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

Exit 22 — MD 109 — Exit 18 — MD 121

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	58	58	58	54	55	58	58	57	58	58	58	58	58	58	57	58	60	62	61	62	61	63	63	63	64	64	64	64	63	63	64	
Density	18	18	18	18	12	17	14	20	19	19	19	19	19	19	19	19	19	19	19	12	12	9	11	10	13	10	14	13	13	13	13	13	10	12	
LOS	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A	A	B	A	B	B	B	B	B	B	B	B	
Volume	2120	2117	2112	2111	2102	2039	2199	2201	2208	2198	2188	2212	2213	2197	2210	2211	2199	2210	2203	2202	2195	2190	1988	2371	2365	2577	2575	2565	2561	2561	2565	2547	2547	2203	
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3	
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047	
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	
SegmentID																																			

Exit 16 — MD 27 — Exit 15 — MD 118 — Exit 13 — Middlebrook Rd — Exit 11 — Watkins Mill Rd — MD 124 — Exit 10 — MD 117 — Exit 9 — I-370 — Exit 8 — Shady Grove Rd

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	63	63	63	63	62	63	62	62	63	63	63	63	64	63	63	64	63	64	60	62	62	62	61	61	61	62	63	64	64	64	64	60	59	60
Density	11	14	12	12	14	12	15	14	19	19	19	18	18	17	18	17	14	14	14	16	19	19	20	21	21	21	17	17	13	13	13	14	18	18	
LOS	B	B	B	B	B	B	B	B	C	C	C	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	B	B	B	B	B	B	B	B	
Volume	2751	2735	2975	2978	2632	2949	2921	3533	3534	3542	3540	4427	4437	4426	4430	4365	4424	4431	3574	4869	4829	4861	4864	6460	6477	6402	6467	4238	4232	3385	3383	4211	4216	4222	
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	5	5	4	5	4	4	4	5	5	5	6	4	5	4	4	5	4	4	
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	2000	527	1491	1471	1167	838	658	2000	1062	1569	1151	431	1058	1258	1263	2000	1427	1046	420	497	
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	1026	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2000075	2000081	2000082	723	
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	

Exit 5 — MD 189 — Exit 4 — Montrose Rd — Exit 1 — I-270 Spur — Westlake Terrace — Democracy Blvd — I-270 W Spur/I-495

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	61	61	61	60	60	60	59	59	61	60	60	60	60	61	60	60	61	60	60	59	59	60	60	58	58	58	59	59	57	29	19	20	15	
Density	18	14	14	14	18	18	16	20	20	16	16	16	16	16	17	22	22	22	22	20	21	21	17	20	20	20	16	16	16	12	30	60	57	82	
LOS	B	B	B	B	C	B	B	C	C	B	B	B	B	B	B	C	C	C	C	C	C	C	B	C	C	C	B	B	B	B	D	F	F	F	
Volume	4222	3491	3499	4328	4326	4310	4803	4802	4801	3893	3897	3902	3896	3887	5318	5336	5349	5332	5342	7359	7348	7288	7310	7055	3467	3452	3632	2821	2804	3427	3415	3375	3363	7434	
Lanes	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	6	6	6	7	6	3	3	4	3	3	5	4	3	3	6	
Length	1518	2000	1645	473	1022	1591	655	921	1515	2000	1237	1874	2000	1407	598	882	303	2000	1022	2000	1707	722	400	371	2000	1000	963	2000	461	522	937	2000	520	554	
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2000124	159	194	194	2000134	2000135	728	239	239	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375	
SegmentID	1	1	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1	

2040 No-Build AM - I-495 OL Link Evaluation Results

2040 No-Build AM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	15	19	23	50	56	57	58	59	59	58	58	59	59	59	59	58	59	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53	53	53
Density	107	84	78	35	32	31	21	14	17	17	15	15	18	18	17	22	21	17	20	20	17	20	19	19	23	24	24	24	24	24	24	19	20	20
LOS	F	F	F	E	D	D	C	B	B	B	B	B	C	C	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C
Volume	7918	7890	5266	5278	5271	5264	2481	2482	2010	1997	2687	2685	2162	4248	4967	4982	4979	4952	4758	4763	5072	4620	4609	5063	4947	5103	5113	5116	5107	5107	5092	5072	4253	4243
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	1268	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	729	508
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
Speed	52	54	54	52	52	54	54	52	55	54	54	50	49	53	54	55	55	51	53	54	51	50	56	56	55	55	55	56	49	34	28	34	33	31
Density	18	20	20	25	31	29	30	30	25	26	26	27	35	32	31	29	28	27	29	28	29	37	33	34	34	34	34	27	36	52	60	60	62	63
LOS	C	C	C	C	D	D	D	D	C	C	C	D	D	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	E	F	F	F	F	F
Volume	4733	4364	4361	6393	6310	6379	6376	6373	5561	5570	5565	6761	6787	6751	6794	6272	6257	6911	6187	6177	7532	7505	7523	7526	7518	7532	7493	7531	7006	6909	8333	8169	8085	7877
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	481	657	677	798	2000	773	1493	2000	2000	1594	706	788	515	1390	726	505	449	551	554	462	1023	2000	2000	2000	933	536	940	2000	518	1353	2000	1046	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214						Exit 16 Arena Dr			Exit 17 MD 202						Exit 19 US 50										Exit 20 MD 450									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	23	19	20	17	18	22	20	17	17	17	11	18	20	46	54	56	59	57	58	58	58	58	47	28	24	23	21	18	34	54	58	58	55
Density	56	73	77	91	93	85	82	72	97	95	96	113	85	77	42	36	35	26	30	23	25	25	25	31	61	83	68	90	97	64	40	38	37	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	C	C	C	C	D	F	F	F	F	F	F	E	E	E	E
Volume	7995	6666	7287	7207	7862	7817	7153	7207	5015	4999	4989	7673	7650	7700	7692	7714	7714	7707	6712	6709	5823	5824	5826	8554	8590	7972	7843	7699	8694	8657	8710	8716	8716	8714
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1160	803	743	1378	1328	648	1500	2000	2000	1019	1002	499	722	2000	1520	793	705	785	562	2000	276	288	800	1391	716	276	949	1042	455	2000	2000	2000	1837
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201												Exit 25 US 1							Exit 27 I-95					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	56	53	53	51	50	51	52	52	53	53	54	55	54	48	52	57	56	56	56	58	58	58	58	56	58	59	59	53	28	7	8	8	8
Density	38	31	34	34	33	41	41	34	35	34	29	29	24	30	33	36	28	35	36	30	29	25	23	22	23	18	18	15	21	39	144	130	132	139
LOS	E	D	D	D	D	E	E	D	E	D	D	D	C	D	D	E	D	E	E	D	D	C	C	C	C	C	B	B	C	E	F	F	F	F
Volume	8675	8653	7145	7163	8407	8291	8318	8798	7321	7349	7784	7827	8040	8010	8035	7488	7939	7965	7959	6836	6812	7274	7790	7794	7796	4268	4232	4350	4372	4274	6058	6032	5946	5401
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	595	570	541	439	501	699	1815	589	828	434	995	471	993	1104	1978	1301	1225	1250	244	973	1149	1517	673	1486	2000	355	1017	490	825	1506	839	1513	814
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 No-Build AM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	8	6	7	7	6	8	7	11	11	10	9	8	11	12	11	10	11	9	14	14	14	14	12	11	10	14	11	19	20	19	23	23	21	14
Density	142	151	147	145	157	142	149	121	119	105	134	145	120	118	120	108	122	138	109	106	106	109	101	129	129	115	126	93	90	90	77	76	66	99
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5319	5632	5178	5154	5457	5449	5439	5356	5324	5302	4933	5530	5475	5503	5450	5671	5393	6067	6058	6078	6027	5966	5958	5567	6366	6294	7049	7034	6999	6947	6912	6859	5477	5386
Lanes	5	6	5	5	6	5	5	4	4	5	4	5	4	4	4	5	4	5	4	4	4	4	5	4	5	4	5	4	4	4	4	4	4	4
Length	509	450	501	284	347	1136	1629	1881	1185	301	793	713	805	1020	517	277	854	787	704	2000	832	1091	449	621	594	336	957	536	2000	2000	1795	1336	311	1657
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur						Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	13	12	15	15	14	14	13	12	10	7	7	9	8	8	8	7	7	7	10	9	10	10	12	24	26	42	51	52	53	52	52	53	41
Density	111	107	105	106	106	108	113	115	98	129	153	121	138	141	145	115	153	135	144	136	137	136	128	105	71	77	48	39	38	32	34	36	35	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	E	E	E
Volume	5792	5709	6395	6284	6283	6198	6134	6114	6084	5327	2996	3543	3566	3549	3555	3539	3130	2796	3921	3903	3905	3912	3898	3895	10045	10034	10045	10045	9876	10044	8717	7492	7456	8213
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	746	998	526	1257	2000	87	1045	402	1593	288	910	494	913	1192	325	2000	22	406	1085	2000	2000	2000	1657	551	936	2000	659	446	1032	1585	2000	663	1788
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	47	52	52	51	50	52	53	53	53	53	52	52	53	52
Density	44	40	39	32	40	34	32	25	21	21	20	23	20	24
LOS	E	E	E	D	E	D	D	C	C	C	C	C	C	C
Volume	8219	8258	8111	8234	8080	8984	6742	6737	6738	6734	7168	7246	7523	7542
Lanes	4	4	4	5	4	5	4	5	6	6	7	6	7	6
Length	2000	1149	521	922	1713	1560	280	1428	2000	1765	734	1049	1413	613
LinkID	495415	495415	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	2	1	1	1	1	1	1	1	2	1	1	1	1

2040 No-Build AM - I-495 IL Link Evaluation Results

2040 No-Build AM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	32	26	20	14	11	10	9	8	12	13	15	48	53	55	57	56	56	56	56	57	57	57	57	57	55	57	57	54	58	57	57	57	42	56
Density	42	51	55	86	101	116	131	139	114	109	94	40	36	28	28	35	35	35	28	30	25	25	24	28	29	24	24	27	26	26	26	26	26	23
LOS	E	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	D	D	D	D	C	C	C	D	D	C	C	D	C	C	C	D	D	C
Volume	8135	7974	7870	7115	6858	7991	7825	7025	6994	6965	8421	7638	7671	7816	7815	7782	7809	7801	7769	6910	7230	7202	8149	7985	8112	8118	8131	4436	4438	4433	4442	4455	4454	3827
Lanes	6	6	7	6	6	7	7	6	5	5	6	4	4	5	5	4	4	4	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3
Length	2000	184	1499	2000	98	1502	1538	645	676	490	635	500	706	1511	777	2000	1461	1064	400	1947	1495	621	1123	398	1764	732	1509	2000	2000	2000	1671	1173	305	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	495414	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)
10 30 40 50 70

	Exit 34 MD 355															Exit 33 MD 185									Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	56	50	50	59	60	53	28	21	43	55	58	54	57	55	59	59	59	59	52	58	56	45	54	32	54	58	60	59	59	60	60	59
Density	20	18	25	28	37	28	22	30	57	74	45	35	27	29	28	24	28	25	31	31	35	32	26	33	28	42	30	24	28	29	29	29	28	28
LOS	C	C	C	D	E	D	C	D	F	F	F	E	D	D	D	C	D	C	D	D	E	D	D	D	D	E	D	C	D	D	D	D	D	D
Volume	3538	4214	4223	4231	3680	6636	7885	7906	7855	7786	7753	7776	7772	7743	6368	6523	6516	7360	7354	7298	7332	7319	7327	7345	6153	6845	6540	6891	6801	6871	6849	6828	6701	6656
Lanes	3	4	3	3	2	4	6	5	5	5	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4
Length	21	439	659	1113	1519	1951	513	1013	1002	521	1603	252	526	658	913	228	793	1635	2000	164	2000	1786	2000	50	837	411	323	1131	452	2000	1086	1248	248	500
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	1124	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650								Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	60	61	60	61	55	56	48	56	59	60	61	60	61	60	45	53	59	59	60	61	62	60	61	61	62	57	48	35	30	38	43	45	39
Density	23	25	25	22	24	24	29	28	31	29	29	28	23	27	27	32	31	28	27	26	20	20	17	21	21	20	21	32	44	51	51	45	43	40
LOS	C	C	C	C	C	C	D	D	D	D	D	D	C	D	D	D	D	D	D	D	C	C	B	C	C	C	C	D	E	F	F	F	E	E
Volume	6693	5939	5961	6518	5847	6539	6565	6887	6904	6878	6868	6846	6836	6489	6439	7101	6584	6606	7852	7837	4853	4878	5206	5212	5167	3700	5980	6081	6206	7721	7715	7759	7680	7761
Lanes	5	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	260	499	524	1562	808	422	768	284	1222	2000	1072	1153	356	352	505	464	500	1046	1496	1493	1028	536	347	2000	140	1527	1473	2000	1605	670	846	626	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295													Exit 20 MD 450					Exit 19 US 50					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	48	54	52	46	53	53	52	50	50	54	55	55	53	54	55	55	55	55	55	54	54	54	52	55	46	49	56	56	54	57	57	56	53	53
Density	37	28	28	32	28	25	31	28	33	25	26	26	25	28	28	22	28	28	28	29	28	29	23	25	29	34	24	24	20	21	21	23	29	36
LOS	E	D	D	D	D	C	D	D	D	C	C	C	C	D	D	C	D	D	D	D	D	D	C	C	D	D	C	C	C	C	C	C	D	E
Volume	7046	7400	7382	7396	6048	6490	6459	6889	6752	6756	5666	5670	6653	6096	6068	6153	6134	6161	6165	6155	6155	6134	6005	5479	6619	6599	6603	5423	5447	4749	4771	7748	7756	7759
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1046	440	1150	761	810	740	938	452	520	566	554	497	516	779	711	2000	2000	2000	1629	1217	263	1109	984	561	1359	1371	213	2000	616	1434	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 No-Build AM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	55	56	55	55	55	54	56	57	57	57	54	57	58	56	54	56	57	56	48	30	28	25	23	22	25	25	51	57	53	56	58	58	58	59
Density	35	28	28	36	36	36	32	27	27	27	32	24	27	27	35	34	33	27	34	53	54	75	83	85	74	76	29	26	27	28	27	23	29	28
LOS	E	D	D	E	E	E	D	D	D	D	D	C	D	D	E	D	D	D	D	F	F	F	F	F	F	F	D	D	D	D	D	C	D	D
Volume	7717	7733	7766	5835	5841	5825	7310	7625	7633	7622	6900	6910	6316	7619	7618	7628	7548	7628	6552	6458	7634	7532	7496	7479	7490	7462	6014	6004	6963	6144	6159	6680	6684	6709
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1072	1492	2000	2000	2000	772	1366	456	484	565	511	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	62	63	63	63	61	60	59	58	26	12	7	8	7	9	8	8	8	8	8	8	7	7	8	8	10	10	9	12	12	9	7	5
Density	28	23	24	24	24	20	26	27	27	22	48	79	121	140	132	137	144	146	149	143	146	146	119	146	127	112	108	106	111	99	100	115	95	139
LOS	D	C	C	C	C	C	C	D	D	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6697	6697	6074	6091	6076	6316	6296	6345	6333	6349	6262	3794	4422	4361	4733	4729	4708	4691	4609	4588	4515	4449	4457	4180	4138	4548	4305	4294	4796	4842	4781	2036	2051	1427
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	823	2000	727	761	1487	1134	789	706	691	807	2000	2000	2000	2000	670	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	1158	1158	1158	1158	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	4	6	8	11	12	15	18	45	57	58	58	54	46	57
Density	154	141	108	105	92	103	87	51	34	34	34	36	44	36
LOS	F	F	F	F	F	F	F	F	D	D	D	E	E	E
Volume	2772	2728	3444	3435	3443	3007	4666	4623	5893	5899	5902	5874	10081	10100
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Exit 16 — Arena Dr

Exit 15 — MD 214

Exit 13 — Ritchie Marlboro Rd

Exit 11 — MD 4

Exit 9 — MD 337

Exit 7 — MD 5

Exit 4 — MD 414

Exit 3 — MD 210

Exit 2 — I-295

WWB

2040 No-Build AM - I-270 NB Link Evaluation Results

2040 No-Build AM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur						Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	63	64	64	63	63	63	63	63	63	63	63	63	63	64	64	64	64	64	64	64	63	63	63	63	61	63	64	64	64	64	64	64
Density	24	22	20	14	18	14	18	15	15	12	15	15	14	14	14	11	11	11	11	13	13	13	13	11	11	11	12	11	11	11	10	10	10	9
LOS	C	C	C	B	C	B	C	B	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	A	A	B	B	A	A	A	A	A	A	A
Volume	8131	3686	3685	3672	3474	3613	3460	3780	3763	3875	3867	5717	6104	6099	6087	3386	3379	3386	3391	3202	3192	3193	3189	2716	2718	3566	3566	2747	2748	2745	3073	3066	3057	2359
Lanes	6	3	3	4	3	4	3	4	4	5	4	6	7	7	7	5	5	5	5	4	4	4	4	4	4	5	5	4	4	4	5	5	5	4
Length	1509	2000	1447	894	790	887	457	820	1170	718	1863	447	1521	1210	1533	2000	954	425	1486	2000	1344	1921	1536	1407	531	640	1405	464	2000	1696	1482	1475	1523	2000
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	280	428	742	289	289	251	743	300	744	304	305	316	745	745	320	741	747	327
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

				Exit 9							Exit 10		Exit 11											Exit 13				Exit 15							Exit 16
				I-370							MD 117		MD 124				Watkins Mill Rd							Middlebrook Rd				MD 118							MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	64	64	64	64	64	63	56	60	62	63	64	64	64	64	63	63	63	62	64	63	63	63	63	59	62	63	63	63	63	63	62	63	64	63	63
Density	9	7	9	9	9	9	13	14	14	12	12	12	12	12	12	11	14	14	14	14	14	11	13	14	14	14	11	13	15	14	13	13	13	11	14
LOS	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B
Volume	2354	2349	2337	2322	2321	2315	4246	4267	4259	3003	3005	2995	2989	3670	3624	3655	4337	4341	4353	4334	4359	4023	4077	3594	3593	3578	3381	2758	2755	3202	2505	2516	2719	2697
Lanes	4	5	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	1947	337	1171	633	2000	1616	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	874	672	820	1561	1090	527	1717	520	1157	771	687
LinkID	327	335	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	2	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

											Exit 18																	Exit 22								
											MD 121																	MD 109								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	63	63	64	63	63	63	63	63	62	63	59	62	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	63	62	63	63	62	62	62
Density	11	15	15	15	15	15	15	15	12	10	11	10	13	13	13	13	20	20	20	20	20	20	20	20	20	20	13	19	13	19	19	19	19	19
LOS	B	B	B	B	B	B	B	B	B	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	C	B	C	C	C	C	C
Volume	2819	2840	2851	2851	2843	2841	2845	2843	2844	1967	2517	2525	2514	2535	2523	2513	2501	2506	2496	2479	2501	2485	2487	2491	2493	2485	2483	2344	2419	2403	2403	2398	2399	2391
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4

							Exit 26																					Exit 31								
							MD 80																					MD 85								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	62	62	62	62	61	57	62	59	60	62	63	63	63	63	63	63	63	63	63	63	63	62	62	63	63	62	57	63	61	63				
Density	19	19	19	19	19	19	14	17	16	24	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	15	20	15	16	13	12				
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B				
Volume	2387	2392	2383	2379	2373	2362	2329	2111	2831	2818	2827	2824	2818	2821	2816	2804	2804	2771	2806	2807	2803	2797	2795	2792	2775	2783	2536	2496	1998	3054	3054				
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4				
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392				
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577				
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1				

2040 No-Build AM - I-270 SB Link Evaluation Results

2040 No-Build AM
I-270 SB

					Exit 31																								Exit 26									
					MD 85																								MD 80									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	17	17	16	12	12	11	9	8	18	18	18	18	18	18	18	18	18	18	18	18	18	17	17	14	13	15	19	28	28	28	28	27	27	27		
Density	87	87	94	124	125	91	138	130	90	87	87	90	90	90	89	88	87	87	89	88	89	90	90	75	105	82	98	67	65	66	65	65	67	67		
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
Volume	4514	4494	4501	2952	2947	2940	2426	3218	3196	3213	3209	3166	3162	3172	3153	3165	3153	3154	3137	3127	3113	3103	3105	3113	2820	3662	3686	3682	3636	3660	3670	3578	3637	3647		
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2		
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000		
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2		

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																								Exit 18									
					MD 109																								MD 121									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	27	27	27	26	25	25	23	25	39	43	44	43	42	42	42	44	44	45	45	52	53	52	52	51	52	52	53	38	20	16	16	16	13	10		
Density	68	68	68	69	48	72	62	82	53	48	47	49	50	50	50	48	47	47	46	27	27	20	24	23	30	25	33	46	86	103	108	108	100	136		
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	D	F	F	F	F	F	F	F		
Volume	3646	3648	3638	3632	3619	3584	4196	4120	4207	4192	4179	4208	4197	4163	4195	4188	4174	4190	4185	4197	4193	4184	3740	4786	4790	5180	5184	5154	5072	5041	5069	5060	5094	3890		
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3		
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047		
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1		
SegmentID																																				

					Exit 16			Exit 15			Exit 13						Exit 11				Exit 10			Exit 9						Exit 8							
					MD 27			MD 118			Middlebrook Rd						Watkins Mill Rd				MD 124			MD 117						I-370						Shady Grove Rd			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	14	13	14	15	16	17	18	33	41	40	38	37	36	33	27	18	17	14	17	23	23	38	39	35	44	49	45	41	20	15	16	29	40		
Density	126	115	106	100	110	86	102	81	60	49	50	53	53	54	61	71	89	92	115	94	88	86	53	51	58	45	34	40	35	62	80	81	57	41		
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	E	D	F	F	F	F	E		
Volume	4802	4766	5427	5415	5003	5413	5354	5996	5999	6023	6023	7920	7943	7894	7908	7571	6495	6429	6470	8050	8009	8020	8023	9995	10072	9930	10074	7105	7107	4866	4947	6480	6492	6494		
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	5	5	6	4	5	4	4	5	4	4		
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	673	992	1581	595	1167	838	658	2000	1062	1569	1151	431	1058	1258	1263	2000	1427	1046	420	497		
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	5020423	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2000075	2000081	2000082	723		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1		

												Exit 5					Exit 4												Exit 1								
												MD 189					Montrose Rd							I-270 Spur					Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	43	40	27	20	26	25	22	36	45	53	53	53	53	53	53	53	53	53	53	52	48	51	53	53	53	53	53	53	52	49	45	45	40	24		
Density	38	32	48	58	57	59	63	48	38	27	27	27	27	27	26	26	26	26	26	30	33	31	26	29	28	28	23	26	27	25	33	45	52	71		
LOS	E	D	F	F	F	F	F	F	E	D	D	D	D	D	C	D	D	D	D	D	D	D	C	D	D	D	C	D	D	C	D	F	F	F		
Volume	6503	5080	5156	5842	5879	5894	6804	6812	6823	5693	5689	5696	5696	5707	6916	6946	6966	6949	6977	10983	10988	10929	10984	10786	5906	5906	6032	5576	5587	6050	6035	6092	6142	10045		
Lanes	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	5	5	5	5	7	7	7	8	7	4	4	5	4	4	5	4	3	3	6		
Length	1518	2000	1645	473	1022	1591	655	921	1515	2000	1237	1874	2000	1407	598	882	303	2000	1023	2000	1707	722	400	330	2000	999	962	2000	457	522	937	2000	520	551		
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2000124	159	194	194	2000134	2000135	728	239	239	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375		
SegmentID	1	1	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1		

2040 No-Build PM - I-495 OL Link Evaluation Results

2040 No-Build PM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	17	20	23	50	55	57	58	58	58	58	56	57	58	58	56	52	58	58	58	58	57	58	58	53	53	53	53	53	52	52	49	28	12	10
Density	105	93	76	36	32	31	32	21	25	25	26	26	29	27	26	35	32	25	28	28	24	26	26	25	31	31	31	32	32	32	34	48	111	131
LOS	F	F	F	E	D	D	D	C	C	C	D	C	D	D	D	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	D	F	F	F
Volume	9076	9113	5303	5311	5306	5307	3679	3674	2857	2851	4384	4405	3290	6295	7271	7296	7282	7240	6554	6571	6757	6073	6073	6603	6466	6640	6654	6668	6656	6644	6627	6589	5264	5234
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	729	508
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337							Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	12	13	13	20	22	20	20	18	17	18	18	38	45	40	27	24	18	23	24	20	35	40	37	35	31	30	24	62	19	18	16	29	29	27
Density	123	116	109	105	82	77	83	83	86	90	88	82	48	41	45	59	67	81	74	71	80	56	49	53	56	62	63	62	89	93	94	63	63	67
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5903	5575	5579	6624	6550	6639	6613	6629	6193	6154	6143	7311	7339	7294	7303	6420	6371	7302	6672	6639	7867	7845	7870	7860	7806	7717	7602	7640	6690	6646	7505	7241	7279	7166
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	481	657	677	798	2000	773	1493	2000	2000	1594	706	788	515	1390	726	505	449	551	554	462	1023	2000	2000	2000	933	536	940	2000	518	1353	2000	1046	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50							Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	19	13	13	16	14	18	21	18	13	13	13	10	15	18	24	43	48	53	57	49	22	19	16	16	19	17	16	14	14	17	19	16	15	13
Density	78	119	107	108	101	83	82	75	119	120	119	124	98	83	76	43	38	28	25	23	56	66	74	71	73	87	72	96	90	88	82	90	100	107
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	7353	5978	6842	6821	7246	7270	6845	6906	4686	4652	4638	7338	7323	7367	7367	7366	7362	7360	5699	5700	4980	4873	4791	6826	6903	5926	5804	5490	6145	6051	6051	5946	5865	5750
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1160	803	743	1378	1328	648	1500	2000	2000	1020	1002	499	722	2000	1520	793	705	785	562	2000	276	520	571	1391	716	276	949	1042	455	2000	2000	2000	1837
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1							Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	13	10	9	10	9	13	14	13	13	15	12	12	11	13	17	21	16	29	47	53	56	57	57	58	56	58	59	58	58	58	53	53	53	53
Density	108	109	128	123	132	112	106	104	111	103	112	113	105	106	84	79	93	66	41	32	30	27	25	24	25	19	18	15	19	19	23	23	23	25
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	D	C	C	C	C	C	B	C	C	C	C	C	C
Volume	5677	5667	4785	4793	5880	5815	5845	6636	5921	5997	6861	6873	7140	7081	7119	6719	7601	7628	7638	6918	6885	7728	8427	8427	8416	4342	4295	4344	4382	4366	7347	7370	7357	6679
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	595	570	541	439	501	699	1815	589	828	434	995	471	993	1104	1978	1301	1225	1250	244	973	1149	1517	673	1486	2000	355	1017	490	825	1506	839	1513	814
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 No-Build PM

I-495 OL

	Exit 28 MD 650									Exit 29 MD 193						Exit 30 US 29								Exit 31 MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	52	53	51	44	35	32	29	25	22	18	21	19	17	14	16	15	22	21	21	21	18	15	11	16	12	20	24	23	23	17	16	12
Density	25	23	24	24	23	32	39	52	56	51	65	69	70	82	90	91	91	91	79	79	81	81	74	98	116	100	114	87	71	75	74	98	90	123
LOS	C	C	C	C	C	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6639	7179	6422	6411	7048	6985	6878	6655	6488	6460	5576	6169	6059	6060	6065	6359	5974	6868	6855	6805	6752	6717	6758	5695	6467	6395	6903	6902	6967	6928	6883	6828	5816	5751
Lanes	5	6	5	5	6	5	5	4	4	5	4	5	4	4	4	5	4	5	4	4	4	4	5	4	5	4	5	4	4	4	4	4	4	4
Length	509	450	501	284	347	1136	1629	1881	1185	301	793	713	805	1020	517	277	854	787	704	2000	832	1091	449	719	500	336	957	536	2000	2000	1795	1336	311	1657
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								Exit 39 I-270 W Spur							MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	11	13	14	16	19	19	16	15	14	12	6	7	8	8	8	7	6	6	6	9	8	8	9	12	16	16	15	17	17	17	15	14	15	17
Density	114	118	98	102	88	87	101	108	91	118	147	123	142	144	149	118	158	140	153	142	145	143	130	104	77	92	97	87	84	71	87	105	102	83
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6343	6270	6674	6633	6633	6584	6561	6499	6448	5605	2866	3381	3396	3382	3399	3403	2953	2633	3675	3633	3622	3641	3638	3633	7295	7299	7292	7280	7178	7340	6489	5916	5911	6999
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	746	998	526	1257	2000	87	1045	402	1593	288	910	494	913	1192	325	2000	22	406	1085	2000	2000	2000	1657	554	939	2000	659	446	1032	1585	2000	663	1788
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	21	21	21	24	41	51	53	54	54	54	54	53	54	54
Density	84	84	81	59	43	34	30	23	19	19	18	22	19	23
LOS	F	F	F	F	E	D	D	C	C	C	C	C	C	C
Volume	7017	7014	6886	6995	6988	8680	6282	6274	6276	6272	7019	7036	7319	7335
Lanes	4	4	4	5	4	5	4	5	6	6	7	6	7	6
Length	2000	1149	521	922	1713	1524	316	1428	2000	1765	734	1049	1413	613
LinkID	495415	495415	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	2	1	1	1	1	1	1	1	2	1	1	1	1

2040 No-Build PM - I-495 IL Link Evaluation Results

2040 No-Build PM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	6	6	6	5	5	5	6	9	9	9	11	11	8	9	11	10	10	10	9	9	9	10	12	12	13	13	6	5	4	3	3	3	3
Density	143	128	128	152	152	163	155	154	122	121	132	130	131	140	130	127	134	136	112	144	133	134	113	112	112	81	81	131	153	168	184	186	145	193
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5551	5421	5421	5084	4963	5736	5625	5498	5441	5350	6741	5659	5622	5781	5716	5606	5533	5456	5379	4909	5922	5797	6826	6576	6589	6461	6327	2320	2144	2015	1884	1855	1821	1643
Lanes	6	7	7	6	6	7	7	6	5	5	6	4	4	5	5	4	4	4	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3
Length	2000	1499	1499	2000	98	1502	1538	645	676	490	635	500	706	1511	777	2000	1461	1064	400	1947	1495	621	1123	398	1764	732	1509	2000	2000	2000	1671	1173	305	2000
LinkID	1100	1037	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	495414	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355								Exit 33 MD 185														Exit 31 MD 97											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	3	3	4	4	5	6	7	8	7	7	7	7	7	7	6	5	7	7	10	10	10	10	10	10	9	7	10	9	12	16	16	15	15	15
Density	175	162	167	150	166	161	126	127	132	130	143	142	120	119	148	156	143	148	129	128	120	120	101	101	128	141	131	125	117	90	92	95	96	97
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	1509	1956	1932	1892	1741	3724	4910	4892	4847	4856	4047	4037	4050	4069	3576	3844	3848	4963	4984	4899	4960	4930	4903	4963	4531	5194	5017	5503	5502	5649	5771	5802	5729	5707
Lanes	3	4	3	3	2	4	6	5	5	5	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4
Length	21	439	659	1113	1519	1951	513	1013	1002	522	1603	252	526	658	913	228	793	1635	2000	164	2000	1786	2000	50	837	411	323	1131	452	2000	1086	1248	248	500
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	1124	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	13	11	11	10	12	10	14	13	21	25	35	43	44	42	41	33	34	41	50	51	51	50	46	46	44	41	24	17	14	16	27	37	43	47
Density	87	111	116	123	119	122	111	110	86	73	53	42	34	41	42	46	52	44	32	32	26	26	24	31	33	28	54	94	114	95	72	52	44	33
LOS	F	F	F	F	F	F	F	F	F	F	F	E	D	E	E	F	F	E	D	D	C	D	C	D	D	D	F	F	F	F	F	F	E	D
Volume	5739	4988	5059	6146	5611	6187	6227	7018	7124	7263	7341	7380	7388	6912	6879	7624	7169	7200	8073	8140	5195	5232	5632	5685	5663	3374	6450	6358	6248	7730	7708	7736	7649	7712
Lanes	5	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	260	499	524	1562	808	422	768	284	1222	2000	1072	1153	356	352	505	464	500	1046	1496	1493	1028	536	347	2000	140	1527	1473	2000	1605	671	846	626	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450							Exit 19 US 50				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	48	49	49	51	51	50	47	40	43	46	33	29	27	31	33	31	29	30	27	25	23	21	19	18	20	25	17	11	11	10	11	12	18	24
Density	37	36	31	30	30	28	36	38	45	33	49	56	58	59	55	48	64	61	68	72	76	81	71	89	75	74	87	128	106	124	119	104	83	77
LOS	E	E	D	D	D	D	E	E	E	D	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	7144	7163	7596	7607	6181	6892	6844	7642	7637	7655	6452	6396	7836	7337	7302	7356	7290	7281	7173	7098	7008	6834	6644	6323	7544	7478	7454	5608	5620	5166	5166	7588	7546	7519
Lanes	4	4	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	58	1046	440	1150	761	810	740	938	452	520	566	554	497	516	779	711	2000	2000	2000	1629	1217	263	1180	915	561	1359	1371	213	2000	616	1434	754	2000
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 No-Build PM

I-495 IL

							Exit 16 Arena Dr					Exit 15 MD 214								Exit 13 Ritchie Marlboro Rd										Exit 11 MD 4						
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	24	22	21	17	17	16	24	29	26	25	30	29	28	23	48	50	50	52	52	52	52	52	52	51	51	50	52	52	51	52	52	52	52	52	52
Density	77	66	72	106	106	107	70	49	54	56	54	44	52	60	37	35	35	27	26	26	26	32	32	33	33	33	28	28	26	28	28	25	32	32	
LOS	F	F	F	F	F	F	F	F	F	F	F	E	F	F	E	D	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	D	D	
Volume	7450	7446	7474	5303	5297	5265	6574	7088	7080	7037	6398	6384	5852	7069	7030	7033	6957	7040	5461	5446	6641	6611	6609	6623	6629	6634	5838	5826	6644	5774	5788	6593	6577	6577	
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1072	1492	2000	2000	2000	772	1366	456	484	565	511	527	1147	344	1293	
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153	
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1	

				Exit 9 MD 337									Exit 7 MD 5													Exit 4 MD 414										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	61	63	63	61	60	56	57	61	63	64	62	63	63	63	63	63	63	63	63	63	61	63	63	61	62	63	62	62	60	61	63	63	
Density	31	25	25	24	24	22	28	30	30	22	22	16	17	21	18	22	22	22	22	22	22	22	18	21	21	18	20	20	17	22	22	28	18	21	
LOS	D	C	C	C	C	C	D	D	D	C	C	B	B	C	B	C	C	C	C	C	C	C	B	C	C	C	C	C	B	C	C	D	C	C	
Volume	6560	6561	6111	6124	6090	6783	6758	6805	6801	6815	6819	4160	5251	5266	5566	5595	5600	5590	5578	5567	5571	5540	5532	5267	5220	5647	4929	4917	5385	5395	5301	3437	3456	2620	
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2	
Length	896	625	2000	2000	770	663	823	2000	727	761	1487	1134	789	706	691	807	2000	2000	2000	2000	670	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386	
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	1158	1158	1158	1158	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305	
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	1	2	1	1	1	

	Exit 3 MD 210					Exit 2 I-295			WWB					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	58	54	43	26	20	42	48	53	53	53	56	56
Density	14	18	16	23	29	64	78	52	45	41	41	40	31	31
LOS	B	C	B	C	D	F	F	F	E	E	E	E	D	D
Volume	3297	3279	3789	3777	3755	3310	4759	4403	6406	6403	6404	6371	8654	8669
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 No-Build PM - I-270 NB Link Evaluation Results

2040 No-Build PM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6								Exit 8
			I-270 W Spur/I-495			Democracy Blvd		Westlake Terrace				I-270 Spur						Montrose Rd				MD 189				MD 28								Shady Grove Rd	
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	13	52	53	55	54	53	53	53	54	53	53	52	53	53	53	52	53	54	52	53	53	53	49	52	53	53	53	52	51	51	53	53	53	53		
Density	81	24	24	18	22	18	24	23	22	21	26	30	28	28	28	28	27	27	27	33	33	33	35	31	31	30	30	34	35	35	30	31	30	29		
LOS	F	C	C	B	C	B	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	D	D		
Volume	6327	3824	3863	3879	3505	3819	3774	4800	4795	5468	5493	9375	10321	10341	10336	7168	7166	7179	7204	6974	6980	6987	7000	6462	6477	7896	7894	7162	7155	7182	8062	8066	8067	6198		
Lanes	6	3	3	4	3	4	3	4	4	5	4	6	7	7	7	5	5	5	5	4	4	4	4	4	4	5	5	4	4	4	5	5	5	4		
Length	1509	2000	1447	894	790	887	457	820	1170	717	1850	447	1521	1210	1533	2000	955	425	1486	2000	1344	1921	1536	1407	531	640	1405	464	2000	1696	1482	1475	1523	2000		
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	280	428	742	289	289	251	743	300	744	304	305	316	745	745	320	741	747	327		
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1		

Speed Color Scale (mph)

10 30 40 50 70

						Exit 9					Exit 10		Exit 11											Exit 13				Exit 15							Exit 16		
						I-370					MD 117		MD 124				Watkins Mill Rd							Middlebrook Rd				MD 118							MD 27		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	52	53	53	51	46	42	38	32	27	24	20	17	16	19	15	13	12	14	14	13	14	13	14	17	19	22	21	19	16	16	16	17		
Density	29	23	30	29	30	30	30	40	43	49	56	63	72	82	84	91	100	116	117	105	85	101	100	113	106	70	75	77	79	76	87	91	73	89		
LOS	D	C	D	D	D	D	D	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
Volume	6200	6211	6211	6199	6239	6228	8258	8221	8135	6223	6102	5958	5844	6865	6776	6706	7590	7457	7331	7213	7227	6797	6839	6115	6093	6050	5673	5076	5075	5667	4254	4224	4544	4499		
Lanes	4	5	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3		
Length	1947	337	1171	633	2000	1610	531	843	1357	2000	2000	2000	1479	584	913	444	1112	2000	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687		
LinkID	327	335	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381		
SegmentID	2	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

											Exit 18																			Exit 22								
											MD 121																			MD 109								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	17	18	17	17	17	16	16	17	14	10	11	11	11	11	12	23	43	51	52	52	52	52	52	52	52	52	52	53	53	52	51	52	51	48	46	
Density	70	90	93	94	95	98	101	92	86	123	96	94	127	130	115	62	50	42	41	41	41	41	41	41	41	41	41	27	38	27	41	40	41	44	45	
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	F	
Volume	4691	4708	4702	4685	4708	4724	4735	4725	4709	3794	4242	4263	4245	4289	4283	4279	4269	4281	4266	4241	4282	4259	4260	4275	4287	4277	4284	4027	4216	4207	4220	4212	4187	4175		
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2		
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000		
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771		
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4		

							Exit 26																				Exit 31					
							MD 80																				MD 85					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	40	36	34	34	34	33	28	23	20	39	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	53	53	52	53	53	53	
Density	51	58	60	61	60	62	49	80	72	56	43	42	42	42	42	42	42	41	42	42	42	42	42	42	42	27	38	25	34	25	25	
LOS	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C	
Volume	4159	4169	4144	4161	4162	4141	4087	3640	4363	4356	4375	4368	4375	4375	4373	4352	4357	4318	4379	4375	4373	4372	4366	4365	4344	4361	3985	3928	3602	5328	5323	
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4	
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392	
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577	
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1	

2040 No-Build PM - I-270 SB Link Evaluation Results

2040 No-Build PM
I-270 SB

					Exit 31																								Exit 26									
					MD 85																								MD 80									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	58	58	58	56	59	54	59	62	63	63	63	63	63	63	62	61	60	59	59	59	58	58	61	60	59	58	59	60	59	59	58	58		
Density	21	20	20	22	22	15	16	16	22	21	20	20	20	20	20	20	20	21	21	21	21	21	21	14	16	13	19	20	19	19	19	19	20	20		
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C		
Volume	3552	3540	3552	2610	2607	2588	1897	2577	2558	2564	2561	2557	2554	2550	2521	2541	2527	2513	2514	2512	2499	2498	2498	2485	1971	2288	2293	2290	2274	2287	2290	2243	2284	2289		
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2		
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000		
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2		

10 30 40 50 70 **Speed Color Scale (mph)**

					Exit 22																			Exit 18												
					MD 109																			MD 121												
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	57	57	58	58	57	57	57	56	56	57	56	56	56	56	56	56	60	62	61	61	61	62	62	63	63	63	63	63	63	63	64		
Density	20	20	20	20	13	19	14	21	21	21	21	21	21	21	21	21	21	21	21	13	13	10	11	10	13	11	15	15	15	15	15	15	11	13		
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B		
Volume	2282	2279	2271	2263	2255	2172	2379	2382	2382	2364	2361	2388	2397	2382	2395	2392	2381	2391	2379	2373	2370	2369	2061	2462	2458	2840	2840	2830	2809	2805	2800	2789	2800	2426		
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3		
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047		
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1		
SegmentID																																				

					Exit 16			Exit 15			Exit 13							Exit 11				Exit 10			Exit 9							Exit 8				
					MD 27			MD 118			Middlebrook Rd							Watkins Mill Rd				MD 124			MD 117							I-370					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	63	63	63	63	62	63	61	61	63	63	62	63	62	63	63	64	64	63	59	63	63	62	58	62	62	63	63	64	64	64	64	60	59	59	
Density	12	16	14	14	16	14	18	17	22	22	22	21	20	21	21	20	14	14	15	17	20	20	21	23	22	21	18	17	14	14	14	14	15	18	18	
LOS	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	B	B	B	B	C	C	C	C	C	C	B	B	B	B	B	B	C	C		
Volume	3052	3043	3406	3415	3033	3402	3365	4066	4067	4080	4094	5129	5155	5146	5157	4923	3673	3646	3879	5089	5031	5068	5072	6801	6802	6698	6774	4320	4315	3478	3470	4390	4389	4385		
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	5	5	6	4	5	4	4	5	4	4		
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	955	1503	595	1167	838	658	2000	1062	1569	1151	431	1058	1258	1263	2000	1427	1046	420	497		
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	10040506	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2000075	2000081	2000082	723		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1		

												Exit 5					Exit 4											Exit 1									
												MD 189					Montrose Rd							I-270 Spur				Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	61	60	60	60	60	60	59	59	60	60	60	60	60	61	61	61	61	61	60	59	59	54	42	59	59	59	59	59	57	57	57	43	16		
Density	18	15	15	15	18	18	16	21	21	17	17	17	17	17	18	18	18	18	18	18	18	18	18	25	16	16	13	13	13	13	16	21	28	77		
LOS	C	B	B	B	C	C	B	C	C	B	B	B	B	B	B	B	C	B	C	C	C	C	B	C	B	B	B	B	B	B	B	C	D	F		
Volume	4387	3618	3626	4417	4412	4400	4915	4905	4903	3994	3992	3988	3980	3981	5478	5496	5510	5490	5515	7651	7649	7598	7615	7307	3730	3725	3895	3007	3005	3637	3625	3644	3651	7295		
Lanes	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	5	5	5	5	7	7	7	8	7	4	4	5	4	4	5	4	3	3	6		
Length	1518	2000	1645	473	1022	1591	655	921	1515	2000	1237	1874	2000	1407	598	882	303	2000	1023	2000	1707	722	400	334	2000	999	962	2000	457	522	937	2000	520	554		
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2000124	159	194	194	2000134	2000135	728	239	239	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375		
SegmentID	1	1	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1		

2040 Alt-5 AM - I-495 OL Link Evaluation Results

2040 Alt-5 AM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	15	23	50	55	56	59	59	59	58	59	59	59	59	59	58	59	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53	53	53
Density	104	109	76	35	32	32	21	14	17	17	15	15	18	18	17	22	21	17	20	20	18	19	19	19	23	23	24	24	23	22	22	17	18	18
LOS	F	F	F	E	D	D	C	B	B	B	B	B	B	C	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	B	C	B
Volume	8111	7939	5316	5321	5315	5313	2431	2436	1944	1942	2625	2624	2134	4265	5027	5041	5036	4999	4764	4784	5111	4558	4550	4973	4864	5004	5000	4988	4970	4646	4638	4620	3861	3830
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	53	54	53	53	54	54	53	55	54	55	53	52	55	55	56	56	53	55	56	52	54	58	58	57	57	57	57	58	58	58	57	57	57
Density	29	17	18	18	23	22	22	23	19	19	19	20	26	25	25	22	22	21	22	22	24	29	27	27	27	27	27	27	21	23	23	23	29	28	28
LOS	D	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D	D	D	C	C	C	C	D	D	D
Volume	4178	3664	3800	4848	4784	4823	4816	4800	4115	4105	4118	5337	5412	5375	5408	4864	4869	5511	4827	4815	6222	6200	6208	6190	6180	6173	6126	6140	5305	5338	6505	6503	6502	6368
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214					Exit 16 Arena Dr			Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	59	57	58	57	56	57	59	58	58	58	60	59	59	54	57	58	60	57	58	58	58	58	60	58	58	58	59	57	53	58	59	59	57
Density	22	23	21	26	23	24	26	20	25	25	25	18	22	22	29	28	28	21	25	20	20	20	20	19	24	28	22	26	25	34	31	30	30	31
LOS	C	C	C	D	C	C	D	C	C	C	C	B	C	C	D	D	D	C	C	C	C	C	C	C	C	D	C	D	C	D	D	D	D	D
Volume	6502	5428	6088	6116	6725	6722	5922	6001	4348	4344	4338	6343	6419	6421	6407	6364	6433	6443	5697	5706	4776	4774	4745	6865	7001	6383	6298	6182	7186	7150	7169	7173	7175	7179
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201										Exit 25 US 1								Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	54	53	53	52	53	52	52	54	54	54	56	55	53	53	57	58	58	58	58	57	58	59	58	59	59	58	56	17	6	7	7	48
Density	31	25	27	27	26	30	32	27	27	26	22	22	19	23	23	28	22	27	27	22	22	20	17	17	17	15	14	12	16	53	145	134	131	20
LOS	D	C	D	D	C	D	D	D	D	C	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	F	F	F	F	C
Volume	7164	7181	5717	5725	6752	6350	6685	7113	5574	5513	5986	6026	6254	6213	6207	5999	6346	6342	6354	5136	5072	5636	5984	5933	5911	3467	3401	3564	3576	3591	5607	5640	5608	4920
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt-5 AM
I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29									Exit 31 MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	48	53	53	53	53	54	53	53	53	53	52	32	23	47	53	52	51	48	52	52	53	53	53	52	46	31	28	49	44	41	42	39	32
Density	19	18	17	17	15	18	18	23	23	23	19	21	21	34	46	27	24	24	26	34	32	31	31	25	29	30	34	42	54	40	43	46	44	38	45
LOS	C	C	B	B	B	C	C	C	C	C	C	C	D	F	D	C	C	D	D	D	D	D	C	D	D	D	E	F	E	E	F	E	E	E
Volume	4896	5196	4484	4480	4739	4831	4893	4883	4876	4865	4447	4421	5339	5280	5116	5107	4934	6622	6501	6606	6480	6576	6592	6173	6163	6182	7806	7708	7704	7635	7478	7455	5898	5799
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	26	28	25	26	25	19	17	16	15	11	7	5	8	7	7	7	7	7	6	9	9	9	10	12	22	21	24	22	22	19	20	22	22	25
Density	48	55	55	64	67	83	97	100	84	114	144	153	146	149	151	113	150	141	156	138	139	138	129	103	69	87	76	83	83	82	84	83	83	67
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6247	6163	6814	6666	6655	6465	6487	6418	6335	5059	2926	3295	3318	3315	3309	3323	3248	3155	3774	3787	3786	3797	3804	3840	9152	9140	9081	9117	8999	9151	8444	7300	7329	8414
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1657	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	44	51	53	52	52	52	53	52	53	53	53	53	53	52
Density	47	33	36	30	37	33	31	31	31	31	25	31	26	34
LOS	F	D	E	D	E	D	D	D	D	D	C	D	D	D
Volume	8418	8454	7544	7896	7672	8591	6520	6490	6524	6522	6495	6496	7011	7032
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1628	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt-5 AM - I-495 IL Link Evaluation Results

2040 Alt-5 AM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	34	31	27	21	19	17	17	18	20	20	21	45	52	55	57	55	55	56	55	57	57	57	57	57	56	57	57	54	57	57	57	54	34	55
Density	53	56	53	74	82	87	84	93	84	84	77	40	36	28	27	30	38	37	30	32	26	25	22	26	27	26	26	29	27	27	27	29	34	24
LOS	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	E	E	D	D	C	C	C	C	D	C	D	D	D	D	D	D	D	C
Volume	7194	7013	7075	6318	6276	7364	7248	6889	6698	6812	8268	7149	7377	7527	7564	8316	8302	8296	8285	7174	7361	7279	7466	7316	7441	7362	7433	4653	4651	4644	4645	4638	4603	3949
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	5	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1503	2000	2000	2000	1662	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355															Exit 33 MD 185										Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	56	51	50	53	28	22	36	32	45	55	57	56	56	51	58	54	35	28	35	41	19	18	57	59	60	57	59	55	58	60	60	60
Density	18	18	24	27	38	32	59	75	56	62	45	36	28	28	30	27	30	29	55	67	56	47	81	83	26	25	25	21	24	26	31	24	27	26
LOS	B	B	C	D	E	D	F	F	F	F	E	E	D	D	D	D	D	D	F	F	F	F	F	F	C	C	C	C	C	D	D	C	D	C
Volume	3026	4051	4058	4090	3800	6700	8151	8111	8042	8014	7978	7995	7998	7965	6807	6981	6967	7800	7825	7484	7741	7711	7654	7622	5876	5914	5935	7188	7102	7218	7212	7202	6512	6237
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	58	46	27	22	21	22	14	23	25	25	23	20	20	19	17	40	52	58	60	61	62	60	60	60	62	58	54	45	36	40	43	44	38
Density	26	28	35	49	66	55	68	91	70	63	62	68	60	72	75	78	38	30	26	24	18	18	16	20	20	20	21	28	32	41	46	43	41	39
LOS	D	D	D	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	C	C	B	B	B	C	C	C	C	D	D	E	F	E	E	E
Volume	6278	6455	6352	6701	5891	5873	5848	6408	6369	6311	6254	6174	6135	5826	5721	6569	6131	6141	7421	7385	4384	4404	4838	4849	4815	3641	6001	5975	5854	7413	7326	7375	7281	7336
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450					Exit 19 US 50					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	54	53	50	54	54	54	52	52	54	55	55	53	54	55	56	55	55	55	54	54	53	52	55	48	51	56	56	54	57	58	57	53	54
Density	35	25	26	27	25	22	27	25	31	23	24	24	24	27	26	21	27	27	27	27	27	27	22	23	26	30	22	23	20	20	20	22	28	34
LOS	D	C	C	D	C	C	D	C	D	C	C	C	C	D	D	C	D	D	D	D	D	D	C	C	C	D	C	C	C	C	C	C	D	D
Volume	6773	6833	6801	6812	5513	5925	5897	6343	6333	6218	5307	5289	6373	5819	5798	5878	5876	5869	5870	5849	5838	5827	5698	5157	6267	6239	6232	5240	5249	4546	4529	7306	7433	7434
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-5 AM

I-495 IL

							Exit 16						Exit 15							Exit 13										Exit 11							
							Arena Dr						MD 214							Ritchie Marlboro Rd										MD 4							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	55	56	56	56	56	55	57	58	58	58	54	57	58	55	56	58	58	59	59	59	59	58	58	57	56	51	57	59	54	57	58	59	59	59	59	59
Density	33	26	26	33	33	33	31	25	26	26	31	24	26	27	33	32	31	25	26	26	24	30	31	31	32	35	26	25	25	27	27	23	28	28	28	28
LOS	D	D	D	D	D	D	D	C	C	C	D	C	D	D	D	D	D	C	C	C	C	D	D	D	D	D	C	C	C	D	D	C	D	D	D	D
Volume	7384	7390	7410	5495	5486	5487	6955	7354	7380	7372	6664	6692	6137	7387	7342	7324	7241	7313	6100	6161	7063	7068	7079	7084	7084	7088	5910	5908	6850	6146	6176	6677	6661	6664	6647	6649
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4	4	5
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293	896	625
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153	1154	112309
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1

				Exit 9									Exit 7												Exit 4											
				MD 337									MD 5												MD 414											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	63	63	63	63	62	59	60	62	51	17	10	10	10	11	11	11	13	12	12	12	11	10	10	9	11	12	9	15	13	16	12	8	6	7
Density	28	22	24	24	24	20	25	26	26	20	25	61	104	124	106	123	130	107	112	123	126	125	105	133	131	126	119	113	132	101	111	90	80	121	126	135
LOS	D	C	C	C	C	C	C	D	D	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6647	6649	5990	6028	6011	6231	6209	6273	6266	6286	6306	4093	5013	5116	5533	5621	5616	5932	5925	5908	5919	5907	5925	5474	5450	5883	5404	5394	5989	6018	5897	2915	2926	1957	3073	3042
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2	4	3
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386	907	581
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305	117307	117308
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1

	Exit 3						Exit 2							
	MD 210						I-295			WWB				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	7	9	12	14	15	18	45	57	58	58	53	46	56
Density	126	135	108	101	90	101	86	51	34	34	34	36	44	36
LOS	F	F	F	F	F	F	F	F	D	D	D	E	E	E
Volume	3073	3042	3738	3719	3725	3067	4685	4608	5861	5854	5862	5826	10045	10068
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt-5 AM - I-270 NB Link Evaluation Results

2040 Alt-5 AM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	63	62	64	62	63	62	64	64	64	64	64	63	64	64	63	61	63	61	60	60	61	59	59	59	59	59	59	59	58	58	58	59
Density	26	24	22	15	16	12	17	14	13	13	13	12	12	12	12	12	10	11	13	16	16	13	14	14	13	13	16	13	12	15	15	15	12	10
LOS	D	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
Volume	7433	2760	2757	2739	2039	2203	2178	2535	2526	2525	2508	4693	4696	4683	4652	4657	4621	4103	4068	4733	4726	4671	4199	4782	4766	4754	4577	3975	4168	4250	4225	4215	4203	2890
Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	6	5	6	6	6	5	5	6	5	5	5	6	5
Length	1503	2000	1418	897	788	886	453	816	1169	730	1875	430	1464	1957	783	980	769	698	801	2000	2000	517	742	1343	526	657	425	789	598	1189	1474	1474	991	2000
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

				Exit 9						Exit 10		Exit 11													Exit 13				Exit 15							Exit 16	
				I-370						MD 117		MD 124				Watkins Mill Rd									Middlebrook Rd				MD 118							MD 27	
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	48	60	60	60	58	58	60	60	60	60	60	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	62	62	61	62
Density	10	12	6	6	6	7	8	10	10	10	10	10	10	11	10	13	13	13	13	12	10	11	12	13	13	10	12	13	13	11	12	12	10	13
LOS	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	B	B	A	B
Volume	2885	3474	1115	1106	1116	1576	2915	2925	2910	2478	2473	2473	2467	3195	3159	3186	3847	3847	3842	3810	3822	3475	3518	3087	3055	3055	2846	2336	2335	2775	2178	2187	2424	2407
Lanes	5	6	3	3	3	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	118	441	1059	630	836	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

											Exit 18																		Exit 22								
											MD 121																		MD 109								
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	62	62	62	62	62	62	61	61	62	58	61	62	63	62	62	62	62	62	62	62	62	61	61	62	61	61	62	61	61	61	61	61	61	61	61
Density	10	14	14	14	14	14	14	14	10	9	10	10	12	13	13	13	19	19	19	19	19	19	19	19	19	19	13	18	12	18	18	18	18	19	18	19
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C
Volume	2512	2530	2541	2535	2538	2541	2548	2539	2534	1722	2327	2338	2334	2354	2345	2336	2336	2343	2340	2325	2342	2323	2322	2326	2321	2308	2317	2168	2243	2235	2233	2232	2243	2248	2231	2220
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000	1502	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771	771	412
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4	5	1	2

							Exit 26																			Exit 31										
							MD 80																			MD 85										
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	60	60	60	60	59	57	61	58	58	61	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	57	63	61	63	62	61	62	62	61	62
Density	18	18	18	18	19	19	13	16	16	23	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	14	19	14	15	12	11	13	12	12	10	13
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B	B	B	B	A	B
Volume	2231	2220	2218	2222	2225	2210	2178	1972	2704	2699	2700	2689	2680	2684	2677	2662	2667	2642	2673	2662	2657	2644	2634	2631	2611	2619	2364	2329	1832	2885	2879	2878	2879	2879	2879	2879
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4	4	4	4	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392	1115	392	1115	392	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577	425	577	425	577	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1	2	3	4	5	6

2040 Alt-5 AM - I-270 SB Link Evaluation Results

2040 Alt-5 AM
I-270 SB

					Exit 31																															
					MD 85																															
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	20	17	12	12	11	8	8	17	17	18	17	17	17	17	18	18	18	18	18	18	18	18	14	14	15	19	27	28	28	28	27	28	28	
Density	83	77	91	123	126	91	141	133	92	90	90	91	91	91	90	90	88	88	89	85	88	86	89	75	103	82	98	67	65	66	66	66	66	66	
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
Volume	4509	4518	4551	2916	2918	2884	2375	3171	3154	3149	3167	3148	3152	3151	3126	3146	3152	3142	3131	3149	3132	3160	3158	3141	2882	3676	3674	3674	3640	3667	3665	3585	3655	3692	
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000	
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453	
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2	

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																														
					MD 109																															
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	28	28	28	27	27	26	23	26	40	43	43	43	43	43	45	45	43	46	46	52	53	52	52	51	52	52	53	52	37	21	19	18	14	11	
Density	65	66	66	68	45	71	60	80	53	49	49	49	49	48	47	47	48	46	46	27	27	20	24	24	31	26	34	34	48	87	97	101	94	130	
LOS	F	F	F	F	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	D	D	F	F	F	F	F	F	
Volume	3686	3688	3681	3677	3665	3626	4236	4149	4227	4204	4183	4218	4215	4182	4210	4215	4197	4212	4198	4207	4215	4223	3757	4928	4925	5346	5352	5341	5349	5399	5434	5401	5400	4122	
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3	
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047	
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	

	Exit 16					Exit 15			Exit 13								Exit 11			Exit 10			Exit 9								Exit 8				
	MD 27					MD 118			Middlebrook Rd								Watkins Mill Rd			MD 124			MD 117								I-370				Shady Grove Rd		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	15	13	14	15	16	17	18	34	42	41	36	40	42	46	52	53	53	53	50	51	52	53	47	50	50	53	53	53	53	42	30	36	34	
Density	125	112	104	97	109	85	102	81	59	48	49	55	50	46	43	32	27	27	33	33	41	40	40	43	34	33	28	27	25	25	34	48	48	44	
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	D	D	D	E	E	E	E	D	D	D	D	C	C	D	F	F	E	
Volume	4952	4889	5513	5496	5046	5419	5353	6000	6001	6023	6011	7888	7914	7888	7905	6628	5773	5771	6888	8386	8320	8394	8402	10191	10193	10088	10199	10228	6624	6673	9901	9976	8690	9052	
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	5	5	7	7	5	6	
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1633	1783	599	731	480	
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723	
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	

								Exit 5						Exit 4														Exit 1								
								MD 189						Montrose Rd										I-270 Spur				Westlake Terrace	Democracy Blvd					I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	39	36	37	36	35	34	30	28	27	17	18	25	20	41	53	53	51	48	33	28	34	50	52	52	53	53	52	53	53	52	52	50	40	22	
Density	47	52	52	53	55	56	52	65	70	105	99	74	88	51	33	36	34	41	54	63	52	35	33	34	25	25	25	30	30	20	25	35	44	69	
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	E	D	E	F	F	F	D	D	D	C	C	C	D	D	C	C	D	E	F	
Volume	9102	9505	9566	9578	9615	9626	9515	9099	9351	10437	10419	9435	10463	10490	10394	9525	10376	9842	10665	10610	10545	10499	10350	10541	5261	5251	5258	4773	4779	5245	5228	5265	5289	9152	
Lanes	5	5	5	5	5	5	6	5	5	6	6	5	6	5	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6	
Length	795	2000	1661	469	1017	935	444	935	998	608	1801	1637	697	2000	449	900	640	885	1395	2000	1704	716	393	325	2000	999	940	2000	450	517	937	2000	520	551	
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375	
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1	

2040 Alt 5 PM - I-495 OL Link Evaluation Results

2040 Alt 5 PM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	17	19	22	50	55	57	58	58	58	58	57	57	58	58	56	52	58	58	58	58	57	58	58	53	53	53	53	53	52	53	53	53	53	53
Density	106	94	78	35	31	31	31	21	24	25	25	25	29	28	27	36	32	26	29	29	24	27	27	25	31	32	32	32	32	30	30	23	23	23
LOS	F	F	F	E	D	D	D	C	C	C	C	C	D	D	D	E	D	C	D	D	C	D	D	C	D	D	D	D	D	D	D	C	C	C
Volume	9052	9072	5234	5239	5242	5246	3603	3606	2837	2841	4323	4339	3346	6443	7474	7483	7469	7425	6718	6725	6932	6239	6229	6713	6577	6771	6772	6777	6760	6205	6207	6163	4877	4849
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337								Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
Speed	53	53	53	52	51	52	53	53	52	32	21	17	42	50	52	53	53	50	52	52	53	50	52	52	52	53	53	53	53	53	53	47	51	53
Density	20	24	24	23	29	28	28	28	27	44	68	80	41	34	33	28	28	28	30	29	28	36	35	35	35	35	34	28	30	31	28	40	36	35
LOS	C	C	C	C	D	D	D	D	D	E	F	F	E	D	D	D	D	D	D	D	D	E	E	E	E	D	D	D	D	D	D	E	E	E
Volume	5354	5045	5054	5931	5900	5937	5952	5957	5619	5665	5735	6874	6892	6901	6892	6027	6021	6893	6144	6125	7352	7324	7347	7342	7339	7341	7291	7340	6451	6480	7468	7451	7449	7426
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	53	53	53	49	51	53	53	53	53	53	53	53	51	48	51	53	57	58	58	58	58	48	54	57	58	57	56	56	57	58	58	
Density	28	27	25	31	27	29	32	25	33	33	33	22	26	26	34	36	34	26	24	19	22	22	22	20	30	29	22	25	23	30	30	29	29	29
LOS	D	D	C	D	D	D	D	C	D	D	D	C	D	D	D	E	D	C	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D
Volume	7452	5761	6579	6586	7063	7071	6588	6617	5311	5304	5300	6922	6896	6928	6902	6915	6914	6866	5610	5570	5078	5080	5041	7066	7153	6224	6137	5876	6676	6680	6677	6675	6696	6715
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1								Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	52	50	52	52	51	52	52	37	19	17	22	27	22	34	49	55	57	57	57	58	56	58	58	58	58	58	53	53	53	53
Density	29	23	25	25	27	34	33	29	32	31	28	40	68	92	71	69	74	59	41	33	31	28	25	25	25	22	22	18	22	22	24	24	24	26
LOS	D	C	C	C	D	D	D	D	D	D	D	E	F	F	F	F	F	F	E	D	D	D	C	C	C	C	C	B	C	C	C	C	C	D
Volume	6688	6582	5407	5409	6910	6841	6784	7420	6550	6519	7423	7481	7744	7690	7723	7434	8111	8126	8126	7201	7125	7892	8544	8541	8519	5177	5129	5194	5219	5195	7691	7724	7703	6995
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt 5 PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	53	53	52	53	48	40	34	25	52	53	36	21	43	51	51	51	46	47	51	52	53	53	54	53	52	36	45	50	51	53	53	53
Density	26	25	25	25	23	28	31	46	54	59	30	30	38	65	37	32	32	30	41	40	36	36	29	30	29	30	24	43	43	38	37	36	30	30
LOS	D	C	C	C	C	D	D	F	F	F	D	D	E	F	E	D	D	D	E	E	E	E	D	D	D	D	C	E	E	E	E	E	D	D
Volume	6935	7472	6609	6639	7237	7364	7339	7259	7208	7190	6262	6250	6838	6830	6486	6529	6555	7591	7493	7524	7381	7500	7535	6290	6313	6291	7629	7607	7652	7648	7605	7625	6414	6381
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1131	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187							I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	52	50	47	49	52	52	53	53	53	49	53	53	53	53	53	53	53	53	53	53	51	49	52	53	53	53	51	48	43	34	29	31
Density	28	34	29	38	41	39	37	37	29	29	22	20	25	25	25	18	23	21	20	27	27	27	28	29	20	23	23	23	24	21	27	40	48	45
LOS	D	D	D	E	E	E	E	E	D	D	C	C	C	C	C	C	C	C	C	D	D	D	D	D	C	C	C	C	C	C	D	E	F	E
Volume	7240	7226	7650	7688	7698	7686	7648	7685	7653	6099	3583	3951	3963	3965	3961	3869	3681	3409	4237	4281	4274	4269	4259	4244	6158	6137	6150	6151	6052	6189	5866	5437	5545	6911
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	1034	386	1589	284	907	487	893	1176	325	2000	31	402	1084	2000	2000	2000	1642	551	937	2000	655	442	1021	1587	2000	575	1737
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	33	#DIV/0!	26	27	41	51	53	53	53	53	54	52	53	52
Density	53	#DIV/0!	64	49	41	32	28	28	28	28	24	30	27	34
LOS	F	#DIV/0!	F	F	E	D	D	D	D	D	C	D	D	D
Volume	6964	7013	6655	6665	6718	8207	5932	5927	5940	5946	6385	6368	7128	7169
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt 5 PM - I-495 IL Link Evaluation Results

3E+06

2040 Alt 5 PM
I-495 IL

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

| | | |

2040 Alt 5 PM

I-495 IL

							Exit 16 Arena Dr					Exit 15 MD 214						Exit 13 Ritchie Marlboro Rd										Exit 11 MD 4						
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	47	51	52	52	52	51	46	50	51	50	49	52	52	49	50	51	50	53	53	53	52	52	50	50	49	52	53	50	52	52	52	52	52
Density	41	31	30	32	33	33	35	28	28	28	32	25	28	29	35	35	35	27	27	27	27	33	33	35	35	29	29	27	28	28	26	32	32
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	E	E	D	D	D	D	D	D	D	D	E	D	D	D	D	D	C	D	D
Volume	7695	7716	7768	5030	5045	5039	6403	7010	7020	7014	6361	6375	5808	7068	7075	7109	7033	7105	5696	5700	6909	6897	6904	6908	6893	6891	6020	6008	6832	5830	5787	6628	6612	6621
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1
			Exit 9 MD 337										Exit 7 MD 5													Exit 4 MD 414								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	61	63	63	62	60	59	59	62	63	63	61	63	63	63	63	63	63	63	63	62	62	63	63	62	63	63	62	61	59	61	62	63
Density	31	25	25	24	24	22	28	29	29	22	21	17	17	21	17	22	19	24	24	24	24	24	19	23	22	20	21	21	18	24	24	31	20	21
LOS	D	C	C	C	C	C	D	D	D	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	C	C
Volume	6601	6594	6048	6066	6042	6713	6743	6743	6736	6730	6725	4196	5149	5173	5469	5508	5977	6050	6050	6044	6049	6021	6023	5670	5626	6054	5246	5232	5702	5714	5610	3764	3785	2661
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295						WWB	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	58	55	43	23	18	42	49	53	53	53	56	56
Density	14	19	17	23	30	72	88	54	44	41	41	40	31	31
LOS	B	C	B	C	D	F	F	F	E	E	E	E	D	D
Volume	3365	3345	3846	3843	3847	3337	4789	4454	6436	6440	6427	6376	8674	8697
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt 5 PM - I-270 NB Link Evaluation Results

2040 Alt 5 PM
I-270 NB

		Exit 1																																	
		I-270 W Spur/I-495					Democracy Blvd		Westlake Terrace				I-270 Spur						Exit 4 Montrose Rd				Exit 5 MD 189					Exit 6 MD 28								
Direction of Travel		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	33	40	50	54	54	53	52	52	53	53	53	54	54	53	53	53	52	52	53	51	52	53	53	50	52	52	52	48	44	41	33	28	23	22
	Density	48	54	43	27	34	25	38	32	31	31	32	30	30	30	30	30	26	28	33	40	39	38	36	35	34	33	39	37	36	46	56	65	63	56
	LOS	F	F	E	D	D	C	E	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	D	D	D	E	E	E	F	F	F	F	F
	Volume	7916	4353	4345	4340	3691	3989	3968	5040	5028	5038	5035	9680	9715	9702	9675	9675	9682	8858	8769	10137	10119	10116	9453	10352	10381	10383	10103	8854	9525	9452	9204	8998	8833	8708
	Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	5	5	6	6	6	5	5	6	5	5	5	6	7
	Length	1508	2000	1339	894	788	886	450	793	1166	705	1845	431	1520	1204	1533	999	769	702	531	2000	1343	799	690	1389	530	634	406	872	598	2000	1459	1474	998	515
	LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
	SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Exit 8 Shady Grove Rd			Exit 9 I-370						Exit 10 MD 117		Exit 11 MD 124				Watkins Mill Rd								Exit 13 Middlebrook Rd				Exit 15 MD 118						Exit 16 MD 27	
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	22	19	17	13	10	8	9	13	13	14	13	13	13	12	11	14	12	11	11	14	15	14	14	14	14	17	19	23	23	19	18	17	17	19
	Density	66	74	66	81	104	118	107	86	80	90	94	95	95	95	100	103	116	121	120	91	75	89	87	103	100	66	70	72	72	71	82	84	68	82
	LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	Volume	7219	8384	3350	3272	4045	3908	5450	5396	5326	4972	4932	4828	4808	5784	5721	5715	6672	6626	6611	6569	6548	6200	6280	5685	5661	5636	5358	4909	4919	5522	4359	4375	4666	4582
	Lanes	5	6	3	3	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
	Length	726	481	1026	634	2000	749	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
	LinkID	323	336	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
	SegmentID	1	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		Exit 18 MD 121																	Exit 22 MD 109																	
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	19	19	19	18	18	17	17	18	15	13	13	12	11	11	12	22	42	51	52	52	52	52	52	52	52	52	53	53	51	51	52	52	52	52
	Density	64	82	83	85	88	88	89	84	75	99	80	83	122	131	117	63	50	41	40	40	40	40	40	40	40	40	26	37	27	41	40	40	40	40
	LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
	Volume	4723	4713	4700	4693	4640	4603	4595	4621	4619	3700	4125	4162	4176	4211	4197	4205	4200	4213	4197	4171	4210	4187	4188	4195	4200	4188	4194	3976	4155	4140	4155	4158	4159	4160
	Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
	Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
	LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
	SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		Exit 26 MD 80																								Exit 31 MD 85					
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	52	52	52	52	52	51	50	52	49	44	49	52	52	52	52	52	52	52	52	52	52	52	52	52	52	51	53	53	52	53	53	53	53	53
	Density	40	40	40	40	40	40	27	34	29	49	44	42	41	41	41	41	41	41	41	41	41	41	41	41	42	42	42	27	37	25	33	25	25	25
	LOS	E	E	E	E	E	E	D	D	D	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C	C
	Volume	4154	4159	4153	4153	4150	4138	4090	3564	4333	4318	4335	4333	4323	4319	4317	4294	4302	4261	4321	4318	4316	4319	4314	4310	4291	4308	3946	3897	3504	5320	5329			
	Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4			
	Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392			
	LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577			
	SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1			

2040 Alt 5 PM - I-270 SB Link Evaluation Results

2040 Alt 5 PM I-270 SB

					Exit 31																						Exit 26										
					MD 85																						MD 80										
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	58	58	58	56	59	55	60	63	63	63	63	63	63	63	62	61	61	59	59	58	57	58	60	59	58	58	59	59	59	59	58	58		
Density	20	20	20	22	22	15	16	15	21	20	20	20	20	20	20	20	20	20	20	21	21	21	22	14	16	13	19	20	19	19	19	19	19	19		
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C		
Volume	3509	3492	3505	2577	2581	2564	1852	2504	2494	2505	2509	2495	2491	2494	2463	2479	2480	2471	2461	2471	2469	2469	2479	2470	1986	2254	2260	2258	2240	2249	2247	2200	2244	2251		
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2		
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000		
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2		

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

					Exit 22																				Exit 18										
					MD 109																				MD 121										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	58	57	58	59	59	55	58	57	58	59	59	59	59	59	59	59	58	60	62	62	62	61	63	63	63	64	64	64	64	64	64	64		
Density	19	20	19	20	13	18	13	21	20	20	20	20	20	20	20	20	19	20	20	13	12	9	11	10	13	11	15	15	15	15	15	14	11	12		
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A	A	B	B	B	B	B	B	B	B	A	B		
Volume	2251	2253	2247	2241	2232	2141	2347	2350	2349	2333	2331	2346	2332	2309	2313	2306	2288	2296	2290	2290	2286	2281	1965	2385	2387	2779	2786	2794	2788	2776	2768	2750	2755	2359		
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3		
Length	2000	1801	1775	948	546	716	1665	130	2000	322	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871		
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047		
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1		

					Exit 16				Exit 15			Exit 13						Exit 11				Exit 10				Exit 9						Exit 8				
					MD 27				MD 118			Middlebrook Rd						Watkins Mill Rd				MD 124				MD 117				I-370						Shady Grove Rd			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	63	63	62	63	62	63	61	61	63	63	63	62	61	61	63	64	64	63	59	62	63	63	60	61	59	63	63	64	59	58	59	57	57		
Density	12	16	13	13	15	13	17	16	21	21	21	20	20	20	20	13	12	12	15	17	20	20	20	22	18	19	15	15	11	13	13	16	15	18		
LOS	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	B	B	B	B	B	C	C	C	C	B	C	B	B	A	B	B	B	B	B		
Volume	2979	2969	3304	3296	2908	3274	3240	3930	3931	3937	3933	4940	4970	4950	4957	4025	3044	3027	3720	4969	4937	4970	4964	6546	6557	6570	6552	6569	3453	5409	5408	4752	5332	5952		
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	5	7	7	5	6	6		
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	1257	1243	795	1607	706	478	708		
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1		

							Exit 6					Exit 5					Exit 4							Exit 1											
							MD 28					MD 189					Montrose Rd						I-270 Spur				Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	55	42	29	23	19	17	15	12	10	8	6	5	5	4	4	3	4	4	4	4	55	58	59	59	59	56	56	56	56	52		
Density	21	21	21	21	18	25	37	44	52	57	63	76	89	101	109	137	130	150	156	169	155	157	164	156	7	7	7	7	7	7	8	11	11	20		
LOS	C	C	C	C	B	C	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	B	B	C		
Volume	5923	5947	5925	5946	5909	5356	5377	6025	5882	5678	5496	4612	4364	4533	3902	3652	3790	3257	3825	3532	3491	3453	3483	3457	1623	1616	1613	1175	1164	1917	1907	1907	1904	6158		
Lanes	5	5	5	5	6	5	5	6	6	6	6	5	5	6	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6		
Length	1085	607	1508	2000	291	896	986	575	1050	610	836	816	1571	691	452	809	650	937	415	2000	1709	719	387	330	2000	983	955	2000	442	498	934	2000	506	551		
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375		
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1		

2040 Alt-8 AM - I-495 OL Link Evaluation Results

2040 Alt-8 AM
I-495 OL

									Exit 2			Exit 3										Exit 4													
	WWB								I-295			MD 210										MD 414													
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	14	14	23	51	56	57	59	59	59	58	58	59	59	59	59	58	59	59	59	59	58	59	59	53	53	53	53	53	53	53	53	54	54	
Density	111	113	76	34	32	31	21	14	16	17	15	15	19	18	18	22	22	17	21	21	18	20	20	20	25	26	26	26	26	23	23	18	18	
LOS	F	F	F	D	D	D	C	B	B	B	B	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	
Volume	8018	7952	5278	5292	5276	5268	2417	2424	1931	1933	2664	2678	2209	4346	5174	5182	5176	5149	4934	4946	5249	4787	4780	5436	5316	5462	5454	5441	5405	4825	4812	4781	3823	3794
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

									Exit 7						Exit 9							Exit 11											Exit 13						
									MD 5						MD 337							MD 4											Ritchie Marlboro Rd						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	54	52	53	55	54	51	55	55	55	52	51	55	55	56	56	51	54	56	54	52	58	58	57	57	57	58	58	59	58	57	56	58	58	
Density	16	17	18	23	28	27	27	29	23	23	23	24	31	29	29	26	26	25	26	25	26	34	31	31	31	31	31	25	26	26	25	32	31	31		
LOS	B	B	B	C	D	D	D	D	C	C	C	C	D	D	D	C	C	C	D	C	D	D	D	D	D	D	D	C	D	D	C	D	D	D		
Volume	4246	3719	3851	5893	5827	5884	5878	5862	5103	5098	5108	6259	6338	6298	6332	5762	5770	6473	5661	5639	7181	7176	7198	7181	7191	7196	7154	7163	6134	6142	7215	7202	7198	7048		
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4		
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208		
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020		
SegmentID	1	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1			

											Exit 15					Exit 16			Exit 17								Exit 19							Exit 20						
											MD 214					Arena Dr			MD 202								US 50							MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	57	58	57	56	56	59	58	58	58	58	60	59	59	53	57	58	60	57	58	58	58	60	56	56	57	58	57	53	58	59	59	56		
Density	25	25	23	29	26	26	29	22	26	26	26	19	24	24	33	30	30	23	28	22	24	24	23	21	27	30	24	28	27	36	32	32	32	34		
LOS	C	C	C	D	C	D	D	C	D	D	D	C	C	C	D	D	D	C	D	C	C	C	C	C	D	D	C	D	D	E	D	D	D	D		
Volume	7188	5962	6720	6746	7349	7346	6455	6546	4563	4556	4538	6907	6979	6974	6954	6908	6971	6966	6434	6432	5503	5508	5478	7360	7505	6815	6732	6575	7583	7554	7565	7578	7580	7575		
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4		
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849		
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027		
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4		

													Exit 22					Exit 23								Exit 25							Exit 27						
													MD 295					MD 201								US 1							I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	53	53	52	52	53	51	51	54	54	54	55	54	53	53	56	58	58	58	58	57	59	59	58	59	59	58	58	58	53	53	53	53		
Density	33	26	29	29	27	32	33	29	28	27	23	23	19	23	24	30	23	28	28	22	22	19	17	17	17	16	15	13	16	16	19	19	19	20		
LOS	D	D	D	D	D	D	D	D	D	D	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	B	C	C	C	C		
Volume	7540	7551	6110	6119	7072	6671	7025	7369	5762	5709	6149	6186	6343	6305	6293	6203	6546	6540	6545	5108	5036	5543	5927	5865	5861	3676	3613	3783	3791	3772	6093	6115	6099	5392		
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5		
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806		
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107		
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1		

2040 Alt-8 AM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	48	52	53	53	53	54	52	53	53	53	53	50	39	46	52	52	52	48	52	52	53	53	48	32	23	11	18	34	31	40	46	44	37
Density	20	20	19	19	17	21	21	26	26	21	24	24	24	31	32	28	28	27	35	34	33	33	26	33	51	72	122	92	61	66	51	44	37	43
LOS	C	C	C	C	B	C	C	D	D	C	C	C	C	D	D	D	D	D	E	D	D	D	D	D	F	F	F	F	F	F	F	E	E	E
Volume	5370	5776	5056	5053	5336	5442	5509	5511	5513	5504	5061	5044	6087	6049	5955	5954	5764	6961	6830	6969	6866	6985	7018	6462	6468	6514	8191	8174	8225	8215	8140	8087	6392	6274
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur						Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	30	31	27	29	29	27	26	25	23	19	12	10	12	12	10	9	8	7	6	8	8	8	9	11	21	23	38	46	45	41	39	37	36	34
Density	45	54	55	61	63	64	67	71	60	77	90	96	98	104	117	94	136	140	147	143	143	143	133	114	78	86	52	43	44	41	45	51	52	48
LOS	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	F	F	F
Volume	6663	6564	7315	7175	7175	6962	7015	6975	6912	5871	3260	3663	3625	3590	3527	3460	3192	2997	3585	3550	3566	3581	3615	3657	9916	9903	9854	9936	9772	9970	8673	7449	7470	7987
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1655	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	47	52	53	52	52	53	53	53	53	53	53	53	53	52
Density	43	31	34	28	34	30	28	28	28	28	22	28	24	31
LOS	E	D	D	D	D	D	D	D	D	D	C	D	C	D
Volume	8034	8080	7092	7429	7144	7996	5923	5893	5926	5918	5899	5911	6346	6354
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1628	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt-8 AM - I-495 IL Link Evaluation Results

2040 Alt-8 AM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy							Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	50	42	27	23	19	19	20	21	21	24	46	53	55	57	54	54	56	56	57	57	57	57	57	57	54	54	54	58	58	57	57	57	58
Density	31	35	33	57	68	75	77	86	81	81	71	38	35	27	27	32	40	38	31	34	28	27	24	29	30	31	31	27	25	25	25	25	19	21
LOS	D	D	D	F	F	F	F	F	F	F	F	E	D	D	D	D	E	E	D	D	D	D	C	D	D	D	D	D	C	C	C	C	C	C
Volume	7055	6851	6926	6231	6166	7232	7110	7021	6845	6956	8376	7102	7328	7491	7544	8624	8614	8588	8572	7674	7893	7804	8435	8267	8407	8311	8391	4319	4328	4339	4339	4340	4342	3715
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	5	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1503	2000	2000	2000	1662	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355															Exit 33 MD 185									Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	55	51	36	20	20	37	36	45	54	57	55	57	53	58	58	40	27	33	39	21	19	57	60	60	57	59	57	58	59	59	59
Density	16	17	23	23	33	49	81	82	55	57	45	37	29	29	30	26	30	27	49	70	59	49	74	77	25	25	25	21	24	25	30	24	28	26
LOS	B	B	C	C	D	F	F	F	F	F	F	E	D	D	D	D	D	D	F	F	F	F	F	F	C	C	C	C	C	C	D	C	D	D
Volume	2849	3854	3854	3876	3350	7198	8287	8236	8164	8132	8114	8128	8126	8095	6837	6988	6978	7762	7830	7493	7741	7672	7584	7531	5831	5867	5889	7039	6958	7068	7083	7074	6493	6224
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	5	4	5	4	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	60	60	60	60	58	24	51	54	57	58	50	44	34	24	43	54	59	61	61	61	60	60	60	61	58	56	52	27	35	40	43	38
Density	26	27	27	22	25	20	26	56	33	31	29	29	27	36	46	60	38	30	26	25	20	20	18	23	23	24	23	29	32	61	59	51	47	43
LOS	D	D	D	C	C	C	C	F	D	D	D	D	D	E	F	F	E	D	D	C	C	C	C	C	C	C	C	D	D	F	F	F	F	E
Volume	6264	6440	6357	6686	5924	5970	5978	6679	6702	6709	6713	6690	6684	6295	6173	7017	6449	6433	7671	7613	4941	4961	5479	5476	5436	4323	6608	6608	6592	8180	8125	8189	8094	8139
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450					Exit 19 US 50				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	48	55	54	52	54	54	54	49	51	54	55	55	55	55	56	56	55	55	55	54	55	54	52	55	38	50	56	56	54	58	58	57	55	55
Density	40	28	28	30	29	25	31	30	36	26	28	28	25	28	28	23	28	28	29	29	29	29	24	25	35	34	24	26	21	22	22	21	27	33
LOS	E	D	D	D	D	C	D	D	E	D	D	D	C	D	D	C	D	D	D	D	D	D	C	C	E	D	C	C	C	C	C	C	D	D
Volume	7623	7735	7720	7753	6287	6682	6643	7307	7300	7178	6147	6126	6799	6257	6227	6290	6308	6306	6327	6307	6295	6265	6137	5546	6754	6723	6721	5761	5778	5088	5080	7184	7312	7314
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-8 AM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	57	57	56	56	56	57	58	58	58	55	57	58	56	57	58	58	59	59	59	58	57	56	51	44	37	53	58	53	56	58	59	59	59
Density	32	26	26	31	31	31	30	25	25	25	30	23	25	26	32	31	31	24	28	28	26	32	33	36	42	49	28	26	26	27	26	22	27	27
LOS	D	C	C	D	D	D	D	C	C	C	D	C	C	C	D	D	D	C	D	D	C	D	D	E	E	F	D	C	C	D	D	C	D	D
Volume	7276	7290	7316	5276	5294	5285	6896	7277	7301	7300	6528	6527	5912	7190	7193	7189	7101	7191	6499	6548	7365	7355	7342	7369	7384	7356	5934	5954	6864	6036	6072	6398	6388	6407
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	63	63	63	63	62	62	62	63	63	42	14	10	9	10	10	11	14	13	13	13	12	11	11	10	12	13	10	16	14	18	13	8
Density	27	22	23	23	23	19	24	24	24	19	19	26	71	123	118	135	136	113	110	120	121	122	102	128	127	121	116	109	123	98	108	87	80	128
LOS	D	C	C	C	C	C	C	C	C	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6398	6406	5728	5749	5724	5911	5890	5935	5931	5947	5946	4324	5088	4996	5336	5390	5390	5993	6044	6164	6224	6120	6135	5708	5664	6165	5619	5613	6138	6141	6022	3041	3036	1970
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	8	9	12	13	15	18	45	57	58	58	55	46	57
Density	122	131	107	103	91	102	85	51	34	34	34	36	44	36
LOS	F	F	F	F	F	F	F	F	D	D	D	E	E	E
Volume	3008	2973	3642	3633	3630	3037	4705	4606	5880	5877	5862	5836	10087	10095
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Exit 16 Arena Dr

Exit 15 MD 214

Exit 13 Ritchie Marlboro Rd

Exit 11 MD 4

Exit 9 MD 337

Exit 7 MD 5

Exit 4 MD 414

Exit 3 MD 210

Exit 2 I-295

WWB

2040 Alt-8 AM - I-270 NB Link Evaluation Results

2040 Alt-8 AM
I-270 NB

						Exit 1																													
			I-270 W Spur/I-495			Democracy Blvd		Westlake Terrace				I-270 Spur						Exit 4				Exit 5					Exit 6							Exit 8	
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	54	58	60	60	62	61	60	61	62	62	63	64	64	63	63	64	63	61	63	61	61	61	62	60	60	59	59	60	60	60	58	58	59	60	
Density	31	23	23	17	16	13	17	14	14	14	14	12	14	14	14	14	12	13	14	16	16	14	14	14	14	14	16	13	12	14	14	15	12	10	
LOS	D	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
Volume	8391	4079	4079	4055	3015	3146	3113	3435	3418	3414	3411	6152	6171	6182	6145	6140	6095	5522	5323	5959	5950	5872	5310	5965	5952	5942	5744	4815	4962	5077	5062	5066	5052	3541	
Lanes	5	3	3	4	3	4	3	4	4	4	4	8	7	7	7	7	8	7	6	6	6	7	6	7	7	7	6	6	7	6	6	6	7	6	
Length	1503	2000	1387	897	785	887	453	816	1169	731	1853	971	942	1957	783	980	769	698	801	2000	2000	517	742	1343	526	657	417	789	598	1190	1474	1475	991	2000	
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327	
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

				Exit 9						Exit 10		Exit 11												Exit 13				Exit 15						Exit 16	
				I-370						MD 117		MD 124				Watkins Mill Rd								Middlebrook Rd				MD 118						MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	50	61	61	61	59	59	61	61	61	61	61	61	61	61	61	61	62	62	62	62	62	61	61	61	62	61	61	61	61	62	62	61	62	
Density	10	11	5	5	7	7	9	10	10	11	11	11	11	11	10	13	13	13	13	12	10	11	12	13	13	10	12	14	14	12	13	13	11	14	
LOS	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	B	B	A	B	
Volume	3535	3964	1273	1258	1268	1610	3052	3068	3064	2615	2605	2594	2591	3246	3208	3235	3900	3897	3890	3859	3866	3528	3567	3157	3122	3116	3013	2501	2503	2951	2368	2377	2608	2583	
Lanes	6	7	4	4	3	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3	
Length	118	441	1059	630	836	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687	
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381	
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

																	Exit 18												Exit 22							
																	MD 121												MD 109							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	62	62	62	62	62	62	62	61	62	58	61	62	62	62	62	61	61	61	61	61	61	61	61	61	61	60	61	60	61	61	61	61	61	
Density	11	15	15	15	15	15	15	15	11	10	11	10	13	13	13	13	20	20	20	20	20	20	20	20	20	20	13	18	13	19	19	19	19	19	
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	C	B	C	C	C	C	C	
Volume	2689	2708	2716	2707	2705	2703	2702	2692	2695	1867	2444	2453	2447	2468	2460	2454	2442	2447	2435	2419	2433	2410	2413	2420	2422	2412	2411	2261	2332	2323	2324	2323	2324	2312	
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000	
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771	
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4	

							Exit 26																			Exit 31					
							MD 80																			MD 85					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	61	61	61	61	60	57	61	58	59	61	63	63	63	63	63	63	63	63	63	63	63	63	63	61	62	57	63	61	63	
Density	19	19	19	19	19	19	13	17	16	24	23	22	22	22	22	22	22	21	22	22	22	22	22	22	22	15	20	14	15	12	12				
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B	B				
Volume	2289	2290	2291	2296	2294	2280	2250	2048	2789	2781	2790	2789	2782	2776	2769	2745	2739	2705	2738	2732	2718	2710	2711	2708	2702	2717	2456	2426	1913	2951	2943				
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4				
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392				
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577				
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1				

2040 Alt-8 AM - I-270 SB Link Evaluation Results

2040 Alt-8 AM I-270 SB

					Exit 31																								Exit 26								
					MD 85																								MD 80								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	21	27	27	23	21	18	13	10	18	18	17	17	17	16	16	17	17	17	17	17	17	17	16	13	13	14	18	25	26	26	26	26	26	26	26	26
Density	73	57	58	67	72	56	93	102	87	88	90	91	91	93	92	91	90	91	91	89	91	90	92	78	107	85	101	71	68	69	69	69	69	69	69	69
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4732	4690	4696	3065	3048	2985	2414	3188	3166	3170	3142	3121	3111	3062	3018	3069	3056	3052	3053	3064	3053	3053	3031	2998	2745	3544	3549	3556	3550	3578	3606	3525	3587	3597	3597	3597
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000	2000	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2	3	4

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																				Exit 18											
					MD 109																				MD 121											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	27	26	26	26	25	24	23	24	36	39	41	41	40	40	42	40	43	43	45	51	49	24	12	10	13	14	15	15	16	17	17	17	14	10	10	10
Density	68	68	68	69	48	73	61	83	57	53	50	50	52	52	50	52	48	48	46	27	28	44	106	120	116	91	112	112	106	100	101	104	96	132	132	132
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	3605	3612	3600	3583	3573	3550	4160	4068	4159	4141	4126	4161	4165	4139	4168	4170	4155	4168	4152	4158	4156	4154	3693	4689	4660	5090	5089	5123	5187	5201	5255	5238	5263	4077	4077	4077
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3	3	3
Length	2000	1801	1775	948	546	716	1664	92	2000	406	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871	1871	1871
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047	2000047	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	2	3

					Exit 16			Exit 15			Exit 13						Exit 11			Exit 10			Exit 9					Exit 8								
					MD 27			MD 118			Middlebrook Rd						Watkins Mill Rd			MD 124			MD 117			I-370					Shady Grove Rd							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	15	13	14	16	17	18	19	33	39	37	34	41	45	49	53	53	53	50	37	39	36	32	29	43	39	25	33	53	53	52	48	46	44	44	44
Density	125	111	107	97	108	83	100	80	60	52	54	58	49	44	40	32	28	28	34	46	54	59	64	68	39	42	56	43	21	21	24	27	33	31	31	31
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	D	F	F	F	F	F	E	E	F	E	C	C	C	D	D	D	D	D
Volume	5004	4961	5574	5569	5157	5525	5466	6023	6025	6038	6050	7944	7958	7936	7954	6735	5893	5898	6933	8415	8332	8368	8323	9966	9975	9852	9938	9935	6586	6619	10181	10183	9122	9576	9576	9576
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	6	6	8	8	6	7	7	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1634	1783	598	731	480	480	480
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723	723	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

												Exit 5					Exit 4											Exit 1								
												MD 189					Montrose Rd							I-270 Spur				Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	47	47	46	45	42	41	39	36	33	25	25	32	24	43	53	53	48	52	52	50	42	50	52	50	53	53	51	53	53	53	52	50	49	21	21	21
Density	34	36	36	38	40	41	37	44	49	64	64	55	69	45	31	36	35	37	33	34	42	34	29	32	26	26	24	27	26	19	23	31	42	78	78	78
LOS	D	E	E	E	E	E	E	E	F	F	F	F	F	F	D	E	E	E	D	D	E	D	D	D	C	C	C	D	D	C	C	D	E	F	F	F
Volume	9630	10133	10158	10165	10213	10250	10151	9564	9801	11241	11313	10468	11568	11638	11548	11355	11896	11504	12074	12128	12140	12085	11861	11294	5453	5449	6240	5643	5601	6167	6149	6152	6238	9916	9916	9916
Lanes	6	6	6	6	6	6	7	6	6	7	7	6	7	6	7	6	7	6	7	7	7	7	8	7	4	4	5	4	4	6	5	4	3	6	6	6
Length	795	2000	1659	469	1017	934	444	935	998	608	1803	1636	696	2000	449	900	640	885	1396	2000	1704	716	393	324	2000	287	941	2000	455	517	511	795	1707	551	551	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	90	495375	495375	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1	2	3

2040 Alt 8 PM - I-495 OL Link Evaluation Results

2040 Alt 8 PM
I-495 OL

		WWB								I-295 (Exit 2)			MD 210 (Exit 3)									MD 414 (Exit 4)													
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	21	23	50	56	56	58	58	58	58	57	58	58	58	53	49	57	57	58	58	57	58	58	53	53	53	53	52	52	53	53	53	53	53	
Density	102	90	77	35	32	31	31	21	24	24	25	25	30	29	29	40	34	27	30	30	25	28	28	26	32	33	33	34	34	28	28	22	22	22	
LOS	F	F	F	D	D	D	D	C	C	C	C	C	D	D	D	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	C	C	
Volume	9293	9295	5266	5272	5277	5278	3609	3609	2784	2786	4285	4298	3435	6690	7775	7778	7759	7715	6943	6956	7202	6437	6429	6938	6784	6996	7014	7033	6996	5953	5958	5920	4607	4583	
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503	
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981	
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		MD 5									MD 337										MD 4															
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	53	52	51	52	53	53	53	53	35	17	43	51	52	53	53	50	51	52	52	50	52	52	52	53	53	53	53	53	53	50	52	53	
Density	19	23	23	21	27	27	27	26	25	25	38	73	37	31	31	26	26	27	29	28	27	36	34	34	34	34	33	27	29	30	27	35	34	33	
LOS	C	C	C	C	D	D	D	D	C	C	E	F	E	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	D	D	D	
Volume	5125	4778	4792	5613	5581	5607	5596	5604	5225	5228	5228	6399	6406	6422	6425	5619	5619	6590	5887	5869	7170	7147	7163	7162	7158	7152	7105	7151	6251	6278	7025	7040	7055	7032	
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4	
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201	
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020	
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1	

			MD 214					Arena Dr		MD 202											US 50								MD 450								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	53	53	49	52	53	53	53	53	53	53	53	52	51	52	53	57	58	58	58	58	58	44	51	56	57	57	55	56	57	58	58	
Density	26	26	24	30	26	28	31	24	32	32	32	21	25	25	32	32	32	25	26	20	23	23	23	20	32	30	22	25	23	30	29	29	28	28	
LOS	D	C	C	D	D	D	D	C	D	D	D	C	C	C	D	D	D	C	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D	
Volume	7058	5487	6389	6389	6859	6854	6430	6455	5044	5047	5029	6623	6602	6645	6623	6627	6622	6580	5882	5844	5324	5330	5286	7048	7140	6097	6013	5757	6550	6556	6552	6545	6540	6540	
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4	
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849	
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027	
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	

				MD 295							MD 201											US 1								I-95							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	52	51	52	52	51	53	53	53	53	53	50	51	54	50	53	56	58	57	57	58	58	58	58	58	58	58	53	53	53	53	
Density	28	22	26	25	26	33	32	28	31	29	27	27	23	28	29	34	29	38	36	29	28	26	24	23	23	22	22	18	22	22	24	24	24	26	
LOS	D	C	C	C	C	D	D	D	D	D	D	D	C	D	D	D	D	E	E	D	D	C	C	C	C	C	C	B	C	C	C	C	C	C	
Volume	6522	6423	5425	5419	6697	6636	6587	7201	6232	6208	7067	7118	7366	7343	7374	6969	7632	7626	7640	6571	6508	7338	8112	8105	8087	5119	5074	5144	5173	5152	7479	7508	7488	6839	
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5	
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806	
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107	
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	

2040 Alt 8 PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	50	52	53	52	52	50	50	53	53	53	53	48	24	43	51	51	51	46	48	52	52	53	53	54	53	52	47	46	50	51	53	53	53
Density	26	24	25	25	23	28	29	36	34	27	30	30	30	59	40	34	34	30	41	39	35	36	28	30	29	29	24	33	41	38	37	36	30	30
LOS	C	C	C	C	C	D	D	E	D	D	D	D	D	F	E	D	D	D	E	E	E	E	D	D	D	D	C	D	E	E	E	E	D	D
Volume	6791	7338	6513	6551	7000	7239	7238	7236	7248	7243	6421	6418	7152	7139	6890	6931	6950	7602	7464	7485	7352	7477	7505	6265	6286	6256	7626	7604	7652	7645	7601	7618	6406	6384
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1131	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	53	51	49	50	52	52	53	53	53	49	53	53	53	52	53	53	53	53	53	53	51	50	54	54	54	53	54	53	54	54	54	52
Density	28	34	29	37	39	38	37	37	29	30	23	21	26	26	26	19	22	20	19	26	26	26	27	27	20	24	24	24	24	20	22	26	26	27
LOS	D	D	D	E	E	E	E	E	D	D	C	C	D	D	C	C	C	C	C	D	C	C	D	D	C	C	C	C	C	C	C	C	C	D
Volume	7214	7192	7627	7664	7662	7650	7618	7656	7640	6443	3663	4122	4137	4141	4136	4048	3471	3213	4090	4123	4124	4122	4125	4114	6487	6471	6494	6503	6392	6495	6047	5602	5607	6922
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	951	466	1589	284	907	487	893	1176	325	2000	31	492	985	2000	2000	2000	1642	551	937	2000	655	442	1021	1592	2000	575	1737
LinkID	1953310	1953311	1953312	1963312	11064	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	54	50	47	52	53	53	54	53	54	53	53	53
Density	33	26	28	25	33	29	26	25	25	25	22	28	25	31
LOS	D	C	D	C	D	D	C	C	C	C	C	D	C	D
Volume	6919	6923	6100	6090	6150	7532	5431	5433	5440	5442	5884	5863	6542	6560
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt 8 PM - I-495 IL Link Evaluation Results

3E+06

2040 Alt 8 PM
I-495 IL

| Direction of Travel | → | → | →

2040 Alt 8 PM

I-495 IL

	Exit 16 Arena Dr											Exit 15 MD 214						Exit 13 Ritchie Marlboro Rd									Exit 11 MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	47	52	53	53	53	53	49	51	51	47	48	51	52	50	51	52	52	53	53	53	53	53	52	52	52	53	53	50	52	53	52	53	53
Density	38	28	28	29	29	29	32	27	27	29	32	24	26	27	33	33	32	25	24	24	24	29	29	30	30	30	26	26	25	25	25	23	28	28
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	C	C	C	C	D	D	D	D	D	C	C	C	C	C	C	D	D
Volume	7298	7316	7354	4644	4652	4659	6230	6776	6795	6793	6104	6099	5507	6740	6746	6749	6677	6751	5179	5174	6211	6197	6206	6197	6199	6196	5478	5471	6281	5234	5193	5984	5970	5984
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	Exit 9 MD 337											Exit 7 MD 5													Exit 4 MD 414							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	62	63	63	62	62	61	61	63	63	63	61	63	63	63	63	63	63	63	63	62	63	63	63	62	63	63	62	62	61	61	63	63
Density	28	23	22	22	22	19	24	25	25	19	19	16	16	19	17	21	19	24	24	24	24	24	19	22	22	19	20	20	18	22	22	31	20	19
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	D	C	C
Volume	5977	5978	5474	5492	5467	6019	6042	6048	6035	6031	6020	3923	4889	4901	5233	5277	5916	5987	5973	5968	5969	5946	5939	5527	5478	5889	5060	5048	5508	5532	5431	3713	3727	2411
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295						WWB	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	59	57	57	53	25	43	48	53	53	53	56	56
Density	13	17	15	20	20	29	63	51	43	40	40	39	30	30
LOS	B	B	B	C	C	D	F	F	E	E	E	E	D	D
Volume	3050	3032	3477	3468	3473	3063	4634	4300	6308	6308	6293	6246	8377	8384
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt 8 PM - I-270 NB Link Evaluation Results

2040 Alt 8 PM
I-270 NB

		Exit 1																	Exit 4				Exit 5					Exit 6							
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	13	52	54	55	55	53	53	52	54	54	54	53	53	53	53	53	52	52	53	52	53	53	53	50	51	51	53	52	52	52	52	53	53	53
Density	87	19	18	14	16	14	19	20	20	20	21	22	25	25	25	25	22	24	27	32	32	32	30	30	30	29	32	29	27	31	31	31	26	23
LOS	F	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	C
Volume	6548	2946	2954	2955	2655	3070	3053	4230	4222	3283	3304	9261	9294	9286	9274	9271	9268	8863	8703	10057	10037	10037	9483	10519	10547	10550	10213	9134	9808	9800	9791	9778	9778	9757
Lanes	6	3	3	4	3	4	3	4	4	3	3	8	7	7	7	7	8	7	6	6	6	6	6	7	7	7	6	6	7	6	6	6	7	8
Length	1508	2000	128	894	788	878	450	778	1836	321	1564	1183	782	1201	1533	995	769	702	531	2000	1343	799	690	1389	530	634	406	872	598	2000	1459	1474	998	515
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Exit 8		Exit 9							Exit 10		Exit 11				Watkins Mill Rd								Exit 13				Exit 15						Exit 16	
		Shady Grove Rd		I-370							MD 117		MD 124												Middlebrook Rd				MD 118						MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	35	27	24	23	21	19	22	22	21	19	18	17	16	15	17	14	14	13	13	13	12	12	11	11	13	12	14	13	11	10	10	11	12
Density	26	38	38	42	56	61	54	58	56	66	71	74	77	77	82	86	95	99	104	96	82	94	95	112	111	77	93	100	106	104	115	117	93	108
LOS	D	E	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	8327	9297	4144	4056	5150	5031	6274	6282	6188	5638	5499	5398	5250	6087	6012	5985	6862	6798	6662	6304	6245	5670	5715	5066	5015	4936	4635	4110	4045	4582	3567	3586	3979	3970
Lanes	6	7	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	18	474	1026	657	2000	749	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
LinkID	323	336	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	1	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		Exit 18										MD 121																	Exit 22							
																													MD 109							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	12	13	13	13	12	12	12	12	11	9	10	10	11	11	12	23	43	51	52	52	52	52	52	52	52	52	53	53	52	50	52	52	52	52
Density	84	105	105	107	113	113	116	116	97	133	105	103	128	129	115	62	50	42	41	40	41	41	41	41	41	41	27	38	27	42	40	40	40	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
Volume	4140	4164	4194	4199	4197	4181	4177	4173	4140	3726	4247	4230	4210	4286	4271	4274	4261	4274	4262	4235	4271	4250	4253	4262	4276	4264	4269	4043	4223	4211	4223	4229	4227	4225
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		Exit 26																									Exit 31							
							MD 80																				MD 85							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	52	52	51	47	37	26	39	51	52	52	50	50	51	51	51	50	51	51	51	52	52	51	53	53	52	53	52	53			
Density	40	40	40	41	40	41	30	49	56	56	43	42	42	44	44	43	43	43	43	43	43	43	42	43	43	27	38	25	34	25	25			
LOS	E	E	E	E	E	E	D	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C			
Volume	4222	4235	4232	4236	4231	4216	4163	3660	4357	4341	4362	4360	4363	4367	4373	4351	4357	4314	4373	4376	4375	4378	4391	4395	4369	4384	4019	3967	3582	5354	5356			
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4			
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392			
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577			
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1			

2040 Alt 8 PM - I-270 SB Link Evaluation Results

2040 Alt 8 PM
I-270 SB

					Exit 31																				Exit 26										
					MD 85																				MD 80										
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	57	58	58	56	59	55	59	62	63	63	63	63	63	63	62	61	61	59	58	58	58	58	60	59	58	58	59	59	59	58	58	57
Density	21	21	21	23	23	16	17	16	22	21	20	20	20	20	20	20	21	21	21	22	22	22	22	15	17	13	20	20	20	20	20	20	20	20
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C
Volume	3611	3602	3616	2664	2662	2643	1938	2585	2567	2573	2572	2575	2575	2569	2539	2561	2567	2567	2556	2552	2548	2551	2558	2545	2068	2323	2320	2317	2305	2320	2329	2282	2320	2324
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																				Exit 18										
					MD 109																				MD 121										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	56	56	56	57	57	56	53	56	56	56	56	57	56	56	56	56	56	53	59	62	61	62	61	62	62	63	63	63	63	63	63	63	64
Density	21	21	21	20	13	19	14	23	22	21	21	21	21	21	21	21	21	21	22	13	13	10	11	10	13	12	15	15	15	15	15	15	12	13
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B
Volume	2317	2317	2301	2300	2297	2207	2412	2413	2413	2394	2393	2408	2410	2384	2385	2375	2359	2363	2344	2351	2350	2345	2021	2438	2446	2885	2897	2907	2914	2932	2939	2922	2929	2532
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

					Exit 16																														
					MD 27																														
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	62	63	63	63	62	63	61	61	62	63	62	62	61	60	63	64	64	63	59	62	63	63	58	45	40	23	23	64	58	58	59	57	56
Density	13	17	14	14	16	14	18	17	23	22	22	21	21	21	21	13	13	13	16	18	21	21	21	24	26	29	43	43	8	12	12	14	14	16
LOS	B	B	B	B	B	B	C	B	C	C	C	C	C	C	C	B	B	B	B	B	C	C	C	C	C	D	E	E	A	B	B	B	B	B
Volume	3178	3160	3511	3500	3098	3474	3439	4129	4129	4134	4128	5132	5146	5116	5119	4221	3246	3222	3921	5220	5183	5224	5229	6981	6997	7005	6968	6938	3001	5395	5398	5083	5758	6435
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	6	8	8	6	7	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	960	1027	795	1607	706	478	708
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

							Exit 6					Exit 5					Exit 4								Exit 1										
							MD 28					MD 189					Montrose Rd						I-270 Spur			Westlake Terrace	Democracy Blvd							I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	56	57	57	56	56	56	56	53	48	30	13	12	10	9	8	5	5	5	5	5	55	58	58	59	59	56	57	57	57	54
Density	19	19	19	19	16	17	18	19	19	19	19	20	22	32	65	82	85	105	110	141	150	151	153	148	11	10	8	7	7	7	8	10	14	20
LOS	C	C	C	C	B	B	B	C	C	C	C	C	C	D	F	F	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	A	B	C
Volume	6406	6437	6404	6412	6394	5854	6147	7293	7350	7341	7349	6471	6411	6723	6047	5717	6095	5444	5814	5233	4947	4896	4902	4888	2331	2337	2395	1699	1690	2352	2340	2344	2359	6487
Lanes	6	6	6	6	7	6	6	7	7	7	7	6	6	7	7	6	7	6	7	7	7	7	7	7	4	4	5	4	4	6	5	4	3	6
Length	1085	607	1508	2000	291	896	983	575	1050	610	832	816	1571	691	452	809	645	937	415	2000	1707	706	387	340	2000	718	1210	2000	441	498	934	961	1538	551
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	136	495375
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1

2040 Alt-9 AM - I-495 OL Link Evaluation Results

2040 Alt-9 AM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	15	23	51	56	57	59	59	59	58	59	59	59	59	59	58	59	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53	53	53
Density	102	108	77	34	31	31	21	14	16	16	15	15	18	18	17	22	21	17	20	20	18	20	20	19	24	24	24	24	24	21	21	17	17	17
LOS	F	F	F	D	D	D	C	B	B	B	B	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B
Volume	8183	8014	5249	5260	5263	5256	2407	2408	1918	1921	2597	2599	2140	4325	5056	5069	5065	5038	4812	4826	5218	4713	4706	5101	4998	5139	5141	5145	5110	4539	4527	4505	3714	3675
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337										Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	44	54	54	53	53	55	54	53	55	55	55	55	52	52	55	55	56	56	52	55	55	56	55	53	58	58	57	57	57	58	58	58	56	55	57	57
Density	18	16	17	18	23	22	23	23	19	19	19	21	27	25	25	22	22	22	23	22	24	31	28	28	29	29	29	23	25	25	25	31	31	30
LOS	C	B	B	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	D	D	D	D	D	D	C	C	C	C	D	D	D
Volume	4007	3494	3620	4856	4812	4867	4881	4873	4237	4239	4232	5427	5493	5459	5486	4978	4984	5714	5040	5027	6510	6505	6536	6551	6578	6571	6517	6528	5758	5775	6960	6951	6935	6789
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214						Exit 16 Arena Dr			Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	59	57	57	57	56	57	58	56	57	57	57	60	58	53	51	57	58	60	57	58	58	58	59	57	57	58	59	57	52	58	59	59	57
Density	24	25	23	28	25	25	28	22	28	28	28	19	24	26	34	30	30	23	28	22	24	24	23	20	26	29	23	27	26	35	32	32	32	33
LOS	C	C	C	D	C	C	D	C	D	D	D	C	C	D	D	D	D	C	D	C	C	C	C	C	C	D	C	D	D	E	D	D	D	D
Volume	6926	5749	6483	6498	7080	7085	6306	6399	4787	4800	4783	6867	6932	6924	6902	6839	6909	6903	6421	6420	5497	5501	5471	7242	7379	6685	6594	6451	7441	7412	7434	7443	7435	7431
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1								Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	53	53	53	53	53	52	52	54	53	54	55	54	53	53	56	57	58	58	58	57	58	59	59	59	59	58	58	58	53	53	53	53
Density	32	26	28	28	26	31	33	28	27	26	22	22	19	23	23	29	22	28	27	21	21	18	16	16	16	14	14	12	15	15	19	19	19	21
LOS	D	C	D	D	D	D	D	D	D	C	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	B	C	C	C	C
Volume	7396	7409	6046	6060	6982	6572	6929	7334	5600	5544	5999	6046	6233	6188	6167	5993	6316	6332	6352	4883	4818	5265	5717	5668	5658	3342	3281	3448	3463	3454	6129	6154	6149	5492
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt-9 AM
I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29									Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	49	52	53	53	53	53	52	53	52	53	53	49	49	50	53	52	51	48	52	52	53	53	50	39	25	11	17	31	28	35	40	39	27
Density	21	20	20	19	17	21	21	27	27	21	24	24	25	25	31	29	28	27	35	34	33	33	26	33	42	65	119	94	64	70	56	49	40	56
LOS	C	C	C	C	B	C	C	D	D	C	C	C	C	C	D	D	D	D	E	D	D	D	D	D	E	F	F	F	F	F	F	F	E	F
Volume	5469	5868	5145	5145	5421	5530	5605	5601	5615	5605	5129	5101	6168	6147	6147	6142	5927	6969	6842	6976	6874	6990	7023	6551	6507	6473	8022	7904	7894	7886	7838	7884	6261	6171
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187							I-270 W Spur						Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	23	25	22	26	26	24	23	23	21	16	10	8	11	10	9	9	9	9	8	12	12	13	14	20	35	29	26	22	21	18	18	21	21	25
Density	57	66	66	70	71	73	77	79	67	91	113	119	119	127	138	106	141	133	143	124	124	122	112	77	42	63	69	84	85	85	87	85	86	67
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	F	F	F	F	F	F	F	F	F
Volume	6644	6560	7371	7250	7263	7089	7139	7107	7052	5877	3499	3953	3936	3883	3852	3851	3685	3562	4496	4506	4535	4573	4580	4628	8944	8971	8912	9021	8879	9033	8000	7220	7223	8434
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1657	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	44	51	53	52	52	52	53	53	53	53	53	53	53	52
Density	48	33	35	30	36	33	30	30	30	30	24	30	25	32
LOS	F	D	E	D	E	D	D	D	D	D	C	D	C	D
Volume	8452	8493	7446	7795	7541	8504	6416	6384	6414	6408	6381	6384	6738	6750
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1628	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt-9 AM - I-495 IL Link Evaluation Results

2040 Alt-9 AM
I-495 IL

	Exit 44 VA 193						Exit 43 GW Memorial Pkwy				Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	56	57	54	32	27	23	21	21	23	46	53	55	57	54	54	56	54	57	57	57	57	57	56	57	57	54	57	57	57	49	26	54
Density	30	29	24	27	29	45	54	74	78	79	71	37	33	26	25	31	38	37	31	33	26	26	23	27	28	27	27	30	28	28	29	33	46	26
LOS	D	D	C	D	D	E	F	F	F	F	F	E	D	D	C	D	E	E	D	D	D	C	C	D	D	D	D	D	D	D	D	D	F	D
Volume	6876	6751	6873	6192	6186	7276	7163	6732	6539	6635	8049	6741	6964	7170	7221	8300	8309	8294	8266	7382	7483	7396	7804	7650	7788	7722	7794	4884	4884	4882	4884	4885	4886	4212
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	5	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1503	2000	2000	2000	1662	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355							Exit 33 MD 185																Exit 31 MD 97										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	55	46	49	58	56	31	47	51	46	46	46	40	35	28	28	23	26	22	27	27	15	17	55	59	59	57	60	58	59	60	60	60
Density	19	19	26	32	39	29	29	52	43	40	43	43	35	40	48	49	61	64	72	82	70	69	95	86	25	24	24	20	23	24	29	23	26	25
LOS	C	C	D	D	E	D	D	F	E	E	E	E	D	E	F	F	F	F	F	F	F	F	F	F	C	C	C	C	C	C	D	C	D	C
Volume	3226	4345	4353	4389	3801	6693	8137	8131	8069	8045	7991	7975	7971	7921	6712	6854	6798	7492	7481	7158	7404	7382	7345	7342	5594	5626	5645	6863	6778	6883	6894	6885	6300	6042
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	60	60	60	60	57	24	50	54	53	48	42	39	32	22	43	54	59	61	61	61	60	60	60	61	58	57	57	49	44	46	47	41
Density	25	26	26	22	24	19	26	56	34	31	32	35	32	41	49	64	38	30	26	25	20	20	18	23	23	23	22	28	28	33	45	44	42	39
LOS	C	D	C	C	C	C	C	F	D	D	D	E	D	E	F	F	E	D	D	C	C	C	C	C	C	C	C	D	D	D	E	E	E	E
Volume	6085	6263	6194	6517	5808	5857	5872	6751	6764	6760	6756	6710	6694	6342	6228	7051	6486	6487	7706	7662	4921	4938	5495	5494	5445	4188	6375	6371	6353	7974	7928	7993	7902	7967
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450					Exit 19 US 50				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	55	54	51	54	54	54	51	52	55	56	55	54	55	56	56	56	56	56	55	55	54	53	55	45	52	57	56	53	58	58	57	54	55
Density	38	28	28	29	28	24	30	27	34	25	26	26	25	28	27	22	27	27	27	28	28	28	23	24	29	32	23	24	21	21	21	21	27	33
LOS	E	D	D	D	D	C	D	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	C	C	D	D	C	C	C	C	C	C	D	D
Volume	7415	7536	7515	7535	6094	6488	6469	6967	6963	6845	5847	5837	6647	6094	6069	6134	6133	6120	6123	6121	6110	6097	5945	5359	6557	6534	6552	5505	5517	4801	4792	7149	7292	7275
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-9 AM

I-495 IL

							Exit 16 Arena Dr					Exit 15 MD 214							Exit 13 Ritchie Marlboro Rd									Exit 11 MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	57	56	57	58	58	58	56	58	59	57	57	58	58	59	59	59	58	57	56	54	47	40	55	59	53	56	58	59	59	60
Density	32	25	25	31	31	31	30	25	25	25	29	22	25	25	31	31	31	24	26	27	25	31	32	33	38	45	26	25	25	26	25	22	27	27
LOS	D	C	C	D	D	D	D	C	C	C	D	C	C	C	D	D	D	C	D	D	C	D	D	D	E	F	D	C	C	D	C	C	D	D
Volume	7222	7230	7262	5261	5293	5292	6846	7189	7203	7196	6428	6430	5879	7166	7160	7165	7079	7148	6269	6305	7187	7203	7200	7179	7156	7161	5811	5827	6756	5900	5918	6364	6363	6372
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1
			Exit 9 MD 337										Exit 7 MD 5													Exit 4 MD 414								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	63	63	63	63	62	61	61	63	61	20	10	10	10	11	11	12	15	13	13	13	13	12	12	11	12	13	10	16	14	18	13	9
Density	27	21	23	23	23	19	24	24	24	19	19	48	101	121	106	121	123	107	107	117	120	120	99	126	125	118	116	109	117	97	105	84	76	115
LOS	D	C	C	C	C	C	C	C	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6358	6359	5709	5738	5708	5907	5896	5936	5915	5930	5927	3878	4808	4894	5350	5522	5612	6212	6189	6250	6311	6273	6294	5850	5832	6185	5636	5624	6125	6079	5964	3005	2986	1984
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295		WWB				
	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	8	9	12	14	15	17	45	57	58	58	55	47	57
Density	119	130	108	100	90	101	90	50	34	34	34	35	43	35
LOS	F	F	F	F	F	F	F	F	D	D	D	D	E	E
Volume	3067	3044	3725	3701	3700	3089	4682	4582	5840	5835	5837	5789	10008	10032
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt-9 AM - I-270 NB Link Evaluation Results

2040 Alt-9 AM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	62	62	64	63	63	62	64	64	64	64	64	63	64	64	63	61	63	61	60	61	61	59	59	59	59	59	59	58	58	58	59		
Density	27	25	23	15	16	12	17	14	13	13	13	12	12	12	12	12	11	12	13	16	16	13	14	14	14	14	16	14	12	15	15	15	12	10	
LOS	D	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
Volume	7794	2902	2899	2878	2077	2218	2193	2536	2525	2523	2504	4751	4754	4752	4729	4747	4709	4366	4202	4919	4894	4831	4357	4987	4971	4957	4740	4125	4257	4351	4331	4324	4316	2999	
Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	6	5	6	6	6	5	5	6	5	5	5	6	5	
Length	1503	2000	1418	897	788	886	453	816	1169	730	1875	430	1464	1957	783	980	769	698	801	2000	2000	517	742	1343	526	657	425	789	598	1189	1474	1474	991	2000	
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327	
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	

Speed Color Scale (mph)

10 30 40 50 70

				Exit 9						Exit 10		Exit 11												Exit 13				Exit 15							Exit 16	
				I-370						MD 117		MD 124				Watkins Mill Rd								Middlebrook Rd				MD 118							MD 27	
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	49	60	60	60	58	59	60	60	60	60	60	60	60	60	60	60	61	61	61	61	61	60	60	60	61	60	60	60	60	61	61	61	61	
Density	10	12	7	7	7	8	9	10	10	11	11	11	11	11	11	13	13	13	13	13	11	12	12	13	13	10	12	13	13	12	12	12	10	13	
LOS	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	B	B	A	B	
Volume	2999	3470	1192	1179	1188	1768	3024	3040	3043	2597	2593	2593	2591	3264	3221	3245	3907	3906	3896	3862	3868	3524	3566	3149	3109	3106	2918	2401	2399	2839	2233	2249	2461	2436	
Lanes	5	6	3	3	3	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3	
Length	118	441	1059	630	836	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687	
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381	
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

											Exit 18																				Exit 22						
											MD 121																				MD 109						
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	61	61	61	61	61	61	61	61	62	58	61	62	62	62	61	61	61	61	61	61	61	60	60	60	60	60	60	60	61	60	60	60	60	59
Density	10	14	14	14	14	14	14	14	11	10	10	10	13	13	13	13	19	20	19	19	19	19	19	19	19	19	13	18	13	19	19	19	19	19	
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	C	B	C	C	C	C	C	
Volume	2544	2558	2570	2567	2563	2571	2576	2566	2563	1778	2351	2355	2346	2367	2358	2362	2359	2370	2360	2345	2357	2343	2343	2345	2344	2335	2332	2191	2266	2264	2271	2262	2263	2251	
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000	
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771	
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4	

							Exit 26																			Exit 31									
							MD 80																			MD 85									
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	59	59	59	58	55	59	56	56	60	63	63	63	63	63	63	63	63	63	63	63	62	62	62	62	62	57	63	61	63				
Density	19	19	19	19	19	19	13	17	16	24	23	22	21	21	21	21	21	21	21	21	21	21	21	21	21	14	19	14	15	12	11				
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B				
Volume	2233	2231	2232	2236	2236	2226	2198	1999	2734	2722	2730	2717	2706	2701	2704	2690	2686	2655	2689	2693	2693	2672	2664	2655	2637	2651	2392	2361	1868	2908	2899				
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4				
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392				
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577				
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1				

2040 Alt-9 AM - I-270 SB Link Evaluation Results

2040 Alt-9 AM
I-270 SB

					Exit 31																						Exit 26									
					MD 85																						MD 80									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	16	16	12	12	11	9	8	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	13	14	15	18	26	27	27	28	27	27	27
Density	90	89	95	125	126	91	138	128	90	87	88	89	88	88	89	88	86	89	88	88	90	90	93	77	105	83	99	69	66	67	66	66	67	67
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4422	4413	4448	2939	2930	2932	2425	3216	3195	3191	3190	3160	3192	3178	3138	3148	3157	3123	3137	3100	3093	3088	3068	3063	2828	3630	3639	3611	3588	3622	3637	3578	3632	3645
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																			Exit 18											
					MD 109																			MD 121											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	27	27	26	26	25	24	23	25	36	42	43	44	44	44	42	43	43	42	42	51	53	52	52	51	52	52	53	53	53	49	40	39	33	19
Density	67	67	69	70	49	73	61	82	58	50	48	48	48	47	50	48	48	49	49	27	26	20	24	23	30	25	33	32	33	35	43	44	39	72
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	D	D	D	D	E	E	E	F
Volume	3646	3663	3621	3612	3603	3570	4184	4105	4190	4167	4153	4187	4179	4150	4178	4170	4151	4166	4152	4170	4168	4155	3721	4731	4737	5157	5160	5158	5153	5156	5158	5156	5199	4042
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

					Exit 16																															
					MD 27																															
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	12	15	13	14	15	16	18	18	32	36	35	33	42	46	48	42	22	17	15	16	23	23	22	24	48	50	53	53	53	53	52	50	51	51
Density	100	110	106	98	110	84	102	82	62	55	57	60	48	43	41	39	64	83	113	98	85	86	89	81	33	32	26	26	22	22	24	25	31	27
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	F	F	F	F	F	F	F	F	D	D	D	C	C	C	C	C	D	D
Volume	4952	4928	5504	5492	5072	5429	5380	5970	5975	5991	5982	7880	7924	7908	7907	6599	5691	5616	6574	8040	7960	8019	8038	9606	9640	9539	9645	9669	5730	5763	8947	8928	7722	8154
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	5	5	7	7	5	6
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1633	1783	599	731	480
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

												Exit 5					Exit 4												Exit 1							
												MD 189					Montrose Rd							I-270 Spur				Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	53	53	53	53	53	53	53	47	52	44	48	53	53	50	53	53	52	46	51	53	53	53	53	53	53	53	53	53	53	50	35
Density	32	33	33	33	33	33	27	31	31	29	33	32	35	39	29	32	31	34	30	30	34	31	29	30	20	20	20	24	24	16	20	27	29	42
LOS	D	D	D	D	D	D	D	D	D	D	D	D	E	E	D	D	D	D	D	D	D	D	D	D	C	C	C	C	C	B	C	D	D	E
Volume	8197	8617	8659	8654	8693	8701	8594	8057	8226	9322	9333	8323	9347	9385	9299	8514	9359	8940	9360	9391	9398	9370	9238	9410	4352	4341	4355	3842	3852	4282	4270	4293	4299	8944
Lanes	5	5	5	5	5	5	6	5	5	6	6	5	6	5	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6
Length	795	2000	1661	469	1017	935	444	935	998	608	1801	1637	697	2000	449	900	640	885	1395	2000	1704	716	393	325	2000	999	940	2000	450	517	937	2000	520	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1

2040 Alt 9 PM - I-495 OL Link Evaluation Results

2040 Alt 9 PM
I-495 OL

		WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414												
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	21	23	50	56	56	58	58	58	58	56	57	58	58	53	49	57	57	58	58	57	58	58	53	53	53	53	52	52	52	53	53	53	53	
Density	102	90	77	35	32	31	31	21	24	24	25	25	30	29	29	40	34	27	30	30	25	28	28	26	32	33	33	34	34	28	28	22	22	21	
LOS	F	F	F	D	D	D	D	C	C	C	C	C	D	D	D	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	C	C	
Volume	9293	9295	5266	5272	5277	5278	3609	3609	2784	2786	4285	4298	3437	6693	7774	7775	7744	7702	6932	6943	7196	6426	6410	6929	6791	6997	7009	7026	6992	5955	5956	5923	4606	4577	
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503	
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981	
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1	

Speed Color Scale (mph)
10 30 40 50 70

		Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	53	52	51	52	53	53	53	53	53	35	18	43	51	52	53	53	51	52	53	53	51	52	52	53	53	53	53	53	53	53	50	52	53
Density	19	23	23	21	27	27	27	26	25	25	38	72	37	32	31	26	26	26	28	28	27	35	35	34	34	34	33	27	30	30	27	35	34	33	
LOS	C	C	C	C	D	D	D	D	C	C	E	F	E	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	E	D	D	
Volume	5123	4775	4789	5606	5578	5604	5593	5603	5220	5220	5218	6411	6427	6440	6433	5623	5623	6594	5886	5872	7177	7153	7170	7164	7161	7160	7115	7154	6255	6270	7014	7028	7044	7021	
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4	
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201	
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020	
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1	

			Exit 15 MD 214					Exit 16 Arena Dr			Exit 17 MD 202										Exit 19 US 50										Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	53	53	50	52	52	53	53	53	53	53	53	52	51	52	53	57	58	58	58	58	48	52	56	58	57	56	56	57	58	58		
Density	26	26	24	30	26	27	31	25	32	32	32	21	25	25	32	32	32	25	26	20	23	23	23	20	30	29	21	25	23	29	29	29	28	28	
LOS	D	C	C	D	D	D	D	C	D	D	D	C	C	C	D	D	D	C	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D	
Volume	7046	5479	6376	6379	6845	6844	6431	6456	5045	5043	5026	6617	6595	6630	6621	6632	6626	6577	5873	5834	5319	5317	5276	7044	7139	6100	6014	5757	6545	6545	6546	6528	6532	6546	
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4	
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849	
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027	
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	

				Exit 22 MD 295							Exit 23 MD 201										Exit 25 US 1							Exit 27 I-95								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	51	50	52	52	52	53	53	53	53	53	50	51	54	53	55	57	58	57	57	58	57	58	58	58	58	58	53	53	53	53	
Density	28	22	26	25	26	33	32	28	30	29	27	27	23	28	29	34	28	36	35	29	28	26	24	23	24	22	22	18	22	22	24	24	24	26	
LOS	D	C	C	C	D	D	D	D	D	D	D	D	C	D	D	D	D	E	D	D	D	C	C	C	C	C	C	B	C	C	C	C	C	C	
Volume	6527	6431	5437	5434	6717	6663	6608	7219	6244	6215	7076	7126	7373	7347	7381	6980	7649	7616	7630	6565	6500	7339	8117	8124	8109	5128	5078	5145	5177	5156	7482	7517	7505	6848	
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5	
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806	
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107	
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	

2040 Alt 9 PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	52	53	51	52	51	50	53	53	53	53	51	29	44	52	51	52	47	49	52	52	53	53	54	53	53	46	46	50	51	53	53	53
Density	26	24	25	25	23	28	29	36	34	27	30	30	28	49	39	34	34	30	40	38	36	36	28	30	29	29	24	33	41	38	37	36	30	30
LOS	C	C	C	C	C	D	D	E	D	D	D	D	D	F	E	D	D	D	E	E	E	E	D	D	D	D	C	D	E	E	E	E	D	D
Volume	6797	7345	6516	6551	7038	7227	7224	7215	7231	7226	6412	6402	7141	7144	6905	6945	6967	7628	7476	7486	7336	7460	7492	6257	6277	6250	7612	7587	7630	7627	7587	7602	6401	6376
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1133	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	53	51	46	48	52	52	53	53	53	49	53	53	53	53	53	53	53	52	53	53	46	44	49	53	53	53	54	54	54	54	54	52
Density	28	34	29	37	41	40	37	37	29	30	23	21	26	26	26	19	25	23	22	30	30	30	35	36	24	26	26	26	25	21	24	27	27	28
LOS	D	D	D	E	E	E	E	E	D	D	C	C	D	D	D	C	C	C	C	D	D	D	D	E	C	D	C	C	C	C	C	D	D	D
Volume	7207	7189	7631	7666	7665	7647	7616	7651	7625	6432	3654	4164	4176	4179	4176	4080	4048	3740	4755	4791	4778	4780	4782	4797	6887	6862	6868	6866	6754	6868	6382	5894	5900	7271
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	1034	386	1589	284	907	487	893	1176	325	2000	31	402	1081	2000	2000	2000	1642	551	937	2000	655	442	1021	1587	2000	575	1737
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	53	51	46	51	53	53	53	53	54	53	53	53
Density	34	27	30	25	35	30	27	26	26	26	23	29	26	32
LOS	D	D	D	C	E	D	D	D	D	D	C	D	C	D
Volume	7271	7282	6415	6399	6447	7826	5627	5629	5637	5631	6078	6069	6764	6786
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt 9 PM - I-495 IL Link Evaluation Results

3E+06

2040 Alt 9 PM — I-495 IL

Exit 44 — VA 193 | Exit 43 — GW Memorial Pkwy | Bridge — American Legion | Exit 41 — Clara Barton Pkwy | Exit 39 — MD 190 | Exit 36 — MD 187 | I-270 W Spur

| Direction of Travel | → | → | →

2040 Alt 9 PM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	52	52	52	52	52	48	51	51	48	48	51	52	49	51	51	51	53	53	53	53	53	53	52	51	50	53	53	50	52	53	52	52	53
Density	37	29	28	30	30	30	33	27	27	28	32	24	27	28	34	33	33	26	25	25	24	29	29	30	30	31	26	26	25	25	25	23	29	28
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	C	C	C	C	D	D	D	D	D	D	C	C	C	C	C	D	D
Volume	7370	7392	7431	4706	4720	4711	6288	6833	6840	6837	6145	6148	5552	6781	6787	6790	6712	6788	5214	5211	6234	6214	6209	6201	6210	6212	5488	5479	6296	5254	5215	5998	5989	5995
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	61	63	63	62	62	61	61	63	63	63	61	63	63	63	63	63	63	63	63	62	63	63	63	62	63	63	62	61	60	60	63	63
Density	28	23	22	22	22	19	25	25	25	19	19	16	16	19	17	21	19	24	24	24	24	24	19	22	22	19	20	20	18	22	23	31	20	19
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	D	C	C
Volume	5973	5963	5456	5467	5450	6006	6039	6040	6032	6032	6027	3927	4889	4908	5244	5275	5892	5968	5954	5960	5954	5920	5917	5514	5466	5877	5052	5038	5496	5526	5431	3726	3744	2427
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	58	57	57	52	25	41	48	53	53	53	56	56
Density	13	17	15	20	20	30	61	52	43	40	40	39	30	30
LOS	B	B	B	C	C	D	F	F	E	E	E	E	D	D
Volume	3069	3051	3492	3481	3486	3070	4627	4277	6278	6275	6260	6215	8334	8339
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt 9 PM - I-270 NB Link Evaluation Results

2040 Alt 9 PM
I-270 NB

		I-270 W Spur/I-495					Democracy Blvd		Westlake Terrace				I-270 Spur						Montrose Rd				MD 189						MD 28							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	14	52	53	55	54	53	53	52	53	54	53	54	54	54	53	53	51	52	53	52	52	53	53	49	51	52	53	52	52	51	46	40	35	32
Density	99	29	28	18	24	19	28	27	27	27	27	29	29	29	29	29	26	28	33	38	37	37	34	34	33	33	37	33	30	37	41	45	42	40
LOS	F	D	D	C	C	C	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	D	D	D	D	E	D	D	E	E	F	E	E
Volume	7037	3037	3035	3027	2624	3016	3000	4293	4280	4290	4305	9330	9361	9348	9331	9323	9322	8822	8683	9798	9767	9762	9126	10092	10117	10112	9829	8624	9438	9438	9308	9108	8906	8729
Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	5	5	6	6	6	5	5	6	5	5	5	6	7
Length	1508	2000	1339	894	788	886	450	793	1166	705	1845	431	1520	1204	1533	999	769	702	531	2000	1343	799	690	1389	530	634	406	872	598	2000	1459	1474	998	515
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Shady Grove Rd			I-370						MD 117		MD 124			Watkins Mill Rd							Middlebrook Rd				MD 118							MD 27		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	20	20	17	15	13	12	16	17	17	15	14	14	13	13	15	12	12	12	15	14	14	14	14	14	16	18	21	20	17	16	15	15	16
Density	50	69	58	65	80	86	81	73	66	80	88	90	89	90	94	100	111	118	117	92	78	91	88	104	102	69	75	77	78	76	89	93	76	91
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	7239	8333	3431	3368	4648	4502	5855	5806	5740	5288	5184	5132	5152	6048	6020	5985	6890	6846	6820	6707	6679	6243	6310	5655	5632	5605	5290	4744	4734	5305	4196	4193	4498	4431
Lanes	5	6	3	3	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	726	481	1026	634	2000	749	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
LinkID	323	336	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	1	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		MD 121																							MD 109										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	17	18	18	18	18	17	18	15	12	12	12	11	11	12	21	42	51	52	52	52	52	52	52	52	52	53	53	50	51	52	52	52	52
Density	71	90	88	86	89	88	91	87	76	104	86	89	124	130	119	68	50	41	40	40	40	40	40	40	40	41	26	38	28	41	40	40	40	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
Volume	4602	4604	4651	4706	4673	4640	4617	4599	4583	3764	4175	4190	4167	4204	4210	4218	4202	4215	4205	4184	4226	4205	4206	4215	4224	4210	4211	4005	4186	4176	4186	4188	4195	4198
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		MD 80																							MD 85					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	52	52	51	50	41	30	40	50	50	50	50	50	51	51	50	50	51	51	50	50	48	50	53	53	52	53	53	53
Density	40	40	40	40	40	41	28	44	49	53	44	43	43	43	43	43	43	43	44	43	43	43	44	45	44	27	38	25	34	26	25
LOS	E	E	E	E	E	E	D	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C
Volume	4194	4197	4186	4196	4200	4185	4130	3621	4337	4317	4338	4336	4338	4337	4340	4326	4333	4292	4351	4359	4361	4353	4350	4355	4336	4352	3994	3940	3565	5370	5364
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1

2040 Alt 9 PM - I-270 SB Link Evaluation Results

2040 Alt 9 PM
I-270 SB

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	58	58	58	56	59	54	58	62	63	63	63	63	63	63	62	61	60	58	57	56	56	57	59	57	53	56	57	58	57	57	57	56
Density	21	21	21	23	23	16	17	16	22	21	21	21	21	21	20	21	21	21	22	22	23	23	23	15	18	14	22	21	21	20	21	20	21	21
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C
Volume	3616	3604	3625	2683	2685	2666	1965	2609	2599	2611	2602	2596	2599	2600	2571	2597	2596	2590	2592	2585	2582	2586	2583	2566	2085	2356	2364	2361	2342	2357	2366	2314	2355	2363
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Exit 31 — MD 85

Exit 26 — MD 80

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

Exit 22 — MD 109

Exit 18 — MD 121

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	55	55	55	55	56	57	55	51	55	55	54	56	54	56	56	56	56	56	55	59	62	61	62	61	62	62	63	63	63	63	63	63	63	64
Density	21	21	21	22	14	20	15	24	22	22	23	22	23	22	22	22	22	22	22	13	13	10	11	10	13	12	15	15	15	15	15	15	11	13
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B
Volume	2361	2360	2354	2348	2340	2251	2458	2462	2464	2444	2434	2446	2445	2427	2436	2424	2401	2404	2391	2392	2390	2390	2080	2498	2496	2886	2886	2878	2865	2847	2842	2818	2821	2429
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	2000	1801	1775	948	546	716	1665	130	2000	322	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

Exit 16 — MD 27

Exit 15 — MD 118

Exit 13 — Middlebrook Rd

Exit 11 — MD 124

Exit 10 — MD 117

Exit 9 — I-370

Exit 8 — Shady Grove Rd

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	63	63	63	63	62	63	61	61	62	63	63	62	61	60	63	64	64	63	59	62	63	63	60	61	59	63	63	64	59	58	59	57	57
Density	12	16	14	14	16	14	18	16	22	22	21	20	20	21	21	13	12	12	15	17	20	20	20	23	19	19	16	15	10	13	13	16	15	18
LOS	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	B	B	B	B	B	C	C	C	C	C	C	B	B	A	B	B	B	B	B
Volume	3068	3053	3406	3406	3019	3378	3348	4038	4042	4054	4048	5051	5074	5063	5083	4164	3181	3163	3830	5118	5084	5122	5124	6800	6808	6831	6806	6815	3297	5226	5225	4563	5255	5952
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	5	7	7	5	6	6
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	1257	1243	795	1607	706	478	708
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

Exit 6 — MD 28

Exit 5 — MD 189

Exit 4 — Montrose Rd

Exit 1 — Westlake Terrace / Democracy Blvd

I-270 Spur

I-270 W Spur/I-495

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	56	57	57	56	57	57	56	55	56	56	54	55	21	54	51	13	11	9	8	8	57	58	59	59	59	57	57	57	57	49
Density	21	21	21	21	18	19	20	19	19	19	19	20	20	18	19	21	48	20	19	69	81	96	104	107	10	10	10	8	8	7	9	12	12	24
LOS	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C	C	F	C	C	F	F	F	F	F	A	A	A	A	A	A	A	B	B	C
Volume	5921	5943	5920	5936	5911	5360	5589	6474	6527	6510	6488	5603	5591	6140	6131	5857	5972	5405	5714	5350	5127	4906	4910	4877	2315	2318	2321	1490	1479	2075	2065	2073	2073	6887
Lanes	5	5	5	5	6	5	5	6	6	6	6	5	5	6	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6
Length	1085	607	1508	2000	291	896	986	575	1050	610	836	816	1571	691	452	809	650	937	415	2000	1709	719	387	330	2000	983	955	2000	442	498	934	2000	506	551
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1

2040 Alt-10 AM - I-495 OL Link Evaluation Results

2040 Alt-10 AM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	15	23	51	56	57	59	59	59	58	59	59	59	59	59	58	59	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53	53	53
Density	102	108	77	34	31	31	21	14	16	16	15	15	18	18	17	22	21	17	20	20	18	20	20	19	24	24	24	24	24	21	21	17	17	17
LOS	F	F	F	D	D	D	C	B	B	B	B	B	C	C	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	B	B	B
Volume	8183	8014	5249	5260	5263	5256	2407	2408	1918	1921	2599	2601	2142	4327	5066	5077	5072	5047	4819	4836	5226	4717	4712	5108	5005	5146	5144	5149	5113	4533	4527	4507	3717	3684
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	53	54	54	54	55	54	54	55	55	55	55	52	52	55	55	55	56	56	52	54	56	54	53	58	58	57	57	57	57	58	58	56	55	57	57
Density	28	16	17	19	23	23	23	23	20	20	20	21	27	25	25	23	23	22	24	23	25	31	29	29	29	29	29	23	25	25	25	32	31	30
LOS	D	B	B	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	D	D	D	D	D	D	C	C	C	C	D	D	D
Volume	4013	3501	3624	4990	4946	4993	4995	4983	4339	4339	4338	5532	5604	5566	5598	5084	5085	5812	5137	5135	6623	6615	6651	6665	6684	6684	6642	6655	5877	5891	7084	7086	7066	6915
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214						Exit 16 Arena Dr			Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	59	57	58	58	56	57	59	57	58	58	60	59	59	54	57	58	60	57	58	58	58	58	60	58	58	58	59	57	54	58	59	59	57
Density	24	25	23	29	25	26	28	22	29	28	28	19	24	24	33	30	30	23	29	22	24	24	24	20	26	29	23	28	26	35	32	32	32	33
LOS	C	C	C	D	C	C	D	C	D	D	D	C	C	C	D	D	D	C	D	C	C	C	C	C	C	D	C	D	D	D	D	D	D	D
Volume	7049	5845	6571	6595	7181	7194	6390	6479	4841	4829	4823	6945	7041	7047	7022	6957	7042	7032	6535	6518	5571	5571	5536	7307	7449	6745	6663	6526	7527	7492	7514	7529	7522	7512
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1								Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	53	53	52	52	53	51	52	54	54	54	55	55	53	53	57	58	58	58	58	57	58	59	58	59	59	58	58	58	53	53	53	53
Density	32	26	29	29	27	32	33	29	27	26	22	22	19	23	23	29	22	28	28	21	21	18	16	16	16	14	14	12	15	15	19	20	19	21
LOS	D	D	D	D	D	D	D	D	D	C	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	B	C	C	C	C
Volume	7478	7489	6119	6119	7044	6637	6990	7376	5626	5565	6020	6063	6253	6220	6198	6028	6361	6367	6372	4896	4829	5280	5740	5685	5674	3358	3295	3461	3473	3462	6137	6170	6162	5497
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt-10 AM
I-495 OL

	Exit 28 MD 650											Exit 29 MD 193			Exit 30 US 29									Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	50	52	53	53	53	53	52	53	53	53	53	50	44	48	53	52	52	49	52	52	53	53	50	36	22	11	18	32	31	41	51	52	53
Density	21	20	20	19	17	21	21	27	27	21	24	24	25	28	32	29	29	27	35	34	33	33	26	33	45	74	120	90	64	67	49	40	31	30
LOS	C	C	C	C	B	C	C	D	D	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	F	F	F	F	F	F	F	E	D	D
Volume	5474	5868	5148	5150	5422	5528	5596	5595	5605	5603	5124	5097	6162	6175	6207	6202	5981	7001	6869	7005	6902	7019	7045	6560	6561	6583	8202	8151	8166	8194	8124	8177	6493	6476
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187							I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	49	46	42	40	39	36	30	19	14	16	15	13	12	10	9	7	9	8	7	8	9	17	22	28	26	24	20	19	21	21	25
Density	27	33	30	40	43	45	47	49	42	53	56	66	72	80	90	72	106	112	123	125	141	151	143	126	91	86	67	74	77	81	85	85	86	66
LOS	D	D	D	E	E	E	F	F	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	7026	7010	7894	7839	7842	7607	7620	7584	7549	6311	3224	3581	3527	3474	3394	3330	3042	2856	3466	3391	3292	3237	3259	3235	9429	9437	9374	9498	9350	9527	8298	7202	7140	8358
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1655	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	45	52	53	52	52	52	53	53	53	53	53	53	53	52
Density	47	33	35	30	36	33	30	30	30	30	24	30	26	33
LOS	F	D	D	D	E	D	D	D	D	D	C	D	C	D
Volume	8382	8445	7378	7720	7466	8515	6422	6389	6427	6423	6398	6404	6770	6788
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1629	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt-10 AM - I-495 IL Link Evaluation Results

2040 Alt-10 AM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	58	54	43	27	22	20	20	20	23	46	53	55	57	54	55	56	56	57	57	57	57	57	54	56	57	54	58	58	57	56	36	56
Density	30	30	24	29	37	55	64	86	82	82	72	37	34	27	26	31	39	38	30	33	27	27	24	28	30	29	24	26	25	25	25	26	30	22
LOS	D	D	C	D	E	F	F	F	F	F	F	E	D	D	C	D	E	E	D	D	D	D	C	D	D	D	C	D	C	C	C	C	D	C
Volume	6966	6843	6974	6272	6241	7346	7208	6789	6605	6714	8185	6882	7096	7285	7323	8493	8482	8442	8415	7542	7712	7633	8239	8072	8213	8129	8203	4267	4273	4292	4303	4295	4296	3675
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	6	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1501	2000	2000	2000	1661	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 34 MD 355															Exit 33 MD 185										Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	52	51	59	53	33	43	40	42	43	39	30	28	24	25	22	23	20	25	27	15	17	56	59	60	57	60	57	59	60	60	60
Density	16	17	22	25	32	28	31	49	46	48	46	46	40	51	59	56	67	68	79	88	72	67	95	87	25	23	23	20	22	24	29	22	26	25
LOS	B	B	C	C	D	D	D	F	F	F	F	F	E	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	C	C	D	C	C	C
Volume	2823	3822	3817	3836	3284	6501	8046	8029	7937	7843	7813	7823	7803	7713	6554	6690	6630	7300	7271	6957	7189	7186	7200	7225	5512	5548	5569	6757	6677	6782	6776	6763	6198	5951
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95				Exit 25 US 1						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	60	60	61	61	58	25	51	54	48	45	41	38	35	23	43	55	59	61	61	61	60	60	60	61	58	57	57	49	48	48	49	44
Density	25	26	25	21	23	19	25	53	32	30	34	36	32	40	44	59	36	29	25	25	20	20	18	22	22	22	22	28	27	32	41	41	40	36
LOS	C	C	C	C	C	C	C	F	D	D	D	E	D	E	E	F	E	D	C	C	C	C	C	C	C	C	C	D	D	D	E	E	E	E
Volume	5993	6166	6082	6400	5700	5734	5737	6591	6614	6603	6571	6506	6504	6160	6027	6835	6305	6308	7493	7453	4817	4828	5388	5387	5333	4074	6264	6259	6238	7866	7821	7889	7805	7875
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450					Exit 19 US 50				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	55	55	53	55	54	54	51	51	54	55	56	55	55	56	56	56	56	56	55	55	54	53	54	32	48	56	57	54	58	58	57	55	56
Density	37	27	27	28	27	24	30	27	34	25	26	26	24	27	27	22	27	27	27	28	28	28	22	25	41	34	23	24	20	21	21	21	26	32
LOS	E	D	D	D	D	C	D	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	C	C	E	D	C	C	C	C	C	C	D	D
Volume	7318	7428	7402	7429	6017	6408	6385	6886	6888	6782	5801	5785	6603	6057	6027	6080	6080	6079	6087	6080	6079	6060	5925	5344	6532	6500	6498	5460	5472	4778	4784	7130	7250	7229
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-10 AM

I-495 IL

	Exit 16 Arena Dr											Exit 15 MD 214								Exit 13 Ritchie Marlboro Rd									Exit 11 MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	57	57	57	58	58	58	56	58	59	57	57	58	58	59	60	59	59	57	57	53	46	36	53	58	53	57	59	59	59	60
Density	32	25	25	31	31	31	30	25	25	25	29	22	25	25	31	31	30	24	26	27	25	31	32	34	39	50	27	25	26	26	25	22	27	27
LOS	D	C	C	D	D	D	D	C	C	C	D	C	C	C	D	D	D	C	D	D	C	D	D	D	E	F	D	C	C	D	C	C	D	D
Volume	7201	7211	7237	5240	5265	5273	6830	7161	7176	7173	6422	6416	5864	7119	7121	7129	7043	7115	6259	6305	7209	7220	7222	7227	7222	7195	5821	5837	6764	5913	5939	6379	6371	6392
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	Exit 9 MD 337											Exit 7 MD 5												Exit 4 MD 414									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	59	63	63	63	63	62	60	60	63	63	19	8	9	9	10	10	11	14	12	12	13	12	11	12	10	12	13	10	16	14	19	15	9
Density	27	22	23	23	23	19	24	25	24	19	19	51	115	135	116	134	136	112	110	121	123	120	101	126	125	119	115	108	124	98	105	82	68	110
LOS	D	C	C	C	C	C	C	C	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6386	6389	5733	5753	5717	5923	5898	5943	5915	5922	5919	3863	4703	4801	5257	5334	5383	5978	5961	6024	6122	6148	6174	5794	5763	6117	5603	5587	6124	6139	6057	3090	3103	2047
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295		WWB					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	7	8	8	12	13	15	18	45	57	58	58	55	46	57
Density	118	132	110	104	93	103	87	51	34	34	33	35	43	35
LOS	F	F	F	F	F	F	F	F	D	D	D	D	E	E
Volume	3102	3048	3716	3689	3652	3020	4643	4550	5801	5812	5805	5767	9981	10008
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt-10 AM - I-270 NB Link Evaluation Results

2040 Alt-10 AM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	59	62	61	62	62	63	62	63	63	63	63	63	63	63	63	63	60	62	61	60	60	61	59	59	58	58	60	59	59	58	58	59	59
Density	24	22	21	16	16	13	16	14	14	14	13	12	13	14	14	14	12	13	14	16	16	14	14	14	14	14	15	13	11	14	14	14	12	10
LOS	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
Volume	8203	3924	3925	3907	2953	3110	3083	3427	3419	3417	3396	5968	5952	5986	5971	5980	5956	5356	5070	5803	5798	5727	5120	5708	5674	5660	5390	4629	4765	4862	4836	4846	4837	3515
Lanes	6	3	3	4	3	4	3	4	4	4	4	8	7	7	7	7	8	7	6	6	6	7	6	7	7	7	6	6	7	6	6	6	7	6
Length	1501	2000	1411	897	783	884	452	815	1168	728	1872	432	1471	1957	783	980	766	698	801	2000	2000	517	742	1343	527	658	425	788	598	1189	1473	1473	990	2000
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

				Exit 9						Exit 10		Exit 11												Exit 13					Exit 15						Exit 16	
				I-370						MD 117		MD 124				Watkins Mill Rd								Middlebrook Rd					MD 118						MD 27	
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	50	60	60	60	58	59	60	60	60	60	60	60	60	60	60	60	61	61	61	61	61	60	61	61	61	60	60	60	61	61	62	61	61
Density	10	11	6	6	6	8	9	10	10	11	11	11	11	11	11	14	13	13	13	13	11	12	12	13	13	10	12	14	13	12	12	12	10	14
LOS	A	B	A	A	A	A	A	A	A	B	B	B	B	A	A	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	B	B	A	B
Volume	3502	3970	1406	1406	1400	1865	3110	3125	3118	2685	2689	2685	2675	3326	3280	3312	3991	3988	3984	3950	3954	3607	3646	3199	3168	3169	2974	2447	2441	2876	2273	2285	2521	2500
Lanes	6	7	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	119	441	1059	611	646	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

												Exit 18																		Exit 22							
												MD 121																		MD 109							
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	62	62	62	62	61	61	61	60	62	58	61	62	62	62	61	61	61	61	61	61	61	60	60	60	60	60	60	61	60	60	60	60	60	60	60
Density	11	14	14	14	14	14	14	14	11	10	11	10	13	13	13	13	20	20	20	20	20	20	20	20	20	20	13	19	13	19	19	19	20	20
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	C	B	C	C	C	C	C
Volume	2607	2620	2636	2627	2614	2616	2618	2610	2605	1820	2434	2441	2431	2453	2443	2442	2444	2445	2438	2421	2442	2422	2420	2426	2426	2413	2411	2267	2341	2337	2347	2344	2351	2341
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4

							Exit 26																			Exit 31					
							MD 80																			MD 85					
→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	60	60	60	59	56	60	56	58	61	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	57	63	61	63
Density	19	19	19	20	20	20	14	17	17	24	23	22	22	22	22	22	22	21	22	22	22	22	22	22	22	15	20	14	15	12	12
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B
Volume	2335	2329	2321	2335	2349	2337	2308	2101	2832	2813	2804	2784	2777	2771	2755	2733	2729	2692	2726	2737	2752	2755	2747	2742	2725	2731	2470	2435	1926	2969	2969
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1

2040 Alt-10 AM - I-270 SB Link Evaluation Results

2040 Alt-10 AM
I-270 SB

					Exit 31																					Exit 26									
					MD 85																					MD 80									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	15	15	11	11	10	8	8	17	18	17	17	17	17	18	18	18	18	18	18	18	18	17	14	14	15	18	27	27	27	27	26	27	28
Density	91	94	99	128	128	93	141	133	93	89	92	92	91	92	89	89	88	88	89	88	89	88	90	74	104	82	99	69	66	68	67	69	68	66
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4338	4306	4339	2871	2876	2846	2342	3134	3117	3142	3111	3109	3132	3131	3133	3172	3164	3170	3146	3147	3143	3130	3123	3117	2861	3662	3668	3652	3623	3635	3648	3577	3647	3668
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																			Exit 18									
					MD 109																			MD 121									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	28	28	28	27	26	26	23	26	38	43	44	44	44	43	43	44	44	44	45	52	53	52	52	51	52	51	34	24	18	19	18	18	14	11
Density	66	66	66	69	47	70	60	81	55	49	48	48	48	48	50	48	48	48	47	27	27	20	24	24	31	26	52	74	98	93	98	101	94	131
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	F	F	F	F	F	F	F	F
Volume	3664	3671	3670	3663	3650	3617	4220	4145	4229	4198	4190	4230	4218	4187	4223	4227	4202	4210	4196	4203	4198	4190	3757	4927	4929	5343	5332	5331	5354	5402	5410	5383	5400	4140
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

					Exit 16			Exit 15			Exit 13							Exit 11			Exit 10				Exit 9							Exit 8		
					MD 27			MD 118			Middlebrook Rd							Watkins Mill Rd			MD 124			MD 117				I-370						Shady Grove Rd		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	15	13	14	16	16	18	19	34	42	39	37	41	47	49	53	53	53	49	39	38	33	28	26	49	52	53	53	52	53	52	51	52	51
Density	124	111	105	97	108	84	101	81	60	49	52	54	48	42	40	32	28	28	36	43	56	65	76	76	34	32	27	27	33	26	28	28	29	26
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	E	E	F	F	F	F	D	D	D	D	D	C	D	D	D	D
Volume	4964	4950	5579	5585	5144	5507	5454	6045	6056	6077	6054	7931	7952	7927	7940	6695	5854	5859	6983	8559	8496	8545	8496	10094	10095	9990	10102	10123	6798	6834	10264	10244	9036	9433
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	4	5	7	7	6	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1633	1783	599	731	480
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

												Exit 5					Exit 4											Exit 1							
												MD 189					Montrose Rd							I-270 Spur				Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	53	53	53	53	53	52	35	31	38	29	45	52	52	49	52	44	30	35	44	38	32	17	13	17	17	16	17	18	17	25	17
Density	30	31	32	31	31	31	26	29	30	44	50	44	55	42	30	35	33	35	38	55	48	37	37	49	84	108	74	84	88	60	69	90	83	91
LOS	D	D	D	D	D	D	D	D	D	E	F	E	F	E	D	E	D	E	E	F	F	E	E	F	F	F	F	F	F	F	F	F	F	F
Volume	9458	9871	9896	9886	9908	9911	9786	9299	9501	10735	10854	9943	11166	11239	11152	11003	11365	11006	11700	11701	11637	11555	11347	11009	5538	5629	6306	5708	5715	6188	6171	6205	6208	9429
Lanes	6	6	6	6	6	6	7	6	6	7	7	6	7	6	7	6	7	6	7	7	7	7	8	7	4	4	5	4	4	6	5	4	3	6
Length	795	2000	1659	469	1017	934	444	935	998	608	1803	1636	696	2000	449	900	640	885	1396	2000	1704	716	393	324	2000	296	941	2000	448	517	938	988	1523	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	5021576	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1

2040 Alt 10 PM - I-495 OL Link Evaluation Results

2040 Alt 10 PM
I-495 OL

	WWB			Exit 2 I-295						Exit 3 MD 210											Exit 4 MD 414												
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	21	23	50	56	56	58	58	58	58	56	58	58	58	53	49	56	57	58	58	57	58	58	53	53	53	53	52	52	53	53	53	53	53
Density	102	90	77	35	32	31	31	21	24	24	25	25	30	29	29	40	35	27	30	30	25	28	28	26	32	33	33	34	34	28	28	22	22	21
LOS	F	F	F	D	D	D	D	C	C	C	C	C	D	D	D	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	C	C
Volume	9293	9295	5266	5272	5277	5278	3609	3609	2784	2786	4284	4298	3435	6690	7775	7793	7780	7735	6961	6976	7228	6459	6454	6976	6823	7034	7039	7051	7017	5962	5962	5930	4611	4583
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	52	53	52	51	52	53	53	53	53	53	39	20	43	51	52	53	53	53	50	52	53	53	51	52	52	52	53	53	53	53	53	53	53
Density	19	23	23	22	27	27	27	27	25	25	34	65	37	32	31	27	27	26	29	28	27	35	34	34	34	34	33	27	30	30	27	36	34	33
LOS	C	C	C	C	D	D	D	D	C	C	D	F	E	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	E	D	D
Volume	5123	4778	4794	5615	5583	5604	5595	5612	5233	5237	5235	6427	6447	6460	6453	5648	5642	6612	5894	5877	7176	7149	7163	7156	7156	7152	7111	7159	6267	6287	7046	7054	7067	7049
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	53	53	47	51	53	53	53	53	53	53	53	53	52	51	53	53	57	58	58	58	58	58	47	53	55	57	57	56	56	57	58	58
Density	27	26	24	30	26	29	32	25	32	32	32	21	25	25	32	32	32	25	26	20	23	23	23	20	31	29	22	25	23	30	29	29	28	28
LOS	D	C	C	D	D	D	D	C	D	D	D	C	C	C	D	D	D	C	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D
Volume	7072	5499	6394	6396	6865	6863	6441	6460	5045	5035	5014	6616	6595	6640	6631	6634	6624	6566	5858	5815	5303	5315	5272	7047	7140	6105	6019	5767	6558	6563	6561	6546	6546	6545
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295										Exit 23 MD 201											Exit 25 US 1								Exit 27 I-95						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	52	51	52	52	51	53	52	53	53	53	51	51	54	50	53	55	57	57	57	58	57	58	58	58	58	58	53	53	53	53
Density	28	22	26	25	26	33	32	28	31	30	27	27	23	28	29	34	28	38	36	30	28	26	24	23	24	22	22	18	22	22	24	24	24	26
LOS	D	C	C	C	D	D	D	D	D	D	D	D	C	D	D	D	D	E	E	D	D	C	C	C	C	C	C	B	C	C	C	C	C	C
Volume	6518	6429	5438	5437	6723	6669	6623	7247	6268	6235	7102	7150	7397	7361	7381	6972	7631	7631	7634	6578	6513	7357	8131	8125	8113	5124	5070	5134	5160	5144	7474	7511	7492	6838
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt 10 PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193			Exit 30 US 29									Exit 31 MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	52	53	52	52	51	50	53	53	53	53	51	30	45	52	51	52	46	48	52	52	53	53	54	53	53	42	43	45	45	31	24	15
Density	26	24	25	25	22	28	29	36	34	27	30	30	28	47	39	34	34	29	41	39	36	36	28	30	29	29	24	36	45	43	42	61	66	108
LOS	C	C	C	C	C	D	D	E	D	D	D	D	D	F	E	D	D	D	E	E	E	E	D	D	D	D	C	E	E	E	E	F	F	F
Volume	6794	7343	6514	6549	6962	7231	7233	7219	7231	7228	6416	6411	7147	7154	6916	6954	6967	7630	7483	7494	7343	7464	7497	6261	6286	6257	7632	7620	7670	7662	7606	7613	6364	6336
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1129	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187							I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	14	18	18	21	30	41	48	50	52	53	53	49	53	54	53	53	53	53	52	53	53	53	52	51	53	53	54	54	54	54	54	54	54	52
Density	103	100	84	91	65	47	40	39	29	30	19	18	22	22	22	16	21	20	19	26	25	25	26	26	22	26	26	26	25	22	23	27	27	27
LOS	F	F	F	F	F	F	E	E	D	D	C	B	C	C	C	B	C	C	C	C	C	C	D	D	C	D	D	D	C	C	C	D	D	D
Volume	7198	7187	7615	7666	7687	7680	7640	7679	7651	6392	3026	3501	3510	3510	3503	3419	3410	3149	4015	4040	4044	4035	4029	4002	6995	6982	7025	7026	6909	7029	6295	5809	5801	7088
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	1034	386	1589	284	907	487	893	1176	325	2000	31	402	1085	2000	2000	2000	1642	551	937	2000	655	442	1021	1587	2000	575	1737
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→
Speed	53	54	54	52	48	52	53	54	54	54	54	53	53	53
Density	34	26	28	23	32	28	25	25	25	25	22	27	24	31
LOS	D	D	D	C	D	D	C	C	C	C	C	D	C	D
Volume	7091	7096	6076	6057	6092	7409	5339	5340	5346	5348	5817	5798	6466	6497
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt 10 PM - I-495 IL Link Evaluation Results

3E+06

2040 Alt 10 PM
I-495 IL

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187	
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	57	57	58	58	57	56	56	54	54	55	55	55	55	55	54	53	54	54	54	45	33	28	25	26	44	47	53	55	54	54	54	52	19		4
Density	23	19	19	21	21	22	22	28	28	29	28	29	29	24	24	28	36	28	28	33	35	48	51	66	65	32	31	23	22	22	22	23	17	60		79
LOS	C	C	C	C	C	C	C	D	D	D	D	D	D	C	C	D	E	D	D	D	D	F	F	F	F	D	D	C	C	C	C	C	B	F		F
Volume	5319	5324	5324	4967	4966	6238	6218	6167	6103	6208	7649	6343	6372	6545	6528	7682	7689	7686	7677	7026	7910	7828	8557	8409	8529	8590	8604	3663	3660	3655	3658	3659	3605	3457		1425
Lanes	4	5	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	5	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3		2
Length	2000	1499	1499	2000	93	1457	1556	642	679	466	602	477	685	1486	775	989	2000	1045	395	1944	1491	616	1108	391	1767	723	1506	2000	2000	2000	1581	1174	303	1996		399
LinkID	1100	1037	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541577	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270		2541495
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1		1

	Exit 34 MD 355															Exit 33 MD 185										Exit 31 MD 97									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	10	10	12	15	11	12	14	16	16	19	20	18	17	15	13	16	16	26	25	29	32	26	23	20	17	18	14	17	25	34	35	30	29		
Density	87	87	122	101	111	128	117	97	108	109	92	86	75	80	100	98	98	98	77	77	68	61	61	67	86	103	98	95	97	65	61	47	64	62		
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
Volume	3569	3569	3572	3599	3266	5492	6828	6895	6896	6865	6836	6847	6856	6833	6118	6437	6446	7916	7941	7808	7832	7849	7806	7777	6862	6882	6906	8210	8083	8215	8214	8195	7573	7258		
Lanes	4	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4		
Length	438	438	655	1105	1490	1944	514	1013	998	521	1600	252	526	658	913	228	788	1632	2000	163	2000	1753	2000	47	834	411	323	1125	454	1034	2000	1238	243	518		
LinkID	1271	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	2541504	1125	1990014	495307		
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1		

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95						Exit 25 US 1							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	29	26	25	19	18	17	18	16	29	33	41	50	52	53	52	42	38	43	53	53	52	52	51	53	53	53	53	54	53	48	41	43	47	50		
Density	64	72	75	84	97	82	96	98	70	61	49	40	31	35	36	39	51	45	33	32	28	29	25	30	30	29	23	29	29	32	46	45	40	30		
LOS	F	F	F	F	F	F	F	F	F	F	F	E	D	E	E	E	F	F	D	D	D	D	C	D	D	D	C	D	D	D	F	E	E	D		
Volume	7342	7549	7522	7854	7045	7060	7055	8039	8052	8048	8052	8047	8051	7461	7477	8171	7705	7719	8636	8614	5950	5973	6387	6393	6345	4596	6123	6118	6126	7584	7527	7598	7506	7572		
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5		
Length	268	491	512	1554	785	422	765	283	1222	2000	1068	1127	346	339	505	457	500	1047	1493	1492	1028	536	347	2000	140	1527	1464	2000	1607	668	846	610	481	1016		
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314		
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1		

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450				Exit 19 US 50							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	51	52	52	52	53	52	51	45	46	52	53	52	49	49	51	53	51	52	52	51	51	51	51	52	44	48	52	53	52	53	53	51	49	48		
Density	35	31	28	28	28	26	33	33	40	28	31	31	31	37	35	27	35	35	35	35	35	35	28	31	35	40	30	29	23	27	27	24	30	39		
LOS	E	D	D	D	D	C	D	D	E	D	D	D	D	E	D	D	D	D	D	E	E	E	D	D	D	E	D	D	C	D	D	C	D	E		
Volume	7143	6416	7249	7217	5935	6693	6650	7434	7407	7367	6443	6461	7572	7144	7115	7199	7175	7199	7206	7217	7225	7212	7048	6463	7728	7711	7722	6064	6072	5681	5678	7459	7452	7456		
Lanes	4	4	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4		
Length	2000	23	1042	442	1150	761	810	734	928	447	512	554	554	497	516	754	706	2000	2000	2000	1629	1217	263	1180	915	561	1358	1369	213	2000	603	1423	754	2000		
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311		
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1		

2040 Alt 10 PM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	52	52	52	52	52	49	51	51	49	48	51	52	49	51	52	51	53	53	53	53	53	52	52	50	52	53	49	52	53	52	53
Density	38	29	28	30	30	30	32	27	27	28	32	24	27	28	34	33	33	26	25	25	24	30	30	30	31	26	26	26	25	25	23	29	28
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	C	C	C	C	D	D	D	D	D	C	C	C	C	C	D	D
Volume	7416	7424	7460	4726	4739	4739	6321	6869	6872	6854	6143	6151	5570	6801	6801	6785	6707	6780	5231	5249	6261	6237	6228	6207	6203	6200	5483	5475	6291	5258	5218	6010	5997	6003
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	61	63	63	62	62	61	61	63	63	63	61	63	63	63	63	63	63	63	63	62	62	63	63	62	63	63	62	62	60	61	63	63
Density	28	23	22	22	22	19	25	25	25	19	19	16	16	20	17	21	19	24	24	24	24	24	19	22	22	19	20	20	18	22	23	31	20	19
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	D	C	C
Volume	5979	5970	5457	5474	5456	6005	6038	6045	6046	6041	6039	3943	4909	4926	5254	5280	5906	5983	5976	5972	5972	5939	5931	5516	5461	5868	5047	5035	5490	5515	5425	3729	3745	2430
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	58	57	57	55	30	45	49	53	53	53	56	56
Density	13	17	15	21	20	28	53	48	43	40	40	39	30	30
LOS	B	B	B	C	C	D	F	F	E	E	E	E	D	D
Volume	3080	3058	3506	3492	3492	3081	4653	4306	6314	6308	6293	6251	8363	8372
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Exit 16 Arena Dr

Exit 15 MD 214

Exit 13 Ritchie Marlboro Rd

Exit 11 MD 4

Exit 9 MD 337

Exit 7 MD 5

Exit 4 MD 414

Exit 3 MD 210

Exit 2 I-295

WWB

2040 Alt 10 PM - I-270 NB Link Evaluation Results

2040 Alt 10 PM
I-270 NB

		Exit 1																																	
		I-270 W Spur/I-495					Democracy Blvd		Westlake Terrace				I-270 Spur						Exit 4 Montrose Rd				Exit 5 MD 189					Exit 6 MD 28								
Direction of Travel		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	47	45	51	54	53	51	50	51	53	53	50	53	54	54	53	53	50	47	45	43	42	40	35	33	32	31	31	21	18	19	22	20	17	16
	Density	31	37	32	23	28	24	32	30	29	29	31	27	31	31	31	31	29	33	39	45	46	48	51	50	51	52	61	78	83	90	79	89	91	81
	LOS	D	E	D	C	D	C	D	D	D	D	D	D	D	D	D	D	D	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	Volume	8604	4937	4935	4933	4409	4831	4816	6159	6135	6143	6135	11546	11577	11566	11592	11612	11610	10840	10611	11769	11696	11633	10728	11607	11575	11522	11175	9815	10530	10466	10488	10485	10473	10471
	Lanes	6	3	3	4	3	4	3	4	4	4	4	8	7	7	7	7	8	7	6	6	6	6	6	7	7	7	6	6	7	6	6	6	7	8
	Length	1506	2000	1342	888	772	883	449	791	1166	701	1845	431	1524	1205	1533	998	768	702	531	2000	1341	798	687	1389	531	634	406	872	598	2000	1458	1473	998	515
	LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
	SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Exit 8 Shady Grove Rd			Exit 9 I-370						Exit 10 MD 117		Exit 11 MD 124			Watkins Mill Rd							Exit 13 Middlebrook Rd				Exit 15 MD 118						Exit 16 MD 27	
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	15	33	53	46	39	33	22	25	24	22	20	19	17	15	14	17	14	13	18	16	16	15	16	15	15	17	17	18	17	15	14	13	13	14
	Density	99	45	21	24	27	41	51	54	56	69	77	80	84	87	94	98	107	112	82	87	73	84	83	97	95	67	78	88	92	87	102	109	88	108
	LOS	F	F	C	C	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	Volume	8687	10355	4444	4404	4215	5363	6851	6821	6718	6206	6080	5936	5801	6628	6559	6511	7491	7441	7301	6963	6909	6464	6509	5793	5756	5685	5361	4787	4740	5306	4213	4205	4517	4426
	Lanes	6	7	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
	Length	100	481	1027	631	558	2000	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
	LinkID	323	336	339	749	411	10040816	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
	SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		Exit 18 MD 121																	Exit 22 MD 109																	
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	13	14	13	13	13	14	14	14	11	9	10	10	11	11	12	22	43	51	52	52	52	52	52	52	52	52	53	53	48	49	52	52	52	52
	Density	86	110	114	119	120	108	114	112	102	138	107	103	128	130	116	63	50	41	40	40	41	40	40	40	41	41	26	38	29	43	41	40	40	40
	LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
	Volume	4582	4614	4625	4599	4642	4651	4650	4616	4627	3788	4213	4239	4256	4272	4235	4241	4239	4248	4231	4207	4246	4223	4222	4232	4250	4237	4241	4035	4216	4204	4218	4223	4223	4229
	Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
	Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
	LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
	SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		Exit 26 MD 80																								Exit 31 MD 85					
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
	Speed	52	52	52	52	52	51	48	41	28	40	50	52	52	52	52	52	52	52	52	52	52	52	52	52	51	52	53	52	53	53	53	53	53	53
	Density	40	40	40	40	40	41	29	45	53	55	44	42	42	42	42	42	41	42	41	42	42	42	42	42	42	42	28	38	25	34	25	25	25	25
	LOS	E	E	E	E	E	E	D	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C	C	C
	Volume	4225	4227	4218	4227	4228	4206	4149	3643	4365	4344	4368	4367	4362	4363	4364	4347	4353	4307	4366	4369	4372	4369	4371	4373	4355	4372	4016	3962	3585	5348	5341			
	Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4			
	Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392			
	LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577			
	SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1			

2040 Alt 10 PM - I-270 SB Link Evaluation Results

2040 Alt 10 PM
I-270 SB

					Exit 31																					Exit 26									
					MD 85																					MD 80									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	57	58	58	56	59	55	59	63	63	63	63	63	63	63	62	61	60	58	58	57	57	58	60	59	58	58	58	59	59	58	58	58
Density	21	21	21	24	24	16	17	16	22	21	21	21	21	21	21	21	21	22	22	23	23	23	23	15	18	14	21	21	21	20	21	20	21	21
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C
Volume	3666	3652	3670	2734	2737	2717	2013	2655	2642	2650	2647	2655	2649	2643	2619	2646	2649	2641	2646	2646	2639	2645	2640	2628	2146	2419	2422	2427	2410	2416	2417	2376	2426	2438
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																				Exit 18									
					MD 109																				MD 121									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	57	57	58	59	58	54	57	57	56	57	57	56	56	56	54	55	54	59	62	62	62	61	63	62	63	63	63	63	63	63	63	64
Density	21	21	21	21	14	20	15	24	23	22	23	23	23	23	23	23	23	23	23	14	13	10	12	11	14	12	16	16	16	16	16	15	12	13
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B
Volume	2429	2422	2410	2409	2406	2323	2543	2560	2570	2551	2547	2556	2545	2521	2529	2515	2499	2496	2481	2483	2473	2468	2158	2577	2577	2975	2973	2970	2962	2955	2948	2930	2934	2524
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	2000	1801	1775	948	546	716	1665	130	2000	322	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

					Exit 16			Exit 15			Exit 13							Exit 11				Exit 10				Exit 9							Exit 8		
					MD 27			MD 118			Middlebrook Rd							Watkins Mill Rd				MD 124				MD 117				I-370				Shady Grove Rd		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	62	63	62	63	62	63	61	61	63	63	63	62	61	61	63	64	64	63	58	62	63	63	60	62	62	63	63	63	56	56	56	55	55
Density	13	17	14	14	16	14	18	17	23	22	22	21	21	21	21	13	13	13	16	18	22	21	21	24	19	19	16	16	16	16	16	17	17	19
LOS	B	B	B	B	B	B	C	B	C	C	C	C	C	C	C	B	B	B	B	C	C	C	C	C	C	C	B	B	B	B	B	B	B	C
Volume	3161	3143	3498	3492	3104	3476	3441	4133	4137	4150	4144	5158	5180	5162	5178	4246	3256	3238	4011	5370	5329	5371	5371	7041	7058	7084	7067	7096	3947	6384	6392	5726	6433	7152
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	4	7	7	6	7	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	1257	1243	795	1607	706	478	708
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

						Exit 6					Exit 5					Exit 4							Exit 1											
						MD 28					MD 189					Montrose Rd							I-270 Spur					Westlake Terrace	Democracy Blvd					I-270 W Spur/I-495
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	55	55	55	55	55	56	56	55	55	55	53	52	55	55	17	24	14	50	38	15	12	9	8	8	57	59	58	59	59	57	57	57	57	53
Density	21	22	21	21	19	20	20	20	20	20	21	22	21	19	59	49	75	23	26	61	74	92	90	106	13	13	11	10	10	9	10	13	17	22
LOS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	C	D	F	F	F	F	F	B	B	B	A	A	A	A	A	B	C
Volume	7123	7153	7117	7137	7097	6521	6731	7699	7762	7750	7721	6847	6846	7440	7224	6957	7201	6750	7076	6620	6322	6027	6004	5751	2951	2955	3121	2306	2272	2976	2970	2973	2977	6995
Lanes	6	6	6	6	7	6	6	7	7	7	7	6	6	7	7	6	7	6	7	7	7	7	8	7	4	4	5	4	4	6	5	4	3	6
Length	1085	607	1509	2000	291	896	986	574	1050	610	836	816	1572	691	452	808	650	937	415	2000	1709	719	387	328	2000	300	955	2000	447	498	932	990	1511	551
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	10040822	495375
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1

2040 Alt-13B AM - I-495 OL Link Evaluation Results

2040 Alt-13B AM
I-495 OL

	WWB								I-295			MD 210										MD 414											
	Exit 2											Exit 3										Exit 4											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	19	17	25	52	56	57	59	59	58	58	59	59	59	59	59	58	59	59	59	59	58	59	59	54	53	53	53	53	53	53	53	53
Density	90	98	75	35	33	32	22	15	17	18	15	15	19	19	18	22	22	17	21	21	18	20	20	19	24	25	25	25	25	22	22	17	18	17
LOS	F	F	F	E	D	D	C	B	B	B	B	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B
Volume	8636	8483	5529	5541	5549	5546	2563	2564	2045	2041	2723	2724	2243	4529	5215	5212	5199	5169	4932	4947	5334	4820	4817	5213	5094	5238	5235	5231	5195	4608	4598	4576	3765	3737
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	MD 5									MD 337										MD 4										Ritchie Marlboro Rd					
	Exit 7									Exit 9										Exit 11										Exit 13					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	34	54	54	54	54	55	54	53	55	55	55	53	53	55	55	56	56	51	55	56	50	53	58	58	57	57	57	58	58	58	56	55	57	57
Density	24	17	17	19	24	23	24	24	20	20	20	21	27	26	26	23	23	23	24	23	27	32	29	30	30	30	30	24	26	26	26	33	32	31
LOS	C	B	B	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	D	D	D	D	D	D	D	C	C	D	D	D	D	D
Volume	4071	3552	3683	5130	5079	5132	5118	5101	4461	4463	4459	5631	5716	5686	5712	5206	5224	5947	5253	5230	6770	6766	6806	6815	6799	6802	6771	6791	6012	6030	7270	7235	7218	7067
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1	

			MD 214					Arena Dr		MD 202											US 50								MD 450							
			Exit 15					Exit 16		Exit 17											Exit 19								Exit 20							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	58	57	57	57	57	58	56	57	57	57	60	59	58	54	57	58	60	57	58	58	58	60	57	58	58	59	58	54	58	59	59	57
Density	25	26	23	29	26	26	28	23	29	29	29	20	24	24	33	31	31	24	29	23	24	24	24	21	26	30	23	28	26	35	33	32	32	33
LOS	C	C	C	D	C	C	D	C	D	D	D	C	C	C	D	D	D	C	D	C	C	C	C	C	D	D	C	D	D	D	D	D	D	D
Volume	7194	5975	6724	6752	7333	7313	6508	6585	4948	4975	4974	7095	7160	7146	7116	7052	7131	7124	6626	6624	5687	5697	5666	7431	7565	6852	6764	6614	7611	7584	7614	7623	7617	7594
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

					MD 295						MD 201											US 1								I-95						
					Exit 22						Exit 23											Exit 25								Exit 27						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	53	53	53	52	53	49	51	54	54	54	55	54	53	53	56	57	58	58	58	58	58	59	58	59	59	58	58	58	53	53	53	53
Density	33	26	29	29	27	32	33	30	28	26	23	23	19	23	24	29	23	28	28	21	21	18	16	16	16	14	14	12	15	15	19	20	19	21
LOS	D	D	D	D	D	D	D	D	D	D	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	B	C	C	C	C
Volume	7558	7564	6165	6174	7101	6682	7035	7434	5701	5642	6098	6132	6307	6280	6267	6091	6407	6416	6434	4942	4874	5328	5780	5722	5705	3364	3300	3471	3489	3478	6205	6230	6225	5559
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt-13B AM

I-495 OL

			Exit 28										Exit 29				Exit 30									Exit 31								
			MD 650										MD 193				US 29									MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	49	53	53	53	53	53	52	53	53	53	53	53	51	46	50	53	52	45	42	40	36	33	29	26	24	21	10	14	24	22	25	24	24	16
Density	21	20	20	19	17	21	21	27	27	21	24	24	25	27	31	29	29	32	42	44	48	52	48	60	66	75	124	104	78	86	73	77	60	92
LOS	C	C	C	C	B	C	C	D	D	C	C	C	C	D	D	D	D	D	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5538	5880	5141	5138	5412	5521	5596	5587	5587	5576	5168	5146	6203	6182	6213	6216	6023	7210	7037	7107	6911	6961	6938	6357	6300	6279	7645	7527	7482	7446	7352	7326	5887	5796
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33									Exit 34							Exit 36												Exit 39					
	MD 185									MD 355							MD 187								I-270 W Spur						MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	12	15	13	18	18	17	16	16	15	11	6	5	8	8	8	8	8	8	7	12	12	12	13	18	31	23	23	21	21	17	18	21	21	23
Density	102	99	104	94	95	97	102	105	88	121	157	160	141	142	143	107	143	137	148	122	122	124	112	81	49	77	78	87	86	88	88	86	88	73
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6123	6036	6824	6729	6715	6542	6590	6549	6500	5420	2989	3478	3494	3507	3512	3500	3513	3396	4296	4325	4362	4385	4415	4431	9001	8993	8998	9073	8913	9046	8024	7241	7199	8542
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1657	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

				Exit 41	Bridge			Exit 43							Exit 44																			
				Clara Barton Pkwy	American Legion			GW Memorial Pkwy							VA 193																			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	43	51	52	52	51	52	53	53	53	53	53	53	53	52																				
Density	49	34	36	30	37	33	31	31	30	31	24	31	26	33																				
LOS	F	D	E	D	E	D	D	D	D	D	C	D	C	D																				
Volume	8579	8618	7521	7866	7620	8620	6462	6421	6452	6452	6433	6439	6771	6796																				
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4																				
Length	1628	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610																				
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114																				
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1																				

2040 Alt-13B AM - I-495 IL Link Evaluation Results

2040 Alt-13B AM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy								Exit 39 MD 190							I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	30	27	23	17	15	15	14	15	15	16	17	45	53	55	57	52	54	56	56	56	57	57	57	57	55	57	56	54	58	57	57	48	27	55
Density	55	59	57	81	92	94	95	105	100	99	92	36	32	25	24	32	38	37	29	33	27	27	24	28	30	29	30	30	28	28	28	33	45	25
LOS	F	F	F	F	F	F	F	F	F	F	F	E	D	C	C	D	E	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	E	C
Volume	6640	6432	6480	5685	5593	6843	6692	6344	6158	6266	7648	6479	6686	6853	6876	8212	8214	8198	8178	7465	7726	7634	8295	8127	8274	8187	8273	4775	4784	4796	4804	4821	4825	4134
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	5	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1503	2000	2000	2000	1662	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 34 MD 355															Exit 33 MD 185										Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	55	42	49	58	60	43	53	58	50	48	46	38	32	23	25	22	25	21	25	25	14	15	56	59	59	58	60	58	59	60	60	60
Density	18	19	26	35	39	28	27	37	38	35	40	41	35	42	52	60	67	68	75	83	74	73	102	97	25	23	23	19	22	23	29	23	26	25
LOS	C	C	D	D	E	D	D	E	E	D	E	E	D	E	F	F	F	F	F	F	F	F	F	F	C	C	C	C	C	C	D	C	C	C
Volume	3166	4349	4359	4407	3851	6631	8047	8071	8030	8024	8001	8010	7996	7926	6712	6863	6825	7515	7457	7146	7345	7291	7246	7221	5538	5564	5580	6737	6647	6750	6752	6755	6210	5961
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	5	4	5	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193										Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	60	60	61	60	59	24	55	56	58	60	58	53	37	23	46	55	60	61	61	61	60	60	60	61	58	57	57	50	48	48	49	42
Density	25	26	25	21	24	19	24	55	30	29	28	27	23	30	41	61	35	29	25	24	19	19	18	22	22	22	22	28	28	32	41	41	40	38
LOS	C	C	C	C	C	C	C	F	D	D	D	D	C	D	E	F	E	D	C	C	C	C	B	C	C	C	C	D	D	D	E	E	E	E
Volume	5998	6167	6090	6405	5700	5743	5761	6541	6569	6574	6581	6571	6586	6239	6126	6975	6431	6432	7454	7419	4760	4779	5334	5337	5298	4070	6349	6351	6334	7969	7923	7989	7898	7972
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295												Exit 20 MD 450					Exit 19 US 50				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	55	54	52	54	54	54	52	52	54	55	55	54	55	55	56	56	55	55	55	55	54	53	55	47	52	57	56	54	58	58	57	55	56
Density	38	28	28	29	28	24	30	27	34	26	27	27	25	28	28	22	28	28	28	28	28	29	23	25	28	32	23	25	21	21	21	21	27	33
LOS	E	D	D	D	D	C	D	D	D	C	D	D	C	D	D	C	D	D	D	D	D	D	C	C	D	D	C	C	C	C	C	C	D	D
Volume	7423	7563	7548	7570	6159	6564	6536	7038	7036	6924	5931	5914	6726	6169	6134	6198	6213	6203	6202	6198	6200	6198	6056	5469	6656	6639	6651	5580	5587	4867	4870	7212	7347	7327
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-13B AM

I-495 IL

	Exit 16 Arena Dr											Exit 15 MD 214								Exit 13 Ritchie Marlboro Rd									Exit 11 MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	58	57	56	56	57	58	58	58	56	58	59	57	57	58	58	59	59	59	58	57	56	52	44	34	54	58	52	56	58	59	59	60
Density	32	25	25	31	32	32	30	25	25	25	29	23	25	25	31	31	31	24	27	27	25	32	32	35	41	53	27	25	27	27	26	22	27	27
LOS	D	C	C	D	D	D	D	C	C	C	D	C	C	C	D	D	D	C	D	D	C	D	D	E	E	F	D	C	D	D	D	C	D	D
Volume	7280	7292	7323	5313	5340	5333	6900	7242	7255	7251	6472	6477	5910	7174	7177	7176	7084	7166	6309	6378	7296	7313	7295	7290	7263	7247	5868	5881	6892	6031	6060	6499	6487	6493
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	Exit 9 MD 337											Exit 7 MD 5												Exit 4 MD 414									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	63	63	63	63	62	61	61	63	63	27	14	16	16	15	13	13	15	14	14	14	13	12	12	10	13	13	10	16	15	18	14	8
Density	27	22	23	23	23	19	24	25	25	19	19	37	71	75	68	88	103	93	104	115	115	113	98	122	122	121	115	112	128	99	107	85	77	130
LOS	D	C	C	C	C	C	C	C	C	C	C	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6476	6481	5832	5859	5849	6041	6015	6040	6027	6042	6039	3948	4825	4902	5339	5461	5553	6215	6291	6333	6381	6432	6453	5994	5946	6344	5820	5805	6351	6339	6227	3153	3179	2133
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295		WWB					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	7	8	9	13	14	15	17	46	57	58	58	56	48	57
Density	121	129	104	100	91	103	92	50	34	34	34	35	42	36
LOS	F	F	F	F	F	F	F	F	D	D	D	D	E	E
Volume	3138	3124	3799	3770	3766	3049	4697	4599	5857	5859	5851	5803	10054	10080
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt-13B AM - I-270 NB Link Evaluation Results

2040 Alt-13B AM
I-270 NB

						Exit 1												Exit 4				Exit 5					Exit 6							Exit 8
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur						Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	55	60	62	63	62	62	62	64	64	63	64	64	63	63	64	63	61	63	60	60	60	61	59	59	58	58	59	59	59	58	58	59	59
Density	30	32	29	19	21	15	22	16	16	16	16	14	14	14	14	14	12	13	14	18	18	15	16	16	16	16	18	15	13	16	16	16	13	12
LOS	D	D	D	C	C	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Volume	8273	3499	3489	3468	2633	2777	2752	3081	3073	3078	3064	5483	5484	5480	5455	5453	5411	4771	4441	5348	5339	5280	4850	5509	5501	5486	5224	4480	4657	4753	4728	4723	4705	3428
Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	6	5	6	6	6	5	5	6	5	5	5	6	5
Length	1503	2000	1418	897	788	886	453	816	1169	730	1875	430	1464	1957	783	980	769	698	801	2000	2000	517	742	1343	526	657	425	789	598	1189	1474	1474	991	2000
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

				Exit 9							Exit 10		Exit 11											Exit 13				Exit 15						Exit 16	
				I-370							MD 117		MD 124				Watkins Mill Rd							Middlebrook Rd				MD 118						MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	49	60	60	60	60	60	61	61	62	62	62	62	62	62	62	62	63	63	63	63	63	62	62	62	62	62	62	62	62	62	63	62	63
Density	12	13	7	7	7	5	7	9	9	8	8	8	8	9	9	11	11	11	11	11	9	10	10	11	11	9	11	12	12	11	12	12	10	13
LOS	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	A	A	B	B	A	B	B	B	B
Volume	3433	3898	1278	1266	1277	1278	2623	2638	2634	2068	2065	2060	2055	2736	2702	2723	3391	3385	3379	3354	3361	3117	3151	2837	2809	2809	2644	2258	2259	2697	2243	2258	2493	2473
Lanes	5	6	3	3	3	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	118	441	1059	630	836	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

												Exit 18																	Exit 22							
												MD 121																	MD 109							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	63	63	63	63	63	63	62	62	63	59	62	63	63	63	62	63	62	62	62	62	62	62	62	62	62	62	60	62	62	62	62	62	62
Density	10	14	14	14	14	14	14	14	10	9	10	10	12	13	13	13	19	19	19	19	19	19	19	19	19	19	19	13	18	12	18	18	18	18
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C
Volume	2581	2597	2613	2613	2606	2601	2603	2591	2587	1772	2370	2375	2363	2380	2375	2373	2369	2370	2363	2348	2370	2360	2361	2362	2359	2343	2345	2194	2263	2257	2264	2266	2259	2248
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4

							Exit 26																			Exit 31					
							MD 80																			MD 85					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	62	62	62	62	61	58	62	59	61	62	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	56	63	61	64
Density	18	18	18	18	18	18	13	16	15	22	22	22	22	22	21	21	21	21	21	21	21	21	21	21	21	14	19	14	15	12	11
LOS	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B	B
Volume	2239	2236	2236	2240	2239	2227	2199	2003	2738	2720	2729	2725	2721	2713	2701	2691	2691	2665	2693	2689	2688	2675	2676	2671	2652	2660	2400	2363	1855	2911	2904
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1

2040 Alt-13B AM - I-270 SB Link Evaluation Results

2040 Alt-13B AM
I-270 SB

	Exit 31																							Exit 26											
					MD 85																			MD 80											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	15	15	15	12	12	10	8	8	17	18	17	18	17	17	17	17	18	18	18	18	17	17	16	13	13	14	18	26	26	25	25	26	25	26
Density	99	96	98	119	125	94	144	132	90	89	90	90	92	92	90	90	88	88	89	88	90	91	93	76	107	84	100	71	68	72	71	68	71	69
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4385	4371	4384	2894	2890	2886	2361	3158	3137	3165	3144	3158	3123	3130	3104	3135	3148	3136	3117	3104	3085	3075	3069	3063	2805	3623	3630	3619	3586	3598	3608	3530	3594	3636
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

	Exit 22																							Exit 18											
					MD 109																			MD 121											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	26	27	26	25	23	24	22	25	36	39	40	40	43	42	41	41	45	45	45	52	52	52	52	51	52	52	53	53	40	28	27	25	19	12
Density	69	69	69	72	51	75	64	83	57	53	52	52	49	49	51	52	47	47	46	27	27	20	24	24	31	26	34	34	44	63	67	73	72	120
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	D	D	E	F	F	F	F	F
Volume	3637	3643	3632	3620	3614	3568	4182	4109	4185	4149	4138	4208	4218	4172	4186	4195	4175	4189	4182	4187	4184	4183	3756	4930	4937	5355	5350	5347	5339	5361	5406	5391	5440	4182
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

	Exit 16					Exit 15			Exit 13										Exit 11			Exit 10				Exit 9							Exit 8		
	MD 27					MD 118			Middlebrook Rd								Watkins Mill Rd			MD 124			MD 117				I-370							Shady Grove Rd		
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	16	13	14	17	17	18	19	36	45	44	41	41	42	45	53	53	53	53	50	51	52	53	50	49	51	53	53	53	53	52	50	51	49
Density	123	106	108	98	105	83	100	82	56	46	46	50	49	47	44	32	28	28	34	35	43	42	41	43	36	35	29	29	24	24	26	28	33	30
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	D	D	D	E	E	E	E	E	D	D	D	C	C	D	D	D	D
Volume	5015	4993	5665	5658	5203	5604	5535	6134	6141	6166	6159	8071	8087	8056	8072	6821	5988	5980	7143	8656	8593	8670	8676	10589	10599	10481	10591	10623	6351	6383	9706	9677	8301	8707
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	5	5	7	7	5	6
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1633	1783	599	731	480
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

											Exit 5					Exit 4												Exit 1								
											MD 189					Montrose Rd							I-270 Spur					Westlake Terrace	Democracy Blvd						I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	51	52	52	53	53	53	53	53	53	53	44	51	39	48	52	53	52	53	53	52	46	51	53	53	53	53	53	53	53	53	53	53	50	31
Density	34	35	35	35	35	35	28	32	33	31	37	35	42	42	31	34	32	35	31	31	35	32	30	31	22	21	22	26	26	17	21	29	30	49
LOS	D	E	E	D	D	D	D	D	D	D	E	D	E	E	D	D	D	E	D	D	E	D	D	D	C	C	C	C	C	B	C	D	D	F
Volume	8737	9128	9153	9133	9166	9178	9069	8527	8695	9787	9785	8776	9826	9898	9821	9001	9797	9361	9664	9689	9719	9709	9559	9735	4605	4592	4608	4071	4080	4500	4489	4532	4544	9001
Lanes	5	5	5	5	5	5	6	5	5	6	6	5	6	5	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6
Length	795	2000	1661	469	1017	935	444	935	998	608	1801	1637	697	2000	449	900	640	885	1395	2000	1704	716	393	325	2000	999	940	2000	450	517	937	2000	520	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1

2040 Alt 13B PM - I-495 OL Link Evaluation Results

2040 Alt 13B PM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414												
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	21	23	50	56	56	58	58	58	58	56	57	58	58	50	49	57	57	58	58	57	58	58	53	53	53	53	52	52	52	53	53	53	53
Density	102	90	77	35	32	31	31	21	24	24	25	25	30	29	31	40	34	27	30	30	25	28	28	26	32	33	33	34	34	28	28	22	22	21
LOS	F	F	F	D	D	D	D	C	C	C	C	C	D	D	D	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	C	C
Volume	9293	9295	5266	5272	5277	5278	3609	3609	2784	2786	4284	4298	3435	6690	7771	7773	7756	7714	6942	6954	7201	6436	6424	6934	6783	6994	7010	7031	6994	5952	5954	5923	4611	4587
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4													Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	53	52	52	52	53	53	53	53	33	17	43	50	52	53	53	50	52	53	53	50	52	52	53	53	53	53	53	53	53	49	52	53
Density	19	23	23	22	27	27	26	26	25	25	40	74	38	32	31	26	26	26	28	28	27	35	34	34	34	34	33	27	29	30	27	35	34	33
LOS	C	C	C	C	D	D	D	D	C	C	E	F	E	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D	E	D	D
Volume	5123	4781	4794	5614	5586	5604	5593	5602	5225	5227	5230	6395	6413	6428	6419	5613	5616	6591	5885	5862	7169	7139	7158	7160	7152	7136	7082	7122	6231	6258	7024	7019	7029	7013
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	53	53	49	51	53	53	53	53	53	53	53	52	51	52	53	57	58	58	58	58	48	53	56	58	57	56	57	57	58	58	58	58	58
Density	26	26	24	30	26	28	31	25	32	32	32	21	25	25	32	33	32	25	26	20	23	23	23	30	29	21	25	23	29	29	29	28	28	28	28	28
LOS	D	C	C	D	C	D	D	C	D	D	D	C	C	C	D	D	D	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D	D	D	D
Volume	7037	5476	6360	6366	6831	6845	6438	6467	5059	5055	5033	6625	6601	6644	6634	6647	6638	6595	5893	5841	5332	5337	5292	7073	7165	6120	6030	5767	6554	6548	6551	6551	6550	6560
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4	4	4
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849	
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027	
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4		

	Exit 22 MD 295									Exit 23 MD 201									Exit 25 US 1								Exit 27 I-95								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	51	50	52	52	51	53	53	53	53	53	51	51	55	53	56	57	58	57	57	58	57	58	58	58	58	58	53	53	53	53		
Density	28	22	26	26	26	34	32	28	31	30	27	27	23	28	29	35	28	36	35	29	28	26	24	23	24	22	22	18	22	22	24	24	24	26		
LOS	D	C	C	C	D	D	D	D	D	D	D	D	C	D	D	D	D	E	D	D	D	C	C	C	C	C	C	B	C	C	C	C	C	C		
Volume	6541	6437	5445	5454	6745	6687	6629	7237	6285	6263	7130	7180	7426	7399	7416	6996	7665	7672	7676	6604	6537	7367	8129	8123	8110	5108	5058	5131	5160	5140	7471	7505	7485	6813		
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5		
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806		
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107		
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1		

2040 Alt 13B PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29								Exit 31 MD 97									
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	51	52	53	52	53	50	50	53	53	53	53	49	24	44	51	51	53	49	48	52	52	53	53	54	53	53	45	47	50	52	53	53	53
Density	25	24	25	25	22	27	29	36	34	27	30	30	29	59	39	34	34	28	37	37	34	34	27	28	28	28	23	33	40	37	36	35	29	29
LOS	C	C	C	C	C	D	D	E	D	D	D	D	D	F	E	D	D	D	E	E	D	D	D	D	D	D	C	D	E	E	E	D	D	D
Volume	6761	7315	6493	6522	7012	7219	7216	7214	7217	7212	6395	6383	7115	7117	6859	6909	6930	7285	7183	7189	7039	7158	7185	5982	6001	5973	7368	7338	7391	7397	7358	7380	6154	6130
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1133	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355								Exit 36 MD 187							Exit 39 I-270 W Spur						MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	53	52	49	50	52	52	53	53	53	49	53	53	53	53	53	53	53	53	52	53	53	50	49	52	53	54	54	54	54	54	54	52
Density	27	33	28	36	38	37	36	36	28	29	22	20	25	25	25	18	24	22	22	29	29	29	30	31	23	26	26	26	25	22	23	27	27	28
LOS	D	D	D	E	E	E	E	E	D	D	C	C	C	C	C	C	C	C	C	D	D	D	D	D	C	D	D	D	C	C	C	D	D	D
Volume	6952	6938	7398	7434	7429	7432	7414	7455	7433	6256	3503	3999	4008	4009	4008	3918	3869	3572	4558	4597	4585	4585	4590	4576	7002	6988	7004	7004	6889	7010	6338	5858	5869	7206
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	1034	386	1589	284	907	487	893	1176	325	2000	31	402	1081	2000	2000	2000	1642	551	937	2000	655	442	1021	1587	2000	575	1737
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193											
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	54	52	49	52	53	53	54	54	54	53	53	53	
Density	34	27	28	23	30	29	25	25	25	25	22	28	25	31	
LOS	D	D	D	C	D	D	C	C	C	C	C	D	C	D	
Volume	7224	7227	5935	5918	5949	7425	5394	5394	5405	5408	5836	5820	6487	6506	
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4	
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601	
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114	
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1	

2040 Alt 13B PM - I-495 IL Link Evaluation Results

2040 Alt 13B PM
I-495 IL

				Exit 44				Exit 43			Bridge		Exit 41								Exit 39												Exit 36
				VA 193				GW Memorial Pkwy			American Legion		Clara Barton Pkwy								MD 190							I-270 W Spur						MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	58	58	58	58	57	56	56	53	54	54	55	56	56	55	54	54	46	41	35	26	23	26	26	23	21	19	10	8	8	8	8	8	7
Density	23	18	18	21	21	22	22	28	29	29	28	28	28	23	23	27	34	31	35	47	55	61	48	57	64	69	78	121	146	147	148	145	108	154
LOS	C	C	C	C	C	C	C	D	D	D	D	D	D	C	C	D	D	D	D	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5350	5349	5349	4997	4999	6264	6249	6209	6127	6225	7583	6158	6194	6339	6334	7278	7277	7222	7162	6545	7150	7041	7504	7331	7346	7301	7248	3657	3573	3549	3512	3483	3454	3077
Lanes	4	5	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	5	5	4	5	5	6	5	5	5	5	3	3	3	3	3	4	3
Length	2000	1499	1499	2000	93	1457	1556	642	679	466	602	477	685	1486	775	989	2000	1045	395	1944	1491	616	1108	391	1767	724	1508	2000	2000	2000	1582	1174	303	1996
LinkID	1100	1037	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541577	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

					Exit 34										Exit 33										Exit 31								
					MD 355										MD 185										MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	7	7	8	9	12	9	10	11	13	13	15	16	14	14	13	11	14	15	23	23	27	28	24	23	19	17	17	14	16	25	35	33	46	50
Density	116	116	139	118	123	138	126	111	118	121	103	100	86	88	108	108	105	103	84	83	72	69	64	68	88	103	99	95	98	64	59	50	41	36
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E
Volume	3219	3219	3209	3225	2940	4899	6213	6298	6267	6187	6193	6214	6227	6245	5663	6027	6071	7570	7652	7584	7682	7656	7669	7699	6800	6826	6857	8181	8065	8195	8192	8232	7581	7272
Lanes	4	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	438	438	655	1105	1490	1944	514	1013	998	521	1600	252	526	658	913	228	788	1632	2000	163	2000	1753	2000	47	834	411	323	1125	454	1034	2000	1238	243	518
LinkID	1271	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	2541504	1125	1990014	495307
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1

				Exit 30				Exit 29									Exit 28										Exit 27							Exit 25						
				US 29				MD 193									MD 650										I-95							US 1						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	52	54	54	54	53	45	45	43	44	51	52	53	53	48	44	47	53	53	53	53	52	53	53	53	53	54	53	50	46	45	48	49
Density	35	36	36	28	32	25	32	35	43	45	43	37	29	33	33	33	42	39	31	31	27	27	24	29	29	27	23	28	28	30	41	41	38	30
LOS	E	E	E	D	D	C	D	D	E	E	E	E	D	D	D	D	E	E	D	D	D	D	C	D	D	D	C	D	D	D	E	E	E	D
Volume	7366	7574	7568	7558	6748	6739	6762	7726	7739	7700	7664	7650	7646	7088	7111	7795	7331	7338	8246	8218	5721	5737	6133	6125	6073	4354	6004	5992	5998	7463	7414	7480	7392	7467
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	268	491	512	1554	785	422	765	283	1222	2000	1068	1127	346	339	505	457	500	1047	1493	1492	1028	536	347	2000	140	1527	1464	2000	1607	668	846	610	481	1016
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

				Exit 24				Exit 23				Exit 22														Exit 20					Exit 19						
				Greenbelt Metro Station				MD 201				MD 295														MD 450					US 50						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	50	52	52	52	53	51	50	46	45	52	53	52	50	49	51	53	51	52	52	51	51	51	51	52	45	49	52	53	52	53	53	51	51	49
Density	35	31	28	27	28	26	32	32	40	28	30	31	30	36	34	27	35	34	34	35	35	35	27	31	34	39	29	28	23	26	26	24	29	37
LOS	D	D	D	D	D	C	D	D	E	D	D	D	D	E	D	D	D	D	D	D	D	D	D	D	D	E	D	D	C	D	D	C	D	E
Volume	7039	6316	7139	7104	5827	6582	6537	7326	7319	7279	6372	6390	7502	7078	7043	7125	7108	7138	7113	7115	7132	7118	6954	6381	7622	7584	7592	5951	5958	5570	5563	7351	7349	7347
Lanes	4	4	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	23	1042	442	1150	761	810	734	928	447	512	554	554	497	516	754	706	2000	2000	2000	1629	1217	263	1180	915	561	1358	1369	213	2000	603	1423	754	2000
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt 13B PM

I-495 IL

	Exit 16 Arena Dr											Exit 15 MD 214							Exit 13 Ritchie Marlboro Rd										Exit 11 MD 4					
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	50	52	53	53	52	52	50	51	51	50	49	52	52	50	51	52	52	53	53	53	53	53	53	51	51	51	53	53	50	52	53	52	52	53
Density	37	28	28	30	30	30	31	27	26	27	31	24	26	27	33	33	32	25	25	25	24	30	30	30	30	31	26	26	25	25	25	23	29	29
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	C	C	C	C	D	D	D	D	D	D	D	C	C	C	C	D	D
Volume	7313	7332	7364	4662	4671	4675	6247	6790	6793	6789	6105	6114	5526	6756	6750	6744	6665	6748	5215	5220	6264	6260	6266	6254	6245	6254	5528	5514	6331	5298	5255	6047	6033	6045
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	Exit 9 MD 337												Exit 7 MD 5													Exit 4 MD 414							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	62	63	63	62	62	61	61	63	63	63	61	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	62	62	58	60	62	63
Density	28	23	22	22	22	19	25	25	25	19	19	16	16	20	17	21	19	24	24	24	24	24	19	22	22	19	20	20	18	22	23	31	20	20
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	D	C	C
Volume	6022	6017	5502	5517	5499	6053	6080	6080	6076	6072	6066	3986	4952	4962	5295	5333	5917	5984	5967	5961	5951	5923	5915	5513	5470	5884	5055	5039	5503	5521	5426	3742	3757	2452
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	Exit 3 MD 210						Exit 2 I-295		WWB					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	58	57	57	57	34	45	49	53	53	53	56	56
Density	13	17	15	21	21	27	46	49	44	40	40	40	30	30
LOS	B	B	B	C	C	D	F	F	E	E	E	E	D	D
Volume	3088	3064	3512	3507	3514	3105	4683	4342	6351	6348	6337	6289	8408	8420
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

2040 Alt 13B PM - I-270 NB Link Evaluation Results

2040 Alt 13B PM
I-270 NB

		Exit 1																																	
		I-270 W Spur/I-495					Democracy Blvd		Westlake Terrace				I-270 Spur						Exit 4 Montrose Rd				Exit 5 MD 189					Exit 6 MD 28								
Direction of Travel		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	19	52	53	54	54	53	52	53	54	54	53	54	54	54	53	53	52	52	53	52	53	53	53	49	51	52	53	52	52	50	52	53	47	42
Density	78	33	32	21	27	21	32	28	28	28	28	29	28	29	29	29	26	28	32	38	37	37	34	34	33	33	37	33	30	38	37	36	33	31
LOS	F	D	D	C	D	C	D	D	D	D	D	D	D	D	D	D	C	D	D	E	E	E	D	D	D	D	E	D	D	E	E	E	D	D
Volume	7248	3423	3420	3414	2953	3354	3335	4469	4467	4491	4492	9221	9249	9257	9250	9241	9245	8790	8604	9786	9768	9774	9136	10145	10173	10169	9881	8647	9495	9500	9504	9494	9381	9211
Lanes	5	2	2	3	2	3	2	3	3	3	3	6	6	6	6	6	7	6	5	5	5	5	5	6	6	6	5	5	6	5	5	5	6	7
Length	1508	2000	1339	894	788	886	450	793	1166	705	1845	431	1520	1204	1533	999	769	695	531	2000	1343	799	690	1389	530	634	406	872	598	2000	1459	1474	998	515
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

		Exit 8 Shady Grove Rd			Exit 9 I-370						Exit 10 MD 117		Exit 11 MD 124			Watkins Mill Rd							Exit 13 Middlebrook Rd				Exit 15 MD 118						Exit 16 MD 27	
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	37	19	15	14	11	10	10	13	14	16	15	14	14	13	13	15	12	12	12	14	14	14	14	14	14	17	18	21	20	18	16	15	15	16
Density	42	75	74	82	102	108	98	85	77	79	85	88	91	91	94	99	112	117	117	96	80	91	89	103	100	67	74	78	79	77	89	92	75	91
LOS	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	7635	8511	3416	3360	4446	4295	5653	5636	5595	5175	5102	5047	5049	5974	5978	5997	6873	6903	6850	6694	6721	6339	6376	5729	5713	5666	5350	4801	4793	5377	4233	4209	4520	4456
Lanes	5	6	3	3	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	726	481	1026	634	2000	749	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
LinkID	323	336	339	749	411	411	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	1	1	1	1	1	2	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

		Exit 18 MD 121																	Exit 22 MD 109																
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	16	17	17	17	17	17	17	17	15	12	12	12	11	11	12	23	42	51	52	52	52	52	52	52	52	52	53	53	48	50	52	53	52	52
Density	71	90	89	90	92	90	91	89	78	107	88	90	126	130	115	62	50	41	40	40	40	40	40	40	40	41	26	38	29	41	40	40	40	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
Volume	4618	4608	4615	4597	4578	4565	4582	4580	4571	3728	4157	4156	4131	4221	4225	4228	4209	4220	4211	4186	4226	4203	4204	4216	4230	4217	4219	4010	4191	4179	4190	4195	4192	4191
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

		Exit 26 MD 80																							Exit 31 MD 85					
		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	52	52	51	50	51	42	43	51	52	52	52	52	52	52	52	52	52	52	52	52	51	51	53	53	52	53	53	53
Density	40	40	40	40	40	41	27	35	35	50	43	42	42	42	42	41	42	41	42	42	42	42	43	43	43	28	38	25	34	26	25
LOS	E	E	E	E	E	E	D	E	D	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	C	D	C	C
Volume	4185	4190	4178	4182	4186	4171	4119	3615	4359	4340	4363	4367	4364	4369	4368	4348	4358	4314	4376	4380	4380	4388	4390	4384	4364	4381	4024	3970	3595	5397	5390
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1

2040 Alt 13B PM - I-270 SB Link Evaluation Results

2040 Alt 13B PM
I-270 SB

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	57	58	58	56	59	54	59	62	63	63	63	63	63	63	62	61	60	59	58	58	58	58	60	59	57	57	58	59	58	58	58	58	58
Density	21	20	20	22	22	15	16	15	21	20	20	20	20	20	20	20	20	20	20	21	21	21	21	14	17	13	20	20	19	19	19	19	19	19	19
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C
Volume	3512	3500	3510	2581	2584	2567	1857	2513	2507	2520	2518	2514	2505	2501	2474	2499	2493	2471	2462	2465	2468	2469	2470	2463	1988	2248	2245	2251	2232	2241	2243	2192	2230	2247
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Exit 31 — MD 85

Exit 26 — MD 80

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

Exit 22 — MD 109

Exit 18 — MD 121

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	57	57	57	58	59	58	53	58	58	58	58	58	58	58	58	59	58	59	61	62	62	62	61	63	63	63	64	64	63	63	63	63	64
Density	20	20	20	20	13	18	13	22	20	20	20	20	20	20	20	20	19	19	19	13	12	9	10	10	13	11	15	15	15	15	15	14	11	12
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A	A	B	B	B	B	B	B	B	B	A	B
Volume	2253	2257	2249	2234	2222	2126	2323	2321	2321	2306	2306	2320	2317	2302	2307	2291	2269	2275	2269	2280	2279	2273	1957	2376	2378	2775	2788	2794	2785	2776	2770	2748	2756	2363
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
LinkID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1
SegmentID	2000	1801	1775	948	546	716	1665	130	2000	322	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871

Exit 16 — MD 27

Exit 15 — MD 118

Exit 13 — Middlebrook Rd

Exit 11 — MD 124

Exit 10 — MD 117

Exit 9 — I-370

Exit 8 — Shady Grove Rd

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	63	63	63	63	62	63	61	61	63	63	63	62	61	62	63	64	64	63	59	62	63	63	60	61	60	63	63	63	60	59	59	57	57
Density	12	16	13	13	16	13	17	16	22	21	21	20	20	20	20	13	12	12	15	17	20	20	20	22	18	18	15	15	13	15	15	19	18	20
LOS	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	B	B	B	B	B	C	C	C	C	B	C	B	B	B	B	B	C	B	C
Volume	2996	2984	3334	3334	2951	3316	3282	3977	3989	4002	3997	4997	5020	4994	4992	4053	3084	3065	3694	4941	4910	4944	4939	6588	6593	6599	6578	6601	4127	6122	6121	5466	6098	6704
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	5	7	7	5	6	6
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	1257	1243	795	1607	706	478	708
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

Exit 6 — MD 28

Exit 5 — MD 189

Exit 4 — Montrose Rd

I-270 Spur

Exit 1 — Westlake Terrace / Democracy Blvd

I-270 W Spur/I-495

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	58	57	57	54	37	30	25	22	20	17	14	11	10	9	8	8	7	6	6	5	5	5	55	58	59	59	59	57	57	57	57	52
Density	23	23	23	23	20	23	33	39	45	50	55	65	79	85	87	108	105	120	126	142	131	137	147	146	11	10	10	10	10	9	11	14	14	23
LOS	C	C	C	C	C	C	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	B	B	C
Volume	6661	6689	6667	6690	6661	6080	6212	7018	6885	6693	6551	5607	5371	5609	5144	4877	5278	4642	5052	4696	4609	4502	4541	4517	2393	2391	2393	1820	1803	2404	2392	2405	2410	7002
Lanes	5	5	5	5	6	5	5	6	6	6	6	5	5	6	6	5	6	5	6	6	6	6	6	6	4	4	4	3	3	5	4	3	3	6
Length	1085	607	1508	2000	291	896	986	575	1050	610	836	816	1571	691	452	809	650	937	415	2000	1709	719	387	330	2000	983	955	2000	442	498	934	2000	506	551
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	2	1

2040 Alt-13C AM - I-495 OL Link Evaluation Results

2040 Alt-13C AM
I-495 OL

	WWB			Exit 2 I-295			Exit 3 MD 210														Exit 4 MD 414												
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	13	13	23	50	56	57	59	59	59	58	59	59	59	59	59	58	59	59	59	59	58	59	60	54	53	53	53	53	53	53	53	54	53
Density	121	116	77	35	31	31	21	14	16	16	15	15	18	18	17	22	21	17	20	20	17	19	19	19	23	24	24	24	24	21	21	17	17
LOS	F	F	F	D	D	D	C	B	B	B	B	B	C	B	B	C	C	B	C	C	B	C	C	C	C	C	C	C	C	C	C	B	B
Volume	7766	7766	5260	5265	5266	5263	2411	2413	1922	1915	2617	2619	2147	4179	4957	4979	4966	4935	4696	4715	5040	4561	4555	4976	4874	5017	5018	5020	4992	4455	4444	4422	3653	3620
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	912	602	710	514
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337										Exit 11 MD 4												Exit 13 Ritchie Marlboro Rd						
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	54	53	53	55	54	52	56	55	55	53	52	54	55	56	56	52	54	56	54	52	58	57	56	57	57	57	57	58	58	55	55	57	57
Density	16	17	17	22	27	26	27	27	23	23	23	24	31	29	29	26	26	25	27	26	27	35	32	32	33	32	32	26	28	27	27	35	33	33
LOS	B	B	B	C	D	D	D	D	C	C	C	C	D	D	D	D	D	C	D	D	D	E	D	D	D	D	D	C	D	D	D	D	D	D
Volume	4139	3646	3776	5733	5675	5739	5739	5722	5057	5073	5090	6260	6341	6300	6330	5847	5856	6547	5844	5823	7366	7354	7378	7379	7384	7382	7333	7343	6371	6374	7568	7568	7566	7418
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1080	495	659	677	798	2000	773	1497	2000	2000	1589	712	783	514	1391	727	497	445	549	549	462	1023	2000	2000	2000	924	536	944	2000	552	1346	2000	1038	208
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	57	57	57	56	57	58	56	57	57	57	60	59	59	52	55	57	60	57	58	58	58	58	59	56	57	58	59	57	51	58	59	59	56
Density	26	27	25	31	27	27	30	24	31	30	30	20	25	25	35	32	32	24	29	23	24	24	24	21	27	31	24	29	27	38	33	33	33	34
LOS	D	D	C	D	D	D	D	C	D	D	D	C	C	C	E	D	D	C	D	C	C	C	C	C	D	D	C	D	D	E	D	D	D	D
Volume	7571	6307	7035	7056	7643	7638	6754	6831	5125	5132	5109	7252	7324	7315	7279	7213	7290	7286	6612	6606	5640	5646	5618	7561	7695	6994	6901	6740	7737	7695	7709	7727	7720	7720
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1288	1155	805	737	1300	1328	646	1500	2000	2000	993	1003	493	720	2000	1537	793	705	785	562	2000	273	501	576	1391	716	276	949	1041	440	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1								Exit 27 I-95							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	57	54	53	52	52	53	50	52	54	54	54	55	55	53	53	57	58	58	58	58	58	58	59	58	58	59	58	57	58	53	53	53	53
Density	33	27	29	29	27	32	33	30	27	26	23	22	19	23	23	29	23	28	28	23	22	19	17	16	17	16	16	14	17	17	20	20	20	22
LOS	D	D	D	D	D	D	D	D	D	C	C	C	C	C	C	D	C	D	D	C	C	C	B	B	B	B	B	B	B	B	C	C	C	C
Volume	7704	7716	6178	6188	7159	6735	7088	7576	5652	5585	6042	6086	6287	6261	6257	6158	6484	6474	6486	5240	5171	5420	5830	5778	5759	3847	3775	3960	3972	3954	6418	6447	6441	5765
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	903	583	562	541	439	493	685	1823	571	829	434	995	461	993	1102	1980	1297	1225	1251	249	950	1128	1517	679	1496	2000	359	1012	490	825	1506	839	1509	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt-13C AM
I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29									Exit 31 MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	48	52	53	53	53	53	52	52	51	53	53	50	40	47	52	52	51	48	44	41	37	30	21	17	15	10	16	27	25	31	32	30	23
Density	22	21	20	20	18	22	22	28	28	23	25	25	26	32	34	30	30	29	37	41	43	49	49	77	99	107	130	98	72	77	61	59	51	64
LOS	C	C	C	C	B	C	C	D	D	C	C	C	C	D	D	D	D	D	E	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	5734	6083	5373	5371	5634	5746	5828	5829	5848	5848	5330	5302	6375	6383	6382	6376	6156	7279	7132	7262	7176	7304	7305	6554	6542	6535	7844	7791	7767	7670	7533	7489	6052	5932
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	501	445	502	281	353	1135	1625	1875	1184	302	760	713	799	1025	506	268	819	787	716	2000	797	1091	449	621	594	321	955	536	2000	2000	1805	1336	311	1655
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	19	22	19	23	22	21	20	19	18	15	9	7	9	8	7	7	6	6	5	7	7	8	8	9	18	22	29	25	25	20	21	22	22	25
Density	67	71	74	76	79	80	85	87	72	93	116	126	128	138	150	118	158	149	160	150	149	148	141	123	88	88	65	75	76	81	82	82	83	67
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6312	6226	6960	6864	6826	6656	6665	6609	6552	5508	2956	3329	3285	3231	3168	3156	2891	2794	3335	3329	3339	3338	3339	3322	9479	9510	9457	9540	9388	9557	8477	7319	7310	8481
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	998	526	1235	2000	113	1041	402	1589	295	910	494	911	1176	324	2000	30	407	1083	2000	2000	2000	1655	551	937	2000	672	439	1037	1584	2000	604	1765
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	44	52	53	52	52	52	53	53	53	53	53	53	53	52
Density	48	33	35	30	36	32	31	31	31	31	25	31	26	33
LOS	F	D	E	D	E	D	D	D	D	D	C	D	C	D
Volume	8488	8540	7477	7824	7579	8480	6522	6486	6525	6520	6501	6514	6852	6865
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1629	978	521	921	1716	1561	272	1408	2000	1763	728	1048	1410	610
LinkID	495415	2541710	1067	495416	495417	495418	11230	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt-13C AM - I-495 IL Link Evaluation Results

2040 Alt-13C AM
I-495 IL

				Exit 44				Exit 43			Bridge		Exit 41								Exit 39													Exit 36
				VA 193				GW Memorial Pkwy			American Legion		Clara Barton Pkwy								MD 190							I-270 W Spur							MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	45	37	31	23	20	17	17	18	17	17	19	44	51	55	57	45	53	56	56	57	57	57	57	54	56	58	54	58	58	58	57	47	57
Density	38	45	44	66	73	80	82	95	94	96	84	38	34	26	25	38	40	38	30	33	27	27	25	30	32	30	25	25	24	24	24	24	22	22
LOS	E	F	E	F	F	F	F	F	F	F	F	E	D	D	C	E	E	E	D	D	D	D	C	D	D	D	C	C	C	C	C	C	C	C
Volume	6838	6645	6702	5972	5917	6938	6773	6640	6464	6565	7952	6761	6973	7127	7150	8513	8518	8514	8486	7576	7761	7683	8595	8429	8577	8502	8586	4149	4165	4182	4181	4183	4186	3751
Lanes	4	4	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	4	5	4	5	5	6	5	5	5	6	3	3	3	3	3	4	3
Length	2000	183	1499	2000	93	1502	1539	645	688	506	641	500	705	1499	761	1010	2000	1064	400	1958	1492	620	1122	398	1767	740	1501	2000	2000	2000	1661	1172	303	2000
LinkID	1100	1100	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541704	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

						Exit 34								Exit 33										Exit 31									
						MD 355								MD 185										MD 97									
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	57	53	51	59	55	39	49	55	49	50	51	41	35	31	30	23	25	21	25	27	15	17	57	59	60	58	59	58	59	60	60	61
Density	16	17	23	25	33	28	29	41	40	36	40	39	31	38	47	43	56	64	73	82	71	68	93	84	24	23	23	19	22	23	28	22	25	24
LOS	B	B	C	C	D	D	D	E	E	E	E	E	D	E	F	E	F	F	F	F	F	F	F	F	C	C	C	C	C	C	D	C	C	C
Volume	2871	3871	3881	3913	3372	6523	7931	7957	7912	7874	7811	7809	7798	7724	6585	6708	6667	7324	7311	6991	7222	7198	7177	7187	5510	5544	5564	6594	6518	6615	6616	6606	6012	5768
Lanes	3	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	26	442	659	1105	1518	1927	494	1003	1000	522	1604	252	526	658	913	228	793	1661	2000	170	2000	1743	2000	50	837	411	323	1134	454	1031	2000	1238	243	518
LinkID	1270	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	5021562	1125	1990014	495307
SegmentID	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1

						Exit 30						Exit 29								Exit 28								Exit 27							Exit 25							
						US 29						MD 193								MD 650								I-95							US 1							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	61	61	61	61	61	59	25	50	55	59	61	55	45	35	23	42	53	59	61	61	62	60	60	60	62	58	57	57	52	49	49	50	45
Density	24	25	24	21	23	18	24	53	33	30	28	27	24	34	44	62	38	30	26	25	20	20	18	23	22	23	22	29	28	30	39	39	38	34
LOS	C	C	C	C	C	C	C	F	D	D	D	D	C	D	E	F	E	D	C	C	C	C	C	C	C	C	C	D	D	D	E	E	E	D
Volume	5802	5964	5893	6289	5559	5595	5609	6569	6579	6579	6578	6558	6579	6238	6129	6969	6430	6434	7688	7642	4811	4837	5439	5449	5414	4171	6509	6505	6476	7688	7643	7710	7630	7694
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	270	498	522	1543	808	422	771	284	1222	2000	1068	1153	331	339	509	464	500	1048	1490	1493	1028	536	347	2000	140	1527	1466	2000	1612	673	845	625	481	1017
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

						Exit 24						Exit 23						Exit 22										Exit 20							Exit 19							
						Greenbelt Metro Station						MD 201						MD 295										MD 450							US 50							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	49	55	54	49	54	54	54	51	51	54	55	56	54	55	56	56	56	56	56	55	55	54	53	56	50	53	57	56	54	58	58	57	55	56
Density	37	27	27	29	27	23	29	27	34	25	26	26	24	28	27	22	27	27	27	28	28	28	23	24	26	31	23	25	21	21	21	21	26	33
LOS	E	D	D	D	D	C	D	D	D	C	C	C	C	D	D	C	D	D	D	D	D	D	C	C	D	D	C	C	C	C	C	C	D	D
Volume	7170	7290	7278	7293	5862	6253	6230	6902	6900	6787	5742	5716	6619	6093	6058	6123	6128	6113	6108	6100	6108	6088	5951	5370	6589	6563	6556	5594	5609	4941	4933	7143	7272	7273
Lanes	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	1540	1039	440	1150	761	810	740	929	454	507	559	554	497	516	779	706	2000	2000	2000	1629	1217	263	1109	984	561	1359	1365	195	2000	608	1453	754	2000
LinkID	103501	2530003	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt-13C AM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	57	57	56	56	55	56	58	58	58	55	57	58	56	56	58	57	59	59	59	58	57	56	53	48	39	53	58	54	57	59	59	59	60
Density	32	26	26	32	32	32	31	25	25	25	30	23	26	26	32	31	31	25	27	27	25	32	32	34	38	46	27	25	25	26	25	22	27	27
LOS	D	C	C	D	D	D	D	C	C	C	D	C	C	C	D	D	D	C	D	D	C	D	D	D	E	F	D	C	C	D	C	C	D	D
Volume	7223	7235	7264	5304	5324	5337	6939	7302	7309	7305	6533	6536	5974	7232	7247	7244	7158	7242	6280	6325	7248	7238	7233	7227	7230	7234	5845	5857	6780	5955	5980	6436	6433	6436
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1038	1492	2000	2000	2000	764	1366	456	482	565	512	527	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	60	60	63	63	63	63	62	61	61	63	63	55	18	14	10	10	10	11	14	13	13	12	12	11	11	10	12	12	10	15	14	16	12	8
Density	27	21	23	23	23	19	24	25	24	19	19	18	55	94	108	133	134	111	110	120	122	122	102	128	126	119	118	112	122	100	109	92	85	129
LOS	D	C	C	C	C	C	C	C	C	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	6409	6395	5752	5783	5763	5966	5942	5981	5951	5959	5960	3985	4966	5067	5472	5514	5512	6071	6067	6081	6153	6085	6107	5741	5732	6083	5508	5499	6063	6060	5910	2960	2949	2022
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	4	5	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	808	2000	725	736	1473	1134	787	706	691	802	1093	808	2000	2000	2000	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541555	2541557	2541557	2541557	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	6	8	9	12	13	15	18	44	57	58	58	54	46	56
Density	126	132	105	104	92	102	87	52	34	34	34	36	43	35
LOS	F	F	F	F	F	F	F	F	D	D	D	E	E	E
Volume	3106	3074	3711	3700	3681	3056	4661	4574	5831	5834	5835	5791	9975	9989
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Exit 16 Arena Dr

Exit 15 MD 214

Exit 13 Ritchie Marlboro Rd

Exit 11 MD 4

Exit 9 MD 337

Exit 7 MD 5

Exit 4 MD 414

Exit 3 MD 210

Exit 2 I-295

WWB

2040 Alt-13C AM - I-270 NB Link Evaluation Results

2040 Alt-13C AM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							Exit 8
			I-270 W Spur/I-495			Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							Shady Grove Rd
Direction of Travel		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed		58	59	61	61	62	62	63	62	63	63	63	63	63	63	63	63	63	60	62	61	61	60	61	59	59	58	58	60	59	59	58	58	59	59
Density		25	25	24	18	19	15	19	16	16	16	16	13	15	15	15	15	13	13	14	17	17	14	15	15	15	15	17	14	12	15	15	15	13	11
LOS		C	C	C	B	C	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
Volume		8586	4438	4436	4405	3497	3654	3618	3963	3944	3956	3931	6460	6448	6480	6442	6446	6416	5676	5418	6138	6136	6066	5544	6163	6144	6128	5861	4991	5122	5220	5203	5205	5195	3777
Lanes		6	3	3	4	3	4	3	4	4	4	4	8	7	7	7	7	8	7	6	6	6	7	6	7	7	7	6	6	7	6	6	6	7	6
Length		1501	2000	1411	897	783	884	452	815	1168	728	1872	432	1471	1957	783	980	766	698	801	2000	2000	517	742	1343	527	658	425	788	598	1189	1473	1473	990	2000
LinkID		1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541643	428	742	289	289	251	743	300	744	304	305	316	745	2541654	320	741	747	327
SegmentID		1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

				Exit 9						Exit 10	Exit 11												Exit 13				Exit 15							Exit 16	
				I-370						MD 117	MD 124					Watkins Mill Rd							Middlebrook Rd				MD 118							MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	50	61	61	60	60	60	61	62	62	62	62	62	62	62	62	62	63	62	62	62	62	61	62	62	62	61	61	62	62	62	63	62	62
Density	11	12	7	7	7	7	8	10	10	10	10	10	10	10	10	13	13	13	13	12	10	11	12	13	13	10	12	13	13	12	12	12	10	13
LOS	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	B	B	A	B
Volume	3765	4218	1628	1628	1624	1638	2995	3008	3002	2586	2588	2582	2580	3258	3221	3249	3927	3929	3927	3898	3913	3556	3599	3169	3131	3129	2941	2426	2423	2862	2235	2241	2465	2438
Lanes	6	7	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	119	441	1059	611	646	2000	531	843	1357	2000	2000	2000	1479	584	745	611	1112	2000	2000	725	763	636	672	865	676	821	1564	1084	527	1716	520	1157	771	687
LinkID	327	335	339	749	411	2541578	347	348	754	350	350	350	350	362	363	762	2430241	2430244	2430244	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

												Exit 18																	Exit 22							
												MD 121																	MD 109							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	63	63	63	63	63	62	62	62	63	58	62	63	63	63	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	62	62	62	62
Density	10	14	14	14	14	14	14	14	10	9	10	10	12	13	13	13	19	19	19	19	19	19	19	19	19	19	19	13	18	12	18	18	18	18	18
LOS	A	B	B	B	B	B	B	B	A	A	A	A	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C
Volume	2546	2562	2575	2574	2571	2561	2553	2544	2547	1744	2354	2362	2355	2375	2367	2365	2362	2361	2351	2338	2356	2338	2336	2345	2349	2332	2335	2186	2255	2250	2253	2250	2250	2249
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	2	3	4

							Exit 26																			Exit 31				
							MD 80																			MD 85				
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	62	62	62	62	62	62	59	62	59	60	62	63	63	63	63	63	63	63	63	63	63	63	63	63	63	62	57	63	61	63
Density	18	18	18	18	18	18	12	16	16	23	22	22	22	22	22	21	22	21	22	22	21	21	22	22	21	14	19	14	15	12	12
LOS	C	C	B	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B
Volume	2248	2239	2230	2230	2230	2221	2191	1994	2742	2735	2744	2739	2730	2721	2720	2704	2708	2680	2712	2710	2703	2698	2701	2696	2679	2685	2424	2392	1887	2937	2934
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1

2040 Alt-13C AM - I-270 SB Link Evaluation Results

2040 Alt-13C AM

I-270 SB

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	17	16	15	11	11	10	8	8	17	17	17	17	17	17	18	18	18	17	17	18	17	17	17	14	13	15	18	26	26	26	27	26	26	26
Density	89	89	98	127	128	92	142	135	93	90	92	92	92	92	89	89	88	90	89	88	90	90	92	75	106	83	100	70	68	69	68	67	68	69
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	4426	4387	4401	2858	2858	2836	2295	3089	3096	3127	3102	3115	3124	3118	3124	3138	3134	3098	3110	3100	3107	3107	3084	3067	2803	3613	3611	3611	3575	3624	3634	3557	3611	3615
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	376	654	1400	110	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Exit 31 — MD 85

Exit 26 — MD 80

Speed Color Scale (mph)

10 | 30 | 40 | 50 | 70

Exit 22 — MD 109

Exit 18 — MD 121

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	26	25	25	24	24	24	22	24	35	40	41	39	40	41	39	40	41	41	43	51	53	52	52	51	52	52	53	47	29	21	18	18	14	10
Density	69	71	71	73	49	73	63	85	59	52	50	53	52	50	53	52	50	50	48	27	26	20	23	24	31	25	33	38	61	84	99	100	94	131
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	D	C	C	C	D	C	D	E	F	F	F	F	F	F
Volume	3608	3569	3564	3558	3557	3519	4135	4059	4138	4117	4106	4139	4142	4108	4131	4133	4116	4129	4119	4126	4123	4120	3673	4866	4865	5301	5304	5299	5306	5376	5387	5376	5395	4108
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	2000	1801	1775	948	546	716	1664	92	2000	406	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

Exit 16 — MD 27

Exit 15 — MD 118

Exit 13 — Middlebrook Rd

Exit 11 — Watkins Mill Rd

Exit 10 — MD 124

Exit 9 — MD 117

Exit 8 — I-370

Shady Grove Rd

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	10	14	13	14	16	17	18	19	34	43	41	40	41	46	49	53	53	53	53	49	49	43	33	30	49	52	53	53	52	53	52	51	52	52
Density	127	112	106	97	108	83	100	80	59	48	49	50	49	44	41	32	28	28	33	36	44	50	64	69	35	32	28	28	33	26	28	28	29	26
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	D	D	D	D	E	E	F	F	F	D	D	D	D	D	C	D	D	D	C
Volume	4907	4863	5575	5566	5135	5516	5460	6072	6074	6102	6097	7978	8001	7973	7985	6758	5890	5895	7012	8635	8581	8617	8565	10267	10277	10168	10282	10304	6817	6854	10093	10080	8898	9365
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	4	4	4	4	5	4	4	4	5	6	6	7	7	4	5	7	7	6	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	719	1566	1324	2000	658	992	1581	593	1167	838	658	2000	1062	1569	1152	431	1058	1250	1271	1633	1783	599	731	480
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2531003	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000075	2541660	2000081	2000082	723
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

Exit 5 — MD 189

Exit 4 — Montrose Rd

Exit 1 — Westlake Terrace / Democracy Blvd

I-270 Spur

I-270 W Spur/I-495

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	53	53	50	46	42	38	17	15	19	15	25	20	17	17	19	17	19	26	26	20	18	15	13	17	17	17	17	18	17	25	18
Density	30	31	31	31	31	33	30	36	40	84	95	80	98	68	71	94	86	90	90	80	60	61	68	83	86	100	72	81	84	58	68	90	81	88
LOS	D	D	D	D	D	D	D	E	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	9395	9806	9834	9827	9854	9836	9648	9005	9094	10205	10130	9079	9994	9994	9813	9636	10381	10050	10813	10896	10945	10991	10887	10494	5244	5338	6007	5474	5570	6023	6024	6113	6152	9479
Lanes	6	6	6	6	6	6	7	6	6	7	7	6	7	6	7	6	7	6	7	7	7	7	8	7	4	4	5	4	4	6	5	4	3	6
Length	795	2000	1659	469	1017	934	444	935	998	608	1803	1636	696	2000	449	900	640	885	1396	2000	1704	716	393	324	2000	296	941	2000	448	517	938	988	1523	551
LinkID	724	2000093	2000093	2000098	2000099	725	2000115	2000120	727	2000124	2541718	159	194	2541716	2000134	2000135	728	239	2541712	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	5021576	495375
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1

2040 Alt 13C PM - I-495 OL Link Evaluation Results

2040 Alt 13C PM
I-495 OL

	WWB								Exit 2 I-295			Exit 3 MD 210										Exit 4 MD 414											
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	18	21	23	47	55	57	58	58	58	58	56	57	58	58	53	49	57	58	58	58	57	58	58	53	53	53	53	52	52	52	52	53	53	53
Density	102	90	78	38	32	31	31	21	24	24	26	25	30	29	29	39	34	27	30	30	25	27	27	26	32	33	33	33	33	28	28	22	21	21
LOS	F	F	F	E	D	D	D	C	C	C	C	C	D	D	D	E	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	C	C	C
Volume	9314	9325	5334	5344	5351	5351	3639	3634	2787	2778	4326	4329	3430	6651	7718	7732	7721	7677	6899	6915	7136	6376	6363	6907	6755	6965	6977	6980	6948	5880	5876	5846	4421	4396
Lanes	5	5	3	3	3	3	2	3	2	2	3	3	2	4	5	4	4	5	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4
Length	2000	2000	2000	2000	2000	195	1182	890	2000	1282	2000	1297	1256	824	1314	1054	1042	448	914	495	674	410	694	1037	428	2000	2000	2000	2000	1655	906	601	711	503
LinkID	1	1	218503	218503	218503	218503	218507	218508	218509	218509	318105	318105	217308	217315	217316	971	972	217318	216105	973	216107	216110	974	216112	216115	979	979	979	979	979	980	216114	215901	981
SegmentID	1	2	1	2	3	4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1	1

Speed Color Scale (mph)

10 30 40 50 70

	Exit 7 MD 5									Exit 9 MD 337									Exit 11 MD 4													Exit 13 Ritchie Marlboro Rd					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	53	53	53	52	52	53	53	53	53	34	18	43	51	52	53	53	50	52	53	53	51	52	52	52	53	53	53	53	53	53	50	52	53
Density	19	23	23	21	27	26	26	26	24	24	37	71	37	31	31	26	26	26	28	27	27	35	34	34	34	33	33	26	29	29	26	34	33	32
LOS	C	C	C	C	D	D	D	C	C	C	E	F	E	D	D	C	C	C	D	D	D	D	D	D	D	D	D	D	D	D	C	D	D	D
Volume	5081	4766	4777	5502	5470	5498	5502	5508	5118	5107	5111	6317	6329	6340	6334	5508	5515	6479	5725	5705	7053	7026	7045	7050	7049	7044	6993	7036	6071	6100	6876	6873	6887	6868
Lanes	5	4	4	5	4	4	4	4	4	4	4	5	4	4	4	4	4	5	4	4	5	4	4	4	4	4	4	5	4	4	5	4	4	4
Length	1083	480	634	675	794	2000	763	1486	2000	2000	1592	691	785	496	1388	717	498	448	540	549	461	1023	2000	2000	2000	922	531	937	2000	484	1349	2000	1038	201
LinkID	215904	215905	982	215907	215908	983	983	984	214702	214702	214702	213501	213502	985	986	212301	992	212303	212305	1003	212307	212308	1004	1004	1004	1004	1005	212309	211206	211206	211212	1006	1006	1020
SegmentID	1	1	1	1	1	1	2	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	2	1	1	2	1

	Exit 15 MD 214							Exit 16 Arena Dr		Exit 17 MD 202											Exit 19 US 50								Exit 20 MD 450							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	52	53	53	49	51	52	53	53	53	53	53	53	52	51	52	53	57	58	58	58	58	58	48	53	56	58	57	56	57	57	58	58
Density	26	25	24	30	26	27	31	24	31	31	31	20	25	25	31	32	31	24	25	19	22	22	22	20	30	29	21	24	23	29	29	28	28	28
LOS	C	C	C	D	C	D	D	C	D	D	D	C	C	C	D	D	D	C	C	C	C	C	C	C	D	D	C	C	C	D	D	D	D	D
Volume	6896	5343	6228	6224	6707	6713	6286	6302	4882	4885	4876	6491	6467	6507	6479	6479	6477	6433	5662	5626	5103	5102	5061	6985	7071	6034	5960	5666	6464	6471	6482	6487	6475	6458
Lanes	5	4	5	4	5	5	4	5	3	3	3	6	5	5	4	4	4	5	4	5	4	4	4	6	5	4	5	4	5	4	4	4	4	4
Length	1282	1142	804	696	1370	1318	634	1492	2000	2000	987	959	499	722	2000	1520	763	699	785	561	2000	232	498	571	1393	714	276	949	1024	430	2000	2000	2000	1849
LinkID	211214	210903	210905	210906	210909	1022	209703	209704	209710	209710	209710	208515	208516	1023	326	326	1024	208518	207302	207303	207305	207305	1025	207306	207307	206101	206102	206104	206108	206109	1027	1027	1027	1027
SegmentID	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4

	Exit 22 MD 295									Exit 23 MD 201											Exit 25 US 1							Exit 27 I-95							
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	58	58	53	53	52	50	52	52	51	53	53	53	53	53	51	51	55	54	56	57	58	57	57	58	57	58	58	58	58	58	53	53	53	53
Density	28	22	25	25	26	33	32	28	30	29	27	27	23	28	28	33	27	35	33	29	28	25	23	23	23	22	22	18	22	22	23	24	23	26
LOS	D	C	C	C	C	D	D	D	D	D	D	D	C	D	D	D	D	D	D	D	D	C	C	C	C	C	C	B	C	C	C	C	C	C
Volume	6424	6331	5302	5301	6652	6623	6583	7196	6134	6119	6980	7017	7267	7243	7260	6819	7468	7460	7469	6467	6399	7218	7924	7914	7890	5162	5110	5172	5207	5194	7441	7466	7456	6838
Lanes	4	5	4	4	5	4	4	5	4	4	5	5	6	5	5	4	5	4	4	4	4	5	6	6	6	4	4	5	4	4	6	6	6	5
Length	889	603	553	533	437	498	700	1797	577	830	434	995	461	987	1090	1980	1294	1224	1251	249	957	1109	1517	660	1474	2000	355	1017	490	825	1506	839	1489	806
LinkID	1029	206110	205903	1030	205905	205907	1031	205909	204704	1032	204706	204707	204709	204710	1033	2530009	203501	1034	1036	20020	202306	202308	202311	1035	1038	201103	201103	201104	201105	1039	201106	1040	1042	201107
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1

2040 Alt 13C PM

I-495 OL

	Exit 28 MD 650											Exit 29 MD 193				Exit 30 US 29									Exit 31 MD 97								
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	50	52	53	52	52	50	50	53	48	53	53	49	26	43	51	51	52	47	48	52	52	52	53	54	53	53	47	46	50	52	52	50	27
Density	26	24	25	25	22	28	29	36	34	30	30	30	29	56	40	34	34	29	40	39	35	36	28	29	29	29	24	33	41	38	37	36	32	59
LOS	C	C	C	C	C	D	D	E	D	D	D	D	D	F	E	D	D	D	E	E	E	E	D	D	D	D	C	D	E	E	E	E	D	F
Volume	6789	7339	6514	6540	6955	7224	7233	7218	7224	7219	6358	6350	7090	7105	6892	6931	6944	7624	7488	7488	7333	7446	7472	6238	6255	6223	7581	7568	7622	7619	7578	7575	6383	6300
Lanes	5	6	5	5	6	5	5	4	4	5	4	4	5	5	4	4	4	5	4	4	4	4	5	4	4	4	6	5	4	4	4	4	4	4
Length	502	440	502	282	353	1129	1612	1881	1178	290	768	700	796	1021	515	267	830	785	702	2000	797	1092	447	706	491	334	956	536	2000	2000	1803	1336	309	1642
LinkID	1043	7404	2000824	1046	7405	7409	1044	7407	1047	2000762	2000759	2000753	2000752	1049	1050	495302	495303	495304	495305	1051	1051	1053	7024	7026	7028	7029	7031	495316	1055	1055	1055	1056	1970012	495339
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	1	1	1

	Exit 33 MD 185									Exit 34 MD 355							Exit 36 MD 187								I-270 W Spur							Exit 39 MD 190					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	15	17	17	20	27	40	49	50	52	47	53	49	53	53	53	53	53	53	53	53	53	53	52	51	54	54	54	54	55	55	55	55	55	53
Density	95	103	85	92	70	47	38	37	29	34	18	17	21	21	21	16	19	18	16	22	22	22	22	22	20	24	25	25	24	20	22	25	25	26
LOS	F	F	F	F	F	F	E	E	D	D	C	B	C	C	C	B	C	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Volume	7085	7053	7446	7467	7475	7488	7461	7493	7462	6383	2909	3384	3400	3400	3398	3319	3085	2850	3419	3442	3451	3454	3449	3441	6621	6614	6653	6657	6541	6666	5919	5423	5437	6752
Lanes	5	4	5	4	4	4	4	4	5	4	3	4	3	3	3	4	3	3	4	3	3	3	3	3	6	5	5	5	5	6	5	4	4	5
Length	752	733	981	503	1240	2000	72	1034	386	1589	284	907	487	893	1176	325	2000	31	402	1085	2000	2000	2000	1642	551	937	2000	655	442	1021	1587	2000	575	1737
LinkID	1953310	1953311	1953312	1953313	1058	1247	1247	1059	1248	1249	1251	1273	1276	1060	1061	1272	1275	1275	1274	495373	1063	1063	1063	1063	495375	495392	1064	1064	1066	495408	495407	495406	495406	495401
SegmentID	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	4	1	1	1	2	1	1	1	1	2	1

	Exit 41 Clara Barton Pkwy	Bridge American Legion	Exit 43 GW Memorial Pkwy	Exit 44 VA 193
	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	54	54	51	49	52	53	54	54	54	54	53	53	53
Density	32	25	28	23	31	29	26	26	26	26	21	27	25	32
LOS	D	C	D	C	D	D	D	C	C	D	C	D	C	D
Volume	6757	6776	5961	5956	6001	7510	5577	5576	5584	5600	5810	5793	6681	6712
Lanes	4	5	4	5	4	5	4	4	4	4	5	4	5	4
Length	1466	999	843	931	1715	1529	320	1385	2000	1725	732	1051	1414	601
LinkID	495415	2541579	1067	495416	495417	495418	11138	1069	2530014	2530014	1083	1084	1101	1114
SegmentID	1	1	1	1	1	1	1	1	1	2	1	1	1	1

2040 Alt 13C PM - I-495 IL Link Evaluation Results

2040 Alt 13C PM
I-495 IL

	Exit 44 VA 193							Exit 43 GW Memorial Pkwy			Bridge American Legion		Exit 41 Clara Barton Pkwy							Exit 39 MD 190								I-270 W Spur						Exit 36 MD 187
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	58	58	58	58	57	57	56	55	55	55	56	56	56	56	55	54	53	48	23	13	13	18	21	24	42	43	53	55	54	54	54	50	54
Density	21	17	17	20	20	20	20	25	25	26	26	26	26	22	22	26	32	26	29	69	114	111	77	77	71	33	33	21	21	21	21	21	17	19
LOS	C	B	B	C	C	C	C	C	C	C	D	D	D	C	C	C	D	D	D	F	F	F	F	F	F	D	D	C	C	C	C	C	B	C
Volume	4976	4975	4975	4691	4690	5637	5625	5624	5562	5656	7175	5819	5849	6018	6008	6990	6989	6957	6920	6281	7158	7145	8433	8261	8387	8433	8432	3359	3371	3372	3377	3374	3337	3106
Lanes	4	5	5	4	4	5	5	4	4	4	5	4	4	5	5	5	4	5	5	4	5	5	6	5	5	6	6	3	3	3	3	3	4	3
Length	2000	1499	1499	2000	93	1457	1556	642	679	466	602	477	685	1486	775	989	2000	1045	395	1944	1491	616	1108	391	1767	723	1506	2000	2000	2000	1581	1174	303	1996
LinkID	1100	1037	1037	495411	495411	1089	1054	1080	1079	1113	1073	495412	1062	495413	1057	495414	2541577	1115	495402	495403	495404	1116	495405	495409	1117	495391	1118	495371	495371	495371	495371	1119	1263	1270
SegmentID	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 34 MD 355															Exit 33 MD 185										Exit 31 MD 97								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	54	54	54	50	23	10	10	12	14	14	17	18	16	15	14	12	15	15	23	23	26	28	23	22	19	16	17	13	15	23	30	28	23	23
Density	14	14	19	21	62	133	122	104	115	115	98	93	80	85	105	101	104	102	83	83	73	66	66	70	89	105	101	99	102	68	66	57	79	76
LOS	B	B	C	C	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	3139	3139	3142	3182	2886	5110	6418	6467	6440	6441	6516	6557	6536	6490	5824	6114	6144	7637	7589	7568	7594	7539	7508	7501	6650	6664	6679	7962	7769	7908	7909	7886	7241	6945
Lanes	4	4	3	3	2	4	5	5	4	4	4	4	5	5	4	5	4	5	4	4	4	4	5	5	4	4	4	6	5	5	4	5	4	4
Length	438	438	655	1105	1490	1944	514	1013	998	521	1600	252	526	658	913	228	788	1632	2000	163	2000	1753	2000	47	834	411	323	1125	454	1034	2000	1238	243	518
LinkID	1271	1271	1257	1121	1258	1250	1260	1261	1120	1262	495331	1122	495332	2000004	495333	495334	495335	495336	495317	495317	2000003	2000003	7015	7015	7017	7019	7021	7023	1953113	1124	2541504	1125	1990014	495307
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1

	Exit 30 US 29					Exit 29 MD 193											Exit 28 MD 650							Exit 27 I-95					Exit 25 US 1					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	23	21	22	17	17	16	18	16	27	31	41	51	52	53	53	49	46	47	53	53	52	52	51	52	53	52	53	54	53	50	46	45	47	50
Density	78	85	83	91	99	85	98	101	73	64	49	39	30	35	35	33	42	41	32	32	29	29	25	31	30	30	23	29	29	30	41	43	40	30
LOS	F	F	F	F	F	F	F	F	F	F	F	E	D	D	D	D	E	E	D	D	D	D	C	D	D	D	C	D	D	D	E	E	E	D
Volume	7033	7236	7242	7701	6882	6888	6909	7952	7939	7942	7941	7947	7947	7373	7393	8092	7636	7642	8546	8521	5967	5992	6402	6423	6375	4783	6185	6178	6194	7602	7554	7617	7532	7601
Lanes	4	4	4	5	4	5	4	5	4	4	4	4	5	4	4	5	4	4	5	5	4	4	5	4	4	3	5	4	4	5	4	4	4	5
Length	268	491	512	1554	785	422	765	283	1222	2000	1068	1127	346	339	505	457	500	1047	1493	1492	1028	536	347	2000	140	1527	1464	2000	1607	668	846	610	481	1016
LinkID	495308	495309	1127	495295	2100087	2000197	2000764	2000770	2000771	1129	1129	1130	7410	2201100	1131	7412	101100	1132	101111	1128	101104	1138	101106	101107	101107	1137	101110	102301	102301	102312	102313	1135	1136	102314
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1

	Exit 24 Greenbelt Metro Station					Exit 23 MD 201							Exit 22 MD 295													Exit 20 MD 450					Exit 19 US 50					
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	51	52	52	52	53	52	51	44	45	52	53	52	51	50	51	53	51	52	52	51	51	51	51	52	45	48	46	52	52	53	53	51	48	47
Density	35	31	28	28	28	26	33	34	42	29	31	31	30	36	35	28	35	35	35	36	36	36	28	32	35	40	34	30	24	28	28	25	32	40
LOS	E	D	D	D	D	D	D	D	E	D	D	D	D	E	E	D	E	E	E	E	E	E	D	D	D	E	D	D	C	D	D	C	D	E
Volume	7209	6480	7349	7312	5994	6741	6702	7561	7541	7503	6513	6531	7640	7233	7202	7279	7260	7298	7316	7320	7324	7302	7141	6544	7806	7767	7805	6241	6249	5862	5869	7597	7591	7590
Lanes	4	4	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	4	4	4	5	4	5	4	5	4	5	4	4	6	5	4
Length	2000	23	1042	442	1150	761	810	734	928	447	512	554	554	497	516	754	706	2000	2000	2000	1629	1217	263	1180	915	561	1358	1369	213	2000	603	1423	754	2000
LinkID	103501	103501	1139	103502	104704	104706	104707	104709	104710	104711	105902	1140	105904	105906	1141	105908	105909	1142	1142	1142	1142	1143	105910	106105	106108	106109	106110	107301	107302	107307	107307	107309	1144	107311
SegmentID	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

2040 Alt 13C PM

I-495 IL

Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	48	51	52	52	52	52	49	50	51	50	47	51	52	49	50	51	51	53	53	53	53	53	53	52	51	51	53	53	50	52	53	52	52	53
Density	39	29	29	31	31	31	33	28	28	28	34	25	28	29	35	34	34	26	25	25	24	30	30	31	31	31	27	26	25	26	25	23	29	29
LOS	E	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	D	C	C	C	D	D	D	D	D	D	D	C	C	C	C	D	D
Volume	7557	7575	7610	4856	4869	4869	6433	7011	7011	7006	6330	6337	5705	6956	6942	6938	6865	6946	5242	5238	6331	6319	6327	6325	6328	6330	5578	5564	6365	5361	5317	6125	6118	6131
Lanes	4	5	5	3	3	3	4	5	5	5	4	5	4	5	4	4	4	5	4	4	5	4	4	4	4	4	4	4	5	4	4	5	4	4
Length	190	855	1495	2000	2000	1908	1069	1470	249	1490	1056	692	986	1397	2000	796	480	997	2000	1053	1469	2000	2000	2000	761	1366	456	479	560	505	526	1147	344	1293
LinkID	107311	107312	1145	108500	108500	108500	109704	109707	1146	1148	110904	110905	110907	110913	1147	1147	1149	110915	111105	111105	111111	111112	111112	111112	111112	1150	112301	1151	112303	112305	1152	112307	112308	1153
SegmentID	2	1	1	1	2	3	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	3	4	1	1	1	1	1	1	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	53	53	61	63	63	62	62	61	61	63	63	63	61	63	63	63	63	63	63	63	63	62	62	63	63	62	63	63	62	61	58	60	63	63
Density	29	23	23	22	22	20	25	25	25	20	19	16	16	20	17	21	19	25	24	24	25	24	20	23	23	20	21	21	18	23	24	31	20	20
LOS	D	C	C	C	C	C	C	C	C	C	C	B	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	C	C
Volume	6127	6114	5589	5603	5576	6157	6188	6174	6177	6171	6158	4082	5020	5038	5382	5415	6101	6176	6164	6150	6144	6110	6108	5737	5692	6100	5201	5187	5642	5661	5554	3779	3802	2535
Lanes	4	5	4	4	4	5	4	4	4	5	5	4	5	4	5	4	5	4	4	4	4	4	5	4	4	5	4	4	5	4	4	2	3	2
Length	896	625	2000	2000	770	663	810	2000	681	757	1486	1142	789	703	680	1827	799	2000	2000	2000	708	860	617	1155	507	909	508	589	349	2000	55	1054	1707	1386
LinkID	1154	112309	113503	113503	113503	114701	114702	1155	1155	114703	1157	115905	115910	115911	115913	115914	1158	2541545	2541545	2541545	2541545	1159	115915	116102	1161	116104	116106	1162	116108	116109	116109	116110	116111	117305
SegmentID	1	1	1	2	3	1	1	1	2	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	2	1	1	1

	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	59	60	59	57	57	47	21	43	49	53	53	53	56	56
Density	14	18	15	21	21	34	76	50	43	40	40	40	30	30
LOS	B	B	B	C	C	D	F	F	E	E	E	E	D	D
Volume	3219	3204	3606	3596	3602	3183	4703	4329	6339	6341	6336	6299	8446	8445
Lanes	4	3	4	3	3	2	3	2	3	3	3	3	5	5
Length	907	581	640	2000	598	1132	851	1030	2000	2000	2000	1329	2000	1262
LinkID	117307	117308	117310	117311	117311	118503	118504	118506	118508	118508	118508	118508	44	44
SegmentID	1	1	1	1	2	1	1	1	1	2	3	4	1	2

Exit 16 Arena Dr

Exit 15 MD 214

Exit 13 Ritchie Marlboro Rd

Exit 11 MD 4

Exit 9 MD 337

Exit 7 MD 5

Exit 4 MD 414

Exit 3 MD 210

Exit 2 I-295

WWB

2040 Alt 13C PM - I-270 NB Link Evaluation Results

2040 Alt 13C PM
I-270 NB

						Exit 1													Exit 4				Exit 5					Exit 6							
		I-270 W Spur/I-495				Democracy Blvd		Westlake Terrace				I-270 Spur							Montrose Rd				MD 189					MD 28							
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	43	45	50	52	53	51	49	52	53	53	49	53	54	54	53	53	50	53	53	52	52	52	53	46	50	50	52	52	51	46	37	34	30	25
Density	33	38	34	24	28	24	33	29	29	29	31	27	31	31	32	32	30	30	34	38	37	37	35	37	35	35	38	33	31	40	49	52	50	52
LOS	D	E	D	C	D	C	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	D	E	D	D	E	D	D	E	F	F	F	F
Volume	8432	5065	5045	5044	4537	4952	4940	6095	6073	6092	6082	11715	11756	11739	11745	11756	11744	10974	10747	11687	11689	11685	11057	12068	12087	12077	11730	10333	11165	11033	10767	10574	10458	10339
Lanes	6	3	3	4	3	4	3	4	4	4	4	8	7	7	7	7	8	7	6	6	6	6	6	7	7	7	6	6	7	6	6	6	7	8
Length	1506	2000	1342	888	772	883	449	791	1166	701	1845	431	1524	1205	1533	998	768	702	531	2000	1341	798	687	1389	531	634	406	872	598	2000	1458	1473	998	515
LinkID	1118	495372	495372	232	234	235	237	134	241	242	243	274	275	738	739	280	2541645	428	742	289	289	251	743	300	744	304	305	316	745	2541657	320	741	747	2541659
SegmentID	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Speed Color Scale (mph): 10 | 30 | 40 | 50 | 70

	Exit 8			Exit 9						Exit 10		Exit 11											Exit 13				Exit 15						Exit 16	
	Shady Grove Rd			I-370						MD 117		MD 124				Watkins Mill Rd							Middlebrook Rd				MD 118						MD 27	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	24	31	51	30	21	19	15	20	22	25	20	18	17	15	14	16	14	13	20	18	17	15	15	14	14	17	18	19	18	16	14	14	13	14
Density	58	45	23	38	53	69	76	67	63	63	77	84	90	93	97	107	112	114	74	81	72	87	89	109	107	72	80	90	94	90	104	109	90	111
LOS	F	F	C	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Volume	8443	9877	4636	4584	4404	5326	6828	6811	6782	6299	6213	6082	6003	6861	6792	6759	7751	7653	7533	7158	7127	6693	6769	6056	6016	5986	5699	5135	5079	5649	4434	4434	4703	4609
Lanes	6	7	4	4	4	4	6	5	5	4	4	4	4	5	5	4	5	5	5	5	6	5	5	4	4	5	4	3	3	4	3	3	4	3
Length	100	481	1027	631	558	2000	531	843	1357	2000	2000	2000	1479	584	913	444	1112	258	2000	725	763	636	665	872	672	820	1561	1090	527	1717	520	1157	771	687
LinkID	323	336	339	749	411	10040816	347	348	754	350	350	350	350	362	363	762	2430241	2430244	10040808	763	364	365	367	369	764	370	372	374	765	376	378	766	380	381
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	Exit 18																			Exit 22														
	MD 121																			MD 109														
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	14	14	14	13	13	15	14	14	12	9	10	10	11	11	12	23	43	51	52	52	52	52	52	52	52	52	54	53	52	51	52	52	52	52
Density	87	113	117	118	118	106	111	111	101	137	105	102	128	129	115	61	50	42	41	40	41	40	40	41	41	41	26	38	27	41	40	40	40	40
LOS	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E	E	E	D	E	D	E	E	E	E	E
Volume	4770	4769	4766	4745	4703	4711	4733	4740	4773	3829	4248	4253	4236	4271	4256	4256	4252	4262	4246	4219	4256	4227	4231	4243	4254	4241	4249	4014	4191	4176	4189	4193	4198	4198
Lanes	4	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2
Length	457	1044	2000	2000	2000	2000	718	756	736	920	211	877	400	1727	2000	1731	2000	2000	905	482	2000	383	1176	2000	1202	1164	340	1049	291	1204	2000	2000	2000	2000
LinkID	383	384	767	767	767	767	767	768	385	387	389	1001	390	769	391	391	272	272	272	392	394	394	395	396	396	750	397	399	401	402	771	771	771	771
SegmentID	1	1	1	2	3	4	5	1	1	1	1	1	1	1	1	2	1	2	3	1	1	2	1	1	2	1	1	1	1	1	1	2	3	4

							Exit 26																			Exit 31								
							MD 80																			MD 85								
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	52	52	52	52	52	52	50	52	39	42	51	52	52	51	51	51	51	50	50	50	50	51	50	48	49	52	53	52	53	53	53			
Density	40	40	40	40	40	41	27	35	38	52	43	42	42	43	43	43	43	43	43	44	43	43	44	45	44	28	38	25	34	26	25			
LOS	E	E	E	E	E	E	D	E	E	F	E	E	E	E	E	E	E	E	E	E	E	E	E	F	E	D	E	C	D	C	C			
Volume	4196	4203	4197	4205	4200	4183	4131	3624	4390	4367	4388	4384	4385	4374	4366	4342	4346	4308	4371	4367	4367	4363	4371	4375	4353	4370	4012	3958	3570	5395	5394			
Lanes	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	4	4			
Length	1502	2000	1497	2000	698	1279	214	773	615	868	2000	2000	2000	2000	1813	539	1225	391	2000	2000	2000	2000	2000	178	1025	473	1416	241	945	1115	392			
LinkID	771	412	412	446	446	783	403	405	407	408	784	784	784	784	784	1010	1017	1007	869	869	869	869	869	869	785	415	417	421	423	425	577			
SegmentID	5	1	2	1	2	1	1	1	1	1	1	2	3	4	5	1	1	1	1	2	3	4	5	6	1	1	1	1	1	1	1			

2040 Alt 13C PM - I-270 SB Link Evaluation Results

2040 Alt 13C PM
I-270 SB

					Exit 31																				Exit 26										
					MD 85																				MD 80										
Direction of Travel	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	57	58	55	57	58	56	59	55	59	62	63	63	63	63	63	63	62	61	60	59	58	57	57	57	60	59	56	57	58	59	58	59	58	57
Density	21	21	22	23	23	16	16	16	22	21	20	20	20	20	20	20	21	21	21	22	22	22	22	15	17	13	21	20	20	20	20	19	20	20
LOS	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C
Volume	3602	3585	3597	2642	2641	2624	1915	2576	2561	2572	2570	2569	2567	2560	2532	2557	2561	2554	2554	2546	2547	2541	2534	2514	2024	2300	2308	2314	2303	2317	2313	2271	2320	2348
Lanes	3	3	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
Length	931	404	446	474	1052	294	849	378	1140	2000	2000	2000	2000	2000	262	2000	2000	2000	2000	2000	2000	548	1088	377	654	1399	88	1849	565	2000	2000	57	2000	2000
LinkID	683	2000012	157	2000014	699	2000016	2000017	2000020	2000021	703	703	703	703	703	703	448	448	448	448	448	448	448	704	201	2000022	2000025	2000026	705	447	455	455	455	453	453
SegmentID	1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	1	2	3	4	5	6	7	1	1	1	1	1	1	1	1	2	3	1	2

Speed Color Scale (mph)

10 30 40 50 70

					Exit 22																				Exit 18										
					MD 109																				MD 121										
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	56	56	56	57	57	56	51	56	55	54	56	56	57	56	56	56	55	55	59	62	62	62	61	63	62	63	63	63	63	63	63	63	64
Density	21	21	21	20	13	19	14	24	21	22	22	21	21	21	21	21	21	21	21	13	12	9	11	10	13	11	15	15	15	14	14	14	11	12
LOS	C	C	C	C	B	C	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A	A	B	B	B	B	B	B	B	B	A	B
Volume	2340	2326	2311	2284	2271	2182	2398	2400	2398	2379	2373	2397	2393	2371	2382	2368	2341	2342	2329	2329	2322	2312	2002	2417	2414	2813	2808	2799	2775	2741	2728	2712	2722	2357
Lanes	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	4	3	4	3	3	3	3	3	3	4	3
Length	2000	1801	1775	948	546	716	1665	130	2000	322	487	2000	475	658	2000	2000	856	2000	1724	624	766	708	839	828	553	1076	2000	2000	2000	2000	214	890	618	1871
LinkID	453	453	410	706	2000027	2000029	2000031	2000032	707	707	2000033	2000034	2000034	2000036	2000037	2000037	2000037	260	260	2000038	708	2000039	2000041	1002	2000044	709	2020578	2020578	2020578	2020578	2020578	710	2000045	2000047
SegmentID	3	4	1	1	1	1	1	1	1	2	1	1	2	1	1	2	3	1	2	1	1	1	1	1	1	1	1	2	3	4	5	1	1	1

					Exit 16					Exit 15				Exit 13						Exit 11				Exit 10				Exit 9						Exit 8		
					MD 27					MD 118				Middlebrook Rd						Watkins Mill Rd				MD 124				MD 117						I-370				Shady Grove Rd			
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	61	63	63	63	63	62	63	61	61	63	63	63	62	61	60	63	64	64	63	59	62	63	63	63	60	62	62	63	63	63	57	56	57	55	55
Density	12	16	13	14	16	14	18	17	22	22	22	20	21	21	21	13	13	13	16	18	21	21	21	23	19	19	16	16	18	16	17	17	17	19
LOS	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	B	B	B	B	B	C	C	C	C	C	C	B	B	B	B	B	B	B	C
Volume	3000	2990	3378	3391	3018	3403	3372	4076	4082	4091	4091	5107	5141	5130	5137	4211	3227	3202	3981	5293	5258	5302	5296	7012	7032	7059	7040	7060	4455	6520	6524	5774	6487	7224
Lanes	4	3	4	4	3	4	3	4	3	3	3	4	4	4	4	5	4	4	4	5	4	4	4	5	6	6	7	7	4	7	7	6	7	7
Length	684	1035	1007	1058	1713	543	751	500	1025	2000	723	1566	1324	2000	655	527	1503	595	1167	838	658	2000	1062	1569	1152	411	1058	1257	1243	795	1607	706	478	708
LinkID	2000049	2000050	2000052	711	2000054	2000056	2000057	2000059	2000060	712	712	2000062	713	1026	1026	2541402	2000063	718	2000064	2000067	2000068	720	720	2000070	2000097	721	2000071	2000072	2000074	2000078	2000080	2000083	2000086	2000089
SegmentID	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1

						Exit 6						Exit 5					Exit 4							Exit 1										
						MD 28						MD 189					Montrose Rd							I-270 Spur					Westlake Terrace	Democracy Blvd					I-270 W Spur/I-495	
	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Speed	56	56	56	56	55	56	56	54	55	55	53	51	55	54	36	32	26	22	18	10	9	8	7	7	57	59	58	59	59	57	57	57	57	54
Density	22	22	22	22	19	20	21	22	21	21	22	24	22	21	30	38	41	50	58	90	98	107	104	120	13	12	11	10	10	9	11	14	14	20
LOS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	E	E	F	F	F	F	F	F	F	B	B	A	A	A	A	A	B	B	C
Volume	7197	7231	7194	7221	7211	6579	6923	8184	8237	8218	8199	7283	7288	7857	7584	7167	7574	6658	7164	6562	6148	5819	5808	5589	2878	2894	3065	2458	2423	3128	3124	3133	3133	6621
Lanes	6	6	6	6	7	6	6	7	7	7	7	6	6	7	7	6	7	6	7	7	7	7	8	7	4	4	5	4	4	6	5	4	4	6
Length	1085	607	1509	2000	291	896	986	574	1050	610	836	816	1572	691	452	808	650	937	415	2000	1709	719	387	328	2000	300	955	2000	447	498	932	990	990	551
LinkID	2000091	2000094	2000095	2000109	449	2000110	2000118	2000121	2000122	2000125	2000126	160	740	130	445	2000137	2000139	2000141	2000143	129	129	730	443	442	133	133	137	138	138	141	2020142	2115374	2115374	495375
SegmentID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1

Appendix I:

Crash Analysis Report

EXECUTIVE SUMMARY

This report summarizes the historical crash data along I-270 and I-495 to help identify potential safety impacts of the I-270 / I-495 Managed Lane Study. Crash data was obtained from MDOT SHA's Office of Traffic Safety and Traffic Development & Support Division. The first submission of data obtained from MDOT SHA covered a five-year period from 2012-2016 and consisted of multiple segments which include some overlaps with adjacent segments.

A review of the crash data revealed that during the initial study period there were a total of 2,918 crashes along I-270, including 6 where fatal crashes, and 8,971 crashes along I-495, including 47 were fatal crashes.

The crash data for I-270 was obtained for Montgomery and Frederick Counties, covering a distance of approximately 35 miles. Twenty segments of I-270 were analyzed and individual summaries are included in Section A of this report. The crash rates per 100 million vehicle miles (MVM) for fifteen of the twenty I-270 segments analyzed are above the latest available 2017 statewide average crash rate per 100 MVM for similar facilities.

Crash data along I-495 was obtained for Montgomery and Prince Georges County, extending for approximately 42 miles. Twenty-eight segments of I-495 were analyzed and those individual summaries are included in Section B of this report. The crash rates per 100 million vehicle miles (MVM) for twenty-seven of the twenty-eight I-495 segments analyzed are above the latest available 2017 statewide average crash rate per 100 MVM for similar facilities.

Subsequent to completing the analysis of the first data set provided by MDOT SHA for 2012-2016, additional data for 2017 crashes became available and has been included in this report. Section C includes supplemental 2017 analysis for I-270 crashes, while Section D includes supplemental 2017 analysis for I-495 segments.

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STUDYWIDE SUMMARY

Crash data was obtained from MDOT SHA's Office of Traffic Safety and Traffic Development & Support Division. The data covers a period from 2012-2016 and made up of multiple segments which include some overlaps with adjacent segments. **Table 1** and **Table 2** show the segments that were evaluated for both corridors. **Figure 1** also shows a map of the study area.

Table 1- I-495/I-95 Crash Segment

Interstate	Section	Mile Marker
I-495	American Legion Bridge-MD190	0-2.37
I-495	MD 495X - MD 190	2.21-2.37
I-495	MD 190 - IS 270 Y	2.37-3.95
I-495	I-270 Y SPUR - MD 187	3.95-5.61
I-495	MD187 - MD 355	5.62-6.71
I-495	MD 355 - MD 185	6.71-8.24
I-495	MD 185 - MD 97	8.24-10.44
I-495	MD 97 - US 29	10.44-11.88
I-495	US 29 - MD 193	11.88-12.52
I-495	MD 193 - MD 650	12.52-14.10
I-495	MD 650 - IS 95	14.11-14.38 & 0.0-1.74
I-95	I-295 - MD 210	1.75-2.75
I-95	MD 210 - MD 414	2.75-4.33
I-95	MD 414 - MD 5	4.33-7.3
I-95	MD 5 - Forestville Rd	7.3-9.69
I-95	Forestville Rd - MD 4	9.69-10.78
I-95	MD 4 - Ritchie Marlboro Rd	10.78-13.14
I-95	Marlboro Rd - MD 214	13.14-14.78
I-95	MD 214 - Arena Dr	14.78-15.83
I-95	Arena Dr - MD 202	15.83-16.56
I-95	MD202 - IS 595	16.56-18.54
I-95	IS 595 - MD 450	18.54-19.59
I-95	MD 450 - MD 295	19.59-22.12
I-95	MD 295 - MD 201	22.12-23.04
I-95	MD 201 - 0.4 Mi S of US 1	23.04-24.79
I-95	0.4 Mi S of US 1 - US 1	24.69-25.19
I-95	US 1 - IS 495	25.19-26.11
I-95	IS 495 - IS 95	26.11-26.78

Table 2- I-495 Crash Segment

Interstate	Section	Mile Marker
I-270	IS 495 - MD 187	0-1.54
I-270	MD 187 - IS 270 Y	1.54-2.68
I-270	IS 270 Y - Montrose Rd	2.39-4.14
I-270	Montrose Rd - MD 189	4.14-5.5
I-270	MD 189 - MD 28	5.5-6.46
I-270	MD 28 - Shady Grove Rd	6.46-8.39
I-270	Shady Grove Rd - IS 370	8.39-9.32
I-270	IS 370 - MD 117	9.32-10.85
I-270	MD 117 - MD 124	10.85-11.47
I-270	MD 124 - Middlebrook Rd	11.47-13.97
I-270	Middlebrook Rd - MD 118	13.98-14.74
I-270	MD118 - Father Hurley Blvd	14.74-15.78
I-270	Father Hurley Blvd - MD 121	15.78-18.43
I-270	MD121 – MD 109	18.46-22.29
I-270	MD109 - Fred Co/L	22.29-22.51
I-270	Frederick Co/L - MD 80	0.00-3.51
I-270	MD 80 - MD 85	3.52-8.65
I-270	MD 85 - IS 70	8.65-10.09
I-270 Y	IS 495 - Democracy Blvd	0-0.99
I-270 Y	Democracy Blvd - IS 270	.99-2.09

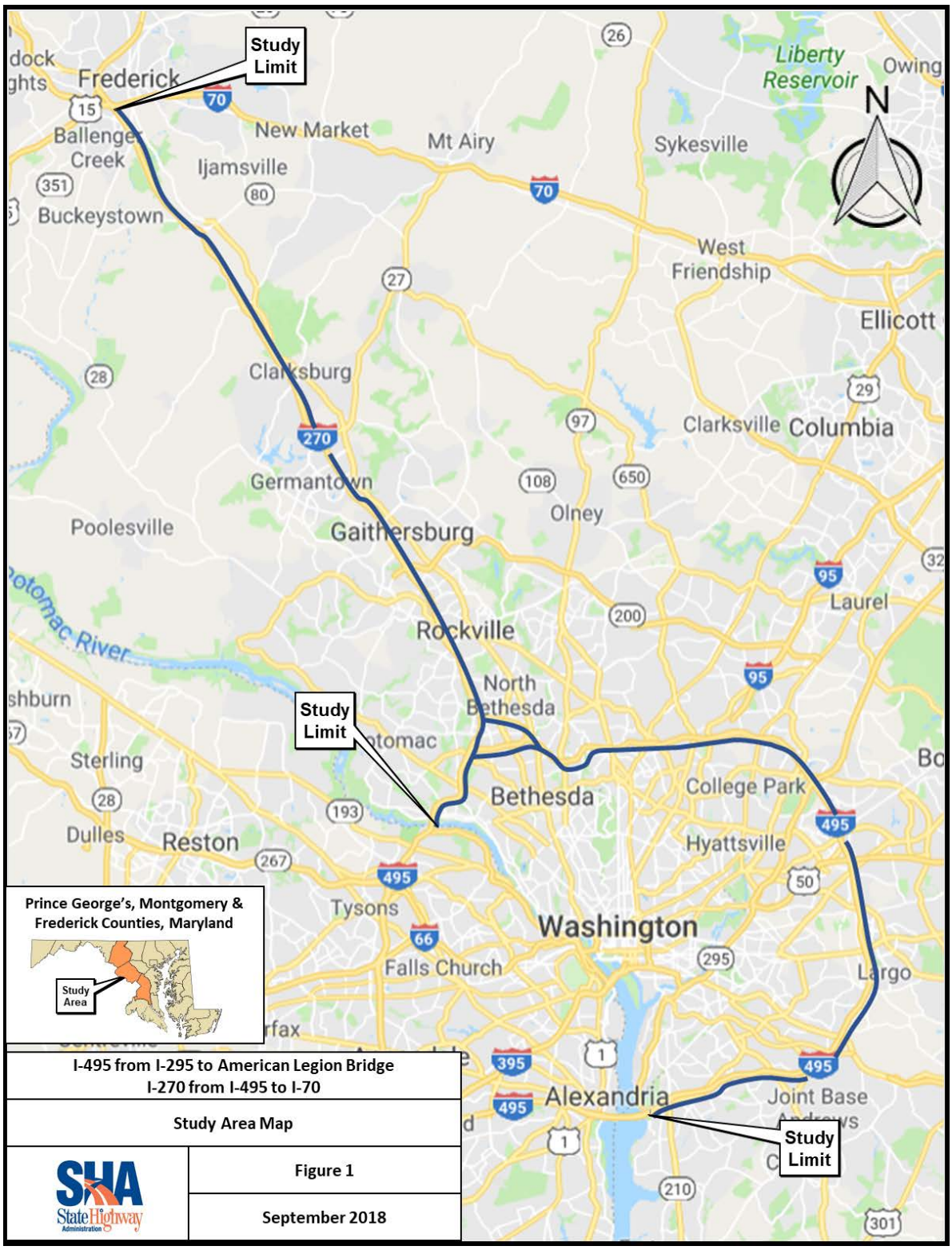

Figure 1: Study Area Map

A review of the crash data revealed that during the study period there was a total of 8,971 crashes along I-495 of which 47 were fatal crashes, and 2,918 crashes along I-270 of which 6 where fatal crashes.

Additional analysis of the crash data along I-495 and I-270 corridors are summarized in **Tables 3** and **Table 4** showing the total number of crashes within the study area without any of duplicates as was shown in the segment reports. The detailed crash analysis for each segment of the two corridors for the five-year period of 2012 through 2016 is presented in **Section A – I-270 Segment Analysis**, and **Section B – I-495 Segment Analysis**.

Supplemental crash data covering the year 2017 was obtained by the project team following completion of the initial crash analysis. The data for the year 2017 is summarized in **Section C** and **Section D** of this report.

Table 3: I-495 Corridor Total (2012 through 2016)

Time of Day	# of Crashes	Surface Condition	# of Crashes
6:00 AM to 9:00 AM	1338	Wet	1885
9:00 AM to 11:00 AM	806	Dry	6675
11:00 AM to 1:00 PM	637	Snow/Ice	181
1:00 PM to 4:00 PM	1356	7:00 PM to 6:00 AM	230
4:00 PM to 7:00 PM	1789	**Total**	8971
7:00 PM to 6:00 AM	3045	**Reported Year**	**# of Crashes**
Total	8971	2012	1379
Severity	**# of Crashes**	2013	1606
Fatal	47	2014	1811
Injury	3011	2015	1892
Property Damage Only	5913	2016	2283
Total	**8971**	**Total**	**8971**

Table 4: I-270 Corridor Total (2012 through 2016)

Time of Day	# of Crashes	Surface Condition	# of Crashes
6:00 AM to 9:00 AM	440	Wet	567
9:00 AM to 11:00 AM	275	Dry	2250
11:00 AM to 1:00 PM	240	Snow/Ice	60
1:00 PM to 4:00 PM	425	Unknown	41
4:00 PM to 7:00 PM	733	**Total**	**2918**
7:00 PM to 6:00 AM	805	**Reported Year**	**# of Crashes**
Total	**2918**	2012	438
Severity	**# of Crashes**	2013	498
Fatal	6	2014	587
Injury	984	2015	633
Property Damage Only	1928	2016	762
Total	**2918**	**Total**	**2918**

SECTION A: I-270 (2012 – 2016 Segment Analysis)

A-01 Crash Analysis – I-270 from I-495 to MD 187

SHA provided crash data for the I-270 segment from I-495 to MD 187 (milepost 0.00 to 1.54) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 339 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 109.37 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a steady increase from 43 crashes in 2012 to 59 crashes in 2013, 68 crashes in 2014, 79 crashes in 2015 and 90 crashes in 2016. A summary of the crash data is shown in Table A-01.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 0.00 to 0.50 of this segment appear as a CSIS location in 2015 and 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 112 crashes resulted in injuries while 227 resulted in property damage only. There was one pedestrian-related crash in 2015.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Collisions with fixed objects were the second, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Sideswipe crashes accounted for approximately ten percent (10%) of the total crashes.
- Approximately forty percent (40%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.54. Approximately twenty-three percent (23%) of the total crashes occurred in this subsegment. This is located at Exit 1A, Old Georgetown Rd.
- The next highest frequency of crashes occurred at milepost 0.00. Approximately eight percent (8%) of the total crashes occurred in this subsegment. This is located at Exit 35 (I-495).
- There were no alcohol related crashes in the five-year period,
- Forty-five percent (45%) of all crashes were due to, “Fail to give full Attention” and “Followed too Closely.”

Table A-01: Crash Data Summary for 2012 to 2016 (I-270 – I-495 to MD 187)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	26	Opposite Dir	0
9:00 AM to 11:00 AM	37	Rear End	205
11:00 AM to 1:00 PM	28	Sideswipe	35
1:00 PM to 4:00 PM	48	Left Turn	0
4:00 PM to 7:00 PM	109	Angle	0
7:00 PM to 6:00 AM	91	Pedestrian	1
Total	**339**	Other Collision	50
Surface Condition	**# of Crashes**	Fixed Object: Embankment	1
Wet	76	Fixed Object: Guardrail/Barrier	39
Dry	254	Fixed Object: Light Pole	2
Snow/Ice	5	Fixed Object: Other Pole	0
Other	4	Fixed Object: Tree/Shrubbery	2
Total	**339**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	43	Parked Vehicle	1
2013	59	**Total**	**339**
2014	68	**Contributing Factor**	**# of Crashes**
2015	79	Fail to give full Attention	92
2016	90	Too Fast for Conditions	58
Total	**339**	Followed too Closely	59
Illumination	**# of Crashes**	Other or Unknown	77
Day	208	Fail to Obey Traffic Signal	1
Dawn / Dusk	17	Fail to Yield Right-of-way	3
Dark – Lights On	94	Influence of Alcohol	11
Dark – No Lights	13	Improper Lane Change	7
Other	7	Fail to Drive in Single Lane	10
Total	**339**	Fell Asleep, Fainted, etc.	10
Weather Condition	**# of Crashes**	Rain, Snow	1
Clear/Cloudy	274	Exceeded Speed Limit	1
Foggy	0	Influence of Medication	1
Raining	53	Physical/Mental Difficulty	0
Snow/Sleet	5	Wrong Way on One Way	0
Other	7	Improper Turn	1
Total	**339**	Animal	1
Severity	**# of Crashes**	Lic. Restr. Non-compliance	1
Fatal	0	Fail to Keep Right of Center	0
Injury	112	Stopping in Lane Roadway	2
Property Damage Only	227	Debris or Obstruction	3
Total	**339**	**Total**	**339**
Segment Crash Rate=109.37 crashes per 100 million vehicle miles			

A-02 Crash Analysis – I-270 from MD 187 to I-270

SHA provided crash data for the I-270 segment from MD 187 to I-270 (milepost 1.54 to 2.68) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 240 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 96.85 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 40 crashes in 2012 to 44 crashes in 2013, 45 crashes in 2014, 53 crashes in 2015 and 58 crashes in 2016. A summary of the crash data is shown in **Table A-02**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 1.359 to 1.859 of this segment appear as a primary CSIS location in 2015.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 81 crashes resulted in injuries while 159 resulted in property damage only. There were no pedestrian-related crashes.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- Collisions with fixed objects were the second, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- Sideswipe crashes accounted for approximately twelve percent (12%) of the total crashes.
- Approximately forty-seven percent (47%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.54. Approximately thirty-three percent (33%) of the total crashes occurred in this subsegment. This is located at Exit 1A, Old Georgetown Rd.
- The next highest frequency of crashes occurred at milepost 1.81. Approximately ten percent (10%) of the total crashes occurred in this subsegment. This is located at Exit 1B, Rockledge Drive.
- There were no alcohol related crashes in the five-year period,
- forty-two percent (42%) of all crashes were due to, “Fail to give full Attention” and “Too Fast for Conditions.”

Table A-02: Crash Data Summary for 2012 to 2016 (I-270 – MD 187 to I-270)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	28	Opposite Dir	0
9:00 AM to 11:00 AM	21	Rear End	120
11:00 AM to 1:00 PM	20	Sideswipe	29
1:00 PM to 4:00 PM	26	Left Turn	0
4:00 PM to 7:00 PM	85	Angle	0
7:00 PM to 6:00 AM	60	Pedestrian	0
Total	**240**	Other Collision	45
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Dry	56	Fixed Object: Guardrail/Barrier	32
Wet	176	Fixed Object: Light Pole	2
Snow/Ice	6	Fixed Object: Contr. Barrier	1
Unknown	2	Fixed Object: Curb	1
Total	**240**	Fixed Object: Embankment	3
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	40	Parked Vehicle	3
2013	44	**Total**	**29**
2014	45	**Contributing Factor**	**# of Crashes**
2015	53	Fail to give full Attention	65
2016	58	Too Fast for Conditions	38
Total	**240**	Followed too Closely	30
Illumination	**# of Crashes**	Other or Unknown	60
Day	155	Fail to Obey Other Control	2
Dawn / Dusk	5	Fail to Yield Right-of-way	2
Dark – Lights On	64	Influence of Alcohol	7
Dark – No Lights	14	Improper Lane Change	9
Other	2	Fail to Drive in Single Lane	9
Total	**240**	Fell Asleep, Fainted, etc.	6
Weather Condition	**# of Crashes**	Improper Braking	1
Clear/Cloudy	193	Wet	1
Foggy	0	Vehicle Defect	2
Raining	34	Physical/Mental Difficulty	2
Snow/Sleet	8	Wrong Way on One Way	1
Other	5	Improper Turn	1
Total	**240**	Animal	2
Severity	**# of Crashes**	Lic. Restr. Non-compliance	1
Fatal	0	Fail to Keep Right of Center	0
Injury	81	Stopping in Lane Roadway	1
Property Damage Only	159	Shoulders Low, Soft, or High	0
Total	**240**	**Total**	**29**
Segment Crash Rate=96.85 crashes per 100 million vehicle miles			

A-03 Crash Analysis – I-270 from I-270Y to Montrose Road

SHA provided crash data for the I-270 segment from I-270Y to Montrose Road (milepost 2.39 to 4.14) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 329 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 40.90 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 47 crashes in 2013 to 56, 76, and 92 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-03**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 3.89 to 4.39 appear as a primary CSIS location in 2012, 2015, and 2016 and as a secondary CSIS location in 2014.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 127 crashes resulted in injuries while 202 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-one percent (51%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipes he third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately forty-six percent (46%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 4.14. Approximately thirty-three percent (33%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 927 (Montrose Road).
- The next highest frequency of crashes occurred at milepost 3.89. Approximately seven percent (7%) of the total crashes occurred in this subsegment.
- There were eight (8) alcohol related crashes in the five-year period, accounting for approximately two percent (2%) of the total crashes.

Table A-03: Crash Data Summary for 2012 to 2016 (I-270 – I-270Y to Montrose Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	76	Opposite Dir	0
9:00 AM to 11:00 AM	30	Rear End	169
11:00 AM to 1:00 PM	30	Sideswipe	50
1:00 PM to 4:00 PM	46	Left Turn	0
4:00 PM to 7:00 PM	76	Angle	0
7:00 PM to 6:00 AM	71	Pedestrian	0
Total	**329**	Other Collision	50
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	83	Fixed Object: Guardrail/Barrier	38
Dry	234	Fixed Object: Curb	5
Snow/Ice	8	Fixed Object: Sign Pole	1
Unknown	4	Fixed Object: Bridge	1
Total	**329**	Fixed Object: Contr. Barrier	4
Reported Year	**# of Crashes**	Other Fixed Object	6
2012	58	Parked Vehicle	4
2013	47	**Total**	**329**
2014	56	**Contributing Factor**	**# of Crashes**
2015	76	Fail to give full Attention	88
2016	92	Too Fast for Conditions	53
Total	**329**	Followed too Closely	43
Illumination	**# of Crashes**	Other or Unknown	70
Day	210	Fail to Obey Traffic Signal	1
Dawn / Dusk	19	Fail to Yield Right-of-way	3
Dark – Lights On	83	Influence of Alcohol	8
Dark – No Lights	7	Improper Lane Change	20
Other	10	Fail to Drive in Single Lane	22
Total	**329**	Fell Asleep, Fainted, etc.	4
Weather Condition	**# of Crashes**	Wet	1
Clear/Cloudy	259	Exceeded Speed Limit	2
Foggy	0	Ice or Snow Covered	0
Raining	55	Physical/Mental Difficulty	4
Snow/Sleet	5	Rain, Snow	2
Other	10	Vehicle Defect	3
Total	**329**	Animal	2
Severity	**# of Crashes**	Fail to Obey Other Control	1
Fatal	0	Wrong Way on One Way	1
Injury	127	Stopping in Lane Roadway	1
Property Damage Only	202	Lic. Restr. Non-compliance	0
Total	**329**	**Total**	**329**
Segment Crash Rate=40.9 crashes per 100 million vehicle miles			

A-04 Crash Analysis – I-270 from Montrose Road to MD 189

SHA provided crash data for the I-270 segment from Montrose Road to MD 189 (milepost 4.14 to 5.50) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 318 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 50.78 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 50 crashes in 2012 and 39 crashes in 2013, to an increase to 57, 74, and 98 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-4**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 3.89 to 4.39 appear as a primary CSIS location in 2012, 2015, and 2016 and as a secondary CSIS location in 2014.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 102 crashes resulted in injuries while 216 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-four percent (54%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipes were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 4.14. Approximately thirty-four percent (34%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 927 (Montrose Road).
- The next highest frequency of crashes occurred at milepost 13.97. Approximately seventeen percent (17%) of the total crashes occurred in this subsegment. This is located at Exit 5, MD 189 (Falls Road).
- There were seven (7) alcohol related crashes in the five-year period, accounting for approximately two percent (2%) of the total crashes.

Table A-4: Crash Data Summary for 2012 to 2016 (I-270 –Montrose Road to MD 189)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	79	Opposite Dir	0
9:00 AM to 11:00 AM	46	Rear End	172
11:00 AM to 1:00 PM	26	Sideswipe	46
1:00 PM to 4:00 PM	43	Left Turn	0
4:00 PM to 7:00 PM	54	Angle	0
7:00 PM to 6:00 AM	70	Pedestrian	1
Total	**318**	Other Collision	41
Surface Condition	**# of Crashes**	Fixed Object: Curb	3
Wet	69	Fixed Object: Guardrail/Barrier	44
Dry	237	Fixed Object: Crash Attenuator	1
Snow/Ice	9	Fixed Object: Light Pole	0
Unknown	3	Fixed Object: Sign Pole	1
Total	**318**	Fixed Object: Contr. Barrier	2
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	50	Parked Vehicle	4
2013	39	**Total**	**318**
2014	57	**Contributing Factor**	**# of Crashes**
2015	74	Fail to give full Attention	86
2016	98	Too Fast for Conditions	48
Total	**318**	Followed too Closely	50
Illumination	**# of Crashes**	Other or Unknown	70
Day	220	Influence of Medication	0
Dawn / Dusk	16	Fail to Yield Right-of-way	7
Dark – Lights On	71	Influence of Alcohol	7
Dark – No Lights	5	Improper Lane Change	12
Other	6	Fail to Drive in Single Lane	22
Total	**318**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Improper Backing	2
Clear/Cloudy	262	Exceeded Speed Limit	2
Foggy	0	Vehicle Defect	1
Raining	43	Physical/Mental Difficulty	4
Snow/Sleet	7	Rain, Snow	0
Other	6	Ice or Snow Covered	0
Total	**318**	Wet	1
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	0	Fail to Obey Other Control	1
Injury	102	Improper Passing	1
Property Damage Only	216	Lic. Restr. Non-compliance	0
Total	**318**	**Total**	**318**
Segment Crash Rate=50.78 crashes per 100 million vehicle miles			

A-05 Crash Analysis – I-270 from MD 189 to MD 28

SHA provided crash data for the I-270 segment from MD 189 to MD 28 (milepost 5.50 to 6.46) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 231 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 54.20 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 39 crashes in 2012 and 35 crashes in 2013 to 56, 42, and 59 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-5**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that, milepost 6.29 to 6.71 appeared as a primary CSIS location in 2014, and as a secondary CSIS location in 2012, 2013, 2015, and 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 74 crashes resulted in injuries while 157 resulted in property damage only. There were no pedestrian-related crashes.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-six percent (46%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the second most common type of crash and accounted for approximately twenty-seven percent (27%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was at milepost 6.46, the interchange of I-270@ MD28. Approximately fifty-one percent (51%) of the total crashes occurred at this location.
- There were thirteen (13) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table A-5: Crash Data Summary for 2012 to 2016 (I-270 – MD 189 to MD 28)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	59	Opposite Dir	0
9:00 AM to 11:00 AM	24	Rear End	107
11:00 AM to 1:00 PM	11	Sideswipe	32
1:00 PM to 4:00 PM	26	Left Turn	0
4:00 PM to 7:00 PM	45	Angle	0
7:00 PM to 6:00 AM	66	Pedestrian	0
Total	**231**	Other Collision	29
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Dry	164	Fixed Object: Guardrail/Barrier	55
Wet	59	Fixed Object: Light Pole	2
Snow/Ice	5	Fixed Object: Construction Barrier	3
Unknown	3	Fixed Object: Crash Attenuator	1
Total	**231**	Fixed Object: Tree/Shrubbery	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	39	Parked Vehicle	0
2013	35	**Total**	**231**
2014	56	**Contributing Factor**	**# of Crashes**
2015	42	Fail to give full Attention	48
2016	59	Too Fast for Conditions	39
Total	**231**	Followed too Closely	37
Illumination	**# of Crashes**	Other or Unknown	48
Day	142	Fail to Obey Other Control	1
Dawn / Dusk	12	Fail to Yield Right-of-way	0
Dark – Lights On	67	Influence of Alcohol	0
Dark – No Lights	6	Improper Lane Change	13
Other	4	Fail to Drive in Single Lane	19
Total	**231**	Fell Asleep, Fainted, etc.	6
Weather Condition	**# of Crashes**	Fail to Obey Traffic Signal	2
Clear/Cloudy	178	Improper passing	2
Foggy	0	Vehicle Defect	1
Raining	42	Physical or mental difficulty	1
Snow/Sleet	8	Exceeded Speed Limit	0
Other	3	Improper Turn	0
Total	**231**	Under influence of alcohol	10
Severity	**# of Crashes**	Wet	1
Fatal	0	Animal	2
Injury	74	Wrong way on one way	1
Property Damage Only	157	Sleet, Hail, Freezing Rain	0
Total	**231**	**Total**	**231**
Segment Crash Rate = 54.2 crashes per 100 million vehicle miles			

A-06 Crash Analysis – I-270 from MD 28 to Shady Grove Road

SHA provided crash data for the I-270 segment from MD 28 to Shady Grove Road (milepost 6.46 to 8.39) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 451 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 57.72 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 74 crashes in 2013 to 99, 98, and 122 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-6**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 8.14 to 8.64 appear as a primary CSIS location in 2013, 2015, and 2016 and as a secondary CSIS location in 2012 and 2014. Mile points 6.21 to 6.71 appear as a primary CSIS location in 2014 and 2016 and as a secondary CSIS location in 2012, 2013, and 2015.

Two (2) crashes resulted in two (2) fatalities. The first fatal crash occurred during the day and involved a single southbound vehicle colliding with a fixed object at mile point 8.09. The second fatal crash occurred during the day and involved a single southbound vehicle with an unknown collision type at mile point 8.39. Of the reported crashes, 163 crashes resulted in injuries while 286 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-four percent (54%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-six percent (26%) of the total crashes.
- The third most common type of crash was categorized at “Other” and accounted for approximately eleven percent (11%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 6.46. Approximately twenty- two percent (22%) of the total crashes occurred in this subsegment. This is located at Exit 6, MD 28 (W Montgomery Avenue).
- The next highest frequency of crashes occurred at milepost 8.39. Approximately twenty-one percent (21%) of the total crashes occurred in this subsegment. This is located at Exit 8, Shady Grove Road.

- There were fifteen (15) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table A-6: Crash Data Summary for 2012 to 2016 (I-270 – MD 28 to Shady Grove Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	119	Opposite Dir	0
9:00 AM to 11:00 AM	39	Rear End	245
11:00 AM to 1:00 PM	23	Sideswipe	41
1:00 PM to 4:00 PM	49	Left Turn	0
4:00 PM to 7:00 PM	105	Angle	0
7:00 PM to 6:00 AM	116	Pedestrian	0
Total	**451**	Other Collision	48
Surface Condition	**# of Crashes**	Fixed Object: Curb	7
Wet	115	Fixed Object: Guardrail/Barrier	92
Dry	321	Fixed Object: Crash Attenuator	2
Snow/Ice	10	Fixed Object: Light Pole	3
Unknown	5	Fixed Object: Embankment	2
Total	**451**	Fixed Object: Contr. Barrier	4
Reported Year	**# of Crashes**	Other Fixed Object	7
2012	58	Parked Vehicle	0
2013	74	**Total**	**451**
2014	99	**Contributing Factor**	**# of Crashes**
2015	98	Fail to give full Attention	98
2016	122	Too Fast for Conditions	87
Total	**451**	Followed too Closely	70
Illumination	**# of Crashes**	Other or Unknown	117
Day	282	Influence of Medication	0
Dawn / Dusk	23	Fail to Yield Right-of-way	2
Dark – Lights On	125	Influence of Alcohol	15
Dark – No Lights	12	Improper Lane Change	14
Other	9	Fail to Drive in Single Lane	19
Total	**451**	Fell Asleep, Fainted, etc.	11
Weather Condition	**# of Crashes**	Improper Backing	2
Clear/Cloudy	348	Improper Signal	1
Foggy	1	Vehicle Defect	5
Raining	84	Physical/Mental Difficulty	2
Snow/Sleet	7	Influence of Drugs	1
Other	11	Operator Using Cell Phone	1
Total	**451**	Wet	2
Severity	**# of Crashes**	Improper Turn	1
Fatal	2	Fail to Obey Traffic Signal	1
Injury	163	Rain, Snow	1
Property Damage Only	286	Stopping in Lane Roadway	1
Total	**451**	**Total**	**451**
Segment Crash Rate=57.72 crashes per 100 million vehicle miles			

A-07 Crash Analysis – I-270 from Shady Grove Road to I-370

SHA provided crash data for the I-270 segment from Shady Grove Road to I-370 (milepost 8.39 to 9.32) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 347 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 95.5 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 44 crashes in 2012 and 60 crashes in 2013 to 58, 85, and 100 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-7**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 8.14 to 8.64 appear as a primary CSIS location in 2013, 2015, and 2016 and as a secondary CSIS location in 2012 and 2014. Mile points 8.94 to 9.44 appear as a primary CSIS location in 2013, 2015, and 2016.

Three (3) crashes resulted in three (3) fatalities. The first fatal crash occurred during the day and involved a single southbound vehicle with an unknown collision type at mile point 8.39. The second fatal crash occurred at night and involved a single northbound driver colliding with a fixed object at mile point 9.06. The third fatal crash occurred at night and involved a northbound and southbound vehicle colliding at mile point 9.09. Of the reported crashes, 123 crashes resulted in injuries while 221 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-six percent (46%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Sideswipes were the third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 8.39. Approximately twenty-seven percent (27%) of the total crashes occurred in this subsegment. This is located at Exit 8, Shady Grove Road.
- There were eighteen (18) alcohol related crashes in the five-year period, accounting for approximately five percent (5%) of the total crashes.

Table A-7: Crash Data Summary for 2012 to 2016 (I-270 –Shady Grove Road to I-370)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	47	Opposite Dir	1
9:00 AM to 11:00 AM	42	Rear End	160
11:00 AM to 1:00 PM	22	Sideswipe	51
1:00 PM to 4:00 PM	51	Left Turn	0
4:00 PM to 7:00 PM	85	Angle	0
7:00 PM to 6:00 AM	100	Pedestrian	0
Total	**347**	Other Collision	46
Surface Condition	**# of Crashes**	Fixed Object: Curb	3
Wet	94	Fixed Object: Guardrail/Barrier	66
Dry	242	Fixed Object: Crash Attenuator	3
Snow/Ice	7	Fixed Object: Light Pole	1
Unknown	4	Fixed Object: Embankment	3
Total	**347**	Fixed Object: Contr. Barrier	5
Reported Year	**# of Crashes**	Other Fixed Object	7
2012	44	Parked Vehicle	1
2013	60	**Total**	**347**
2014	58	**Contributing Factor**	**# of Crashes**
2015	85	Fail to give full Attention	81
2016	100	Too Fast for Conditions	60
Total	**347**	Followed too Closely	42
Illumination	**# of Crashes**	Other or Unknown	86
Day	218	Influence of Medication	0
Dawn / Dusk	12	Fail to Yield Right-of-way	3
Dark – Lights On	98	Influence of Alcohol	18
Dark – No Lights	12	Improper Lane Change	12
Other	7	Fail to Drive in Single Lane	17
Total	**347**	Fell Asleep, Fainted, etc.	7
Weather Condition	**# of Crashes**	Improper Backing	0
Clear/Cloudy	272	Exceeded Speed Limit	2
Foggy	0	Vehicle Defect	3
Raining	63	Physical/Mental Difficulty	5
Snow/Sleet	6	Influence of Drugs	1
Other	6	Operator Using Cell Phone	2
Total	**347**	Wet	3
Severity	**# of Crashes**	Improper Turn	1
Fatal	3	Fail to Obey Traffic Signal	2
Injury	123	Improper Passing	1
Property Damage Only	221	Stopping in Lane Roadway	1
Total	**347**	**Total**	**347**
Segment Crash Rate=95.5 crashes per 100 million vehicle miles			

A-08 Crash Analysis – I-270 from I-370 to MD 117

SHA provided crash data for the I-270 segment from I-370 to MD 117 (milepost 9.32 to 10.85) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 300 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 50.57 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 37 crashes in 2012 and 52 crashes in 2013, to 64 in 2014, a decrease to 61 in 2015, and an increase to 86 in 2016. A summary of the crash data is shown in **Table A-8**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 8.94 to 9.44 appear as a primary CSIS location in 2013, 2015, and 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 113 crashes resulted in injuries while 187 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-five percent (55%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately nineteen percent (19%) of the total crashes.
- Sideswipes were the third most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Approximately forty percent (40%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 9.32. Approximately nineteen percent (19%) of the total crashes occurred in this subsegment. This is located at Exit 9, I-370.
- The next highest frequency of crashes occurred at milepost 10.85. Approximately eighteen percent (18%) of the total crashes occurred in this subsegment. This is located at Exit 10, MD 117 (W Diamond Avenue).
- There were eleven (11) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table A-8: Crash Data Summary for 2012 to 2016 (I-270 – I-370 to MD 117)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	41	Opposite Dir	0
9:00 AM to 11:00 AM	29	Rear End	164
11:00 AM to 1:00 PM	24	Sideswipe	50
1:00 PM to 4:00 PM	27	Left Turn	0
4:00 PM to 7:00 PM	79	Angle	0
7:00 PM to 6:00 AM	100	Pedestrian	0
Total	**300**	Other Collision	27
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	66	Fixed Object: Guardrail/Barrier	49
Dry	226	Fixed Object: Curb	0
Snow/Ice	5	Fixed Object: Sign Pole	0
Unknown	3	Fixed Object: Tree/Shrubbery	1
Total	**300**	Fixed Object: Contr. Barrier	3
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	37	Parked Vehicle	1
2013	52	**Total**	**300**
2014	64	**Contributing Factor**	**# of Crashes**
2015	61	Fail to give full Attention	88
2016	86	Too Fast for Conditions	50
Total	**300**	Followed too Closely	37
Illumination	**# of Crashes**	Other or Unknown	66
Day	160	Fail to Obey Traffic Signal	0
Dawn / Dusk	12	Fail to Yield Right-of-way	6
Dark – Lights On	98	Influence of Alcohol	11
Dark – No Lights	18	Improper Lane Change	11
Other	12	Fail to Drive in Single Lane	9
Total	**300**	Fell Asleep, Fainted, etc.	8
Weather Condition	**# of Crashes**	Operator Using Cell Phone	2
Clear/Cloudy	242	Exceeded Speed Limit	2
Foggy	0	Ice or Snow Covered	1
Raining	42	Physical/Mental Difficulty	1
Snow/Sleet	9	Rain, Snow	1
Other	7	Vehicle Defect	1
Total	**300**	Improper Backing	1
Severity	**# of Crashes**	Fail to Obey Other Control	1
Fatal	0	Influence of Drugs	2
Injury	113	Stopping in Lane Roadway	1
Property Damage Only	187	Lic. Restr. Non-compliance	1
Total	**300**	**Total**	**300**
Segment Crash Rate=50.57 crashes per 100 million vehicle miles			

A-09 Crash Analysis – I-270 from MD 117 to MD 124

SHA provided crash data for the I-270 segment from MD 117 to MD 124 (milepost 10.85 to 11.47) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 193 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 95.72 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 26 crashes in 2012 and 31 crashes in 2013, to a decrease to 30 in 2014, an increase to 50, and 56 in 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-9**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 11.29 to 11.79 appear as a secondary CSIS location in 2014, 2015, 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 81 crashes resulted in injuries while 112 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-eight percent (58%) of the total crashes.
- Sideswipes were the second most common type of crash and accounted for approximately twenty percent (20%) of the total crashes.
- The third most common type of crash was categorized at “Other” and accounted for approximately eleven percent (11%) of the total crashes.
- Approximately forty-seven percent (47%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 11.47. Approximately thirty-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 11, MD 124 (Quince Orchard Road).
- The next highest frequency of crashes occurred at milepost 10.85. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 10, MD 117 (W Diamond Avenue).
- There were four (4) alcohol related crashes in the five-year period, accounting for approximately two percent (2%) of the total crashes.

Table A-9: Crash Data Summary for 2012 to 2016 (I-270 – MD 117 to MD 124)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	32	Opposite Dir	0
9:00 AM to 11:00 AM	14	Rear End	112
11:00 AM to 1:00 PM	12	Sideswipe	38
1:00 PM to 4:00 PM	29	Left Turn	0
4:00 PM to 7:00 PM	59	Angle	0
7:00 PM to 6:00 AM	47	Pedestrian	0
Total	**193**	Other Collision	22
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	34	Fixed Object: Guardrail/Barrier	16
Dry	156	Fixed Object: Culvert/Ditch	0
Snow/Ice	2	Fixed Object: Curb	1
Unknown	1	Fixed Object: Tree/Shrubbery	0
Total	**193**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	26	Parked Vehicle	0
2013	31	**Total**	**193**
2014	30	**Contributing Factor**	**# of Crashes**
2015	50	Fail to give full Attention	50
2016	56	Too Fast for Conditions	33
Total	**193**	Followed too Closely	24
Illumination	**# of Crashes**	Other or Unknown	51
Day	122	Influence of Medication	0
Dawn / Dusk	7	Fail to Yield Right-of-way	2
Dark – Lights On	57	Influence of Alcohol	4
Dark – No Lights	4	Improper Lane Change	8
Other	3	Fail to Drive in Single Lane	8
Total	**193**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Improper Turn	1
Clear/Cloudy	169	Exceeded Speed Limit	1
Foggy	0	Vehicle Defect	0
Raining	19	Physical/Mental Difficulty	1
Snow/Sleet	0	Rain, Snow	1
Other	5	ice or Snow Covered	1
Total	**193**	Wet	1
Severity	**# of Crashes**	Fail to Obey Other Control	1
Fatal	0	Fail to Obey Traffic Signal	1
Injury	81	Improper Passing	1
Property Damage Only	112	Lic. Restr. Non-compliance	1
Total	**193**	**Total**	**193**
Segment Crash Rate=95.72 crashes per 100 million vehicle miles			

A-10 Crash Analysis – I-270 from MD 124 to Middlebrook Road

SHA provided crash data for the I-270 segment from MD 124 to Middlebrook Road (milepost 11.47 to 13.98) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 310 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 40.79 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 41 crashes in 2012 and 49 crashes in 2013 to 63, 74, and 83 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-10**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 11.29 to 11.79 appear as a secondary CSIS location in 2014, 2015, 2016. Mile points 13.72 to 14.22 appear a secondary CSIS location in 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 104 crashes resulted in injuries while 206 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-seven percent (57%) of the total crashes.
- Sideswipes were the second most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 11.47. Approximately twenty percent (20%) of the total crashes occurred in this subsegment. This is located at Exit 11, MD 124 (Quince Orchard Road).
- The next highest frequency of crashes occurred at milepost 13.97. Approximately fourteen percent (14%) of the total crashes occurred in this subsegment. This is located at Exit 13, Middlebrook Road.
- There were sixteen (16) alcohol related crashes in the five-year period, accounting for approximately five percent (5%) of the total crashes.

Table A-10: Crash Data Summary for 2012 to 2016 (I-270 – MD 124 to Middlebrook Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	51	Opposite Dir	0
9:00 AM to 11:00 AM	16	Rear End	178
11:00 AM to 1:00 PM	19	Sideswipe	51
1:00 PM to 4:00 PM	53	Left Turn	0
4:00 PM to 7:00 PM	89	Angle	0
7:00 PM to 6:00 AM	82	Pedestrian	1
Total	**310**	Other Collision	33
Surface Condition	**# of Crashes**	Fixed Object: Embankment	1
Wet	46	Fixed Object: Guardrail/Barrier	37
Dry	256	Fixed Object: Culvert/Ditch	1
Snow/Ice	5	Fixed Object: Curb	4
Unknown	3	Fixed Object: Tree/Shrubbery	1
Total	**310**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	41	Parked Vehicle	0
2013	49	**Total**	**310**
2014	63	**Contributing Factor**	**# of Crashes**
2015	74	Fail to give full Attention	77
2016	83	Too Fast for Conditions	50
Total	**310**	Followed too Closely	39
Illumination	**# of Crashes**	Other or Unknown	73
Day	186	Influence of Medication	0
Dawn / Dusk	21	Fail to Yield Right-of-way	1
Dark – Lights On	70	Influence of Alcohol	16
Dark – No Lights	31	Improper Lane Change	14
Other	2	Fail to Drive in Single Lane	19
Total	**310**	Fell Asleep, Fainted, etc.	11
Weather Condition	**# of Crashes**	Improper Turn	0
Clear/Cloudy	272	Exceeded Speed Limit	0
Foggy	1	Vehicle Defect	1
Raining	25	Physical/Mental Difficulty	1
Snow/Sleet	3	Rain, Snow	1
Other	9	Ice or Snow Covered	1
Total	**310**	Wet	1
Severity	**# of Crashes**	Debris or Obstruction	2
Fatal	0	Animal	1
Injury	104	Improper Passing	2
Property Damage Only	206	Lic. Restr. Non-compliance	0
Total	**310**	**Total**	**310**
Segment Crash Rate=40.79 crashes per 100 million vehicle miles			

A-11 Crash Analysis – I-270 from Middlebrook Road to MD 118

SHA provided crash data for the I-270 segment from MD 124 to Middlebrook Road (milepost 13.98 to 14.74) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 93 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 51.43 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 20 crashes in 2012 to 23 crashes in 2013, to a decrease to 11 in 2014, and an increase to 12, and 27 in 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-11**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 13.47 to 13.97 appear as a secondary CSIS location in 2015. Mile points 13.72 to 14.22 appear as a secondary CSIS location in 2016.

There were 2 fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 30 crashes resulted in injuries while 61 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- Collisions with fixed objects were the second most common type of crash which included guardrail/barriers, light poles, and other objects and accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipes were the third most common type of crash and accounted for approximately fifteen percent (12%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 14.74. Approximately twenty-seven percent (27%) of the total crashes occurred in this subsegment. This is located at Exit 15, MD 118 (Germantown Road).
- The next highest frequency of crashes occurred at milepost 14.47. Approximately ten percent (10%) of the total crashes occurred in this subsegment. This is located at a ramp approaching Exit 15, MD 118 (Germantown Road).
- There were six (6) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table A-11: Crash Data Summary for 2012 to 2016 (I-270 – Middlebrook Road to MD 118)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	15	Opposite Dir	0
9:00 AM to 11:00 AM	9	Rear End	55
11:00 AM to 1:00 PM	3	Sideswipe	11
1:00 PM to 4:00 PM	15	Left Turn	0
4:00 PM to 7:00 PM	27	Angle	0
7:00 PM to 6:00 AM	24	Pedestrian	0
Total	**93**	Other Collision	11
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	18	Fixed Object: Guardrail/Barrier	10
Dry	73	Fixed Object: Culvert/Ditch	1
Snow/Ice	1	Fixed Object: Light Pole	1
Unknown	1	Fixed Object: Sign Pole	1
Total	**93**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	20	Parked Vehicle	0
2013	23	**Total**	**93**
2014	11	**Contributing Factor**	**# of Crashes**
2015	12	Fail to give full Attention	22
2016	27	Too Fast for Conditions	9
Total	**93**	Followed too Closely	15
Illumination	**# of Crashes**	Other or Unknown	20
Day	61	Influence of Medication	0
Dawn / Dusk	6	Fail to Yield Right-of-way	0
Dark – Lights On	23	Influence of Alcohol	6
Dark – No Lights	2	Improper Lane Change	6
Other	1	Fail to Drive in Single Lane	6
Total	**93**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Improper Backing	1
Clear/Cloudy	72	Exceeded Speed Limit	0
Foggy	3	Vehicle Defect	1
Raining	10	Physical/Mental Difficulty	1
Snow/Sleet	2	Rain, Snow	0
Other	6	Ice or Snow Covered	0
Total	**93**	Wet	2
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	2	Animal	2
Injury	30	Improper Passing	1
Property Damage Only	61	Lic. Restr. Non-compliance	1
Total	**93**	**Total**	**93**
Segment Crash Rate=51.43 crashes per 100 million vehicle miles			

A-12 Crash Analysis – I-270 from MD 118 to Father Hurley Boulevard

SHA provided crash data for the I-270 segment from MD 118 to Father Hurley Boulevard (milepost 14.74 to 15.78) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 133 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 72.74 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 17 crashes in 2012 and 14 crashes in 2013, to an increase to 20, 31, and 51 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-12**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 15.69 to 16.19 appear as a secondary CSIS location in 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a rear end between two northbound vehicles at mile point 15.53. Of the reported crashes, 39 crashes resulted in injuries while 93 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-three percent (63%) of the total crashes.
- Sideswipes were the second most common type of crash and accounted for approximately eleven percent (11%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 15.78. Approximately thirty-five percent (35%) of the total crashes occurred in this subsegment. This is located at Exit 16, Father Hurley Boulevard.
- The next highest frequency of crashes occurred at milepost 14.74. Approximately twenty-three percent (23%) of the total crashes occurred in this subsegment. This is located at Exit 15, MD 118 (Germantown Road).
- There were five (5) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table A-12: Crash Data Summary for 2012 to 2016 (I-270 – MD 118 to Father Hurley Boulevard)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	18	Opposite Dir	0
9:00 AM to 11:00 AM	21	Rear End	84
11:00 AM to 1:00 PM	5	Sideswipe	15
1:00 PM to 4:00 PM	18	Left Turn	0
4:00 PM to 7:00 PM	34	Angle	0
7:00 PM to 6:00 AM	37	Pedestrian	1
Total	**133**	Other Collision	19
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	29	Fixed Object: Guardrail/Barrier	8
Dry	100	Fixed Object: Curb	1
Snow/Ice	3	Fixed Object: Sign Pole	1
Unknown	1	Fixed Object: Bridge	2
Total	**133**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	17	Parked Vehicle	0
2013	14	**Total**	**133**
2014	20	**Contributing Factor**	**# of Crashes**
2015	31	Fail to give full Attention	38
2016	51	Too Fast for Conditions	14
Total	**133**	Followed too Closely	14
Illumination	**# of Crashes**	Other or Unknown	42
Day	85	Influence of Medication	0
Dawn / Dusk	3	Fail to Yield Right-of-way	0
Dark – Lights On	38	Influence of Alcohol	5
Dark – No Lights	7	Improper Lane Change	7
Other	0	Fail to Drive in Single Lane	4
Total	**133**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Wet	0
Clear/Cloudy	103	Exceeded Speed Limit	0
Foggy	1	Ice or Snow Covered	1
Raining	17	Physical/Mental Difficulty	1
Snow/Sleet	4	Debris or Obstruction	2
Other	8	Sleet, Hail, Freezing Rain	0
Total	**133**	Animal	1
Severity	**# of Crashes**	Fail to Keep Right of Center	0
Fatal	1	Improper Passing	1
Injury	39	Improper Backing	1
Property Damage Only	93	Lic. Restr. Non-compliance	1
Total	**133**	**Total**	**133**
Segment Crash Rate=72.74 crashes per 100 million vehicle miles			

A-13 Crash Analysis – I-270 from Father Hurley Boulevard to MD 121

SHA provided crash data for the I-270 segment from Father Hurley Boulevard to MD 121 (milepost 15.78 to 18.43) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 238 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 48.97 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 25 crashes in 2012 and 35 crashes in 2013 to 44, 51, and 83 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-13**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 15.69 to 16.19 appear as a secondary CSIS location in 2016. Mile points 18.05 to 18.55 appear as a primary CSIS location in 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a rear end between two northbound vehicles at mile point 18.43. Of the reported crashes, 78 crashes resulted in injuries while 159 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-one percent (61%) of the total crashes.
- The second most common type of crash was categorized as “Other” and accounted for approximately fourteen percent (14%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately forty percent (40%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 18.43. Approximately twenty-eight percent (28%) of the total crashes occurred in this subsegment. This is located at Exit 18, MD 121 (Clarksburg Road).
- The next highest frequency of crashes occurred at milepost 15.78. Approximately twenty percent (20%) of the total crashes occurred in this subsegment. This is located at Exit 16, Father Hurley Boulevard.
- There were four (4) alcohol related crashes in the five-year period, accounting for approximately two percent (2%) of the total crashes.

Table A-13: Crash Data Summary for 2012 to 2016 (I-270 –Father Hurley Boulevard to MD 121)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	35	Opposite Dir	0
9:00 AM to 11:00 AM	20	Rear End	145
11:00 AM to 1:00 PM	15	Sideswipe	29
1:00 PM to 4:00 PM	42	Left Turn	0
4:00 PM to 7:00 PM	61	Angle	0
7:00 PM to 6:00 AM	65	Pedestrian	0
Total	**238**	Other Collision	34
Surface Condition	**# of Crashes**	Fixed Object: Embankment	1
Wet	44	Fixed Object: Guardrail/Barrier	20
Dry	185	Fixed Object: Light Pole	2
Snow/Ice	6	Fixed Object: Sign Pole	1
Unknown	3	Fixed Object: Bridge	1
Total	**238**	Fixed Object: Curb	2
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	25	Parked Vehicle	0
2013	35	**Total**	**238**
2014	44	**Contributing Factor**	**# of Crashes**
2015	51	Fail to give full Attention	57
2016	83	Too Fast for Conditions	38
Total	**238**	Followed too Closely	34
Illumination	**# of Crashes**	Other or Unknown	71
Day	151	Influence of Medication	1
Dawn / Dusk	7	Fail to Yield Right-of-way	1
Dark – Lights On	49	Influence of Alcohol	4
Dark – No Lights	29	Improper Lane Change	3
Other	2	Fail to Drive in Single Lane	9
Total	**238**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Wet	1
Clear/Cloudy	191	Exceeded Speed Limit	1
Foggy	0	Ice or Snow Covered	1
Raining	35	Physical/Mental Difficulty	1
Snow/Sleet	6	Debris or Obstruction	3
Other	6	Sleet, Hail, Freezing Rain	1
Total	**238**	Animal	2
Severity	**# of Crashes**	Fail to Keep Right of Center	1
Fatal	1	Influence of Drugs	2
Injury	78	Stopping in Lane Roadway	1
Property Damage Only	159	Fail to Ober Other Control	1
Total	**238**	**Total**	**238**
Segment Crash Rate=48.97 crashes per 100 million vehicle miles			

A-14 Crash Analysis – I-270 from MD 121 to MD 109

SHA provided crash data for the I-270 segment from MD 121 to MD 109 (milepost 18.43 to 22.29) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 348 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 57.35 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 38.80 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 45 crashes in 2012 and 52 crashes in 2013 to 61, 81, and 109 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-14**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that this segment did not appear as a primary or secondary CSIS location between 2012 and 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a rear end between two northbound vehicles at mile point 18.43. Of the reported crashes, 110 crashes resulted in injuries while 237 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- The second most common type of crash was categorized at “Other” and accounted for approximately eighteen percent (18%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty-five percent (35%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 18.43. Approximately nineteen percent (19%) of the total crashes occurred in this subsegment. This is located at Exit 18, MD 121 (Clarksburg Road).
- The next highest frequency of crashes occurred at milepost 22.29. Approximately nine percent (9%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 109 (Old Hundred Road).
- There were fifteen (15) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table A-14: Crash Data Summary for 2012 to 2016 (I-270 – MD 121 to MD 109)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	41	Opposite Dir	0
9:00 AM to 11:00 AM	31	Rear End	196
11:00 AM to 1:00 PM	37	Sideswipe	34
1:00 PM to 4:00 PM	67	Left Turn	0
4:00 PM to 7:00 PM	82	Angle	0
7:00 PM to 6:00 AM	90	Pedestrian	0
Total	**348**	Other Collision	62
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	60	Fixed Object: Guardrail/Barrier	45
Dry	277	Fixed Object: Culvert/Ditch	1
Snow/Ice	8	Fixed Object: Curb	1
Unknown	3	Fixed Object: Tree/Shrubbery	2
Total	**348**	Fixed Object: Sign Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	4
2012	45	Parked Vehicle	1
2013	52	**Total**	**348**
2014	61	**Contributing Factor**	**# of Crashes**
2015	81	Fail to give full Attention	85
2016	109	Too Fast for Conditions	52
Total	**348**	Followed too Closely	53
Illumination	**# of Crashes**	Other or Unknown	90
Day	244	Influence of Medication	1
Dawn / Dusk	9	Fail to Yield Right-of-way	3
Dark – Lights On	58	Influence of Alcohol	15
Dark – No Lights	33	Improper Lane Change	4
Other	4	Fail to Drive in Single Lane	21
Total	**348**	Fell Asleep, Fainted, etc.	6
Weather Condition	**# of Crashes**	Vision Obstruction	1
Clear/Cloudy	283	Exceeded Speed Limit	2
Foggy	0	Vehicle Defect	2
Raining	41	Physical/Mental Difficulty	1
Snow/Sleet	12	Rain, Snow	3
Other	12	Animal	3
Total	**348**	Wet	1
Severity	**# of Crashes**	Fail to Obey Other Control	1
Fatal	1	Influence of Drugs	2
Injury	110	Stopping in Lane Roadway	1
Property Damage Only	237	Lic. Restr. Non-compliance	1
Total	**348**	**Total**	**348**
Segment Crash Rate=57.35 crashes per 100 million vehicle miles			

A-15 Crash Analysis – I-270 from MD 109 to Frederick Co/L

SHA provided crash data for the I-270 segment from MD 109 to Frederick Co/L (milepost 22.29 to 22.51) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 46 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 134.97 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.30 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 5 crashes in 2012 and 7 crashes in 2013, to a decrease to 3 in 2014, and an increase to 13, and 18 in 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-15**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that this segment did not appear as a primary or secondary CSIS location between 2012 and 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 16 crashes resulted in injuries while 30 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately thirty-five percent (35%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately thirty percent (30%) of the total crashes.
- The third most common type of crash was categorized at “Other” and accounted for approximately twenty-four percent (24%) of the total crashes.
- Approximately twenty-six percent (26%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 22.29. Approximately sixty-five percent (65%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 109 (Old Hundred Road).
- The next highest frequency of crashes occurred at milepost 22.51. Approximately seven percent (7%) of the total crashes occurred in this subsegment. This is located at Frederick Co/L.
- There were zero (0) alcohol related crashes in the five-year period, accounting for approximately zero percent (0%) of the total crashes.

Table A-15: Crash Data Summary for 2012 to 2016 (I-270 – MD 109 to Frederick Co/L)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	4	Opposite Dir	0
9:00 AM to 11:00 AM	2	Rear End	16
11:00 AM to 1:00 PM	6	Sideswipe	5
1:00 PM to 4:00 PM	7	Left Turn	0
4:00 PM to 7:00 PM	8	Angle	0
7:00 PM to 6:00 AM	19	Pedestrian	0
Total	**46**	Other Collision	11
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	10	Fixed Object: Guardrail/Barrier	12
Dry	35	Fixed Object: Culvert/Ditch	1
Snow/Ice	0	Fixed Object: Curb	1
Unknown	1	Fixed Object: Tree/Shrubbery	0
Total	**46**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2012	5	Parked Vehicle	0
2013	7	**Total**	**46**
2014	3	**Contributing Factor**	**# of Crashes**
2015	13	Fail to give full Attention	14
2016	18	Too Fast for Conditions	11
Total	**46**	Followed too Closely	2
Illumination	**# of Crashes**	Other or Unknown	10
Day	27	Fail to Obey Traffic Signal	0
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	8	Influence of Alcohol	0
Dark – No Lights	5	Improper Lane Change	1
Other	2	Fail to Drive in Single Lane	4
Total	**46**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Operator Using Cell Phone	0
Clear/Cloudy	32	Exceeded Speed Limit	0
Foggy	0	Ice or Snow Covered	0
Raining	9	Physical/Mental Difficulty	0
Snow/Sleet	0	Rain, Snow	0
Other	5	Animal	1
Total	**46**	Wet	1
Severity	**# of Crashes**	Fail to Obey Other Control	1
Fatal	0	Influence of Drugs	1
Injury	16	Stopping in Lane Roadway	0
Property Damage Only	30	Lic. Restr. Non-compliance	0
Total	**46**	**Total**	**46**
Segment Crash Rate=134.97 crashes per 100 million vehicle miles			

A-16 Crash Analysis – I-270 from the Frederick County Line to MD 80

SHA provided crash data for the I-270 segment from the Frederick County line to MD 80 (milepost 0.00 to 3.51) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 239 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 43.95 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 61 crashes in 2012 to 67 crashes in 2013, a decrease to 51 crashes 2014, while there were 60 and 54 crashes in 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-16**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that this segment did not appear as a primary or secondary CSIS location between 2012 and 2016.

There were 3 fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 90 crashes resulted in injuries while 200 resulted in property damage only. There were no pedestrian-related crashes.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-two percent (62%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately ten percent (10%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 PM - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.18. Approximately eleven percent (11%) of the total crashes occurred in this subsegment. This is located at the Dr. Perry Road overpass.
- The next highest frequency of crashes occurred at milepost 2.52. Approximately eight percent (8%) of the total crashes occurred in this subsegment. This is located approximately 0.5 miles from Montgomery Co. Line.
- There were 10 alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.
- Sixty percent (60%) of all crashes were due to “Followed too Closely” and “Too Fast for Conditions.”

Table A-16: Crash Data Summary for 2012 to 2016 (I-270 – I-495 to Democracy Blvd)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	49	Opposite Dir	1
9:00 AM to 11:00 AM	32	Rear End	182
11:00 AM to 1:00 PM	31	Sideswipe	29
1:00 PM to 4:00 PM	40	Left Turn	0
4:00 PM to 7:00 PM	58	Angle	0
7:00 PM to 6:00 AM	83	Pedestrian	2
Total	**293**	Other Collision	35
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	52	Fixed Object: Guardrail/Barrier	32
Dry	224	Fixed Object: Light Pole	2
Snow/Ice	10	Fixed Object: Sign Pole	0
Other	7	Fixed Object: Curb	1
Total	**293**	Fixed Object: Tree/Shrubbery	1
Reported Year	**# of Crashes**	Fixed Object: Construction Barrier	2
2012	61	Embankment	6
2013	67	**Total**	**293**
2014	51	**Contributing Factor**	**# of Crashes**
2015	60	Fail to give full Attention	40
2016	54	Too Fast for Conditions	56
Total	**293**	Followed too Closely	87
Illumination	**# of Crashes**	Other or Unknown	49
Day	189	Fail to Obey Other Control	0
Dawn / Dusk	13	Fail to Yield Right-of-way	0
Dark – Lights On	30	Influence of Alcohol	5
Dark – No Lights	55	Improper Lane Change	8
Other	6	Fail to Drive in Single Lane	23
Total	**293**	Fell Asleep, Fainted, etc.	9
Weather Condition	**# of Crashes**	Operator Using Cell Phone	0
Clear/Cloudy	245	Influence of Drugs	1
Foggy	2	Vehicle Defect	4
Raining	29	Physical/Mental Difficulty	1
Snow/Sleet	10	Exceeded Speed Limit	0
Other	7	Ice or Snow Covered	1
Total	**293**	Animal	3
Severity	**# of Crashes**	Debris or Obstruction	2
Fatal	3	Clothing Not Visible	1
Injury	90	Stopping in Lane Roadway	1
Property Damage Only	200	Ruts, Holes Bumps	2
Total	**293**	**Total**	**293**
Segment Crash Rate=43.95 crashes per 100 million vehicle miles			

A-17 Crash Analysis – I-270 from MD 80 to MD 85

SHA provided crash data for the I-270 segment from MD 80 to MD 85 (milepost 3.52 to 8.65) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 409 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 53.95 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 57 crashes in 2012 to 66 crashes in 2013, 86 crashes in 2014, 95 crashes in 2015 and 105 crashes in 2016. A summary of the crash data is shown in **Table A-17**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed the following locations appear as CSIS primary or secondary locations in 2012 to 2016. The table below shows those locations.

I-270 CSIS Locations

Mile Point	2012		2013		2014		2015		2016	
	P	S	P	S	P	S	P	S	P	S
3.64 - 4.14							x			
3.89 - 4.39	x					x			x	
6.21 - 6.71		x		x	x	x				
6.29 - 6.79									x	
5.25 - 5.75	No desig.									
8.09 - 8.59	x		x							
8.20 - 8.70									x	
8.14 - 8.64		x			x		x			

Note: P-Primary, S-Secondary

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 120 crashes resulted in injuries while 289 resulted in property damage only. There were no pedestrian-related crashes between 2012 and 2016.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- Collisions with fixed objects were the second, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipe crashes accounted for approximately eight percent (8%) of the total crashes.
- Approximately thirty-seven (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.65. Approximately fifteen percent (15%) of the total crashes occurred in this subsegment. This is located at Spurs to/from I-270 local lanes (north of Shady Grove Road).

- The next highest frequency of crashes occurred at milepost 3.52. Approximately ten percent (10%) of the total crashes occurred in this subsegment. This is located at the beginning and end of I-270 local lanes (south of Montrose Road).
- Approximately five (4%) of all crashes were alcohol or drug related in the five-year period,
- Forty percent (40%) of all crashes were due to, “Fail to give full Attention” and “Followed too Closely.”

Table A-17: Crash Data Summary for 2012 to 2016 (I-270 – MD 80 to MD 85)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	77	Opposite Dir	0
9:00 AM to 11:00 AM	44	Rear End	227
11:00 AM to 1:00 PM	35	Sideswipe	32
1:00 PM to 4:00 PM	59	Left Turn	0
4:00 PM to 7:00 PM	73	Angle	0
7:00 PM to 6:00 AM	121	Pedestrian	0
Total	**409**	Other Collision	80
Surface Condition	**# of Crashes**	Fixed Object: Embankment	7
Wet	65	Fixed Object: Guardrail/Barrier	51
Dry	328	Fixed Object: Light Pole	1
Snow/Ice	8	Fixed Object: Sign Pole	3
Other	8	Fixed Object: Tree/Shrubbery	4
Total	**409**	Fixed Object: Curb	2
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	57	Parked Vehicle	0
2013	66	**Total**	**409**
2014	86	**Contributing Factor**	**# of Crashes**
2015	95	Fail to give full Attention	73
2016	105	Too Fast for Conditions	56
Total	**409**	Followed too Closely	92
Illumination	**# of Crashes**	Other or Unknown	118
Day	251	Influence of Medication	2
Dawn / Dusk	36	Fail to Yield Right-of-way	3
Dark – Lights On	46	Influence of Alcohol	11
Dark – No Lights	71	Improper Lane Change	6
Other	5	Fail to Drive in Single Lane	27
Total	**409**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Rain, Snow	1
Clear/Cloudy	341	Exceeded Speed Limit	1
Foggy	0	Vehicle Defect	3
Raining	47	Physical/Mental Difficulty	1
Snow/Sleet	9	Road Under Construction	2
Other	12	Sleet, Hail, Freezing Rain	1
Total	**409**	Animal	1
Severity	**# of Crashes**	Improper Backing	1
Fatal	0	Influence of Combined Subst.	2
Injury	120	Stopping in Lane Roadway	1
Property Damage Only	289	Improper Passing	2
Total	**409**	**Total**	**409**
Segment Crash Rate=53.95 crashes per 100 million vehicle miles			

A-18 Crash Analysis – I-270 from MD 85 to I-70

SHA provided crash data for the I-270 segment from MD 85 to I-70 (milepost 8.65 to 10.09) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 191 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 67.20 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 26 crashes in 2012 to 41 crashes in 2013, a decrease to 36 crashes in 2014, and an increase to 38 crashes in 2015 and 50 crashes in 2016. A summary of the crash data is shown in **Table A-18**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 8.96 to 9.46 of this segment appear as a CSIS location in 2012 but appear as a primary location in 2013, 2015 and 2016.

There was one fatal crash in the study segment in 2012. Of the reported crashes, 61 crashes resulted in injuries while 129 resulted in property damage only. There was one pedestrian-related crash in 2015.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty -nine percent (49%) of the total crashes.
- Collisions with fixed objects were the second, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- Sideswipe crashes accounted for approximately seventeen percent (17%) of the total crashes.
- Approximately thirty-five (35%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.65. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located at Spurs to/from I-270 local lanes (north of Shady Grove Road).
- The next highest frequency of crashes occurred at milepost 9.68. Approximately six percent (6%) of the total crashes occurred in this subsegment. This is located at Exit 9 (north of I-370).
- Approximately five (5%) of all crashes were alcohol related in the five-year period,
- Thirty-six percent (36%) of all crashes were due to, “Fail to give full Attention” and “Followed too Closely.”

Table A-18: Crash Data Summary for 2012 to 2016 (I-270 – MD 85 to I-70)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	29	Opposite Dir	0
9:00 AM to 11:00 AM	17	Rear End	94
11:00 AM to 1:00 PM	17	Sideswipe	33
1:00 PM to 4:00 PM	26	Left Turn	0
4:00 PM to 7:00 PM	38	Angle	0
7:00 PM to 6:00 AM	64	Pedestrian	1
Total	**191**	Other Collision	20
Surface Condition	**# of Crashes**	Fixed Object: Embankment	2
Wet	43	Fixed Object: Guardrail/Barrier	30
Dry	140	Fixed Object: Light Pole	2
Snow/Ice	4	Fixed Object: Sign Pole	5
Other	4	Fixed Object: Tree/Shrubbery	1
Total	**191**	Fixed Object: Curb	1
Reported Year	**# of Crashes**	Fixed Object: Culvert/Ditch	1
2012	26	Parked Vehicle	1
2013	41	**Total**	**191**
2014	36	**Contributing Factor**	**# of Crashes**
2015	38	Fail to give full Attention	33
2016	50	Too Fast for Conditions	32
Total	**191**	Followed too Closely	36
Illumination	**# of Crashes**	Other or Unknown	39
Day	104	Fail to Obey Other Control	2
Dawn / Dusk	14	Fail to Yield Right-of-way	0
Dark – Lights On	60	Influence of Alcohol	9
Dark – No Lights	11	Improper Lane Change	4
Other	2	Fail to Drive in Single Lane	21
Total	**191**	Fell Asleep, Fainted, etc.	4
Weather Condition	**# of Crashes**	Rain, Snow	1
Clear/Cloudy	155	Exceeded Speed Limit	2
Foggy	1	Vehicle Defect	2
Raining	30	Physical/Mental Difficulty	2
Snow/Sleet	3	Wrong Way on One Way	0
Other	2	Improper Turn	0
Total	**191**	Animal	1
Severity	**# of Crashes**	Lic. Restr. Non-compliance	0
Fatal	1	Influence of Combined Subst.	1
Injury	61	Stopping in Lane Roadway	1
Property Damage Only	129	Debris or Obstruction	1
6:00 AM to 9:00 AM	29	Opposite Dir	0
Segment Crash Rate=67.20 crashes per 100 million vehicle miles			

A-19 Crash Analysis – I-270 from I-495 to Democracy Blvd

SHA provided crash data for the I-270 segment from I-495 to Democracy Blvd (milepost 0.00 to 0.99) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 29 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 12.40 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 6 crashes in 2012 to 5 crashes in 2013 and 3 crashes 2014 while there was an increase to 5 and 10 crashes in 2015 and 2016, respectively. A summary of the crash data is shown in **Table A-19**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that this segment did not appear as a primary or secondary CSIS location between 2012 and 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 10 crashes resulted in injuries while 19 resulted in property damage only. There were no pedestrian-related crashes.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-four percent (24%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately twenty-eight percent (28%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 PM - 7:00 PM.
- The location with the highest frequency of crashes occurred between milepost 0.90 and 0.99 Approximately thirty-eight percent (38%) of the total crashes occurred in this subsegment.
- The next highest frequency of crashes occurred between the milepost 0.00 and 0.10. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 35, I-495 (Capital Beltway)
- There were no alcohol related crashes in the five-year period,
- Fifty-two percent (52%) of all crashes were due to “Fail to give full Attention” and “Followed too Closely.”

Table A-19: Crash Data Summary for 2012 to 2016 (I-270 – I-495 to Democracy Blvd)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	3	Opposite Dir	0
9:00 AM to 11:00 AM	0	Rear End	17
11:00 AM to 1:00 PM	1	Sideswipe	4
1:00 PM to 4:00 PM	10	Left Turn	0
4:00 PM to 7:00 PM	5	Angle	0
7:00 PM to 6:00 AM	10	Pedestrian	0
Total	**29**	Other Collision	1
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	8	Fixed Object: Guardrail/Barrier	7
Dry	21	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Contr. Barrier	0
Unknown	0	Fixed Object: Curb	0
Total	**29**	Fixed Object: Embankment	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2012	6	Parked Vehicle	0
2013	5	**Total**	**29**
2014	3	**Contributing Factor**	**# of Crashes**
2015	5	Fail to give full Attention	8
2016	10	Too Fast for Conditions	6
Total	**29**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	3
Day	21	Fail to Obey Other Control	0
Dawn / Dusk	3	Fail to Yield Right-of-way	0
Dark – Lights On	4	Influence of Alcohol	0
Dark – No Lights	1	Improper Lane Change	2
Other	0	Fail to Drive in Single Lane	1
Total	**29**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Vehicle Defect	0
Clear/Cloudy	22	Improper Turn	0
Foggy	0	Wet	1
Raining	7	Physical/Mental Difficulty	0
Snow/Sleet	0	Fail to Keep Right of Center	0
Other	0	Improper Passing	0
Total	**29**	Rain, Snow	0
Severity	**# of Crashes**	Icy or Snow Covered	0
Fatal	0	Exceeded Speed Limit	0
Injury	10	Stopping in Lane Roadway	0
Property Damage Only	19	Animal	0
Total	**29**	**Total**	**29**
Segment Crash Rate=12.40 crashes per 100 million vehicle miles			

A-20 Crash Analysis – I-270 from Democracy Blvd to I-270

SHA provided crash data for the I-270 segment from Democracy Blvd to I-270 (milepost 0.99 to 2.09) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 32 crashes were reported along the I-270 study segment during the five-year study period. The crash rate for the study segment is 12.05 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 3 crashes in both 2012 and 2013 to 7 crashes in 2014, a decreased to 6 crashes in 2015, and an increase to 13 crashes in 2016. A summary of the crash data is shown in **Table A-20**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 1.29-1.79 of this segment appear as a secondary CSIS location in 2012 and primary CSIS location 2013. Mile point 1.359-1.859 appeared as a CSIS location in 2015 and mile point 1.410-1.910 a primary CSIS location 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 6 crashes resulted in injuries while 26 resulted in property damage only. There were no pedestrian-related crashes.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-three percent (63%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately three percent (3%) of the total crashes.
- Approximately forty-four percent (44%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.00. Approximately forty-three percent (43%) of the total crashes occurred in this subsegment. This is located at Exit 1, Democracy Boulevard.
- The next highest frequency of crashes occurred at milepost 1.35. Approximately nine percent (9%) of the total crashes occurred in this subsegment.
- There were no alcohol related crashes in the five-year period,
- Seventy-two percent (72%) of all crashes were due to, “Fail to give full Attention” or “Too Fast for Conditions.”

Table A-20: Crash Data Summary for 2012 to 2016 (I-270 – Democracy Blvd to I-270)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	2	Opposite Dir	0
9:00 AM to 11:00 AM	2	Rear End	17
11:00 AM to 1:00 PM	1	Sideswipe	4
1:00 PM to 4:00 PM	5	Left Turn	0
4:00 PM to 7:00 PM	12	Angle	0
7:00 PM to 6:00 AM	10	Pedestrian	0
Total	**32**	Other Collision	1
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	6	Fixed Object: Guardrail/Barrier	7
Dry	26	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Contr. Barrier	0
Unknown	0	Fixed Object: Curb	0
Total	**32**	Fixed Object: Embankment	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2012	3	Parked Vehicle	0
2013	3	**Total**	**32**
2014	7	**Contributing Factor**	**# of Crashes**
2015	6	Fail to give full Attention	17
2016	13	Too Fast for Conditions	6
Total	**32**	Followed too Closely	1
Illumination	**# of Crashes**	Other or Unknown	2
Day	21	Fail to Obey Other Control	0
Dawn / Dusk	1	Fail to Yield Right-of-way	0
Dark – Lights On	8	Influence of Alcohol	0
Dark – No Lights	1	Improper Lane Change	2
Other	1	Fail to Drive in Single Lane	2
Total	**32**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Operator Using Cell Phone	1
Clear/Cloudy	26	Influence of Drugs	0
Foggy	0	Vehicle Defect	0
Raining	6	Physical/Mental Difficulty	0
Snow/Sleet	0	Exceeded Speed Limit	0
Other	0	Improper Turn	0
Total	**32**	Influence of Drugs	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Fail to Keep Right of Center	0
Injury	6	Stopping in Lane Roadway	0
Property Damage Only	26	Shoulders Low, Soft, or High	0
Total	**32**	**Total**	**32**
Segment Crash Rate=12.05 crashes per 100 million vehicle miles			

SECTION B: I-95/495 (2012 – 2016 Segment Analysis)

B-01 Crash Analysis – I-495 from American Legion Bridge to MD 190

SHA provided crash data for the I-495 segment from the American Legion bridge to MD 190 (milepost 0.00 to 2.37) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 496 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 51.7 crashes per 100 million vehicle miles (MVM), which is above the latest available (2017) statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 72 crashes in 2013 to 94, 127 and 133 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-01**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 2.12 to 2.62 appear as a primary CSIS location in 2012, 2014, 2015, and 2016 and as a secondary CSIS location in 2013. Mile points 0.02 to 0.52 appear as a secondary CSIS location in 2015.

Three (3) crashes resulted in three (3) fatalities. The first fatal crash occurred at night and involved a rear end between two eastbound vehicles at mile point 0.52. The second fatal crash occurred at night and involved a rear end between an eastbound vehicle and a parked vehicle at milepost 0.86. The third fatal crash occurred at night and involved a sideswipe between two eastbound vehicles at mile point 1.11. Of the reported crashes, 165 crashes resulted in injuries while 328 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately thirty-nine percent (39%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.37. Approximately twenty-five percent (25%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 190 (River Road).
- There were thirteen (13) alcohol related crashes in the five-year period, accounting for approximately 3 percent (3%) of the total crashes.

Table B-01: Crash Data Summary for 2012 to 2016 (American Legion Bridge to MD 190)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	58	Opposite Dir	0
9:00 AM to 11:00 AM	44	Rear End	293
11:00 AM to 1:00 PM	30	Sideswipe	86
1:00 PM to 4:00 PM	77	Left Turn	0
4:00 PM to 7:00 PM	136	Angle	0
7:00 PM to 6:00 AM	151	Pedestrian	1
Total	**496**	Other Collision	50
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	2
Wet	92	Fixed Object: Guardrail/Barrier	50
Dry	387	Fixed Object: Contr. Barrier	2
Snow/Ice	9	Fixed Object: Curb	6
Unknown	8	Fixed Object: Embankment	1
Total	**496**	Fixed Object: Other Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	70	Parked Vehicle	2
2013	72	**Total**	**496**
2014	94	**Contributing Factor**	**# of Crashes**
2015	127	Fail to give full Attention	131
2016	133	Too Fast for Conditions	78
Total	**496**	Followed too Closely	81
Illumination	**# of Crashes**	Other or Unknown	110
Day	304	Improper Backing	1
Dawn / Dusk	18	Fail to Yield Right-of-way	2
Dark – Lights On	144	Influence of Alcohol	13
Dark – No Lights	19	Improper Lane Change	27
Other	11	Fail to Drive in Single Lane	26
Total	**496**	Fell Asleep, Fainted, etc.	11
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	400	Rain, Snow	1
Foggy	2	Physical/Mental Difficulty	2
Raining	58	Debris or Obstruction	2
Snow/Sleet	8	Fail to Obey Other Control	1
Other	28	Influence of Drugs	2
Total	**496**	Improper Backing	1
Severity	**# of Crashes**	Illegally in Roadway	1
Fatal	3	Stopping in Lane Roadway	1
Injury	165	Wet	2
Property Damage Only	328	Improper Turn	2
Total	**496**	**Total**	**496**
Segment Crash Rate=51.7 crashes per 100 million vehicle miles			

B-02 Crash Analysis – I-495 from I-495X to MD 190

SHA provided crash data for the I-495 segment from I-495X to MD 190 (milepost 2.21 to 2.37) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 164 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 253.23 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 16 crashes in 2012 and 15 crashes in 2013 to 22, 49, and 62 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-02**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 2.12 to 2.62 appear as a primary CSIS location for years 2012, 2014, 2105, and 2016 and as a secondary CSIS location in 2013.

There are were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 60 crashes resulted in injuries while 104 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-seven percent (57%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, culverts/ditches, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately thirty-nine percent (39%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.37. Approximately seventy-three percent (73%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 190 (River Road).
- The next highest frequency of crashes occurred at milepost 2.21. Approximately nine percent (9%) of the total crashes occurred in this subsegment. This is located at Cabin John Parkway.
- There were five (5) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-2: Crash Data Summary for 2012 to 2016 (I-495 – I-495X to MD 190)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	17	Opposite Dir	0
9:00 AM to 11:00 AM	15	Rear End	94
11:00 AM to 1:00 PM	9	Sideswipe	28
1:00 PM to 4:00 PM	24	Left Turn	0
4:00 PM to 7:00 PM	47	Angle	0
7:00 PM to 6:00 AM	52	Pedestrian	0
Total	**164**	Other Collision	20
Surface Condition	**# of Crashes**	Fixed Object: Crash Attenuator	0
Wet	37	Fixed Object: Guardrail/Barrier	18
Dry	126	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Culvert/Ditch	1
Unknown	1	Fixed Object: Curb	0
Total	**164**	Fixed Object: Contr. Barrier	2
Reported Year	**# of Crashes**	Other Fixed Object	0
2012	16	Parked Vehicle	1
2013	15	**Total**	**164**
2014	22	**Contributing Factor**	**# of Crashes**
2015	49	Fail to give full Attention	47
2016	62	Too Fast for Conditions	25
Total	**164**	Followed too Closely	23
Illumination	**# of Crashes**	Other or Unknown	42
Day	97	Fail to Obey Other Control	1
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	50	Influence of Alcohol	5
Dark – No Lights	7	Improper Lane Change	9
Other	6	Fail to Drive in Single Lane	5
Total	**164**	Fell Asleep, Fainted, etc.	4
Weather Condition	**# of Crashes**	Rain, Snow	0
Clear/Cloudy	126	Influence of Drugs	0
Foggy	1	Vehicle Defect	0
Raining	21	Physical/Mental Difficulty	1
Snow/Sleet	3	Improper Passing	0
Other	13	Improper Turn	1
Total	**164**	Influence of Combined Subst.	0
Severity	**# of Crashes**	Road Under Construction	1
Fatal	0	Fail to Keep Right of Center	0
Injury	60	Stopping in Lane Roadway	0
Property Damage Only	104	Operator using Cell Phone	0
Total	**164**	**Total**	**164**
Segment Crash Rate=253.23 crashes per 100 million vehicle miles			

B-03 Crash Analysis – I-495 from MD 190 to I-270Y

SHA provided crash data for the I-495 segment from MD 190 to I-270Y (milepost 2.37 to 3.95) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 389 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 56.8 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 51 crashes in 2012 and 52 crashes in 2013 to 73, 99, and 114 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-3**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 2.12 to 2.62 appear as a primary CSIS location in 2012, 2014, 2015, and 2016 and a secondary location in 2013. Mile points 3.37 to 3.87 appear as secondary CSIS location in 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred during the day and involved a sideswipe between two northbound vehicles at milepost 3.69. Of the reported crashes, 139 crashes resulted in injuries while 249 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-two percent (52%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, sign poles, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately forty-one percent (41%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.37. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 190 (River Road).
- The next highest frequency of crashes occurred at milepost 3.69. Approximately eight percent (8%) of the total crashes occurred in this subsegment. This is located at the MD 191 (Bradley Boulevard) overpass.
- There were ten (10) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-3: Crash Data Summary for 2012 to 2016 (I-495 – MD 190 to I-270Y)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	49	Opposite Dir	1
9:00 AM to 11:00 AM	31	Rear End	204
11:00 AM to 1:00 PM	25	Sideswipe	80
1:00 PM to 4:00 PM	60	Left Turn	0
4:00 PM to 7:00 PM	109	Angle	0
7:00 PM to 6:00 AM	115	Pedestrian	0
Total	**389**	Other Collision	46
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	95	Fixed Object: Guardrail/Barrier	49
Dry	279	Fixed Object: Light Pole	1
Snow/Ice	10	Fixed Object: Embankment	1
Unknown	5	Fixed Object: Crash Attenuator	1
Total	**389**	Fixed Object: Contr. Bridge	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	51	Parked Vehicle	2
2013	52	**Total**	**389**
2014	73	**Contributing Factor**	**# of Crashes**
2015	99	Fail to give full Attention	103
2016	114	Too Fast for Conditions	58
Total	**389**	Followed too Closely	58
Illumination	**# of Crashes**	Other or Unknown	90
Day	226	Fail to Obey Other Control	1
Dawn / Dusk	18	Fail to Yield Right-of-way	1
Dark – Lights On	111	Influence of Alcohol	10
Dark – No Lights	23	Improper Lane Change	32
Other	11	Fail to Drive in Single Lane	22
Total	**389**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Wet	3
Clear/Cloudy	301	Influence of Combined Subst.	1
Foggy	1	Influence of Medication	1
Raining	57	Physical/Mental Difficulty	1
Snow/Sleet	8	Improper Parking	0
Other	22	Improper Turn	2
Total	**389**	Improper Passing	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	1	Exceeded Speed Limit	0
Injury	139	Stopping in Lane Roadway	1
Property Damage Only	249	Rain, Snow	0
Total	**389**	**Total**	**389**
Segment Crash Rate=56.08 crashes per 100 million vehicle miles			

B-04 Crash Analysis – I-495 from the I-270 Spur to MD 187

SHA provided crash data for the I-495 segment from the I-270 Spur to MD 187 (milepost 3.95 to 5.61) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 190 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 58.48 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 30 crashes in 2012 and 26 crashes in 2013 to 33, 54, and 47 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-4**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that this segment did not appear as a primary or secondary CSIS location between 2012 and 2016.

There are were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 41 crashes resulted in injuries while 149 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty percent (40%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-eight percent (28%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately twenty percent (20%) of the total crashes.
- Approximately thirty-six percent (36%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 5.61. Approximately twenty-nine percent (29%) of the total crashes occurred in this subsegment. This is located at Exit 36, Old Georgetown Road.
- The next highest frequency of crashes occurred at milepost 4.21. Approximately twelve percent (12%) of the total crashes occurred in this subsegment.
- There was one (1) alcohol related crash in the five-year period, accounting for approximately one percent (1%) of the total crashes.

Table B-4: Crash Data Summary for 2012 to 2016 (I-495 – I-270 Spur to MD 187)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	28	Opposite Dir	0
9:00 AM to 11:00 AM	22	Rear End	76
11:00 AM to 1:00 PM	11	Sideswipe	22
1:00 PM to 4:00 PM	41	Left Turn	0
4:00 PM to 7:00 PM	40	Angle	0
7:00 PM to 6:00 AM	48	Pedestrian	0
Total	**190**	Other Collision	38
Surface Condition	**# of Crashes**	Fixed Object: Bridge	2
Wet	77	Fixed Object: Guardrail/Barrier	43
Dry	108	Fixed Object: Light Pole	1
Snow/Ice	4	Fixed Object: Sign Pole	2
Other	1	Fixed Object: Embankment	1
Total	**190**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	30	Parked Vehicle	1
2013	26	**Total**	**190**
2014	33	**Contributing Factor**	**# of Crashes**
2015	54	Fail to give full Attention	52
2016	47	Too Fast for Conditions	45
Total	**190**	Followed too Closely	19
Illumination	**# of Crashes**	Other or Unknown	48
Day	133	Fail to Obey Other Control	0
Dawn / Dusk	7	Fail to Yield Right-of-way	1
Dark – Lights On	36	Influence of Alcohol	1
Dark – No Lights	7	Improper Lane Change	1
Other	7	Fail to Drive in Single Lane	19
Total	**190**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Improper Passing	1
Clear/Cloudy	134	Influence of Drugs	0
Foggy	0	Vehicle Defect	1
Raining	48	Physical/Mental Difficulty	1
Snow/Sleet	5	Exceeded Speed Limit	0
Other	3	Improper Turn	0
Total	**190**	Influence of Drugs	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Fail to Keep Right of Center	0
Injury	41	Stopping in Lane Roadway	0
Property Damage Only	149	Shoulders Low, Soft, or High	0
Total	**190**	**Total**	**190**
Segment Crash Rate=58.48 crashes per 100 million vehicle miles			

B-05 Crash Analysis – I-495 from MD 187 to MD 355

SHA provided crash data for the I-495 segment from MD 187 to MD 355 (milepost 5.62 to 6.71) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 443 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 206.22 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 56 crashes in 2012 and 78 crashes in 2013 to 73, 125, and 111 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-5**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 6.36-6.86 of this segment appear as a primary CSIS location for years 2012 to 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 144 crashes resulted in injuries while 299 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately thirty-three percent (33%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-eight percent (28%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- Approximately thirty percent (30%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 6.71. Approximately twenty-seven percent (27%) of the total crashes occurred in this subsegment. This is located at Exit 34, MD355 (Rockville Pike).
- The next highest frequency of crashes occurred at milepost 6.52. Approximately ten percent (10%) of the total crashes occurred in this subsegment.
- There were five (5) alcohol related crashes in the five-year period, accounting for approximately one percent (1%) of the total crashes.

Table B-5: Crash Data Summary for 2012 to 2016 (I-495 – MD 187 to MD 355)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	58	Opposite Dir	0
9:00 AM to 11:00 AM	51	Rear End	145
11:00 AM to 1:00 PM	32	Sideswipe	91
1:00 PM to 4:00 PM	75	Left Turn	0
4:00 PM to 7:00 PM	73	Angle	0
7:00 PM to 6:00 AM	154	Pedestrian	1
Total	**443**	Other Collision	78
Surface Condition	**# of Crashes**	Fixed Object: Bridge	12
Wet	225	Fixed Object: Guardrail/Barrier	100
Dry	213	Fixed Object: Light Pole	1
Snow/Ice	4	Fixed Object: Tree/Shrubbery	2
Unknown	1	Fixed Object: Curb	4
Total	**443**	Fixed Object: Contr. Barrier	4
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	56	Parked Vehicle	2
2013	78	**Total**	**443**
2014	73	**Contributing Factor**	**# of Crashes**
2015	125	Fail to give full Attention	108
2016	111	Too Fast for Conditions	113
Total	**443**	Followed too Closely	38
Illumination	**# of Crashes**	Other or Unknown	105
Day	243	Fail to Obey Other Control	1
Dawn / Dusk	22	Fail to Yield Right-of-way	8
Dark – Lights On	143	Influence of Alcohol	5
Dark – No Lights	23	Improper Lane Change	20
Other	12	Fail to Drive in Single Lane	21
Total	**443**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Animal	1
Clear/Cloudy	260	Influence of Drugs	2
Foggy	7	Vehicle Defect	2
Raining	162	Wet	4
Snow/Sleet	3	Exceeded Speed Limit	2
Other	11	Improper Turn	3
Total	**443**	Influence of Combined Subst.	1
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	0	Fail to Keep Right of Center	2
Injury	144	Stopping in Lane Roadway	3
Property Damage Only	299	Shoulders Low, Soft, or High	0
Total	**443**	**Total**	**443**
Segment Crash Rate=206.22 crashes per 100 million vehicle miles			

B-06 Crash Analysis – I-495 from MD 355 to MD 185

SHA provided crash data for the I-495 segment from MD 355 to MD 185 (milepost 6.71 to 8.24) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 869 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 288.20 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 118 crashes in 2012 and 139 crashes in 2013 to 130, 244, and 238 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-6**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 6.36 to 6.86 and mile points 7.99 to 8.49 appear as primary CSIS locations in 2014, 2015, and 2016. Mile points 6.46 to 6.96 appear as a primary CSIS location in 2012 and 2013. Lastly, mile points 7.11 to 7.61 appear as a secondary CSIS location in 2014.

Two (2) crashes resulted in two (2) fatalities. The first fatal crash occurred at night and involved a single westbound vehicle colliding with a fixed object at milepost 6.72. The second fatal crash occurred at night and involved a single vehicle colliding with a fixed object at milepost 8.24. Of the reported crashes, 281 crashes resulted in injuries while 586 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately thirty-nine percent (39%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-nine percent (29%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty percent (30%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.24. Approximately thirty-four percent (34%) of the total crashes occurred in this subsegment. This is located at Exit 33, MD 185 (Connecticut Avenue).
- The next highest frequency of crashes occurred at milepost 6.71. Approximately fourteen percent (14%) of the total crashes occurred in this subsegment. This is located at Exit 34, MD 355 (Rockville Pike).
- There were fifteen (15) alcohol related crashes in the five-year period, accounting for approximately two percent (2%) of the total crashes.

Table B-6: Crash Data Summary for 2012 to 2016 (I-495 – MD 355 to MD 185)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	124	Opposite Dir	0
9:00 AM to 11:00 AM	84	Rear End	336
11:00 AM to 1:00 PM	61	Sideswipe	140
1:00 PM to 4:00 PM	118	Left Turn	0
4:00 PM to 7:00 PM	139	Angle	0
7:00 PM to 6:00 AM	343	Pedestrian	1
Total	**869**	Other Collision	134
Surface Condition	**# of Crashes**	Fixed Object: Bridge	3
Wet	443	Fixed Object: Guardrail/Barrier	224
Dry	410	Fixed Object: Light Pole	4
Snow/Ice	5	Fixed Object: Contr. Barrier	5
Unknown	11	Fixed Object: Curb	5
Total	**869**	Fixed Object: Embankment	6
Reported Year	**# of Crashes**	Other Fixed Object	7
2012	118	Parked Vehicle	4
2013	139	**Total**	**869**
2014	130	**Contributing Factor**	**# of Crashes**
2015	244	Fail to give full Attention	218
2016	238	Too Fast for Conditions	210
Total	**869**	Followed too Closely	82
Illumination	**# of Crashes**	Other or Unknown	205
Day	449	Fail to Obey Other Control	2
Dawn / Dusk	36	Fail to Yield Right-of-way	5
Dark – Lights On	333	Influence of Alcohol	15
Dark – No Lights	33	Improper Lane Change	29
Other	18	Fail to Drive in Single Lane	61
Total	**869**	Fell Asleep, Fainted, etc.	8
Weather Condition	**# of Crashes**	Vehicle Defect	3
Clear/Cloudy	515	Improper Turn	3
Foggy	7	Wet	14
Raining	308	Physical/Mental Difficulty	1
Snow/Sleet	12	Fail to Keep Right of Center	2
Other	27	Improper Passing	3
Total	**869**	Rain, Snow	3
Severity	**# of Crashes**	Icy or Snow Covered	1
Fatal	2	Exceeded Speed Limit	1
Injury	281	Stopping in Lane Roadway	2
Property Damage Only	586	Animal	1
Total	**869**	**Total**	**869**
Segment Crash Rate=288.20 crashes per 100 million vehicle miles			

B-07 Crash Analysis – I-495 from MD 185 to MD 97

SHA provided crash data for the I-495 segment from MD 185 to MD 97 (milepost 8.24 to 10.44) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 1099 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 118.58 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar. The number of crashes along the study segment shows an increase from 131 crashes in 2012 and 208 crashes in 2013 to 169, 276, and 315 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-7**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 7.99 to 8.49 and mile points 10.14 to 10.69 appear as primary CSIS locations from 2012 to 2016. Mile points 9.44 to 9.94 and mile points 8.74 to 9.24 appear as secondary CSIS locations in 2013. Lastly, mile points 9.19 to 9.69 appear as a secondary CSIS location in 2014 and 2016.

Four (4) crashes resulted in six (6) fatalities. The first fatal crash occurred at night and involved a single eastbound vehicle and a fixed object at milepost 8.24. The second fatal crash occurred at night and involved a rear end between eastbound two vehicles traveling eastbound at milepost 8.33. The third fatal crash occurred at night and involved an unknown type of collision between two westbound vehicles at milepost 8.34. Lastly, the fourth fatal crash occurred during the night involving a single westbound vehicle at milepost 8.45. Of the reported crashes, 357 crashes resulted in injuries while 736 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-six percent (46%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately thirty-two percent (32%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.24. Approximately twenty-seven percent (27%) of the total crashes occurred in this subsegment. This is located at Exit 33, MD 185 (Connecticut Avenue).
- There were forty (40) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-7: Crash Data Summary for 2012 to 2016 (I-495 – MD 185 to MD 97)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	159	Opposite Dir	2
9:00 AM to 11:00 AM	102	Rear End	510
11:00 AM to 1:00 PM	85	Sideswipe	156
1:00 PM to 4:00 PM	172	Left Turn	0
4:00 PM to 7:00 PM	189	Angle	0
7:00 PM to 6:00 AM	392	Pedestrian	1
Total	**1099**	Other Collision	156
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	2
Wet	436	Fixed Object: Guardrail/Barrier	236
Dry	633	Fixed Object: Light Pole	5
Snow/Ice	13	Fixed Object: Sign Pole	3
Unknown	17	Fixed Object: Curb	5
Total	**1099**	Fixed Object: Contr. Barrier	7
Reported Year	**# of Crashes**	Other Fixed Object	12
2012	131	Parked Vehicle	4
2013	208	**Total**	**1099**
2014	169	**Contributing Factor**	**# of Crashes**
2015	276	Fail to give full Attention	261
2016	315	Too Fast for Conditions	245
Total	**1099**	Followed too Closely	122
Illumination	**# of Crashes**	Other or Unknown	269
Day	605	Fail to Obey Other Control	3
Dawn / Dusk	51	Fail to Yield Right-of-way	4
Dark – Lights On	382	Influence of Alcohol	40
Dark – No Lights	51	Improper Lane Change	37
Other	10	Fail to Drive in Single Lane	71
Total	**1099**	Fell Asleep, Fainted, etc.	11
Weather Condition	**# of Crashes**	Wet	13
Clear/Cloudy	728	Influence of Combined Subst.	1
Foggy	11	Vehicle Defect	5
Raining	306	Physical/Mental Difficulty	4
Snow/Sleet	14	Improper Parking	0
Other	40	Improper Turn	1
Total	**1099**	Improper Passing	2
Severity	**# of Crashes**	Debris or Obstruction	2
Fatal	6	Exceeded Speed Limit	2
Injury	357	Stopping in Lane Roadway	3
Property Damage Only	736	Rain, Snow	3
Total	**1099**	**Total**	**1099**
Segment Crash Rate=118.58 crashes per 100 million vehicle miles			

B-08 Crash Analysis – I-495 from MD 97 to US 29

SHA provided crash data for the I-495 segment from MD 97 to US 29 (milepost 10.44 to 11.88) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 616 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 106.60 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 83 crashes in 2012 and 96 crashes in 2013 to 113, 143, and 181 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-8**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 10.19 to 10.69 appear as a primary CSIS location from years 2012 to 2016. Mile points 11.63 to 12.13 appear as a primary CSIS location in 2012, 2014, 2015, and 2016.

Two (2) crashes resulted in two (2) fatalities. The first fatal crash occurred during the day because of an unknown probable cause and involved a single vehicle at milepost 10.44. The second fatal crash occurred during the night and involved a pedestrian stopping in the westbound roadway at milepost 11.38. Of the reported crashes, 229 crashes resulted in injuries while 385 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 10.44. Approximately thirty-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 31, MD 97 (Georgia Avenue).
- The next highest frequency of crashes occurred at milepost 11.88. Approximately eleven percent (11%) of the total crashes occurred in this subsegment. This is located at Exit 30, US 29 (Colesville Road).
- There were seventeen (17) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-8: Crash Data Summary for 2012 to 2016 (I-495 – MD 97 to US 29)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	81	Opposite Dir	2
9:00 AM to 11:00 AM	53	Rear End	346
11:00 AM to 1:00 PM	50	Sideswipe	93
1:00 PM to 4:00 PM	97	Left Turn	0
4:00 PM to 7:00 PM	122	Angle	0
7:00 PM to 6:00 AM	213	Pedestrian	3
Total	**616**	Other Collision	55
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	6
Wet	121	Fixed Object: Guardrail/Barrier	82
Dry	477	Fixed Object: Light Pole	3
Snow/Ice	11	Fixed Object: Sign Pole	3
Unknown	7	Fixed Object: Curb	10
Total	**616**	Fixed Object: Contr. Barrier	2
Reported Year	**# of Crashes**	Other Fixed Object	7
2012	83	Parked Vehicle	4
2013	96	**Total**	**616**
2014	113	**Contributing Factor**	**# of Crashes**
2015	143	Fail to give full Attention	152
2016	181	Too Fast for Conditions	94
Total	**616**	Followed too Closely	94
Illumination	**# of Crashes**	Other or Unknown	158
Day	356	Fail to Obey Other Control	1
Dawn / Dusk	29	Fail to Yield Right-of-way	6
Dark – Lights On	177	Influence of Alcohol	17
Dark – No Lights	40	Improper Lane Change	20
Other	14	Fail to Drive in Single Lane	44
Total	**616**	Fell Asleep, Fainted, etc.	12
Weather Condition	**# of Crashes**	Wet	2
Clear/Cloudy	497	Influence of Drugs	1
Foggy	3	Vehicle Defect	3
Raining	90	Physical/Mental Difficulty	4
Snow/Sleet	6	Improper Parking	2
Other	20	Improper Turn	1
Total	**616**	Improper Backing	1
Severity	**# of Crashes**	Road Under Construction	0
Fatal	2	Exceeded Speed Limit	1
Injury	229	Stopping in Lane Roadway	3
Property Damage Only	385	Operator using Cell Phone	0
Total	**616**	**Total**	**616**
Segment Crash Rate=106.60 crashes per 100 million vehicle miles			

B-09 Crash Analysis – I-495 from US 29 to MD 193

SHA provided crash data for the I-495 segment from US 29 to MD 193 (milepost 11.88 to 12.52) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 293 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 147.04 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 51 crashes in 2012 and 23 crashes in 2013 to 55, 87, and 77 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-9**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 11.63 to 12.13 appear as a primary CSIS location for the years 2012, 2015, and 2016. Mile points 12.27 to 12.77 appear as a primary CSIS location from 2014 to 2016 and as a secondary CSIS location in 2012.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a rear end between two eastbound vehicles at milepost 11.91. Of the reported crashes, 102 crashes resulted in injuries while 190 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-one percent (61%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately thirty-two percent (32%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 12.52. Approximately thirty-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 193 (University Boulevard East).
- The next highest frequency of crashes occurred at milepost 11.88. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 30, US 29 (Colesville Road).
- There were thirteen (13) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-9: Crash Data Summary for 2012 to 2016 (I-495 – US 29 to MD 193)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	34	Opposite Dir	0
9:00 AM to 11:00 AM	19	Rear End	180
11:00 AM to 1:00 PM	30	Sideswipe	47
1:00 PM to 4:00 PM	46	Left Turn	0
4:00 PM to 7:00 PM	59	Angle	0
7:00 PM to 6:00 AM	105	Pedestrian	0
Total	**293**	Other Collision	28
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	1
Wet	36	Fixed Object: Guardrail/Barrier	23
Dry	249	Fixed Object: Light Pole	3
Snow/Ice	3	Fixed Object: Contr. Barrier	1
Unknown	5	Fixed Object: Curb	3
Total	**293**	Fixed Object: Embankment	1
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	51	Parked Vehicle	1
2013	23	**Total**	**293**
2014	55	**Contributing Factor**	**# of Crashes**
2015	87	Fail to give full Attention	74
2016	77	Too Fast for Conditions	38
Total	**293**	Followed too Closely	44
Illumination	**# of Crashes**	Other or Unknown	78
Day	164	Influence of Drugs	2
Dawn / Dusk	17	Fail to Yield Right-of-way	1
Dark – Lights On	93	Influence of Alcohol	13
Dark – No Lights	14	Improper Lane Change	5
Other	5	Fail to Drive in Single Lane	21
Total	**293**	Fell Asleep, Fainted, etc.	10
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	261	Sleet, Hail, Freezing, Rain	1
Foggy	0	Debris or Obstruction	1
Raining	21	Improper Right Turn on Red	1
Snow/Sleet	3	Fail to Keep Right of Center	2
Other	8	Influence of Medication	1
Total	**293**	Rain, Snow	0
Severity	**# of Crashes**	Icy or Snow Covered	0
Fatal	1	Exceeded Speed Limit	0
Injury	102	Stopping in Lane Roadway	0
Property Damage Only	190	Animal	0
Total	**293**	**Total**	**293**
Segment Crash Rate=147.04 crashes per 100 million vehicle miles			

B-10 Crash Analysis – I-495 from MD 193 to MD 650

SHA provided crash data for the I-495 segment from MD 193 to MD 650 (milepost 12.52 to 14.10) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 440 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is crashes 73.52 per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 61 crashes in 2013 to 101, 104, and 104 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-10**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 13.85 to 14.35 appear as a secondary CSIS location for the years 2012, 2013, 2015, and 2016. Mile points 12.27 to 12.57 appear as a primary CSIS location in 2014, 2015, and 2016 and a secondary CSIS location in 2012. Mile points 13.6 to 14.1 appear as a primary CSIS location in 2014 and a secondary CSIS location in 2016.

There are were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 166 crashes resulted in injuries while 274 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-one percent (61%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately twelve percent (12%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 12.52. Approximately twenty-two percent (22%) of the total crashes occurred in this subsegment. This is located at Exit 29, MD 193 (University Boulevard East).
- The next highest frequency of crashes occurred at milepost 14.10. Approximately twenty-one percent (21%) of the total crashes occurred in this subsegment. This is located at Exit 28, MD 650 (New Hampshire Avenue).
- There were fourteen (14) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-10: Crash Data Summary for 2012 to 2016 (I-495 – MD 193 to MD 650)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	65	Opposite Dir	0
9:00 AM to 11:00 AM	40	Rear End	270
11:00 AM to 1:00 PM	39	Sideswipe	80
1:00 PM to 4:00 PM	67	Left Turn	0
4:00 PM to 7:00 PM	79	Angle	0
7:00 PM to 6:00 AM	150	Pedestrian	0
Total	**440**	Other Collision	37
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	3
Wet	56	Fixed Object: Guardrail/Barrier	27
Dry	369	Fixed Object: Light Pole	5
Snow/Ice	6	Fixed Object: Other Pole	4
Unknown	9	Fixed Object: Curb	5
Total	**440**	Fixed Object: Embankment	3
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	70	Parked Vehicle	1
2013	61	**Total**	**440**
2014	101	**Contributing Factor**	**# of Crashes**
2015	104	Fail to give full Attention	122
2016	104	Too Fast for Conditions	55
Total	**440**	Followed too Closely	65
Illumination	**# of Crashes**	Other or Unknown	109
Day	261	Fail to Obey Traffic Signal	1
Dawn / Dusk	18	Fail to Yield Right-of-way	3
Dark – Lights On	127	Influence of Alcohol	14
Dark – No Lights	25	Improper Lane Change	16
Other	9	Fail to Drive in Single Lane	27
Total	**440**	Fell Asleep, Fainted, etc.	13
Weather Condition	**# of Crashes**	Vehicle Defect	2
Clear/Cloudy	379	Influence of Drugs	4
Foggy	0	Influence of Medication	0
Raining	36	Physical/Mental Difficulty	2
Snow/Sleet	8	Fail to Keep Right of Center	1
Other	17	Improper Backing	1
Total	**440**	Sleet, Hail, Freezing Rain	1
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	0	Exceeded Speed Limit	0
Injury	166	Stopping in Lane Roadway	2
Property Damage Only	274	Animal	1
Total	**440**	**Total**	**440**
Segment Crash Rate=73.52 crashes per 100 million vehicle miles			

B-11 Crash Analysis – I-495 from MD 650 to I-95

SHA provided crash data for the I-495 segment from MD 650 to I-95 (milepost 0 to 1.74 in PG Co. and 14.11 to 14.38 in Montgomery Co.) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 420 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 46.18 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 74 crashes in 2013 to 116 in 2014 and 84 and 88 in 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-11**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 0.36 to 0.86 in 2013, mile point 0.09 to 0.59 in 2014 and mile point 0.68 to 1.18 in 2016 all appear as secondary CSIS locations.

Three (3) crashes resulted in three (3) fatalities. The first fatal crash occurred in 2013 at night and involved a sideswipe which was alcohol related at mile point 0.7. The second was a rear end which also occurred in 2013 at night in the eastbound direction at mile point 0.87. The last fatal crash was a rear end crash that occurred in 2016 during the night in the eastbound at mile point 1.04. Of the reported crashes, 130 crashes resulted in injuries while 287 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-six percent (46%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately nineteen percent (19%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately eighteen (18%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.04 in Prince George's County. Approximately ten percent (10%) of the total crashes occurred in this subsegment. This is located at the on-ramp from I-95X SB to EB I-495.
- There were twenty-four (24) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table B-11: Crash Data Summary for 2012 to 2016 (MD 650 to I-95)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	68	Opposite Dir	2
9:00 AM to 11:00 AM	47	Rear End	195
11:00 AM to 1:00 PM	28	Sideswipe	77
1:00 PM to 4:00 PM	59	Left Turn	0
4:00 PM to 7:00 PM	74	Angle	0
7:00 PM to 6:00 AM	144	Pedestrian	0
Total	**420**	Other Collision	61
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	77	Fixed Object: Guardrail/Barrier	57
Dry	315	Fixed Object: Contr. Barrier	11
Snow/Ice	13	Fixed Object: Curb	1
Other	15	Fixed Object: Embankment	4
Total	**420**	Fixed Object: Other Pole	2
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	58	Parked Vehicle	6
2013	74	**Total**	**420**
2014	116	**Contributing Factor**	**# of Crashes**
2015	84	Fail to give full Attention	95
2016	88	Too Fast for Conditions	65
Total	**420**	Followed too Closely	44
Illumination	**# of Crashes**	Other or Unknown	101
Day	233	Improper Backing	1
Dawn / Dusk	25	Fail to Yield Right-of-way	3
Dark – Lights On	91	Influence of Alcohol	17
Dark – No Lights	57	Improper Lane Change	24
Other	14	Fail to Drive in Single Lane	30
Total	**420**	Fell Asleep, Fainted, etc.	10
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	315	Rain, Snow	0
Foggy	0	Physical/Mental Difficulty	1
Raining	77	Debris or Obstruction	1
Snow/Sleet	13	Fail to Obey Other Control	3
Other	15	Influence of Drugs	2
Total	**420**	Improper Backing	9
Severity	**# of Crashes**	Illegally in Roadway	9
Fatal	3	Stopping in Lane Roadway	2
Injury	130	Wet	1
Property Damage Only	287	Improper Turn	1
Total	**420**	**Total**	**420**
Segment Crash Rate=46.18 crashes per 100 million vehicle miles			

B-12 Crash Analysis – I-495 from MD 210 to I-295

SHA provided crash data for the I-495 segment from MD 210 to I-295 (milepost 1.75 to 2.75) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 205 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 67.38 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 30 crashes in 2012 and 27 crashes in 2013 to an increase to 36, 47, and 65 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-12**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 2.56 to 3.06 appear as a primary CSIS location in 2014 and 2016 and as a secondary CSIS location in 2015. Mile points 1.36 to 1.86 appear as a primary CSIS location in 2015 and as a secondary CSIS location in 2014.

One (1) crash resulted in one (1) fatality. Of the reported crashes, 61 crashes resulted in injuries while 143 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-seven percent (57%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- Sideswipe crashes were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately forty-three percent (43%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.75. Approximately fourteen percent (14%) of the total crashes occurred in this subsegment. This is located at Exit 3, MD 210 (Indian Head Highway).
- The next highest frequency of crashes occurred between milepost 1.75 and 1.754. Approximately twelve percent (12%) of the total crashes occurred in this subsegment. This is located between Exit 2 (I-295) and Exit 3 (MD 210).
- There were eleven (11) alcohol related crashes in the five-year period, accounting for approximately four percent (5%) of the total crashes.

Table B-12: Crash Data Summary for 2012 to 2016 (MD 210 to I-295)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	55	Opposite Dir	0
9:00 AM to 11:00 AM	22	Rear End	116
11:00 AM to 1:00 PM	16	Sideswipe	26
1:00 PM to 4:00 PM	25	Left Turn	0
4:00 PM to 7:00 PM	33	Angle	0
7:00 PM to 6:00 AM	54	Pedestrian	1
Total	**205**	Other Collision	21
Surface Condition	**# of Crashes**	Fixed Object: Contr. Barrier	1
Wet	45	Fixed Object: Guardrail/Barrier	32
Dry	141	Fixed Object: Light Pole	1
Snow/Ice	7	Fixed Object: Culvert/Ditch	1
Unknown	12	Fixed Object: Tree/Shrubbery	1
Total	**205**	Fixed Object: Other Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	0
2012	30	Parked Vehicle	4
2013	27	**Total**	**205**
2014	36	**Contributing Factor**	**# of Crashes**
2015	47	Fail to give full Attention	42
2016	65	Too Fast for Conditions	27
Total	**205**	Followed too Closely	37
Illumination	**# of Crashes**	Other or Unknown	51
Day	129	Failure to Keep Right of Center	2
Dawn / Dusk	15	Fail to Yield Right-of-way	1
Dark – Lights On	44	Influence of Alcohol	9
Dark – No Lights	12	Improper Lane Change	6
Other	5	Fail to Drive in Single Lane	19
Total	**205**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	161	Improper Backing	2
Foggy	0	Improper Signal	1
Raining	34	Lic. Restr. Non-Compliance	1
Snow/Sleet	6	Improper Passing	1
Other	4	Influence of Drugs	1
Total	**205**	Rain, Snow	0
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	1	Illegally in Roadway	1
Injury	61	Animal	1
Property Damage Only	143	Vision Obstruction	0
Total	**205**	**Total**	**205**
Segment Crash Rate=67.38 crashes per 100 million vehicle miles			

B-13 Crash Analysis – I-495 from MD 414 to MD 210

SHA provided crash data for the I-495 segment from MD 414 to MD 210 (milepost 2.75 to 4.33) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 298 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 64.03 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 39 crashes in 2012 and 46 crashes in 2013 to 58, 61, and 94 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-13**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 4.08 to 4.58 appear as a primary CSIS location from 2013 to 2016 and as a secondary CSIS location in 2012. Mile points 2.56 to 3.06 appear as a primary CSIS location in 2014 and 2016 and as a secondary CSIS location in 2015.

Five (5) crashes resulted in five (5) fatalities. Of the reported crashes, 88 crashes resulted in injuries while 205 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-six percent (46%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- The third most common type of crash was categorized as Fixed Object and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately forty-four percent (44%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 4.33. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 414 (St. Barnabas Road).
- The next highest frequency of crashes occurred at milepost 4.31. Approximately five percent (5%) of the total crashes occurred in this subsegment. This is located at within the Exit 4, interchange.
- There were sixteen (16) alcohol related crashes in the five-year period, accounting for approximately five percent (5%) of the total crashes.

Table B-13: Crash Data Summary for 2012 to 2016 (MD 414 to MD 210)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	70	Opposite Dir	0
9:00 AM to 11:00 AM	24	Rear End	136
11:00 AM to 1:00 PM	17	Sideswipe	62
1:00 PM to 4:00 PM	32	Left Turn	0
4:00 PM to 7:00 PM	60	Angle	0
7:00 PM to 6:00 AM	95	Pedestrian	0
Total	**298**	Other Collision	49
Surface Condition	**# of Crashes**	Fixed Object: Curb	1
Wet	44	Fixed Object: Guardrail/Barrier	35
Dry	230	Fixed Object: Light Pole	3
Snow/Ice	10	Fixed Object: Embankment	1
Unknown	14	Fixed Object: Tree/Shrubbery	2
Total	**298**	Fixed Object: Sign Pole	2
Reported Year	**# of Crashes**	Other Fixed Object	4
2012	39	Parked Vehicle	3
2013	46	**Total**	**298**
2014	58	**Contributing Factor**	**# of Crashes**
2015	61	Fail to give full Attention	66
2016	94	Too Fast for Conditions	36
Total	**298**	Followed too Closely	28
Illumination	**# of Crashes**	Other or Unknown	66
Day	181	Failure to Keep Right of Center	2
Dawn / Dusk	19	Fail to Yield Right-of-way	1
Dark – Lights On	73	Influence of Alcohol	13
Dark – No Lights	22	Improper Lane Change	19
Other	3	Fail to Drive in Single Lane	40
Total	**298**	Fell Asleep, Fainted, etc.	8
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	247	Improper backing	4
Foggy	1	Improper Turn	1
Raining	34	Lic. Restr. Non-Compliance	1
Snow/Sleet	10	Fail to Ober Other Control	2
Other	6	Influence of Drugs	2
Total	**298**	Rain, Snow	2
Severity	**# of Crashes**	Debris or Obstruction	3
Fatal	5	Exceeded Speed Limit	1
Injury	88	Animal	1
Property Damage Only	205	Vision Obstruction	1
Total	**298**	**Total**	**298**
Segment Crash Rate=64.03 crashes per 100 million vehicle miles			

B-14 Crash Analysis – I-495 from MD 5 to MD 414

SHA provided crash data for the I-495 segment from MD 5 to MD 414 (milepost 4.33 to 7.3) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 546 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 64.85 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 71 crashes in 2012 and 101 crashes in 2013 to 100, 122, and 152 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-14**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 7.05 to 7.55 appear as a primary CSIS location from 2012 to 2016. Mile points 4.08 to 4.58 appear as a primary CSIS location from 2013 to 2016 and as a secondary CSIS location in 2012.

Two (2) crashes resulted in two (2) fatalities. The first fatal crash occurred at night and involved two northbound vehicles colliding with an unspecific crash type at mile point 5.66. The second fatal crash occurred during the day and involved a single northbound vehicle hitting a fixed object at mile point 5.70. Of the reported crashes, 182 crashes resulted in injuries while 362 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-three percent (43%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately twenty percent (20%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 7.3. Approximately fifteen percent (15%) of the total crashes occurred in this subsegment. This is located at Exit 7, MD 5 (Branch Avenue).
- The next highest frequency of crashes occurred at milepost 4.33. Approximately twelve percent (12%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 144 (St. Barnabas Road).
- There were twenty-two (22) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-14: Crash Data Summary for 2012 to 2016 (MD 5 to MD 414)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	88	Opposite Dir	2
9:00 AM to 11:00 AM	44	Rear End	236
11:00 AM to 1:00 PM	27	Sideswipe	113
1:00 PM to 4:00 PM	75	Left Turn	0
4:00 PM to 7:00 PM	115	Angle	0
7:00 PM to 6:00 AM	197	Pedestrian	1
Total	**546**	Other Collision	107
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	3
Wet	69	Fixed Object: Guardrail/Barrier	66
Dry	434	Fixed Object: Light Pole	4
Snow/Ice	18	Fixed Object: Embankment	4
Unknown	25	Fixed Object: Tree/Shrubbery	5
Total	**546**	Fixed Object: Sign Pole	2
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	71	Parked Vehicle	1
2013	101	**Total**	**546**
2014	100	**Contributing Factor**	**# of Crashes**
2015	122	Fail to give full Attention	99
2016	152	Too Fast for Conditions	63
Total	**546**	Followed too Closely	65
Illumination	**# of Crashes**	Other or Unknown	132
Day	308	Influence of Drugs	3
Dawn / Dusk	29	Fail to Yield Right-of-way	3
Dark – Lights On	114	Influence of Alcohol	27
Dark – No Lights	90	Improper Lane Change	32
Other	5	Fail to Drive in Single Lane	75
Total	**546**	Fell Asleep, Fainted, etc.	18
Weather Condition	**# of Crashes**	Vehicle Defect	3
Clear/Cloudy	460	Physical/Mental Difficulty	4
Foggy	1	Icy or Snow Covered	1
Raining	56	Operator using Cell Phone	2
Snow/Sleet	16	Fail to Ober Other Control	2
Other	13	Influence of Medication	1
Total	**546**	Wrong Way on One Way	1
Severity	**# of Crashes**	Debris or Obstruction	2
Fatal	2	Exceeded Speed Limit	6
Injury	182	Stopping in Lane Roadway	4
Property Damage Only	362	Animal	1
Total	**546**	**Total**	**544**
Segment Crash Rate=64.85 crashes per 100 million vehicle miles			

B-15 Crash Analysis – I-495 from Forestville Road to MD 5

SHA provided crash data for the I-495 segment from Forestville Road to MD 5 (milepost 7.30 to 9.69) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 520 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 63.23 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 75 crashes in 2012 and 96 crashes in 2013 to 119, 104, and 126 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-15**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 7.05 to 7.55 appear as a primary CSIS location from 2012 to 2016. Mile points 8.72 to 9.22 appear as a primary CSIS location in 2013 and as a secondary CSIS location in 2014. Mile points 9.6 to 10.1 appear as a primary CSIS location in 2014.

Five (5) crashes resulted in five (5) fatalities. The first fatal crash occurred at night and involved an opposite direction collision between two vehicles at mile point 7.33. The second fatal crash occurred during the day and was a sideswipe between two southbound vehicles at mile point 7.55. The third fatal crash occurred at night and involved a rear end of two southbound vehicles at mile point 7.80. The fourth fatal crash occurred at night and involved a rear end between two southbound vehicles at mile point 9.07. Lastly, the fifth fatal crash occurred at night and involved a sideswipe between two southbound vehicles at mile point 9.55. Of the reported crashes, 169 crashes resulted in injuries while 346 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty percent (40%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-three percent (23%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately nineteen percent (19%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 7.30. Approximately sixteen percent (16%) of the total crashes occurred in this subsegment. This is located at Exit 7, MD 5 (Branch Avenue).
- There were thirty (30) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table B-15: Crash Data Summary for 2012 to 2016 (I-495 – Forestville Road to MD 5)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	76	Opposite Dir	4
9:00 AM to 11:00 AM	39	Rear End	207
11:00 AM to 1:00 PM	26	Sideswipe	120
1:00 PM to 4:00 PM	72	Left Turn	0
4:00 PM to 7:00 PM	114	Angle	0
7:00 PM to 6:00 AM	193	Pedestrian	1
Total	**520**	Other Collision	101
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	83	Fixed Object: Guardrail/Barrier	54
Dry	398	Fixed Object: Light Pole	3
Snow/Ice	23	Fixed Object: Embankment	4
Unknown	16	Fixed Object: Tree/Shrubbery	5
Total	**520**	Fixed Object: Sign Pole	5
Reported Year	**# of Crashes**	Other Fixed Object	14
2012	75	Parked Vehicle	1
2013	96	**Total**	**520**
2014	119	**Contributing Factor**	**# of Crashes**
2015	104	Fail to give full Attention	84
2016	126	Too Fast for Conditions	55
Total	**520**	Followed too Closely	57
Illumination	**# of Crashes**	Other or Unknown	134
Day	274	Influence of Drugs	7
Dawn / Dusk	27	Fail to Yield Right-of-way	4
Dark – Lights On	134	Influence of Alcohol	30
Dark – No Lights	77	Improper Lane Change	24
Other	8	Fail to Drive in Single Lane	71
Total	**520**	Fell Asleep, Fainted, etc.	21
Weather Condition	**# of Crashes**	Vehicle Defect	9
Clear/Cloudy	428	Physical/Mental Difficulty	2
Foggy	1	Animal	1
Raining	57	Improper Passing	2
Snow/Sleet	23	Fail to Ober Other Control	3
Other	11	Influence of Medication	3
Total	**520**	Rain, Snow	3
Severity	**# of Crashes**	Improper Backing	4
Fatal	5	Exceeded Speed Limit	2
Injury	169	Stopping in Lane Roadway	3
Property Damage Only	346	Wrong Way on One Way	1
Total	**520**	**Total**	**520**
Segment Crash Rate=63.23 crashes per 100 million vehicle miles			

B-16 Crash Analysis – I-495 from MD 4 to Forestville Road

SHA provided crash data for the I-495 segment from MD 4 to Forestville Road (milepost 9.69 to 10.78) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 448 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 78.52 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 62 crashes in 2012 and 68 crashes in 2013 to 108, 99, and 111 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-16**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 10.53 to 11.03 appear as a primary CSIS location from 2012 to 2016. Mile points 9.60 to 10.10 appear as a primary CSIS location in 2014.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a single northbound vehicle that collided into a fixed object at mile point 9.99. Of the reported crashes, 145 crashes resulted in injuries while 302 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-five percent (45%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-three percent (23%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.12. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 11, MD 4 (Pennsylvania Avenue).
- The next highest frequency of crashes occurred at milepost 9.99. Approximately four percent (4%) of the total crashes occurred in this subsegment. This is located at the bridge over Suitland Parkway.
- There were seventeen (17) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-16: Crash Data Summary for 2012 to 2016 (MD 4 to Forestville Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	69	Opposite Dir	0
9:00 AM to 11:00 AM	42	Rear End	200
11:00 AM to 1:00 PM	26	Sideswipe	102
1:00 PM to 4:00 PM	82	Left Turn	0
4:00 PM to 7:00 PM	83	Angle	0
7:00 PM to 6:00 AM	146	Pedestrian	0
Total	**448**	Other Collision	66
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	84	Fixed Object: Guardrail/Barrier	55
Dry	343	Fixed Object: Light Pole	7
Snow/Ice	6	Fixed Object: Embankment	3
Unknown	15	Fixed Object: Tree/Shrubbery	3
Total	**448**	Fixed Object: Sign Pole	3
Reported Year	**# of Crashes**	Other Fixed Object	7
2012	62	Parked Vehicle	1
2013	68	**Total**	**448**
2014	108	**Contributing Factor**	**# of Crashes**
2015	99	Fail to give full Attention	76
2016	111	Too Fast for Conditions	47
Total	**448**	Followed too Closely	69
Illumination	**# of Crashes**	Other or Unknown	114
Day	277	Failure to Keep Right of Center	3
Dawn / Dusk	13	Fail to Yield Right-of-way	3
Dark – Lights On	102	Influence of Alcohol	17
Dark – No Lights	51	Improper Lane Change	28
Other	5	Fail to Drive in Single Lane	48
Total	**448**	Fell Asleep, Fainted, etc.	13
Weather Condition	**# of Crashes**	Vehicle Defect	7
Clear/Cloudy	355	Improper Backing	1
Foggy	3	Physical/Mental Difficulty	2
Raining	67	Influence of Medication	2
Snow/Sleet	7	Fail to Ober Other Control	2
Other	16	Influence of Drugs	4
Total	**448**	Rain, Snow	4
Severity	**# of Crashes**	Debris or Obstruction	4
Fatal	1	Stopping in Lane Roadway	2
Injury	145	Improper Passing	1
Property Damage Only	302	Fail to Ober Traffic Signal	1
Total	**448**	**Total**	**448**
Segment Crash Rate=78.52 crashes per 100 million vehicle miles			

B-17 Crash Analysis – I-495 from Marlboro Road to MD 4

SHA provided crash data for the I-495 segment from Marlboro Road to MD 4 (milepost 10.78 to 13.14) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 648 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 71.21 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 82 crashes in 2012 and 148 crashes in 2013 to 127, 136, and 155 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-17**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 10.53 to 11.03 appear as a primary CSIS location from 2012 to 2016. Mile points 12.89 to 13.39 appear as a primary CSIS location from 2013 to 2016.

Three (3) crashes resulted in three (3) fatalities. The first fatal crash occurred at night and involved a rear end between two southbound vehicles at mile point 12.97. The second fatal crash occurred at night and involved a sideswipe between two southbound vehicles at mile point 13.11. The third fatal crash occurred at night and involved a rear end between two southbound vehicles at milepost 13.14. Of the reported crashes, 220 crashes resulted in injuries while 425 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-seven percent (47%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-three percent (23%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty-one percent (31%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 13.14. Approximately nineteen percent (19%) of the total crashes occurred in this subsegment. This is located at Exit 13, Ritchie Marlboro Road.
- The next highest frequency of crashes occurred at milepost 10.78. Approximately sixteen percent (16%) of the total crashes occurred in this subsegment. This is located at Exit 11, MD 4 (Pennsylvania Avenue).
- There were twenty-two (22) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-17: Crash Data Summary for 2012 to 2016 (Marlboro Road to MD 4)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	104	Opposite Dir	2
9:00 AM to 11:00 AM	42	Rear End	302
11:00 AM to 1:00 PM	44	Sideswipe	150
1:00 PM to 4:00 PM	119	Left Turn	0
4:00 PM to 7:00 PM	100	Angle	0
7:00 PM to 6:00 AM	239	Pedestrian	0
Total	**648**	Other Collision	103
Surface Condition	**# of Crashes**	Fixed Object: Curb	1
Wet	94	Fixed Object: Guardrail/Barrier	68
Dry	522	Fixed Object: Light Pole	6
Snow/Ice	8	Fixed Object: Embankment	2
Unknown	24	Fixed Object: Tree/Shrubbery	2
Total	**648**	Fixed Object: Sign Pole	6
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	82	Parked Vehicle	1
2013	148	**Total**	**648**
2014	127	**Contributing Factor**	**# of Crashes**
2015	136	Fail to give full Attention	124
2016	155	Too Fast for Conditions	65
Total	**648**	Followed too Closely	97
Illumination	**# of Crashes**	Other or Unknown	165
Day	368	Influence of Drugs	4
Dawn / Dusk	30	Fail to Yield Right-of-way	4
Dark – Lights On	145	Influence of Alcohol	22
Dark – No Lights	98	Improper Lane Change	32
Other	7	Fail to Drive in Single Lane	75
Total	**648**	Fell Asleep, Fainted, etc.	18
Weather Condition	**# of Crashes**	Vehicle Defect	11
Clear/Cloudy	539	Physical/Mental Difficulty	1
Foggy	2	Wet	1
Raining	78	Improper Passing	1
Snow/Sleet	7	Fail to Ober Other Control	4
Other	22	Influence of Medication	4
Total	**648**	Rain, Snow	3
Severity	**# of Crashes**	Debris or Obstruction	7
Fatal	3	Exceeded Speed Limit	2
Injury	220	Stopping in Lane Roadway	4
Property Damage Only	425	Failure to Keep Right of Center	4
Total	**648**	**Total**	**648**
Segment Crash Rate=71.21 crashes per 100 million vehicle miles			

B-18 Crash Analysis – I-495 from MD 214 to Marlboro Road

SHA provided crash data for the I-495 segment from MD 214 to Marlboro Road (milepost 13.14 to 14.78) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 491 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 48.96 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 62 crashes in 2012 and 117 crashes in 2013 to 80, 103, and 129 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-18**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 12.89 to 13.39 appear as a primary CSIS location from 2012 to 2016. Mile points 14.53 to 15.03 appear as a primary CSIS location from 2012 to 2016.

Six (6) crashes resulted in six (6) fatalities. Of the reported crashes, 180 crashes resulted in injuries while 305 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-seven percent (47%) of the total crashes.
- The second most common type of crash was categorized as Sideswipe and accounted for approximately eighteen percent (18%) of the total crashes.
- Fixed Objects crashes were the third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 13.40. Approximately twenty-five percent (25%) of the total crashes occurred in this subsegment. This is located at Exit 13 on I-95/I-495.
- The next highest frequency of crashes occurred at milepost 14.78. Approximately seventeen percent (%) of the total crashes occurred in this subsegment. This is located at Exit 15 on I-95/I-495.
- There were six (6) alcohol related crashes in the five-year period, accounting for approximately one percent (1%) of the total crashes.

Table B-18: Crash Data Summary for 2012 to 2016 (MD 214 to Marlboro Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	92	Opposite Dir	1
9:00 AM to 11:00 AM	42	Rear End	231
11:00 AM to 1:00 PM	39	Sideswipe	87
1:00 PM to 4:00 PM	78	Left Turn	0
4:00 PM to 7:00 PM	88	Angle	0
7:00 PM to 6:00 AM	152	Pedestrian	2
Total	**491**	Other Collision	97
Surface Condition	**# of Crashes**	Fixed Object: Contr. Barrier	1
Wet	72	Fixed Object: Guardrail/Barrier	54
Dry	402	Fixed Object: Light Pole	1
Snow/Ice	4	Fixed Object: Embankment	1
Unknown	13	Fixed Object: Tree/Shrubbery	4
Total	**491**	Fixed Object: Sign Pole	3
Reported Year	**# of Crashes**	Other Fixed Object	8
2012	62	Parked Vehicle	1
2013	117	**Total**	**491**
2014	80	**Contributing Factor**	**# of Crashes**
2015	103	Fail to give full Attention	91
2016	129	Too Fast for Conditions	63
Total	**491**	Followed too Closely	77
Illumination	**# of Crashes**	Other or Unknown	106
Day	301	Wet	6
Dawn / Dusk	26	Fail to Yield Right-of-way	2
Dark – Lights On	96	Influence of Alcohol	20
Dark – No Lights	63	Improper Lane Change	31
Other	5	Fail to Drive in Single Lane	59
Total	**491**	Fell Asleep, Fainted, etc.	16
Weather Condition	**# of Crashes**	Vehicle Defect	2
Clear/Cloudy	423	Physical/Mental Difficulty	1
Foggy	4	Improper Turn	1
Raining	46	Lic. Restr. Non-Compliance	1
Snow/Sleet	5	Fail to Ober Other Control	5
Other	13	Influence of Drugs	3
Total	**491**	Rain, Snow	1
Severity	**# of Crashes**	Debris or Obstruction	3
Fatal	6	Exceeded Speed Limit	1
Injury	180	Stopping in Lane Roadway	1
Property Damage Only	305	Road Under Construction	1
Total	**491**	**Total**	**491**
Segment Crash Rate=48.96 crashes per 100 million vehicle miles			

B-19 Crash Analysis – I–495 from Arena Drive to MD 214

SHA provided crash data for the I-495 segment from Arena Drive to MD 214 (milepost 14.78 to 15.83) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 333 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 77.65 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 47 crashes in 2012 and 62 crashes in 2013 to 48, 82, and 94 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-19**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 14.48-14.98 of this segment appear as a primary CSIS location from 2012 to 2016.

Two (2) crashes resulted in two (2) fatalities. The first fatal crash occurred during the night and involved a rear end between two southbound vehicles at milepost 15.28. The second fatal crash occurred during the night and involved a head on collision with one northbound and one southbound vehicle at milepost 15.58. Of the reported crashes, 97 crashes resulted in injuries while 234 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-eight percent (48%) of the total crashes.
- Sideswipes were the second most common type of crash and accounted for approximately twenty-four percent (24%) of the total crashes.
- The third most common type of crash was categorized at “Other” and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 14.78. Approximately thirty percent (30%) of the total crashes occurred in this subsegment. This is located at Exit 15, MD 214 (Central Avenue).
- The next highest frequency of crashes occurred at milepost 15.83. Approximately thirteen percent (13%) of the total crashes occurred in this subsegment. This is located at Exit 16, MD 202 (Arena Drive).
- There were eleven (11) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-19: Crash Data Summary for 2012 to 2016 (I-495 – Arena Drive to MD 214)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	48	Opposite Dir	1
9:00 AM to 11:00 AM	22	Rear End	160
11:00 AM to 1:00 PM	22	Sideswipe	80
1:00 PM to 4:00 PM	53	Left Turn	0
4:00 PM to 7:00 PM	75	Angle	0
7:00 PM to 6:00 AM	113	Pedestrian	0
Total	**333**	Other Collision	46
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	35	Fixed Object: Guardrail/Barrier	35
Dry	274	Fixed Object: Light Pole	2
Snow/Ice	2	Fixed Object: Construction Barrier	1
Unknown	22	Fixed Object: Crash Attenuator	3
Total	**333**	Fixed Object: Tree/Shrubbery	0
Reported Year	**# of Crashes**	Other Fixed Object	3
2012	47	Parked Vehicle	1
2013	62	**Total**	**333**
2014	48	**Contributing Factor**	**# of Crashes**
2015	82	Fail to give full Attention	68
2016	94	Too Fast for Conditions	28
Total	**333**	Followed too Closely	53
Illumination	**# of Crashes**	Other or Unknown	77
Day	188	Fail to Obey Other Control	3
Dawn / Dusk	16	Fail to Yield Right-of-way	3
Dark – Lights On	83	Influence of Alcohol	11
Dark – No Lights	44	Improper Lane Change	26
Other	2	Fail to Drive in Single Lane	36
Total	**333**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Fail to Obey Traffic Signal	3
Clear/Cloudy	296	Improper passing	3
Foggy	0	Vehicle Defect	3
Raining	29	Physical or mental difficulty	1
Snow/Sleet	2	Exceeded Speed Limit	2
Other	6	Improper Turn	1
Total	**333**	Under influence of alcohol	3
Severity	**# of Crashes**	Wet	2
Fatal	2	Animal	1
Injury	97	Wrong way on one way	2
Property Damage Only	234	Sleet, Hail, Freezing Rain	2
Total	**333**	**Total**	**333**
Segment Crash Rate=77.65 crashes per 100 million vehicle miles			

B-20 Crash Analysis – I-495 from MD 202 to Arena Drive

SHA provided crash data for the I-495 segment from MD 202 to Arena Drive (milepost 15.83 to 16.56) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 299 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 107.20 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 35 crashes in 2012 and 38 crashes in 2013 to 72, 57, and 97 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-20**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 16.33 to 16.83 appear as a primary location from 2012 to 2016. Mile points 15.74-16.24 appear as a secondary CSIS location in 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred during the night and involved a rear end between two southbound vehicles at milepost 16.55. Of the reported crashes, 95 crashes resulted in injuries while 203 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-nine percent (49%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-seven percent (27%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was at milepost 16.56. Approximately thirty-six percent (36%) of the total crashes occurred in this subsegment. This is located at Exit 17, MD 202 (Landover Road).
- The next highest frequency of crashes occurred at milepost 15.83. Approximately fourteen percent (14%) of the total crashes occurred in this subsegment. This is located at Exit 16, Arena Drive.
- There were ten (10) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table B-20: Crash Data Summary for 2012 to 2016 (I-495 – MD 202 to Arena Drive)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	31	Opposite Dir	0
9:00 AM to 11:00 AM	22	Rear End	148
11:00 AM to 1:00 PM	25	Sideswipe	80
1:00 PM to 4:00 PM	60	Left Turn	0
4:00 PM to 7:00 PM	72	Angle	0
7:00 PM to 6:00 AM	89	Pedestrian	0
Total	**299**	Other Collision	27
Surface Condition	**# of Crashes**	Fixed Object: Crash Attenuator	1
Wet	49	Fixed Object: Guardrail/Barrier	32
Dry	236	Fixed Object: Light Pole	3
Snow/Ice	3	Fixed Object: Sign Pole	3
Unknown	11	Fixed Object: Curb	2
Total	**299**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	35	Parked Vehicle	1
2013	38	**Total**	**299**
2014	72	**Contributing Factor**	**# of Crashes**
2015	57	Fail to give full Attention	73
2016	97	Too Fast for Conditions	20
Total	**299**	Followed too Closely	41
Illumination	**# of Crashes**	Other or Unknown	79
Day	185	Fail to Obey Other Control	2
Dawn / Dusk	10	Fail to Yield Right-of-way	3
Dark – Lights On	69	Influence of Alcohol	10
Dark – No Lights	29	Improper Lane Change	22
Other	6	Fail to Drive in Single Lane	31
Total	**299**	Fell Asleep, Fainted, etc.	6
Weather Condition	**# of Crashes**	Rain, Snow	2
Clear/Cloudy	244	Influence of Drugs	1
Foggy	2	Vehicle Defect	1
Raining	36	Physical/Mental Difficulty	1
Snow/Sleet	4	Improper Passing	1
Other	13	Improper Turn	1
Total	**299**	Influence of Combined Subst.	1
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	1	Fail to Keep Right of Center	1
Injury	95	Stopping in Lane Roadway	1
Property Damage Only	203	Operator using Cell Phone	1
Total	**299**	**Total**	**299**
Segment Crash Rate=107.20 crashes per 100 million vehicle miles			

B-21 Crash Analysis – I-495 from US 50 to MD 202

SHA provided crash data for the I-495 segment from US 50 to MD 202 (milepost 16.56 to 18.54) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 694 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 86.80 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 76 crashes in 2012 and 110 crashes in 2013 to 166, 145, and 197 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-21**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 16.31 to 16.81 appear as a primary CSIS location from 2012 to 2016. Mile points 18.29 to 18.79 appear as a primary CSIS location from 2014 to 2016 and as a secondary CSIS location in 2013.

Three (3) crashes resulted in three (3) fatalities. The first fatal crash occurred at night and involved a northbound vehicle and a pedestrian at milepost 16.64. The second fatal crash occurred at night and involved an unknown collision type of a southbound vehicle at milepost 18.52. The third fatal crash occurred at night and involved a rear end between two southbound vehicles at milepost 18.53. Of the reported crashes, 230 crashes resulted in injuries while 461 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-eight percent (48%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 18.54. Approximately sixteen percent (16%) of the total crashes occurred in this subsegment. This is located at Exit 19, I-595 (John Hanson Highway).
- There were twenty-seven (27) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-21: Crash Data Summary for 2012 to 2016 (I-495 – US 50 to MD 202)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	85	Opposite Dir	2
9:00 AM to 11:00 AM	65	Rear End	334
11:00 AM to 1:00 PM	55	Sideswipe	173
1:00 PM to 4:00 PM	100	Left Turn	0
4:00 PM to 7:00 PM	142	Angle	0
7:00 PM to 6:00 AM	247	Pedestrian	1
Total	**694**	Other Collision	83
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	2
Wet	117	Fixed Object: Guardrail/Barrier	78
Dry	536	Fixed Object: Light Pole	3
Snow/Ice	7	Fixed Object: Contr. Barrier	4
Unknown	34	Fixed Object: Curb	2
Total	**694**	Fixed Object: Sign Pole	5
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	76	Parked Vehicle	2
2013	110	**Total**	**694**
2014	166	**Contributing Factor**	**# of Crashes**
2015	145	Fail to give full Attention	151
2016	197	Too Fast for Conditions	77
Total	**694**	Followed too Closely	98
Illumination	**# of Crashes**	Other or Unknown	160
Day	401	Influence of Drugs	4
Dawn / Dusk	29	Fail to Yield Right-of-way	5
Dark – Lights On	168	Influence of Alcohol	27
Dark – No Lights	78	Improper Lane Change	46
Other	18	Fail to Drive in Single Lane	83
Total	**694**	Fell Asleep, Fainted, etc.	14
Weather Condition	**# of Crashes**	Vehicle Defect	3
Clear/Cloudy	573	Physical/Mental Difficulty	2
Foggy	3	Debris or Obstruction	4
Raining	91	Wet	1
Snow/Sleet	5	Fail to Ober Other Control	6
Other	22	Influence of Medication	0
Total	**694**	Rain, Snow	4
Severity	**# of Crashes**	Operator Using Cell Phone	1
Fatal	3	Exceeded Speed Limit	3
Injury	230	Stopping in Lane Roadway	3
Property Damage Only	461	Lic. Restr. Non-compliance	2
Total	**694**	**Total**	**694**
Segment Crash Rate=86.80 crashes per 100 million vehicle miles			

B-22 Crash Analysis – I-495 from MD 450 to US 50

SHA provided crash data for the I-495 segment from MD 450 to US 50 (milepost 18.54 to 19.59) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 488 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 120.52 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 74 crashes in 2013 to 97, 101 and 146 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-22**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 19.50 to 20.00 appear as a primary CSIS location from 2012 to 2016. Mile points 18.29 to 18.79 appear as a primary CSIS location from 2013 to 2016 and as a secondary CSIS location in 2012.

Two (2) crashes resulted in two (2) fatalities. Of the reported crashes, 166 crashes resulted in injuries while 320 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty-two percent (32%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred between mileposts 19:57 and 19.59. Approximately thirty-three percent (33%) of the total crashes occurred in this subsegment. This is located at Exit 20, MD 450 (Annapolis Road).
- The next highest frequency of crashes occurred between milepost 18.55. Approximately five percent (5%) of the total crashes occurred in this subsegment. This is located at Exit 19, I-595 (John Hanson Highway).
- There were twenty-eight (28) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table B-22: Crash Data Summary for 2012 to 2016 (MD 450 to US 50)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	73	Opposite Dir	0
9:00 AM to 11:00 AM	44	Rear End	243
11:00 AM to 1:00 PM	39	Sideswipe	106
1:00 PM to 4:00 PM	78	Left Turn	0
4:00 PM to 7:00 PM	81	Angle	0
7:00 PM to 6:00 AM	173	Pedestrian	0
Total	**488**	Other Collision	50
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	90	Fixed Object: Guardrail/Barrier	72
Dry	380	Fixed Object: Light Pole	1
Snow/Ice	9	Fixed Object: Curb	3
Unknown	9	Fixed Object: Tree/Shrubbery	1
Total	**488**	Fixed Object: Other Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	70	Parked Vehicle	9
2013	74	**Total**	**488**
2014	97	**Contributing Factor**	**# of Crashes**
2015	101	Fail to give full Attention	111
2016	146	Too Fast for Conditions	61
Total	**488**	Followed too Closely	59
Illumination	**# of Crashes**	Other or Unknown	110
Day	273	Failure to Keep Right of Center	3
Dawn / Dusk	24	Fail to Yield Right-of-way	4
Dark – Lights On	142	Influence of Alcohol	28
Dark – No Lights	30	Improper Lane Change	28
Other	19	Fail to Drive in Single Lane	47
Total	**488**	Fell Asleep, Fainted, etc.	12
Weather Condition	**# of Crashes**	Vehicle Defect	5
Clear/Cloudy	391	Rain, Snow	1
Foggy	1	Physical/Mental Difficulty	1
Raining	71	Debris or Obstruction	1
Snow/Sleet	6	Fail to Obey Other Control	4
Other	19	Influence of Drugs	4
Total	**488**	Lic. Restr. Non-compliance	1
Severity	**# of Crashes**	Improper Turn	1
Fatal	2	Stopping in Lane Roadway	6
Injury	166	Influence of Medication	1
Property Damage Only	320	Exceeded Speed Limit	0
Total	**488**	**Total**	**488**
Segment Crash Rate=120.52 crashes per 100 million vehicle miles			

B-23 Crash Analysis – I-495 from MD 295 to MD 450

SHA provided crash data for the I-495 segment from MD 295 to MD 450 (milepost 19.59 to 22.12) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 800 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 85.11 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 137 crashes in 2012 and 113 crashes in 2013 to 140, 176 and 234 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-23**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 21.97 to 22.47 and mile points 19.5 to 20.0 appear as primary CSIS locations from 2012 to 2016. Mile points 20.59 to 21.09 appear as a primary CSIS location in 2016.

Two (2) crashes resulted in two (2) fatalities. The fatal crash occurred at night and involved a southbound vehicle striking a pedestrian at mile point 21.95. The second fatal crash occurred during the day and involved a rear end between two northbound vehicles at mile point 22.08. Of the reported crashes, 299 crashes resulted in injuries while 299 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately thirty-five percent (35%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.12. Approximately twenty-two percent (22%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 295 (Baltimore Washington Parkway).
- The next highest frequency of crashes occurred at milepost 19.59. Approximately seventeen percent (17%) of the total crashes occurred in this subsegment. This is located at Exit 20, MD 450 (Annapolis Road).
- There were thirty-seven (37) alcohol related crashes in the five-year period, accounting for approximately five percent (5%) of the total crashes.

Table B-23: Crash Data Summary for 2012 to 2016 (MD 295 to MD 450)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	106	Opposite Dir	1
9:00 AM to 11:00 AM	67	Rear End	477
11:00 AM to 1:00 PM	61	Sideswipe	138
1:00 PM to 4:00 PM	140	Left Turn	0
4:00 PM to 7:00 PM	177	Angle	0
7:00 PM to 6:00 AM	249	Pedestrian	2
Total	**800**	Other Collision	71
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	2
Wet	128	Fixed Object: Guardrail/Barrier	94
Dry	643	Fixed Object: Light Pole	4
Snow/Ice	17	Fixed Object: Embankment	0
Unknown	12	Fixed Object: Tree/Shrubbery	4
Total	**800**	Fixed Object: Sign Pole	3
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	137	Parked Vehicle	2
2013	113	**Total**	**800**
2014	140	**Contributing Factor**	**# of Crashes**
2015	176	Fail to give full Attention	200
2016	234	Too Fast for Conditions	125
Total	**800**	Followed too Closely	115
Illumination	**# of Crashes**	Other or Unknown	192
Day	469	Failure to Keep Right of Center	3
Dawn / Dusk	31	Fail to Yield Right-of-way	3
Dark – Lights On	189	Influence of Alcohol	37
Dark – No Lights	80	Improper Lane Change	41
Other	31	Fail to Drive in Single Lane	39
Total	**800**	Fell Asleep, Fainted, etc.	12
Weather Condition	**# of Crashes**	Vehicle Defect	6
Clear/Cloudy	659	Improper Backing	3
Foggy	3	Physical/Mental Difficulty	2
Raining	94	Influence of Medication	4
Snow/Sleet	15	Fail to Ober Other Control	7
Other	29	Influence of Drugs	3
Total	**800**	Rain, Snow	3
Severity	**# of Crashes**	Wet	2
Fatal	2	Stopping in Lane Roadway	1
Injury	299	Shoulders Low, Soft, or High	1
Property Damage Only	499	Ice or Snow Covered	1
Total	**800**	**Total**	**800**
Segment Crash Rate=85.11 crashes per 100 million vehicle miles			

B-24 Crash Analysis – I-495 from MD 201 to MD 295

SHA provided crash data for the I-495 segment from MD 201 to MD 295 (milepost 22.12 to 23.04) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 542 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 154.33 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 110 crashes in 2012 and 88 crashes in 2013 to 72, 99, and 173 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-24**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 21.87 to 22.37 appear as a primary CSIS location from 2012 to 2016. Mile points 22.79 to 23.29 appear as a primary CSIS location in 2012, 2014, 2015, and 2016 and as a secondary CSIS location in 2013.

There are were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 182 crashes resulted in injuries while 360 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately nineteen percent (19%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately twelve percent (12%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.12. Approximately thirty-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 295 (Baltimore Washington Parkway).
- The next highest frequency of crashes occurred at milepost 23.04. Approximately twenty-two percent (22%) of the total crashes occurred in this subsegment. This is located at Exit 23, MD 201 (Kenilworth Avenue).
- There were twenty-four (24) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-24: Crash Data Summary for 2012 to 2016 (MD 201 to MD 295)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	73	Opposite Dir	0
9:00 AM to 11:00 AM	64	Rear End	318
11:00 AM to 1:00 PM	38	Sideswipe	103
1:00 PM to 4:00 PM	88	Left Turn	0
4:00 PM to 7:00 PM	113	Angle	0
7:00 PM to 6:00 AM	166	Pedestrian	1
Total	**542**	Other Collision	51
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	62	Fixed Object: Guardrail/Barrier	46
Dry	458	Fixed Object: Light Pole	6
Snow/Ice	13	Fixed Object: Embankment	3
Unknown	9	Fixed Object: Tree/Shrubbery	4
Total	**542**	Fixed Object: Sign Pole	2
Reported Year	**# of Crashes**	Other Fixed Object	4
2012	110	Parked Vehicle	3
2013	88	**Total**	**542**
2014	72	**Contributing Factor**	**# of Crashes**
2015	99	Fail to give full Attention	134
2016	173	Too Fast for Conditions	62
Total	**542**	Followed too Closely	83
Illumination	**# of Crashes**	Other or Unknown	138
Day	333	Wet	1
Dawn / Dusk	24	Fail to Yield Right-of-way	11
Dark – Lights On	130	Influence of Alcohol	24
Dark – No Lights	35	Improper Lane Change	18
Other	20	Fail to Drive in Single Lane	36
Total	**542**	Fell Asleep, Fainted, etc.	13
Weather Condition	**# of Crashes**	Vehicle Defect	4
Clear/Cloudy	471	Physical/Mental Difficulty	1
Foggy	1	Fail to Keep Right of Center	3
Raining	49	Operator using Cell Phone	1
Snow/Sleet	9	Fail to Ober Other Control	6
Other	12	Influence of Medication	1
Total	**542**	Rain, Snow	1
Severity	**# of Crashes**	Debris or Obstruction	1
Fatal	0	Exceeded Speed Limit	1
Injury	182	Stopping in Lane Roadway	1
Property Damage Only	360	Improper Backing	2
Total	**542**	**Total**	**542**
Segment Crash Rate=154.33 crashes per 100 million vehicle miles			

B-25 Crash Analysis – I-495 from 0.4 MI S of US 1 to MD 201

SHA provided crash data for the I-495 segment from 0.4 MI S of US 1 to MD 201 (milepost 23.04 to 24.79) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 425 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 64.01 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. A total of 425 crashes were reported along the I-495 study segment during the five-year study. The number of crashes along the study segment shows an increase from 101 crashes in 2012 and 74 crashes in 2013 to 58, 81, and 111 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-25**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 22.79 to 23.29 appear as a primary CSIS location in 2012, 2014, 2015, and 2016 and a secondary CSIS location in 2013.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 157 crashes resulted in injuries while 268 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-five percent (55%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately nineteen percent (19%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 23.04. Approximately twenty-eight percent (28%) of the total crashes occurred in this subsegment. This is located at Exit 23, MD 201 (Kenilworth Avenue).
- The next highest frequency of crashes occurred at milepost 24.25. Approximately five percent (5%) of the total crashes occurred in this subsegment. This is located at Exit 24, Greenbelt Commuter Station Road.
- There were twenty-five (25) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table B-25: Crash Data Summary for 2012 to 2016 (I-495 – 0.4 MI S of US 1 to MD 201)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	59	Opposite Dir	2
9:00 AM to 11:00 AM	45	Rear End	234
11:00 AM to 1:00 PM	29	Sideswipe	80
1:00 PM to 4:00 PM	53	Left Turn	0
4:00 PM to 7:00 PM	103	Angle	0
7:00 PM to 6:00 AM	136	Pedestrian	1
Total	**425**	Other Collision	36
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	0
Wet	66	Fixed Object: Guardrail/Barrier	63
Dry	346	Fixed Object: Light Pole	2
Snow/Ice	5	Fixed Object: Embankment	1
Unknown	8	Fixed Object: Tree/Shrubbery	2
Total	**425**	Fixed Object: Sign Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	2
2012	101	Parked Vehicle	1
2013	74	**Total**	**425**
2014	58	**Contributing Factor**	**# of Crashes**
2015	81	Fail to give full Attention	97
2016	111	Too Fast for Conditions	54
Total	**425**	Followed too Closely	69
Illumination	**# of Crashes**	Other or Unknown	80
Day	249	Influence of Drugs	2
Dawn / Dusk	24	Fail to Yield Right-of-way	6
Dark – Lights On	111	Influence of Alcohol	25
Dark – No Lights	27	Improper Lane Change	27
Other	14	Fail to Drive in Single Lane	32
Total	**425**	Fell Asleep, Fainted, etc.	11
Weather Condition	**# of Crashes**	Vehicle Defect	3
Clear/Cloudy	359	Physical/Mental Difficulty	1
Foggy	0	Debris or Obstruction	2
Raining	51	Improper Passing	1
Snow/Sleet	3	Fail to Ober Other Control	2
Other	12	Influence of Medication	1
Total	**425**	Rain, Snow	1
Severity	**# of Crashes**	Improper Backing	2
Fatal	0	Exceeded Speed Limit	2
Injury	157	Stopping in Lane Roadway	2
Property Damage Only	268	Fail to Keep Right of Center	5
Total	**425**	**Total**	**425**
Segment Crash Rate=64.01 crashes per 100 million vehicle miles			

B-26 Crash Analysis – I-495 from US 1 to 0.4 MI S of US 1

SHA provided crash data for the I-495 segment from US 1 to 0.4 MI S of US 1(milepost 24.69 to 25.19) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 301 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 149.30 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 53 crashes in 2013 to 44, 58 and 88 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-26**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 24.94 to 25.44 appear as a primary CSIS location from 2012 to 2016.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 95 crashes resulted in injuries while 206 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-one percent (51%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-six percent (26%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 25.19. Approximately fifty percent (50%) of the total crashes occurred in this subsegment. This is located at Exit 25, US 1 (Baltimore Avenue).
- The next highest frequency of crashes occurred at milepost 25.17. Approximately seven percent (7%) of the total crashes occurred in this subsegment.
- There were thirteen (13) alcohol related crashes in the five-year period, accounting for approximately four percent (4%) of the total crashes.

Table B-26: Crash Data Summary for 2012 to 2016 (US 1 to 0.4 MI S of US 1)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	47	Opposite Dir	0
9:00 AM to 11:00 AM	31	Rear End	153
11:00 AM to 1:00 PM	24	Sideswipe	78
1:00 PM to 4:00 PM	41	Left Turn	0
4:00 PM to 7:00 PM	68	Angle	0
7:00 PM to 6:00 AM	90	Pedestrian	1
Total	**301**	Other Collision	29
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	37	Fixed Object: Guardrail/Barrier	32
Dry	259	Fixed Object: Light Pole	1
Snow/Ice	2	Fixed Object: Embankment	1
Unknown	3	Fixed Object: Tree/Shrubbery	2
Total	**301**	Fixed Object: Crash Attenuator	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	58	Parked Vehicle	1
2013	53	**Total**	**301**
2014	44	**Contributing Factor**	**# of Crashes**
2015	58	Fail to give full Attention	69
2016	88	Too Fast for Conditions	30
Total	**301**	Followed too Closely	35
Illumination	**# of Crashes**	Other or Unknown	85
Day	186	Failure to Keep Right of Center	2
Dawn / Dusk	11	Fail to Yield Right-of-way	3
Dark – Lights On	75	Influence of Alcohol	13
Dark – No Lights	19	Improper Lane Change	16
Other	10	Fail to Drive in Single Lane	21
Total	**301**	Fell Asleep, Fainted, etc.	9
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	263	Improper Passing	2
Foggy	0	Physical/Mental Difficulty	1
Raining	31	Debris or Obstruction	3
Snow/Sleet	2	Fail to Obey Other Control	2
Other	5	Influence of Drugs	3
Total	**301**	Animal	2
Severity	**# of Crashes**	Improper Parking	1
Fatal	0	Stopping in Lane Roadway	1
Injury	95	Failure to Obey Traffic Signal	1
Property Damage Only	206	Exceeded Speed Limit	1
Total	**301**	**Total**	**301**
Segment Crash Rate=149.3 crashes per 100 million vehicle miles			

B-27 Crash Analysis – I-495 from I-495 to US 1

SHA provided crash data for the I-495 segment from I-495 to US 1 (milepost 25.19 to 26.11) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 439 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 121.44 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 78 crashes in 2012 and 69 crashes in 2013 to 66 in 2014, and an increase to 87, and 139 in 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-27**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 24.99 to 25.49 appear as a primary CSIS location from 2012 to 2016. Mile points 25.87 to 26.37 appear as a secondary CSIS location in 2013 and 2016.

There were no fatal crashes in the study segment between 2012 to 2016. Of the reported crashes, 132 crashes resulted in injuries while 307 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-five percent (45%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately twenty-four percent (24%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 25.19. Approximately thirty-four percent (34%) of the total crashes occurred in this subsegment. This is located at Exit 25, US 1 (Baltimore Avenue).
- The next highest frequency of crashes occurred at milepost 26.11. Approximately thirteen percent (13%) of the total crashes occurred in this subsegment. This is located at Exit 27, I-495 Capital Beltway.
- There were twenty (20) alcohol related crashes in the five-year period, accounting for approximately five percent (5%) of the total crashes.

Table B-27: Crash Data Summary for 2012 to 2016 (I-495 – I-495 to US 1)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	78	Opposite Dir	0
9:00 AM to 11:00 AM	44	Rear End	198
11:00 AM to 1:00 PM	38	Sideswipe	105
1:00 PM to 4:00 PM	64	Left Turn	0
4:00 PM to 7:00 PM	87	Angle	0
7:00 PM to 6:00 AM	128	Pedestrian	1
Total	**439**	Other Collision	64
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	4
Wet	54	Fixed Object: Guardrail/Barrier	51
Dry	360	Fixed Object: Light Pole	1
Snow/Ice	13	Fixed Object: Embankment	2
Unknown	12	Fixed Object: Tree/Shrubbery	5
Total	**439**	Fixed Object: Sign Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	5
2012	78	Parked Vehicle	2
2013	69	**Total**	**439**
2014	66	**Contributing Factor**	**# of Crashes**
2015	87	Fail to give full Attention	107
2016	139	Too Fast for Conditions	50
Total	**439**	Followed too Closely	43
Illumination	**# of Crashes**	Other or Unknown	121
Day	274	Influence of Drugs	5
Dawn / Dusk	19	Fail to Yield Right-of-way	2
Dark – Lights On	93	Influence of Alcohol	20
Dark – No Lights	35	Improper Lane Change	25
Other	18	Fail to Drive in Single Lane	33
Total	**439**	Fell Asleep, Fainted, etc.	7
Weather Condition	**# of Crashes**	Vehicle Defect	3
Clear/Cloudy	364	Physical/Mental Difficulty	2
Foggy	1	Animal	3
Raining	42	Improper Passing	5
Snow/Sleet	10	Fail to Ober Other Control	2
Other	22	Influence of Medication	1
Total	**439**	Rain, Snow	1
Severity	**# of Crashes**	Improper Backing	1
Fatal	0	Exceeded Speed Limit	4
Injury	132	Stopping in Lane Roadway	1
Property Damage Only	307	Failure to Keep Right of Center	3
Total	**439**	**Total**	**439**
Segment Crash Rate=121.44 crashes per 100 million vehicle miles			

B-28 Crash Analysis – I-495 from I-495 to I-95X

SHA provided crash data for the I-495 segment from I-495 to I-95X (milepost 26.11 to 26.78) covering the five-year period from January 1, 2012 to December 31, 2016.

A total of 111 crashes were reported along the I-495 study segment during the five-year study period. The crash rate for the study segment is 36.61 crashes per 100 million vehicle miles (MVM), which is below the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 19 crashes in 2012 and 20 crashes in 2013 to 18, 17, and 37 in 2014, 2015 and 2016, respectively. A summary of the crash data is shown in **Table B-28**.

A review of the Candidate Safety Improvement Section (CSIS) list revealed that mile points 25.74 to 26.24 appear as a secondary CSIS location in 2013 and 2016.

One (1) crash resulted in one (1) fatality. The fatal crash occurred at night and involved a rear end between two westbound vehicles at mile point 26.21. Of the reported crashes, 21 crashes resulted in injuries while 89 resulted in property damage only.

Additional analysis of the crash data revealed the following trends during the five-year study period from 2012 through 2016:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-four percent (44%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-six percent (26%) of the total crashes.
- The third most common type of crash was categorized as “Other” and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 26.11. Approximately forty-eight percent (48%) of the total crashes occurred in this subsegment. This is located at the I-495 and I-95 interchange.
- The next highest frequency of crashes occurred at milepost 26.2. Approximately seven percent (7%) of the total crashes occurred in this subsegment.
- There were seven (7) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table B-28: Crash Data Summary for 2012 to 2016 (I-495 – I-495 to I-95X)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	20	Opposite Dir	0
9:00 AM to 11:00 AM	6	Rear End	49
11:00 AM to 1:00 PM	4	Sideswipe	15
1:00 PM to 4:00 PM	18	Left Turn	0
4:00 PM to 7:00 PM	21	Angle	0
7:00 PM to 6:00 AM	42	Pedestrian	0
Total	**111**	Other Collision	18
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	2
Wet	22	Fixed Object: Guardrail/Barrier	18
Dry	82	Fixed Object: Sign Pole	2
Snow/Ice	4	Fixed Object: Other Pole	1
Unknown	3	Fixed Object: Culvert/Ditch	3
Total	**111**	Fixed Object: Embankment	2
Reported Year	**# of Crashes**	Other Fixed Object	1
2012	19	Parked Vehicle	0
2013	20	**Total**	**111**
2014	18	**Contributing Factor**	**# of Crashes**
2015	17	Fail to give full Attention	34
2016	37	Too Fast for Conditions	18
Total	**111**	Followed too Closely	10
Illumination	**# of Crashes**	Other or Unknown	23
Day	51	Fail to Obey Traffic Signal	0
Dawn / Dusk	14	Fail to Yield Right-of-way	0
Dark – Lights On	23	Influence of Alcohol	7
Dark – No Lights	17	Improper Lane Change	6
Other	6	Fail to Drive in Single Lane	6
Total	**111**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Vehicle Defect	1
Clear/Cloudy	86	Influence of Drugs	1
Foggy	0	Wet	1
Raining	17	Physical/Mental Difficulty	0
Snow/Sleet	3	Fail to Keep Right of Center	1
Other	5	Improper Backing	0
Total	**111**	Rain,Snow	1
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	1	Exceeded Speed Limit	0
Injury	21	Stopping in Lane Roadway	0
Property Damage Only	89	Animal	0
Total	**111**	**Total**	**111**
Segment Crash Rate=36.61 crashes per 100 million vehicle miles			

SECTION C: 2017 Crash Analysis - I-270

C-01 2017 Crash Analysis – I-270 from I-495 to MD 187

SHA provided crash data for the I-270 segment from I-495 to MD 187 (milepost 0.00 to 1.54) covering the period from January 1, 2017 to December 31, 2017.

A total of eighty-two (82) crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 130.40 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a slight decrease from 90 crashes in 2016. A summary of the 2017 crash data is shown in Table C-01.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 24 crashes resulted in injuries while 58 resulted in property damage only. There were no pedestrian-related crashes in 2017.

The contributing factors for forty-five percent (45%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately seventy percent (70%) of the total crashes.
- The second most common type of crash was categorized as "Other" which also accounted for approximately eleven percent (11%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately 10 percent (10%) of the total crashes.
- Sideswipe crashes accounted for approximately ten percent (10%) of the total crashes.
- Approximately fifty-four percent (54%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.54. Approximately thirty- seven percent (37%) of the total crashes occurred in this subsegment. This is located at Exit 1A, Old Georgetown Rd.
- There were four (4) alcohol related crashes, which is five percent (5%) of the total crashes in the study period.

Table C-01: Crash Data Summary for 2017 (I-270 – I-495 to MD 187)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	7	Opposite Dir	0
9:00 AM to 11:00 AM	4	Rear End	57
11:00 AM to 1:00 PM	5	Sideswipe	8
1:00 PM to 4:00 PM	11	Left Turn	0
4:00 PM to 7:00 PM	37	Angle	0
7:00 PM to 6:00 AM	18	Pedestrian	0
Total	**82**	Other Collision	9
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	17	Fixed Object: Guardrail/Barrier	7
Dry	60	Fixed Object: Light Pole	1
Snow/Ice	0	Fixed Object: Other Pole	0
Other	5	Fixed Object: Tree/Shrubbery	0
Total	**82**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	82	Parked Vehicle	0
		Total	**82**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	18
		Too Fast for Conditions	19
Total	**82**	Followed too Closely	11
Illumination	**# of Crashes**	Other or Unknown	20
Day	48	Fail to Obey Traffic Signal	0
Dawn / Dusk	6	Fail to Yield Right-of-way	1
Dark – Lights On	23	Influence of Alcohol	4
Dark – No Lights	4	Improper Lane Change	1
Other	1	Fail to Drive in Single Lane	6
Total	**82**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Rain, Snow	0
Clear/Cloudy	63	Exceeded Speed Limit	0
Foggy	0	Influence of Medication	0
Raining	11	Physical/Mental Difficulty	0
Snow/Sleet	1	Wrong Way on One Way	0
Other	7	Improper Turn	0
Total	**82**	Animal	0
Severity	**# of Crashes**	Lic. Restr. Non-compliance	0
Fatal	0	Fail to Keep Right of Center	0
Injury	24	Stopping in Lane Roadway	0
Property Damage Only	58	Debris or Obstruction	0
Total	**82**	**Total**	**82**
Segment Crash Rate=130.40 crashes per 100 million vehicle miles			

C-02 2017 Crash Analysis – I-270 from MD 187 to I-270

SHA provided crash data for the I-270 segment from MD 187 to I-270 (milepost 1.54 to 2.68) covering the study period from January 1, 2017 to December 31, 2017.

A total of 53 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 108.30 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 40 crashes in 2012 to 44 crashes in 2013, 45 crashes in 2014, 53 crashes in 2015, 58 crashes in 2016, and a slight decrease to 53 crashes in 2017. A summary of the crash data for 2017 is shown in **Table C-02**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 21 crashes resulted in injuries while 32 resulted in property damage only. There were no pedestrian-related crashes.

Fifty-one percent (51%) of all crashes were due to, “Fail to give full Attention” and “Speeds too Fast for Conditions.” Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-two percent (62%) of the total crashes.
- Collisions with fixed objects were the second, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- The third most common type of crash was categorized as “Other” which also accounted for approximately nine percent (9%) of the total crashes.
- Sideswipe crashes accounted for approximately eight percent (8%) of the total crashes.
- Approximately forty-three percent (43%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.83. Approximately thirty-seven percent (37%) of the total crashes occurred in this subsegment. This is located at Exit 1B, MD 187B Rockledge Blvd.
- There was one (1) alcohol related crash during the study period.

Table C-02: Crash Data Summary for 2017 (I-270 – MD 187 to I-270)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	4	Opposite Dir	0
9:00 AM to 11:00 AM	4	Rear End	33
11:00 AM to 1:00 PM	3	Sideswipe	4
1:00 PM to 4:00 PM	6	Left Turn	0
4:00 PM to 7:00 PM	19	Angle	0
7:00 PM to 6:00 AM	17	Pedestrian	0
Total	**53**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	12	Fixed Object: Guardrail/Barrier	11
Dry	38	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Other Pole	0
Other	3	Fixed Object: Culvert/Ditch	0
Total	**53**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	53	Parked Vehicle	0
		Total	**53**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	18
		Too Fast for Conditions	9
Total	**53**	Followed too Closely	3
Illumination	**# of Crashes**	Other or Unknown	18
Day	30	Fail to Obey Traffic Signal	0
Dawn / Dusk	0	Fail to Yield Right-of-way	0
Dark – Lights On	21	Influence of Alcohol	1
Dark – No Lights	2	Improper Lane Change	3
Other	0	Fail to Drive in Single Lane	0
Total	**53**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Improper Backing	0
Clear/Cloudy	38	Rain, Snow	0
Foggy	0	Exceeded Speed Limit	1
Raining	8	Physical/Mental Difficulty	0
Snow/Sleet	0	Wrong Way on One Way	0
Other	7	Improper Turn	0
Total	**53**	Animal	0
Severity	**# of Crashes**	Lic. Restr. Non-compliance	0
Fatal	0	Fail to Keep Right of Center	0
Injury	21	Stopping in Lane Roadway	0
Property Damage Only	32	Shoulders Low, Soft, or High	0
Total	**53**	**Total**	**53**
Segment Crash Rate=108.30 crashes per 100 million vehicle miles			

C-03 2017 Crash Analysis – I-270 from I-270Y to Montrose Road

SHA provided crash data for the I-270 segment from I-270Y to Montrose Road (milepost 2.39 to 4.14) covering the period from January 1, 2017 to December 31, 2017.

A total of 108 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 46.40 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 47 crashes in 2013 to 56, 76, 92 in 2014, 2015, 2016, respectfully; and an increase to 108 in 2017. A summary of the 2017 crash data is shown in **Table C-03**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 42 crashes resulted in injuries while 66 resulted in property damage only.

Forty-two percent (42%) of all crashes were due to, “Failure to give full Attention” and “Following too Closely”. Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- Sideswipes where the second most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Another common type of crash was categorized as “Other” which accounted for approximately twelve percent (12%) of the total crashes
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 4.14. Approximately thirty-three percent (33%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 927 (Montrose Road).
- There were four (4) alcohol related crashes in the study year period, accounting for approximately four percent (4%) of the total crashes.

Table C-03: Crash Data Summary for 2017 (I-270 – I-270Y to Montrose Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	26	Opposite Dir	1
9:00 AM to 11:00 AM	16	Rear End	64
11:00 AM to 1:00 PM	5	Sideswipe	16
1:00 PM to 4:00 PM	10	Left Turn	0
4:00 PM to 7:00 PM	15	Angle	0
7:00 PM to 6:00 AM	36	Pedestrian	0
Total	**108**	Other Collision	13
Surface Condition	**# of Crashes**	Fixed Object: Curb	3
Wet	21	Fixed Object: Guardrail/Barrier	5
Dry	86	Fixed Object: Light Pole	3
Snow/Ice	1	Fixed Object: Fence	1
Other	0	Fixed Object: Culvert/Ditch	0
Total	**108**	Fixed Object: Contr. Barrier	2
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	108	Parked Vehicle	0
		Total	**108**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	31
		Too Fast for Conditions	11
Total	**108**	Followed too Closely	14
Illumination	**# of Crashes**	Other or Unknown	27
Day	55	Fail to Obey Traffic Signal	0
Dawn / Dusk	7	Fail to Yield Right-of-way	0
Dark – Lights On	44	Influence of Alcohol	4
Dark – No Lights	0	Improper Lane Change	8
Other	2	Fail to Drive in Single Lane	4
Total	**108**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Exceeded Speed Limit	2
Clear/Cloudy	84	Wet	0
Foggy	0	Vehicle Defect	0
Raining	11	Physical/Mental Difficulty	1
Snow/Sleet	1	Wrong Way on One Way	0
Other	12	Improper Parking	1
Total	**108**	Animal	0
Severity	**# of Crashes**	Lic. Restr. Non-compliance	0
Fatal	0	Fail to Keep Right of Center	0
Injury	42	Stopping in Lane Roadway	0
Property Damage Only	66	Shoulders Low, Soft, or High	0
Total	**108**	**Total**	**108**
Segment Crash Rate=76.40 crashes per 100 million vehicle miles			

C-04 2017 Crash Analysis – I-270 from Montrose Road to MD 189

SHA provided crash data for the I-270 segment from Montrose Road to MD 189 (milepost 4.14 to 5.50) covering the period from January 1, 2017 to December 31, 2017.

A total of 48 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 37.10 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 50 crashes in 2012 and 39 crashes in 2013, to an increase to 57, 74, and 98 in 2014, 2015, 2016 respectively, and decreased to 48 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-4**.

There was one (1) fatal crash in the study segment in 2017. Of the reported crashes, 14 crashes resulted in injuries while 33 resulted in property damage only.

Thirty-three percent (33%) of all crashes were due to "Failure to give full Attention" and "Speed to Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- The third most common type of crash was categorized as "Other" which also accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipes accounted for approximately two percent (2%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 5.50. Approximately thirty-four percent (34%) of the total crashes occurred in this subsegment. This is located at Exit 5, MD 9189 (Falls Road).
- There were four (4) alcohol related crashes in the study period, accounting for approximately eight percent (8%) of the total crashes.

Table C-4: Crash Data Summary for 2017 (I-270 –Montrose Road to MD 189)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	13	Opposite Dir	0
9:00 AM to 11:00 AM	6	Rear End	29
11:00 AM to 1:00 PM	3	Sideswipe	1
1:00 PM to 4:00 PM	4	Left Turn	0
4:00 PM to 7:00 PM	11	Angle	0
7:00 PM to 6:00 AM	11	Pedestrian	0
Total	**48**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Curb	1
Wet	12	Fixed Object: Guardrail/Barrier	8
Dry	35	Fixed Object: Curb	0
Snow/Ice	0	Fixed Object: Light Pole	0
Other	1	Fixed Object: Sign Pole	0
Total	**48**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	48	Parked Vehicle	0
		Total	**48**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	9
		Too Fast for Conditions	7
Total	**48**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	18
Day	31	Influence of Medication	0
Dawn / Dusk	2	Fail to Yield Right-of-way	1
Dark – Lights On	14	Influence of Alcohol	4
Dark – No Lights	1	Improper Lane Change	1
Other	0	Fail to Drive in Single Lane	1
Total	**48**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Improper Turn	1
Clear/Cloudy	36	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	9	Physical/Mental Difficulty	0
Snow/Sleet	1	Rain, Snow	0
Other	2	Ice or Snow Covered	0
Total	**48**	Wet	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	1	Fail to Obey Other Control	0
Injury	14	Improper Passing	0
Property Damage Only	33	Lic. Restr. Non-compliance	0
Total	**48**	**Total**	**48**
Segment Crash Rate=37.10 crashes per 100 million vehicle miles			

C-05 2017 Crash Analysis – I-270 from MD 189 to MD 28

SHA provided crash data for the I-270 segment from MD 189 to MD 28 (milepost 5.51 to 6.46) covering the period from January 1, 2017 to December 31, 2017.

A total of 42 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 489.40 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 39 crashes in 2012 and 35 crashes in 2013 to 56, 42, and 59 in 2014, 2015, 2016 respectively, and decreased to 42 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-05**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 18 crashes resulted in injuries while 24 resulted in property damage only. There were no pedestrian-related crashes.

The contributing factors for fifty-seven one percent (31%) of all crashes were due to "Failure to give full Attention" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-five percent (55%) of the total crashes.
- Sideswipe crashes were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Another most common type of crash was categorized as "Other" which also accounted for approximately fourteen percent (14%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was at milepost 6.46, the interchange of I-270@ MD28. Approximately fifty-five percent (55%) of the total crashes occurred at this location.
- There was one (1) alcohol related crash during the study period, accounting for approximately two percent (2%) of the total crashes.

Table C-05: Crash Data Summary for 2017 (I-270 – MD 189 to MD 28)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	11	Opposite Dir	0
9:00 AM to 11:00 AM	6	Rear End	23
11:00 AM to 1:00 PM	3	Sideswipe	7
1:00 PM to 4:00 PM	5	Left Turn	0
4:00 PM to 7:00 PM	6	Angle	0
7:00 PM to 6:00 AM	11	Pedestrian	0
Total	**42**	Other Collision	6
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	9	Fixed Object: Guardrail/Barrier	3
Dry	32	Fixed Object: Crash Attenuator	1
Snow/Ice	0	Fixed Object: Light Pole	0
Other	1	Fixed Object: Construction Barrier	1
Total	**42**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	42	Parked Vehicle	0
		Total	**42**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	11
		Too Fast for Conditions	13
Total	**42**	Followed too Closely	2
Illumination	**# of Crashes**	Other or Unknown	9
Day	26	Fail to Obey Other Control	0
Dawn / Dusk	1	Fail to Yield Right-of-way	1
Dark – Lights On	12	Influence of Alcohol	1
Dark – No Lights	1	Improper Lane Change	2
Other	2	Fail to Drive in Single Lane	2
Total	**42**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Improper Passing	0
Clear/Cloudy	33	Exceeded Speed Limit	0
Foggy	1	Vehicle Defect	0
Raining	5	Physical/Mental Difficulty	0
Snow/Sleet	0	Rain, Snow	0
Other	3	Ice or Snow Covered	0
Total	**42**	Wet	0
Severity	**# of Crashes**	Animal	0
Fatal	0	Wrong Way On One Way	0
Injury	18	Improper Turn	0
Property Damage Only	24	Lic. Restr. Non-compliance	0
Total	**42**	**Total**	**42**
Segment Crash Rate=489.40 crashes per 100 million vehicle miles			

C-06 2017 Crash Analysis – I-270 from MD 28 to Shady Grove Road

SHA provided crash data for the I-270 segment from MD 28 to Shady Grove Road (milepost 6.47 to 8.39) covering the period from January 1, 2017 to December 31, 2017.

A total of 106 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 67.70 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 74 crashes in 2013 to 99, 98, and 122 in 2014, 2015 and 2016 respectively, with an increase to 106 in 2017. A summary of the 2017 crash data is shown in **Table C-06**.

No fatal crashes were reported in the study period. Of the reported crashes, 42 crashes resulted in injuries while 64 resulted in property damage only. There were no pedestrian-related crashes.

The contributing factors for fourteen percent (14%) of all crashes were due to "Failure to give full Attention" and "Speed to Fast for Conditions". Additional analysis of the crash data revealed the following trends during the period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-two percent (52%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- The third most common type of crash was categorized at "Other" and accounted for approximately fourteen percent (14%) of the total crashes.
- Sideswipe crashes accounted for twelve (12) percent of the total.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The section with the highest frequency of crashes occurred at milepost 8.39. Approximately thirty percent (30%) of the total crashes occurred in this subsegment. This is located at Exit 8, Shady Grove Road.
- There were fifteen (15) alcohol related crashes in the five-year period, accounting for approximately three percent (3%) of the total crashes.

Table C-06: Crash Data Summary for 2017 (I-270 – MD 28 to Shady Grove Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	22	Opposite Dir	0
9:00 AM to 11:00 AM	13	Rear End	55
11:00 AM to 1:00 PM	4	Sideswipe	13
1:00 PM to 4:00 PM	14	Left Turn	0
4:00 PM to 7:00 PM	29	Angle	0
7:00 PM to 6:00 AM	24	Pedestrian	0
Total	**106**	Other Collision	15
Surface Condition	**# of Crashes**	Fixed Object: Curb	6
Wet	29	Fixed Object: Guardrail/Barrier	15
Dry	76	Fixed Object: Crash Attenuator	2
Snow/Ice	0	Fixed Object: Light Pole	0
Other	1	Fixed Object: Embankment	0
Total	**106**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	106	Parked Vehicle	0
		Total	**106**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	30
		Too Fast for Conditions	15
Total	**106**	Followed too Closely	11
Illumination	**# of Crashes**	Other or Unknown	31
Day	72	Influence of Medication	0
Dawn / Dusk	5	Fail to Yield Right-of-way	1
Dark – Lights On	24	Influence of Alcohol	8
Dark – No Lights	4	Improper Lane Change	2
Other	1	Fail to Drive in Single Lane	2
Total	**106**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Improper Backing	0
Clear/Cloudy	78	Improper Signal	0
Foggy	0	Vehicle Defect	0
Raining	17	Physical/Mental Difficulty	0
Snow/Sleet	1	Influence of Drugs	0
Other	10	Operator Using Cell Phone	0
Total	**106**	Wet	0
Severity	**# of Crashes**	Improper Turn	0
Fatal	0	Fail to Obey Traffic Signal	0
Injury	42	Fail to Obey Other Control	1
Property Damage Only	64	Stopping in Lane Roadway	0
Total	**106**	**Total**	**106**
Segment Crash Rate=67.70 crashes per 100 million vehicle miles			

C-07 2017 Crash Analysis – I-270 from Shady Grove Road to I-370

SHA provided crash data for the I-270 segment from Shady Grove Road to I-370 (milepost 8.40 to 9.32) covering the period from January 1, 2017 to December 31, 2017.

A total of 56 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 75.5 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 44 crashes in 2012 and 60 crashes in 2013 to 58, 85, and 100 in 2014, 2015 and 2016 respectively, and a decrease to 56 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-07**.

There were no fatal crashes in the study period. Of the reported crashes, 13 crashes resulted in injuries while 43 resulted in property damage only.

The contributing factors for forty-six percent (46%) of all crashes were due to "Failure to give full Attention" and "Speed to Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- The second most common type of crash was categorized at "Other" and accounted for approximately twenty-one percent (21%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Sideswipes accounted for approximately thirteen percent (13%) of the total crashes.
- Approximately forty-one percent (41%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of occurred at milepost 9.32. Approximately thirety-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 9, I-370.
- There were two (2) alcohol related crashes in the period, accounting for approximately four percent (4%) of the total crashes.

Table C-07: Crash Data Summary for 2017 (I-270 –Shady Grove Road to I-370)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	11	Opposite Dir	0
9:00 AM to 11:00 AM	5	Rear End	28
11:00 AM to 1:00 PM	3	Sideswipe	7
1:00 PM to 4:00 PM	5	Left Turn	0
4:00 PM to 7:00 PM	12	Angle	0
7:00 PM to 6:00 AM	20	Pedestrian	0
Total	**56**	Other Collision	12
Surface Condition	**# of Crashes**	Fixed Object: Curb	2
Wet	19	Fixed Object: Guardrail/Barrier	5
Dry	33	Fixed Object: Crash Attenuator	0
Snow/Ice	1	Fixed Object: Sign Pole	1
Other	3	Fixed Object: Embankment	0
Total	**56**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	56	Parked Vehicle	1
		Total	**56**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	15
		Too Fast for Conditions	11
Total	**56**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	14
Day	26	Influence of Medication	0
Dawn / Dusk	4	Fail to Obey Other Control	1
Dark – Lights On	24	Influence of Alcohol	2
Dark – No Lights	1	Improper Lane Change	2
Other	1	Fail to Drive in Single Lane	2
Total	**56**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Improper Backing	0
Clear/Cloudy	38	Exceeded Speed Limit	2
Foggy	0	Vehicle Defect	0
Raining	12	Physical/Mental Difficulty	0
Snow/Sleet	2	Influence of Drugs	0
Other	4	Operator Using Cell Phone	0
Total	**56**	Wet	0
Severity	**# of Crashes**	Improper Turn	0
Fatal	0	Fail to Obey Traffic Signal	0
Injury	13	Improper Passing	0
Property Damage Only	43	Stopping in Lane Roadway	0
Total	**56**	**Total**	**56**
Segment Crash Rate=75.50 crashes per 100 million vehicle miles			

C-08 2017 Crash Analysis – I-270 from I-370 to MD 117

SHA provided crash data for the I-270 segment from I-370 to MD 117 (milepost 9.33 to 10.85) covering the period from January 1, 2017 to December 31, 2017.

A total of 77 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 60.30 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 37 crashes in 2012 and 52 crashes in 2013, to 64 in 2014, a decrease to 61 in 2015, an increase to 86 in 2016, and an decrease to 77 in 2017. A summary of the crash data is shown in **Table C-08**.

There was one (1) fatal crash in the study segment in 2017. Of the reported crashes, 27 crashes resulted in injuries while 49 resulted in property damage only.

The contributing factors for forty-three percent (43%) of all crashes were due to "Failure to give full Attention" and "Speed to Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-eight percent (58%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately eighteen percent (18%) of the total crashes.
- The third most common type of crash was categorized at "Other" and accounted for approximately fourteen percent (14%) of the total crashes.
- Sideswipes accounted for approximately eight percent (8%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 10.85. Approximately eighteen percent (18%) of the total crashes occurred in this subsegment. This is located at Exit 10, MD 117 (W Diamond Avenue).
- There was three (3) alcohol related crashes in the period, accounting for approximately four percent (4%) of the total crashes.

Table C-08: Crash Data Summary for 2017 (I-270 – I-370 to MD 117)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	12	Opposite Dir	0
9:00 AM to 11:00 AM	12	Rear End	45
11:00 AM to 1:00 PM	5	Sideswipe	6
1:00 PM to 4:00 PM	9	Left Turn	0
4:00 PM to 7:00 PM	17	Angle	0
7:00 PM to 6:00 AM	22	Pedestrian	1
Total	**77**	Other Collision	11
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	10	Fixed Object: Guardrail/Barrier	13
Dry	66	Fixed Object: Curb	0
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	1	Fixed Object: Tree/Shrubbery	0
Total	**77**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	77	Parked Vehicle	0
		Total	**77**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	22
		Too Fast for Conditions	11
Total	**77**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	23
Day	51	Fail to Obey Traffic Signal	0
Dawn / Dusk	5	Fail to Yield Right-of-way	1
Dark – Lights On	18	Influence of Alcohol	3
Dark – No Lights	2	Improper Lane Change	5
Other	1	Fail to Drive in Single Lane	5
Total	**77**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Operator Using Cell Phone	0
Clear/Cloudy	62	Exceeded Speed Limit	0
Foggy	0	Ice or Snow Covered	0
Raining	6	Physical/Mental Difficulty	0
Snow/Sleet	1	Rain, Snow	0
Other	8	Vehicle Defect	0
Total	**77**	Improper Backing	0
Severity	**# of Crashes**	Fail to Obey Other Control	0
Fatal	1	Influence of Drugs	0
Injury	27	Stopping in Lane Roadway	0
Property Damage Only	49	Lic. Restr. Non-compliance	0
Total	**77**	**Total**	**77**
Segment Crash Rate=60.30 crashes per 100 million vehicle miles			

C-09 2017 Crash Analysis – I-270 from MD 117 to MD 124

SHA provided crash data for the I-270 segment from MD 117 to MD 124 (milepost 10.86 to 11.47) covering the period from January 1, 2017 to December 31, 2017.

A total of 32 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 78.60 crashes per 100 million vehicle miles (MVM), which is above the latest available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 26 crashes in 2012 and 31 crashes in 2013, to a decrease to 30 in 2014, an increase to 50, and 56 in 2015 and 2016 respectively, and a decrease to 32 in 2017. A summary of the 2017 crash data is shown in **Table C-09**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 8 crashes resulted in injuries while 24 resulted in property damage only.

The contributing factors for forty- seven percent (47%) of all crashes were due to "Failure to give full Attention" and "Speed too Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-nine percent (69%) of the total crashes.
- Sideswipes were a common type of crash and accounted for approximately sixteen percent (16%) of the total crashes.
- Another most common type of crash was categorized at "Other" and accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately sixty-six percent (66%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 11.47. Approximately thirty-two percent (32%) of the total crashes occurred in this subsegment. This is located at Exit 11, MD 124 (Quince Orchard Road).
- There were zero alcohol related crashes in the period.

Table C-09: Crash Data Summary for 2017 (I-270 – MD 117 to MD 124)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	8	Opposite Dir	0
9:00 AM to 11:00 AM	2	Rear End	22
11:00 AM to 1:00 PM	1	Sideswipe	5
1:00 PM to 4:00 PM	4	Left Turn	0
4:00 PM to 7:00 PM	13	Angle	0
7:00 PM to 6:00 AM	4	Pedestrian	0
Total	**32**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	6	Fixed Object: Guardrail/Barrier	0
Dry	25	Fixed Object: Culvert/Ditch	0
Snow/Ice	1	Fixed Object: Curb	0
Other	0	Fixed Object: Tree/Shrubbery	0
Total	**32**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	32	Parked Vehicle	0
		Total	**32**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	7
		Too Fast for Conditions	8
Total	**32**	Followed too Closely	4
Illumination	**# of Crashes**	Other or Unknown	9
Day	20	Influence of Medication	1
Dawn / Dusk	3	Fail to Yield Right-of-way	1
Dark – Lights On	8	Influence of Alcohol	0
Dark – No Lights	1	Improper Lane Change	1
Other	0	Fail to Drive in Single Lane	0
Total	**32**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Improper Turn	0
Clear/Cloudy	26	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	4	Physical/Mental Difficulty	0
Snow/Sleet	1	Rain, Snow	0
Other	1	ice or Snow Covered	0
Total	**32**	Wet	0
Severity	**# of Crashes**	Fail to Obey Other Control	0
Fatal	0	Fail to Obey Traffic Signal	0
Injury	8	Improper Passing	0
Property Damage Only	24	Lic. Restr. Non-compliance	0
Total	**32**	**Total**	**32**
Segment Crash Rate=78.60 crashes per 100 million vehicle miles			

C-10 2017 Crash Analysis – I-270 from MD 124 to Middlebrook Road

SHA provided crash data for the I-270 segment from MD 124 to Middlebrook Road (milepost 11.48 to 13.98) covering the period from January 1, 2017 to December 31, 2017.

A total of 61 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 37.70 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 41 crashes in 2012 and 49 crashes in 2013 to 63, 74, and 83 in 2014, 2015 and 2016 respectively, and decreased to 61 in 2017. A summary of the 2017crash data is shown in **Table C-10**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 21 crashes resulted in injuries while 40 resulted in property damage only.

The contributing factors for thirty-one percent (38%) of all crashes were due to "Speeds too Fast for Conditions" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately seventy percent (70%) of the total crashes.
- Another most common type of crash was categorized at "Other" and accounted for approximately thirteen percent (13%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately ten percent (10%) of the total crashes.
- Sideswipes were another common type of crash and accounted for approximately seven percent (7%) of the total crashes.
- Approximately thirty-six percent (36%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 12.97. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located near the end of the structure over the Great Seneca Creek.
- There were three (3) alcohol related crashes in the period, accounting for approximately five percent (5%) of the total crashes.

Table C-10: Crash Data Summary for 2017 (I-270 – MD 124 to Middlebrook Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	8	Opposite Dir	0
9:00 AM to 11:00 AM	8	Rear End	43
11:00 AM to 1:00 PM	7	Sideswipe	4
1:00 PM to 4:00 PM	8	Left Turn	0
4:00 PM to 7:00 PM	14	Angle	0
7:00 PM to 6:00 AM	16	Pedestrian	0
Total	**61**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	10	Fixed Object: Guardrail/Barrier	6
Dry	51	Fixed Object: Culvert/Ditch	0
Snow/Ice	0	Fixed Object: Curb	0
Other	0	Fixed Object: Tree/Shrubbery	0
Total	**61**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	61	Parked Vehicle	0
		Total	**61**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	9
		Too Fast for Conditions	11
Total	**61**	Followed too Closely	12
Illumination	**# of Crashes**	Other or Unknown	19
Day	40	Influence of Medication	0
Dawn / Dusk	0	Fail to Yield Right-of-way	0
Dark – Lights On	12	Influence of Alcohol	3
Dark – No Lights	6	Improper Lane Change	1
Other	3	Fail to Drive in Single Lane	4
Total	**61**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Improper Parking	1
Clear/Cloudy	47	Exceeded Speed Limit	1
Foggy	0	Vehicle Defect	0
Raining	7	Physical/Mental Difficulty	0
Snow/Sleet	0	Rain, Snow	0
Other	7	Ice or Snow Covered	0
Total	**61**	Wet	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Animal	0
Injury	21	Improper Passing	0
Property Damage Only	40	Lic. Restr. Non-compliance	0
Total	**61**	**Total**	**61**
Segment Crash Rate=37.70 crashes per 100 million vehicle miles			

C-11 2017 Crash Analysis – I-270 from Middlebrook Road to MD 118

SHA provided crash data for the I-270 segment from MD 124 to Middlebrook Road (milepost 13.98 to 14.74) covering the period from January 1, 2017 to December 31, 2017.

A total of 20 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 52.90 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 20 crashes in 2012 to 23 crashes in 2013, to a decrease to 11 in 2014, and an increase to 12, and 27 in 2015 and 2016 respectively, and a decrease to 20 in 2017. A summary of the 2017 crash data is shown in **Table C-11**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 5 crashes resulted in injuries while 15 resulted in property damage only.

The contributing factors for forty percent (40) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-five percent (45%) of the total crashes.
- Sideswipes were the second most common type of crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Collisions with fixed objects were a common type of crash which included guardrail/barriers, light poles, and other objects and accounted for approximately fifteen percent (15%) of the total crashes.
- Another common type of crash was categorized as "Other" also accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately forty-five percent (45%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 14.74. Approximately fifty-five percent (55%) of the total crashes occurred in this subsegment. This is located at Exit 15, MD 118 (Germantown Road).
- There was one (1) alcohol related crash in the period, accounting for approximately five percent (5%) of the total crashes.

Table C-11: Crash Data Summary for 2017 (I-270 – Middlebrook Road to MD 118)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	2	Opposite Dir	0
9:00 AM to 11:00 AM	1	Rear End	9
11:00 AM to 1:00 PM	2	Sideswipe	5
1:00 PM to 4:00 PM	3	Left Turn	0
4:00 PM to 7:00 PM	7	Angle	0
7:00 PM to 6:00 AM	5	Pedestrian	0
Total	**20**	Other Collision	3
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	7	Fixed Object: Guardrail/Barrier	3
Dry	13	Fixed Object: Culvert/Ditch	0
Snow/Ice	0	Fixed Object: Light Pole	0
Other	0	Fixed Object: Sign Pole	0
Total	**20**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	20	Parked Vehicle	0
		Total	**20**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	5
		Too Fast for Conditions	3
Total	**20**	Followed too Closely	2
Illumination	**# of Crashes**	Other or Unknown	6
Day	13	Influence of Medication	0
Dawn / Dusk	0	Fail to Yield Right-of-way	0
Dark – Lights On	7	Influence of Alcohol	1
Dark – No Lights	0	Improper Lane Change	2
Other	0	Fail to Drive in Single Lane	1
Total	**20**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Improper Backing	0
Clear/Cloudy	14	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	4	Physical/Mental Difficulty	0
Snow/Sleet	0	Rain, Snow	0
Other	2	Ice or Snow Covered	0
Total	**20**	Wet	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Animal	0
Injury	5	Improper Passing	0
Property Damage Only	15	Lic. Restr. Non-compliance	0
Total	**20**	**Total**	**20**
Segment Crash Rate=52.90 crashes per 100 million vehicle miles			

C-12 2017 Crash Analysis – I-270 from MD 118 to Father Hurley Boulevard

SHA provided crash data for the I-270 segment from MD 118 to Father Hurley Boulevard (milepost 14.75 to 15.78) covering the period from January 1, 2017 to December 31, 2017.

A total of 21 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 46.30 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 17 crashes in 2012 and 14 crashes in 2013, to an increase to 20, 31, and 51 in 2014, 2015 and 2016 respectively, and decreased to 21 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-12**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 4 crashes resulted in injuries while 17 resulted in property damage only.

The contributing factors for thirty-three percent (33%) of all crashes were due to "Failure to give full Attention" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-three percent (43%) of the total crashes.
- The second most common type of crash was categorized as "Other" and accounted for approximately thirty-three percent (33%) of the total crashes.
- Collisions with fixed objects were a common type of crash which included guardrail/barriers, light poles, and other objects and accounted for approximately fourteen percent (14%) of the total crashes.
- Sideswipes were a common type of crash and accounted for approximately ten percent (10%) of the total crashes.
- Approximately twenty-nine percent (29%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 15.78. Approximately forty-three percent (43%) of the total crashes occurred in this subsegment. This is located at Exit 16, Father Hurley Boulevard.
- There were no alcohol related crashes reported in the study period.

Table C-12: Crash Data Summary for 2017 (I-270 – MD 118 to Father Hurley Boulevard)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	3	Opposite Dir	0
9:00 AM to 11:00 AM	2	Rear End	9
11:00 AM to 1:00 PM	1	Sideswipe	2
1:00 PM to 4:00 PM	5	Left Turn	0
4:00 PM to 7:00 PM	3	Angle	0
7:00 PM to 6:00 AM	7	Pedestrian	0
Total	**21**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	3	Fixed Object: Guardrail/Barrier	3
Dry	18	Fixed Object: Curb	0
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	0	Fixed Object: Bridge	0
Total	**21**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	21	Parked Vehicle	0
		Total	**21**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	5
		Too Fast for Conditions	1
Total	**21**	Followed too Closely	2
Illumination	**# of Crashes**	Other or Unknown	11
Day	11	Influence of Medication	0
Dawn / Dusk	1	Fail to Yield Right-of-way	0
Dark – Lights On	9	Influence of Alcohol	0
Dark – No Lights	0	Improper Lane Change	1
Other	0	Improper Passing	1
Total	**21**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Wet	0
Clear/Cloudy	16	Exceeded Speed Limit	0
Foggy	0	Ice or Snow Covered	0
Raining	2	Physical/Mental Difficulty	0
Snow/Sleet	1	Debris or Obstruction	0
Other	2	Sleet, Hail, Freezing Rain	0
Total	**21**	Animal	0
Severity	**# of Crashes**	Fail to Keep Right of Center	0
Fatal	0	Improper Passing	0
Injury	4	Improper Backing	0
Property Damage Only	17	Lic. Restr. Non-compliance	0
Total	**21**	**Total**	**21**
Segment Crash Rate=46.30 crashes per 100 million vehicle miles			

C-13 2017 Crash Analysis – I-270 from Father Hurley Boulevard to MD 121

SHA provided crash data for the I-270 segment from Father Hurley Boulevard to MD 121 (milepost 15.79 to 18.43) covering the period from January 1, 2017 to December 31, 2017.

A total of 42 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 40.30 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 25 crashes in 2012 and 35 crashes in 2013 to 44, 51, and 83 in 2014, 2015 and 2016 respectively, and decreased to 42 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-13**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 10 crashes resulted in injuries while 32 resulted in property damage only.

The contributing factors for forty-eight percent (48%) of all crashes were due to "Failure to give full Attention" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-two percent (62%) of the total crashes.
- The second most common type of crash was categorized as "Other" and accounted for approximately twenty-one percent (21%) of the total crashes.
- Sideswipes were the third most common type of crash and accounted for approximately ten percent (10%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were also a common type of crash and accounted for approximately seven percent (7%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 18.43. Approximately thirty-four percent (34%) of the total crashes occurred in this subsegment. This is located at Exit 18, MD 121 (Clarksburg Road).
- There was one (1) alcohol related crash in the period, accounting for approximately two percent (2%) of the total crashes.

Table C-13: Crash Data Summary for 2017 (I-270 –Father Hurley Boulevard to MD 121)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	2	Opposite Dir	0
9:00 AM to 11:00 AM	2	Rear End	26
11:00 AM to 1:00 PM	4	Sideswipe	4
1:00 PM to 4:00 PM	10	Left Turn	0
4:00 PM to 7:00 PM	12	Angle	0
7:00 PM to 6:00 AM	12	Pedestrian	0
Total	**42**	Other Collision	9
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	8	Fixed Object: Guardrail/Barrier	3
Dry	30	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	4	Fixed Object: Bridge	0
Total	**42**	Fixed Object: Curb	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	42	Parked Vehicle	0
		Total	**42**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	9
		Too Fast for Conditions	11
Total	**42**	Followed too Closely	5
Illumination	**# of Crashes**	Other or Unknown	13
Day	27	Influence of Medication	0
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	9	Influence of Alcohol	1
Dark – No Lights	2	Improper Lane Change	2
Other	0	Fail to Drive in Single Lane	1
Total	**42**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Wet	0
Clear/Cloudy	31	Exceeded Speed Limit	0
Foggy	0	Ice or Snow Covered	0
Raining	7	Physical/Mental Difficulty	0
Snow/Sleet	0	Debris or Obstruction	0
Other	4	Sleet, Hail, Freezing Rain	0
Total	**42**	Animal	0
Severity	**# of Crashes**	Fail to Keep Right of Center	0
Fatal	0	Influence of Drugs	0
Injury	10	Stopping in Lane Roadway	0
Property Damage Only	32	Fail to Ober Other Control	0
Total	**42**	**Total**	**42**
Segment Crash Rate=40.30 crashes per 100 million vehicle miles			

C-14 2017 Crash Analysis – I-270 from MD 121 to MD 109

SHA provided crash data for the I-270 segment from MD 121 to MD 109 (milepost 18.44 to 22.29) covering the period from January 1, 2017 to December 31, 2017.

A total of 88 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 74.90 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.30 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 45 crashes in 2012 and 52 crashes in 2013 to 61, 81, and 109 in 2014, 2015 and 2016 respectively, and decreased to 88 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-14**.

There was no fatal crashes in the study segment in 2017. Of the reported crashes, 23 crashes resulted in injuries while 65 resulted in property damage only.

The contributing factors for forty-nine percent (49%) of all crashes were due to "Failure to give full Attention" and "Speeds to Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- The second most common type of crash were collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- The third most common type of crash was categorized at "Other" and accounted for approximately eleven percent (11%) of the total crashes.
- Sideswipes were also a common type of crash and accounted for approximately six percent (6%) of the total crashes.
- Approximately twenty-four percent (24%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.29. Approximately sixteen percent (16%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 109 (Old Hundred Road).
- There were two (2) alcohol related crashes in the period, accounting for approximately two percent (2%) of the total crashes.

Table C-14: Crash Data Summary for 2017 (I-270 – MD 121 to MD 109)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	9	Opposite Dir	0
9:00 AM to 11:00 AM	13	Rear End	53
11:00 AM to 1:00 PM	9	Sideswipe	5
1:00 PM to 4:00 PM	20	Left Turn	0
4:00 PM to 7:00 PM	12	Angle	0
7:00 PM to 6:00 AM	25	Pedestrian	1
Total	**88**	Other Collision	10
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	22	Fixed Object: Guardrail/Barrier	17
Dry	59	Fixed Object: Culvert/Ditch	0
Snow/Ice	2	Fixed Object: Curb	0
Other	5	Fixed Object: Sign Pole	1
Total	**88**	Fixed Object: Other Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	88	Parked Vehicle	0
		Total	**88**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	31
		Too Fast for Conditions	12
Total	**88**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	30
Day	58	Influence of Combined Subst.	1
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	14	Influence of Alcohol	2
Dark – No Lights	9	Improper Lane Change	2
Other	3	Fail to Drive in Single Lane	2
Total	**88**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Vision Obstruction	0
Clear/Cloudy	61	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	18	Physical/Mental Difficulty	0
Snow/Sleet	1	Rain, Snow	0
Other	8	Animal	0
Total	**88**	Wet	0
Severity	**# of Crashes**	Fail to Obey Other Control	0
Fatal	0	Influence of Drugs	0
Injury	23	Stopping in Lane Roadway	0
Property Damage Only	65	Lic. Restr. Non-compliance	0
Total	**88**	**Total**	**88**
Segment Crash Rate=74.90 crashes per 100 million vehicle miles			

C-15 2017 Crash Analysis – I-270 from MD 109 to Frederick Co/L

SHA reviewed crash data for the I-270 segment from MD 109 to Frederick Co/L (milepost 22.30 to 22.51) covering the period from January 1, 2017 to December 31, 2017.

There were no crashes reported along the I-270 study segment during the period.

C-16 2017 Crash Analysis – I-270 from the Frederick County Line to MD 80

SHA provided crash data for the I-270 segment from the Frederick County line to MD 80 (milepost 0.00 to 3.52) covering the period from January 1, 2017 to December 31, 2017.

A total of 102 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 93.00 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 61 crashes in 2012 to 67 crashes in 2013, a decrease to 51 crashes 2014, while there were 60 and 54 crashes in 2015 and 2016 respectively, and an increase to 102 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-16**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 33 crashes resulted in injuries while 69 resulted in property damage only. There were no pedestrian-related crashes.

The contributing factors for thirty-one percent (31%) of all crashes were due to "Failure to give full Attention" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-two percent (62%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the second most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- The third most common type of crash was categorized at "Other" and accounted for approximately fifteen percent (15%) of the total crashes.
- Sideswipe crashes were also a common type of crash and accounted for approximately five percent (5%) of the total crashes.
- Approximately fifty-one percent (51%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 PM - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 3.52. Approximately twenty-eight percent (28%) of the total crashes occurred in this subsegment. This is located at Exit 26 – MD 80 (Fingerboard Road).
- There were 2 alcohol related crashes in the period, accounting for approximately two percent (2%) of the total crashes.

Table C-16: Crash Data Summary for 2017 (I-270 – I-495 to Democracy Blvd)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	10	Opposite Dir	1
9:00 AM to 11:00 AM	15	Rear End	63
11:00 AM to 1:00 PM	7	Sideswipe	5
1:00 PM to 4:00 PM	22	Left Turn	0
4:00 PM to 7:00 PM	18	Angle	0
7:00 PM to 6:00 AM	30	Pedestrian	0
Total	**102**	Other Collision	15
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	25	Fixed Object: Guardrail/Barrier	14
Dry	71	Fixed Object: Other	1
Snow/Ice	1	Fixed Object: Light Pole	2
Other	5	Fixed Object: Curb	0
Total	**102**	Fixed Object: Tree/Shrubbery	0
Reported Year	**# of Crashes**	Fixed Object: Construction Barrier	0
2017	102	Embankment	1
		Total	**102**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	30
		Too Fast for Conditions	14
Total	**102**	Followed too Closely	22
Illumination	**# of Crashes**	Other or Unknown	23
Day	66	Fail to Obey Other Control	0
Dawn / Dusk	6	Fail to Yield Right-of-way	1
Dark – Lights On	6	Influence of Alcohol	2
Dark – No Lights	24	Improper Lane Change	3
Other	0	Fail to Drive in Single Lane	4
Total	**102**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Operator Using Cell Phone	0
Clear/Cloudy	73	Influence of Drugs	0
Foggy	1	Vehicle Defect	0
Raining	16	Physical/Mental Difficulty	1
Snow/Sleet	1	Exceeded Speed Limit	0
Other	11	Ice or Snow Covered	0
Total	**102**	Animal	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Clothing Not Visible	0
Injury	33	Stopping in Lane Roadway	0
Property Damage Only	69	Ruts, Holes Bumps	0
Total	**102**	**Total**	**102**
Segment Crash Rate=93.00 crashes per 100 million vehicle miles			

C-17 2017 Crash Analysis – I-270 from MD 80 to MD 85

SHA provided crash data for the I-270 segment from MD 80 to MD 85 (milepost 3.53 to 8.65) covering the period from January 1, 2017 to December 31, 2017.

A total of 103 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 62.40 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 57 crashes in 2012 to 66 crashes in 2013, 86 crashes in 2014, 95 crashes in 201, 105 crashes in 2016, and a decrease to 103 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-17**.

There was one (1) fatal crash in the study segment in 2017. Of the reported crashes, 35 crashes resulted in injuries while 67 resulted in property damage only. There were no pedestrian-related crashes in 2017.

The contributing factors for forty-two percent (42%) of all crashes were due to "Failure to give full Attention" and "Following too Closely." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-seven percent (67%) of the total crashes.
- The second most common type of crash was categorized at "Other" and accounted for approximately seventeen percent (17%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately seventeen percent (17%) of the total crashes.
- Sideswipe crashes accounted for approximately six percent (6%) of the total crashes.
- Approximately thirty-three (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.65. Approximately twenty-three percent (23%) of the total crashes occurred in this subsegment. This is located at Spurs to/from I-270 local lanes (north of Shady Grove Road).
- The next highest frequency of crashes occurred at milepost 3.52. Approximately ten percent (10%) of the total crashes occurred in this subsegment. This is located at the beginning and end of I-270 local lanes (south of Montrose Road).
- Approximately three (3%) of all crashes were alcohol or drug related in the period,

Table C-17: Crash Data Summary for 2017 (I-270 – MD 80 to MD 85)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	17	Opposite Dir	0
9:00 AM to 11:00 AM	10	Rear End	69
11:00 AM to 1:00 PM	14	Sideswipe	6
1:00 PM to 4:00 PM	12	Left Turn	0
4:00 PM to 7:00 PM	17	Angle	0
7:00 PM to 6:00 AM	33	Pedestrain	0
Total	**103**	Other Collision	18
Surface Condition	**# of Crashes**	Fixed Object: Embankment	1
Wet	19	Fixed Object: Guardrail/Barrier	5
Dry	83	Fixed Object: Light Pole	1
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	1	Fixed Object: Tree/Shrubbery	0
Total	**103**	Fixed Object: Curb	2
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	103	Parked Vehicle	1
		Total	**103**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	23
		Too Fast for Conditions	11
Total	**103**	Followed too Closely	20
Illumination	**# of Crashes**	Other or Unknown	28
Day	61	Influence of Drugs	1
Dawn / Dusk	5	Improper Turn	1
Dark – Lights On	18	Influence of Alcohol	3
Dark – No Lights	16	Improper Lane Change	4
Other	3	Fail to Drive in Single Lane	9
Total	**103**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Rain, Snow	0
Clear/Cloudy	78	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	15	Physical/Mental Difficulty	0
Snow/Sleet	0	Road Under Construction	0
Other	10	Sleet, Hail, Freezing Rain	0
Total	**103**	Animal	0
Severity	**# of Crashes**	Improper Backing	0
Fatal	1	Influence of Combined Subst.	0
Injury	35	Stopping in Lane Roadway	0
Property Damage Only	67	Improper Passing	0
Total	**103**	**Total**	**103**
Segment Crash Rate=62.40 crashes per 100 million vehicle miles			

C-18 2017 Crash Analysis – I-270 from MD 85 to I-70

SHA provided crash data for the I-270 segment from MD 85 to I-70 (milepost 8.66 to 10.09) covering the period from January 1, 2017 to December 31, 2017.

A total of 40 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 65.20 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 26 crashes in 2012 to 41 crashes in 2013, a decrease to 36 crashes in 2014, an increase to 38 crashes in 2015 and 50 crashes in 2016, and a decrease to 40 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-18**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 11 crashes resulted in injuries while 29 resulted in property damage only. There were no pedestrian-related crashes in 2017.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention" and "Speed too Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- The second most common type of crash was categorized at "Other" and accounted for approximately twenty percent (20%) of the total crashes.
- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13) of the total crashes.
- Sideswipe crashes accounted for approximately eight percent (8%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 10.09. Approximately thirteen percent (13%) of the total crashes occurred in this subsegment. This is located at Spurs to/from I-270 local lanes (north of Shady Grove Road).
- Approximately five (5%) of all crashes were alcohol related in the study period,

Table C-18: Crash Data Summary for 2017 (I-270 – MD 85 to I-70)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	10	Opposite Dir	0
9:00 AM to 11:00 AM	3	Rear End	24
11:00 AM to 1:00 PM	1	Sideswipe	3
1:00 PM to 4:00 PM	4	Left Turn	0
4:00 PM to 7:00 PM	10	Angle	0
7:00 PM to 6:00 AM	12	Pedestrian	0
Total	**40**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Embankment	0
Wet	6	Fixed Object: Guardrail/Barrier	3
Dry	33	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Sign Pole	1
Other	1	Fixed Object: Fence	1
Total	**40**	Fixed Object: Curb	0
Reported Year	**# of Crashes**	Fixed Object: Culvert/Ditch	0
2017	40	Parked Vehicle	0
		Total	**40**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	11
		Too Fast for Conditions	9
Total	**40**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	10
Day	20	Fail to Obey Other Control	0
Dawn / Dusk	5	Fail to Yield Right-of-way	0
Dark – Lights On	11	Influence of Alcohol	2
Dark – No Lights	4	Improper Lane Change	1
Other	0	Fail to Drive in Single Lane	0
Total	**40**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Rain, Snow	0
Clear/Cloudy	30	Exceeded Speed Limit	0
Foggy	0	Vehicle Defect	0
Raining	6	Physical/Mental Difficulty	0
Snow/Sleet	0	Wrong Way on One Way	0
Other	4	Improper Turn	0
Total	**40**	Animal	0
Severity	**# of Crashes**	Lic. Restr. Non-compliance	0
Fatal	0	Influence of Combined Subst.	0
Injury	11	Stopping in Lane Roadway	0
Property Damage Only	29	Debris or Obstruction	0
Total	**40**	**Total**	**40**

C-19 2017 Crash Analysis – I-270 from I-495 to Democracy Blvd

SHA provided crash data for the I-270 segment from I-495 to Democracy Blvd (milepost 0.00 to 0.99) covering the period from January 1, 2017 to December 31, 2017.

A total of 12 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 25.40 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 6 crashes in 2012 to 5 crashes in 2013 and 3 crashes 2014 while there was an increase to 5 and 10 crashes in 2015 and 2016 respectively, and an increase to 12 crashes in 2017. A summary of the crash data is shown in **Table C-19**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 6 crashes resulted in injuries while 6 resulted in property damage only. There were no pedestrian-related crashes.

The contributing factor for forty-two percent (42%) of all crashes was due to "Speeds too Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Collisions with fixed objects, which include guardrail/barriers, light poles, and other objects were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- Rear-end crashes were the second most common type of crash and accounted for approximately thirty-three (33%) of the total crashes.
- The third most common type of crash was categorized at "Other" and accounted for approximately eight percent (8%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 PM - 7:00 PM.
- The location with the highest frequency of crashes occurred between the milepost 0.00 and 0.10. Approximately forty-two percent (42%) of the total crashes occurred in this subsegment. This is located at Exit 35, I-495 (Capital Beltway) .
- There was one alcohol related crash in the period.

Table C-19: Crash Data Summary for 2017 (I-270 – I-495 to Democracy Blvd)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	4	Opposite Dir	0
9:00 AM to 11:00 AM	0	Rear End	4
11:00 AM to 1:00 PM	1	Sideswipe	0
1:00 PM to 4:00 PM	3	Left Turn	0
4:00 PM to 7:00 PM	2	Angle	1
7:00 PM to 6:00 AM	2	Pedestrian	0
Total	**12**	Other Collision	1
Surface Condition	**# of Crashes**	Fixed Object: Curb	1
Wet	7	Fixed Object: Guardrail/Barrier	5
Dry	5	Fixed Object: Crash Attenuator	0
Snow/Ice	0	Fixed Object: Light Pole	0
Other	0	Fixed Object: Construction Barrier	0
Total	**12**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	12	Parked Vehicle	0
		Total	**12**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	0
		Too Fast for Conditions	5
Total	**12**	Followed too Closely	0
Illumination	**# of Crashes**	Other or Unknown	5
Day	8	Fail to Obey Other Control	0
Dawn / Dusk	2	Fail to Yield Right-of-way	0
Dark – Lights On	2	Influence of Alcohol	1
Dark – No Lights	0	Improper Lane Change	0
Other	0	Fail to Drive in Single Lane	0
Total	**12**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Vehicle Defect	0
Clear/Cloudy	7	Improper Turn	0
Foggy	0	Wet	0
Raining	5	Physical/Mental Difficulty	1
Snow/Sleet	0	Fail to Keep Right of Center	0
Other	0	Improper Passing	0
Total	**12**	Rain, Snow	0
Severity	**# of Crashes**	Icy or Snow Covered	0
Fatal	0	Exceeded Speed Limit	0
Injury	6	Stopping in Lane Roadway	0
Property Damage Only	6	Animal	0
Total	**12**	**Total**	**12**
Segment Crash Rate=25.40 crashes per 100 million vehicle miles			

C-20 2017 Crash Analysis – I-270 from Democracy Blvd to I-270

SHA provided crash data for the I-270 segment from Democracy Blvd to I-270 (milepost 1.00 to 2.09) covering the period from January 1, 2017 to December 31, 2017.

A total of 6 crashes were reported along the I-270 study segment during the study period. The crash rate for the study segment is 11.50 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 3 crashes in both 2012 and 2013 to 7 crashes in 2014, a decreased to 6 crashes in 2015, an increase to 13 crashes in 2016, and a decrease to 6 crashes in 2017. A summary of the 2017 crash data is shown in **Table C-20**.

There were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 6 crashes resulted in injuries while 26 resulted in property damage only. There were no pedestrian-related crashes.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention", "Speeds too Fast for Conditions", and "Following too Closely." Additional analysis of the crash data revealed the following trends during the five-year study period:

- Sideswipe crashes were the most common type of crash and accounted for approximately eight-three percent (83%) of the total crashes.
- The second most common type of crash was categorized at "Other" and accounted for approximately seventeen percent (17%) of the total crashes
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The 2017 crashes all occurred at milepost 1.00. This is located at Exit 1, Democracy Boulevard.
- There were no alcohol related crashes in the study period,

Table C-20: Crash Data Summary for 2017 (I-270 – Democracy Blvd to I-270)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	0	Opposite Dir	0
9:00 AM to 11:00 AM	0	Rear End	0
11:00 AM to 1:00 PM	0	Sideswipe	5
1:00 PM to 4:00 PM	1	Left Turn	0
4:00 PM to 7:00 PM	3	Angle	0
7:00 PM to 6:00 AM	2	Pedestrian	0
Total	**6**	Other Collision	1
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	0	Fixed Object: Guardrail/Barrier	0
Dry	6	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	0	Fixed Object: Curb	0
Total	**6**	Fixed Object: Tree/Shrubbery	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	6	Parked Vehicle	0
		Total	**6**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	1
		Too Fast for Conditions	1
Total	**6**	Followed too Closely	1
Illumination	**# of Crashes**	Other or Unknown	2
Day	5	Fail to Obey Other Control	0
Dawn / Dusk	0	Fail to Yield Right-of-way	0
Dark – Lights On	1	Influence of Alcohol	0
Dark – No Lights	0	Improper Lane Change	0
Other	0	Fail to Drive in Single Lane	0
Total	**6**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Operator Using Cell Phone	0
Clear/Cloudy	5	Influence of Drugs	0
Foggy	0	Vehicle Defect	0
Raining	0	Physical/Mental Difficulty	0
Snow/Sleet	0	Exceeded Speed Limit	1
Other	1	Improper Turn	0
Total	**6**	Influence of Drugs	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Fail to Keep Right of Center	0
Injury	0	Stopping in Lane Roadway	0
Property Damage Only	6	Shoulders Low, Soft, or High	0
Total	**6**	**Total**	**6**
Segment Crash Rate=11.50 crashes per 100 million vehicle miles			

SECTION D: 2017 Crash Analysis - I-95 / I-495

D-01 2017 Crash Analysis – I-495 from American Legion Bridge to MD 190

SHA provided crash data for the I-495 segment from the American Legion bridge to MD 190 (milepost 0.00 to 2.37) covering the period from January 1, 2017 to December 31, 2017.

A total of 140 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 69.90 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 72 crashes in 2013 to 94, 127 and 133 in 2014, 2015 and 2016 respectively, and increased to 140 in 2017. A summary of the 2017 crash data is shown in **Table D-01**.

One (1) crash resulted in one (1) fatality. Of the reported crashes, 47 crashes resulted in injuries while 92 resulted in property damage only.

The contributing factors for forty-six percent (46%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-nine percent (59%) of the total crashes.
- The second most common type of crash were sideswipe crashes which accounted for approximately eighteen percent (18%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Another common type of crash was categorized as "Other" which accounted for approximately ten percent (10%) of the total crashes.
- Approximately forty-two percent (42%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.37. Approximately thirty-eight percent (38%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 190 (River Road).
- There was one (1) alcohol related crash in the study period, accounting for approximately 1 percent (1%) of the total crashes.

Table D-01: Crash Data Summary for 2017 (American Legion Bridge to MD 190)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	21	Opposite Dir	0
9:00 AM to 11:00 AM	8	Rear End	82
11:00 AM to 1:00 PM	9	Sideswipe	25
1:00 PM to 4:00 PM	29	Left Turn	0
4:00 PM to 7:00 PM	38	Angle	0
7:00 PM to 6:00 AM	35	Pedestrian	1
Total	**140**	Other Collision	14
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	0
Wet	19	Fixed Object: Guardrail/Barrier	15
Dry	115	Fixed Object: Contr. Barrier	1
Snow/Ice	1	Fixed Object: Curb	1
Other	5	Fixed Object: Embankment	0
Total	**140**	Fixed Object: Other Pole	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	140	Parked Vehicle	0
		Total	**140**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	39
		Too Fast for Conditions	26
Total	**140**	Followed too Closely	16
Illumination	**# of Crashes**	Other or Unknown	41
Day	83	Exceeding Speed Limit	1
Dawn / Dusk	7	Fail to Yield Right-of-way	2
Dark – Lights On	41	Influence of Alcohol	1
Dark – No Lights	4	Improper Lane Change	5
Other	5	Fail to Drive in Single Lane	4
Total	**140**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Operator Using Cell Phone	1
Clear/Cloudy	108	Rain, Snow	0
Foggy	0	Physical/Mental Difficulty	1
Raining	15	Debris or Obstruction	0
Snow/Sleet	1	Fail to Obey Other Control	1
Other	16	Influence of Drugs	0
Total	**140**	Improper Backing	0
Severity	**# of Crashes**	Illegally in Roadway	0
Fatal	1	Stopping in Lane Roadway	1
Injury	47	Wet	0
Property Damage Only	92	Improper Turn	0
Total	**140**	**Total**	**140**
Segment Crash Rate=69.90 crashes per 100 million vehicle miles			

D-02 2017 Crash Analysis – I-495 from I-495X to MD 190

(2017 Data Not Provided for this Segment)

D-03 2017 Crash Analysis – I-495 from MD 190 to I-270Y

SHA provided crash data for the I-495 segment from MD 190 to I-270Y (milepost 2.38 to 3.95) covering the period from January 1, 2017 to December 31, 2017.

A total of 57 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 40.0 crashes per 100 million vehicle miles (MVM), which is below the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 51 crashes in 2012 and 52 crashes in 2013 to 73, 99, and 114 in 2014, 2015 and 2016 respectively, and a decrease to 57 in 2017. A summary of the 2017 crash data is shown in **Table D-03**.

There were no fatal crashes in 2017. Of the reported crashes, 13 crashes resulted in injuries while 44 resulted in property damage only.

The contributing factors for forty percent (40%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-seven percent (47%) of the total crashes.
- Sideswipe crashes where the second most common crash and accounted for approximately twenty-eight percent (28%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately nineteen percent (19%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately four percent (4%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 3.73. Approximately fourteen percent (14%) of the total crashes occurred in this subsegment. This is located at the MD 191 (Bradley Boulevard) overpass.
- There were two (2) alcohol related crashes in the study period, accounting for approximately four percent (4%) of the total crashes.

Table D-03: Crash Data Summary for 2017 (I-495 – MD 190 to I-270Y)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	9	Opposite Dir	0
9:00 AM to 11:00 AM	3	Rear End	27
11:00 AM to 1:00 PM	4	Sideswipe	16
1:00 PM to 4:00 PM	10	Left Turn	0
4:00 PM to 7:00 PM	12	Angle	0
7:00 PM to 6:00 AM	19	Pedestrian	1
Total	**57**	Other Collision	2
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	0
Wet	14	Fixed Object: Guardrail/Barrier	10
Dry	41	Fixed Object: Light Pole	1
Snow/Ice	0	Fixed Object: Embankment	0
Other	2	Fixed Object: Crash Attenuator	0
Total	**57**	Fixed Object: Contr. Bridge	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	57	Parked Vehicle	0
		Total	**57**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	14
		Too Fast for Conditions	9
Total	**57**	Followed too Closely	8
Illumination	**# of Crashes**	Other or Unknown	17
Day	27	Fail to Obey Other Control	0
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	22	Influence of Alcohol	2
Dark – No Lights	2	Improper Lane Change	3
Other	2	Fail to Drive in Single Lane	3
Total	**57**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Wet	0
Clear/Cloudy	39	Influence of Combined Subst.	0
Foggy	0	Influence of Medication	0
Raining	10	Physical/Mental Difficulty	0
Snow/Sleet	0	Improper Parking	0
Other	8	Improper Turn	0
Total	**57**	Improper Passing	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Exceeded Speed Limit	0
Injury	13	Stopping in Lane Roadway	0
Property Damage Only	44	Rain, Snow	0
Total	**57**	**Total**	**57**
Segment Crash Rate=40.00 crashes per 100 million vehicle miles			

D-04 2017 Crash Analysis – I-495 from the I-270 Spur to MD 187

SHA provided crash data for the I-495 segment from the I-270 Spur to MD 187 (milepost 3.95 to 5.61) covering the period from January 1, 2017 to December 31, 2017.

A total of 64 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 89.6 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 30 crashes in 2012 and 26 crashes in 2013 to 33, 54, and 47 in 2014, 2015 and 2016 respectively, and an increase to 64 in 2017. A summary of the 2017 crash data is shown in **Table D-04**.

There are were no fatal crashes in the study segment in 2017. Of the reported crashes, 23 crashes resulted in injuries while 41 resulted in property damage only.

The contributing factors for forty-four percent (44%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- The second most common type of crash was categorized as "Other" which also accounted for approximately sixteen (16%) of the total crashes.
- Sideswipe crashes were the third common crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were another common type of crash and accounted for approximately eleven percent (11%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 5.61. Approximately seventeen percent (17%) of the total crashes occurred in this subsegment. This is located at Exit 36, Old Georgetown Road.
- Another location also with the same frequency of crashes occurred at milepost 4.21. Approximately seventeen percent (17%) of the total crashes occurred in this subsegment.
- There were two (2) alcohol related crash in the study period, accounting for approximately three percent (3%) of the total crashes.

Table D-04: Crash Data Summary for 2017 (I-495 – I-270 Spur to MD 187)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	4	Opposite Dir	
9:00 AM to 11:00 AM	7	Rear End	36
11:00 AM to 1:00 PM	6	Sideswipe	9
1:00 PM to 4:00 PM	9	Left Turn	
4:00 PM to 7:00 PM	17	Angle	
7:00 PM to 6:00 AM	21	Pedestrian	
Total	**64**	Other Collision	10
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	16	Fixed Object: Guardrail/Barrier	6
Dry	48	Fixed Object: Light Pole	
Snow/Ice		Fixed Object: Sign Pole	
Other		Fixed Object: Embankment	
Total	**64**	Fixed Object: Contr. Barrier	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	64	Parked Vehicle	2
		Total	**64**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	17
		Too Fast for Conditions	11
Total	**64**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	19
Day	38	Fail to Obey Other Control	2
Dawn / Dusk	3	Fail to Yield Right-of-way	
Dark – Lights On	18	Influence of Alcohol	2
Dark – No Lights	3	Improper Lane Change	1
Other	2	Fail to Drive in Single Lane	3
Total	**64**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Improper Passing	
Clear/Cloudy	47	Influence of Drugs	
Foggy		Vehicle Defect	
Raining	10	Physical/Mental Difficulty	
Snow/Sleet	3	Exceeded Speed Limit	
Other	4	Improper Turn	
Total	**64**	Influence of Drugs	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Fail to Keep Right of Center	
Injury	23	Stopping in Lane Roadway	
Property Damage Only	41	Shoulders Low, Soft, or High	
Total	**64**	**Total**	**64**
Segment Crash Rate=89.60 crashes per 100 million vehicle miles			

D-05 2017 Crash Analysis – I-495 from MD 187 to MD 355

SHA provided crash data for the I-495 segment from MD 187 to MD 355 (milepost 5.62 to 6.71) covering the period from January 1, 2017 to December 31, 2017.

A total of 120 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 268.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 56 crashes in 2012 and 78 crashes in 2013 to 73, 125, and 111 in 2014, 2015 and 2016 respectively, and increased to 120 in 2017. A summary of the 2017 crash data is shown in **Table D-05**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 27 crashes resulted in injuries while 93 resulted in property damage only.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately thirty-five percent (35%) of the total crashes.
- The second most common type of crash was categorized as "Other" which also accounted for approximately twenty-six percent (26%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately twenty-three percent (23%) of the total crashes.
- Sideswipe crashes accounted for approximately fifteen percent (15%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 6.71. Approximately thirty-eight percent (38%) of the total crashes occurred in this subsegment. This is located at Exit 34, MD355 (Rockville Pike).
- There were four (4) alcohol related crashes in the study period, accounting for approximately three percent (3%) of the total crashes.

Table D-05: Crash Data Summary for 2017 (I-495 – MD 187 to MD 355)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	21	Opposite Dir	1
9:00 AM to 11:00 AM	7	Rear End	42
11:00 AM to 1:00 PM	10	Sideswipe	18
1:00 PM to 4:00 PM	12	Left Turn	
4:00 PM to 7:00 PM	19	Angle	
7:00 PM to 6:00 AM	51	Pedestrian	
Total	**120**	Other Collision	31
Surface Condition	**# of Crashes**	Fixed Object: Bridge	1
Wet	51	Fixed Object: Guardrail/Barrier	19
Dry	66	Fixed Object: Light Pole	1
Snow/Ice		Fixed Object: Tree/Shrubbery	
Other	3	Fixed Object: Curb	5
Total	**120**	Fixed Object: Crash Attenuator	1
Reported Year	**# of Crashes**	Other Fixed Object	
2017	120	Parked Vehicle	1
		Total	**120**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	31
		Too Fast for Conditions	29
Total	**120**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	35
Day		Fail to Obey Other Control	
Dawn / Dusk	57	Fail to Yield Right-of-way	
Dark – Lights On	7	Influence of Alcohol	4
Dark – No Lights	46	Improper Lane Change	2
Other	10	Fail to Drive in Single Lane	11
Total	**120**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Animal	
Clear/Cloudy	79	Influence of Drugs	
Foggy		Vehicle Defect	
Raining	29	Wet	
Snow/Sleet	1	Exceeded Speed Limit	1
Other	11	Improper Turn	
Total	**120**	Influence of Combined Subst.	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Fail to Keep Right of Center	
Injury	27	Stopping in Lane Roadway	
Property Damage Only	93	Shoulders Low, Soft, or High	
Total	**120**	**Total**	**120**
Segment Crash Rate=268.30 crashes per 100 million vehicle miles			

D-06 2017 Crash Analysis – I-495 from MD 355 to MD 185

SHA provided crash data for the I-495 segment from MD 355 to MD 185 (milepost 6.71 to 8.24) covering the period from January 1, 2017 to December 31, 2017.

A total of 195 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 158.1 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 118 crashes in 2012 and 139 crashes in 2013 to 130, 244, and 238 in 2014, 2015 and 2016 respectively, and a decrease to 195 in 2017. A summary of the 2017 crash data is shown in **Table D-06**.

There were on fatal crashed reported in the segment for 2017. Of the reported crashes, 48 crashes resulted in injuries while 147 resulted in property damage only.

The contributing factors for fifty-one percent (51%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately thirty-seven percent (37%) of the total crashes.
- The second most common type of crash was categorized as "Other" which also accounted for approximately twenty-two percent (22%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- Sideswipe crashes accounted for approximately eighteen percent (18%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 8.24. Approximately forty percent (40%) of the total crashes occurred in this subsegment. This is located at Exit 33, MD 185 (Connecticut Avenue).
- There were four (4) alcohol related crashes in the study period, accounting for approximately two percent (2%) of the total crashes.

Table D-06: Crash Data Summary for 2017 (I-495 – MD 355 to MD 185)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	33	Opposite Dir	0
9:00 AM to 11:00 AM	13	Rear End	73
11:00 AM to 1:00 PM	16	Sideswipe	35
1:00 PM to 4:00 PM	28	Left Turn	0
4:00 PM to 7:00 PM	31	Angle	0
7:00 PM to 6:00 AM	74	Pedestrian	0
Total	**195**	Other Collision	42
Surface Condition	**# of Crashes**	Fixed Object: Bridge	0
Wet	93	Fixed Object: Guardrail/Barrier	36
Dry	95	Fixed Object: Light Pole	1
Snow/Ice	1	Fixed Object: Contr. Barrier	0
Other	6	Fixed Object: Curb	2
Total	**195**	Fixed Object: Embankment	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	195	Parked Vehicle	5
		Total	**195**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	44
		Too Fast for Conditions	56
Total	**195**	Followed too Closely	16
Illumination	**# of Crashes**	Other or Unknown	38
Day	105	Fail to Obey Other Control	0
Dawn / Dusk	12	Fail to Yield Right-of-way	3
Dark – Lights On	71	Influence of Alcohol	4
Dark – No Lights	6	Improper Lane Change	10
Other	1	Fail to Drive in Single Lane	21
Total	**195**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Influence of Drugs	1
Clear/Cloudy	109	Improper Turn	0
Foggy	1	Wet	0
Raining	66	Physical/Mental Difficulty	0
Snow/Sleet	3	Fail to Keep Right of Center	0
Other	16	Improper Passing	1
Total	**195**	Rain, Snow	0
Severity	**# of Crashes**	Icy or Snow Covered	0
Fatal	0	Exceeded Speed Limit	0
Injury	48	Stopping in Lane Roadway	0
Property Damage Only	147	Animal	0
Total	**195**	**Total**	**195**
Segment Crash Rate=158.10 crashes per 100 million vehicle miles			

D-07 2017 Crash Analysis – I-495 from MD 185 to MD 97

SHA provided crash data for the I-495 segment from MD 185 to MD 97 (milepost 8.24 to 10.44) covering the period from January 1, 2017 to December 31, 2017.

A total of 191 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 100.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar. The number of crashes along the study segment shows an increase from 131 crashes in 2012 and 208 crashes in 2013 to 169, 276, and 315 in 2014, 2015 and 2016 respectively, and decreased to 191 in 2017. A summary of the 2017 crash data is shown in **Table D-07**.

There were no crashes that resulted in any fatalities in 2017 within the segment. Of the reported crashes, 64 crashes resulted in injuries while 127 resulted in property damage only.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-five percent (65%) of the total crashes.
- The second most common type of crash was collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects and accounted for approximately fifteen percent (15%) of the total crashes.
- Crashes categorized as "Other" accounted for approximately nine percent (9%) of the total crashes.
- Sideswipe crashes also accounted for approximately nine percent (9%) of the total crashes.
- Approximately thirty percent (30%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 10.44. Approximately twenty-nine percent (29%) of the total crashes occurred in this subsegment. This is located at Exit 31, MD 97 (Georgia Avenue).
- There was one (1) alcohol related crash in the period, accounting for approximately one percent (1%) of the total crashes.

Table D-07: Crash Data Summary for 2017 (I-495 – MD 185 to MD 97)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	33	Opposite Dir	1
9:00 AM to 11:00 AM	18	Rear End	124
11:00 AM to 1:00 PM	19	Sideswipe	18
1:00 PM to 4:00 PM	31	Left Turn	0
4:00 PM to 7:00 PM	24	Angle	0
7:00 PM to 6:00 AM	66	Pedestrian	0
Total	**191**	Other Collision	18
Surface Condition	**# of Crashes**	Fixed Object: Embankment	1
Wet	45	Fixed Object: Guardrail/Barrier	24
Dry	133	Fixed Object: Light Pole	1
Snow/Ice	0	Fixed Object: Sign Pole	2
Other	13	Fixed Object: Curb	0
Total	**191**	Fixed Object: Contr. Barrier	0
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	191	Parked Vehicle	1
		Total	**191**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	57
		Too Fast for Conditions	39
Total	**191**	Followed too Closely	25
Illumination	**# of Crashes**	Other or Unknown	48
Day	104	Fail to Obey Other Control	0
Dawn / Dusk	18	Fail to Yield Right-of-way	1
Dark – Lights On	58	Influence of Alcohol	1
Dark – No Lights	5	Improper Lane Change	5
Other	6	Fail to Drive in Single Lane	6
Total	**191**	Fell Asleep, Fainted, etc.	4
Weather Condition	**# of Crashes**	Wet	0
Clear/Cloudy	147	Influence of Medication	1
Foggy	0	Vehicle Defect	0
Raining	22	Physical/Mental Difficulty	2
Snow/Sleet	1	Improper Parking	0
Other	21	Improper Turn	0
Total	**191**	Improper Passing	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Exceeded Speed Limit	0
Injury	64	Stopping in Lane Roadway	2
Property Damage Only	127	Rain, Snow	0
Total	**191**	**Total**	**191**
Segment Crash Rate=100.30 crashes per 100 million vehicle miles			

D-08 2017 Crash Analysis – I-495 from MD 97 to US 29

SHA provided crash data for the I-495 segment from MD 97 to US 29 (milepost 10.45 to 11.88) covering the period from January 1, 2017 to December 31, 2017.

A total of 91 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 76.2 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 83 crashes in 2012 and 96 crashes in 2013 to 113, 143, and 181 in 2014, 2015 and 2016 respectively, and an decrease to 91 in 2017. A summary of the 2017 crash data is shown in **Table D-08**.

There were no fatal crashes within the segment during 2017. Of the reported crashes, 26 crashes resulted in injuries while 65 resulted in property damage only.

The contributing factors for forty-five percent (45%) of all crashes were due to "Failure to give full Attention" and "Speeds to Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-four percent (64%) of the total crashes.
- The second most common type of crash were sideswipe crashes which accounted for approximately eighteen percent (18%) of the total crashes.
- Crashes categorized as "Other" accounted for approximately nine percent (9%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects also accounted for approximately nine percent (9%) of the total crashes.
- Approximately thirty-seven percent (37%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 11.88. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located at Exit 30, US 29 (Colesville Road).
- There were three (3) alcohol related crashes in the study period, accounting for approximately three percent (3%) of the total crashes.

Table D-08: Crash Data Summary for 2017 (I-495 – MD 97 to US 29)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	16	Opposite Dir	0
9:00 AM to 11:00 AM	7	Rear End	58
11:00 AM to 1:00 PM	3	Sideswipe	16
1:00 PM to 4:00 PM	10	Left Turn	0
4:00 PM to 7:00 PM	18	Angle	0
7:00 PM to 6:00 AM	37	Pedestrian	0
Total	**91**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	0
Wet	16	Fixed Object: Guardrail/Barrier	6
Dry	74	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Sign Pole	0
Other	1	Fixed Object: Curb	1
Total	**91**	Fixed Object: Fence	1
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	91	Parked Vehicle	1
		Total	**91**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	28
		Too Fast for Conditions	16
Total	**91**	Followed too Closely	10
Illumination	**# of Crashes**	Other or Unknown	22
Day	38	Fail to Obey Other Control	0
Dawn / Dusk	6	Fail to Yield Right-of-way	0
Dark – Lights On	41	Influence of Alcohol	3
Dark – No Lights	4	Improper Lane Change	3
Other	2	Fail to Drive in Single Lane	4
Total	**91**	Fell Asleep, Fainted, etc.	2
Weather Condition	**6**	Wet	0
Clear/Cloudy	74	Lic. Restr. Non-compliance	1
Foggy		Passenger Interfere/Obstruct.	1
Raining	10	Physical/Mental Difficulty	0
Snow/Sleet		Improper Parking	0
Other	7	Improper Turn	0
Total	**91**	Improper Backing	0
Severity	**# of Crashes**	Road Under Construction	0
Fatal	0	Exceeded Speed Limit	1
Injury	26	Stopping in Lane Roadway	0
Property Damage Only	65	Operator using Cell Phone	0
Total	**91**	**Total**	**91**
Segment Crash Rate=76.20 crashes per 100 million vehicle miles			

D-09 2017 Crash Analysis – I-495 from US 29 to MD 193

SHA provided crash data for the I-495 segment from US 29 to MD 193 (milepost 11.89 to 12.52) covering the period from January 1, 2017 to December 31, 2017.

A total of 50 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 99.6 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 51 crashes in 2012 and 23 crashes in 2013 to 55, 87, and 77 in 2014, 2015 and 2016 respectively, and an decrease to 50 in 2017. A summary of the 2017 crash data is shown in **Table D-09**.

There were no fatal crashes within the segment in 2017. Of the reported crashes, 20 crashes resulted in injuries while 30 resulted in property damage only.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- Sideswipe crashes were the second most reported crash with accounted for approximately twenty-four percent (24%) of the total crashes
- The third most common type of crash was categorized as "Other" which accounted for approximately sixteen percent (16%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were another common type of crash and accounted for approximately ten percent (10%) of the total crashes.
- Approximately twenty-eight percent (28%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 12.52. Approximately fifty-one percent (512%) of the total crashes occurred in this subsegment. This is located at Exit 39, MD 193 (University Boulevard East).
- There were two (2) alcohol related crashes in the period, accounting for approximately four percent (4%) of the total crashes.

Table D-09: Crash Data Summary for 2017 (I-495 – US 29 to MD 193)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	10	Opposite Dir	0
9:00 AM to 11:00 AM	6	Rear End	25
11:00 AM to 1:00 PM	5	Sideswipe	12
1:00 PM to 4:00 PM	7	Left Turn	0
4:00 PM to 7:00 PM	4	Angle	0
7:00 PM to 6:00 AM	18	Pedestrian	0
Total	**50**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	1
Wet	11	Fixed Object: Guardrail/Barrier	4
Dry	36	Fixed Object: Light Pole	0
Snow/Ice	1	Fixed Object: Contr. Barrier	0
Other	2	Fixed Object: Curb	0
Total	**50**	Fixed Object: Embankment	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	50	Parked Vehicle	0
		Total	**50**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	13
		Too Fast for Conditions	12
Total	**50**	Followed too Closely	5
Illumination	**# of Crashes**	Other or Unknown	12
Day	27	Influence of Drugs	1
Dawn / Dusk	4	Fail to Yield Right-of-way	0
Dark – Lights On	16	Influence of Alcohol	2
Dark – No Lights	2	Improper Lane Change	2
Other	1	Fail to Drive in Single Lane	3
Total	**50**	Fell Asleep, Fainted, etc.	0
Weather Condition	**# of Crashes**	Vehicle Defect	0
Clear/Cloudy	32	Sleet, Hail, Freezing, Rain	0
Foggy	0	Debris or Obstruction	0
Raining	9	Improper Right Turn on Red	0
Snow/Sleet	1	Fail to Keep Right of Center	0
Other	8	Influence of Medication	0
Total	**50**	Rain, Snow	0
Severity	**# of Crashes**	Icy or Snow Covered	0
Fatal	0	Exceeded Speed Limit	0
Injury	20	Stopping in Lane Roadway	0
Property Damage Only	30	Animal	0
Total	**50**	**Total**	**50**
Segment Crash Rate=99.60 crashes per 100 million vehicle miles			

D-10 2017 Crash Analysis – I-495 from MD 193 to MD 650

SHA provided crash data for the I-495 segment from MD 193 to MD 650 (milepost 12.53 to 14.10) covering the period from January 1, 2017 to December 31, 2017.

A total of 106 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is crashes 86.0 per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 61 crashes in 2013 to 101, 104, and 104 in 2014, 2015 and 2016 respectively, and an increase to 106 in 2017. A summary of the 2017 crash data is shown in **Table D-10**.

There are were no fatal crashes in the study segment in 2017. Of the reported crashes, 31 crashes resulted in injuries while 75 resulted in property damage only.

The contributing factors for forty-nine percent (49%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-eight percent (68%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately 9 percent (9%) of the total crashes.
- Crashes categorized as "Other" accounted for approximately five percent (5%) of the total crashes.
- Approximately thirty-eight percent (38%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 14.10. Approximately thirty-seven percent (37%) of the total crashes occurred in this subsegment. This is located at Exit 28, MD 650 (New Hampshire Avenue).
- There were three (3) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-10: Crash Data Summary for 2017 (I-495 – MD 193 to MD 650)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	16	Opposite Dir	0
9:00 AM to 11:00 AM	7	Rear End	72
11:00 AM to 1:00 PM	5	Sideswipe	14
1:00 PM to 4:00 PM	23	Left Turn	0
4:00 PM to 7:00 PM	24	Angle	0
7:00 PM to 6:00 AM	31	Pedestrian	1
Total	**106**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	0
Wet	19	Fixed Object: Guardrail/Barrier	9
Dry	81	Fixed Object: Light Pole	0
Snow/Ice	0	Fixed Object: Sign Pole	1
Other	6	Fixed Object: Curb	0
Total	**106**	Fixed Object: Embankment	0
Reported Year	**# of Crashes**	Other Fixed Object	0
2017	106	Parked Vehicle	4
		Total	**106**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	35
		Too Fast for Conditions	17
Total	**106**	Followed too Closely	14
Illumination	**# of Crashes**	Other or Unknown	25
Day	64	Fail to Obey Traffic Signal	0
Dawn / Dusk	9	Fail to Yield Right-of-way	0
Dark – Lights On	23	Influence of Alcohol	3
Dark – No Lights	8	Improper Lane Change	4
Other	2	Fail to Drive in Single Lane	2
Total	**106**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Vehicle Defect	0
Clear/Cloudy	78	Influence of Drugs	0
Foggy	0	Influence of Medication	0
Raining	11	Physical/Mental Difficulty	0
Snow/Sleet	1	Fail to Keep Right of Center	0
Other	16	Improper Backing	0
Total	**106**	Sleet, Hail, Freezing Rain	0
Severity	**# of Crashes**	Debris or Obstruction	0
Fatal	0	Exceeded Speed Limit	0
Injury	31	Stopping in Lane Roadway	1
Property Damage Only	75	Animal	0
Total	**106**	**Total**	**106**
Segment Crash Rate=86.00 crashes per 100 million vehicle miles			

D-11 2017 Crash Analysis – I-495 from MD 650 to I-95

SHA provided crash data for the I-495 segment from MD 650 to I-95 (milepost 0 to 1.74 in PG Co. and 14.11 to 14.38 in Montgomery Co.) covering the period from January 1, 2017 to December 31, 2017.

A total of 101 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 54.9 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 74 crashes in 2013 to 116 in 2014 and 84 and 88 in 2015 and 2016 respectively, and an increase to 101 in 2017. A summary of the 2017 crash data is shown in **Table D-11**.

There were no fatal crashes in the segment during 2017. Of the reported crashes, 22 crashes resulted in injuries while 79 resulted in property damage only.

The contributing factors for forty-eight percent (48%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Sideswipe crashes were the second most common crash which accounted for approximately nineteen (19%) of the total crashes
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately eight percent (8%) of the total crashes.
- Approximately forty percent (40%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 1.04 in Prince George's County. Approximately twelve percent (12%) of the total crashes occurred in this subsegment. This is located at the on-ramp from I-95X SB to EB I-495.
- There were three (3) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-11: Crash Data Summary for 2017 (MD 650 to I-95)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	18	Opposite Dir	0
9:00 AM to 11:00 AM	7	Rear End	61
11:00 AM to 1:00 PM	4	Sideswipe	19
1:00 PM to 4:00 PM	17	Left Turn	0
4:00 PM to 7:00 PM	22	Angle	0
7:00 PM to 6:00 AM	33	Pedestrian	0
Total	**101**	Other Collision	8
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	0
Wet	14	Fixed Object: Guardrail/Barrier	9
Dry	78	Fixed Object: Tree Shrubbery	1
Snow/Ice	0	Fixed Object: Curb	0
Other	9	Fixed Object: Embankment	1
Total	**101**	Fixed Object: Other Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	101	Parked Vehicle	0
		Total	**101**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	37
		Too Fast for Conditions	11
Total	**101**	Followed too Closely	6
Illumination	**# of Crashes**	Other or Unknown	28
Day	54	Improper Backing	0
Dawn / Dusk	7	Fail to Yield Right-of-way	1
Dark – Lights On	26	Influence of Alcohol	3
Dark – No Lights	12	Improper Lane Change	12
Other	2	Fail to Drive in Single Lane	1
Total	**101**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Vehicle Defect	0
Clear/Cloudy	71	Rain, Snow	0
Foggy	1	Physical/Mental Difficulty	0
Raining	8	Debris or Obstruction	0
Snow/Sleet	0	Fail to Obey Other Control	0
Other	21	Influence of Drugs	0
Total	**101**	Improper Backing	0
Severity	**# of Crashes**	Illegally in Roadway	0
Fatal	0	Stopping in Lane Roadway	0
Injury	22	Wet	0
Property Damage Only	79	Improper Turn	0
Total	**101**	**Total**	**101**
Segment Crash Rate=54.90 crashes per 100 million vehicle miles			

D-12 2017 Crash Analysis – I-495 from MD 210 to I-295

SHA provided crash data for the I-495 segment from MD 210 to I-295 (milepost 1.76 to 2.75) covering the period from January 1, 2017 to December 31, 2017.

A total of 32 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 79.9 crashes per 100 million vehicle miles (MVM), which is above 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 30 crashes in 2012 and 27 crashes in 2013 to an increase to 36, 47, and 65 in 2014, 2015 and 2016 respectively, and a decrease to 32 in 2017. A summary of the 2017 crash data is shown in **Table D-12**.

The contributing factors for forty-four percent (44%) of all crashes were due to "Failure to give full Attention" and "Following too Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-seven percent (47%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the second most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- The third most common type of crash was categorized as "Other" which accounted for approximately sixteen percent (16%) of the total crashes.
- Sideswipe crashes also accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 2.75. Approximately forty-four percent (44%) of the total crashes occurred in this subsegment. This is located at Exit 3, MD 210 (Indian Head Highway).
- There were two (2) alcohol related crashes in the period, accounting for approximately six percent (6%) of the total crashes.

Table D-12: Crash Data Summary for 2019 (MD 210 to I-295)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	6	Opposite Dir	
9:00 AM to 11:00 AM	2	Rear End	15
11:00 AM to 1:00 PM	3	Sideswipe	5
1:00 PM to 4:00 PM	1	Left Turn	
4:00 PM to 7:00 PM	10	Angle	
7:00 PM to 6:00 AM	10	Pedestrian	
Total	**32**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Contr. Barrier	
Wet	5	Fixed Object: Guardrail/Barrier	6
Dry	26	Fixed Object: Light Pole	
Snow/Ice	1	Fixed Object: Culvert/Ditch	
Other		Fixed Object: Tree/Shrubbery	1
Total	**32**	Fixed Object: Other Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	32	Parked Vehicle	
		Total	**32**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	11
		Too Fast for Conditions	2
Total	**32**	Followed too Closely	3
Illumination	**# of Crashes**	Other or Unknown	9
Day	14	Failure to Keep Right of Center	1
Dawn / Dusk	6	Fail to Yield Right-of-way	
Dark – Lights On	3	Influence of Alcohol	2
Dark – No Lights	7	Improper Lane Change	1
Other	2	Fail to Drive in Single Lane	1
Total	**32**	Fell Asleep, Fainted, etc.	
Weather Condition	**# of Crashes**	Physical/Mental Difficulty	1
Clear/Cloudy	25	Improper Turn	1
Foggy	2	Improper Signal	
Raining	2	Lic. Restr. Non-Compliance	
Snow/Sleet		Improper Passing	
Other	3	Influence of Drugs	
Total	**32**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Illegally in Roadway	
Injury	10	Animal	
Property Damage Only	22	Vision Obstruction	
Total	**32**	**Total**	**32**
Segment Crash Rate=79.70 crashes per 100 million vehicle miles			

D-13 2017 Crash Analysis – I-495 from MD 414 to MD 210

SHA provided crash data for the I-495 segment from MD 414 to MD 210 (milepost 2.75 to 4.33) covering the period from January 1, 2017 to December 31, 2017.

A total of 61 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 80.1 crashes per 100 million vehicle miles (MVM), which is above 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 39 crashes in 2012 and 46 crashes in 2013 to 58, 61, and 94 in 2014, 2015 and 2016 respectively, and a decrease to 61 in 2017. A summary of the 2017crash data is shown in **Table D-13**.

There were no fatal crashes within the segment during 2017. Of the reported crashes, 18 crashes resulted in injuries while 43 resulted in property damage only.

The contributing factors for forty-five percent (45%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- The third most common type of crash was categorized as "Other" which also accounted for approximately eleven percent (11%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects also accounted for approximately eleven percent (11%) of the total crashes.
- Approximately forty-six percent (46%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 4.33. Approximately forty-one percent (41%) of the total crashes occurred in this subsegment. This is located at Exit 4, MD 414 (St. Barnabas Road).
- There were three (3) alcohol related crashes in the period, accounting for approximately five percent (5%) of the total crashes

Table D-13: Crash Data Summary for 2017 (MD 414 to MD 210)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	12	Opposite Dir	
9:00 AM to 11:00 AM	3	Rear End	34
11:00 AM to 1:00 PM	2	Sideswipe	13
1:00 PM to 4:00 PM	6	Left Turn	
4:00 PM to 7:00 PM	16	Angle	
7:00 PM to 6:00 AM	22	Pedestrian	
Total	**61**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Curb	
Wet	9	Fixed Object: Guardrail/Barrier	6
Dry	45	Fixed Object: Light Pole	
Snow/Ice	1	Fixed Object: Embankment	
Other	6	Fixed Object: Tree/Shrubbery	1
Total	**61**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	61	Parked Vehicle	
		Total	**61**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	19
		Too Fast for Conditions	5
Total	**61**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	18
Day	25	Failure to Keep Right of Center	
Dawn / Dusk	7	Fail to Yield Right-of-way	1
Dark – Lights On	12	Influence of Alcohol	3
Dark – No Lights	9	Improper Lane Change	5
Other	8	Fail to Drive in Single Lane	
Total	**61**	Fell Asleep, Fainted, etc.	
Weather Condition	**# of Crashes**	Influence of Combined Subst.	1
Clear/Cloudy	48	Physical/Mental Difficulty	1
Foggy	2	Improper Turn	
Raining	6	Lic. Restr. Non-Compliance	
Snow/Sleet		Fail to Obey Other Control	1
Other	5	Influence of Drugs	
Total	**61**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal	0	Exceeded Speed Limit	
Injury	18	Animal	
Property Damage Only	43	Vision Obstruction	
Total	**61**	**Total**	**61**
Segment Crash Rate=80.10 crashes per 100 million vehicle miles			

D-14 2017 Crash Analysis – I-495 from MD 5 to MD 414

SHA provided crash data for the I-495 segment from MD 5 to MD 414 (milepost 4.34 to 7.3) covering the period from January 1, 2017 to December 31, 2017.

A total of 112 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 66.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 71 crashes in 2012 and 101 crashes in 2013 to 100, 122, and 152 in 2014, 2015 and 2016 respectively, and a decrease to 112 in 2017. A summary of the 2017 crash data is shown in **Table D-14**.

There was one (1) fatal crash within the segment. Of the remaining reported crashes, 34 crashes resulted in injuries while 77 resulted in property damage only.

The contributing factors for forty-five percent (45%) of all crashes were due to "Failure to give full Attention" and "Speeds to Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-eight percent (48%) of the total crashes.
- Sideswipe crashes are the second most common type crash and accounted for approximately twenty-six percent (26%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Crashes categorized as "Other" accounted for approximately eleven percent (11%) of the total crashes.
- Approximately thirty-five percent (35%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 7.30. Approximately thirty percent (39%) of the total crashes occurred in this subsegment. This is located at Exit 7, MD 5 (Branch Avenue).
- There were three (3) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-14: Crash Data Summary for 2017 (MD 5 to MD 414)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	17	Opposite Dir	
9:00 AM to 11:00 AM	11	Rear End	54
11:00 AM to 1:00 PM	6	Sideswipe	29
1:00 PM to 4:00 PM	18	Left Turn	
4:00 PM to 7:00 PM	22	Angle	
7:00 PM to 6:00 AM	38	Pedestrian	1
Total	**112**	Other Collision	12
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	24	Fixed Object: Guardrail/Barrier	11
Dry	82	Fixed Object: Light Pole	2
Snow/Ice	1	Fixed Object: Embankment	
Other	5	Fixed Object: Tree/Shrubbery	
Total	**112**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	112	Parked Vehicle	2
		Total	**112**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	32
		Too Fast for Conditions	14
Total	**112**	Followed too Closely	17
Illumination	**# of Crashes**	Other or Unknown	27
Day	64	Influence of Drugs	1
Dawn / Dusk	5	Fail to Yield Right-of-way	
Dark – Lights On	30	Influence of Alcohol	3
Dark – No Lights	9	Improper Lane Change	10
Other	4	Fail to Drive in Single Lane	4
Total	**112**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Influence of Combined Subst.	1
Clear/Cloudy	71	Physical/Mental Difficulty	
Foggy	1	Icy or Snow Covered	
Raining	16	Operator using Cell Phone	
Snow/Sleet	2	Fail to Obey Other Control	
Other	22	Influence of Medication	
Total	**112**	Wrong Way on One Way	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal	1	Exceeded Speed Limit	
Injury	34	Stopping in Lane Roadway	
Property Damage Only	77	Animal	
Total	**112**	**Total**	**112**
Segment Crash Rate=66.30 crashes per 100 million vehicle miles			

D-15 2017 Crash Analysis – I-495 from Forestville Road to MD 5

SHA provided crash data for the I-495 segment from Forestville Road to MD 5 (milepost 7.31 to 9.69) covering the period from January 1, 2017 to December 31, 2017.

A total of 135 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 79.0 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 75 crashes in 2012 and 96 crashes in 2013 to 119, 104, and 126 in 2014, 2015 and 2016 respectively, and increased to 135 in 2017. A summary of the 2017 crash data is shown in **Table D-15**.

There were no fatal crashes within the segment in 2017. Of the remaining reported crashes, 34 crashes resulted in injuries while 101 resulted in property damage only.

The contributing factors for forty-three percent (43%) of all crashes were due to "Failure to give full Attention", "Following to Close" and "Speeds too Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-seven percent (57%) of the total crashes.
- Sideswipe crashes were the second most common type crash and accounted for approximately nineteen (19%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third common type of crash and accounted for approximately twelve percent (12%) of the total crashes.
- Another common type of crash was categorized as "Other" which accounted for approximately eleven percent (11%) of the total crashes.
- Approximately twenty-eight percent (28%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 9.07. Approximately twenty-five percent (25%) of the total crashes occurred in this subsegment. This is located at Exit 9, Suitland Road.
- There was four (4) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-15: Crash Data Summary for 2017 (I-495 – Forestville Road to MD 5)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	8	Opposite Dir	
9:00 AM to 11:00 AM	4	Rear End	77
11:00 AM to 1:00 PM	13	Sideswipe	26
1:00 PM to 4:00 PM	19	Left Turn	
4:00 PM to 7:00 PM	30	Angle	
7:00 PM to 6:00 AM	61	Pedestrian	
Total	**135**	Other Collision	15
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	17	Fixed Object: Guardrail/Barrier	15
Dry	115	Fixed Object: Light Pole	
Snow/Ice		Fixed Object: Embankment	
Other	3	Fixed Object: Tree/Shrubbery	1
Total	**135**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	135	Parked Vehicle	1
		Total	**135**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	28
		Too Fast for Conditions	15
Total	**135**	Followed too Closely	15
Illumination	**# of Crashes**	Other or Unknown	50
Day	68	Influence of Drugs	2
Dawn / Dusk	6	Fail to Yield Right-of-way	4
Dark – Lights On	29	Influence of Alcohol	4
Dark – No Lights	32	Improper Lane Change	3
Other		Fail to Drive in Single Lane	5
Total	**135**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	113	Physical/Mental Difficulty	
Foggy		Animal	
Raining	8	Improper Passing	
Snow/Sleet	2	Fail to Obey Other Control	2
Other	12	Influence of Combined Substance	1
Total	**135**	Rain, Snow	
Severity	**# of Crashes**	Improper Backing	
Fatal		Exceeded Speed Limit	2
Injury	34	Stopping in Lane Roadway	1
Property Damage Only	101	Wrong Way on One Way	
Total	**135**	**Total**	**135**
Segment Crash Rate=79.00 crashes per 100 million vehicle miles			

D-16 2017 Crash Analysis – I-495 from MD 4 to Forestville Road

SHA provided crash data for the I-495 segment from MD 4 to Forestville Road (milepost 9.00 to 10.78) covering the period from January 1, 2017 to December 31, 2017.

A total of 158 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 122.52 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 62 crashes in 2012 and 68 crashes in 2013 to 108, 99, and 111 in 2014, 2015 and 2016 respectively, and an increase to 158 in 2017. A summary of the 2017 crash data is shown in **Table D-16**.

There was one (1) fatal crash within the segment. Of the remaining reported crashes, 38 crashes resulted in injuries while 119 resulted in property damage only.

The contributing factors for forty-nine percent (49%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-eight percent (58%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-seven percent (27%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately eight percent (8%) of the total crashes.
- Another common type of crash was categorized as "Other" which accounted for approximately four percent (4%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 10.78. Approximately nineteen percent (19%) of the total crashes occurred in this subsegment. This is located at the bridge over Suitland Parkway.
- There were four (4) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-16: Crash Data Summary for 2017 (MD 4 to Forestville Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	20	Opposite Dir	
9:00 AM to 11:00 AM	12	Rear End	92
11:00 AM to 1:00 PM	14	Sideswipe	43
1:00 PM to 4:00 PM	29	Left Turn	
4:00 PM to 7:00 PM	34	Angle	
7:00 PM to 6:00 AM	49	Pedestrian	
Total	**158**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	19	Fixed Object: Guardrail/Barrier	8
Dry	125	Fixed Object: Light Pole	1
Snow/Ice		Fixed Object: Bridge	1
Other	14	Fixed Object: Tree/Shrubbery	2
Total	**158**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	158	Parked Vehicle	4
		Total	**158**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	52
		Too Fast for Conditions	14
Total	**158**	Followed too Closely	25
Illumination	**# of Crashes**	Other or Unknown	35
Day	101	Failure to Keep Right of Center	
Dawn / Dusk	5	Fail to Yield Right-of-way	2
Dark – Lights On	35	Influence of Alcohol	4
Dark – No Lights	8	Improper Lane Change	13
Other	9	Fail to Drive in Single Lane	3
Total	**158**	Fell Asleep, Fainted, etc.	5
Weather Condition	**# of Crashes**	Fail to Obey Stop Sign	1
Clear/Cloudy	120	Improper Backing	1
Foggy		Physical/Mental Difficulty	
Raining	10	Influence of Medication	
Snow/Sleet	2	Fail to Obey Other Control	
Other	26	Influence of Drugs	2
Total	**158**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal	1	Stopping in Lane Roadway	
Injury	38	Improper Passing	1
Property Damage Only	119	Fail to Ober Traffic Signal	
Total	**158**	**Total**	**158**
Segment Crash Rate=122.20 crashes per 100 million vehicle miles			

D-17 2017 Crash Analysis – I-495 from Marlboro Road to MD 4

SHA provided crash data for the I-495 segment from Marlboro Road to MD 4 (milepost 10.79 to 13.14) covering the period from January 1, 2017 to December 31, 2017.

A total of 192 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 77.8 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 82 crashes in 2012 and 148 crashes in 2013 to 127, 136, and 155 in 2014, 2015 and 2016 respectively, and an increase to 192 in 2017. A summary of the 2017 crash data is shown in **Table D-17**.

There were no fatal crashes within the segment in 2017. Of the reported crashes, 47 crashes resulted in injuries while 145 resulted in property damage only.

The contributing factors for fifty-one percent (51%) of all crashes were due to "Failure to give full Attention" and "Following to Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-six percent (66%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately seventeen percent (17%) of the total crashes.
- The third most common type of crash was categorized as "Other" which accounted for approximately ten percent (10%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were also a common type of crash and accounted for approximately five percent (5%) of the total crashes.
- Approximately thirty-nine percent (39%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 13.14. Approximately twenty-two percent (22%) of the total crashes occurred in this subsegment. This is located at Exit 13, Ritchie Marlboro Road.
- There were five (5) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-17: Crash Data Summary for 2017 (Marlboro Road to MD 4)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	25	Opposite Dir	
9:00 AM to 11:00 AM	15	Rear End	127
11:00 AM to 1:00 PM	28	Sideswipe	32
1:00 PM to 4:00 PM	26	Left Turn	
4:00 PM to 7:00 PM	49	Angle	1
7:00 PM to 6:00 AM	49	Pedestrian	
Total	**192**	Other Collision	19
Surface Condition	**# of Crashes**	Fixed Object: Curb	
Wet	26	Fixed Object: Guardrail/Barrier	6
Dry	156	Fixed Object: Light Pole	1
Snow/Ice		Fixed Object: Embankment	1
Other	10	Fixed Object: Tree/Shrubbery	1
Total	**192**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	192	Parked Vehicle	3
		Total	**192**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	69
		Too Fast for Conditions	21
Total	**192**	Followed too Closely	29
Illumination	**# of Crashes**	Other or Unknown	41
Day	128	Influence of Drugs	1
Dawn / Dusk	10	Fail to Yield Right-of-way	
Dark – Lights On	25	Influence of Alcohol	5
Dark – No Lights	18	Improper Lane Change	11
Other	11	Fail to Drive in Single Lane	4
Total	**192**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Fail to Obey Traffic Signal	1
Clear/Cloudy	143	Physical/Mental Difficulty	
Foggy		Improper Backing	1
Raining	16	Improper Passing	1
Snow/Sleet	2	Fail to Obey Stop Sign	1
Other	31	Operator Using Cell Phone	4
Total	**192**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Exceeded Speed Limit	
Injury	47	Stopping in Lane Roadway	
Property Damage Only	145	Failure to Keep Right of Center	
Total	**192**	**Total**	**192**
Segment Crash Rate=77.80 crashes per 100 million vehicle miles			

D-18 2017 Crash Analysis – I-495 from MD 214 to Marlboro Road

SHA provided crash data for the I-495 segment from MD 214 to Marlboro Road (milepost 13.14 to 14.78) covering the period from January 1, 2017 to December 31, 2017.

A total of 80 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 71.6 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 62 crashes in 2012 and 117 crashes in 2013 to 80, 103, and 129 in 2014, 2015 and 2016 respectively, and an decrease to 80 in 2017. A summary of the 2017 crash data is shown in **Table D-18**.

No fatal crashes occurred in the segment during 2017. Of the reported crashes, 29 crashes resulted in injuries while 51 resulted in property damage only.

The contributing factors for forty-eight percent (48%) of all crashes were due to "Failure to give full Attention" and "Following too Close." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-three percent (63%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately thirteen percent (13%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately nine percent (9%) of the total crashes.
- Approximately forty-one percent (41%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 14.78. Approximately forty-three percent (43%) of the total crashes occurred in this subsegment. This is located at Exit 15 on I-95/I-495.
- There were two (2) alcohol related crashes in the period, accounting for approximately two percent (2%) of the total crashes.

Table D-18: Crash Data Summary for 2017 (MD 214 to Marlboro Road)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	14	Opposite Dir	
9:00 AM to 11:00 AM	12	Rear End	50
11:00 AM to 1:00 PM	2	Sideswipe	12
1:00 PM to 4:00 PM	13	Left Turn	
4:00 PM to 7:00 PM	19	Angle	
7:00 PM to 6:00 AM	20	Pedestrian	
Total	**80**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Curb	2
Wet	19	Fixed Object: Guardrail/Barrier	7
Dry	57	Fixed Object: Light Pole	
Snow/Ice		Fixed Object: Embankment	
Other	4	Fixed Object: Tree/Shrubbery	1
Total	**80**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	80	Parked Vehicle	1
		Total	**80**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	23
		Too Fast for Conditions	12
Total	**80**	Followed too Closely	15
Illumination	**# of Crashes**	Other or Unknown	21
Day	50	Wet	
Dawn / Dusk	2	Fail to Yield Right-of-way	
Dark – Lights On	19	Influence of Alcohol	2
Dark – No Lights	6	Improper Lane Change	2
Other	3	Fail to Drive in Single Lane	2
Total	**80**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	59	Physical/Mental Difficulty	
Foggy		Improper Turn	
Raining	12	Lic. Restr. Non-Compliance	
Snow/Sleet	2	Fail to Obey Other Control	1
Other	7	Influence of Drugs	
Total	**80**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Exceeded Speed Limit	
Injury	29	Stopping in Lane Roadway	1
Property Damage Only	51	Road Under Construction	
Total	**80**	**Total**	**80**
Segment Crash Rate=71.60 crashes per 100 million vehicle miles			

D-19 2017 Crash Analysis – I-495 from Arena Drive to MD 214

SHA provided crash data for the I-495 segment from Arena Drive to MD 214 (milepost 14.79 to 15.83) covering the period from January 1, 2017 to December 31, 2017.

A total of 83 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 92.4 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 47 crashes in 2012 and 62 crashes in 2013 to 48, 82, and 94 in 2014, 2015 and 2016 respectively, and a decrease to 83 in 2017. A summary of the 2017 crash data is shown in **Table D-19**.

There was one (1) fatal crash in the segment in 2017. Of the remaining reported crashes, 24 crashes resulted in injuries while 58 resulted in property damage only.

The contributing factors for forty-seven percent (47%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-eight percent (28%) of the total crashes.
- The third common type of crash was categorized as "Other" which accounted for approximately six percent (6%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were another common type of crash and accounted for approximately for five percent (5%) of the total crashes.
- Approximately thirty-one percent (31%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was milepost 15.83. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located at Exit 16, MD 202 (Arena Drive).

There were two (2%) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-19: Crash Data Summary for 2017 (I-495 – Arena Drive to MD 214)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	7	Opposite Dir	1
9:00 AM to 11:00 AM	4	Rear End	50
11:00 AM to 1:00 PM	8	Sideswipe	23
1:00 PM to 4:00 PM	23	Left Turn	
4:00 PM to 7:00 PM	19	Angle	
7:00 PM to 6:00 AM	22	Pedestrian	
Total	**83**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Crash Attenuator	
Wet	9	Fixed Object: Guardrail/Barrier	3
Dry	72	Fixed Object: Light Pole	
Snow/Ice	1	Fixed Object: Sign Pole	
Other	1	Fixed Object: Curb	
Total	**83**	Fixed Object: Tree/Shrubbery	1
Reported Year	**# of Crashes**	Other Fixed Object	
2017	83	Parked Vehicle	
		Total	**83**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	25
		Too Fast for Conditions	14
Total	**83**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	20
Day	58	Fail to Obey Other Control	1
Dawn / Dusk		Fail to Yield Right-of-way	3
Dark – Lights On	13	Influence of Alcohol	2
Dark – No Lights	11	Improper Lane Change	4
Other	1	Fail to Drive in Single Lane	3
Total	**83**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Rain, Snow	
Clear/Cloudy	66	Influence of Drugs	1
Foggy		Fail to Obey Traffic Signal	
Raining	9	Improper Passing	
Snow/Sleet	1	Exceeded Speed Limit	
Other	7	Improper Turn	
Total	**83**	Influence of Drugs	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal	1	Fail to Keep Right of Center	
Injury	24	Stopping in Lane Roadway	1
Property Damage Only	58	Shoulders Low, Soft, or High	
Total	**83**	**Total**	**83**
Segment Crash Rate=92.40 crashes per 100 million vehicle miles			

D-20 2017 Crash Analysis – I-495 from MD 202 to Arena Drive

SHA provided crash data for the I-495 segment from MD 202 to Arena Drive (milepost 15.84 to 16.56) covering the period from January 1, 2017 to December 31, 2017.

A total of 78 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 142.9 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 35 crashes in 2012 and 38 crashes in 2013 to 72, 57, and 97 in 2014, 2015 and 2016 respectively, and a decrease to 78 in 2017. A summary of the 2017 crash data is shown in **Table D-20**.

No fatal crashes occurred in the segment in 2017. Of the reported crashes, 23 crashes resulted in injuries while 55 resulted in property damage only.

The contributing factors for fifty percent (50%) of all crashes were due to "Failure to give full Attention", "Speeds too Fast for Conditions", and "Following too Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-five percent (55%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-three percent (23%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately 10 percent (10%) of the total crashes.
- Another common type of crash was categorized as "Other" which accounted for approximately eight percent (8%) of the total crashes.
- Approximately thirty-six percent (36%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes was at milepost 16.56. Approximately fifty percent (50%) of the total crashes occurred in this subsegment. This is located at Exit 17, MD 202 (Landover Road).
- There were two (2) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-20: Crash Data Summary for 2018 (I-495 – MD 202 to Arena Drive)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	10	Opposite Dir	2
9:00 AM to 11:00 AM	5	Rear End	43
11:00 AM to 1:00 PM	4	Sideswipe	18
1:00 PM to 4:00 PM	21	Left Turn	
4:00 PM to 7:00 PM	18	Angle	1
7:00 PM to 6:00 AM	20	Pedestrian	
Total	**78**	Other Collision	6
Surface Condition	**# of Crashes**	Fixed Object: Crash Attenuator	
Wet	16	Fixed Object: Guardrail/Barrier	8
Dry	60	Fixed Object: Light Pole	
Snow/Ice	1	Fixed Object: Sign Pole	
Other	1	Fixed Object: Curb	
Total	**78**	Fixed Object: Contr. Barrier	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	78	Parked Vehicle	
		Total	**78**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	25
		Too Fast for Conditions	7
Total	**78**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	24
Day	49	Fail to Obey Other Control	1
Dawn / Dusk	7	Fail to Yield Right-of-way	2
Dark – Lights On	10	Influence of Alcohol	2
Dark – No Lights	10	Improper Lane Change	3
Other	2	Fail to Drive in Single Lane	2
Total	**78**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Rain, Snow	
Clear/Cloudy	60	Influence of Drugs	
Foggy	1	Fail to Obey Traffic Signal	1
Raining	12	Physical/Mental Difficulty	
Snow/Sleet	1	Improper Passing	1
Other	4	Improper Turn	
Total	**78**	Influence of Combined Subst.	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Fail to Keep Right of Center	
Injury	23	Stopping in Lane Roadway	
Property Damage Only	55	Operator using Cell Phone	
Total	**78**	**Total**	**78**
Segment Crash Rate=142.90 crashes per 100 million vehicle miles			

D-21 2017 Crash Analysis – I-495 from US 50 to MD 202

SHA provided crash data for the I-495 segment from US 50 to MD 202 (milepost 16.57 to 18.54) covering the period from January 1, 2017 to December 31, 2017.

A total of 83 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 94.2 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 76 crashes in 2012 and 110 crashes in 2013 to 166, 145, and 197 in 2014, 2015 and 2016 respectively, and decreased to 83 in 2017. A summary of the 2017 crash data is shown in **Table D-21**.

There was one (1) fatal crash within the segment in 2017. Of the remaining reported crashes, 24 crashes resulted in injuries while 58 resulted in property damage only.

The contributing factors for forty-seven percent (47%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty percent (60%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-eight percent (28%) of the total crashes.
- The third most common type of crash was categorized as "Other" which also accounted for approximately six percent (6%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were also a common type of crash and accounted for approximately five percent (5%) of the total crashes.
- Approximately thirty-one percent (31%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 18.54. Approximately sixteen percent (16%) of the total crashes occurred in this subsegment. This is located at Exit 19, I-595 (John Hanson Highway).
- There were two (2) alcohol related crashes in the period, accounting for approximately two percent (2%) of the total crashes.

Table D-21: Crash Data Summary for 2017 (I-495 – US 50 to MD 202)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	7	Opposite Dir	1
9:00 AM to 11:00 AM	4	Rear End	50
11:00 AM to 1:00 PM	8	Sideswipe	23
1:00 PM to 4:00 PM	23	Left Turn	
4:00 PM to 7:00 PM	19	Angle	
7:00 PM to 6:00 AM	22	Pedestrian	
Total	**83**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	9	Fixed Object: Guardrail/Barrier	3
Dry	72	Fixed Object: Light Pole	
Snow/Ice	1	Fixed Object: Contr. Barrier	
Other	1	Fixed Object: Curb	
Total	**83**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object - Tree	1
2017	83	Parked Vehicle	
		Total	**83**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	25
		Too Fast for Conditions	14
Total	**83**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	20
Day	58	Influence of Drugs	1
Dawn / Dusk		Fail to Yield Right-of-way	3
Dark – Lights On	13	Influence of Alcohol	2
Dark – No Lights	11	Improper Lane Change	4
Other	1	Fail to Drive in Single Lane	3
Total	**83**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	66	Physical/Mental Difficulty	
Foggy		Debris or Obstruction	
Raining	9	Wet	
Snow/Sleet	1	Fail to Obey Other Control	1
Other	7	Influence of Medication	
Total	**83**	Rain,Snow	
Severity	**# of Crashes**	Operator Using Cell Phone	
Fatal	1	Exceeded Speed Limit	
Injury	24	Stopping in Lane Roadway	1
Property Damage Only	58	Lic. Restr. Non-compliance	
Total	**83**	**Total**	**83**
Segment Crash Rate=94.20 crashes per 100 million vehicle miles			

D-22 2017 Crash Analysis – I-495 from MD 450 to US 50

SHA provided crash data for the I-495 segment from MD 450 to US 50 (milepost 18.54 to 19.59) covering the period from January 1, 2017 to December 31, 2017.

A total of 96 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 92.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 70 crashes in 2012 and 74 crashes in 2013 to 97, 101 and 146 in 2014, 2015 and 2016 respectively, and decreased to 96 in 2017. A summary of the 2017 crash data is shown in **Table D-22**.

No fatal crashes occurred in the segment in 2017. Of the reported crashes, 22 crashes resulted in injuries while 74 resulted in property damage only.

The contributing factors for forty-two percent (42%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-eight percent (58%) of the total crashes.
- Sideswipe crashes were the second most common type crash and accounted for approximately twenty-five percent (25%) of the total crashes.
- Collisions with fixed objects were the third common type crash type, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately nine percent (9%) of the total crashes.
- Another most common type of crash was categorized as "Other" which also accounted for approximately seven percent (7%) of the total crashes.
- Approximately thirty-three percent (33%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred between mileposts 19.57 and 19.59. Approximately forty-two percent (42%) of the total crashes occurred in this subsegment. This is located at Exit 20, MD 450 (Annapolis Road).
- There were three (3) alcohol related crashes in the study period, accounting for approximately three percent (3%) of the total crashes.

Table D-22: Crash Data Summary for 2017 (MD 450 to US 50)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	10	Opposite Dir	
9:00 AM to 11:00 AM	8	Rear End	56
11:00 AM to 1:00 PM	8	Sideswipe	24
1:00 PM to 4:00 PM	20	Left Turn	
4:00 PM to 7:00 PM	22	Angle	
7:00 PM to 6:00 AM	28	Pedestrian	
Total	**96**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	11	Fixed Object: Guardrail/Barrier	6
Dry	82	Fixed Object: Light Pole	1
Snow/Ice	1	Fixed Object: Curb	1
Other	2	Fixed Object: Tree/Shrubbery	
Total	**96**	Fixed Object: Other Pole	
Reported Year	**# of Crashes**	Other Fixed Object	1
2017	96	Parked Vehicle	
		Total	**96**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	31
		Too Fast for Conditions	9
Total	**96**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	28
Day	59	Failure to Keep Right of Center	
Dawn / Dusk	3	Fail to Yield Right-of-way	1
Dark – Lights On	18	Influence of Alcohol	3
Dark – No Lights	15	Improper Lane Change	7
Other	1	Fail to Drive in Single Lane	7
Total	**96**	Fell Asleep, Fainted, etc.	3
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	80	Rain, Snow	
Foggy		Physical/Mental Difficulty	
Raining	9	Debris or Obstruction	
Snow/Sleet	1	Fail to Obey Other Control	
Other	6	Influence of Drugs	
Total	**96**	Lic. Restr. Non-compliance	
Severity	**# of Crashes**	Improper Turn	
Fatal		Stopping in Lane Roadway	
Injury	22	Influence of Medication	
Property Damage Only	74	Exceeded Speed Limit	
Total	**96**	**Total**	**96**
Segment Crash Rate=92.30 crashes per 100 million vehicle miles			

D-23 2017 Crash Analysis – I-495 from MD 295 to MD 450

SHA provided crash data for the I-495 segment from MD 295 to MD 450 (milepost 19.60 to 22.12) covering the period from January 1, 2017 to December 31, 2017.

A total of 145 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 97.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 137 crashes in 2012 and 113 crashes in 2013 to 140, 176 and 234 in 2014, 2015 and 2016 respectively, and decreased to 145 in 2017. A summary of the 2017 crash data is shown in **Table D-23**.

There was one (1) fatal crash in the segment during 2017. Of the remaining reported crashes, 47 crashes resulted in injuries while 97 resulted in property damage only.

The contributing factors for forty-three percent (43%) of all crashes were due to "Failure to give full Attention" and "Following too Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-four percent (64%) of the total crashes.
- Sideswipe crashes were the second most common type crash and accounted for approximately fourteen percent (14%) of the total crashes.
- The third most common type of crash was categorized as "Other" which also accounted for approximately ten percent (10%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the also a most common type of crash and accounted for approximately 10 percent (10%) of the total crashes.
- Approximately thirty-one percent (31%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.12. Approximately forty-two percent (44%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 295 (Baltimore Washington Parkway).
- There were four (4) alcohol related crashes in the period, accounting for approximately three percent (3%) of the total crashes.

Table D-23: Crash Data Summary for 2017 (MD 295 to MD 450)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	16	Opposite Dir	
9:00 AM to 11:00 AM	12	Rear End	93
11:00 AM to 1:00 PM	10	Sideswipe	21
1:00 PM to 4:00 PM	30	Left Turn	
4:00 PM to 7:00 PM	29	Angle	1
7:00 PM to 6:00 AM	48	Pedestrian	
Total	**145**	Other Collision	15
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	25	Fixed Object: Guardrail/Barrier	9
Dry	115	Fixed Object: Light Pole	1
Snow/Ice	1	Fixed Object: Embankment	
Other	4	Fixed Object: Curve	4
Total	**145**	Fixed Object: Sign Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	
2017	145	Parked Vehicle	
		Total	**145**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	40
		Too Fast for Conditions	11
Total	**145**	Followed too Closely	22
Illumination	**# of Crashes**	Other or Unknown	48
Day	85	Failure to Keep Right of Center	
Dawn / Dusk	8	Fail to Yield Right-of-way	1
Dark – Lights On	16	Influence of Alcohol	4
Dark – No Lights	32	Improper Lane Change	5
Other	4	Fail to Drive in Single Lane	9
Total	**145**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	117	Improper Backing	
Foggy		Physical/Mental Difficulty	2
Raining	14	Influence of Medication	
Snow/Sleet	2	Fail to Obey Other Control	
Other	12	Influence of Drugs	
Total	**145**	Rain, Snow	
Severity	**# of Crashes**	Wet	
Fatal	1	Exceeded Speed Limit	1
Injury	47	Shoulders Low, Soft, or High	
Property Damage Only	97	Ice or Snow Covered	
Total	**145**	**Total**	**145**
Segment Crash Rate=97.30 crashes per 100 million vehicle miles			

D-24 2017 Crash Analysis – I-495 from MD 201 to MD 295

SHA provided crash data for the I-495 segment from MD 201 to MD 295 (milepost 22.12 to 23.04) covering the period from January 1, 2017 to December 31, 2017.

A total of 160 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 228.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 110 crashes in 2012 and 88 crashes in 2013 to 72, 99, and 173 in 2014, 2015 and 2016 respectively, and increased to 160 in 2017. A summary of the 2017 crash data is shown in **Table D-24**.

There are were no fatal crashes in the study segment between 2012 and 2016. Of the reported crashes, 42 crashes resulted in injuries while 118 resulted in property damage only.

The contributing factors for thirty-eight percent (38%) of all crashes were due to "Failure to give full Attention" and "Following to Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-five percent (55%) of the total crashes.
- Sideswipe crashes were the second most common type crash and accounted for approximately twenty-four percent (24%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately fourteen percent (14%) of the total crashes.
- Another common type of crash was categorized as "Other" which accounted for approximately eight percent (8%) of the total crashes.
- Approximately twenty-eight percent (28%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 22.12. Approximately forty percent (40%) of the total crashes occurred in this subsegment. This is located at Exit 22, MD 295 (Baltimore Washington Parkway).
- The next highest frequency of crashes occurred at milepost 23.04. Approximately twenty-four percent (24%) of the total crashes occurred in this subsegment. This is located at Exit 23, MD 201 (Kenilworth Avenue).
- There were six (6) alcohol related crashes in the period, accounting for approximately four percent (4%) of the total crashes.

Table D-24: Crash Data Summary for 2017 (MD 201 to MD 295)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	19	Opposite Dir	
9:00 AM to 11:00 AM	10	Rear End	88
11:00 AM to 1:00 PM	10	Sideswipe	38
1:00 PM to 4:00 PM	33	Left Turn	
4:00 PM to 7:00 PM	25	Angle	
7:00 PM to 6:00 AM	63	Pedestrian	
Total	**160**	Other Collision	12
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	1
Wet	14	Fixed Object: Guardrail/Barrier	17
Dry	143	Fixed Object: Light Pole	1
Snow/Ice		Fixed Object: Crash Attenuator	1
Other	3	Fixed Object: Tree/Shrubbery	1
Total	**160**	Fixed Object: Sign Pole	1
Reported Year	**# of Crashes**	Other Fixed Object	
2017	160	Parked Vehicle	
		Total	**160**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	44
		Too Fast for Conditions	14
Total	**160**	Followed too Closely	17
Illumination	**# of Crashes**	Other or Unknown	54
Day	85	Wet	
Dawn / Dusk	10	Fail to Yield Right-of-way	3
Dark – Lights On	36	Influence of Alcohol	6
Dark – No Lights	27	Improper Lane Change	4
Other	2	Fail to Drive in Single Lane	6
Total	**160**	Fell Asleep, Fainted, etc.	6
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	139	Physical/Mental Difficulty	
Foggy	1	Fail to Keep Right of Center	1
Raining	10	Operator using Cell Phone	
Snow/Sleet	1	Fail to Obey Other Control	1
Other	9	Under Influence of Drugs	2
Total	**160**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Exceeded Speed Limit	2
Injury	42	Stopping in Lane Roadway	
Property Damage Only	118	Improper Backing	
Total	**160**	**Total**	**160**
Segment Crash Rate=228.30 crashes per 100 million vehicle miles			

D-25 2017 Crash Analysis – I-495 from 0.4 MI S of US 1 to MD 201

SHA provided crash data for the I-495 segment from 0.4 MI S of US 1 to MD 201 (milepost 23.05 to 24.00) covering the period from January 1, 2017 to December 31, 2017.

A total of 84 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 72.3 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 101 crashes in 2012 and 74 crashes in 2013 to 58, 81, and 111 in 2014, 2015 and 2016 respective, and a decrease to 84 in 2017. A summary of the 2107 crash data is shown in **Table D-25**.

There was one (1) fatal crash in the study segment in 2017. Of the remaining reported crashes, 18 crashes resulted in injuries while 35 resulted in property damage only.

The contributing factors for fifty-six percent (56%) of all crashes were due to "Failure to give full Attention" and "Following to Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately sixty-nine percent (69%) of the total crashes.
- Sideswipe crashes were the second most common type crash and accounted for approximately seventeen percent (17%) of the total crashes.
- The third common type of crash was categorized as "Other" which accounted for approximately seven percent (7%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were another common type of crash and accounted for approximately six percent (6%) of the total crashes.
- Approximately thirty percent (30%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 23.13. Approximately thirteen percent (13%) of the total crashes occurred in this subsegment. This is located at near Exit 24, Greenbelt Commuter Station Road.
- There was one (1) alcohol related crash in the period, accounting for approximately two percent (2%) of the total crashes.

Table D-25: Crash Data Summary for 2017 (I-495 – 0.4 MI S of US 1 to MD 201)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	5	Opposite Dir	
9:00 AM to 11:00 AM	5	Rear End	37
11:00 AM to 1:00 PM	6	Sideswipe	9
1:00 PM to 4:00 PM	12	Left Turn	
4:00 PM to 7:00 PM	11	Angle	
7:00 PM to 6:00 AM	15	Pedestrian	
Total	**54**	Other Collision	4
Surface Condition	**# of Crashes**	Fixed Object: Culvert/Ditch	
Wet	8	Fixed Object: Guardrail/Barrier	3
Dry	43	Fixed Object: Light Pole	
Snow/Ice		Fixed Object: Embankment	
Other	3	Fixed Object: Tree/Shrubbery	
Total	**54**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	54	Parked Vehicle	1
		Total	**54**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	19
		Too Fast for Conditions	6
Total	**54**	Followed too Closely	11
Illumination	**# of Crashes**	Other or Unknown	7
Day	36	Influence of Drugs	
Dawn / Dusk	2	Fail to Yield Right-of-way	
Dark – Lights On	5	Influence of Alcohol	1
Dark – No Lights	4	Improper Lane Change	5
Other	7	Fail to Drive in Single Lane	3
Total	**54**	Fell Asleep, Fainted, etc.	1
Weather Condition	**# of Crashes**	Influence of Combined Subst.	
Clear/Cloudy	43	Physical/Mental Difficulty	1
Foggy		Debris or Obstruction	
Raining	5	Improper Passing	
Snow/Sleet	2	Fail to Obey Other Control	
Other	4	Influence of Medication	
Total	**54**	Rain,Snow	
Severity	**# of Crashes**	Improper Backing	
Fatal	1	Exceeded Speed Limit	
Injury	18	Stopping in Lane Roadway	
Property Damage Only	35	Fail to Keep Right of Center	
Total	**54**	**Total**	**54**
Segment Crash Rate=72.30 crashes per 100 million vehicle miles			

D-26 2017 Crash Analysis – I-495 from US 1 to 0.4 MI S of US 1

SHA provided crash data for the I-495 segment from US 1 to 0.4 MI S of US 1(milepost 24.01 to 25.19) covering the period from January 1, 2017 to December 31, 2017.

A total of 125 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 116.8 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 58 crashes in 2012 and 53 crashes in 2013 to 44, 58 and 88 in 2014, 2015 and 2016 respectively, and an increase to 125 in 2017. A summary of the 2017 crash data is shown in **Table D-26**.

There were one (1) fatal crash in the study segment in 2017. Of the remaining reported crashes, 39 crashes resulted in injuries while 85 resulted in property damage only.

The contributing factors for thirty-eight percent (38%) of all crashes were due to "Failure to give full Attention" and "Speeds too Fast for Conditions." Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty percent (50%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty percent (20%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the third most common type of crash and accounted for approximately fifteen percent (15%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately fourteen percent (11%) of the total crashes.
- Approximately thirty-four percent (34%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 25.19. Approximately thirty percent (30%) of the total crashes occurred in this subsegment. This is located at Exit 25, US 1 (Baltimore Avenue).
- There were eight (8) alcohol related crashes in the five-year period, accounting for approximately six percent (6%) of the total crashes.

Table D-26: Crash Data Summary for 2017 (US 1 to 0.4 MI S of US 1)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	15	Opposite Dir	
9:00 AM to 11:00 AM	6	Rear End	63
11:00 AM to 1:00 PM	9	Sideswipe	25
1:00 PM to 4:00 PM	14	Left Turn	
4:00 PM to 7:00 PM	28	Angle	
7:00 PM to 6:00 AM	53	Pedestrian	1
Total	**125**	Other Collision	17
Surface Condition	**# of Crashes**	Fixed Object: Curb	1
Wet	12	Fixed Object: Guardrail/Barrier	17
Dry	110	Fixed Object: Light Pole	
Snow/Ice		Fixed Object: Embankment	
Other	3	Fixed Object: Tree/Shrubbery	
Total	**125**	Fixed Object: Contr. Barrier	1
Reported Year	**# of Crashes**	Other Fixed Object	
2017	125	Parked Vehicle	
		Total	**125**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	34
		Too Fast for Conditions	13
Total	**125**	Followed too Closely	4
Illumination	**# of Crashes**	Other or Unknown	48
Day	63	Failure to Keep Right of Center	
Dawn / Dusk	10	Fail to Yield Right-of-way	3
Dark – Lights On	27	Influence of Alcohol	8
Dark – No Lights	22	Improper Lane Change	3
Other	3	Fail to Drive in Single Lane	3
Total	**125**	Fell Asleep, Fainted, etc.	2
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	101	Improper Passing	1
Foggy		Physical/Mental Difficulty	
Raining	7	Debris or Obstruction	
Snow/Sleet	3	Fail to Obey Other Control	1
Other	14	Influence of Drugs	2
Total	**125**	Influence of Medication	2
Severity	**# of Crashes**	Improper Turn	1
Fatal	1	Stopping in Lane Roadway	
Injury	39	Failure to Obey Traffic Signal	
Property Damage Only	85	Exceeded Speed Limit	
Total	**125**	**Total**	**125**
Segment Crash Rate=116.80 crashes per 100 million vehicle miles			

D-27 2017 Crash Analysis – I-495 from I-495 to US 1

SHA provided crash data for the I-495 segment from I-495 to US 1 (milepost 25.20 to 26.11) covering the period from January 1, 2017 to December 31, 2017.

A total of 61 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 127.2 crashes per 100 million vehicle miles (MVM), which is above the available 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows a decrease from 78 crashes in 2012 and 69 crashes in 2013 to 66 in 2014, and an increase to 87, and 139 in 2015 and 2016 respectively, and a decrease to 61 in 2017. A summary of the 2017 crash data is shown in **Table D-27**.

There were no fatal crashes in the study segment in 2017. Of the reported crashes, 18 crashes resulted in injuries while 43 resulted in property damage only.

The contributing factors for forty-three percent (43%) of all crashes were due to "Failure to give full Attention" and "Following to Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately fifty-six percent (56%) of the total crashes.
- Sideswipe crashes were the second most common crash and accounted for approximately twenty-one percent (21%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were common type of crashes and accounted for approximately eleven percent (11%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately eleven percent (11%) of the total crashes.
- Approximately forty-six percent (46%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 26.11. Approximately thirty-one percent (31%) of the total crashes occurred in this subsegment. This is located at Exit 27, I-495 Capital Beltway.
- There were three (3) alcohol related crashes in the period, accounting for approximately five percent (5%) of the total crashes.

Table D-27: Crash Data Summary for 2017 (I-495 – I-495 to US 1)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	12	Opposite Dir	
9:00 AM to 11:00 AM	3	Rear End	34
11:00 AM to 1:00 PM	2	Sideswipe	13
1:00 PM to 4:00 PM	6	Left Turn	
4:00 PM to 7:00 PM	16	Angle	
7:00 PM to 6:00 AM	22	Pedestrian	
Total	**61**	Other Collision	7
Surface Condition	**# of Crashes**	Fixed Object: Crash Attenuator	
Wet	9	Fixed Object: Guardrail/Barrier	6
Dry	45	Fixed Object: Other Pole	
Snow/Ice	1	Fixed Object: Embankment	
Other	6	Fixed Object: Tree/Shrubbery	1
Total	**61**	Fixed Object: Sign Pole	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	61	Parked Vehicle	
		Total	**61**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	19
		Too Fast for Conditions	5
Total	**61**	Followed too Closely	7
Illumination	**# of Crashes**	Other or Unknown	18
Day	25	Influence of Drugs	
Dawn / Dusk	7	Fail to Yield Right-of-way	1
Dark – Lights On	12	Influence of Alcohol	3
Dark – No Lights	9	Improper Lane Change	5
Other	8	Fail to Drive in Single Lane	
Total	**61**	Fell Asleep, Fainted, etc.	
Weather Condition	**# of Crashes**	Influence of Combined Subst.	1
Clear/Cloudy	48	Physical/Mental Difficulty	1
Foggy	2	Animal	
Raining	6	Improper Passing	
Snow/Sleet		Fail to Obey Other Control	1
Other	5	Influence of Medication	
Total	**61**	Rain, Snow	
Severity	**# of Crashes**	Improper Backing	
Fatal		Exceeded Speed Limit	
Injury	18	Stopping in Lane Roadway	
Property Damage Only	43	Failure to Keep Right of Center	
Total	**61**	**Total**	**61**
Segment Crash Rate=127.20 crashes per 100 million vehicle miles			

D-28 2017 Crash Analysis – I-495 from I-495 to I-95X

SHA provided crash data for the I-495 segment from I-495 to I-95X (milepost 26.11 to 26.78) covering the period from January 1, 2017 to December 31, 201.

A total of 32 crashes were reported along the I-495 study segment during the study period. The crash rate for the study segment is 90.6 crashes per 100 million vehicle miles (MVM), which is above the 2017 statewide average of 44.3 crashes per 100 MVM on similar facilities. The number of crashes along the study segment shows an increase from 19 crashes in 2012 and 20 crashes in 2013 to 18, 17, and 37 in 2014, 2015 and 2016 respectively, and decreased to 32 crashes in 2017. A summary of the 2017 crash data is shown in **Table D-28**.

No fatal crashes were reported in the segment in 2017. Of the reported crashes, 10 crashes resulted in injuries while 22 resulted in property damage only.

The contributing factors for forty-four percent (44%) of all crashes were due to "Failure to give full Attention" and "Following to Close". Additional analysis of the crash data revealed the following trends during the study period:

- Rear-end crashes were the most common type of crash and accounted for approximately forty-seven percent (47%) of the total crashes.
- Collisions with fixed objects, which include bridges, guardrail/barriers, light pole, construction barrier, crash attenuator, and other objects were the second most common type of crash and accounted for approximately twenty-two percent (22%) of the total crashes.
- Sideswipe crashes were a common crash type and accounted for approximately sixteen percent (16%) of the total crashes.
- Another common type of crash was categorized as "Other" which also accounted for approximately sixteen percent (16%) of the total crashes.
- Approximately fifty percent (50%) of the total crashes occurred during the peak hours of 6:00 - 9:00 AM and 4:00 - 7:00 PM.
- The location with the highest frequency of crashes occurred at milepost 26.11. Approximately fifty-nine percent (59%) of the total crashes occurred in this subsegment. This is located at the I-495 and I-95 interchange.
- There were two (2) alcohol related crashes in the period, accounting for approximately six percent (6%) of the total crashes.

Table D-28: Crash Data Summary for 2017 (I-495 – I-495 to I-95X)

Time of Day	# of Crashes	Crash Type	# of Crashes
6:00 AM to 9:00 AM	6	Opposite Dir	
9:00 AM to 11:00 AM	2	Rear End	15
11:00 AM to 1:00 PM	3	Sideswipe	5
1:00 PM to 4:00 PM	1	Left Turn	
4:00 PM to 7:00 PM	10	Angle	
7:00 PM to 6:00 AM	10	Pedestrian	
Total	**32**	Other Collision	5
Surface Condition	**# of Crashes**	Fixed Object: Tree/Shrubbery	1
Wet	5	Fixed Object: Guardrail/Barrier	6
Dry	26	Fixed Object: Sign Pole	
Snow/Ice	1	Fixed Object: Other Pole	
Other		Fixed Object: Culvert/Ditch	
Total	**32**	Fixed Object: Embankment	
Reported Year	**# of Crashes**	Other Fixed Object	
2017	32	Parked Vehicle	0
		Total	**32**
		Contributing Factor	**# of Crashes**
		Fail to give full Attention	11
		Too Fast for Conditions	2
Total	**32**	Followed too Closely	3
Illumination	**# of Crashes**	Other or Unknown	9
Day	14	Fail to Obey Traffic Signal	
Dawn / Dusk	6	Fail to Yield Right-of-way	
Dark – Lights On	3	Influence of Alcohol	2
Dark – No Lights	7	Improper Lane Change	1
Other	2	Fail to Drive in Single Lane	1
Total	**32**	Fell Asleep, Fainted, etc.	
Weather Condition	**# of Crashes**	Vehicle Defect	
Clear/Cloudy	25	Influence of Drugs	
Foggy	2	Wet	
Raining	2	Physical/Mental Difficulty	1
Snow/Sleet		Fail to Keep Right of Center	1
Other	3	Improper Turn	1
Total	**32**	Rain, Snow	
Severity	**# of Crashes**	Debris or Obstruction	
Fatal		Exceeded Speed Limit	
Injury	10	Stopping in Lane Roadway	
Property Damage Only	22	Animal	
Total	**32**	**Total**	**32**
Segment Crash Rate=90.6 crashes per 100 million vehicle miles			

Appendix J:

Forecast Comparison Memo

Introduction

The I-495 & I-270 Managed Lanes Study (Study) is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) with the Federal Highway Administration (FHWA) as the lead federal agency and Maryland Department of Transportation State Highway Administration (MDOT SHA) as the joint lead agency and local project sponsor.

MDOT SHA utilized a design year of 2040 for all traffic modeling efforts necessary to evaluate the Alternatives Retained for Detailed Study (ARDS) and will use the 2040 results to inform selection of the recommended preferred alternative. A position paper was prepared in October 2018 explaining the rationale for selecting a design year of 2040, which is included with this memorandum as **Attachment A**.

The position paper noted that the latest version of the Metropolitan Washington Council of Governments (MWCOG) regional forecasting model at the time the Study was initiated (version 2.3.71) projected traffic demand to the year 2040. After the Study was initiated, a new version of the MWCOG model was released (version 2.3.75, released in Fall 2018), which projects traffic demand out an additional five years, to the year 2045. MDOT SHA will use the updated 2045 forecasts to evaluate the recommended preferred alternative in the Final Environmental Impact Statement (FEIS).

This memorandum compares the MWCOG inputs and outputs between versions 2.3.71 and 2.3.75 and determines if recommendations presented in the Draft Environmental Impact Statement (DEIS) concerning the ARDS would have been different if design year 2045 forecasts had been applied instead of design year 2040 forecasts.

MWCOG Version Comparison

MDOT SHA prepared a report in October 2019 investigating the differences between MWCOG model version 2.3.71 and version 2.3.75. A copy of this report in included with this memorandum as **Attachment B**. According to MWCOG version numbering convention, updates that only change the last digits (2.3.XX) reflect minor changes to the model that do not require recalibration. There are three primary differences between the models for MWCOG version 2.3.71 and MWCOG version 2.3.75:

- Land use updated from Round 9.0 to Round 9.1
- Forecasts performed at five-year intervals out to the year 2045, instead of stopping at 2040
- Transportation network updated with new projects per the latest Constrained Long-Range Plan (CLRP)

Additionally, there were minor enhancements to the model structure to fix past script errors and improve the model chain flow. The model enhancements allow for a more efficient run time but have a negligible effect on the outputs relative to the land use and transportation network assumptions. The impacts of the land use and transportation network assumptions on the forecasts for the Study are discussed in the following sections.

MWCOG Model Inputs (Land Use and Transportation Network)

As noted above, the new version 2.3.75 model uses MWCOG Cooperative Lane Use Forecast Round 9.1. MWCOG uses a cooperative land use forecasting process to forecast the land use at a zonal level. The forecast includes the projected number of households, population, and employment in the region, with input from the local jurisdictions. The difference between year 2040 and 2045 land use forecasts is modest, with the overall region expected to increase households and jobs by approximately four percent. This increase would generally be expected to result in an increase in total trips (across all modes) in the region when comparing the year 2040 to the year 2045.

In addition, the latest CLRP incorporated into MWCOG model version 2.3.75 includes several transit projects in Montgomery County that were not incorporated into the previous version model. These include the North Bethesda Transitway, MD 586 Veirs Mill Road Bus Rapid Transit (BRT), Randolph Road BRT, MD 355 BRT, and New Hampshire Avenue BRT. Several other major transit projects are accounted for in both model versions, including the Purple Line, Corridor Cities Transitway, and MARC capacity improvements. For a complete list of the transportation projects included in the MWCOG models, refer to **Attachment B**. The resulting effect of these transit projects on mode share is summarized below.

MWCOG Model Outputs (Volumes)

To examine the net impact of these land use and transportation network assumption changes between MWCOG model version 2.3.71 and version 2.3.75, the model outputs were compared. Transit mode share remained consistent between the two model versions, at nine percent in Montgomery County and at eight percent in Prince George's County when examining the results for all trip purposes. For trips coded in the model specifically as commuter trips, the transit mode share in the new model version remained at 31 percent in Montgomery County and dropped slightly from 28 percent to 27 percent in Prince George's County. These findings indicate that although the additional transit projects in the new version of the model are substantial projects that will benefit the corridors they serve, they are not expected to have a significant impact on the transit mode share for the region.

The metric of total vehicle miles traveled (VMT) was also examined between the MWCOG model version 2.3.71 in 2040 and the MWCOG model version 2.3.75 in 2045. The results indicated that total VMT is projected to remain flat in Washington, D.C. between 2040 and 2045 (zero percent change) and increase slightly in each of the Counties served by the I-495 & I-270 Managed Lanes Study. Total VMT is projected to increase by approximately three percent in Montgomery County, Maryland and Fairfax County, Virginia, and increase by approximately four percent in Prince George's County, Maryland, between 2040 and 2045.

Projected hourly volumes on the I-495 and I-270 corridors were also compared between the 2040 volumes used for analysis in the DEIS and the new 2045 projections. Tables showing the projected hourly volumes between 6:00 AM and 10:00 AM and between 3:00 PM and 7:00 PM on each highway segment within the Study area under 2045 No Build conditions, as well as the percent change between 2040 and 2045, are included with this memorandum as **Attachment C**. The results indicated that the projected change in demand would be minor (±5 percent) on the majority of roadway segments within the Study area. The following section describes the effect of these volume changes on each of the Build Alternatives evaluated.

Effect on Alternatives Evaluated

During preparation of the DEIS for the I-495 & I-270 Managed Lanes Study, MDOT SHA evaluated six ARDS (Alternative 1, Alternative 8, Alternative 9, Alternative 10, Alternative 13B, Alternative 13C) and three additional potential Build alternatives (Alternative 5, Alternative 9 Modified, and the MD 200 Diversion Alternative) using design year 2040 forecasts obtained from version 2.3.71 of the MWCOG model. The 2040 analysis results were used to compare alternatives and will be used to select the recommended preferred alternative. Based on review of version 2.3.75 of the MWCOG model, the following describes how the 2045 forecasts would have affected each of the Build alternatives studied.

- The No Build Alternative (**Alternative 1**) would have been projected to operate slightly worse under 2045 conditions than 2040 conditions due to the transportation network carrying more VMT daily.
- **Alternative 13B** and **Alternative 13C** would include reversible lanes on I-270 and would only provide capacity improvements in the peak direction along I-270. The 2045 volumes indicated significant increases in volume projections in the off-peak directions on I-270 (northbound during the AM peak period and southbound during the PM peak period) compared to 2040. This change reduces the directional split of traffic on I-270 (from over 60 percent in the peak direction in 2040 to as low as 58 percent in the peak direction in 2045), making reversible lane operations less effective. Therefore, it is likely that these alternatives would perform worse relative to the other Build alternatives operationally using 2045 volumes compared to 2040 volumes.
- In the peak direction on I-270 (southbound during the AM peak period and northbound during the PM peak period), volumes are projected to increase slightly in 2045 compared to 2040. Therefore, **Alternative 8**, which provides only one additional lane of capacity in each direction on I-270, would be expected to operate similarly or slightly worse if evaluated using 2045 forecasts.
- The 2045 volume projections are consistently higher on the top side of I-495 between I-95 and I-270 compared to the 2040 forecasts. Therefore, alternatives that sought to minimize capacity improvements in that area (such as **Alternative 9 Modified** and the **MD 200 Diversion Alternative**) would be expected to operate worse if 2045 forecasts were applied instead of 2040 forecasts.
- The remaining alternatives (**Alternative 5**, **Alternative 9**, and **Alternative 10**) provide a consistent cross-section throughout the study area and therefore the same relative traffic benefits would be expected between the alternatives if they were evaluated using 2045 forecasts. Alternatives 9 and 10 would continue to operate the best in 2045 from a traffic perspective because they provide the most additional capacity, which is needed in 2040 and would still be needed in 2045.

Summary and Conclusions

MDOT SHA compared the modeling assumptions and raw outputs for the MWCOG model version 2.3.71, which projects traffic to a design year of 2040, and MWCOG model version 2.3.75, which projects traffic to a design year of 2045. The new model uses a new round of land use forecasts (Round 9.1) and assumes additional transit projects from the latest CLRP. The net impact of the revised land use and transportation assumptions reflected in the updated MWCOG model version 2.3.75 was determined to be a modest increase (between zero and four percent) in projected vehicle miles traveled within the region.

The changes noted for the 2045 model are minor and would have impacted the results for all ARDS similarly during the evaluation process. Therefore, the relative merit of the ARDS (as well as additional Build alternatives considered, such as the MD 200 Diversion Alternative and Alternative 9M) would not have changed and it would not affect the selection of the recommended preferred alternative if design year 2045 forecasts were used.

Next Steps

MDOT SHA plans to complete a full analysis of the recommended preferred alternative, once selected, using the 2045 model to confirm that acceptable traffic operations would be maintained in the design year of 2045. Elements of the design (such as interchange configurations and the location of direct access to and from the managed lanes) could be modified, if needed, to ensure that the project could accommodate year 2045 traffic demands and meet the purpose and need. The results of this analysis will be included in the FEIS. Because the preferred alternative will not be identified in the DEIS, a separate record of decision (ROD) and FEIS will be prepared. Completion of the Interstate Access Point Approval (IAPA) documentation for the project and updates to the traffic and revenue study will also use analysis based on the year 2045 data.

Attachment A – Design Year Selection Position Paper, October 5, 2018

Attachment B – Differences between MWCOG Planning Model versions 2.3.71 and 2.3.75, October 2019

Attachment C – Volume Comparison Tables – 2040 vs. 2045 No Build

ATTACHMENT A

Design Year Position Paper

Introduction

The I-495 & I-270 Managed Lanes Study is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) with the Federal Highway Administration (FHWA) as the lead federal agency and Maryland Department of Transportation State Highway Administration (MDOT SHA) as the joint lead agency and local project sponsor.

MDOT SHA has been utilizing a design year of 2040 for all traffic modeling efforts necessary for NEPA related activities for this study. This memorandum explains the rationale for selecting this design year and discusses how the study will be coordinated with an adjacent study in Virginia, which is evaluating extending the existing I-495 Express Lanes to near the George Washington Parkway. The Virginia Department of Transportation (VDOT) is using a different design year (2045) during evaluation of their study.

Selection of Design Year 2040

MDOT SHA is assuming a design year of 2040 for all NEPA-related traffic modeling efforts as it is the latest approved regional forecasting model from the Metropolitan Washington Council of Governments (MWCOG). The MWCOG model is the basis for all traffic modeling and analysis, including volume development, operational analysis, alternatives analysis, and other traffic-based environmental analysis (such as air quality conformity and noise mitigation) for the I-495 & I-270 Managed Lanes Study. It is standard practice to use the latest approved model when conducting these project activities for planning studies.

A new version of the MWCOG model is under development, and the new MWCOG model will include data for the year 2045. However, the new model is not expected to be released until November 2018, which falls outside of the timeframe to complete traffic analysis for NEPA purposes to maintain the established schedule. Technical reports for inclusion in the Draft EIS need to be completed in early 2019. Several of these technical reports, including ones for air quality analysis and noise analysis, require extensive amounts of traffic data. Compiling the traffic data is a multi-step process that requires three to four months per alternative. First, regional forecasting models are developed (using the MWCOG model) and run for each alternative. Then, the volume outputs are post-processed to create a balance network of existing peak period volumes. For this study, data covering 5 hours in the morning, 5 hours in the afternoon, for each of 48 interchanges and 63 intersections is required. Then, the volumes are input into a large Vissim simulation model covering the entire study area to generate network measures of effectiveness (MOEs), including speed, density, delay, and level of service (LOS). For each Build alternative, the proposed lane configurations must be coded into both the MWCOG model and the Vissim models. There are currently 7 Build alternatives that are being studied. Work on the existing and 2040 No Build traffic data has been ongoing since March 2018 and work on the Build alternatives began following feedback from the public at a series of public meetings in July 2018. Multiple consultant teams have been working on the different steps of the process concurrently over the last several months to enable the results to be ready for the technical teams to complete their reports on schedule.

Given the size and scope of the project, it would not have been possible for MDOT SHA to wait for the new MWCOG model to be finalized, validated, and released before initiating forecasting and analysis efforts to meet the accelerated NEPA schedule for the study, which is subject to federal streamlining initiatives including Executive Order 13807.

VDOT Coordination and Future Updates

MDOT SHA has been conducting coordination meetings with VDOT on a regular basis (at least once per month). These meetings are typically held in Virginia and include representatives from each project team covering multiple disciplines, including NEPA leads, design staff, and traffic staff. During the meetings, VDOT and MDOT SHA share information regarding each project's status and schedule, and technical staff share design files and traffic data. While both teams have expressed a desire for consistency between projects, it is not practical to align all elements of each study because the timing and scale of the studies are very different. VDOT's study is an Environmental Assessment with only a No-Build and one Build alternative being considered, and their forecasting effort will be starting around the time that the MDOT SHA forecasting effort will be finishing for the No-Build and multiple Build alternatives. Following discussions with the respective FHWA Division offices and representatives from FHWA headquarters, the decision was reached that the MDOT SHA study team can move forward with a 2040 design year for evaluating the Alternatives Retained for Detailed Study (ARDS), while the VDOT project team can move forward with a 2045 design year.

MDOT SHA understands that future activities related to the I-495 & I-270 Managed Lanes Study may require consideration of new information from updated traffic data. MDOT SHA plans to conduct a sensitivity analysis using the 2045 model to confirm the operational results of the preferred alternative. Additionally, completion of any Interstate Access Point Approval (IAPA) documentation for the project will use year 2045 data. Per FHWA, other activities that may require the use of 2045 data include NEPA re-evaluations, sound barrier determinations, and the Traffic and Revenue study.

ATTACHMENT B

MWCOG Model Differences Report



Differences Between MWCOG Planning Model Versions 2.3.71 and 2.3.75

October 2019

U.S. Department of Transportation
Federal Highway Administration

and

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

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1

1 INTRODUCTION

The reason for this investigative report is to examine the differences in the travel demand forecasting model set used for the Managed Lanes Study (MLS) as part of the NEPA process compared to the most recent model set release. The model set includes the modeling files as well as the input data. The input data is the land use forecast and transportation system network. This comparison is being done to demonstrate what updates were made and indicate how those updates might impact the NEPA related analysis done using the outputs from the travel demand modeling results. This memorandum provides an outline of the changes in the MWCOG/TPB Version 2.3.75 (adopted in October 2018) travel demand forecast model to the earlier Version 2.3.71 (adopted in October 2017) used in the NEPA process. There are three elements that were updated with the adoption of the Version 2.3.75 model set. These include slight changes to the model structure, a new round of the land use data, and the updated network files reflecting additional projects that were accepted in the Constrained Long-Range Plan (CLRP). The improvements made to the Version 2.3.75 (adopted in October 2018) model set and the corresponding networks and land use do not significantly impact the model results.

Travel demand forecast model improvements happen at a periodic basis. Land use forecast and CLRP modifications are part of the continuing, coordinated, and comprehensive activities required by Metropolitan Planning Organizations under the 1962 Highway Act. MWCOG annually adopts projects into the CLRP, the land use forecast in the past has been modified approximately every two to five years. The need for long-term transportation investments and a 20-year forecast drives this process. Slight version changes such as the release of the Version 2.3.75 model as compared to the Version 2.3.71 model set as usually updates or fixes to small issues in the model code. MWCOG/TPB is currently working on release of Version 2.5 model set and just announced the selection of a consultant team for the V 3.0 Next Generation Model. If we break down the MWCOG model versioning as X.Y.Z, the following rules are generally applicable:

- For minor changes to the model that do not require re-calibration, MWCOG would only change the Z number;
- For structural changes to the model that would require sub-model re-calibration, MWCOG/TPB would change the Y number
- For major structural changes to the model that would require calibration and validation, MWCOG/TPB would change the X number and this level of effort has in the past also included a new Household Travel Survey (HTS) which is a multi-year data collection effort.

For the purpose of this investigative report, the model comparison is carried out between MWCOG/TPB models 2.3.71 and 2.3.75. The changing of the Z portion of the X.Y.Z versioning shows that minor model

changes have transpired between version 2.3.71 and 2.3.75 that do not involve any of the sub-models in the process.

The total change in year 2040 vehicle miles traveled (VMT), a metric that represents user consumption, is an increase of 1 percent for Montgomery County and a decrease of 0.4 percent for the region (difference between MWCOG models 2.3.75 and 2.3.71). This is well within the accuracy tolerance of the model set.

2

2 Model Structure

The changes to the model structure are of two types: (1) to fix past script errors, and (2) improvements to the model chain flow. The script errors were small and involve an update to the *unbuild_net.s* script. This script is used to manipulate the network date between different databases. The impact of the update does not impact the results. The model chain flow improvements include:

- Removal of the process of running a base and final model for the purposes of developing skims for HOV trips that would use the HOT lanes. Skims are matrices developed from the highway and transit networks. The matrices contain distances, time, and cost calculations for all modes and for all zone-to-zone pairs in the network. In the MWCOG/TPB model set there are a total of 3,722 zones. Each skim matrix has 3,722 rows and columns. The Base and Final run process only impacted HOT lanes where HOV trips can use the facility without a fee. The difference in the skim files had a negligible impact on HOV and HOT trips. This improvement saves time in the model process.
- An added quality control procedure to review and identify transit stations with zero drive access skim values. This improvement records the access and saves the data in a more accessible text file.
- Removal of the Metrorail transit constraint to the core. Earlier versions of model had a transit constraint procedure that limited transit trips into the regional core area. The core area is the Central Business District and covers the high employment density areas in Washington, D.C. Originally in the development of the Version 2.0 models, WMATA requested the constraint be included in the demand forecasting process, but later requested it be eliminated. When first implemented the constraint set limits on the number of transit trips into the core based on 2010 forecast. After year 2010 passed, the constraint level was raised to year 2020 forecast. It was standard practice in the region to override the constraint in project planning activities. The constraint was only applied to Air Quality Conformity work. The model sets always include scripts to override the constraint, although the default was to include the constraint.

Both the removal of the transit constraint to the core and the removal of the Base run reflect better planning practice and were recommended by Cambridge Systematics, Inc. as part of their work for MWCOG/TPB to review the model, this is document in the FY 2011 Task Report for the project. The transit station quality control procedure was a small change and not part of the outside expert consultant review.

3

3 Model Inputs

Land Use

The second update with the Version 2.3.75 model set is the use of the latest MWCOG Cooperative Land Use Forecast Round 9.1. This land use forecast contains forecast at five-year intervals out to the year 2045. Previous land use only forecasted out to year 2040. The land use forecast is a key input into the modeling process. It is one of two major inputs into the process. The land use forecast along with the transportation system networks, are the basic inputs to the travel demand forecast model. MWCOG uses a cooperative land use forecasting process to forecast the land use at the zonal level. The forecast includes the number of households, population, office employment, retail employment, industrial employment, and other employment. The forecast process starts with a regional economic forecast developed by an outside expert economist with oversite from Cooperative Forecasting and Data Subcommittee (CFDS). This subcommittee is a technical subcommittee to the Planning Directors Technical Advisory Committee (PDTAC) and the Region Forward Coalition.

The initial land use forecast serves as the basis for developing the final land use forecast in cooperation with each jurisdiction. Local land use projections are aligned with the regional economic forecast, and then balanced to produce the final Cooperative Forecast which is published. This is an iterative process and continually updated. The model uses this data to calculate the social-economic variables that impact trip making and travel choice. Traveler choice is impacted by the opportunities across the network reflected in travel time and accessibility as well as employment, shopping, and recreational places.

The year 2040 Round 9.0 and year 2040 Round 9.1 land use forecast are approximately the same. The small differences are negligible for both the production and attraction side with households and total jobs staying almost equal. There is substantial growth from the existing to year 2045. The total increase in households is approximately 25 percent and the total increase in jobs is approximately 29 percent. In the study area both Montgomery and Prince George's Counties show slightly lower growth. Montgomery County is forecast to increase households by 19 percent and jobs by 26 percent. Prince George's County is forecast to increase households by 14 percent and jobs by 16 percent.

The difference between year 2040 and 2045 is modest. The overall region is expected to increase households and jobs by four percent. Montgomery County is forecast to increase households by two percent and jobs by four percent. Prince George's County is expected to have households and jobs grow by two percent. The following tables and figures summarize the land use and growth trends.

Table 1 Household Land Use Forecast

	Households			
Jurisdiction	**Existing**	**Year 2040 (9.0)**	**Year 2040 (9.1)**	**Year 2045 (9.1)**
Washington, DC	314,851	396,233	396,233	411,872
Montgomery County	387,908	450,922	450,916	461,916
Prince George's County	331,644	370,023	370,023	376,787
Arlington County	110,386	131,149	135,599	141,843
City of Alexandria	74,769	92,898	92,898	107,082
Fairfax County	427,945	530,118	529,819	549,768
Loudon County	134,528	167,588	166,952	168,671
Prince William County	170,729	209,020	212,999	218,599
Frederick County	97,099	126,539	126,539	131,167
Total	2,049,859	2,474,490	2,481,978	2,567,705

Table 2 Jobs Land Use Forecast

	Households			
Jurisdiction	**Existing**	**Year 2040 (9.0)**	**Year 2040 (9.1)**	**Year 2045 (9.1)**
Washington, DC	836,693	1,011,806	1,011,806	1,045,390
Montgomery County	538,814	653,917	653,865	678,753
Prince George's County	346,951	393,336	393,335	402,145
Arlington County	215,429	267,641	260,975	269,064
City of Alexandria	109,348	142,735	142,735	155,095
Fairfax County	728,824	908,430	899,356	931,892
Loudon County	189,580	273,910	277,790	291,165
Prince William County	191,815	280,546	276,260	293,261
Frederick County	116,205	133,934	141,075	145,526
Total	3,273,659	4,066,255	4,057,197	4,212,291

Figure 1: Existing Households per Square Mile

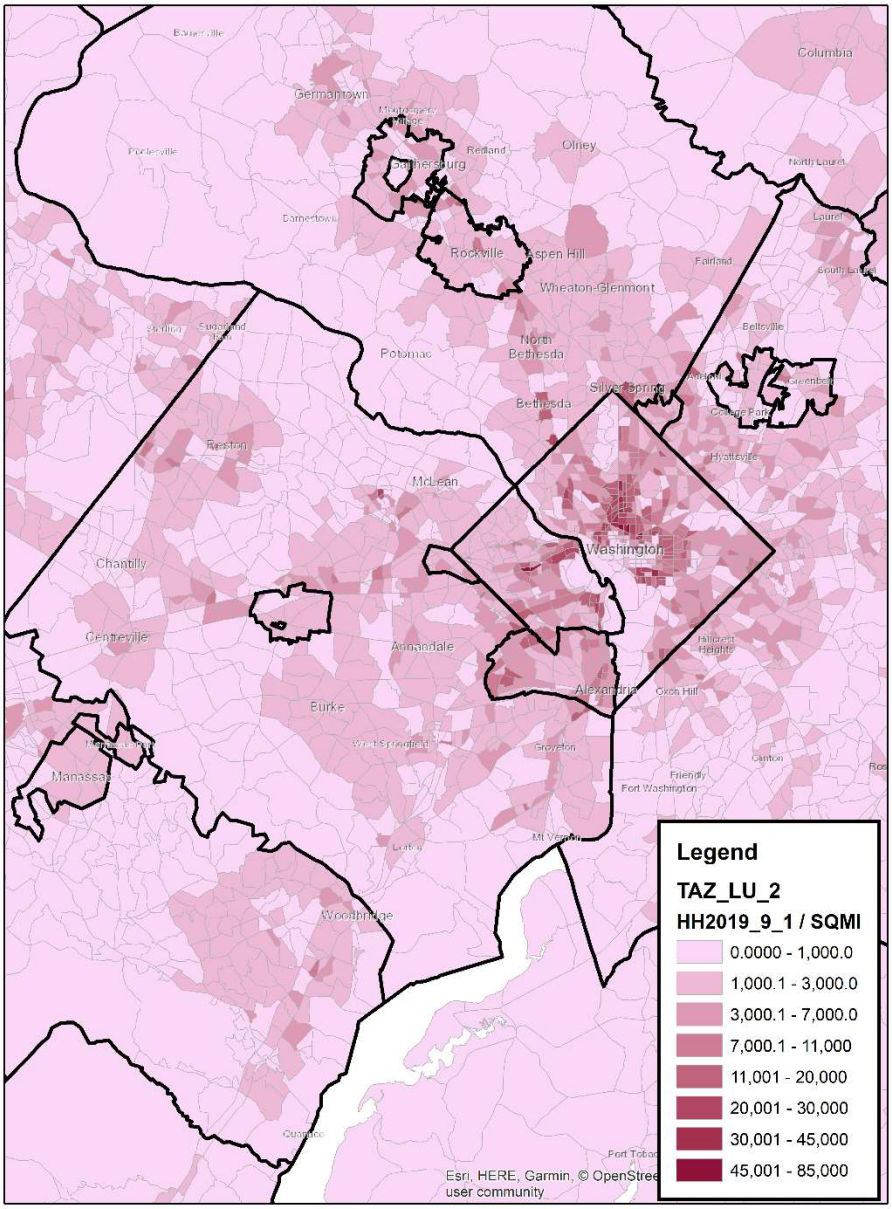


Figure 2: Existing Jobs per Square Mile

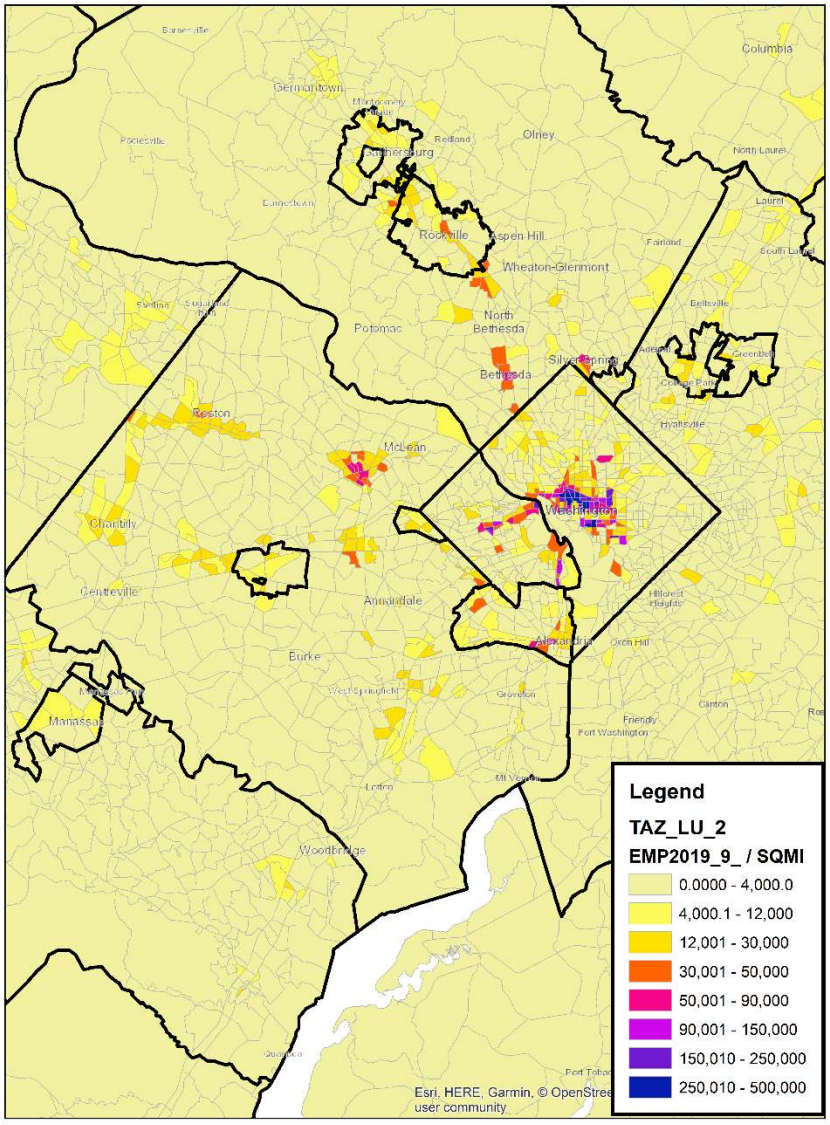


Figure 3: Year 2045 Households per Square Mile

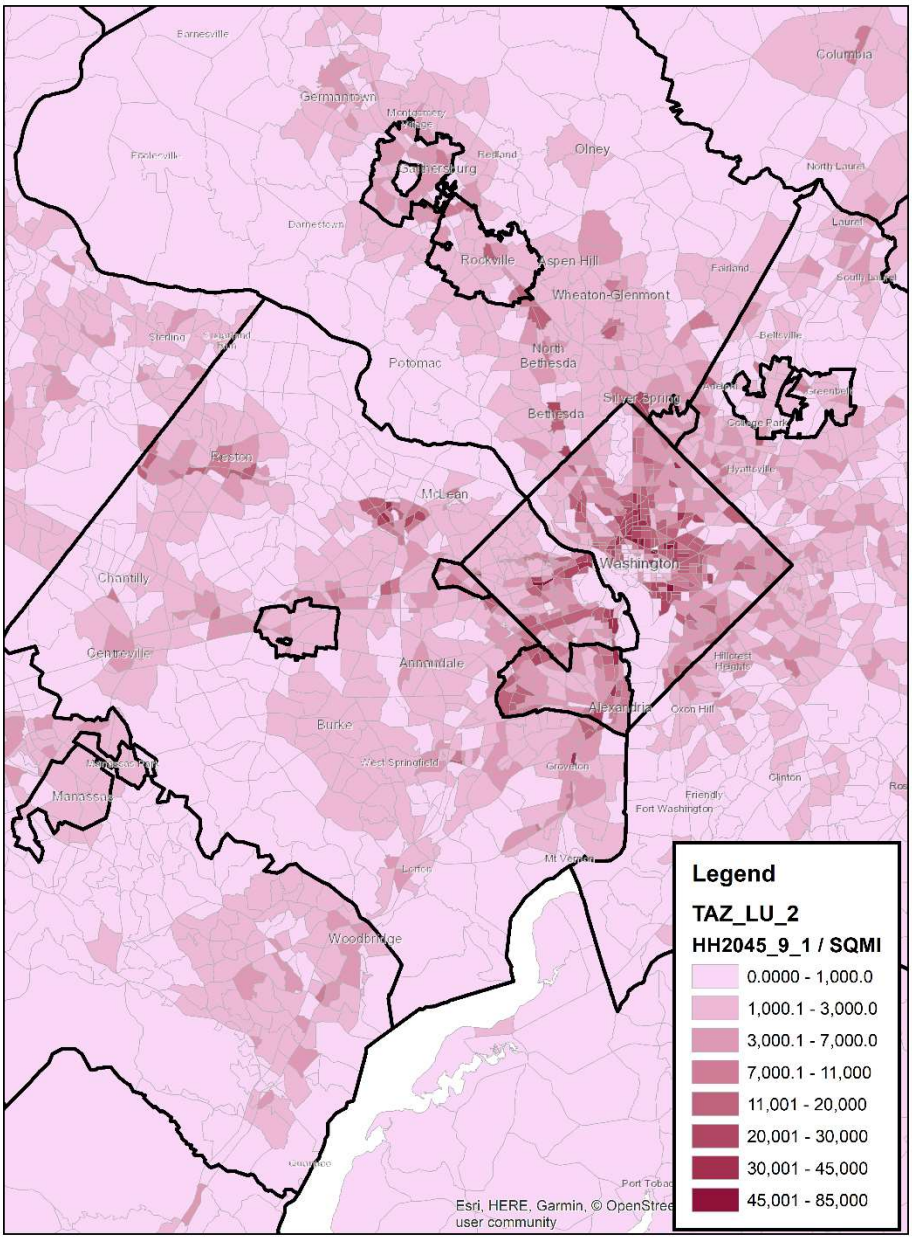


Figure 4: Year 2045 Jobs per Square Mile

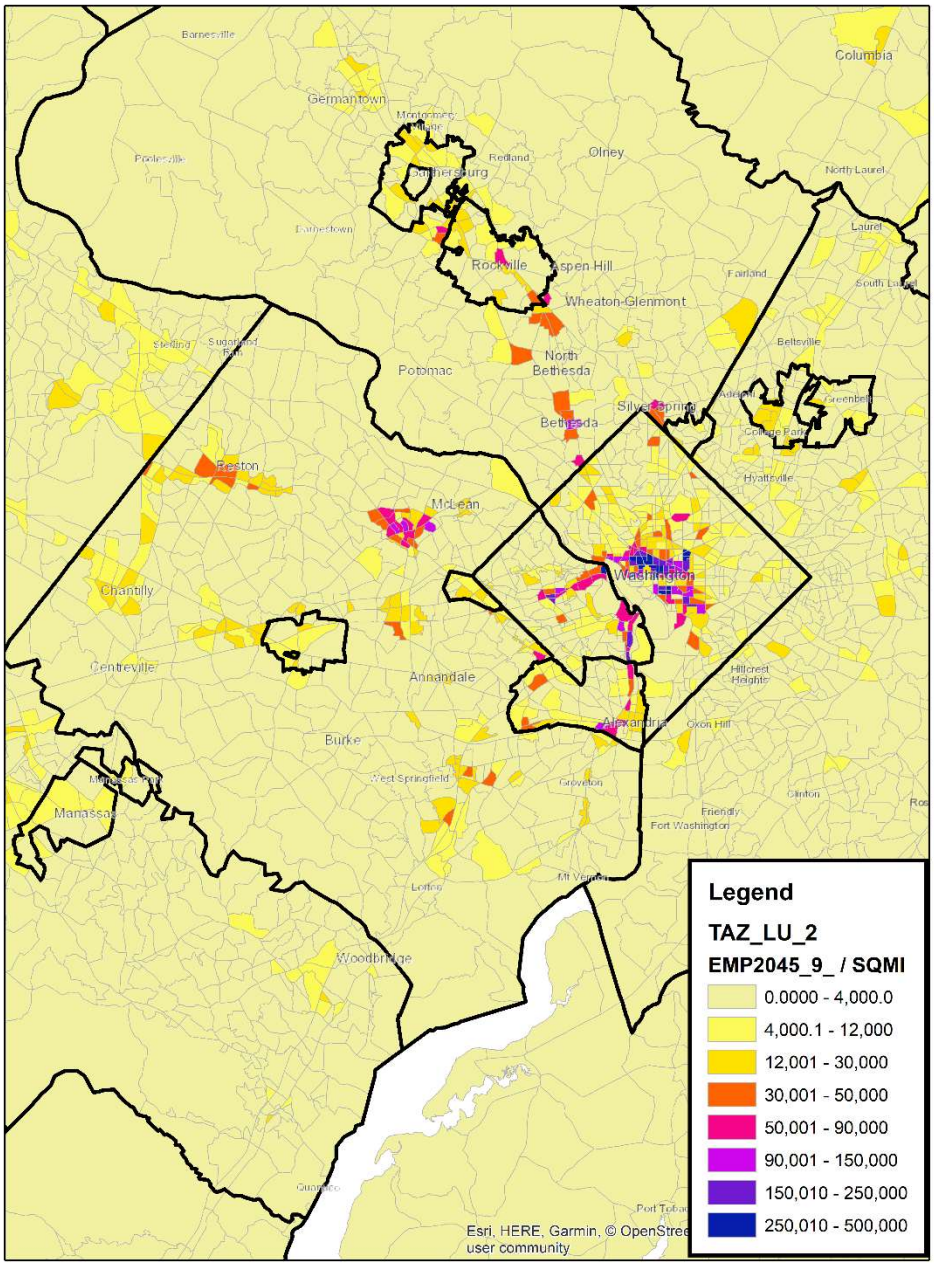


Figure 5: Growth Existing to Year 2045 Households

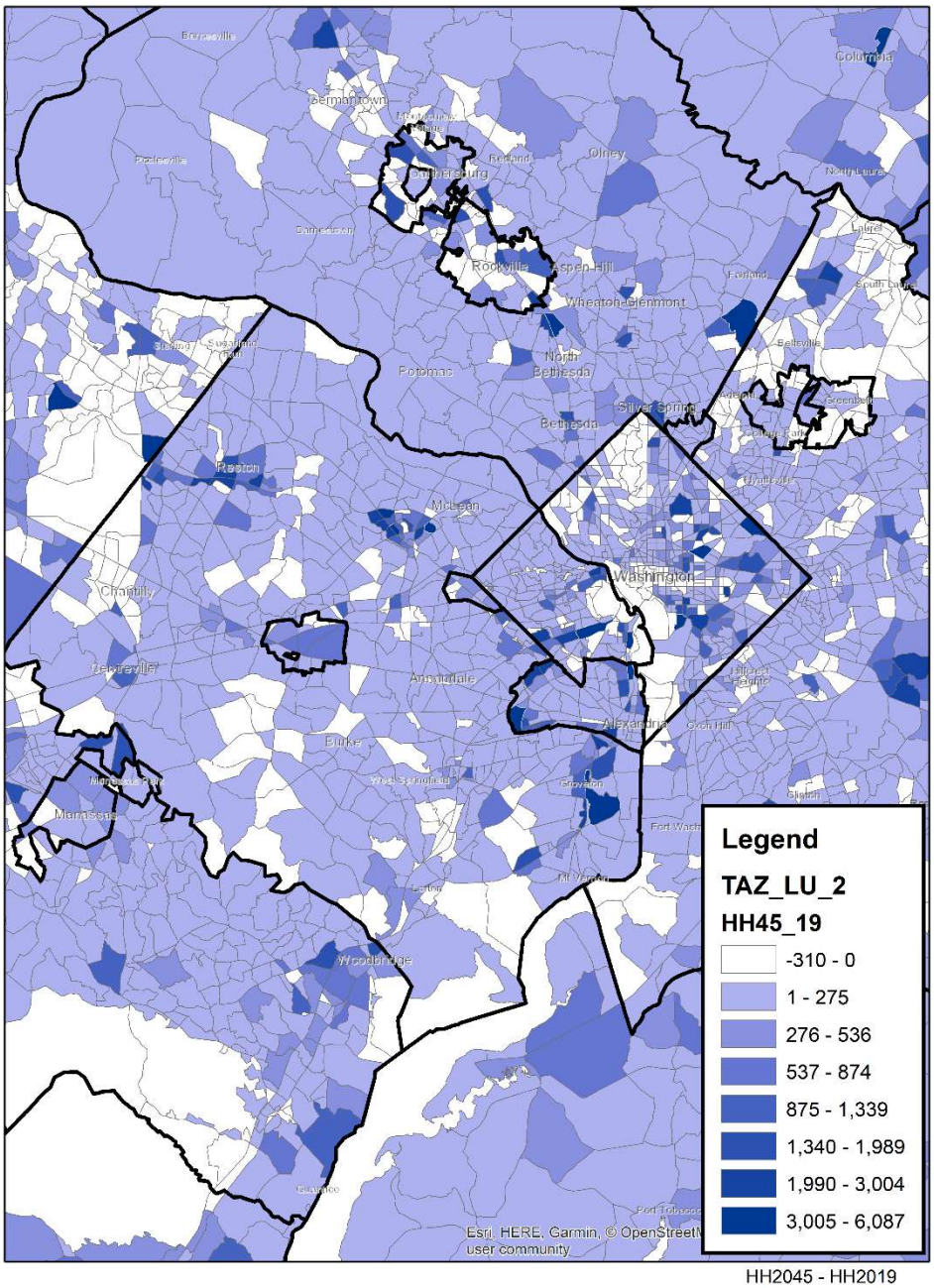
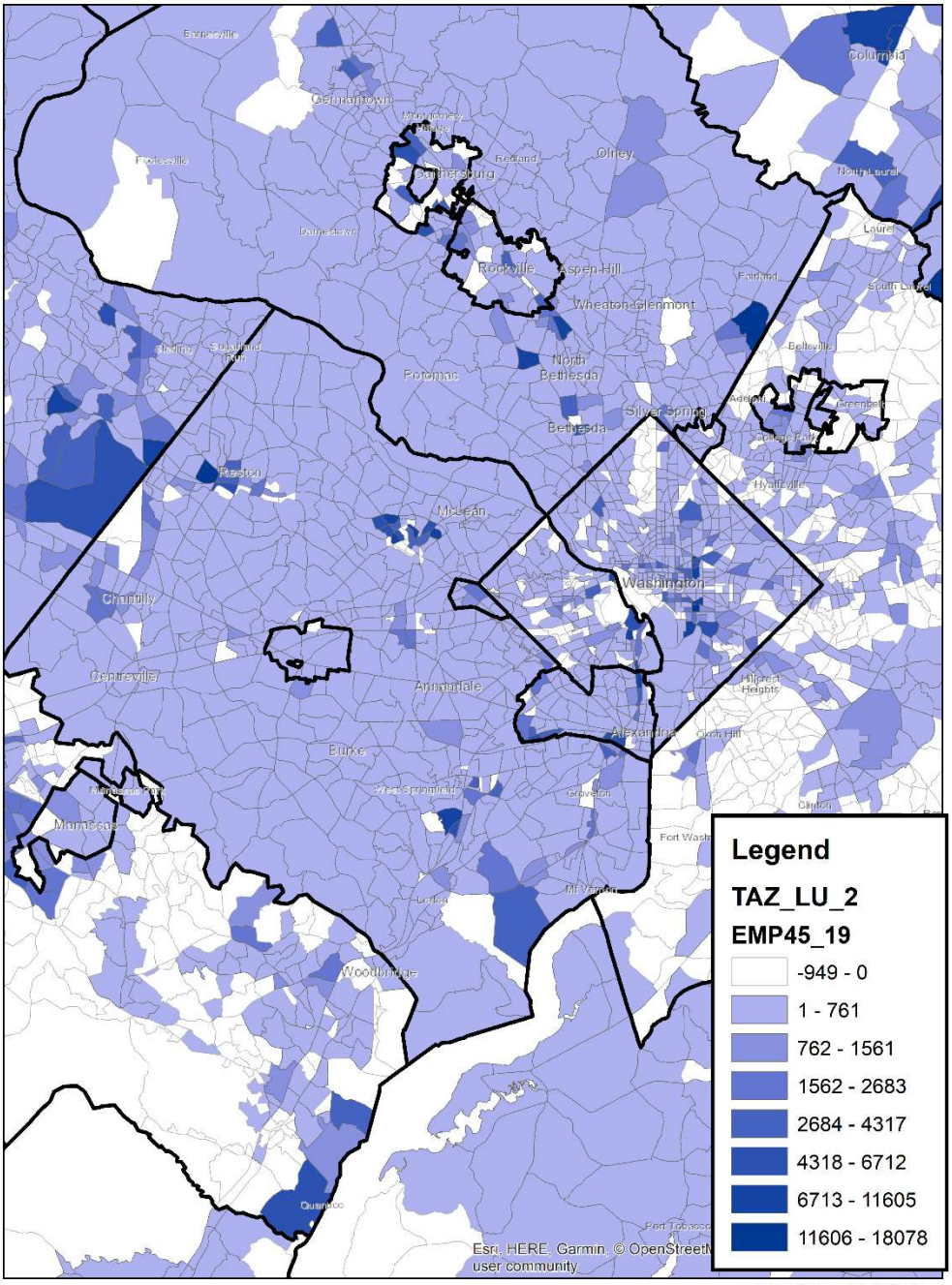
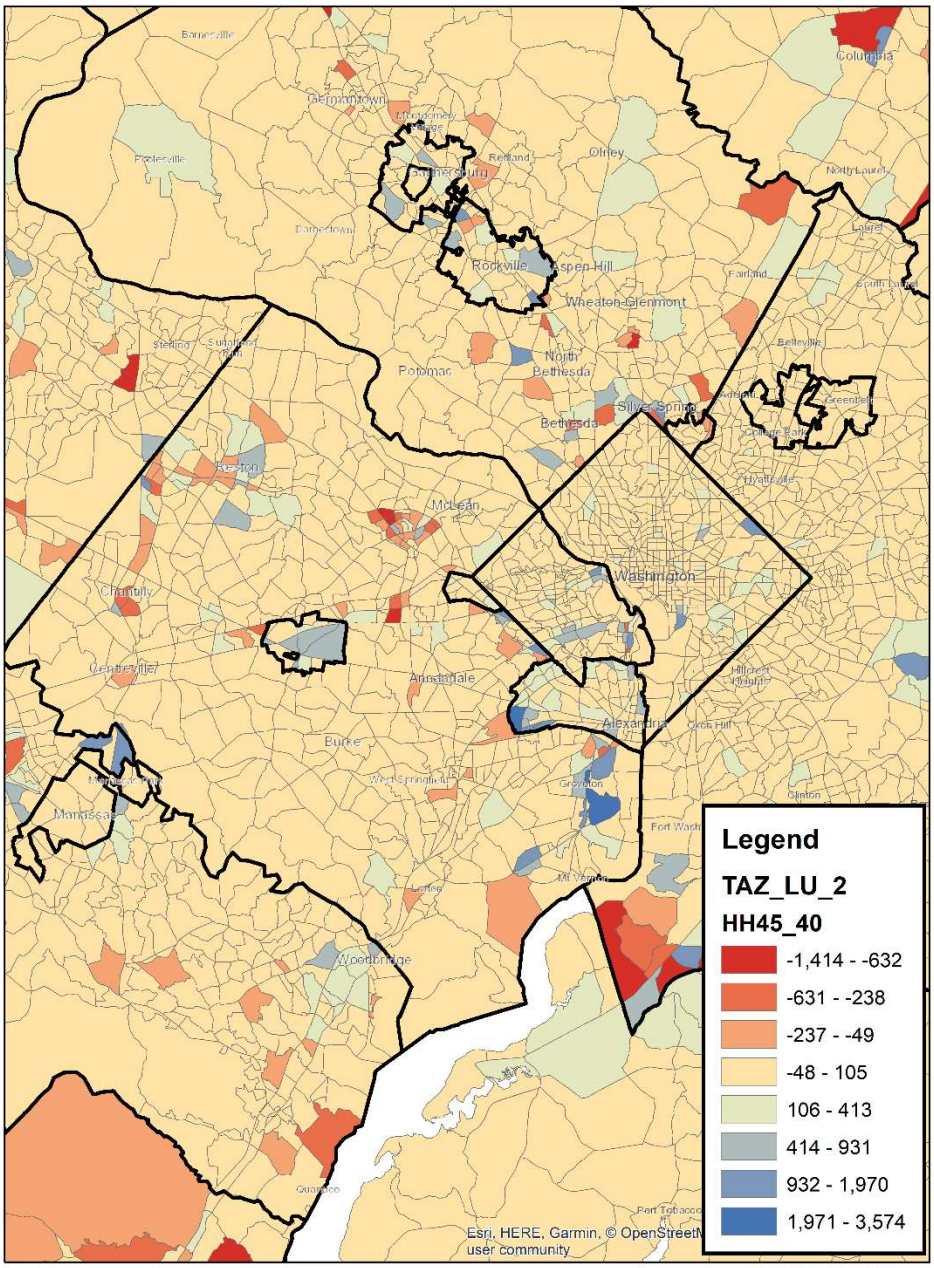


Figure 6: Growth Existing to Year 2045 Jobs



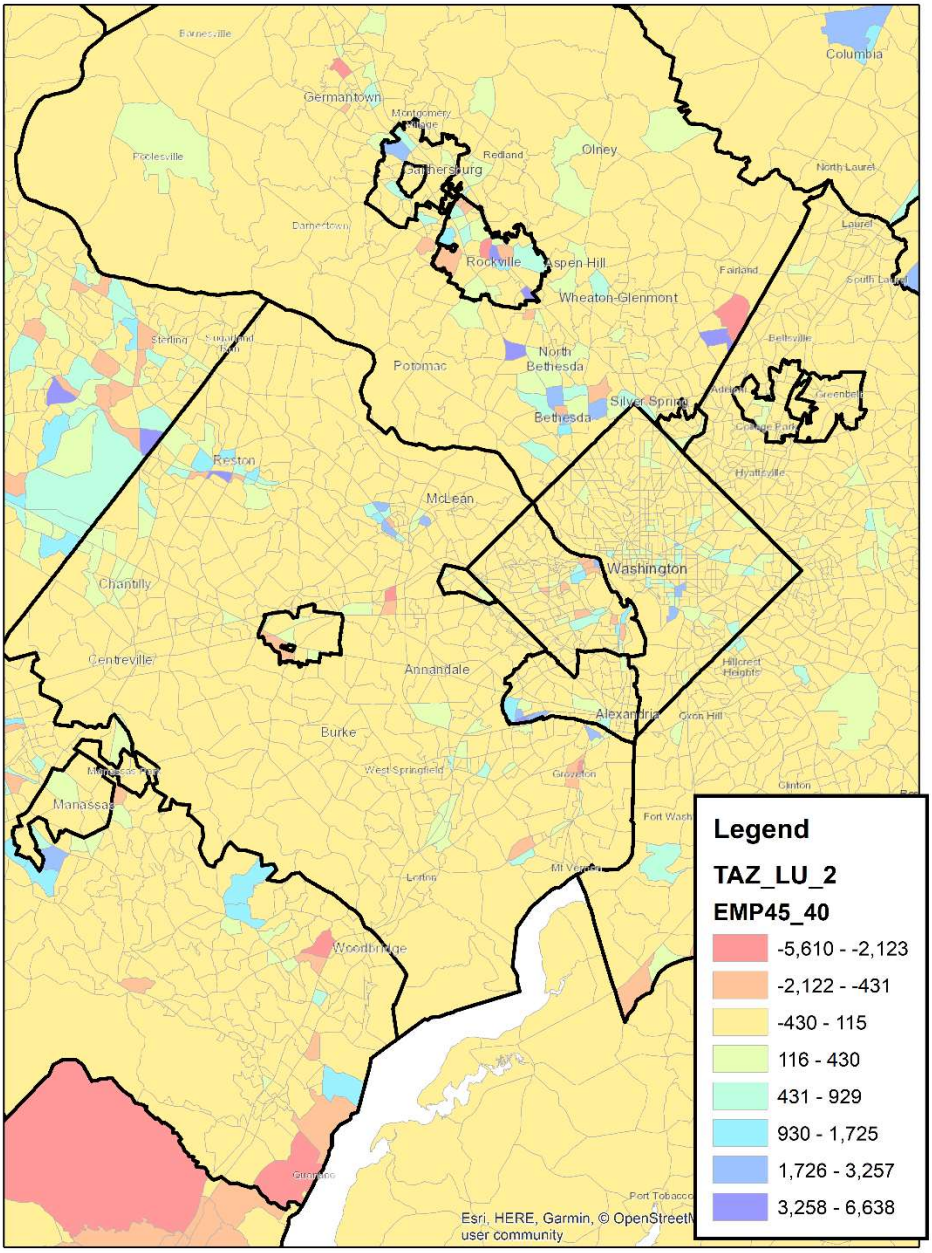
EMP2045 -EMP2019

Figure 7: Growth Year 2040 to Year 2045 Households



HH2045 - HH2040

Figure 8: Growth Year 2040 to Year 2045 Jobs



Highway and Transit Networks

In terms of the transportation system highway networks, there are new projects in Maryland that were included with the CLRP for the V2.3.75 model set that are not in the earlier CLRP. The following list includes projects in the CLRP, new additions included in V2.3.75 model set are in **bold**, all other projects are included in both model sets.

- **I-495 - construct VA HOT from VA 267 to American Legion Bridge 4 HOT lanes, 2025 ($500M)**
- I-70 - widen to 6 lanes with interchange at Meadow Rd, 2025, 2035 ($143M)
- I-95/I-495 - interchange at Greenbelt Metro Station, 2030 ($196M)
- **I-95/I-495 Traffic Relief Plan, construct 4 managed lanes, Virginia State Line American Legion Bridge to Woodrow Wilson Bridge 2025 ($4.2B)**
- **I-270 Traffic Relief Plan, construct 4 managed lanes, 2025 ($3.4B)**
- **I-270 - "Innovative Congestion Management" project to includes auxiliary lanes & additional improvements, 2019 ($114M)**
- I-270 - interchange at Watkins Mill Road Extension, 2021 ($120M)
- Baltimore Washington Parkway (MD-295) at MD-193 (Greenbelt Rd) - intersection improvement, 2020 ($8.5M)
- Suitland Pkwy - interchange at Rena/ Forestville Rd, 2025 ($2.8M)
- US-1 (Baltimore Ave) - reconstruct 4 lanes, 2030 ($116M)
- US-15 (Catoctin Mtn Hwy) - reconstruct intersection at Monocacy Blvd, 2018 ($61M)
- **US-15 (Frederick Freeway and Catoctin Mountain Highway) - widen to 6 lanes with interchange at Biggs Ford Rd, 2030, 2040, 2045 ($220M)**
- **US-29 (Columbia Pike) - improve interchanges at Stewart Ln, Tech Rd/Industrial Pkwy, Musgrove Rd/Fairland Rd, Greencastle Rd, and Blackburn Rd, 2045 ($646M)**
- US-50 (John Hanson Hwy) - westbound ramp to Columbia Park Rd, 2025 ($64M)
- **US-301 (Crain Hwy) - widen to 6 lanes, 2045($4.6B)**
- US-301 - widen Governor Harry Nice Memorial Bridge, 2023 ($768M)
- MD-3 (Robert Crain Hwy) - widen to 6 lanes, 2035 ($1.8B)
- MD-4 (Pennsylvania Ave) - widen to 6 lanes with interchanges at Dowerhouse Rd, Westphalia Rd, and Suitland Pkwy, 2040 ($533M)
- MD-5 (Branch Ave) - upgrade, widen to 6 lanes including interchanges, 2035 ($790M)
- MD-28 (Norbeck Rd) / MD-198 (Spencerville Rd) - widen to 4, 6 lanes, 2045 ($413M)
- MD-85 (Buckeystown Pike) - widen to 4, 6 lanes, 2021, 2035 ($220)
- **MD-97 (Georgia Ave) - widen to 7, 8 lanes, 2025 ($52M)**

- MD-97 (Brookeville Bypass) - construct 2 lane bypass, 2021 ($52M)
- MD-117 (Clopper Rd) - widen to 4 lanes, 2030 ($69M)
- MD-118 (Germantown Rd) - widen to 4 lanes, 2020 ($4.0M)
- MD-124 (Woodfield Rd) - widen to 6 lanes, 2035 ($129M)
- MD-197 (Collington Rd) - widen to 4/5 lanes, 2025 ($94M)
- MD-202 (Landover Rd) - Largo Town Center Metro Access Improvement, reconstruct 6 lanes, 2045 ($24M)
- MD-210 (Indian Head Hwy) - upgrade to 6 lanes and interchange improvement, 2040 ($754M)
- MD-223 (Woodyard Rd) - widen to 4 lanes, 2020 ($2.8M)
- MD-450 (Annapolis Rd) - widen to 4 lanes, 2030 ($67M)
- Mid county Hwy Extension (M-83) - construct 4, 6 lanes, 2025 ($202M)
- Middlebrook Rd Extended - widen to 4 lanes, 2025 ($16M)
- Montrose Pkwy East - construct 4 lanes, 2025 ($140M)
- Corridor Cities Transitway BRT - from Shady Grove to COMSAT, 2020 ($545M)
- **North Bethesda Transitway BRT - from Montgomery Mall to White Flint Metro, 2040 ($115M)**
- **Veirs Mill Rd BRT - from Wheaton Metro to Rockville Metro, 2030 ($6M)**
- **Randolph Rd BRT - from US- 29 to MD-355, 2040 ($102M)**
- **New Hampshire Ave. BRT - from Takoma Metro to Colesville P&R, 2045 ($285M)**
- US-29 BRT - from Silver Spring Metro to Burtonsville P&R, 2020 ($39M)
- **MD-355 BRT - from Bethesda Metro to Clarksburg, 2040 ($1B)**
- MARC - Increase trip capacity and frequency along all commuter rail lines, 2029 ($1B)
- Purple Line - Bethesda to New Carrollton, 2020 ($2.4B)

The latest CLRP has additional high-capacity transit projects in Montgomery County. These include the new Bus Rapid Transit (BRT) lines that are part of the County's Rapid Transit System. Although these are substantial projects and will benefit the corridors that they operate in the change in mode share, the differences between year 2040 Version 2.3.71 model results and the year 2045 Version 2.3.75 model results are negligible.

There are other smaller modifications to the transit service that are related to some of the larger transit investments. These include the route level changes to connect with the Purple Line, Montgomery County's BRT, and in the latest CLRP transit service planned for the managed lanes on the Capital Beltway. Table 3 provides a summary of these modifications. These are just slight modifications in most cases connecting the existing routes to the new high capacity transit.

The transit mode share for commuter trips in Montgomery County remains at 31 percent for both model forecasts. For Prince George's County the transit share drops from 28 percent to 27 percent. For all trip

purposes, the transit mode share in Montgomery County remains consistent at nine percent and in Prince George's County it remains at eight percent.

Table 3 Transit Bus Route Modification Year 2045 CLRP

Route	Route Start	Route Finish	Project Year	Related Project
01 Ride On	LYTTONSVILLE STATION	FRIENDSHIP HEIGHTS STATION & B	2020	Purple Line
10 Ride On	POWDER MILL RD & NEW HAMPSHIRE AVE	TWINBROOK STATION & BAY B - EAST	2045	Randolph Road BRT
101 Ride On	MEDICAL CENTER STATION & BAY E	LAKEFOREST TRANSIT CENTER	2045	MD 355 BRT
12 Ride On	TAKOMA STATION & BAY H	BONIFANT ST & BAY T	2020	Purple Line
13 Ride On	BONIFANT ST & BAY R	TAKOMA STATION & BAY T	2020	Purple Line
14A WMATA	BETHESDA METRO	MCLEAN BIBLE CHURCH PNR	2020	Managed Lanes Beltway
14C WMATA	LAKEFOREST MALL	MCLEAN BIBLE CHURCH PNR	2020	Managed Lanes Beltway
21 Ride On	BRIGGS CHANEY PARK & RIDE	SILVER SPRING STATION & BAY 111	2020	US 29 BRT
22 Ride On	POWDER MILL RD & NEW HAMPSHIRE AVE	SILVER SPRING STATION & BAY 111	2020	US 29 BRT
46 Ride On	S CAMPUS DR & CAMPUS DR	MEDICAL CENTER STATION & BAY E	2045	MD 355 BRT
55 Ride On	ROCKVILLE STATION & BAY B	GERMANTOWN TRANSIT CENTER & BAY B	2045	MD 355 BRT
C8 WMATA	COLLEGE PARK UMD STATION & BUS BAY C	MARINELLI RD & ROCKVILLE PIKE	2045	New Hampshire Ave BRT
J1 WMATA	MEDICAL CTR STATION & BUS BAY F	SILVER SPRING STATION & BUS BAY F	2020	Purple Line
J2 WMATA	MONTGOMERY MALL TRANSIT CTR	SILVER SPRING STATION & BUS BAY F	2020	Purple Line
K6 WMATA	WHITE OAK SHOPPING CENTER	FORT TOTTEN STATION & BUS BAY A	2045	New Hampshire Ave BRT
K9 WMATA	MAHAN RD & NEW HAMPSHIRE AVE	FORT TOTTEN STATION & BUS BAY A	2045	New Hampshire Ave BRT
Z11 WMATA	Burtonsville P & R Lot	SILVER SPRING STATION & BUS BAY 115	2020	US 29 BRT
Z7 WMATA	SOUTH LAUREL PARK & RIDE LOT & BAY B	SILVER SPRING STATION & BUS BAY 116	2020	US 29 BRT
Z8 WMATA	CASTLE BLVD & #14000	SILVER SPRING STATION & BUS BAY 114	2020	US 29 BRT
Z8 WMATA	STEWART LN & OLD COLUMBIA PIKE	SILVER SPRING STATION & BUS BAY 114	2020	US 29 BRT
Z8 WMATA	SILVER SPRING STATION & BUS BAY 114	GREENCASTLE RD & PARK & RIDE LOT	2020	US 29 BRT

4

4 Conclusion

In comparing the MWCOG/TPB Version 2.3.71 to Version 2.3.75, it is noted that the later version includes updates that are improvements in the model process and provide the latest planned projects and land use. In terms of the final travel demand forecast these changes do not significantly impact the results of the model for the purposes of this study. The changes streamline processes and improve the model set, but the result of those updates has limited impact on the study. Table 2 shows the Vehicle Miles Traveled (VMT) by jurisdiction for the study area. It is noted that the change in VMT is relativity small and would not be expected to result in substantial changes on the noise and air analysis.

Table 3 VMT by Jurisdiction

VMT Regional	Year 2040	Year 2045	Percent Change
Washington, DC	9,075,320	9,056,379	0%
Montgomery County	25,499,343	26,172,926	3%
Prince George's County	26,995,933	28,075,753	4%
Fairfax County	31,824,416	32,701,604	3%

The addition of the managed lanes reduced the percent of congested lane miles as compared to the Version 2.3.71 CLRP. The managed lanes are included in the latest CLRP. The congested pricing policies for the managed lanes result in an approximately six percent decrease in freeway vehicle lane miles in congestion for the study corridor. This is approximately the same for both Version 2.3.71 results and the Version 2.3.75 results.

This objective of this report was to provide an outline of the changes in the MWCOG/TPB Version 2.3.75 travel demand forecast model to the earlier Version 2.3.71 used as part of the NEPA process. The improvements included changes to the model structure, the land use and the networks. The improvements made to the Version 2.3.75 model set, and the corresponding networks and land use do not significantly impact the model results. The total changes in metrics that represents user consumption, are small and fall well within the accuracy tolerance of the model set. Although the new version provides a more efficient model run time, there are not significant changes in the end forecast.

ATTACHMENT C

2040 vs. 2045 Volumes

2045 No-Build Travel Demand

I-495 2045 No-Build Demand	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	8015	8640	7990	7360	6965	7865	7535	6545	7900	7775	7725	6390	6595	7430	6975	6620
AMERICAN LEGION BRIDGE	8495	9940	9620	8915	9155	10140	9500	8395	9640	9580	9530	8240	9185	9965	9680	8935
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	7740	9120	8785	8065	8955	9480	8270	7410	8555	8250	7955	7130	8035	8070	7905	7465
BETWEEN MD 190 AND I-270	7550	9265	9365	8650	10975	11565	9975	8825	10340	10420	9715	8965	8345	8770	8480	7790
BETWEEN I-270 WEST AND MD 187	4280	4920	4125	4030	4350	5265	4230	4225	5225	4675	4495	4040	4765	4490	4385	4020
BETWEEN I-270 EAST AND MD 187	3965	4600	3855	3925	4130	4775	3810	4010	4915	4545	4190	3680	4545	4240	4225	3560
BETWEEN MD 355 AND MD 185	6540	8665	7855	7335	7890	9120	8660	8070	8765	8785	8100	7325	8630	8260	8270	7630
BETWEEN MD 185 AND MD 97	6035	8225	7870	7155	9655	9970	8660	8435	9660	9455	8690	7755	8345	8125	8050	7225
BETWEEN MD 97 AND US 29	5815	8085	7600	6965	9395	8840	7080	7355	9870	9665	8860	7870	7955	8040	8100	7085
BETWEEN MD US 29 AND MD 193	5770	7685	7335	6580	8380	7520	6005	6235	9350	9330	8465	7325	7280	7475	7360	6170
BETWEEN MD 193 AND MD 650	6090	8095	7855	6825	8260	7335	5920	6020	9400	9555	8890	7875	7530	7805	7950	6645
BETWEEN MD 650 AND I-95	7355	8990	8210	7135	8925	7965	6835	6630	9855	10120	9345	8465	7875	8300	8330	6995
BETWEEN US 1 AND I-95	7570	8555	8660	7580	8365	8755	7845	6800	8640	8875	8210	6870	9675	9775	9085	7830
BETWEEN GREENBELT STATION AND US 1	8205	9965	9925	8420	8610	9145	7875	6665	9800	10230	9135	7690	8945	9115	8290	7220
BETWEEN GREENBELT STATION AND MD 201	7870	9460	9645	8255	8570	9075	7915	6640	9710	10105	9050	7575	8780	8805	7750	6730
BETWEEN MD 201 AND MD 295	7395	8725	9315	7885	9095	9960	8685	7235	9375	9875	8900	7495	8750	8605	7440	6420
BETWEEN MD 295 AND MD 450	6565	7795	8460	7035	8985	9705	8605	7525	9300	9275	8350	6735	7640	7275	6245	5925
BETWEEN MD 450 AND US 50	7055	8140	8900	7490	9120	9915	9035	7810	9720	9605	9050	7455	8110	7755	6960	6290
BETWEEN US 50 AND MD 202	7710	8655	9360	8080	8355	9280	8130	7355	10010	9305	9210	7850	8525	8065	7325	6665
BETWEEN MD 202 AND ARENA DR	7580	8240	8915	7755	8110	9005	7920	7095	9650	8705	8665	7655	8155	7810	7175	6665
BETWEEN ARENA DR AND MD 214	7505	8200	8635	7670	7930	8780	7840	7030	9610	8330	8180	7335	7925	7695	7120	6625
BETWEEN MD 214 AND RITCHIE MARLBORO RD	7200	7775	7840	7365	7855	9140	8050	6795	9075	8255	8070	7090	8425	8190	7845	6925
BETWEEN RITCHIE MARLBORO AND MD 4	7175	7695	7640	7380	7085	8275	7445	6585	8130	7680	7855	6895	8300	8010	7740	6685
BETWEEN MD 4 AND FORESTVILLE RD	7290	7325	7870	7065	5735	7000	6135	5795	7610	7645	7580	6995	8190	7835	7660	6470
BETWEEN FORESTVILLE AND MD 218	6590	6670	7185	6490	5110	5990	5145	5125	7100	7155	7155	6465	7135	6640	6500	5575
BETWEEN MD 218 AND MD 5	6805	7070	7415	6720	5900	6980	5865	5520	7615	7920	7830	7075	7645	7085	6965	6065
BETWEEN MD 5 AND MD 414	7355	6025	6670	6040	4840	5700	5030	4645	6460	6650	6640	5820	7795	6780	6780	5790
BETWEEN MD 414 AND MD 210	7690	5865	6375	5835	4555	5315	4735	4485	5990	6355	6375	5410	8225	7965	7965	6910
BETWEEN MD 210 AND I-295	9700	7605	7430	6270	4520	5355	4730	4405	6265	6595	6505	5500	8295	8240	8550	7545
WOODROW WILSON BRIDGE	11280	10610	10200	7565	7155	8325	7525	7065	8495	8775	8605	7340	10545	9865	10090	9335

I-270 2045 No-Build Demand	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	3555	3610	3465	2930	2200	3185	3320	2640	2435	2755	2915	2985	4820	4925	4735	3795
BETWEEN MD 80 AND MD 109	4015	4205	3925	3225	2075	2870	3075	2420	2250	2680	2810	2855	4575	5095	5050	4015
BETWEEN MD 109 AND MD 121	4415	4665	4320	3520	2175	2975	3160	2510	2330	2785	2935	2915	4640	5210	5195	4230
BETWEEN MD 121 AND MD 27	5460	5420	5020	4190	2545	3275	3415	2740	2895	3315	3590	3600	5375	5610	5625	4780
BETWEEN MD 27 AND MD 118	6010	5085	4730	4615	2545	3275	3415	2740	3120	3590	3650	3870	5375	5610	5625	4780
BETWEEN MD 118 AND MIDDLEBROOK RD	6655	5745	5580	5150	2740	3610	4210	3715	3510	4065	4180	4355	7590	7370	7350	6455
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	8610	7665	7140	6660	3365	4520	4985	4450	4585	5380	5720	5750	8555	8805	8775	7800
BETWEEN WATKINS MILL AND MD 124	8035	7055	7040	5665	3555	4735	5230	4525	4650	5170	5315	5670	9565	9195	9130	8265
BETWEEN MD 124 AND MD 117	9590	8685	8615	6935	3500	4895	5575	4845	5490	6225	6525	6550	9980	10010	9890	8990
BETWEEN MD 117 AND I-370	11265	10525	10160	8465	4030	5860	7140	6030	6745	7990	8300	7915	11270	11560	11285	10335
BETWEEN I-370 AND SHADY GROVE RD	12150	11170	10345	8970	3745	5480	6790	5805	6500	7665	7900	7750	11535	11985	11275	10750
BETWEEN SHADY GROVE RD AND MD 28	11845	10370	9480	8370	4125	5895	7760	6585	6960	8140	8665	8145	11655	11765	11060	10380
BETWEEN MD 28 AND MD 189	12275	11325	10275	9180	4650	6755	9070	7760	7845	8890	9525	8860	12350	12925	12340	11685
BETWEEN MD 189 AND MONTROSE RD	12150	11590	10600	9345	4695	6690	9060	7785	7610	8660	9140	8650	12385	12670	12320	11625
BETWEEN MONTROSE RD AND I-270 SPLIT	11490	12155	11230	9625	5165	6895	9150	8000	7585	8725	8775	8335	11505	12290	11950	11110
BETWEEN I-270 SPLIT AND MD 187	4605	5500	5210	4360	2315	3080	4390	3765	3900	4015	3870	4080	5215	5510	5430	4975
BETWEEN MD 187 AND I-495	3615	4540	4345	3690	3185	4235	5170	4050	3880	4185	4025	3900	4640	4700	4430	4540
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	6890	6650	6020	5260	2850	3815	4755	4235	3685	4710	4910	4260	6290	6780	6520	6130
BETWEEN DEMOCRACY BLVD AND I-495	6625	6300	5745	4600	3275	4340	5240	4620	3580	4280	4095	3770	5115	5745	5220	4930

Percentage Demand Change - Between 2045 and 2040

I-495 2045 No-Build Percentage Demand Change	AM Peak								PM Peak							
	Inner Loop				Outer Loop				Inner Loop				Outer Loop			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN VA-193 AND GW MEMORIAL PKWY	-8%	-4%	-7%	-11%	22%	17%	10%	6%	2%	4%	0%	-7%	1%	11%	11%	4%
AMERICAN LEGION BRIDGE	5%	5%	5%	4%	17%	11%	6%	2%	0%	3%	0%	-4%	-2%	5%	4%	-1%
BETWEEN CLARA BARTON PARKWAY AND CABIN JOHN PARKWAY	-9%	-5%	-7%	-12%	1%	1%	-4%	-12%	-1%	4%	2%	-2%	-1%	2%	1%	-3%
BETWEEN MD 190 AND I-270	-9%	-4%	-5%	-10%	6%	4%	1%	-8%	8%	8%	6%	7%	0%	5%	3%	1%
BETWEEN I-270 WEST AND MD 187	-11%	4%	-6%	-13%	-2%	8%	-2%	-11%	23%	17%	20%	27%	3%	1%	1%	-1%
BETWEEN I-270 EAST AND MD 187	-13%	5%	-5%	-12%	-3%	3%	-6%	-13%	20%	18%	17%	22%	5%	1%	1%	-3%
BETWEEN MD 355 AND MD 185	-9%	0%	-1%	-6%	8%	11%	-1%	-9%	8%	11%	9%	11%	1%	0%	-2%	-4%
BETWEEN MD 185 AND MD 97	-9%	0%	-2%	-6%	17%	14%	-2%	-6%	7%	7%	6%	6%	1%	-2%	-5%	-7%
BETWEEN MD 97 AND US 29	-2%	4%	0%	-4%	-2%	-1%	-6%	-7%	5%	6%	7%	8%	1%	-1%	-3%	-4%
BETWEEN MD US 29 AND MD 193	1%	5%	1%	-4%	-2%	0%	-3%	-6%	4%	7%	7%	7%	2%	0%	-2%	-4%
BETWEEN MD 193 AND MD 650	0%	4%	1%	-5%	0%	4%	1%	-6%	2%	5%	8%	8%	2%	0%	-1%	-3%
BETWEEN MD 650 AND I-95	-1%	2%	-1%	-6%	1%	5%	4%	-6%	1%	6%	6%	6%	1%	0%	-1%	-4%
BETWEEN US 1 AND I-95	7%	6%	12%	4%	4%	7%	5%	-6%	35%	22%	18%	30%	4%	-1%	-1%	-2%
BETWEEN GREENBELT STATION AND US 1	2%	8%	10%	0%	4%	7%	5%	-5%	28%	24%	14%	14%	3%	-1%	0%	-2%
BETWEEN GREENBELT STATION AND MD 201	4%	8%	13%	4%	3%	4%	4%	-7%	27%	24%	14%	13%	3%	0%	-2%	-4%
BETWEEN MD 201 AND MD 295	5%	8%	12%	2%	3%	4%	4%	-7%	24%	21%	13%	10%	2%	-6%	-10%	-4%
BETWEEN MD 295 AND MD 450	3%	8%	11%	1%	2%	2%	2%	-7%	20%	11%	4%	4%	0%	-7%	-13%	-5%
BETWEEN MD 450 AND US 50	4%	7%	7%	0%	1%	2%	1%	-8%	16%	6%	4%	3%	-1%	-8%	-10%	-6%
BETWEEN US 50 AND MD 202	0%	3%	3%	-2%	-2%	0%	0%	-8%	17%	2%	-1%	0%	3%	-6%	-6%	-2%
BETWEEN MD 202 AND ARENA DR	0%	2%	3%	-3%	-1%	-1%	-2%	-7%	18%	0%	-3%	-3%	-2%	-10%	-10%	-5%
BETWEEN ARENA DR AND MD 214	-1%	0%	1%	-4%	-4%	-5%	-6%	-11%	17%	-2%	-5%	-6%	-4%	-10%	-11%	-6%
BETWEEN MD 214 AND RITCHIE MARLBORO RD	-5%	-4%	-3%	-5%	-2%	-2%	-3%	-11%	16%	-3%	-6%	-8%	1%	-7%	-6%	-6%
BETWEEN RITCHIE MARLBORO AND MD 4	-7%	-6%	-6%	-6%	0%	0%	-1%	-7%	29%	9%	2%	-5%	-1%	-9%	-8%	-8%
BETWEEN MD 4 AND FORESTVILLE RD	0%	1%	0%	-1%	-10%	-7%	-8%	-7%	33%	12%	5%	-1%	2%	-3%	-4%	-5%
BETWEEN FORESTVILLE AND MD 218	1%	1%	0%	-1%	-7%	-6%	-6%	-6%	36%	13%	6%	0%	3%	-3%	-4%	-4%
BETWEEN MD 218 AND MD 5	1%	4%	0%	-2%	-7%	-3%	-7%	-7%	33%	13%	6%	2%	4%	-3%	-4%	-3%
BETWEEN MD 5 AND MD 414	2%	1%	2%	-3%	-4%	-4%	-4%	-5%	38%	14%	7%	2%	5%	-8%	-7%	-9%
BETWEEN MD 414 AND MD 210	0%	-4%	-3%	-5%	-8%	-8%	-9%	-7%	33%	14%	7%	2%	4%	-2%	-1%	-2%
BETWEEN MD 210 AND I-295	9%	6%	1%	-4%	-5%	-5%	-5%	-2%	33%	12%	6%	1%	4%	-1%	3%	3%
WOODROW WILSON BRIDGE	2%	-3%	-2%	-7%	-13%	-13%	-14%	-7%	15%	-2%	-5%	-10%	4%	-3%	-2%	-2%

I-270 2045 No-Build Percentage Demand Change	AM Peak								PM Peak							
	Southbound				Northbound				Southbound				Northbound			
	6-7 AM	7-8 AM	8-9 AM	9-10AM	6-7 AM	7-8 AM	8-9 AM	9-10AM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
BETWEEN MD 85 AND MD 80	-2%	-4%	0%	-11%	19%	9%	8%	-1%	9%	2%	-5%	0%	6%	-7%	-6%	-8%
BETWEEN MD 80 AND MD 109	2%	-1%	3%	-10%	33%	18%	18%	7%	10%	8%	-1%	4%	6%	-2%	-1%	-4%
BETWEEN MD 109 AND MD 121	-2%	-4%	0%	-13%	33%	19%	18%	7%	7%	7%	-2%	4%	5%	-2%	-1%	-5%
BETWEEN MD 121 AND MD 27	-3%	-6%	-2%	-13%	24%	20%	19%	3%	8%	7%	1%	7%	8%	-7%	-7%	-10%
BETWEEN MD 27 AND MD 118	-8%	-12%	-9%	-12%	23%	18%	16%	3%	-3%	0%	-3%	2%	6%	-6%	-6%	-8%
BETWEEN MD 118 AND MIDDLEBROOK RD	-7%	-9%	-5%	-11%	15%	7%	7%	2%	-7%	-4%	-5%	-1%	5%	-8%	-9%	-12%
BETWEEN MIDDLEBROOK RD AND WATKINS MILL	-6%	-8%	-7%	-9%	20%	9%	2%	-1%	-5%	2%	1%	5%	-1%	-7%	-8%	-12%
BETWEEN WATKINS MILL AND MD 124	2%	0%	9%	-7%	34%	11%	0%	-6%	19%	20%	11%	23%	18%	2%	-2%	-4%
BETWEEN MD 124 AND MD 117	-2%	0%	10%	-5%	35%	15%	4%	-2%	9%	13%	6%	15%	16%	1%	-3%	-5%
BETWEEN MD 117 AND I-370	-3%	-1%	5%	-6%	28%	12%	4%	-3%	5%	10%	4%	12%	8%	0%	-4%	-6%
BETWEEN I-370 AND SHADY GROVE RD	16%	4%	7%	-3%	35%	22%	13%	1%	4%	18%	10%	16%	5%	-2%	-4%	-4%
BETWEEN SHADY GROVE RD AND MD 28	13%	1%	4%	-4%	20%	7%	3%	-7%	1%	11%	4%	9%	3%	-4%	-6%	-7%
BETWEEN MD 28 AND MD 189	9%	1%	2%	-5%	18%	5%	0%	-8%	0%	8%	3%	5%	5%	0%	-3%	-3%
BETWEEN MD 189 AND MONTROSE RD	8%	2%	3%	-5%	17%	5%	0%	-7%	1%	10%	5%	7%	6%	-1%	-4%	-4%
BETWEEN MONTROSE RD AND I-270 SPLIT	11%	2%	2%	-4%	9%	1%	-3%	-7%	2%	8%	4%	7%	0%	-2%	-5%	-6%
BETWEEN I-270 SPLIT AND MD 187	9%	-2%	1%	-4%	15%	8%	1%	-5%	9%	7%	2%	10%	4%	-1%	-4%	-8%
BETWEEN MD 187 AND I-495	-1%	-6%	1%	-7%	25%	17%	7%	-6%	3%	6%	3%	7%	5%	1%	-7%	-7%
BETWEEN I-270 SPLIT AND DEMOCRACY BLVD	13%	5%	3%	-5%	5%	-5%	-6%	-9%	-5%	10%	5%	4%	-3%	-3%	-7%	-4%
BETWEEN DEMOCRACY BLVD AND I-495	12%	2%	3%	-5%	6%	-5%	-5%	-8%	-4%	9%	5%	3%	-4%	2%	-4%	-6%