



APPENDIX E
NOISE ANALYSIS TECHNICAL REPORT
ADDENDUM
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of Transportation

**Federal Highway
Administration**

M_{DOT} MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

ES

EXECUTIVE SUMMARY

ES.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 a Supplemental Draft Environmental Impact Statement (SDEIS) 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 County, Maryland, and Fairfax County, Virginia. The MLS study area overlaps with VDOT's I-495 Express Lanes Northern Extension Study between the Potomac River and Live Oak Drive. The Virginia portion of the study area is being evaluated in coordination with the Virginia Department of Transportation (VDOT).

The purpose of the Addendum to the Noise Technical Report is to present an assessment of potential direct impacts of the Preferred Alternative to the noise environment and is being prepared to support and inform the SDEIS. The proposed improvements are classified as a Type I project, as defined in Title 23 of the Code of Federal Regulations Part 772 (23 CFR 772); therefore, impacted noise sensitive areas are eligible for consideration of noise abatement¹. The objective of this report is to present the predicted loudest-hour build traffic noise levels, to determine if these noise levels cause a traffic noise impact, and, if so, to determine whether noise abatement is feasible and reasonable for the Preferred Alternative within the study area.

The Study limits remain unchanged: I-495 from south of the George Washington Memorial Parkway in Fairfax County, Virginia, including replacement of the American Legion Bridge over the Potomac River, to west of MD 5 and along I-270 from I-495 to north of I-370, including the east and west I-270 spurs in Montgomery and Prince George's Counties, Maryland. The Preferred Alternative, Alternative 9 - Phase 1 South (shown in **dark blue** in **Figure 1-1**), includes build improvements within the limits of Phase 1 South only. There is no action, or no improvements included at this time on I-495 east of the I-270 east spur to MD 5 (shown in **light blue** in **Figure 1-1**). While the Preferred Alternative does not include improvements to the remaining parts of I-495 within the scope of the Study area, future improvements on these remaining parts of the system may still be needed.

¹ Section 772.5 (1 through 8) define the types of projects that are classified as a Type I Project. The I-495 and I-270 Managed Lanes Study proposes the addition of through-traffic lanes, including the addition of HOV and HOT lanes. This qualifies this study as a Type I Project according to 772.5 (3).

ES.2 Land Uses and Methodology

The study area was divided into 64 noise sensitive areas (NSAs) in accordance with the MDOT SHA, Virginia Department of Transportation (VDOT), and FHWA noise policies and guidance [VDOT uses the term Common Noise Environment (CNE); however, for this summary, CNEs will be referred to as NSAs]. The NSAs are comprised of areas of different land use activity categories which share a common noise environment and have been combined into a single NSA. Geographically, 4 NSAs are located along I-495 in Virginia, 20 NSAs are located along I-495 in Maryland, and 40 NSAs are located along I-270.

There are several existing Type I and Type II noise barriers within the study corridors. Noise barriers that are anticipated to be displaced for roadway improvements or stormwater management conflicts are assumed to be replaced. Replacement barriers have been analyzed to verify there is no decrease in performance and concluded that replacement noise barriers meet or exceed the noise abatement performance of the existing noise barriers to be replaced including insertion loss and line of sight. Modifications to existing barriers will be re-evaluated during the final design process.

All prediction modeling was performed using FHWA's Traffic Noise Model (TNM) v2.5. The TNM seeks to simulate the noise environment by considering variable inputs for traffic (including autos, medium trucks, heavy trucks, buses, and motorcycles), variable inputs of traffic speed for each vehicle type, variable inputs for roadway design, (including roadway width, horizontal and vertical alignment), variable inputs for terrain lines and propagation features (such as building rows, ground zones, and tree zones), and inclusion of traffic control measures including stop lights and stop signs. The preliminary direct access locations were included in this noise analysis.

The TNM validation process confirms the model's ability to reproduce the Measured Noise Levels. Measured Noise Levels correspond to ambient measurements taken in conjunction with highway traffic counts. A difference of three decibels or less between the monitored and modeled levels is considered acceptable, since this is the limit of change detectable by typical human hearing. FHWA guidance specifies that the arithmetic difference between monitored and predicted existing noise levels is a measure of the model's accuracy.

Impact criteria is defined based upon the Noise Abatement Criteria (NAC) for the identified type of activities or land uses present within each noise-sensitive area (NSA). The majority of NSAs that MDOT SHA and Virginia Department of Transportation (VDOT) evaluate fall within Activity Categories B and C, which are considered impacted at a noise level of 66 dB(A) or greater. Activity Category B noise-sensitive receptors are defined exclusively as residences. Category C noise-sensitive receptors consist of non-residential land uses where frequent outdoor activity exists such as, sporting areas, campgrounds, parks, picnic areas, playgrounds, schools, places of worship, and other recreational areas.

Federal regulation (23 CFR 772), the MDOT SHA *Highway Noise Abatement Planning and Engineering Guidelines* (April 2020), and VDOT *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018) require that noise abatement be investigated at all NSAs where the build traffic noise levels approach or exceed the FHWA NAC for the defined land use category, or where there are substantial increases (10 dB(A) per the 2020 MDOT SHA Guidelines and 2018 VDOT Guidance Manual) from existing to build condition noise levels. According to MDOT SHA's Guidelines and VDOT's Guidance Manual, for a Type I project an impact is identified when design year noise levels are predicted to approach the appropriate NAC for each land use, or when predicted noise levels are anticipated to increase over existing

year noise. For the NSAs that do not approach or exceed the NAC (and therefore are not considered impacted under that criterion), the lowest existing noise level was compared to the future build condition noise level in order to determine where a substantial increase impact would occur. No NSAs will experience a substantial increase as a result of the Preferred Alternative.

Where noise abatement was warranted for consideration, additional criteria were examined to determine if the abatement would be feasible and reasonable. The assessment of noise abatement feasibility, in general, focuses on whether it is physically possible to build an abatement measure (i.e., noise barrier) that achieves a minimally acceptable level of noise reduction. Barrier feasibility considers three primary factors: acoustics (MDOT SHA requires barriers to achieve a 5 dB(A) noise reduction at 70 percent of the impacted residences, VDOT requires barriers to achieve a 5 dB(A) noise reduction at 50 percent of the impacted receptors), safety, and access. Barrier reasonableness considers three primary factors: viewpoints, design goal (MDOT SHA requires barriers to achieve a 7 dB(A) noise reduction at a minimum of three (3)² or 50 percent of the impacted residences, VDOT requires barriers to achieve a 7 dB(A) noise reduction at a minimum of one (1) impacted receptor³), and cost effectiveness (the MDOT SHA threshold is 700-2,700 square feet per benefited residence depending on the scope of the project, the VDOT threshold is 1,600 square feet per benefitted receptor).

ES.3 Impact Analysis Summary

Table ES-1 presents details on preliminary impacts by NSA. Of the 4 NSAs along I-495 in Virginia, three (3) are predicted to result in noise impacts from the Preferred Alternative. One (1) NSA location currently does not have an existing noise barrier and warrants further consideration of noise abatement due to the construction of the proposed highway improvements: NSA VA-02. One NSA was identified for consideration of the extension of existing noise barriers: NSA VA-01 (See *Map 1*).

Of the 20 NSAs along I-495 in Maryland, 19 are predicted to result in noise impacts from the Preferred Alternative; with 15 having levels equal to or exceeding 75 dB(A)⁴. Seven (7) NSA locations currently do not have an existing noise barrier and warrant further consideration of noise abatement due to the construction of the proposed highway improvements: NSAs 1-01, 1-02, 1-04, 1-05, 1-38, 4-01, and 1-10A. Nine (9) NSAs were identified for consideration of extensions of existing noise barriers: NSAs 1-03, 2-01, 1-06, 3-01, 3-04, 1-08, 2-04, 2-06 and 1-09A. (See *Maps 2 through 8*).

Of the 39 NSAs along I-270, 27 are predicted to result in noise impacts from the Preferred Alternative; with 14 having levels equal to or exceeding 75 dB(A). Twelve (12) NSA locations currently do not have an existing noise barrier and warrant further consideration of noise abatement due to the construction of the proposed highway improvements: NSAs 5-37B, 5-33A, 5-24, 5-22, 5-19, 5-18, 5-11, 5-10, 5-09, 5-08,

² NSAs must have a minimum of three (3) impacted receptors in order to be considered for noise abatement in Maryland per MDOT SHA noise policy.

³ A receptor is a discrete or representative location of a noise sensitive area, typically used for modeling purposes. A residence is one dwelling unit, either one single family residence or one dwelling unit in a multifamily dwelling. A receptor may represent more than one residence.

⁴ In Maryland, higher absolute noise levels, defined by MDOT SHA as at or above 75 dB(A), are factored into the reasonableness determination for the barrier system. Noise levels at or above 75 dB(A) may warrant a higher noise reduction design goal than the minimum of 7 dB(A) identified in the MDOT SHA Highway Noise Policy, and this condition is used in determining the cost effectiveness evaluation threshold.

5-07, and 5-06. Ten (10) NSAs were identified for consideration of extensions of existing noise barriers: NSAs 5-36, 5-37A, 5-34A, 5-29, 5-21, 5-20, 5-17, 5-15, 5-13, and 5-12 (See *Maps 5, 6, and 9 through 18*).

ES.4 Barrier Analysis Summary

Federal regulation (23 CFR 772), MDOT SHA *Highway Noise Abatement Planning and Engineering Guidelines* (April 2020), and VDOT *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018) require that noise abatement be investigated at all NSAs where the design year build traffic noise levels approach or exceed the FHWA NAC for the defined land use category. Where noise abatement was warranted for consideration, additional criteria were examined to determine if the abatement is feasible and reasonable.

Several noise barrier scenarios have been analyzed for this Study: existing noise barriers to remain in place; existing noise barriers displaced by proposed construction to be replaced by a reconstructed barrier on a new alignment; existing noise barriers that were evaluated for extensions; and new noise barriers on new alignment. The following is a summary of the noise barrier systems that are considered ***feasible and reasonable***:

- Existing noise barriers would remain in place as they are currently constructed: NSAs 5-23, 5-02, and 5-01.
 - There are no impacts to noise sensitive land uses behind the barrier associated with NSA 5-23; therefore, no additional analysis is required.
 - Although the existing barriers for NSA 5-01 and 5-02 would not be displaced by the current design, noise impacts were predicted at receptors behind the existing noise barriers. The existing noise barriers were evaluated and they both meet the current feasible and reasonable criteria. Therefore, the existing barriers will remain in place.
- Existing noise barriers would remain in place, but would be extended: Barriers 495 MD-14 and 270-9AB, protecting NSAs 2-06, 1-09, and 5-34A.
- Existing noise barrier would be fully or partially displaced by construction and replaced by a reconstructed barrier: Barriers 495 VA-3, 495 MD-6, 495 MD-8, 495 MD-10, 495 MD-13, 270-12A, 270-7B, and 270-7A, protecting NSAs VA-03, 2-02, 3-02, 2-03, 2-05, 5-37A, 5-31, and 5-30.
- Existing noise barrier would be reconstructed and extended: Barriers 495 VA-1, 495 MD-3, 495 MD-5, 495 MD-11, 495 MD-12, 270-11, 270-15, 270-14, and 270-5, protecting NSAs VA-01, VA-02, 1-03, 2-01, 1-06, 3-01, 3-04, 1-08, 2-04, 5-36, 5-29, 5-21, 5-20, 5-15, 5-13, and 5-12.
- New barriers would be constructed where there are not current existing barriers: 495 VA-02, 495 MD-01, 495 MD-02, 495 MD-04, 495 MD-07, 270-12C, 270-08A, 270-06, protecting NSAs VA-02, 1-01, 1-02, 1-04, 1-05, 1-38, 5-37B, and 5-33A.

The following is a summary of the noise barrier systems that are considered ***not feasible and/or reasonable***.

- Barrier 495 MD-15, designed to protect NSA 1-10, does not meet reasonableness due to failure to meet the cost effectiveness reasonableness criteria; since this NSA is at the limit of the Preferred Alternative, a noise barrier for this NSA will be reconsidered when roadway improvements are considered in this area.



- Barrier 270-08B, designed to protect NSA 5-33B, does not meet feasibility due to failure to meet the noise reduction design goal; since this NSA is at the limit of the Preferred Alternative, a noise barrier for this NSA will be reconsidered when roadway improvements are considered in this area.
- Barrier 270-02, designed to protect NSAs 5-09 and 5-08, does not meet feasibility due to failure to meet the noise reduction design goal.
- Barriers 270-16, 270-13, 270-03, and 270-01, designed to protect NSA 5-24, 5-11, 5-10, 5-07, 5-06, do not meet reasonableness due to failure to meet the cost effectiveness reasonable criteria.
- Barrier 270-12B, an extension of existing Barrier 270-12A in front of NSA 5-37A, does not meet feasibility or reasonableness due to failure to meet the noise reduction design goal and cost effectiveness reasonableness criteria.

ES.5 Statement of Likelihood

Based on the studies performed thus far, MDOT SHA recommends installation of highway traffic noise abatement in the form of a noise barrier for the NSAs as reflected in **Table ES-1**. These preliminary indications of likely abatement measures are based upon preliminary design for barrier square footage equal to or less than the maximum amount allowed per benefited residence by the MDOT SHA *Highway Noise Abatement Planning and Engineering Guidelines* (April 2020) and VDOT *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018). Concrete is the typical material used for construction of noise barriers and is assumed as part of the barrier analysis; however, a final determination of material will be made in final design, based upon FHWA requirements to achieve a minimum 20 dB(A) Transmission Loss in accordance with ASTM Recommended Practice E413-87. The findings in this analysis are based upon preliminary design information. A preliminary determination of horizontal and vertical alignment for the noise barriers was made based on the latest design concept (**Table ES-1**); however, final determination of noise barrier feasibility, reasonableness, dimensions and locations will be made in final design. Engineering changes reflected in final design could alter the conclusions reached in this analysis, leading to recommendations to add or omit noise barrier locations. A Final Design Noise Analysis will be performed for this Study based on detailed engineering information during the final design phase. The views and opinions of all benefited property owners and residents may be solicited through public involvement and outreach activities during final design.

Table ES-1: Summary of Noise Sensitive Area (NSA) Impacts and Preliminary Noise Barrier System Abatement

NSA	Map Number	Impacted [* if => than 75 dB(A)]		Preliminary Noise Barrier Mitigation	Feasible and Reasonable?		Preliminary Barrier Dimensions (ft)	
		Yes	No		Yes	No	Length	Height
Area 1: I-495 west side, south of George Washington Parkway								
VA-01	1	Y		495 VA-1	Y		1,871	17
VA-03 ⁵	1	Y		495 VA-3		N/A	3,072	20
Area 2: I-495 west side, between George Washington Parkway and Clara Barton Parkway								
VA-02	1,2	Y*		495 VA-2	Y		2,099	19
VA-04	1,2		N	N/A		N/A	N/A	N/A

⁵ NSA VA-03 has an existing noise barrier; since it is physically impacted by the project it will be replaced in-kind in accordance with VDOT policy. Since this is a replacement barrier, cost effectiveness is not required.

NSA	Map Number	Impacted [* if => than 75 dB(A)]		Preliminary Noise Barrier Mitigation	Feasible and Reasonable?		Preliminary Barrier Dimensions (ft)	
		Yes	No		Yes	No	Length	Height
Area 3: I-495 west side, between Clara Barton Parkway and MD 190								
1-01	2,3	Y*		495 MD-1	Y		1,363	22
1-02	2,3	Y*		495 MD-2	Y		6,281	24
1-04	3,4	Y*						
1-05	4	Y*		495 MD-4	Y		3,434	24
1-03	3	Y*		495 MD-3	Y		3,980	24
2-01	3,4	Y						
Area 4: I-495 west side, between MD 190 and I-270 west spur								
1-06	4	Y*		495 MD-5	Y		6,892	29
3-01	4,5	Y*						
1-38	4	Y		495 MD-7	Y		783	32
4-01 ⁶	4,5	Y*		495 MD-6A		N	N/A	N/A
2-02	5	Y*		495 MD-6	Y		4,433	32
Area 5: I-495 top side, between I-270 west spur and MD 187								
3-02	5,6	Y*		495 MD-8	Y		2,663	31
3-04	7	Y		495 MD-11	Y		3,114	24
1-08	7	Y*						
2-03	6,7	Y*		495 MD-10	Y		1,678	22
2-04	7,8	Y*		495 MD-12	Y		4,092	24
2-05	7,8	Y*		495 MD-13	Y		4,507	20
Area 6: I-495 top side, between MD 187 and I-270 east spur								
2-06	8	Y		495 MD-14	Y		2,134	19
1-09A	8	Y						
1-10A	8	Y*		495 MD-15	Y		1,884	28
Area 7: I-270 west spur, between I-495 and Democracy Boulevard								
5-36	6	Y*		270-11	Y		5,515	26
5-37A ⁷	6	Y		Existing Barrier to Remain	N/A		N/A	N/A
				270-12A - Replacement	Y		347	20
				270-12B - Extension		N	N/A	N/A
5-37B ⁸	5,6	Y*		270-12C	Y		641	27
				270-12D		N	N/A	N/A
Area 8: I-270 west spur, between Democracy Boulevard and Westlake Terrace								
5-32A	6,11		N	N/A	N/A		N/A	N/A

⁶ NSA 4-01 consists of a golf course. Barrier 6A was assessed in combination with Barrier 6; however, the combined barrier system exceeded the MDOT SHA threshold of 2700. Therefore, each noise barrier was evaluated individually. Barrier 6A did not meet the MDOT SHA threshold of 2700, and is therefore, not feasible and reasonable.

⁷ NSA 5-37A consists of single family residences. The existing noise barrier combined with an extended and relocated barrier is not feasible and reasonable; therefore, each noise barrier was evaluated individually. 270-12A was evaluated as an existing noise barrier to be replaced; however, the barrier did not meet the MDOT SHA threshold of 1700 sf-p-r. Since this is a replacement barrier and the cost effectiveness criteria cannot be met, the replacement barrier, Barrier 270-12A must still be constructed and must meet or exceed the existing noise barrier performance. The extension of the noise barrier is not reasonable (>1700 sf-p-r and < 50% of impacts receive 7 dB(A) insertion loss).

⁸ NSA 5-37B consists of the Bethesda Overlook townhouses and the tennis courts and golf course of the Bethesda Country Club. A combined barrier system was evaluated for this area; however, the barrier system did not meet the MDOT SHA threshold of 2700 sf-p-r; therefore, the barriers were assessed separately. Barrier 270-12C, which shields the townhouses and tennis courts is feasible and reasonable; while Barrier 270-12D, which shields the golf course is not feasible and reasonable.



NSA	Map Number	Impacted [* if => than 75 dB(A)]		Preliminary Noise Barrier Mitigation	Feasible and Reasonable?		Preliminary Barrier Dimensions (ft)	
		Yes	No		Yes	No	Length	Height
Area 9: I-270 east spur, between I-495 and MD 187								
5-33A	9,10	Y*		270-8	Y		5,562	28
5-34A	9,10	Y*		270-9	Y		4,069	22
Area 10: I-270 west and east spurs, between Y-split and Westlake Terrace and MD 187								
5-32C ⁹	6,11	N/A		N/A	N/A		N/A	N/A
5-32B ¹⁰	9,11	Y		270-10	N/A		N/A	N/A
5-31	9	Y		270-7B	Y		3,755	11
5-30	11	Y*		270-7A	Y		2,860	16
Area 11: I-270 mainline, between Y-split and Montrose Road								
5-29	11,12	Y*		270-15	Y		5,885	21
5-28	11,12		N	N/A	N/A		N/A	N/A
Area 12: I-270 mainline, between Montrose Road and MD 189								
5-27	13		N	N/A	N/A		N/A	N/A
5-26 ¹¹	13	N/A		N/A	N/A		N/A	N/A
5-25 ¹²	13,14	N/A		N/A	N/A		N/A	N/A
5-24 ¹³	14	Y		270-16		N	N/A	N/A
5-23	13,14		N	Existing Barrier to Remain	N/A		N/A	N/A
Area 13: I-270 mainline, between MD 189 and MD 28								
5-22	14	Y		270-06	Y		4,762	24
5-19	14	Y						
5-18	14,15	Y*						
5-21	14	Y*		270-14	Y		4,666	18
5-20	14	Y*						
5-17	14,15	Y*						
5-16	15		N	N/A	N/A		N/A	N/A
Area 14: I-270 mainline, between MD 28 and Shady Grove Road								
5-15	15	Y		270-5	Y		5,952	22
5-13	15	Y						
5-12	15,16	Y*						
5-14	15,16		N	N/A	N/A		N/A	N/A
5-11 ¹⁴	16	Y		270-13		N	N/A	N/A
5-10 ¹⁵	16	Y		270-3		N	N/A	N/A
5-09 ¹⁶	16	Y		270-2		N	N/A	N/A

⁹ NSA 5-32C consists of an office building without any outdoor uses; therefore, this NSA requires no further consideration.

¹⁰ NSA 5-32B consists of a pedestrian path. The barrier is not reasonable (>1700 sf-p-r).

¹¹ NSA 5-26 consists of commercial, retail, medical and office space without any outdoor uses; therefore, this NSA requires no further consideration.

¹² NSA 5-25 consists of the Montgomery County Detention Center. The outdoor uses are shielded by the building. Due to the distance separation from the roadway and an estimated reduction of 25 dB(A) by the windows, interior impacts are not anticipated; therefore, this NSA requires no further consideration.

¹³ NSA 5-24 consists of a school with outdoor uses. The barrier is not reasonable (>1700 sf-p-r).

¹⁴ NSA 5-11 consists of offices, medical facilities, and an apartment building. The barrier for this area is not reasonable (>1700 sf-p-r).

¹⁵ NSA 5-10 consists of offices, hotels, and a medical facility. The barrier for this area is not reasonable (>1700 sf-p-r).

¹⁶ NSAs 5-08 and 5-09 consist of an apartment complex and a hotel. The barrier evaluated for this area is not feasible (<70% of impacts are benefited).



NSA	Map Number	Impacted [* if => than 75 dB(A)]		Preliminary Noise Barrier Mitigation	Feasible and Reasonable?		Preliminary Barrier Dimensions (ft)	
		Yes	No		Yes	No	Length	Height
5-08 ¹⁹	17	Y						
Area 15: I-270 mainline, between Shady Grove Road and I-370								
5-07 ¹⁷	17	Y*		270-1		N	N/A	N/A
5-06	17	Y						
5-05 ¹⁸	17		N/A	N/A		N/A	N/A	N/A
5-03	17		N	N/A		N/A	N/A	N/A
Area 16: I-270 mainline, north of I-370								
5-04	18		N	N/A		N/A	N/A	N/A
5-02 ¹⁹	18	Y		Existing Barrier to Remain		N/A	N/A	N/A
5-01 ²⁰	18	Y		Existing Barrier to Remain		N/A	N/A	N/A
Summary of Noise Barrier System Mitigation								
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Existing Noise Barriers recommended to be extended							2	
Existing Noise Barriers that would be displaced and replaced with a reconstructed barrier							8	
Existing Noise Barriers recommended to be reconstructed and extended							9	
New Noise Barriers recommended for construction							9	
Noise Barrier is not reasonable or feasible							8	

¹⁷ NSA 5-06 consists of the Rio Washingtonian Center. NSA 5-07 consists of various commercial land uses. The barrier for this area is not reasonable (>2700 sf-p-r).

¹⁸ NSA 5-05 consists of restaurants and shops at the northern end of the Rio Washingtonian Center with no evident outdoor use areas; as such it requires no further consideration.

¹⁹ Impacts were identified in NSA 5-02 behind the existing barrier; however, the existing barrier meets the feasible and reasonableness criteria. Therefore, the existing barrier will remain in place.

²⁰ Impacts were identified in NSA 5-01 behind the existing barrier; however, the existing barrier meets the feasible and reasonableness criteria. Therefore, the existing barrier will remain in place.



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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 a Supplemental Draft Environmental Impact Statement (SDEIS) in accordance with the National Environmental Policy Act (NEPA) for Phase 1 South of 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 County, 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 Addendum to the Noise Technical Report is to present an assessment of potential impacts of the Preferred Alternative to the noise environment and is being prepared to support and inform the SDEIS. The primary change since the DEIS is the change to the Preferred Alternative, Alternative 9 - Phase 1 South to include build improvements within the limits of Phase 1 South only as discussed in section 1.2 Study Corridors. Other changes include the inclusion of additional ramp traffic, updates for design changes including direct access points and exchange ramps, intersection design changes, and changes to noise barrier alignments to reflect updates to limits of disturbance and right of way constraints.

The findings in this document are based on preliminary design information. Project engineering changes reflected in final design could alter the conclusions reached in this analysis, leading to recommendations to add or omit noise barrier locations. A Final Design Noise Analysis will be performed for this Study based on detailed engineering information during the design phase.

1.2 Study Corridors

The Study Corridors discussion remains consistent with Section 1.2 of the Type I Noise Technical Report prepared for the DEIS.



The Study limits remain unchanged: I-495 from south of the George Washington Memorial Parkway in Fairfax County, Virginia, including replacement of the American Legion Bridge over the Potomac River, to west of MD 5 and along I-270 from I-495 to north of I-370, including the east and west I-270 spurs in Montgomery and Prince George's Counties, Maryland. The Preferred Alternative, Alternative 9 - Phase 1 South (shown in **dark blue** in **Figure 1-1**), includes build improvements within the limits of Phase 1 South only. There is no action, or no improvements included at this time on I-495 east of the I-270 east spur to MD 5 (shown in **light blue** in **Figure 1-1**). While the Preferred Alternative does not include improvements to the remaining parts of I-495 within the scope of the Study area, future improvements on these remaining parts of the system may still be needed.

1.3 Study Purpose and Need

The Study Purpose and Need discussion remains consistent with Section 1.3 of the Type I Noise Technical Report prepared for the DEIS.

1.4 Alternatives Evaluated

The Alternatives Evaluated in the DEIS are described in Section 1.4 of the Type I Noise Technical Report prepared for the DEIS. This Addendum focuses on the Preferred Alternative.

1.5 Preferred Alternative

Alternative 9 - Phase 1 South has been identified as the Preferred Alternative and includes a two-lane, HOT managed lanes network on I-495 and I-270 (**Figure 1-2**). On I-495, the Preferred Alternative consists of adding two, HOT managed lanes in each direction from the George Washington Memorial Parkway to east of MD 187. On I-270, the Preferred Alternative consists of converting the one existing HOV lane in each direction to a HOT managed lane and adding one HOT managed lane in each direction on I-270 from I-495 to north of I-370 and on the I-270 East and West Spurs. There is no action, or no improvements included at this time on I-495 east of the I-270 east spur. Along I-270, the existing collector-distributor (C-D) lanes from Montrose Road to I-370 would be removed as part of the proposed improvements. The managed lanes would be separated from the general purpose lanes using pylons placed within a four-foot wide buffer. Transit buses and HOV 3+ vehicles would be permitted to use the managed lanes at no cost.

The preliminary, estimated capital cost for the Preferred Alternative ranges between \$3.0 and \$3.5 Billion. This estimate includes costs for construction, property acquisition, and environmental mitigation.

Figure 1-1: I-495 & I-270 Managed Lanes Study Corridors – Updated Phased Delivery Approach

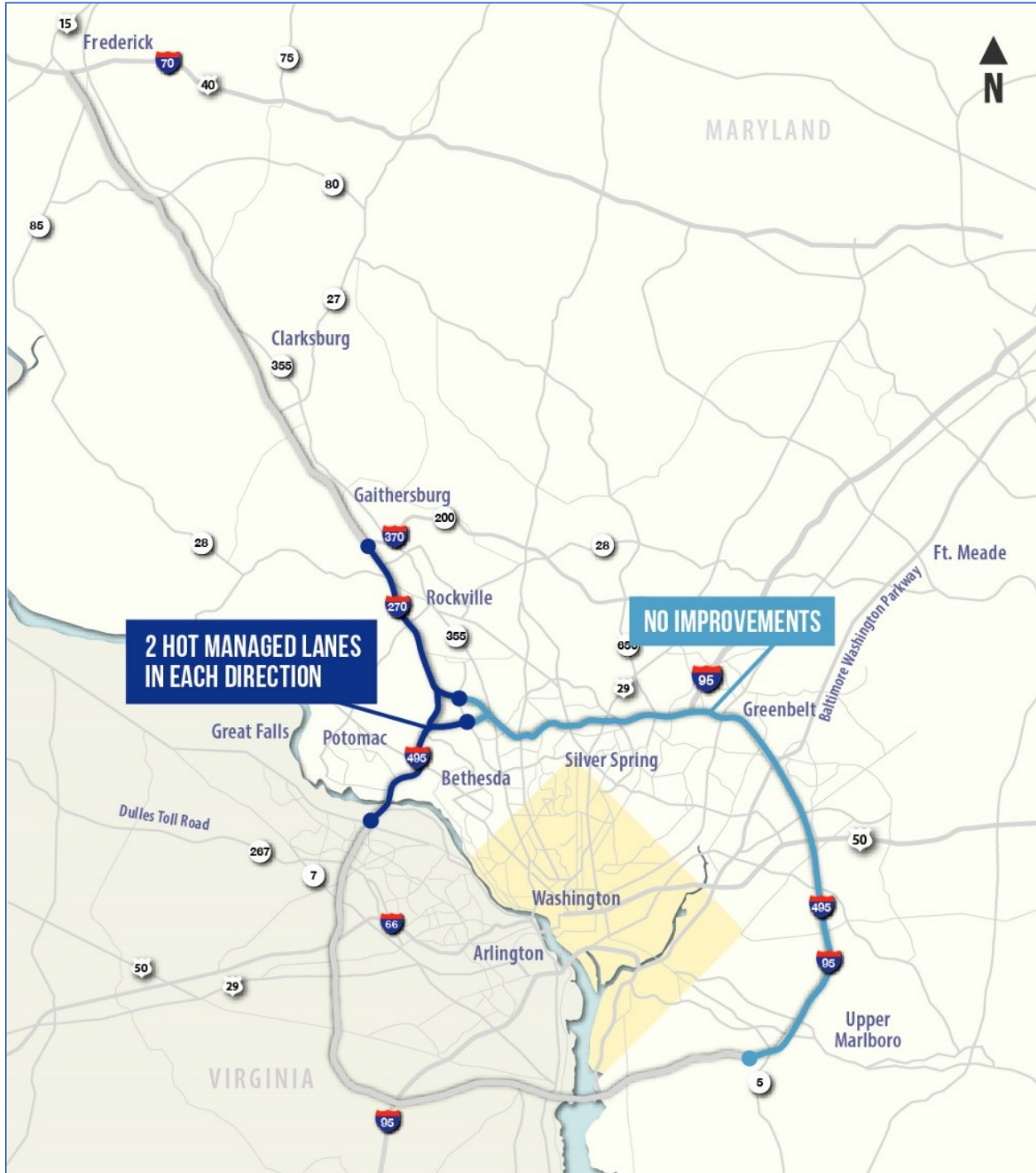
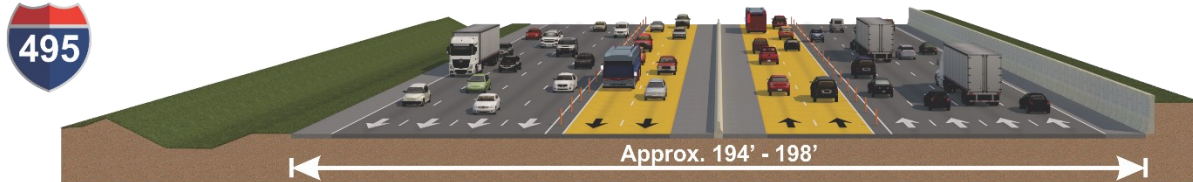
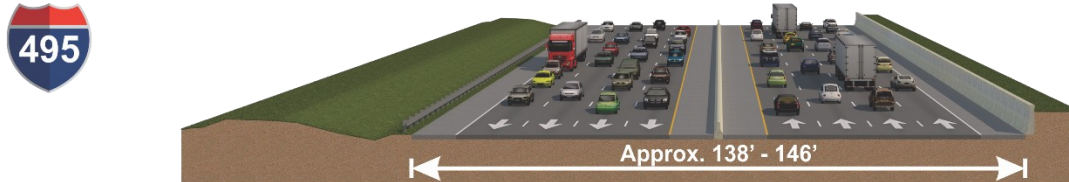


Figure 1-2: Alternative 9 – Phase 1 South Typical Sections (HOT Managed Lanes Shown in Yellow)

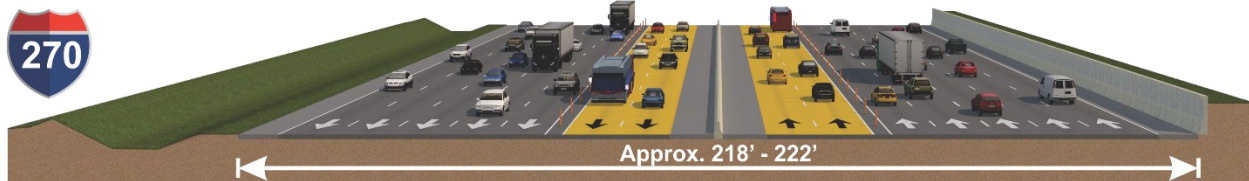
I-495 from the George Washington Memorial Parkway to east of MD 187



I-495 from east of MD 187 to west of MD 5



I-270



1.6 Highway Noise Fundamentals

The highway noise fundamentals discussion remains consistent with Section 1.5 of the Noise Technical Report prepared for the DEIS.

1.7 Noise Abatement Criteria

The Noise Abatement Criteria (NAC) discussion remains consistent with Section 1.6 of the Noise Technical Report prepared for the DEIS.

1.8 Noise Technical Analysis Approach

The background described in the Noise Technical Analysis Approach remains consistent with Section 1.7 of the Noise Technical Report prepared for the DEIS. This Addendum presents the results of the Noise Technical Analysis for the Preferred Alternative, dividing the study area into 16 areas, beginning from the western/southern study boundary of I-495 in Virginia to I-495 in Maryland, to the two spur connections of I-495 with I-270, then to the northern boundary of I-270. I-495, I-270, and George Washington Parkway are the dominant highway noise sources for all noise-sensitive areas (NSAs) within the study limits [VDOT uses the term Common Noise Environment (CNE); however, for this summary, CNEs will be referred to as NSAs].

The MLS study area overlaps with VDOT's I-495 Express Lanes Northern Extension Study between the Potomac River and Live Oak Drive. For the Maryland portion of the study area MDOT SHA's *Highway Noise Abatement Planning and Engineering Guidelines* (April 2020) was followed, and for the Virginia portion of the study area Virginia Department of Transportation's (VDOT) *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018) was followed.

2 MEASUREMENTS AND TNM MODEL VALIDATION

2.1 Introduction

This section separates the different land uses within the study limits into noise sensitive and non-noise sensitive areas, discusses the noise measurements that were collected for the Study, and documents the validation results of the noise prediction modeling. Generally, land use areas that fall within 500 feet of the edge of the proposed roadway have been identified within each NSA and the TNM model has been validated to this distance. Appendix A of the Type I Noise Technical Analysis Report prepared for the DEIS includes information on the input used for the TNM model validation, impact analysis and barrier analysis. Additional information prepared after the DEIS was published includes additional ramp traffic and traffic associated with direct access points and exchange ramps. This information is included in Appendix A of this Addendum.

2.2 Land Uses

The areas of different land use have been combined into a single NSA since they are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. Additionally, grouping them together assists in evaluating mitigation, as one barrier would be analyzed for the NSA, and not just each land use. A description of each NSA is listed below. Any distance references given are relative to the edge of the existing near roadway shoulder, unless otherwise noted. The descriptions have been updated since the publication of the DEIS and have been reorganized based upon the 16 Areas identified for the study corridor for the Preferred Alternative.

2.2.1 Noise-Sensitive Areas

Residential NSAs include single-family residences, single-family attached residences (townhouses), and multi-family residences (condominiums and apartments), located in neighborhoods adjacent to I-495 and I-270. Non-residential NSAs include recreation areas, playgrounds, active sports areas, parks, schools, places of worship, motels, hotels, libraries, and hospitals.

Following is the numbering approach used for the NSAs:

- NSAs VA-xx are in located in Virginia.
- NSAs 1-xx are presently not protected by a noise barrier.
- NSAs 2-xx have existing noise barriers designed prior to 1995.
- NSAs 3-xx have existing noise barriers designed after 1995.
- NSAs 4-xx are areas that are non-residential areas that are noise sensitive land uses.

- NSAs 5-xx are located along I-270, including the I-270 spurs.

Following is a description of each NSA, organized by Area.

A. Area 1: I-495 west side, south of George Washington Parkway

NSA VA-01

This NSA is located west of the southbound lanes of I-495, between the George Washington Memorial Parkway and the grade separation at Live Oak Drive over I-495. This area consists of recreational uses, including Scott's Run Nature Preserve and the Langley Swim and Tennis Club, as well as residences along Live Oak Drive. Trails at Scott's Run Nature Preserve within this NSA include sections of the Potomac Heritage Trail, the Laurel Ridge Trail, the Oak Trail, and some unnamed connector trails within the park boundary (Fairfax County, 2015). The trails at Scott's Run are maintained by Fairfax County Park Authority (Fairfax County, 2019). Receptors do not have direct line of sight with I-495 and are generally at least 10 feet higher in elevation than the interstate mainline. The dominant noise source is traffic from I-495.

Noise abatement is provided to the community by an existing noise barrier designed prior to 1995. The existing noise barrier is approximately 1,335 feet long and 13 feet high on average.

NSA VA-03

This NSA is located east of northbound lanes of I-495, beginning at the grade separation at Live Oak Drive over I-495 and extending along the I-495 North on-ramp to eastbound George Washington Memorial Parkway. This area includes residences located along Lupine Lane, Wemberly Way, Lawton Street, Butternut Court, River Oaks Drive, and Arbor Lane, and recreational uses associated with the Dead Run Trail at Turkey Run Park (managed by the National Park Service (NPS)). Receptors are generally at least +/- 20 feet in elevation relative to the interstate mainline. The dominant noise source is traffic from I-495 and George Washington Memorial Parkway.

Noise abatement is provided to the community by an existing noise barrier designed prior to 1995. The existing noise barrier is approximately 2,666 feet long and 20 feet high on average.

B. Area 2: I-495 west side, between George Washington Parkway and Clara Barton Parkway

NSA VA-02

This NSA is located west of the southbound lanes of I-495, between the American Legion Memorial Bridge and the George Washington Memorial Parkway Interchange. This area consists of residences along Live Oak Drive, Rivercrest Drive, Green Oak Drive, and recreational use associated with the Potomac Heritage Trail. Receptors generally do not have direct line of sight with I-495 and are generally at least 20 to 90 feet higher in elevation relative to the interstate mainline. The dominant noise source is traffic from I-495 and George Washington Memorial Parkway.

NSA VA-04

This NSA is located east of the northbound lanes of I-495 adjacent to the American Legion Memorial Bridge, and north of George Washington Memorial Parkway. This area consists of recreational uses associated with the Potomac Heritage Trail, and Dead Run Trail at Turkey Run Park (managed by the NPS). Receptors generally do not have direct line of sight with I-495 and are generally at least 70 feet lower in

elevation than the adjacent highway. The dominant noise source is traffic from I-495 and George Washington Memorial Parkway.

C. Area 3: I-495 west side, between Clara Barton Parkway and MD 190

NSA 1-01

This area represents single-family residences of the Glengarry community along MacArthur Boulevard, Eggert Drive, and Tammy Court. A short developer barrier protects the northern edge of this community. The area is along the outer loop of I-495 from Clara Barton Parkway to Persimmon Tree Road. The residential receptors are between 130 feet and 930 feet from the edge of the southbound I-495 shoulder. A portion of the C&O Canal Towpath is included in this NSA. One hole at the Congressional Country Club golf course runs adjacent to I-495.

NSA 1-02

This area represents single-family residences along Carlynn Drive, River Rock Terrace, and Carlynn Court of the Congressional Country Club Estates neighborhood. The receptors are 90 feet to 680 feet from the edge of the northbound I-495 shoulder. The area is along the inner loop of I-495 from MacArthur Boulevard to Persimmon Tree Road. A portion of the C&O Canal Towpath is included in this NSA. This NSA is not presently protected by a noise barrier.

NSA 1-04

This area represents single-family residences, a local park, a trail, and a Section 4(f) property (the Moses Hall and Cemetery). Residences in the Evergreen neighborhood are located along Tomlinson Avenue, Osage Lane, and Cypress Grove Lane. The receptors are 110 feet to 1,100 feet from the edge of the northbound I-495 shoulder. The area is along the inner loop of I-495 from Persimmon Tree Road to Seven Locks Road. Seven Locks Local Park is located off of Seven Locks Road, approximately 780 feet from I-495. Outdoor activities at the park include tennis courts, a soccer field, playground, basketball courts, and two swimming pools. A portion of Cabin John Trail is included in this NSA. This community is not presently protected by a noise barrier.

NSA 1-05

This area represents single-family residences along Royal Dominion Drive, Pepperell Drive, and Pepperell Court of the Al Marah neighborhood. The receptors are 210 feet to 1,010 feet from the edge of the northbound I-495 shoulder. The area is along the inner loop of I-495 from Cabin John Parkway to River Road. This community is not presently protected by a noise barrier.

A portion of Booze Creek Stream Valley Park is included in this NSA; however, there are no noise sensitive uses within this park. Consequently, it requires no further consideration.

NSA 1-03

This area represents single-family residences along Persimmon Tree Lane, Comanche Court, Stone Trail Drive, and Hamilton Spring Road of the Carderock Springs neighborhood, and the Carderock Springs Elementary School. The area is along the outer loop of I-495 from Persimmon Tree Road to approximately 2,200 feet east of Persimmon Tree Road. Outdoor activities at the elementary school include a ball field, several playgrounds, and basketball courts, with the nearest located approximately 160 feet from the outer loop of I-495. The outdoor land uses are all located on the highway side of the school and are

therefore not shielded from highway noise by the building. The receptors are 80 feet to 750 feet from the edge of the southbound I-495 shoulder. This community is not presently protected by a noise barrier.

NSA 2-01

This area represents single-family residences, a church, and a trail. Residences of the Carderock Springs neighborhood are located along Hamilton Spring Road, Thornley Court, and Seven Locks Road. The receptors are 200 feet to 1,000 feet from the edge of the southbound I-495 shoulder. The area is along the outer loop of I-495 from 1,600 feet west of Seven Locks Road to Seven Locks Road.

Gibson Grove A.M.E. Zion Church, which has no frequent exterior use, is located along Seven Locks Road, approximately 150 feet from I-495. The building is of wooden construction with no apparent air conditioning. As a result, the structure is expected to have a building noise reduction factor of 10 dB(A) when assessing *interior* impacts. A portion of Cabin John Trail is included in this NSA.

Noise abatement is provided to the community by an existing noise barrier (#15143N0/ #15234N0) constructed in 1993. The existing noise barrier is approximately 1,476 feet long and 16 feet high on average.

D. Area 4: I-495 west side, between MD 190 and I-270 west spur

NSA 1-06

This area represents single-family residences and townhouses of the Seven Locks Hills neighborhood. The residences are located along Seven Locks Road, Old Seven Locks Road, River Quarry Place, and Quarry Manor Terrace and are 210 feet to 1,110 feet from the edge of the southbound I-495 shoulder. The area is along the outer loop of I-495 from River Road to approximately 1,300 feet north of River Road.

Noise abatement is partially provided to the community by an existing noise barrier (#15393N0) constructed in 2004. The existing noise barrier [partially protecting both NSA 1-06 and fully protecting NSA 3-01] is approximately 6,020 feet long with an average height of 27 feet. In some locations the existing wall approaches heights in excess of 34 feet.

NSA 3-01

This area represents single-family residences in the Seven Locks Hills, Charred Oak Estates, Burning Tree Estates, and Rose Hill Estates neighborhoods. The residences are located along Seven Locks Road, Lonesome Pine Lane, Honeybee Lane, Cindy Lane, Honeybee Court, Earl Court, Green Twig Road, Groton Road, Charred Oak Drive, Dwight Drive, Quintana Drive, English Way, Carteret Road, Rosehill Drive, Shadywood Road, Barnum Road, Glennon Drive, Seddon Road, and Bradley Boulevard and are 40 feet to 1,070 feet from the edge of the southbound I-495 shoulder. The area is along the outer loop of I-495 from 1,300 feet north of River Road to Bradley Boulevard.

Noise abatement is provided to the community by an existing noise barrier (#15393N0) constructed in 2004. The existing noise barrier [partially protecting NSA 1-06 and fully protecting NSA 3-01] is approximately 6,020 feet long wall with an average height of 27 feet. In some locations the existing wall approaches heights in excess of 34 feet.

NSA 1-38

This area represents the Fox Hill senior living condominium community located between the ramp from River Road to the inner loop of I-495 to Burdette Road. The receptors are 750 feet to 1,500 feet from the edge of the northbound I-495 shoulder. The complex is approximately five stories with balconies facing I-495 and the ramp. The area is along the inner loop of I-495 from River Road to approximately 800 feet north of River Road. The area is not presently protected by a noise barrier.

NSA 4-01

This area represents the Burning Tree Country Club and is along the inner loop of I-495 from 800 feet north of River Road to approximately 2,600 feet north of River Road. Five of the holes at the golf course run adjacent to I-495.

Noise abatement is partially provided to this recreation facility in addition to NSA 2-02 by an existing noise barrier (#15142N0) constructed in 1994, measuring approximately 4,488 feet in length and 20 feet high on average.

NSA 2-02

This area represents single-family residences in the Arrowood neighborhood along Arrowood Court, Arrowood Road, Arrowood Terrace, Kittery Lane, and Redwood Avenue. The receptors are 110 feet to 1,140 feet from the edge of the northbound I-495 shoulder. The area is along the inner loop of I-495 from Burning Tree Country Club to Bradley Boulevard. A portion of the Burning Tree Country Club is also located in this NSA.

Noise abatement is provided to the community by an existing noise barrier (#15142N0) constructed in 1994. The existing noise barrier is approximately 4,488 feet long and 20 feet high on average.

E. Area 5: I-495 top side, between I-270 west spur and MD 187

NSA 3-02

This area represents single-family residences in the Bradley Manor and Longwood neighborhoods along Armat Drive, Longwood Drive, Brooke Drive, and Rainswood Court. The receptors are 190 feet to 1,220 feet from the edge of the northbound I-495 shoulder. The area is along the inner loop of I-495 from Bradley Boulevard to Greentree Road.

Noise abatement is provided to the community by an existing noise barrier (#15352N0) constructed in 2002, measuring approximately 2,608 feet in length and 26 feet in average height.

NSA 3-04

This area represents single-family residences in the Bradley Manor and Tusculum neighborhoods along Greentree Road, Longwood Drive, Newbold Place, Newbold Drive, Newbold Court, and Michaels Drive. The receptors are 150 feet to 1,370 feet from the edge of the eastbound I-495 shoulder. The area is along the inner loop of I-495 from Greentree Road to approximately 800 feet west of Fernwood Road.

Noise abatement is provided to the community by an existing noise barrier (#15351N0) constructed in 2002. The existing noise barrier, partially protecting part of NSA 1-08 and fully protecting NSA 3-04, measures approximately 2,496 feet in length and 20 feet in average height.

NSA 1-08

This area represents single-family residences and a private swim club in the Tusculum neighborhood along Michaels Court, Michaels Drive, Burning Tree Road, and Fernwood Road. Outdoor uses at the private swim club, Old Georgetown Club Inc., include a swimming pool and tennis courts. The receptors are 130 feet to 990 feet from the edge of the eastbound I-495 shoulder. The area is along the inner loop of I-495 from 850 feet west of Fernwood Road to Fernwood Road.

Noise abatement is partially provided to the NSA by an existing noise barrier (#15351N0) constructed in 2002. The existing noise barrier, partially protecting part of NSA 1-08 and fully protecting NSA 3-04, measures approximately 2,496 feet in length and 20 feet in average height.

NSA 2-03

This area represents single-family residences in the Stratton Woods neighborhood along Renita Lane, Corkran Lane, Rutley Road, Renita Lane, and Tusculum Road. The receptors are 140 feet to 1,110 feet from the edge of the westbound I-495 shoulder. The area is along the outer loop of I-495 from 1,500 feet east of Greentree Road to Fernwood Road.

Noise abatement is provided to the Stratton Woods neighborhood by an existing noise barrier (#15157N0) constructed in 1996. The existing noise barrier is approximately 1,674 feet long and 17 feet high on average.

Additionally, a new residential development, Amalyn Bethesda, is proposed for the area west of the Stratton Woods neighborhood, at the former WMAL property. The developer is coordinating with MDOT SHA regarding the potential to construct a noise barrier on SHA property along I-495. Additional information about this development and barrier will be included in the Final EIS.

NSA 2-04

This area represents single-family residences in the Fernwood neighborhood along Rockhurst Road, Brixton Lane, Holmhurst Road, Stoneham Road, Stoneham Terrace, Stoneham Court, Montauk Avenue, De Paul Drive, Ashburton Lane, Belhaven Road, Marquette Drive, and Marquette Terrace. The receptors are 110 feet to 980 feet from the edge of the westbound I-495 shoulder. The area is along the outer loop of I-495 from Fernwood Road to Old Georgetown Road (MD 187).

Noise abatement is provided to the community by an existing noise barrier (#15156N0) constructed in 1997. The existing noise barrier is approximately 3,740 feet long and 21 feet high on average.

NSA 2-05

This area represents single-family residences in the Ashburton neighborhood along Fernwood Road, Earlham Drive, Singleton Drive, Singleton Court, Singleton Place, Starmont Road, Hollins Drive, Wadsworth Drive, Beck Court, Bulls Run Parkway, Kingsford Road, Kingsford Place, and Ryland Drive. The receptors are 90 feet to 960 feet from the edge of the eastbound I-495 shoulder. The area is along the inner loop of I-495 from Fernwood Road to Old Georgetown Road (MD 187).

Noise abatement is provided to the community by an existing noise barrier (#15154N0) constructed in 1996. The existing noise barrier is approximately 4,502 feet long and 21 feet high on average.

F. Area 6: I-495 top side, between MD 187 and I-270 east spur

NSA 2-06

This area represents single-family residences in the Alta Vista Gardens neighborhood along Ipswich Road, Jarvis Lane, and Broad Street. The receptors are 180 feet to 830 feet from the edge of the westbound I-495 shoulder. The area is along the outer loop of I-495 from Old Georgetown Road (MD 187) to approximately 1,300 feet east of Old Georgetown Road.

Noise abatement is provided to the community by an existing noise barrier (#15155N0) constructed in 1998. The existing noise barrier, partially protecting NSA 1-09 and fully protecting NSA 2-06, is approximately 1,530 feet long and 22 feet high on average.

NSA 1-09A

This area represents single-family residences in the North Bethesda Grove neighborhood along Kingswood Road, Raleigh Tavern Court, Dickens Avenue, Edward Avenue, and Fleming Avenue. The residential receptors are 120 feet to 630 feet from the edge of the westbound I-495 shoulder. The area is along the outer loop of I-495 from approximately 1,300 feet east of Old Georgetown Road to Fleming Local Park.

Noise abatement is partially provided to the community by an existing noise barrier (#15155N0) constructed in 1998. The existing noise barrier, partially protecting NSA 1-09 and fully protecting NSA 2-06, is approximately 1,530 feet long and 22 feet high on average.

NSA 1-10A

This area represents residential areas, academic and religious facilities, and a hotel. The area is along the inner loop of I-495 from Old Georgetown Road to I-270. An assisted-living facility, Maplewood Park Place, is located east of Old Georgetown Road, approximately 170 feet from I-495. Benches, outdoor seating areas, and a garden are located between the building and I-495. To the east of this facility, townhouses are located south of Maplewood Park Drive, between 200 and 500 feet from the edge of the eastbound I-495 shoulder. A short developer barrier protects a portion of this facility.

South of Maplewood Park Place and the townhouses is a group of academic and religious facilities, which include the St. Jane Frances de Chantal Catholic Church, St. Jane de Chantal School, and Rochambeau French International School. Outdoor uses include walking paths, an athletic field and track, and sitting areas, located between 500 and 850 feet from the inner loop of I-495.

The Whitley Park Community is located approximately 150 feet from I-495. The portion of the community within this NSA includes townhouses and a pool that is located approximately 170 feet from I-495. A portion of the Bethesda Trolley Trail is included in this NSA.

Aside from the short developer barrier in front of the eastern edge of Maplewood Park Place, this NSA is not presently protected by a noise barrier.

G. Area 7: I-270 west spur, between I-495 and Democracy Boulevard

NSA 5-36

This area represents single-family residences in the Bradley Manor neighborhood. The receptors are 80 feet to 950 feet from the edge of the westbound I-495 shoulder. The area is along the outer loop of I-495

along the west spur of I-270. The Wolfe's Subdivision community contains single-family residences along Barnett Road. The Academy Woods community contains single-family residences located along Grubby Thicket Way. The nearest of these homes is located approximately 100 feet from the shoulder of the northbound I-270 Spur lanes. The Stratton Commons community is located along Greentree Road, Derbyshire Lane and Surreywood Lane. The residences include both single-family and townhouses. The nearest of these single-family homes and townhouses is located approximately 100 feet from the shoulder of the northbound I-270 Spur lanes.

Noise abatement is provided to a portion of the community by an existing noise barrier (#15353N0), constructed in 2002. The existing noise barrier is approximately 1,488 feet long and 19 feet high on average.

NSA 5-37A

Located south of Democracy Boulevard, the Wildwood Hills community consists of single family houses located along Woodhill Road, Bells Mill Road, and Thomas Branch Drive, with the nearest of these residences located approximately 250 feet from the southbound spur of I-270. Noise abatement is provided to the community by an existing Type I noise barrier (#15363N0), constructed in 2003. The existing noise barrier is approximately 1,584 feet long and 21 feet high on average.

NSA 5-37B

The area is along the outer loop of I-495 from Bradley Boulevard/MD 191 to the north end of the Bethesda Country Club. This area represents townhouses (the Bethesda Overlook), tennis courts and the golf course associated with the Bethesda Country Club. The closest receptor at the Bethesda Overlook community is located 100 feet from the edge of the southbound I-495 shoulder. This area is not presently protected by a noise barrier.

H. Area 8: I-270 west spur, between Democracy Boulevard and Westlake Terrace

NSA 5-32A

This area includes a hotel and office buildings. The Bethesda Marriott Suites hotel has a jogging/fitness trail along the I-270 Spur on-ramp from Democracy Boulevard and an outdoor pool that is partially shielded by the hotel building and parking garage. The office buildings do not have any outdoor uses.

I. Area 9: I-270 east spur, between I-495 and MD 187

NSA 5-33A

This area includes residential uses, as well as recreational uses and a church. The Saint Mark Presbyterian Church is located at 10701 Old Georgetown Road. The church contains a playground at the southern side of the main building, which is primarily used on Sundays (as verified by the church coordinator). On the north side of the building, there is a memorial garden that contains two benches. This area receives some shielding from noise along I-270 by the church buildings.

The Cloisters community (platted as Timberlawn) consists of townhouses and single-family homes located along Valerian Lane and Lady Slipper Terrace. The nearest buildings are approximately 170 feet from the northbound I-270 shoulder. The two-car brick garages are situated directly behind the townhouses and act as a barrier for the rear yards, providing shielding from I-270 traffic noise. Two single-family residences

immediately north of Lady Slipper Terrace are behind an 8-foot berm. Two tennis courts are located at the southern end of the community approximately 120 feet from the highway at their nearest point.

The Timberlawn South at North Bethesda community consists of townhouses located along Pine Haven Terrace and Mist Haven Terrace. The properties closest to I-270 all contain decks. The nearest of these homes are located approximately 210 feet from the northbound I-270 shoulder with the rear of the properties being roughly 180 feet away. The southernmost buildings sit 20 feet above the highway and the northernmost buildings sit roughly 10 feet above the highway.

The Timberlawn Crescent Apartments are located along Luxemburg Street. The three-story apartment buildings have balconies and patios. The nearest buildings are approximately 200 feet from the northbound I-270 shoulder. The southernmost buildings sit 10 feet below the highway and the northernmost buildings sit roughly 10 feet above the highway.

The Brighton Gardens of Tuckerman Lane retirement facility includes two outdoor use areas: the front entrance seating area and the outdoor patio. However, both of these areas are shielded from I-270 by the multi-story masonry building. The rear entrance area is not considered a use of sufficient frequency or duration. The latched windows are (at least) single glazed and appear to be primarily closed for air-conditioning. As a result, the structure is expected to have a minimum building noise reduction factor of 25 dB(A) when assessing *interior* impacts. The facility is located approximately 185 feet from the I-270 northbound shoulder and sits behind a wooded berm of varying height.

The Grosvenor Park Townhouse Condominium community is located along Englishman Drive. A portion of the community is elevated 10 to 12 feet above the highway and the nearest residences are approximately 190 feet from the northbound shoulder. Most of the backyards have wooden privacy fences and elevated decks. A portion of the Bethesda Trolley Trail is included in this NSA.

NSA 5-34A

Wildwood Manor and Wildwood Knolls include single-family residences along Berkshire Drive, Aubinoe Farm Drive, Farnham Drive, Rudyard Drive, Rossmore Drive, St. Albans Drive, Cheshire Terrace, and Fleming Avenue. Noise abatement is provided to the community by an existing Type I noise barrier (#15356N0), constructed in 2003. The existing noise barrier is approximately 3,320 feet long and 21 feet high on average.

The portion of the Grosvenor Woods community located along Snow Point Drive is located at the border of this NSA. The community contains single-family residences; a strip of undeveloped, wooded land sits between the residences and I-270, which is part of the subdivision's open space maintained by the homeowner's association. The nearest of these homes is located approximately 200 feet from the shoulder of the southbound I-270 lanes. A portion of the Bethesda Trolley Trail is included in this NSA.

J. Area 10: I-270 west and east spurs, between Y-split and Westlake Terrace and MD 187

NSA 5-32C

This area includes an office building without any outdoor uses. Consequently, this NSA requires no further consideration.

NSA 5-32B

Democracy Center consists of three commercial office buildings owned by Democracy Associates. There are a few paved walking paths in the northern region of the property and a basketball court and playground, located approximately 240 feet from I-270 Spur. Two Lockheed Martin office buildings are located at 6777 and 6801 Rockledge Drive. The area sits between both the I-270 Spur and I-270. There is a paved walking path in the northwest region of the property. At the nearest points, the path is approximately 135 feet from the I-270 Spur and 180 feet from I-270.

Two office buildings are located within the Rockledge Centre. There are two outdoor courtyards on the highway side with picnic tables. The extent of use is unknown at this time; however, both courtyards are depressed relative to the surrounding parking lot/garages. Therefore, they are shielded from the I-270 highway noise. Consequently, the area requires no further consideration.

The Montgomery Apartments complex is located along Rock Forrest Drive. Parking garages for the tenants have been constructed between the apartment buildings and I-270, and provide shielding from traffic noise. There is a pool area in the middle of the apartment complex, which currently receives abatement from a barrier put in place by the developer. Each apartment building contains a courtyard area with benches, which receives abatement in all directions from highway noise by the buildings. Consequently, this area requires no further consideration.

NSA 5-31

This area includes residential and recreational uses. The Oaks at North Bethesda community consists of single-family residences. An existing developer-brick noise barrier ties into the existing Type I screen wall (#15373N0), constructed in 2002. A paved path, located behind the barrier, begins on the east side of this area and extends along the south side of the community.

The eastern portion of the Windermere community (platted as Heritage Walk) contains single-family residences along Windermere Circle and Charnwood Lane. The nearest rear yards are approximately 70 feet from the northbound I-270 shoulder. The recreational uses associated with the Windermere Community Pool and Sam Suls Recreational Center include a playground, volleyball court, and tennis court.

NSA 5-30

This area represents the western portion of the Windermere community along Daybreak Court. The area includes a row of six single-family detached homes east of I-270 and south of Tuckerman Lane. There are woods and a wooden fence in-between the houses and I-270, with the nearest building less than 100 feet from the road. Additional single family residences are located along Earls Gate Lane, Earls Gate Way, Lancelot Drive, and Roundtable Court. The nearest rear yards are approximately 75 feet from the northbound I-270 shoulder.

Noise abatement is provided to the community by an existing Type I screen wall (#15373N0) constructed in 2002.

K. Area 11: I-270 mainline, between Y-split and Montrose Road

NSA 5-29

This area includes residential communities and park land. The Old Farm and Montrose Woods communities include single-family detached homes located east of I-270 in-between Tuckerman Lane and Old Stage Road, south of Montrose Road. The buildings are located along several local roads and often are situated around cul-de-sacs.

Noise abatement is provided to the community by an existing Type I noise barrier (#15121N0) constructed in 1991. The existing noise barrier is approximately 4,932 feet long and 19 feet high on average.

A portion of the Cabin John Stream Valley Park is located east of I-270 and south of Montrose Road. The area is covered entirely by trees and has no trails or recreational areas. There are no outdoor use areas associated with this area. Consequently, it requires no further consideration.

NSA 5-28

This area includes residential and recreational land uses. Cabin John Regional Park, west of I-270, consists of a trail, running parallel to I-270, and the Robert C. McDonnell Campground, which has seven campsites. The area is covered by trees, and the campground is accessed by an entrance along Tuckerman Lane approximately 0.5 miles west of I-270. The Watkins Glen community consists of the townhomes along Greenleaf Avenue, which is adjacent to the on-ramp from eastbound Montrose Road to the southbound I-270 C-D lanes.

L. Area 12: I-270 mainline, between Montrose Road and MD 189

NSA 5-27

This area includes residences, medical facilities, offices, a warehouse building, and a restaurant. Single-family residences are located to the east of Tower Oaks Boulevard, approximately 900 feet from northbound I-270.

Medical facilities are located to the west of Tower Oaks Boulevard, and further north of the residences, to the east of Tower Oaks Boulevard. The building is of masonry construction with single glazed windows that are closed for air-conditioning. As a result, the structure is expected to have a building noise reduction factor of 25 dB(A) when assessing *interior* impacts. Due to the high noise criteria and the distance separation of approximately 800 feet to I-270, the medical facilities require no further consideration.

One office building, Lafayette Federal Credit Union, located east of I-270, bounded between Tower Oaks Boulevard and the ramp from Montrose Road onto northbound I-270 was evaluated for outdoor uses. There is an 80-foot wide section of woods and a group of picnic tables in-between the ramp and the office building. Given the type of tables, it is clear that they could be relocated easily to other areas of the property if an impact was predicted to occur. As a result, MDOT SHA considers this area to have no outdoor use areas of sufficient frequency, duration, or permanence. Consequently, it requires no further consideration.

The GEICO Materials Management Center, which consists of a warehouse building and parking lot, is located east of I-270 on the northeast side of Tower Oaks Boulevard. There are picnic tables located at the building entrance closest to Tower Oaks Boulevard. Given the type of tables observed in the field, it is

clear that they could be relocated easily to other areas of the property if an impact was predicted to occur. As a result, MDOT SHA considers this area to have no outdoor use areas of sufficient frequency, duration, or permanence. Consequently, it requires no further consideration.

Another office building and a restaurant, located along Tower Oaks Boulevard, contains EMC², a software company were evaluated for outdoor uses. The buildings' elevations are approximately 15-25 feet below Tower Oaks Boulevard, as the side slope from the road is very steep. There are no outdoor uses located within this area. Consequently, it requires no further consideration.

NSA 5-26

This area contains commercial, retail, medical and office space. There are no outdoor noise sensitive uses in this NSA. An office building west of I-270 has a picnic table; however, given the type of table observed in the field, it is clear that it could be relocated easily to other areas of the property if an impact occurred from any proposed build condition. As a result, MDOT SHA considers this area to have no outdoor use areas of sufficient frequency, duration, or permanence. Consequently, it requires no further consideration.

The retail area houses a Harris Teeter store and restaurants with outdoor seating. The outdoor seating is shielded from roadway noise by the building. There is also a separate building utilized by Washington Radiology. There are no unshielded outdoor uses associated with this area. Consequently, it requires no further consideration.

NSA 5-25

This area represents the Montgomery County Detention Center west of I-270. As part of a Category D Land Use, the interior sound levels caused by traffic within the Center must be 51 dB(A) or less. It is estimated the windows cause a 25 dB(A) reduction, thus the sound levels just outside of the building would need to be 76 dB(A). The outdoor activity area is shielded from roadway noise by several large buildings. Due to the high noise criteria and the distance separation of approximately 200 feet to I-270, it requires no further consideration. The outdoor field associated with the Center is shielded by the Center itself, thus the field also requires no further consideration.

NSA 5-24

This area represents the Orchard Ridge community, which includes single-family detached homes located west of Seven Locks Road and west of I-270 along Cliff Hill Court, Big Tree Court, Cliffe Hill Way, and Willowleaf Way.

The Montgomery County Police Rockville Station is located between the residential community and I-270. There are no outdoor use areas associated with this building. Consequently, it requires no further consideration.

NSA 5-23

This area includes an office building, nursing center and residential community. The Tower Building is located east of I-270 and north of Wootton Parkway. There are no outdoor use areas associated with this office building. Consequently, it requires no further consideration.

The Potomac Valley Nursing and Wellness Center is located at 1235 Potomac Valley Rd. The area is shielded from I-270 by a 350-foot section of trees and a retaining wall (#15250R0) that varies in height from 10-18 feet. There are tables and chairs located outside in front of the building. The Markwood Subdivision includes single-family detached houses located along Marcus Court east of I-270 and south of MD 189.

Noise abatement is provided to the community by an existing Type I noise barrier (#15122N0) constructed in 1989. The existing noise barrier is approximately 636 feet long and 19 feet high on average.

M. Area 13: I-270 mainline, between MD 189 and MD 28

NSA 5-22

This area represents the Julius West Middle School located at 651 Great Falls Road (MD 189). The area includes the school, ballfield, tennis courts, and basketball courts. There is a 15-foot high berm and a strip of woods located in between the ball field area and I-270.

NSA 5-19

This NSA consists of the Rose Hill Falls residential community, which also has recreational use areas. A wooded open space contains two paved walking paths, the closest of which is approximately 130 feet from I-270. Other recreational uses include a basketball court, tennis court, playground, and another walking trail. The closest use is 430 feet from I-270. The Rose Hill Falls community along Winding Rose Drive and Blue Hosta Way, contains three-story townhomes. Most of the residences have an elevated deck off the rear exit. The community is situated behind a berm varying in height between five and 15 feet, which is supported by a retaining wall on the community side.

NSA 5-18

This area includes a nursing home, a residential community and two religious facilities (one of which houses a preschool). The Rockville Nursing Home is located 60 feet from the local lanes along I-270. There are benches at the entrance to the nursing home.

The Rockville Christian Church has a large outdoor playground which is utilized weekly during their Playground Potluck and Bible Study on Wednesday evenings. A retaining wall (#15276R0), which is likely providing some shielding to the area, is situated along the northbound I-270 C-D lanes. The First Baptist Church operates the Weekday Early Education Center (W.E.E. Center) preschool, which has outdoor play areas. There is also an outdoor gathering area with benches and a basketball hoop on the church property.

The Foxboro community, which is located approximately 450 feet from the highway, includes single-family detached houses along Adclare Road east of I-270 and south of MD 28.

NSA 5-21

This area represents the Saddlebrook community, which includes single-family detached homes located along Woodsend Place, Woodsend Court, Lawngate Court, and Grovepoint Court along Watts Branch Parkway west of I-270.

Noise abatement is provided to a portion of the community by an existing Type I noise barrier (#15123N0) constructed in 1990. The existing noise barrier is approximately 4,092 feet long and 15 feet high on

average. A retaining wall (#15253R0) concentrated at the southern end of this area is situated in front of the last 270 feet of barrier along the southbound I-270 C-D lanes before following along the off-ramp to MD 189.

NSA 5-20

This NSA consists of a park and a residential community. The Fallswood community includes single-family detached homes located east and west of Watts Branch Parkway, along Fallswood Drive and Fallswood Court.

Noise abatement is provided to the community by an existing Type I noise barrier (#15123N0) constructed in 1990. The existing noise barrier is approximately 4,092 feet long and 15 feet high on average.

Rockmead Park is covered entirely by trees and has no trails or recreational areas. There are no outdoor uses associated with this area. Consequently, it requires no further consideration.

NSA 5-17

This area represents the Rockshire community, which includes townhomes located east of Watts Branch Parkway and west of I-270, just south of MD 28. The community also includes single-family detached homes located west of Watts Branch Parkway, along Lochness Court and Gerard Street.

Noise abatement is provided to the community by an existing Type I noise barrier (#15123N0) constructed in 1990. The existing noise barrier is approximately 4,092 feet long and 15 feet high on average. A retaining wall (#15320R0) concentrated at the northern end of this area is situated in front of the barrier along the southbound I-270 C-D lanes.

NSA 5-16

This area represents Woottons Mill Park. Activities present include a community garden, tennis courts, and walking trails. This area also includes the former location of the Karma Academy School, which is now an open park and a basketball court.

N. Area 14: I-270 mainline, between MD 28 and Shady Grove Road

NSA 5-15

This area consists of residences as well as three churches. Two residences within the West End Park community are located along the west side of Nelson Street. The properties are between 30 and 70 feet away from the northbound I-270 C-D on-ramp and vary between 5 and 10 feet higher than the ramp. Additional residences within the West End Park community are located along the east side of Nelson Street. The northernmost property is approximately 200 feet from the northbound I-270 C-D shoulder and two feet below the highway. The property south of Beall Avenue is approximately 340 feet from the I-270 C-D on-ramp and 15 feet higher than the ramp.

The First Church-Christ Scientist, which has no frequent exterior use, is located between Nelson Street and I-270. Two other churches, Rockville Seventh Day Adventist Church and Rockville Church of God, are located 850 feet from the I-270 C-D lane and also have no outdoor uses. All three buildings are of masonry construction with single glazed windows that are closed for air-conditioning. As a result, the structures are expected to have a building noise reduction factor of 25 dB(A) when assessing *interior* impacts.

NSA 5-13

This area includes the Woodley Gardens Park, which contains two baseball fields, tennis courts, basketball courts, a playground, picnic tables, and grills. Nearest to the highway is one of the baseball fields, which is approximately 180 feet away from the highway and 20 feet below it.

NSA 5-12

This area, east of I-270, includes retail, residences and a senior center with recreational areas. The Woodley Gardens Shopping Center includes an outdoor eating area. It is located about 190 feet away from the highway and 14 feet below it in elevation.

The Regents Square Condominium townhouses are located approximately 50 feet from the shoulder of the northbound I-270 C-D lanes. The community has a park with basketball courts and a playground. The Woodley Woods community is located further north, approximately 75 feet from the shoulder of the northbound I-270 C-D lanes.

The Rockville Senior Center is located approximately 375 feet from the shoulder of the northbound I-270 C-D lanes. There are numerous outdoor noise-sensitive uses on the property including a garden and a walking trail.

Noise abatement is provided to the community by an existing Type I noise barrier (#15124N0), constructed in 1991. The existing noise barrier is approximately 3,468 feet long and 19 feet high on average. A retaining wall (#15276R0), supporting the highway, is situated behind a portion of the barrier.

NSA 5-14

This area consists of office buildings, a hotel, and a restaurant. The Best Western PLUS Rockville Hotel & Suites is located along the west side of I-270. This building and outdoor pool is located approximately 265 feet from the outer shoulder of the southbound I-270 C-D lanes.

Benches are located outside of the restaurant; however, given that there are no tables, the area would not be classified as an area of sufficient frequency or duration. Consequently, the restaurant requires no further consideration.

Eight office buildings are located along the west side of I-270. The nearest of the office buildings is located approximately 100 feet from the southbound shoulder of I-270. There are no outdoor use areas of sufficient frequency, duration, or permanence associated with this area. Consequently, the office buildings require no further consideration.

NSA 5-11

This area, east of I-270, consists of offices, two medical facilities and an apartment building. An office building for Piccard Homes is located approximately 125 feet from the shoulder of the northbound I-270 C-D lanes. There are no outdoor use areas associated with this area. Consequently, it requires no further consideration.

A medical facility, containing the Piccard Surgery Center, is located along the east side of I-270. It has no frequent exterior use. The building appears to be of masonry construction with double glazed windows that are closed for air-conditioning. As a result, the structure is expected to have a minimum building

noise reduction factor of 35 dB(A) when assessing *interior* impacts. The facility is located approximately 100 feet from the shoulder of the northbound I-270 C-D lanes.

Two office buildings are located north of the medical facility. The first building is located approximately 175 feet from the shoulder of the northbound I-270 C-D lanes. There is a landscaped courtyard at the entrance of the building, which contains a few benches. Since the use is not of sufficient duration, it requires no further consideration. The second is an office building for ZeniMax. The ZeniMax office building is located approximately 115 feet from the shoulder of the northbound I-270 C-D lanes. There is an outdoor seating area adjacent to the building.

The Flats at Shady Grove apartment building is located approximately 100 feet from the shoulder of the northbound I-270 C-D lanes. The apartment building has an outdoor pool that is completely surrounded by the building, which shields the use area from I-270.

One office building is located north of the apartment building, approximately 140 feet from the shoulder of the northbound I-270 C-D lanes. There are two picnic benches at the entrance of the building; however, they could be relocated easily to other areas of the property if an impact occurred from any proposed build condition. As a result, MDOT SHA considers this area to have no outdoor use areas of sufficient frequency, duration, or permanence. Consequently, it requires no further consideration.

The Kaiser Permanente Shady Grove Medical Center is located along the east side of I-270, which has no frequent exterior use. The building appears to be of masonry construction with double glazed windows that are closed for air-conditioning. As a result, the structure is expected to have a minimum building noise reduction factor of 35 dB(A) when assessing *interior* impacts. The facility building, which consists of doctor's offices run by Kaiser Permanente, is located approximately 95 feet from the shoulder of the northbound I-270 C-D lanes.

NSA 5-10

This area, west of I-270, consists of offices, two hotels, and a medical facility. Three office buildings are located approximately 225 feet from the southbound shoulder of I-270. The only outdoor noise-sensitive use is located adjacent to the northernmost building (2277 Research Boulevard), which has a large courtyard with numerous benches and tables. However, the outdoor seating is shielded from roadway noise by the building. There are no unshielded outdoor uses associated with this area. Consequently, it requires no further consideration.

Further north are four additional office buildings; the nearest of which is located approximately 160 feet from the southbound shoulder of I-270. There are no outdoor use areas of sufficient frequency, duration, or permanence associated with this area. Consequently, it requires no further consideration.

Two hotels are located along the west side of I-270: the Rockville Hotel (a Ramada by Wyndham) and a Sleep Inn. Both hotels share a common outdoor pool that is located approximately 220 feet from the outer shoulder of southbound I-270.

The medical facility is located along the west side of I-270, and has no frequent exterior use. This facility is located approximately 325 feet from the southbound shoulder of I-270. The building appears to be of masonry construction with double glazed windows that are closed for air-conditioning. As a result, the

structure is expected to have a minimum building noise reduction factor of 35 dB(A) when assessing *interior* impacts.

NSA 5-09

This area, east of I-270, includes a hotel and residential development. The Sheraton Rockville Hotel is located approximately 360 feet from the shoulder of the northbound I-270 C-D lanes and 75 feet from the Redland Boulevard ramp. There are no outdoor use areas associated with this location. Consequently, it requires no further consideration.

The King Farm townhouses are located behind the hotel and north of the hotel, approximately 550 feet from the I-270 C-D lanes and 300 feet from the ramp from I-270 to Shady Grove Road. The development has an extensive paved path system with numerous benches. This outdoor area is approximately 430 feet from the outside shoulder of the northbound I-270 C-D lanes and 85 feet from the Redland Boulevard ramp.

NSA 5-08

This area consists of the apartment building of Gables Upper Rock. It is located approximately 140 feet from the adjacent Shady Grove Road interchange ramps and approximately 550 feet from the outside shoulder of the northbound I-270 C-D lanes. There is an outdoor pool area facing the highway, above the first floor parking garage, as well as other outdoor areas scattered through the complex.

O. Area 15: I-270 mainline, between Shady Grove Road and I-370

NSA 5-07

This area, west of I-270, consists of an office building, two hotels, and residences. The office building at 9711 Washingtonian Boulevard is located along the west side of I-270. The building is located approximately 350 feet from the southbound shoulder of I-270. There is an outdoor seating area with multiple tables located in front of the building, approximately 400 feet from the shoulder of I-270.

The Spring Hill Suites hotel managed by Marriott is located along the west side of I-270. There is an outdoor seating area near the entrance to the hotel.

The Residence Inn hotel managed by Marriott is located along the west side of I-270. An outdoor pool is located approximately 145 feet from the shoulder of the southbound I-270 C-D lanes. The Rocky Gorge townhouse development and the Avalon apartment complex are located behind the hotel. The apartments have balconies facing I-270.

The Leidos Rio office building is approximately 350 feet from the shoulder of I-270. There are no outdoor use areas associated with this location. Consequently, it requires no further consideration.

NSA 5-06

This area, west of I-270, consists of outdoor retail and recreational land uses, as well as an office building and a hotel. The Gaithersburg Marriott Washingtonian Center hotel is located approximately 350 feet from the shoulder of the southbound I-270 C-D lanes. An outdoor patio is shielded by the hotel building. Consequently, it requires no further consideration.

A Sodexo office building is located along the west side of I-270. This facility is located approximately 620 feet from the southbound shoulder of I-270 and contains no evident outdoor use areas. Consequently, it requires no further consideration.

The Rio Washingtonian Center, which includes a variety of restaurants and shops are located approximately 650 feet from the southbound shoulder of I-270 across the lake. The facility is geared toward outdoor use, which includes outdoor eating areas and a boardwalk. The Rio Washingtonian Center also includes a park, located along the west side of I-270. The nearest portion of the path is located approximately 170 feet from the shoulder of the southbound I-270 C-D lanes (approximately 120 feet from the outer ramp shoulder) and consists of a paved walking trail, outdoor carousel, playground, and other features.

NSA 5-05

This area represents a variety of restaurants and shops at the northern end of the Rio Washingtonian Center located along the west side of I-270 adjacent to the ramp from I-370 to I-270. These facilities are generally located approximately 1,300-1,800 feet from the southbound shoulder of I-270 and 100 to 250 feet from the ramp. The area contains a Kohl's, Target, along with various other strip mall shops and is completely commercial with no evident outdoor use areas; as such it requires no further consideration.

NSA 5-03

This area consists of a restaurant, a medical facility, office buildings, and commercial / industrial uses. The restaurant, Red Lobster, is approximately 400 feet from the on-ramp to I-270. There are no outdoor use areas associated with this location. Consequently, it requires no further consideration.

The Shady Grove Development Park consists of five large buildings of mixed office and industrial use, and includes a Veterans Affairs clinic. The buildings are located approximately 150 feet from the outside shoulder of the northbound I-270 C-D lanes. The office buildings have no outdoor use areas of sufficient frequency, duration, or permanence associated with this area. Consequently, they require no further consideration.

The Veteran Affairs clinic also has no outdoor uses. This medical facility is located approximately 170 feet from the southbound shoulder of I-270. The building appears to be of masonry construction with double glazed windows that are closed for air-conditioning. As a result, the structure is expected to have a minimum building noise reduction factor of 35 dB(A) when assessing *interior* impacts.

P. Area 16: I-270 mainline, north of I-370

NSA 5-04

This area represents the Camden Washingtonian Apartments and Lifetime Athletic Club, Spa, and Cafe. The apartments are located approximately 1,400 feet from the outside shoulder of the I-270 C-D lanes, 600 feet from the ramp from I-270 to I-370. The Athletic club includes an outdoor swimming pool that is located approximately 200 feet from the ramp from I-270 to I-370.

NSA 5-02

This area consists of residential and recreational land uses. Malcom King Park is located along the west side of I-270. The park's playground is located approximately 500 feet from the outer shoulder of I-270

southbound. A section of the hiker-biker trail is less than 100 feet away. A retaining wall (#15290R0) that supports the highway ends at the northern end of this location.

The Brighton West Condominiums community is located along the west side of I-270. The nearest of these homes is located approximately 25 feet from the southbound shoulder of I-270.

Noise abatement is provided to the community by an existing Type I noise barrier (#15125N0), constructed in 1991. The existing noise barrier is approximately 2,031 feet long and 14 feet high on average. A retaining wall (#15167R0), which begins at the northern end of this area, is situated in front of the barrier along the southbound I-270 C-D lanes and transitions into another retaining wall (#15290R0) that supports the highway at the southern end of this area.

NSA 5-01

This area consists of multiple residential and recreational land uses. Morris Park, which is maintained by the City of Gaithersburg, contains a playground, tennis and basketball courts, baseball and soccer fields, and a 90-person capacity picnic pavilion. The park is located approximately 360 feet from the edge of pavement where the on-ramp from I-370 merges with the northbound I-270 C-D lanes.

The Brighton East townhouse community is located along the east side of I-270. The nearest residences are located approximately 100 feet from the shoulder of the northbound I-270 C-D lanes. The community pool area is approximately 60 feet from the I-270 C-D lanes.

The Fireside Condominium community, along the east side of I-270, consists of 258 units. The nearest units are located approximately 30 feet from the shoulder of the northbound I-270 C-D lanes. The community pool area and tennis courts are between 30 and 50 feet from the I-270 C-D lanes.

The Brighton East Condominium community is located along Duvall Lane behind the Fireside Condominiums east of I-270. The nearest of these condos are located approximately 300 feet from the shoulder of the northbound I-270 C-D lanes.

Noise abatement is provided to the community by an existing Type I noise barrier (#15126N0), constructed in 1991. The existing noise barrier is approximately 3,148 feet long and 17 feet high on average. A retaining wall (#15166R0) is situated in front of the barrier along the northbound I-270 C-D lanes in front of the majority of the Fireside Condominiums.

Q. Non-Noise-Sensitive Areas

The non-noise sensitive areas discussion remains consistent with Section 2.2.1.B, 2.3.1.B, and 2.6.1.A of the Noise Technical Report prepared for the DEIS.

2.2.2 Noise Measurement Data

The noise measurement data remains consistent with Section 2.2.2, 2.3.2, and 2.6.2 of the Noise Technical Report prepared for the DEIS.

2.2.3 TNM Model Validation

The TNM Model Validation discussion remains consistent with Section 2.2.3, 2.3.3, and 2.6.3 of the Noise Technical Report prepared for the DEIS.

3 PREDICTED NOISE LEVELS AND IMPACT ANALYSIS

3.1 Introduction

The section documents the future predicted noise levels resulting from the proposed design for each NSA and assesses whether or not the NSA is impacted and warrants a barrier analysis. Impacts were assessed based upon the following criteria:

- Predicted 2045 design year noise levels approach or exceed the FHWA NAC for the intended land use (see **Table 1-2** of the Type I Noise Technical Analysis Report prepared for the DEIS).

For the NSAs that do not approach or exceed the NAC (and therefore are not considered impacted under that criterion), the lowest existing noise level was compared to the future build condition noise level in order to determine where a substantial increase impact would occur. No NSAs will experience a substantial increase as a result of the Preferred Alternative.

All prediction modeling was performed using FHWA's TNM v2.5 by applying the 2045 loudest-hour traffic data to the TNM noise barrier analysis models. The preliminary direct access locations were included in this noise analysis. Modifications to the managed lane access points following input from the Counties will be considered in the updated noise analysis in support of the FEIS/ROD. In this region, there are a significant number of side roads that carry high volumes of traffic and contribute to the overall noise environment. This "background noise" can reduce the perceived effectiveness of a noise barrier. During field noise monitoring, a 55 dB(A) background noise level was observed and has been applied to the results of the TNM modeling, using MDOT SHA's standard methodology. This is done to ensure that the proposed noise barrier is effectively reducing noise levels from the highway noise source.

3.2 Traffic Data

The Traffic Data discussion remains consistent with Section 3.2 of the Type I Noise Technical Report prepared for the DEIS.

Appendix B of the Type I Noise Technical Analysis Report prepared for the DEIS contains the LOS C/D volumes, speeds, and truck percentages for the Study area. Appendix A of the Addendum contains the LOS C/D volumes, speeds, and truck percentages for the direct access ramps.

3.3 Relocation of Existing Noise Barriers

There are several existing Type I and Type II noise barriers within the study area. For this analysis, noise barriers that are anticipated to be displaced for roadway improvements or stormwater management conflicts, have been analyzed to verify that there is no decrease in performance as replacement barriers. Any barriers that are displaced, will be re-evaluated during the final design process to verify that replacement noise barriers meet or exceed the noise abatement performance of the existing noise barriers to be replaced including insertion loss and line of sight.

3.4 Predicted Noise Level Results

Sixty-four (64) NSAs were evaluated for noise impacts. Fifty (50) NSAs contained impacts resulting from the Preferred Alternative. Detailed predicted noise level results for each modeled receptor are found in Table B-1, in Appendix B of this Addendum.

3.5 Summary of Noise Abatement Warrants

The following NSAs have noise impacts that warrant further consideration of noise abatement measures due to the construction of the proposed highway improvements: VA-01, VA-03, VA-02, 1-01, 1-02, 1-04, 1-05, 1-03, 2-01, 1-06, 3-01, 1-38, 4-01, 2-02, 3-02, 3-04, 1-08, 2-03, 2-04, 2-05, 2-06, 1-09A, 1-10A, 5-36, 5-37A, 5-37B, 5-33A, 5-34A, 5-31, 5-30, 5-29, 5-24, 5-22, 5-19, 5-18, 5-21, 5-20, 5-17, 5-15, 5-13, 5-12, 5-11, 5-10, 5-09, 5-08, 5-07, 5-06, 5-02, and 5-01.

4

4 BARRIER ANALYSIS

4.1 Introduction

Federal regulation (23 CFR 772) and the MDOT SHA *Highway Noise Abatement Planning and Engineering Guidelines (2020)* require that noise abatement be investigated at all NSAs where the Build traffic noise levels approach or exceed the FHWA NAC for the defined land use category, or where there are substantial increases over peak ambient noise levels. Where noise abatement was warranted for consideration, additional criteria were examined to determine if the abatement is feasible and reasonable. As noted in Section 1.7, the NSAs in Virginia are being evaluated for noise abatement in coordination with VDOT and in compliance with the VDOT Highway Traffic Noise Impact Analysis Guidance Manual. The following sections document the results for each of the barrier systems²¹ that were studied.

4.2 Feasibility and Reasonableness Criteria

The Feasibility and Reasonableness Criteria discussion remains consistent with Section 4.2 of the Type I Noise Technical Report prepared for the DEIS. As discussed in Section 4.2, MDOT SHA sets the appropriate barrier quantity cap (*evaluation threshold*) based on the degree and extent that the subject Type I highway project changes the existing noise environment²². The threshold can increase from a baseline allowance of 700 square-foot per residence (SF-p-r) up to a maximum possible allowance of 2700 SF-p-r as shown in **Table 4-1**. The evaluation threshold is independently determined for each proposed barrier system based upon the project characteristics affecting the noise environment. If a studied barrier system protects areas that fall under different conditions, the analysis will use the higher evaluation threshold in the assessment of barrier reasonableness.

Given the nature of this project, condition no. 1 is assumed to be met (the project increases through capacity), but condition no. 2 would not be met (increases noise levels by a minimum of 3 dB(A)). Therefore, each barrier system starts with a threshold of 1700 SF-p-r. If the project sound levels are at or above 75 dB(A), the threshold increases to 2700 SF-p-r.

²¹ A barrier system refers to a single barrier or group of barriers analyzed together to protect one or more NSAs.

²² The SF-p-r calculation includes equivalent residences (ER) that have been calculated for outdoor noise-sensitive use areas as detailed in Appendix D of the MDOT SHA Highway Noise Abatement Planning and Engineering Guidelines (2020). The calculation of ER includes how often an area is used (calculated as a percentage of hours per 24-hour day, days per 30-day month, and months per 12-month year) multiplied by the total linear frontage (125 feet of linear frontage of the property along the subject highway is equivalent to one (1) residence). This yields a decimal ER value, which is not rounded to the nearest whole number.

Table 4-1: Cost Reasonableness Evaluation Thresholds

Baseline – applies to ALL Type I Projects	NONE of the conditions is present	700 SF-p-r
Condition <ul style="list-style-type: none"> • 1. The project increases through capacity. • 2. The project increases noise levels by a minimum of 3 dB(A) from existing to future build conditions. • 3. The project results in noise levels at or above 75 dB(A). 	Only ONE of the conditions is present	1700 SF-p-r
	TWO OR MORE of the conditions are present	2700 SF-p-r

4.3 Noise Barrier Design Terms

The Noise Barrier Design Terms discussion remains consistent with Section 4.3 of the Type I Noise Technical Report prepared for the DEIS.

4.4 Noise Barrier Design Process

The Noise Barrier Design Process discussion remains consistent with Section 4.4 of the Type I Noise Technical Report prepared for the DEIS.

For new or replacement noise barriers in Maryland, typically, constant height barriers were specified for each NSA. The barrier design is governed primarily by the goal of 7 dB(A) noise reduction at the *critical sensitive receptors*. Critical sensitive receptors are typically defined as first-row, ground level sites, where worst-case noise impacts are found. Noise attenuation at second-row receptors, upper level receptors or other locations not directly adjacent to the proposed barrier are considered a secondary benefit.

For new or replacement noise barriers in Virginia, barriers were modified from the results presented in the *I-495 Express Lanes Northern Extension Noise Technical Report* (February, 2020), where physically impacted by the Preferred Alternative.

4.5 Existing Barrier Assessment

There are three scenarios that can occur for areas with existing barriers:

- The entire noise barrier is disturbed by the construction of the proposed highway improvement. In this case, a replacement barrier is designed.
- Part [or parts] of the noise barrier is disturbed by the construction of the proposed highway improvement. In this case, existing and replacement barrier segments are integrated into one design.
- None of the existing noise barrier is disturbed by construction. In this case, the existing barrier serves as the base design.

In each case, the barrier design – existing or proposed – is evaluated based on the modeled noise reduction (insertion loss) at critical sensitive receptors. If there are no impacts behind the existing barrier then no additional analysis is required. If impacts are predicted, barrier performance is reviewed based

on a comparison of '2045 Build Barrier' predicted noise levels to '2045 No Barrier' predicted noise levels to verify that the noise barrier satisfies the requirements of MDOT SHA *Highway Noise Abatement Planning and Engineering Guidelines* (April 2020) and VDOT *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018).

For existing barriers in Virginia, a full in-kind noise barrier replacement analysis was not conducted during the development of the *I-495 Express Lanes Northern Extension Noise Technical Report* (February, 2020), due to the number of build phases. As a result, the following in-kind barrier replacement methodology was utilized:

- For existing noise barriers that would be physically impacted (or replaced) under the Preferred Alternative, the affected barriers were shifted laterally to the proposed edge of pavement (keeping the same top of wall elevation) to avoid any modeling conflicts in TNM.
- In-kind noise barrier replacement extensions were evaluated for existing barriers that were identified to be physically impacted by the project, and where additional impacts were predicted near either end of the existing barrier.
- Reasonableness of the in-kind noise barrier replacement extensions were evaluated using the area of the barrier extension or the total area of the proposed barrier, consistent with Sections 6.3.5 and 6.3.6 of VDOT *Highway Traffic Noise Impact Analysis Guidance Manual* (February 2018) and modified as appropriate, at the direction of VDOT.
- A full in-kind barrier replacement analysis for each of the respective Build phases will be completed under the appropriate build scenario during final design.

4.5.1 Existing Barriers Not Assessed

One existing barrier would not be displaced by the Preferred Alternative, the barrier associated with NSA 5-23. There are no impacts to noise sensitive land uses behind the barrier associated with NSA 5-23; therefore, no additional analysis is required.

4.6 Noise Barrier Design Results

The noise barrier design results for each studied barrier system are presented below. The studied barriers are depicted in the exhibits attached to this report. Noise Barrier Performance has been modified to account for an anticipated 55 dB(A) "With-Barrier" Background Noise Level. Equivalent residence units were calculated for outdoor noise sensitive uses and Category D areas based on linear frontage and intensity of use. The tables included with each barrier description include only the receptors that would either experience impacts and/or experience benefits from the assessed barrier. Table B-1 in Appendix B includes results of the barriers analysis for all analyzed receptors.

4.6.1 Area 1: I-495 west side, south of George Washington Parkway

A. Barrier System 495 VA-01 (NSA VA-01)²³

Barrier 495 VA-01 is physically impacted by the project; therefore, it would be replaced in-kind. The barrier analysis showed that the replacement barrier was not feasible because it only provides benefits for less than 50% of the impacted receptors. Additional noise impacts at the northern terminus of the replacement barrier were also predicted. As a result, it was decided to analyze the replacement barrier with a northern extension as a barrier system.

A variable height noise barrier ranging from 9 feet to 27 feet tall and measuring approximately 1,871 feet long, is proposed. The barrier system consists of an existing barrier that will be replaced as well as an extension to address additional impacts in NSA VA-02. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 50% or more of the impacted receptors. The barrier also meets the reasonableness criterion of providing at least a single 7 dB(A) noise reduction to an impacted receptor.

There are 19 impacted, benefited residences and 2 non-impacted, benefited residences for a total of 21 benefited residences, which results in a square-foot (SF) per benefited residence of 1,499. Since the square footage per benefited receptor meets the maximum square footage per benefited receptor (MSF/BR) criterion of 1,600, the barrier system was determined to be feasible and reasonable.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-2**. The barrier location and benefit locations are shown on Map No. 1. Barrier system 495 VA-1 *is considered feasible and reasonable* for NSAs VA-01 and VA-02.

Table 4-2: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs VA-01 and VA-02

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
VA-01-2	3	74	11	63
VA-01-3	1	68	7	61
VA-01-5	2	65	5	60
VA-01-6	1	66	4	62
VA-01-7	2	69	5	64
VA-01-8	2	68	5	63
VA-01-10	3	73	8	65
VA-01-11	1	66	4	62
VA-01-13	2	71	6	65
VA-01-14	2	70	6	64
VA-01-19	1	66	1	65
VA-01-20	1	67	1	66
VA-01-21	2	67	1	66

²³ This barrier was modified from the barrier evaluated in the *I-495 Express Lanes Northern Extension Noise Technical Report* (February, 2020), based on roadway design refinements and the limits of the project. As a result, the proposed southern extension of this barrier (located west of Live Oak Drive overpass) was not evaluated and is not shown on the graphics, because it is located outside the limits of the noise study.

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)				
VA-01-22	1	68	0	68				
VA-02-48	2	70	8	62				
VA-02-49	2	72	9	63				
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%; text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
##	Receptor Impacted							
##	Receptor Benefited by Barrier (5 dBA or more)							
Barrier Summary								
TNM Run / Barrier Run		VA-01/barrier VA-01						
Number of Impacted, Benefited Residences		19						
Number of Non-Impacted, Benefited Residences		2						
Total Number of Benefited Locations		21						
Barrier Length (feet)		1,871						
Average Barrier Height (feet)		17						
Area (feet ²)		31,477						
SF per Benefited Residence		1,499						
Feasible and Reasonable?		Yes						
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.								

B. Barrier System 495 VA-3 (NSA VA-03)

Barrier 495 VA-3 is located in NSA VA-03 and would be physically impacted by the project; therefore, it would be replaced in-kind. Although additional noise impacts at the eastern terminus of the replacement barrier were predicted, the barrier could not be extended due to the extension being located within the NPS-managed Turkey Run Park; the NPS has requested that no barriers be constructed within NPS-managed land due to Section 4(f) concerns.

A variable height noise barrier ranging from 14 feet to 24 feet tall and measuring approximately 3,072 feet long, is proposed. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 50% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to at least a single impacted residence.

There are 24 impacted, benefited residences and 6 non-impacted, benefited residences for a total of 30 benefited residences, which results in a SF per benefited residence of 2,094. Although the square footage per benefited receptor exceeds the MSF/BR criterion of 1,600, this barrier would need to be replaced in kind due to being physically impacted by the project.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-2**. The barrier location and benefit locations are shown on Map No. 1. Although Barrier System 495 VA-3 does not meet the cost-effectiveness criterion, since this barrier has to be replaced due to roadway design, Barrier System 495 VA-3 will be **replaced in kind**.

Table 4-3: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA VA-03

Receptor Number	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
VA-03-5	1	65	1	64
VA-03-6	1	66	1	65
VA-03-7	1	63	0	63
VA-03-9	1	65	1	64
VA-03-10	1	64	1	63
VA-03-21	1	66	6	60
VA-03-22	1	66	7	59
VA-03-23	1	64	6	58
VA-03-24	1	67	8	59
VA-03-26	1	61	5	56
VA-03-27	1	73	11	62
VA-03-28	1	69	9	60
VA-03-29	1	64	6	58
VA-03-30	1	68	9	59
VA-03-31	1	72	11	61
VA-03-32	1	70	9	61
VA-03-33	1	71	9	62
VA-03-34	1	66	7	59
VA-03-35	1	67	8	59
VA-03-36	1	74	12	62
VA-03-37	1	70	11	59
VA-03-38	1	65	8	57
VA-03-39	1	72	11	61
VA-03-40	3	68	10	58
VA-03-41	1	69	9	60
VA-03-42	1	69	9	60
VA-03-43	1	64	7	57
VA-03-44	1	66	8	58
VA-03-45	1	66	7	59
VA-03-46	1	66	7	59
VA-03-47	1	71	10	61
VA-03-48	1	63	5	58
VA-03-49	1	67	7	60

##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	495 VA-03/view profile DF ext
Number of Impacted, Benefited Residences	24
Number of Non-Impacted, Benefited Residences	6
Total Number of Benefited Locations	30
Barrier Length (feet)	3,072
Average Barrier Height (feet)	20
Area (feet ²)	62,810
SF per Benefited Residence	2,094
Feasible and Reasonable?	N/A*
* Although the square footage per benefited receptor exceeds the MSF/BR criterion of 1,600, this barrier would need to be replaced in kind due to being physically impacted by the project; therefore, the MSF/BR criterion does not apply.	
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.	

4.6.2 Area 2: I-495 west side, between George Washington Parkway and Clara Barton Parkway

A. Barrier System 495 VA-2 (NSA VA-02)

A noise barrier consisting of heights ranging from 10 feet and 28 feet measuring approximately 2,099 feet long, is proposed. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 50% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to at least a single impacted residence.

There are 25 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 25 benefited residences. Based on a total of 25 benefited receptors, the SF per benefited receptor is 1,584 which is less than the MSF/BR criterion of 1,600. Therefore, this barrier was determined to be feasible and reasonable.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-3**. The barrier location and benefit locations are shown on Maps No. 1 and 2. Barrier System 495 VA-2 *is considered feasible and reasonable* for NSA VA-02.

Table 4-4: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA VA-02

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
VA-02-1	1	80	9	71
VA-02-2	1	78	6	72
VA-02-3	1	75	6	69
VA-02-4	1	75	3	72
VA-02-5	1	75	5	70
VA-02-6	1	74	6	68
VA-02-7	1	71	1	70
VA-02-8	1	70	4	66
VA-02-10	1	70	0	70
VA-02-11	1	69	1	68

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)		
VA-02-12	1	66	1	65		
VA-02-13	1	67	0	67		
VA-02-30	1	70	0	60		
VA-02-33	2	81	10	71		
VA-02-34	3	81	4	77		
VA-02-35	1	80	8	72		
VA-02-36	1	74	7	67		
VA-02-39	2	69	8	61		
VA-02-40	2	76	15	61		
VA-02-41	3	74	15	59		
VA-02-42	4	71	10	61		
VA-02-43	5	71	5	66		
<table border="1"> <tr><td>##</td></tr> <tr><td>##</td></tr> </table>		##	##	Receptor Impacted Receptor Benefited by Barrier (5 dBA or more)		
##						
##						
Barrier Summary						
<i>TNM Run / Barrier Run</i>		495 VA-02/Mod1				
Number of Impacted, Benefited Residences		25				
Number of Non-Impacted, Benefited Residences		0				
Total Number of Benefited Locations		25				
Barrier Length (feet)		2,099				
Average Barrier Height (feet)		19				
Area (feet ²)		39,608				
SF per Benefited Residence		1,584				
Feasible and Reasonable?		Yes				
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.						

4.6.3 Area 3: I-495 west side, between Clara Barton Parkway and MD 190

A. Barrier System 495 MD-1 (NSA 1-01)

Noise impacts were identified at the at the NPS-managed C&O Canal Towpath; however, the NPS has requested that no barriers be constructed within NPS-managed land due to Section 4(f) concerns. Therefore, a barrier was not analyzed for the southern portion of NSA 1-01.

To provide 7 dB(A) insertion loss at the critical sensitive receptors in the northern portion of NSA 1-01, a variable height noise barrier, ranging from 12 feet to 32 feet tall and measuring approximately 1,363 feet long, is proposed. [The existing 10-foot tall privately owned noise barrier, combined with an extended barrier was not able to provide at least 5 dB(A) noise reduction to 70% or more of the impacted residences.] The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 11 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 11 benefited residences. The SF per benefited residence is 2,693, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-5**. The barrier location and benefit locations are shown on Maps No. 2 and 3. Barrier System 495-MD-1 *is considered feasible and reasonable* for NSA 1-01.

Table 4-5: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 1-01

Receptor Number ¹	Equivalent Residences ²	2045 Predicted No Barrier Noise Level	2045 Build Barrier Noise Reduction (dB(A))	2045 Build With Barrier Predicted Noise Level					
M1-1-1	3	76	7	69					
M1-1-2	3	73	11	62					
M1-1-3	2	67	7	60					
R1-1-7	3	72	8	64					
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td rowspan="4"> Critical Sensitive Receptors Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted Receptor Benefited by Barrier (5 dBA or more) </td> </tr> <tr> <td style="text-align: center;">##</td> </tr> <tr> <td style="text-align: center;">##</td> </tr> <tr> <td style="text-align: center;">##</td> </tr> </table>					Bold	Critical Sensitive Receptors Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted Receptor Benefited by Barrier (5 dBA or more)	##	##	##
Bold	Critical Sensitive Receptors Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted Receptor Benefited by Barrier (5 dBA or more)								
##									
##									
##									
Barrier Summary									
TNM Run / Barrier Run			MD-1/Mod1						
Number of Impacted, Benefited Residences			11						
Number of Non-Impacted, Benefited Residences			0						
Total Number of Benefited Locations			11						
Barrier Length (feet)			1,363						
Average Barrier Height (feet)			22						
Area (feet ²)			29,622						
SF per Benefited Residence			2,693						
Feasible and Reasonable?			Yes						
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>									

B. Barrier System 495 MD-2 (NSAs 1-02 and 1-04)

Noise impacts were identified at the at the NPS-managed C&O Canal Towpath; however, the NPS has requested that no barriers be constructed within NPS-managed land due to Section 4(f) concerns. Therefore, a barrier was not analyzed for the southern portion of NSA 1-02.

To provide 7 dB(A) insertion loss at most of the critical sensitive receptors in NSAs 1-02 and 1-04, a constant height noise barrier of 24 feet measuring approximately 6,281 feet long, is proposed. Due to the close nature of the two NSAs, the barrier was evaluated as a system rather than individually. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise

reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 51 impacted, benefited residences and 12.33 non-impacted, benefited residences for a total of 63.33 benefited residences. The SF per benefited residence is 2,380, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-6**. The barrier location and benefit locations are shown on Maps No. 2, 3 and 4. Barrier System 495 MD-2 *is considered feasible and reasonable* for NSAs 1-02 and 1-04.

Table 4-6: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 1-02 and 1-04

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level
M1-2-1	2	67	5	62
M1-2-2	4	66	8	58
M1-2-3	2	78	15	63
M1-2-4	3	78	17	61
M1-2-5	2	70	9	61
R1-2-1	3	73	6	67
R1-2-4	1	66	7	59
R1-2-5	3	64	6	58
R1-2-6	2	65	7	58
M1-4-1	3	74	11	63
M1-4-2	3	76	9	67
M1-4-4	3	67	7	60
M1-4-5	5	70	9	61
M1-4-6	4	73	12	61
M1-4-7	3	67	6	61
R1-4-1	2	69	5	64
R1-4-6	4	71	8	63
R1-4-14	2.33	62	5	57
R1-4-15	5	64	6	58
R1-4-16	2	66	7	59
R1-4-17	3	68	8	60
R1-4-20	2	70	10	60

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	MD-2/24ft
Number of Impacted, Benefited Residences	51
Number of Non-Impacted, Benefited Residences	12.33
Total Number of Benefited Locations	63.33
Barrier Length (feet)	6,281
Average Barrier Height (feet)	24
Area (feet ²)	150,744
SF per Benefited Residence	2,380
Feasible and Reasonable?	Yes
1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only. 2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.	

C. Barrier System 495 MD-4 (NSA 1-05)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 1-05, a variable height noise barrier system, ranging from 20 feet to 32 feet tall and measuring approximately 3,434 feet long, is proposed. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 39 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 39 benefited residences. The SF per benefited residence is 2,079, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-7**. The barrier location and benefit locations are shown on Map No. 4. Barrier System 495 MD-4 *is considered feasible and reasonable* for NSA 1-05.

Table 4-7: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 1-05

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M1-5-1	4	72	6	66
M1-5-2	5	73	7	66
M1-5-3	6	76	14	62
M1-5-4	2	72	10	62
M1-5-5	3	76	12	64
M1-5-6	2	68	7	61
R1-5-1	3	69	10	59
R1-5-3	3	68	1	67
R1-5-4	3	67	1	66
R1-5-7	9	67	7	60
R1-5-9	3	66	5	61



Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)						
R1-5-11	2	67	7	60						
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors									
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted									
##	Receptor Benefited by Barrier (5 dBA or more)									
Barrier Summary										
<i>TNM Run / Barrier Run</i>		MD-4/Mod1								
Number of Impacted, Benefited Residences		39								
Number of Non-Impacted, Benefited Residences		0								
Total Number of Benefited Locations		39								
Barrier Length (feet)		3,434								
Average Barrier Height (feet)		24								
Area (feet ²)		81,091								
SF per Benefited Residence		2,079								
Feasible and Reasonable?		Yes								
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>										

D. Barrier System 495 MD-3 (NSAs 1-03 and 2-01)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 1-03 and 2-01, a variable height noise barrier ranging from 24 to 32 feet tall and measuring approximately 3,980 feet long, is proposed. The barrier system was evaluated as a replacement for the barrier that currently shields NSA 2-01 and an extension that would shield NSA 1-03. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 38.99 impacted, benefited residences and 9 non-impacted, benefited residences for a total of 47.99 benefited residences. The SF per benefited residence is 2,026, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this combined new and replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-8**. The barrier location and benefit locations are shown on Maps No. 3 and 4. Barrier System 495 MD-3 **is considered feasible and reasonable** for NSAs 1-03 and 2-01.

Table 4-8: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 1-03 and 2-01

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
M1-3-1	0.99	78	15	63								
M1-3-2	5	80	14	66								
M1-3-3	5	82	18	64								
R1-3-1	1	66	2	64								
R1-3-5	3	71	10	61								
R1-3-6	4	65	5	60								
R1-3-7	3	70	8	62								
R1-3-9	2	68	7	61								
M2-1-1	3	73	11	62								
M2-1-3	3	71	9	62								
M2-1-4	4	65	6	59								
M2-1-6	7	70	8	62								
R2-1-4	3	69	5	64								
R2-1-5	3	68	6	62								
R2-1-6	1	66 (56) ³	5	61 (51)								
R2-1-7	1	65	6	59								
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			MD-3/Mod2									
Number of Impacted, Benefited Residences			38.99									
Number of Non-Impacted, Benefited Residences			9									
Total Number of Benefited Locations			47.99									
Barrier Length (feet)			3,980									
Average Barrier Height (feet)			24									
Area (feet ²)			97,211									
SF per Benefited Residence			2,026									
Feasible and Reasonable?			Yes									
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p> <p>3. Parenthesis indicates interior sound levels. For this receptor, a building noise reduction factor of 10 dB(A) was assumed as described in Section 2.2.1.C.</p>												

4.6.4 Area 4: I-495 west side, between MD 190 and I-270 west spur

A. Barrier System 495 MD-5 (NSAs 1-06 and 3-01)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 1-06 and 3-01, a variable height noise barrier, ranging from 28 feet to 40 feet tall and measuring approximately 6,892 feet long, is proposed. The barrier system was evaluated as a replacement for the barrier that currently shields NSA 3-01 and an extension that would shield NSA 1-06. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 89 impacted, benefited residences and 10 non-impacted, benefited residences for a total of 99 benefited residences. The SF per benefited residence is 2,019, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this combined new and replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-9**. The barrier location and benefit locations are shown on Maps No. 4 and 5. Barrier System 495 MD-5 *is considered feasible and reasonable* for NSAs 1-06 and 3-01.

Table 4-9: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 1-06 and 3-01

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M1-6-1	6	77	16	61
M1-6-2	1	75	11	64
M1-6-3	2	75	7	68
M3-1-1	2	72	9	63
M3-1-2	4	73	6	67
M3-1-3	3	77	14	63
M3-1-4	2	83	21	62
M3-1-6	3	76	14	62
M3-1-7	1	81	16	65
M3-1-8	2	77	8	69
M3-1-10	2	77	11	66
M3-1-11	2	80	13	67
M3-1-12	4	68	8	60
M3-1-13	4	79	17	62
M3-1-14	5	70	10	60
M3-1-15	1	76	13	63
M3-1-16	1	80	17	63
M3-1-17	2	69	8	61
M3-1-18	2	78	12	66
M3-1-19	4	72	10	62
M3-1-20	2	78	15	63
M3-1-21	3	76	12	64

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M3-1-22	3	82	19	63
M3-1-23	5	73	9	64
M3-1-24	1	81	15	66
M3-1-25	2	79	9	70
M3-1-26	2	81	15	66
M3-1-27	3	77	10	67
M3-1-28	3	82	20	62
M3-1-29	3	82	11	71
R3-1-5	4	65	7	58
R3-1-10	6	63	6	57
R3-1-17	4	66	6	60
R3-1-20	5	68	6	62

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	MD-5/Mod1
Number of Impacted, Benefited Residences	89
Number of Non-Impacted, Benefited Residences	10
Total Number of Benefited Locations	99
Barrier Length (feet)	6,892
Average Barrier Height (feet)	29
Area (feet ²)	199,869
SF per Benefited Residence	2,019
Feasible and Reasonable?	Yes

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.

2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

B. Barrier System 495 MD-7 (NSA 1-38)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 1-38, a constant height barrier of 32 feet measuring approximately 783 feet long, is proposed. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 20 impacted, benefited residences and 2 non-impacted, benefited residences for a total of 22 benefited residences. The SF per benefited residence is 1,138, which is below the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-10**. The barrier location and benefit locations are shown on Map No. 4. Barrier System MD-7 *is considered feasible and reasonable* for NSA 1-38.

Table 4-10: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 1-38

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
R1-38-1	2	68	8	60
R1-38-2	2	71	10	61
R1-38-3	2	71	7	64
R1-38-4	2	68	7	61
R1-38-5	2	70	6	64
R1-38-6	2	71	4	67
R1-38-7	2	69	9	60
R1-38-8	2	71	9	62
R1-38-9	2	72	8	64
R1-38-10	2	65	6	59
R1-38-11	2	68	7	61
R1-38-12	2	70	9	61

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	MD-7/32ft
Number of Impacted, Benefited Residences	20
Number of Non-Impacted, Benefited Residences	2
Total Number of Benefited Locations	22
Barrier Length (feet)	783
Average Barrier Height (feet)	32
Area (feet ²)	25,031
SF per Benefited Residence	1,138
Feasible and Reasonable?	Yes

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.

2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

C. Barrier System 495 MD-6/6A (NSAs 4-01 and 2-02)

This barrier system is comprised of two barriers that were evaluated to provide abatement to NSAs 4-01 and 2-02. The entire barrier system as evaluated met the feasibility criteria of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences and the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of impacted residences. However, in all scenarios, the cost-reasonableness evaluation threshold was exceeded, which was 2,700 SF-p-r for this location (since sound



levels are above 75 dB(A)). Since the entire system was not reasonable, the portion of the barrier system located in front of NSA 4-01 (Barrier 6A) was evaluated separately from the portion of the barrier system located in front of NSA 2-02 (Barrier 6).

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 4-01, a constant height barrier of 28 feet, measuring approximately 1,832 feet long, is proposed. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 7.65 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 7.65 benefits. The 2045 Build Barrier predicted insertion losses, noise levels, and details on barrier design are shown in **Table 4-11**. The barrier location and benefit locations are shown on Maps Nos. 4 and 5. Barrier 6A *is considered feasible but not reasonable* for NSA 4-01, because the square foot per benefited residence exceeds the 2,700 SF-p-r threshold.

Table 4-11: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 4-01

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M4-1-2	0.85	71	8	63
M4-1-3	0.85	75	14	61
M4-1-4	0.85	75	13	62
M4-1-5	0.85	67	9	58
4-1-2	0.85	66	7	59
4-1-3	0.85	66	8	58
4-1-4	0.85	72	12	60
4-1-5	0.85	68	9	59
4-1-6	0.85	73	12	61
		Bold	Critical Sensitive Receptors	
			Effective Noise Reduction (7 dBA or more) at Critical Sensitive	
		##	Receptor Impacted	
		##	Receptor Benefited by Barrier (5 dBA or more)	

Barrier Summary	
TNM Run / Barrier Run	Barrier MD-6T
Number of Impacted, Benefited Residences	7.65
Number of Non-Impacted, Benefited Residences	0
Total Number of Benefited Locations	7.65
Barrier Length (feet)	1,832
Average Barrier Height (feet)	28
Area (feet ²)	51,280
SF per Benefited Residence	6,703
Feasible and Reasonable?	No

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 2-02, a variable height noise barrier ranging from 32 feet to 36 feet tall and measuring approximately 4,433 feet long, is proposed. The barrier system consists of an existing barrier that will be replaced on new alignment. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 55 impacted, benefited residences and 3 non-impacted, benefited residences for a total of 58 benefited residences. The SF per benefited residence is 2,474, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-12**. The barrier location and benefit locations are shown on Map No. 5. Barrier System 495 MD-6 **is considered feasible and reasonable** for NSA 2-02.

Table 4-12: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 2-02

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M2-2-1	4	80	13	67
M2-2-2	2	69	6	63
M2-2-3	4	80	16	64
M2-2-4	5	80	9	71
M2-2-5	0	67	3	64
M2-2-6	3	68	6	62
M2-2-7	7	79	12	67
M2-2-8	3	79	16	63
M2-2-9	3	79	11	68
M2-2-10	2	73	10	63
R2-2-1	3	70	4	66
R2-2-2	2	73	8	65
R2-2-3	2	76	13	63

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
R2-2-4	2	74	11	63								
R2-2-5	3	66	8	58								
R2-2-6	3	73	12	61								
R2-2-7	3	65	6	59								
R2-2-8	1	70	11	59								
R2-2-9	2	67	8	59								
R2-2-10	6	78	16	62								
R2-2-13	1	79	7	72								
<table border="1"> <tr> <td>Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td></td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td>##</td> <td>Receptor Impacted</td> </tr> <tr> <td>##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors		Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
TNM Run / Barrier Run		MD-6/Mod1										
Number of Impacted, Benefited Residences		55										
Number of Non-Impacted, Benefited Residences		3										
Total Number of Benefited Locations		58										
Barrier Length (feet)		4,433										
Average Barrier Height (feet)		32										
Area (feet ²)		143,518										
SF per Benefited Residence		2,474										
Feasible and Reasonable?		Yes										
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>												

4.6.5 Area 5: I-495 top side, between I-270 west spur and MD 187

A. Barrier System 495 MD-8 (NSA 3-02)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 3-02, a variable height noise barrier, ranging from 28 feet to 40 feet tall and measuring approximately 2,663 feet long, is proposed. The barrier system consists of an existing barrier that will be replaced on new alignment. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 29 impacted, benefited residences and 3 non-impacted, benefited residences for a total of 32 benefited residences. The SF per benefited residence is 2,582, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-13**. The barrier location and benefit locations are shown on Maps No. 5 and 6. Barrier System 495 MD-8 *is considered feasible and reasonable* for NSA 3-02.

Table 4-13: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 3-02

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M3-2-1	4	79	15	64
M3-2-2	5	66	5	61
M3-2-3	4	79	17	62
M3-2-4	3	77	15	62
M3-2-5	4	79	16	63
M3-2-6	4	69	7	62
M3-2-7	3	75	7	68
M3-2-8	2	76	7	69
R3-2-2	3	63	5	58

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	MD-8/Mod1
Number of Impacted, Benefited Residences	29
Number of Non-Impacted, Benefited Residences	3
Total Number of Benefited Locations	32
Barrier Length (feet)	2,663
Average Barrier Height (feet)	31
Area (feet ²)	82,632
SF per Benefited Residence	2,582
Feasible and Reasonable?	Yes

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.

2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

B. Barrier System 495 MD-11 (NSAs 3-04 and 1-08)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 3-04 and 1-08, a variable height noise barrier, ranging from 24 feet to 28 feet tall and measuring approximately 3,114 feet long, is proposed. The barrier system was evaluated as a replacement for the barrier that currently shields NSA 3-04 and an extension that would shield NSA 1-08. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 21 impacted, benefited residences and 10 non-impacted, benefited residences for a total of 31 benefited residences. The SF per benefited residence is 2,454, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this combined new and replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-14**. The barrier location and benefit locations are shown on Map No. 7. Barrier System 495 MD-11 *is considered feasible and reasonable* for NSAs 3-04 and 1-08.

Table 4-14: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 3-04 and 1-08

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)						
M3-4-1	2	72	9	63						
M3-4-3	4	68	7	61						
M3-4-4	6	63	5	58						
M3-4-5	4	64	5	59						
M3-4-6	5	67	8	59						
R3-4-5	5	74	13	61						
M1-8-1	2	70	9	61						
M1-8-2	1	75	13	62						
M1-8-3	2	70	5	65						
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors									
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted									
##	Receptor Benefited by Barrier (5 dBA or more)									
Barrier Summary										
TNM Run / Barrier Run			MD-11/Mod1							
Number of Impacted, Benefited Residences			21							
Number of Non-Impacted, Benefited Residences			10							
Total Number of Benefited Locations			31							
Barrier Length (feet)			3,114							
Average Barrier Height (feet)			24							
Area (feet ²)			76,082							
SF per Benefited Residence			2,454							
Feasible and Reasonable?			Yes							
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>										

C. Barrier System 495 MD-10 (NSA 2-03)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 2-03, a variable height noise barrier, ranging from 12 feet to 24 feet tall and measuring approximately 1,678 feet long, is proposed. The barrier system consists of an existing barrier that will be replaced on new alignment. The

noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 8 impacted, benefited residences and 6 non-impacted, benefited residences for a total of 14 benefited residences. The SF per benefited residence is 2,626, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-15**. The barrier location and benefit locations are shown on Maps No. 6 and 7. Barrier System 495 MD-10 *is considered feasible and reasonable* for NSA 2-03.

Table 4-15: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 2-03

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)						
M2-3-2	8	78	15	63						
M2-3-3	6	65	5	60						
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors									
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted									
##	Receptor Benefited by Barrier (5 dBA or more)									
Barrier Summary										
<i>TNM Run / Barrier Run</i>			MD-10/Mod1							
Number of Impacted, Benefited Residences			8							
Number of Non-Impacted, Benefited Residences			6							
Total Number of Benefited Locations			14							
Barrier Length (feet)			1,678							
Average Barrier Height (feet)			22							
Area (feet ²)			36,765							
SF per Benefited Residence			2,626							
Feasible and Reasonable?			Yes							
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>										

D. Barrier System 495 MD-12 (NSA 2-04)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 2-04, a constant height noise barrier system of 24 feet measuring approximately 4,092 feet long, is proposed. The vast majority of the barrier is to be replaced, while a small existing barrier section is anticipated to remain and a proposed extension of 314 feet is to be included as part of the system. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the

impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 102 impacted, benefited residences and 20 non-impacted, benefited residences for a total of 122 benefited residences. The SF per benefited residence is 800, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this replacement, existing, and new noise barrier system is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-16**. The barrier location and benefit locations are shown on Maps No. 7 and 8. Barrier System 495 MD-12 *is considered feasible and reasonable* for NSA 2-04.

Table 4-16: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 2-04

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M2-4-1	5	78	15	63
M2-4-2	7	68	8	60
M2-4-3	7	76	14	62
M2-4-4	2	67	7	60
M2-4-5	11	70	8	62
M2-4-6	9	79	15	64
M2-4-7	8	67	7	60
M2-4-8	14	77	15	62
M2-4-9	3	69	9	60
M2-4-10	8	70	10	60
M2-4-11	5	71	10	61
M2-4-12	5	81	19	62
R2-4-4	5	66	7	59
R2-4-10	7	63	6	57
R2-4-11	10	63	6	57
R2-4-13	7	68	9	59
R2-4-14	6	69	9	60
R2-4-17	3	63	6	57

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)



Barrier Summary	
TNM Run / Barrier Run	MD-12/24ft
Number of Impacted, Benefited Residences	102
Number of Non-Impacted, Benefited Residences	20
Total Number of Benefited Locations	122
Barrier Length (feet)	4,092
Average Barrier Height (feet)	24
Area (feet ²)	97,646
SF per Benefited Residence	800
Feasible and Reasonable?	Yes

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.
 2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

E. Barrier System 495 MD-13 (NSA 2-05)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 2-05, a constant height barrier of 20 feet measuring approximately 4,507 feet long, is proposed. The barrier system consists of an existing barrier that will be replaced as well as a portion of existing to remain. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 109 impacted, benefited residences and 15 non-impacted, benefited residences for a total of 124 benefited residences. The SF per benefited residence is 719, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this replacement noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-17**. The barrier location and benefit locations are shown on Maps No. 7 and 8. Barrier System 495 MD-13 *is considered feasible and reasonable* for NSA 2-05.

Table 4-17: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 2-05

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M2-5-1	6	70	8	62
M2-5-2	10	76	12	64
M2-5-3	7	75	12	63
M2-5-4	11	68	7	61
M2-5-5	8	72	10	62
M2-5-6	9	80	14	66
M2-5-7	8	73	11	62
M2-5-8	12	78	14	64
M2-5-10	6	68	8	60
M2-5-11	6	66	5	61

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
M2-5-12	12	69	7	62
R2-5-3	2	63	5	58
R2-5-5	5	63	5	58
R2-5-6	5	62	5	57
R2-5-7	9	67	7	60
R2-5-9	5	68	7	61
R2-5-10	3	63	5	58

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	MD-1/Mod1
Number of Impacted, Benefited Residences	109
Number of Non-Impacted, Benefited Residences	15
Total Number of Benefited Locations	124
Barrier Length (feet)	4,507
Average Barrier Height (feet)	20
Area (feet ²)	89,165
SF per Benefited Residence	719
Feasible and Reasonable?	Yes

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.

2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.6 Area 6: I-495 top side, between MD 187 and I-270 east spur

A. Barrier System 495 MD-14 (NSA 2-06 and NSA 1-09A)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 2-06 and 1-09A, a barrier system measuring approximately 2,134 feet long, is proposed. The barrier system consists of an existing barrier to remain measuring approximately 1,534 feet, as well as a constant height 16-foot proposed barrier extension of approximately 600 feet. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 27 impacted, benefited residences and 7 non-impacted, benefited residences for a total of 34 benefited residences. The SF per benefited residence is 1,176, which is below the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-18**. The barrier location and benefit locations are shown on Map No. 8. Barrier System 495 MD-14 *is considered feasible and reasonable* for NSAs 2-06 and 1-09A.

Table 4-18: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 2-06 and 1-09A

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
M2-6-2	7	71	10	61								
M2-6-3	4	64	6	58								
M2-6-4	6	69	8	61								
M2-6-5	3	66	7	59								
M2-6-6	7	71	10	61								
M1-9-1	4	69	7	62								
M1-9-2	3	68	3	65								
R1-9-1	3	63	5	58								
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			MD-14/16ft									
Number of Impacted, Benefited Residences			27									
Number of Non-Impacted, Benefited Residences			7									
Total Number of Benefited Locations			34									
Barrier Length (feet)			2,134									
Average Barrier Height (feet)			19									
Area (feet ²)			39,979									
SF per Benefited Residence			1,176									
Feasible and Reasonable?			Yes									
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>												

B. Barrier System 495 MD-15 (NSA 1-10A)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 1-10A, a 28-foot barrier measuring approximately 1,869 feet long, is proposed. [The existing privately owned noise barrier, combined with an extended barrier was not able to provide at least 5 dB(A) noise reduction to 70% or more of the impacted residences.] The new noise barrier system was evaluated on the highway side of the existing privately owned noise barrier and was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 13.34 impacted, benefited residences and 10 non-impacted, benefited residences for a total of 23.34 benefited residences. The SF per benefited residence is 2,260, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-19**. The barrier location and benefit locations are shown on Map No. 8. Barrier System 495 MD-15 *is considered feasible and reasonable* for NSA 1-10A.

Table 4-19: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 1-10A

Receptor Number ¹	Equivalent Residences ²	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
M1-10-1	1.67	71	10	61								
M1-10-2	1.67	70	12	58								
M1-10-3	2	64	5	59								
M1-10-4	0.75	75	8	67								
R1-10-3	4	62	5	57								
R1-10-4	3	66	8	58								
R1-10-7	4	66	7	59								
R1-10-9	4	64	6	58								
R1-10-17	0.75	67	6	61								
R1-10-18	0.75	78	6	72								
R1-10-19	0.75	68	7	61								
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
TNM Run / Barrier Run		MD-15/Mod1										
Number of Impacted, Benefited Residences		13.34										
Number of Non-Impacted, Benefited Residences		10										
Total Number of Benefited Locations		23.34										
Barrier Length (feet)		1,884										
Average Barrier Height (feet)		28										
Area (feet ²)		52,752										
SF per Benefited Residence		2,260										
Feasible and Reasonable?		Yes										
<p>1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.</p> <p>2. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</p>												

4.6.7 Area 7: I-270 west spur, between I-495 and Democracy Boulevard

A. Barrier System 270-11 (NSA 5-36)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-36, a variable height noise barrier, ranging from 10 feet to 30 feet tall and measuring approximately 5,515 feet long, is proposed. Of the 5,515 feet, 1,081 feet is existing barrier to remain, 383 feet is existing barrier to be replaced, and the remainder is proposed new barrier. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 48 impacted, benefited residences and 42 non-impacted, benefited residences for a total of 90 benefited residences. The SF per benefited residence is 1,579, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-20**. The barrier location and benefit locations are shown on Map No. 6. Barrier System 270-11 *is considered feasible and reasonable* for the southern portion of NSA 5-36.

Table 4-20: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-36

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-36-01	1	79	14	65
5-36-02	1	78	13	65
5-36-03	1	76	12	64
5-36-04	1	74	10	64
5-36-05	1	71	8	63
5-36-06	1	68	6	62
5-36-07	1	68	6	62
5-36-08	1	66	3	63
5-36-09	1	69	3	66
5-36-12	1	64	5	59
5-36-13	1	66	6	60
5-36-14	1	66	6	60
5-36-15	1	70	8	62
5-36-16	1	76	8	68
5-36-17	1	79	11	68
5-36-18	1	73	13	60
5-36-19	1	66	8	58
5-36-20	1	63	6	57
5-36-26	1	64	5	59
5-36-28	1	65	6	59
5-36-29	1	66	6	60
5-36-30	1	67	6	61

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-36-31	1	67	6	61
5-36-32	1	67	7	60
5-36-33	1	67	7	60
5-36-34	1	67	7	60
5-36-35	1	66	6	60
5-36-36	1	67	7	60
5-36-37	1	67	8	59
5-36-38	1	64	6	58
5-36-48	1	62	5	57
5-36-49	1	65	7	58
5-36-50	1	64	6	58
5-36-51	1	68	9	59
5-36-52	1	68	6	62
5-36-53	1	68	6	62
5-36-54	1	68	7	61
5-36-55	1	69	8	61
5-36-56	1	69	8	61
5-36-57	1	70	9	61
5-36-58	1	70	9	61
5-36-59	1	71	10	61
5-36-60	1	74	12	62
5-36-61	1	75	12	63
5-36-62	1	75	13	62
5-36-63	1	75	13	62
5-36-64	1	75	14	61
5-36-65	1	76	15	61
5-36-66	1	76	13	63
5-36-67	1	74	12	62
5-36-68	1	71	10	61
5-36-69	1	68	8	60
5-36-70	1	64	6	58
5-36-71	1	63	5	58
5-36-72	1	72	10	62
5-36-73	1	66	7	59
5-36-74	1	64	6	58
5-36-75	1	66	8	58
5-36-76	1	63	6	57
5-36-77	1	63	6	57
5-36-78	1	62	6	56
5-36-79	1	61	5	56
5-36-80	1	61	5	56
5-36-82	1	62	5	57



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-36-83	1	62	5	57
5-36-84	1	62	5	57
5-36-85	1	62	5	57
5-36-86	1	62	5	57
5-36-87	1	62	5	57
5-36-88	1	62	5	57
5-36-89	1	63	5	58
5-36-90	1	64	6	58
5-36-91	1	64	6	58
5-36-92	1	65	7	58
5-36-93	1	65	7	58
5-36-94	1	66	8	58
5-36-95	1	67	9	58
5-36-96	1	63	6	57
5-36-97	1	63	6	57
5-36-98	1	63	6	57
5-36-99	1	63	6	57
5-36-100	1	63	6	57
5-36-101	1	62	5	57
5-36-102	1	62	5	57
5-36-103	1	63	6	57
5-36-104	1	62	5	57
5-36-105	1	62	5	57
5-36-106	1	62	5	57
5-36-107	1	62	5	57
5-36-108	1	62	5	57
5-36-109	1	62	5	57
5-36-110	1	66	8	58
5-36-111	1	63	4	59

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270-11/28ft
Number of Impacted, Benefited Residences	48
Number of Non-Impacted, Benefited Residences	42
Total Number of Benefited Locations	90
Barrier Length (feet)	5,515
Average Barrier Height (feet)	26
Area (feet ²)	142,125
SF per Benefited Residence	1,579
Feasible and Reasonable?	Yes
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.	

B. Barrier System 270-12A/B (NSA 5-37A)

This barrier system is comprised of three barriers that were evaluated to provide abatement to NSA 5-37A. A portion of an existing barrier from Democracy Boulevard to the end of the ramp to I-270 will be replaced; the remaining portion of the existing barrier will remain in place; and an extension along the neighborhood border was evaluated.

The entire barrier system as evaluated met the feasibility criteria of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences and the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of impacted residences. However, in all scenarios, the cost-reasonableness evaluation threshold was exceeded, which was 1,700 SF-p-r for this location (since sound levels are below 75 dB(A)). Since the entire system was not reasonable, the extension of the barrier (Barrier 270-12B) was evaluated separately from the replacement portion of the existing barrier (Barrier 270-12A).

For Barrier 270-12B, there are 2 impacted, benefited residences and 1 non-impacted, benefited residences for a total of 3 benefits. The 2045 Build Barrier predicted insertion losses, noise levels, and details on barrier design are shown in **Table 4-21**. The barrier location and benefit locations are shown on Map No. 6. Barrier 12B *is considered not feasible and not reasonable* for the southern portion of NSA 5-37A.

Table 4-21: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, south portion of NSA 5-37A

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
5-37-01	1	66	7	59								
5-37-02	1	67	7	60								
5-37-11	1	64	5	59								
<table border="1"> <tr> <td>Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td></td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive</td> </tr> <tr> <td>##</td> <td>Receptor Impacted</td> </tr> <tr> <td>##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors		Effective Noise Reduction (7 dBA or more) at Critical Sensitive	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											



Barrier Summary	
<i>TNM Run / Barrier Run</i>	270-12AB/Extension
Number of Impacted, Benefited Residences	2
Number of Non-Impacted, Benefited Residences	1
Total Number of Benefited Locations	3
Barrier Length (feet)	350
Average Barrier Height (feet)	18
Area (feet ²)	6,308
SF per Benefited Residence	2,103
Feasible and Reasonable?	No
<i>1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</i>	

For Barrier 270-12A, there are two impacted, benefited residences and no non-impacted, for a total of two benefited receptors. The 2045 Build Barrier predicted insertion losses, noise levels, and details on barrier design are shown in **Table 4-22**. The barrier location and benefit locations are shown on Map No. 6. Although Barrier 12A does not meet the cost-effectiveness criterion, since this portion of the barrier has to be replaced due to roadway design, this section of Barrier 270-12A will be **replaced to meet or exceed the existing noise barrier performance**.

Table 4-22: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, north portion of NSAs 5-37A

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
5-37-08	1	70	10	60								
5-37-09	1	71	9	62								
<table border="1" style="margin-left: 20px;"> <tr> <td>Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td>##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td>##</td> <td>Receptor Impacted</td> </tr> <tr> <td>##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>	270-12AB/Optimized Barrier											
Number of Impacted, Benefited Residences	2											
Number of Non-Impacted, Benefited Residences	0											
Total Number of Benefited Locations	2											
Barrier Length (feet)	347											
Average Barrier Height (feet)	20											
Area (feet ²)	6,933											
SF per Benefited Residence	2,311											
Feasible and Reasonable?	N/A*											
* Although the Barrier 270-12A does not meet the cost effectiveness criterion, since this portion of the barrier has to be replaced due to roadway design, this section of the barrier will be replaced to meet or exceed the existing noise barrier performance.												
<i>1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.</i>												

C. Barrier System 270-12C/D (NSA 5-37B)

This barrier system is comprised of two barriers that were evaluated to provide abatement to NSA 5-37B. The entire barrier system as evaluated met the feasibility criteria of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences and the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of impacted residences. However, in all scenarios, the cost-reasonableness evaluation threshold was exceeded, which was 2,700 SF-p-r for this location (since sound levels are above 75 dB(A)). Since the entire system was not reasonable, the southern portion of the barrier system located in front of the residences and the tennis courts (Barrier 270-12C) was evaluated separately from the northern portion of the barrier system located in front of the golf course (Barrier 270-12D).

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in the southern portion of NSA 5-37B, a variable height noise barrier, ranging from 24 feet to 32 feet tall and measuring approximately 641 feet long, is proposed. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 13.44 impacted, benefited residences and 1 non-impacted, benefited residences for a total of 14.44 benefited residences. The SF per benefited residence is 1,215, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-23**. The barrier location and benefit locations are shown on Map No. 5. Barrier System 270-12C *is considered feasible and reasonable* for NSA 5-37B.

Table 4-23: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-37B

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-37-20	0.44	71	5	66
5-37-21	1	80	13	67
5-37-22	1	79	16	63
5-37-23	1	79	16	63
5-37-24	1	77	15	62
5-37-25	1	77	15	62
5-37-26	1	76	14	62
5-37-27	1	75	13	62
5-37-28	1	72	12	60
5-37-29	1	72	11	61
5-37-30	1	71	10	61
5-37-31	1	70	9	61
5-37-32	1	69	9	60

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)						
5-37-33	1	66	6	60						
5-37-34	1	65	5	60						
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors									
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Receptor Impacted									
##	Receptor Benefited by Barrier (5 dBA or more)									
Barrier Summary										
<i>TNM Run / Barrier Run</i>			270-12B/Mod1							
Number of Impacted, Benefited Residences			13.44							
Number of Non-Impacted, Benefited Residences			1							
Total Number of Benefited Locations			14.44							
Barrier Length (feet)			641							
Average Barrier Height (feet)			27							
Area (feet ²)			17,539							
SF per Benefited Residence			1,215							
Feasible and Reasonable?			Yes							
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.										

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in the northern portion of NSA 5-37B, a constant height noise barrier of 24 feet, measuring 2,662 feet long was assessed at the edge of shoulder, and an additional constant height noise barrier of 16 feet, measuring 1,130 feet long was assessed at the edge of the structure carrying I-495 over I-270. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted equivalent residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted equivalent residences.

There are 13 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 13 benefited residences. The SF per benefited residence is 6,306, which is above the 2,700 SF-p-r threshold for this barrier system; therefore, this noise barrier is considered to not meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-24**. The barrier location and benefit locations are shown on Maps No. 5 and 6. Barrier System 270-12D *is considered feasible but not reasonable* for NSA 5-37B.

Table 4-24: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-37B

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)								
5-37-40	3.25	73	8	65								
5-37-41	3.25	75	7	68								
5-37-42	3.25	71	7	64								
5-37-43	3.25	69	5	64								
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="background-color: #e6f2ff;"></td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors		Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			270-12CD/Mod1									
Number of Impacted, Benefited Residences			13									
Number of Non-Impacted, Benefited Residences			0									
Total Number of Benefited Locations			13									
Barrier Length (feet)			3,792									
Average Barrier Height (feet)			27									
Area (feet ²)			81,978									
SF per Benefited Residence			6,306									
Feasible and Reasonable?			No									
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.												

4.6.8 Area 8: I-270 west spur, between Democracy Boulevard and Westlake Terrace

A. Barrier System 270-10 - NSA 5-32B

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-32B a 22-foot high noise barrier, approximately 2,100 feet long, is proposed. The new barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 2.42 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 2.42 benefited residences. The SF per benefited residence is 19,091, which is more than the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this proposed noise barrier is not considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in Table 4-25. The barrier location and benefit locations are shown on Maps No. 6 and 11. The noise barrier *is considered feasible and is not considered reasonable* for NSA 5-32.

Table 4-25: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-32

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-32-1	1.00	69	7	62
5-32-2	0.71	71	9	62
5-32-3	0.71	67	5	62

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	270-10 NSA 5-32 Mit/270-10 22' OPT
Number of Impacted, Benefited Residences	2.42
Number of Non-Impacted, Benefited Residences	0
Total Number of Benefited Locations	2.42
Barrier Length (feet)	2,100
Average Barrier Height (feet)	22
Area (feet ²)	46,201
SF per Benefited Residence	19,091
Feasible and Reasonable?	No

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.9 Area 9: I-270 east spur, between I-495 and MD 187

A. Barrier System 270-8 (NSA 5-33A)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-33A, a constant height noise barrier of 28 feet measuring approximately 5,562 feet long, is proposed. The new noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 70 impacted, benefited residences and 93 non-impacted, benefited residences for a total of 163 benefited residences. The SF per benefited residence is 956, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-26**. The barrier location and benefit locations are shown on Maps No. 9 and 10. Barrier System 270-8 **is considered feasible and reasonable** for NSA 5-33A.

Table 4-26: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-33A

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-33-2	1	71	12	59
5-33-3	1	68	9	59
5-33-4	1	68	9	59
5-33-5	1	71	11	60
5-33-6	1	69	11	58
5-33-7	1	70	11	59
5-33-8	1	64	5	59
5-33-9	1	65	6	59
5-33-10	1	65	6	59
5-33-11	1	66	8	58
5-33-12	1	65	7	58
5-33-13	1	66	8	58
5-33-18	1	64	6	58
5-33-34	2	65	7	58
5-33-35	2	64	5	59
5-33-36	2	62	5	57
5-33-37	1	63	6	57
5-33-38	2	64	7	57
5-33-40	2	62	5	57
5-33-41	1	65	7	58
5-33-42	1	71	11	60
5-33-43	2	68	9	59
5-33-44	2	65	7	58
5-33-45	2	66	7	59
5-33-46	1	62	5	57
5-33-47	2	62	6	56
5-33-55	2	62	5	57
5-33-57	2	64	6	58
5-33-58	2	65	7	58
5-33-59	1	65	7	58
5-33-60	1	65	7	58
5-33-70	2	68	8	60
5-33-71	2	69	9	60
5-33-72	2	70	10	60
5-33-73	2	70	9	61
5-33-74	2	70	9	61
5-33-75	2	69	8	61
5-33-76	2	68	8	60
5-33-77	2	65	7	58
5-33-78	1	64	6	58
5-33-79	2	66	7	59

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-33-80	1	62	5	57
5-33-82	1	65	7	58
5-33-84	1	64	6	58
5-33-85	1	66	8	58
5-33-86	1	66	8	58
5-33-87	1	64	6	58
5-33-88	1	65	7	58
5-33-89	2	62	5	57
5-33-90	2	62	5	57
5-33-114	2	68	10	58
5-33-115	2	67	10	57
5-33-116	2	65	8	57
5-33-117	2	64	7	57
5-33-118	2	61	5	56
5-33-120	4	69	9	60
5-33-121	4	69	9	60
5-33-122	4	68	8	60
5-33-123	4	68	8	60
5-33-124	4	66	7	59
5-33-125	4	63	5	58
5-33-129	4	65	7	58
5-33-130	4	63	6	57
5-33-131	4	61	5	56
5-33-138	4	61	5	56
5-33-139	4	61	5	56
5-33-151	1	63	5	58
5-33-152	2	62	5	57
5-33-153	3	63	5	58
5-33-154	4	64	7	57
5-33-155	2	68	9	59
5-33-156	2	68	10	58
5-33-157	1	63	6	57
5-33-158	1	62	5	57
5-33-159	2	62	5	57
5-33-160	2	61	5	56
5-33-163	1	65	8	57
5-33-164	1	63	7	56
5-33-165	2	66	9	57
5-33-166	2	61	5	56
5-33-171	2	66	6	60
5-33-175	2	67	7	60
5-33-176	1	62	6	56

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-33-189	1	67	5	62
5-33-190	1	67	4	63
5-33-191	2	67	4	63
5-33-192	1	67	4	63
5-33-193	1	67	4	63
5-33-194	2	67	3	64
5-33-195	1	68	4	64
5-33-196	2	68	4	64
5-33-197	2	68	3	65
5-33-198	2	68	3	65
5-33-199	2	68	2	66
5-33-220	1	66	2	64
5-33-225	2	80	8	72
5-33-226	2	77	17	60

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	270-08A/28ft
Number of Impacted, Benefited Residences	70
Number of Non-Impacted, Benefited Residences	93
Total Number of Benefited Locations	163
Barrier Length (feet)	5,562
Average Barrier Height (feet)	28
Area (feet ²)	155,760
SF per Benefited Residence	956
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

B. Barrier System 270-9 (NSA 5-34A)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-34A, a variable height noise barrier, ranging from 13 feet to 30 feet tall and measuring approximately 4,069 feet long, is proposed. Of the 4,069 feet, 753 feet is a proposed barrier extension and the remainder is the existing barrier to remain. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 58 impacted, benefited residences and 17 non-impacted, benefited residences for a total of 75 benefited residences. The SF per benefited residence is 1,171, which is below the 1,700 SF-p-r threshold

for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-27**. The barrier location and benefit locations are shown on Maps No. 9 and 10. Barrier System 270-9 *is considered feasible and reasonable* for NSA 5-34A.

Table 4-27: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-34A

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-34-13	2	66	6	60
5-34-14	3	71	9	62
5-34-15	1	72	10	62
5-34-16	1	73	10	63
5-34-17	1	72	11	61
5-34-18	1	71	10	61
5-34-19	1	70	10	60
5-34-22	2	66	7	59
5-34-23	1	66	7	59
5-34-28	1	64	5	59
5-34-29	1	63	5	58
5-34-34	1	69	9	60
5-34-35	1	72	11	61
5-34-36	1	72	10	62
5-34-37	1	72	11	61
5-34-38	1	70	10	60
5-34-39	1	66	7	59
5-34-40	1	67	8	59
5-34-41	1	68	8	60
5-34-42	1	69	9	60
5-34-43	1	68	9	59
5-34-44	1	66	7	59
5-34-45	1	67	8	59
5-34-46	1	67	8	59
5-34-47	1	65	7	58
5-34-48	3	66	7	59
5-34-49	1	67	8	59
5-34-50	1	67	8	59
5-34-51	1	66	7	59
5-34-52	2	71	11	60
5-34-53	2	70	9	61
5-34-54	3	68	8	60
5-34-55	3	69	9	60
5-34-56	2	70	8	62



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-34-57	1	73	10	63
5-34-58	1	65	6	59
5-34-59	2	64	5	59
5-34-61	1	65	6	59
5-34-62	1	66	6	60
5-34-63	1	70	8	62
5-34-64	1	65	7	58
5-34-66	2	65	7	58
5-34-67	1	65	6	59
5-34-68	1	68	7	61
5-34-69	1	65	6	59
5-34-70	2	67	7	60
5-34-71	1	62	5	57
5-34-72	2	63	5	58
5-34-73	1	68	9	59
5-34-74	1	66	8	58
5-34-75	2	65	7	58
5-34-77	1	71	7	64
5-34-78	1	69	7	62
5-34-79	1	67	5	62
5-34-80	1	66	5	61
5-34-83	1	73	5	68
5-34-84	1	72	4	68
5-34-85	1	71	3	68
5-34-86	1	70	2	68
5-34-87	1	69	2	67
5-34-88	1	68	2	66
5-34-89	0.5	72	8	64
5-34-90	0.5	74	7	67

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	270-09A_B/24ft
Number of Impacted, Benefited Residences	58
Number of Non-Impacted, Benefited Residences	17
Total Number of Benefited Locations	75
Barrier Length (feet)	4,069
Average Barrier Height (feet)	22
Area (feet ²)	87,785
SF per Benefited Residence	1,171
Feasible and Reasonable?	Yes
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.	

4.6.10 Area 10: I-270 west and east spurs, between Y-split and Westlake Terrace and MD 187

A. Barrier System 270-7B (NSA 5-31)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-31, a combined replaced and existing noise barrier system is proposed measuring approximately 3,755 feet long. Of the length, 2,618 feet will remain as an existing barrier in place. The remainder, 1,137 feet, will be a replaced barrier on new alignment. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 21 impacted, benefited residences and 14 non-impacted, benefited residences for a total of 35 benefited residences. The SF per benefited residence is 1,172, which is below the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-28**. The barrier location and benefit locations are shown on Map No. 9. Barrier system 270-07B *is considered feasible and reasonable* for NSA 5-31.

Table 4-28: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-31

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-31-07	1	66	4	62
5-31-08	1	67	5	62
5-31-09	1	70	7	63
5-31-10	1	69	7	62
5-31-11	1	71	9	62
5-31-12	1	70	9	61
5-31-13	1	68	8	60
5-31-14	1	67	7	60
5-31-15	1	66	6	60

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)								
5-31-16	1	65	6	59								
5-31-17	1	66	7	59								
5-31-18	1	67	8	59								
5-31-19	1	66	7	59								
5-31-20	1	64	5	59								
5-31-22	2	63	5	58								
5-31-23	2	65	7	58								
5-31-24	2	64	6	58								
5-31-26	2	64	6	58								
5-31-27	2	67	7	60								
5-31-28	2	65	5	60								
5-31-32	2	68	7	61								
5-31-33	2	68	6	62								
5-31-34	2	66	5	61								
5-31-35	2	65	5	60								
5-31-40	2	66	7	59								
5-31-41	2	67	3	64								
5-31-42	2	68	4	64								
<table border="1"> <tr><td>Bold</td><td>Critical Sensitive Receptors</td></tr> <tr><td></td><td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td></tr> <tr><td>##</td><td>Receptor Impacted</td></tr> <tr><td>##</td><td>Receptor Benefited by Barrier (5 dBA or more)</td></tr> </table>					Bold	Critical Sensitive Receptors		Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>		270-07B/sound levels with 270-07B and 07A										
Number of Impacted, Benefited Residences		21										
Number of Non-Impacted, Benefited Residences		14										
Total Number of Benefited Locations		35										
Barrier Length (feet)		3,755										
Average Barrier Height (feet)		11										
Area (feet ²)		41,020										
SF per Benefited Residence		1,172										
Feasible and Reasonable?		Yes										
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.												

B. Barrier System 270-7A (NSA 5-30)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-30, a 16-foot high noise barrier, approximately 2,860 feet long, is proposed. Of the length, 688 feet will remain as an existing barrier in place. The remainder, 2,172 feet, will be a replacement barrier on new alignment. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or

more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 17 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 17 benefited residences. The SF per benefited residence is 2,692, which is less than the 2,700 SF-p-r threshold (since sound levels are above 75 dB(A)); therefore, this proposed noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-29**. The barrier location and benefit locations are shown on Map No. 11. Barrier System 270-7A is **considered feasible and is reasonable** for NSA 5-30.

Table 4-29: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-30

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-30-01	1	71	4	67
5-30-02	1	70	4	66
5-30-03	1	72	6	67
5-30-04	1	74	8	67
5-30-05	1	77	9	67
5-30-06	1	78	10	68
5-30-10	1	66	5	61
5-30-11	1	67	7	60
5-30-12	1	71	8	62
5-30-13	1	76	13	64
5-30-14	1	77	15	62
5-30-15	1	75	13	62
5-30-16	1	73	10	63
5-30-17	1	73	9	64
5-30-18	1	74	9	65
5-30-19	1	73	9	63
5-30-20	1	72	9	63
5-30-21	1	70	8	62
5-30-22	1	70	8	62

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270_8+4_136B_Mit/Optimized Barrier
Number of Impacted, Benefited Residences	17
Number of Non-Impacted, Benefited Residences	0
Total Number of Benefited Locations	17
Barrier Length (feet)	2,860
Average Barrier Height (feet)	16
Area (feet ²)	45,762
SF per Benefited Residence	2,692
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.11 Area 11: I-270 mainline, between Y-split and Montrose Road

A. Barrier System 270-15 (NSA 5-29)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-29 a combination of existing, replaced and new barrier totaling approximately 5,885 feet in length and an average of 21 feet tall is proposed. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 64 impacted, benefited residences and 15 non-impacted, benefited residences for a total of 79 benefited residences. The SF per benefited residence is 1,554, which is less than the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-29**. The barrier location and benefit locations are shown on Maps No. 11 and 12. Barrier System 270-15 *is considered feasible and is considered reasonable* for NSA 5-30.

Table 4-30: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-29

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-29-5	1	66	3	63
5-29-8	2	67	2	65
5-29-9	2	69	1	68
5-29-12	2	69	2	67
5-29-13	2	68	4	64
5-29-14	3	67	4	63
5-29-15	5	69	2	68
5-29-16	1	77	8	69
5-29-17	1	78	9	69
5-29-18	1	79	9	69
5-29-19	1	79	10	69

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-29-20	1	78	11	67
5-29-21	1	78	12	66
5-29-22	1	78	13	65
5-29-23	1	78	14	64
5-29-24	1	76	14	63
5-29-25	1	75	13	62
5-29-26	1	72	10	62
5-29-27	1	71	9	62
5-29-28	1	70	9	61
5-29-29	1	72	11	61
5-29-30	2	72	12	60
5-29-31	1	75	13	62
5-29-32	1	76	15	61
5-29-33	1	73	12	61
5-29-34	1	73	13	60
5-29-35	1	73	12	61
5-29-36	1	74	12	62
5-29-37	1	72	11	61
5-29-38	1	73	11	62
5-29-39	1	73	9	64
5-29-40	1	71	8	63
5-29-41	1	70	7	63
5-29-42	1	72	6	66
5-29-43	1	72	5	68
5-29-44	1	67	2	65
5-29-50	5	65	6	59
5-29-51	2	67	7	60
5-29-52	4	68	9	60
5-29-53	1	66	6	60
5-29-57	3	64	5	59
5-29-58	2	68	7	61
5-29-59	1	68	6	62
5-29-60	5	70	7	63
5-29-65	3	64	5	60
5-29-66	1	66	6	60
5-29-67	4	64	5	59
5-29-77	3	66	5	61
5-29-78	1	70	6	64
5-29-79	1	72	7	65
5-29-80	1	74	4	71
5-29-81	1	75	4	71
5-29-82	1	75	7	68



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-29-83	1	70	6	63
5-29-84	1	72	9	63
5-29-85	1	75	9	66
5-29-86	1	74	9	65
5-29-87	1	75	9	66
5-29-88	1	74	8	66
5-29-89	1	73	9	64
5-29-90	1	71	8	63
5-29-91	1	69	6	63
5-29-92	1	67	5	63
5-29-107	1	69	6	64
5-29-108	2	66	5	61

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270_8+4_270-15 NSA 5-29 Mit/270-15 Opt
Number of Impacted, Benefited Residences	64
Number of Non-Impacted, Benefited Residences	15
Total Number of Benefited Locations	79
Barrier Length (feet)	5,885
Average Barrier Height (feet)	21
Area (feet ²)	122,782
SF per Benefited Residence	1,554
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.12 Area 12: I-270 mainline, between Montrose Road and MD 189

A. Barrier System 270-16 (NSA 5-24)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-24, a 30-foot high noise barrier, approximately 2,154 feet long, is proposed. The new barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. However, the barrier system fails to meet the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There is 14 impacted, benefited residences and 10 non-impacted, benefited residences for a total of 24 benefited residences. The SF per benefited residence is 2,307, which is more than the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is not considered to meet the cost effectiveness criterion.



The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-31**. The barrier location and benefit locations are shown on Map No. 14. Barrier System 270-16 is **considered feasible and is not considered reasonable** for NSA 5-24.

Table 4-31: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-24

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-24-1	1	63	6	57
5-24-2	2	66	9	57
5-24-3	1	67	11	57
5-24-4	1	66	7	60
5-24-5	1	66	6	60
5-24-6	2	63	6	57
5-24-8	2	65	6	59
5-24-9	1	65	6	60
5-24-10	1	66	6	60
5-24-11	1	67	6	60
5-24-12	2	63	6	58
5-24-13	1	66	6	60
5-24-14	1	67	6	60
5-24-17	1	66	6	60
5-24-18	2	66	5	60
5-24-19	2	66	6	61
5-24-20	2	65	6	59

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
<i>TNM Run / Barrier Run</i>	270-16_NSA_5-24_Mit/270-16 NSA 5-24 30'
Number of Impacted, Benefited Residences	14
Number of Non-Impacted, Benefited Residences	10
Total Number of Benefited Locations	24
Barrier Length (feet)	2,154
Average Barrier Height (feet)	30
Area (feet ²)	64,609
SF per Benefited Residence	2,307
Feasible and Reasonable?	No

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.13 Area 13: I-270 mainline, between MD 189 and MD 28

A. Barrier System 270-6 (NSA 5-22, 5-19, and 5-18)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 5-18, 5-19, and 5-22, a constant height noise barrier of 24 feet measuring approximately 4,769 feet long, is proposed. An existing berm is present in the area, but a new proposed barrier provides better noise abatement for the corridor. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 47 impacted, benefited residences and 44.67 non-impacted, benefited residences for a total of 91.67 benefited residences. The SF per benefited residence is 1,247, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-32**. The barrier location and benefit locations are shown on Maps No. 14 and 15. Barrier System 270-6 *is considered feasible and reasonable* for NSAs 5-22, 5-19, and 5-18.

Table 4-32: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 5-18, 5-19, & 5-22

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-18-2	1	67	8	59
5-18-3	1	69	9	60
5-18-7	1	63	5	58
5-18-8	1	73	11	62
5-18-9	1	67	7	60
5-18-10	1	75	13	62
5-19-1	2	65	7	58
5-19-2	2	65	7	58
5-19-3	2	66	7	59
5-19-4	2	67	8	59
5-19-5	3	68	9	59
5-19-6	2	69	9	60
5-19-8	2	62	5	57
5-19-9	2	62	5	57
5-19-10	1	62	5	57
5-19-11	2	65	7	58
5-19-12	2	66	8	58
5-19-13	2	68	9	59
5-19-14	2	66	8	58
5-19-15	2	63	5	58
5-19-19	6	63	6	57
5-19-24	2	62	5	57
5-19-29	6	62	5	57

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)								
5-19-31	2	63	5	58								
5-19-32	2	64	5	59								
5-19-38	2	62	5	57								
5-19-45	1	63	5	58								
5-19-46	1	64	6	58								
5-19-47	6	66	6	60								
5-19-48	5	67	7	60								
5-19-49	5	68	8	60								
5-19-50	7	67	7	60								
5-19-51	6	65	5	60								
5-19-52	2	69	10	59								
5-19-53	1	63	5	58								
5-22-1	1.67	65	6	59								
5-22-2	1	66	8	58								
5-22-3	1	71	11	60								
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			270-06/24ft									
Number of Impacted, Benefited Residences			47									
Number of Non-Impacted, Benefited Residences			44.67									
Total Number of Benefited Locations			91.67									
Barrier Length (feet)			4,769									
Average Barrier Height (feet)			24									
Area (feet ²)			114,305									
SF per Benefited Residence			1,247									
Feasible and Reasonable?			Yes									
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.												

B. Barrier System 270-14 (NSA 5-21, 5-20, and 5-17)

In order to provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 5-21, 5-20, and 5-17, a combination of existing, replaced, and new barrier totaling 4,666 feet in length is proposed. The existing barrier to remain measures approximately 2,260 feet and the replaced barrier on new alignment measures 1,822 feet. In order to address impacts in NSA 5-21, an extended new barrier of 584 feet is proposed. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 84 impacted, benefited residences and 3 non-impacted, benefited residences for a total of 87 benefited residences. The SF per benefited residence is 957, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-33**. The barrier location and benefit locations are shown on Maps No. 14 and 15. Barrier System 270-14 *is considered feasible and reasonable* for NSAs 5-21, 5-20, and 5-17.

Table 4-33: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 5-21, 5-20, 5-17

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-17-1	1	73	8	65
5-17-2	2	74	8	66
5-17-3	2	75	9	66
5-17-4	2	77	11	66
5-17-5	2	80	9	71
5-17-6	1	77	11	66
5-17-7	2	75	11	64
5-17-8	1	72	10	62
5-17-9	1	74	11	63
5-17-10	2	76	12	64
5-17-11	2	78	13	65
5-17-12	2	78	14	64
5-17-13	2	75	12	63
5-17-14	1	72	10	62
5-17-15	1	69	8	61
5-17-16	2	68	7	61
5-17-17	2	69	7	62
5-17-18	2	71	8	63
5-17-19	2	77	14	63
5-17-20	2	72	9	63
5-17-21	2	72	10	62
5-17-22	2	70	9	61
5-17-23	2	69	8	61
5-17-24	2	72	9	63
5-17-25	2	74	11	63
5-17-26	2	76	12	64
5-17-27	5	67	7	60
5-17-35	1	66	6	60
5-17-36	2	67	5	62
5-20-1	2	69	6	63
5-20-2	2	71	8	63
5-20-3	2	74	10	64



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-20-4	1	75	10	65
5-20-5	2	76	11	65
5-20-6	2	76	10	66
5-20-7	2	76	10	66
5-20-13	2	67	6	61
5-20-14	2	66	6	60
5-20-17	1	68	5	63
5-21-1	1	69	6	63
5-21-2	1	67	5	62
5-21-4	1	69	5	64
5-21-5	1	75	9	66
5-21-6	1	75	9	66
5-21-7	1	78	12	66
5-21-8	1	77	11	66
5-21-9	1	76	10	66
5-21-10	1	74	9	65
5-21-11	1	69	8	61
5-21-12	1	75	11	64
5-21-13	1	67	7	60
5-21-16	2	65	5	60
5-21-17	1	65	5	60

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270-14/20ft
Number of Impacted, Benefited Residences	84
Number of Non-Impacted, Benefited Residences	3
Total Number of Benefited Locations	87
Barrier Length (feet)	4,666
Average Barrier Height (feet)	18
Area (feet ²)	83,256
SF per Benefited Residence	957
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.14 Area 14: I-270 mainline, between MD 28 and Shady Grove Road

A. Barrier System 270-05 (NSAs 5-15, 5-13, and 5-12)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 5-15, 5-13, and 5-12 a combination of existing, replaced and new barrier totaling approximately 5,952 feet in length and an average of 22 feet tall is proposed. The noise barrier system was shown to meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 67.05 impacted, benefited residences and 11.10 non-impacted, benefited residences for a total of 78.15 benefited residences. The SF per benefited residence is 1,676, which is less than the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this proposed noise barrier is considered to be meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-34**. The barrier location and benefit locations are shown on Maps No. 15 and 16. Barrier System 270-05 *is considered feasible and reasonable* for NSA 5-15, 5-13, and 5-12.

Table 4-34: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-12

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-12-2	1	79	17	62
5-12-3	1	78	16	62
5-12-4	1	77	15	62
5-12-5	1	77	15	62
5-12-6	1	77	14	63
5-12-7	1	77	14	63
5-12-8	1	78	14	64
5-12-9	1	77	13	64
5-12-10	1	79	14	65
5-12-11	1	78	14	64
5-12-12	1	67	6	61
5-12-14	1	73	12	61
5-12-15	1	68	9	59
5-12-16	2	64	6	58
5-12-20	3	63	5	58
5-12-30	2	66	5	61
5-12-33	2	66	5	61
5-12-36	2	72	9	63
5-12-37	2	73	9	64
5-12-38	3	73	8	65
5-12-39	4	68	7	61
5-12-45	2	65	5	60
5-12-46	4	69	7	62



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-12-50	4	67	4	63
5-12-51	3	66	3	63
5-12-52	2	65	5	60
5-12-57	6	68	5	63
5-12-61	3	66	4	62
5-12-67	2	68	6	62
5-12-69	6	68	5	63
5-12-92	0.59	66	6	60
5-13-1	0.76	65	6	59
5-13-2	0.76	64	5	59
5-15-1	3	69	8	61
5-15-2	2	68	7	61
5-15-3	2	68	7	61
5-15-4	3	68	6	62
5-15-5	2	68	7	61
5-15-6	3	66	6	60
5-15-7	0.05	71 (46) ²	9	62 (37)
5-15-9	2	66	6	60
5-15-15	2	67	7	60
5-15-19	2	68	8	60

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270_8+4_5-12_Mit/270-05 Opt
Number of Impacted, Benefited Residences	67.05
Number of Non-Impacted, Benefited Residences	11.10
Total Number of Benefited Locations	78.15
Barrier Length (feet)	5,952
Average Barrier Height (feet)	22
Area (feet ²)	130,981
SF per Benefited Residence	1,676
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.
 2. Parenthesis indicates interior sound levels. For this receptor, a building noise reduction factor of 25 dB(A) was assumed as described in Section 2.2.1.N.



B. Barrier System 270-13 (NSA 5-11)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-11, a 16-foot high noise barrier, approximately 737 feet long, was evaluated. The new barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There is 0.36 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 0.36 benefited residences. The SF per benefited residence is 32,769, which is more than the 1,700 SF-p-r threshold for this barrier system (since sound levels are less than 75 dB(A)); therefore, this noise barrier is not considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-35**. The barrier location and benefit locations are shown on Map No. 16. Barrier System 270-13 is considered **feasible and is not considered reasonable** for NSA 5-11.

Table 4-35: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-11

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)								
5-11-04	0.36	74	7	67								
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			270_8+4_Wall 270-13/270-13 16'									
Number of Impacted, Benefited Residences			0.36									
Number of Non-Impacted, Benefited Residences			0									
Total Number of Benefited Locations			0.36									
Barrier Length (feet)			737									
Average Barrier Height (feet)			16									
Area (feet ²)			11,797									
SF per Benefited Residence			32,769									
Feasible and Reasonable?			No									
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.												

C. Barrier System 270-3 (NSA 5-10)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSA 5-10, a 20-foot high noise barrier, approximately 1,441 feet long, was evaluated. The new barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 0.33 impacted, benefited residences and 0.50 non-impacted, benefited residences for a total of 0.83 benefited residences. The SF per benefited residence is 34,734, which is more than the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this noise barrier is not considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-36**. The barrier location and benefit locations are shown on Map No. 16. Barrier System 270-03 is **considered feasible and is not considered reasonable** for NSA 5-10.

Table 4-36: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-10

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)								
R-5-10-01	0.50	69	7	63								
R-5-10-02	0.33	73	8	65								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Bold</td> <td>Critical Sensitive Receptors</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Impacted</td> </tr> <tr> <td style="text-align: center;">##</td> <td>Receptor Benefited by Barrier (5 dBA or more)</td> </tr> </table>					Bold	Critical Sensitive Receptors	##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor	##	Receptor Impacted	##	Receptor Benefited by Barrier (5 dBA or more)
Bold	Critical Sensitive Receptors											
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor											
##	Receptor Impacted											
##	Receptor Benefited by Barrier (5 dBA or more)											
Barrier Summary												
<i>TNM Run / Barrier Run</i>			270_8+4_Wall 3/Wall 270-03 20'									
Number of Impacted, Benefited Residences			0.33									
Number of Non-Impacted, Benefited Residences			0.50									
Total Number of Benefited Locations			0.83									
Barrier Length (feet)			1,441									
Average Barrier Height (feet)			20'									
Area (feet ²)			28,829									
SF per Benefited Residence			34,734									
Feasible and Reasonable?			No									
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.												

D. Barrier System 270-2 (NSA 5-09 and 5-08)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 5-09 and 5-08 a 30-foot high noise barrier, approximately 1,630 feet long, was evaluated. The new barrier system does not meet the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also fails to meet the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 7.27 impacted, benefited residences and 35.40 non-impacted, benefited residences for a total of 42.67 benefited residences. The SF per benefited residence is 1,146, which is less than the 1,700 SF-p-r threshold for this barrier system (since sound levels are below 75 dB(A)); therefore, this proposed noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-37**. The barrier location and benefit locations are shown on Maps No. 16 and 17. Barrier System 270-2 is **not considered feasible and is not considered reasonable** for NSAs 5-09 and 5-08.

Table 4-37: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-09 and 5-08

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-08-1	4	64	7	57
5-08-2	4	65	8	57
5-08-3	4	66	6	60
5-08-4	4	67	1	66
5-08-5	4	67	1	66
5-08-8	4	63	6	57
5-08-9	4	64	7	57
5-08-10	4	65	6	59
5-08-11	4	66	1	65
5-08-12	0.23	61	5	57
5-08-13	4	62	6	56
5-08-14	4	64	7	57
5-08-15	4	64	6	58
5-08-17	0.17	63	6	58
5-08-19	4	66	2	63
5-08-20	4	66	2	64
5-08-21	4	66	1	65
5-08-22	4	68	1	67
5-08-23	4	69	0	68
5-09-11	0.27	67	6	61
5-09-12	3	65	4	60
5-09-17	3	67	6	60
5-09-18	3	63	6	57

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270_8+4_Wall_2/Wall 270-02 30'
Number of Impacted, Benefited Residences	7.27
Number of Non-Impacted, Benefited Residences	35.40
Total Number of Benefited Locations	42.67
Barrier Length (feet)	1,630
Average Barrier Height (feet)	30
Area (feet ²)	48,906
SF per Benefited Residence	1,146
Feasible and Reasonable?	No
1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.	

4.6.15 Area 15: I-270 mainline, between Shady Grove Road and I-370

A. Barrier System 270-1 (NSA 5-07 and 5-06)

To provide 7 dB(A) insertion loss at the critical sensitive receptors in NSAs 5-06 and 5-07, a 26-foot high noise barrier, approximately 3,834 feet long, was evaluated. The barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 1.35 impacted, benefited residences and 13.37 non-impacted, benefited residences for a total of 14.72 benefited residences. The SF per benefited residence is 6,772, which is more than the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is not considered to meet the cost effectiveness criterion.

The 2045 Build Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-38**. The barrier location and benefit locations are shown on Map No. 17. Barrier System 270-01 is **not considered feasible and is not considered reasonable** for NSAs 5-07 and 5-06.

Table 4-38: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSAs 5-07, 5-06

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-06-3	0.33	67	8	59
5-06-4	0.73	65	6	59
5-06-6	0.18	64	6	58
5-06-7	0.73	66	7	58
5-06-8	0.73	65	6	59
5-06-11	0.27	65	7	58
5-06-12	0.27	65	7	59
5-06-15	0.15	66	7	59
5-06-16	0.15	67	8	59
5-06-17	0.15	68	7	61
5-06-18	0.15	68	6	62
5-06-19	0.15	69	5	64

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction	2045 Build Barrier Predicted Noise Level (Leq)
5-06-20	0.15	69	5	65
5-06-21	n/a	70	4	66
5-06-22	0.15	66	8	59
5-06-23	0.15	67	8	59
5-06-24	0.15	68	8	61
5-06-25	0.15	69	6	62
5-06-26	0.15	69	6	64
5-06-27	0.15	70	5	65
5-06-28	n/a	70	4	66
5-06-29	n/a	70	3	67
5-07-1	0.09	74	12	62
5-07-2	0.09	70	10	60
5-07-3	0.2	76	11	64
5-07-5	5	63	6	58
5-07-9	4.00	62	5	58
5-07-28	0.3	66	6	60

Bold	Critical Sensitive Receptors
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

Barrier Summary	
TNM Run / Barrier Run	270_8+4_Wall_1/270-01 26'
Number of Impacted, Benefited Residences	1.35
Number of Non-Impacted, Benefited Residences	13.37
Total Number of Benefited Locations	14.72
Barrier Length (feet)	3,834
Average Barrier Height (feet)	26
Area (feet ²)	99,684
SF per Benefited Residence	6,772
Feasible and Reasonable?	No

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

4.6.16 Area 16: I-270 mainline, north of I-370

A. Existing Barrier System for NSA 5-02

Although the existing barrier for NSA 5-02 would not be displaced by the current design, noise impacts are predicted at receptors behind the existing noise barrier. Therefore, the existing noise barrier was evaluated to determine if the current noise criteria is met. The existing barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The

barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 50 impacted, benefited residences and 0 non-impacted, benefited residences for a total of 50 benefited residences. The SF per benefited residence is 582, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Existing Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-39**. The barrier location and benefit locations are shown on Map No. 18. Existing Barrier System 5-02 *is considered feasible and reasonable* to remain for NSA 5-02.

Table 4-39: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-02

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-02-3	7	67	4	62
5-02-4	4	70	7	63
5-02-5	7	80	16	65
5-02-6	4	67	7	60
5-02-7	5	74	13	61
5-02-8	10	75	11	63
5-02-9	8	78	14	65
5-02-10	4	69	10	59
5-02-11	4	80	14	66
5-02-12	4	80	13	67
5-02-31	6	66	2	63
5-02-34	5	69	2	67

Bold	Critical Sensitive Receptors
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)
##	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor

TNM Run / Barrier Run	NSA 5-02/Existing
Number of Impacted, Benefited Residences	50
Number of Non-Impacted, Benefited Residences	0
Total Number of Benefited Locations	50
Barrier Length (feet)	2,031
Average Barrier Height (feet)	14
Area (feet ²)	29,102
SF per Benefited Residence	582
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

B. Existing Barrier System for NSA 5-01

Although the existing barrier for NSA 5-01 would not be displaced by the current design, noise impacts are predicted at receptors behind the existing noise barrier. Therefore, the existing noise barrier was evaluated to determine if the current noise criteria is met. The existing barrier system meets the feasibility criterion of providing at least 5 dB(A) noise reduction to 70% or more of the impacted residences. The barrier also meets the reasonableness criterion of providing a 7 dB(A) noise reduction to the majority of the impacted residences.

There are 217.17 impacted, benefited residences and 35 non-impacted, benefited residences for a total of 252.17 benefited residences. The SF per benefited residence is 215, which is below the 2,700 SF-p-r threshold for this barrier system (since sound levels are above 75 dB(A)); therefore, this noise barrier is considered to meet the cost effectiveness criterion.

The 2045 Existing Barrier predicted insertion losses, noise levels and benefits are shown in **Table 4-40**. The barrier location and benefit locations are shown on Map No. 18. Existing Barrier System 5-01 *is considered feasible and reasonable* to remain for NSA 5-01.

Table 4-40: 2045 Build Predicted Noise Levels, Barrier Benefits, and Barrier Design, NSA 5-01

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-01-4	5	68	6	62
5-01-5	6	69	7	62
5-01-6	6	68	6	61
5-01-7	5	69	7	62
5-01-8	3	67	6	61
5-01-9	4	69	7	62
5-01-10	4	67	7	61
5-01-11	3	68	6	62
5-01-12	2	67	5	62
5-01-13	3	66	4	62
5-01-14	4	66	4	62
5-01-23	5	65	5	60
5-01-25	0.55	69	7	62
5-01-26a	2	65	5	60
5-01-26b	2	69	8	62
5-01-26c	2	71	8	63
5-01-28c	2	64	5	60
5-01-30b	2	65	7	58
5-01-30c	2	67	8	59
5-01-30d	2	70	6	64
5-01-31c	2	62	5	58
5-01-31d	2	67	4	62
5-01-32c	2	62	5	57
5-01-32d	2	65	7	58

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-01-34b	2	69	7	63
5-01-34c	2	73	8	65
5-01-34d	2	74	6	68
5-01-35b	2	67	6	61
5-01-35c	2	70	6	64
5-01-35d	2	71	6	66
5-01-36a	2	71	9	62
5-01-36b	2	76	12	64
5-01-36c	2	77	9	69
5-01-36d	2	78	3	75
5-01-37a	2	64	5	59
5-01-37b	2	70	10	60
5-01-37c	2	73	11	62
5-01-37d	2	74	8	66
5-01-38b	2	65	5	59
5-01-38c	2	67	6	61
5-01-40	0.33	75	11	64
5-01-41b	2	66	8	58
5-01-41c	2	69	10	59
5-01-41d	2	71	10	61
5-01-42c	2	63	6	57
5-01-42d	2	65	7	58
5-01-43a	2	66	7	59
5-01-43b	2	71	11	61
5-01-43c	2	74	11	63
5-01-43d	2	74	5	70
5-01-44b	2	66	8	58
5-01-44c	2	68	9	59
5-01-44d	2	70	9	61
5-01-45a	2	67	7	60
5-01-45b	2	72	11	61
5-01-45c	2	74	10	64
5-01-45d	2	75	4	71
5-01-46a	2	62	5	58
5-01-46b	2	67	8	58
5-01-46c	2	69	9	59
5-01-46d	2	70	8	62
5-01-47a	2	71	10	61
5-01-47b	2	75	12	63
5-01-47c	2	76	9	68
5-01-47d	2	77	3	74
5-01-48a	2	64	6	59

Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-01-48b	2	70	10	60
5-01-48c	2	72	10	62
5-01-48d	2	73	7	66
5-01-49	0.29	75	11	64
5-01-50a	2	67	8	60
5-01-50b	2	74	13	61
5-01-50c	2	76	11	65
5-01-50d	2	77	3	74
5-01-51b	2	66	8	59
5-01-51c	2	70	10	60
5-01-51d	2	72	9	64
5-01-52a	2	71	12	59
5-01-52b	2	74	14	60
5-01-52c	2	74	10	64
5-01-52d	2	75	2	73
5-01-53a	2	63	5	58
5-01-53b	2	67	9	58
5-01-53c	2	68	9	59
5-01-53d	2	70	6	64
5-01-65	5	69	7	62
5-01-66	5	67	6	61
5-01-67a	2	66	5	61
5-01-67b	2	80	19	61
5-01-67c	2	81	14	67
5-01-67d	2	81	3	78
5-01-68a	2	68	7	61
5-01-68b	2	81	19	62
5-01-68c	2	81	14	67
5-01-68d	2	81	1	80
5-01-69b	2	69	10	59
5-01-69c	2	70	10	60
5-01-69d	2	71	6	65
5-01-70c	2	65	6	59
5-01-70d	2	67	7	60
5-01-71a	2	68	8	60
5-01-71b	2	75	14	61
5-01-71c	2	76	11	65
5-01-71d	2	77	3	74
5-01-72a	2	63	5	58
5-01-72b	2	68	10	58
5-01-72c	2	70	11	59
5-01-72d	2	71	9	62



Receptor Number	Equivalent Residences ¹	2045 Predicted Noise Level (Leq)	2045 Build Barrier Noise Reduction (dB(A))	2045 Build Barrier Predicted Noise Level (Leq)
5-01-73a	2	75	13	62
5-01-73b	2	77	12	65
5-01-73c	2	77	4	73
5-01-73d	2	77	1	76
5-01-74a	2	70	10	60
5-01-74b	2	72	11	61
5-01-74c	2	73	8	65
5-01-74d	2	74	4	70
5-01-75a	2	70	9	61
5-01-75b	2	72	9	63
5-01-75c	2	73	8	65
5-01-75d	2	73	4	69
5-01-76a	2	70	8	62
5-01-76b	2	71	8	63
5-01-76c	2	72	6	66
5-01-76d	2	73	3	70
5-01-77a	2	76	12	64
5-01-77b	2	78	12	66
5-01-77c	2	78	5	73
5-01-77d	2	78	1	77
5-01-78a	2	76	11	65
5-01-78b	2	78	11	67
5-01-78c	2	79	6	73
5-01-78d	2	79	2	77

Bold	Critical Sensitive Receptors
	Effective Noise Reduction (7 dBA or more) at Critical Sensitive Receptor
##	Receptor Impacted
##	Receptor Benefited by Barrier (5 dBA or more)

TNM Run / Barrier Run	NSA 5-01 Existing
Number of Impacted, Benefited Residences	217.17
Number of Non-Impacted, Benefited Residences	35
Total Number of Benefited Locations	252.17
Barrier Length (feet)	3,418
Average Barrier Height (feet)	17
Area (feet ²)	54,212
SF per Benefited Residence	215
Feasible and Reasonable?	Yes

1. Equivalent residences are only shown for receptors that are impacted and/or benefited by the evaluated barrier.

5

5 COORDINATION WITH LOCAL LAND USE PLANNING OFFICIALS AND CONSTRUCTION NOISE

5.1 Coordination with Local Land Use Planning Officials

The coordination with local land use planning officials discussion remains consistent with Section 5.1 of the Noise Technical Report prepared for the DEIS.

5.2 Construction Noise

The construction noise discussion remains consistent with Section 5.2 of the Noise Technical Report prepared for the DEIS.

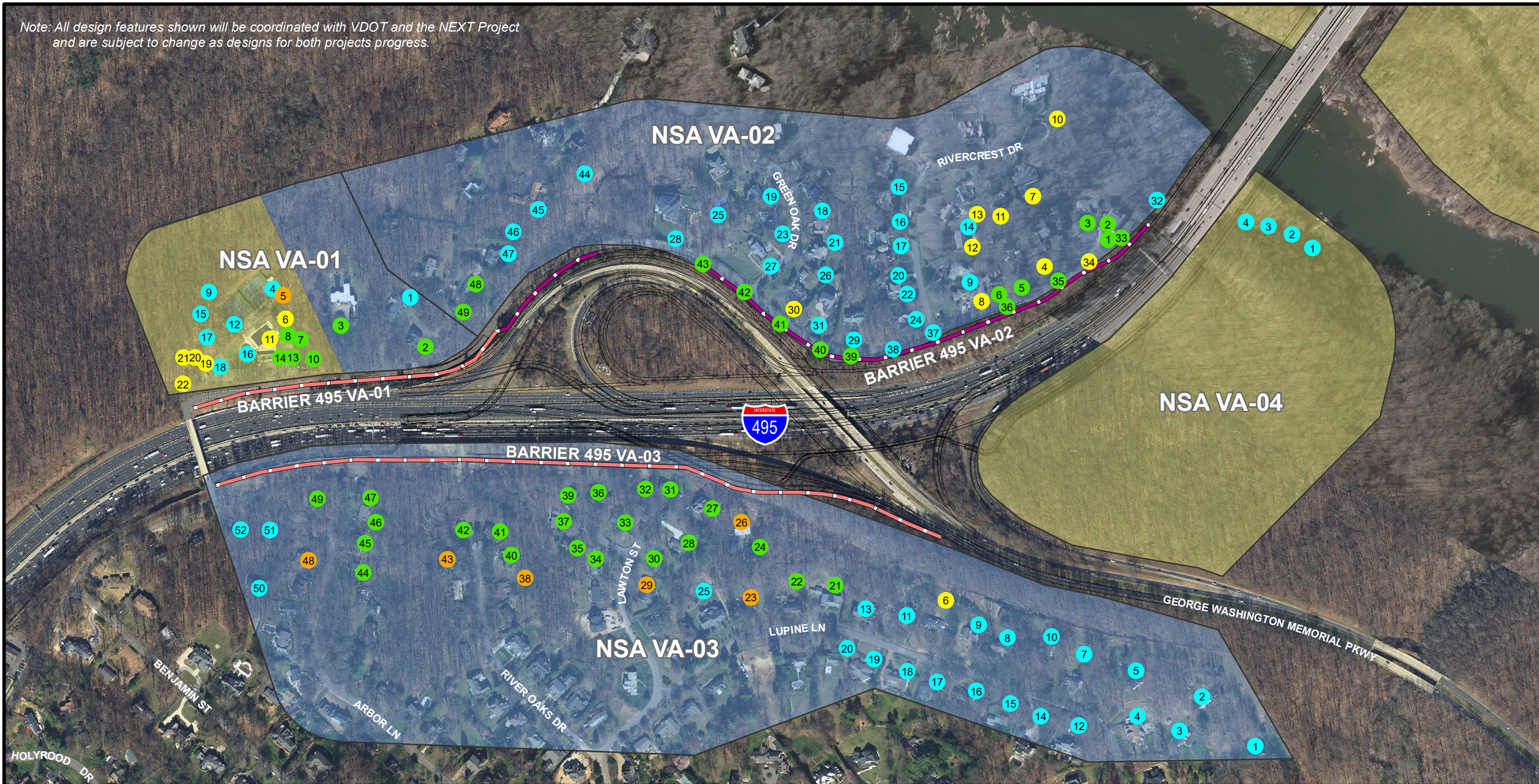
6

6 PREFERRED ALTERNATIVE MAPPING

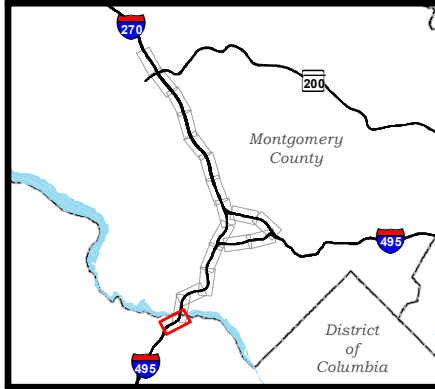
Refer to the following attachments:

- Land Uses and Receptors Build Noise Conditions - September 2021.pdf

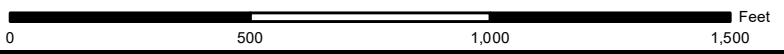
Note: All design features shown will be coordinated with VDOT and the NEXT Project and are subject to change as designs for both projects progress.




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Modeled Receptors	Barriers	Land Use Activity Category
● Impacted, Benefited	 Existing to Remain	 B: Noise Sensitive Area (EXTERIOR)
● Impacted, Not Benefited	 New Alignment (Feasible & Reasonable)	 C: Noise Sensitive Area (EXTERIOR)
● Not Impacted, Benefited	 Existing to be Replaced	 D: Noise Sensitive Area (INTERIOR)
● Not Impacted, Not Benefited	 New Alignment (Not Feasible and/or Reasonable)	 G: Non-Noise Sensitive Area
M# Measurement Location	 Private	 F: Non-Noise Sensitive Area

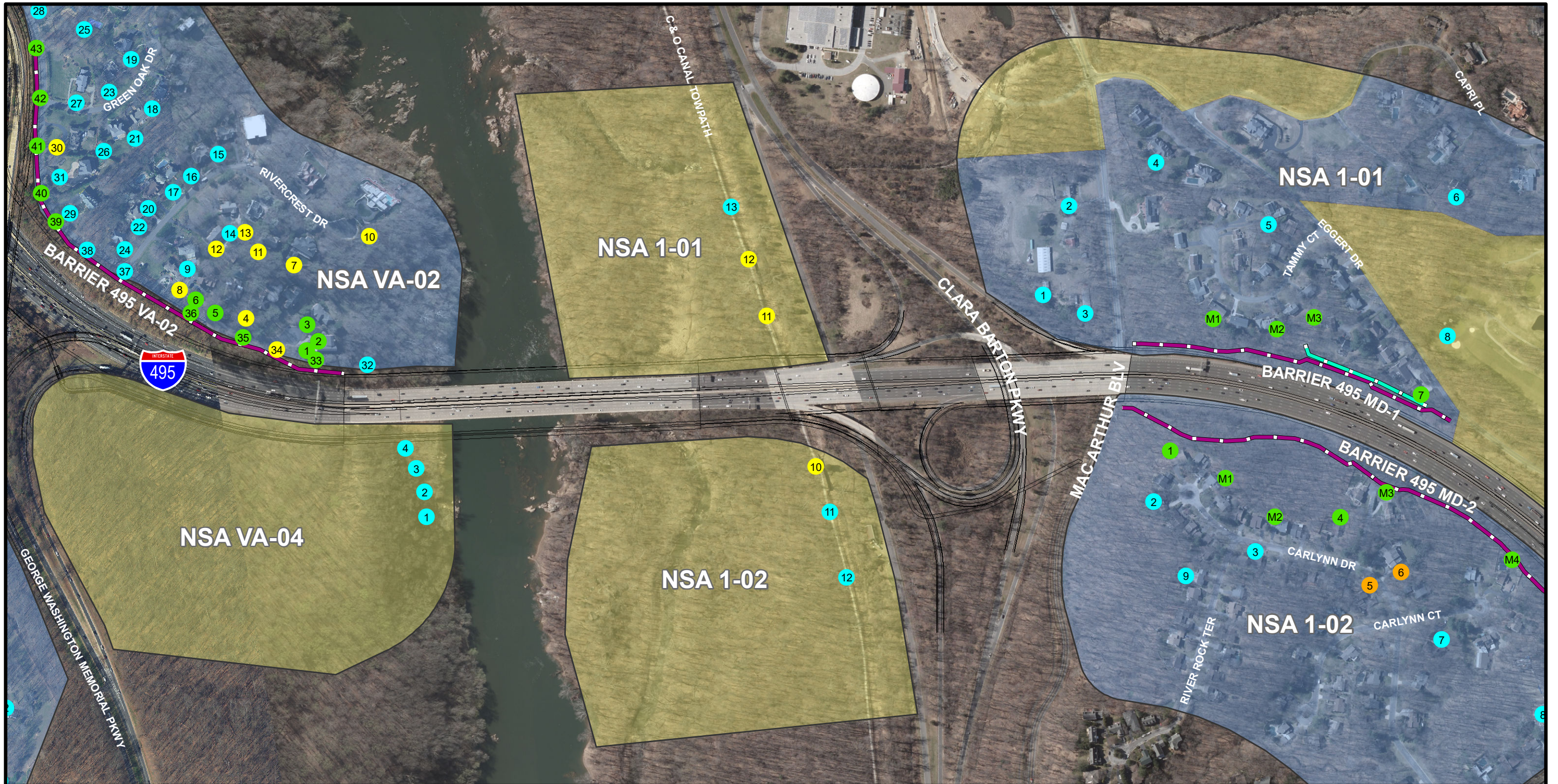



 Maryland
 Department of Transportation
 State Highway Administration
 Office of
 Planning and Preliminary
 Engineering
 Environmental Planning
 Division
 Noise Abatement Design
 & Analysis Team

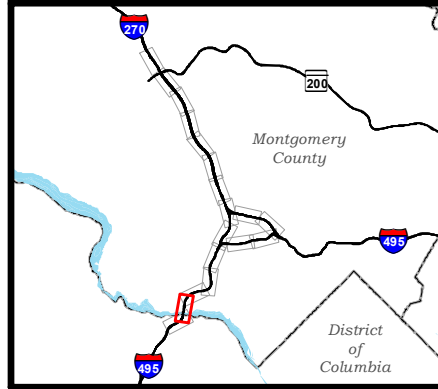
I-495/I-270
Managed Lanes Study

Phase I South

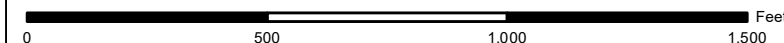

Land Uses and Receptors Build Conditions



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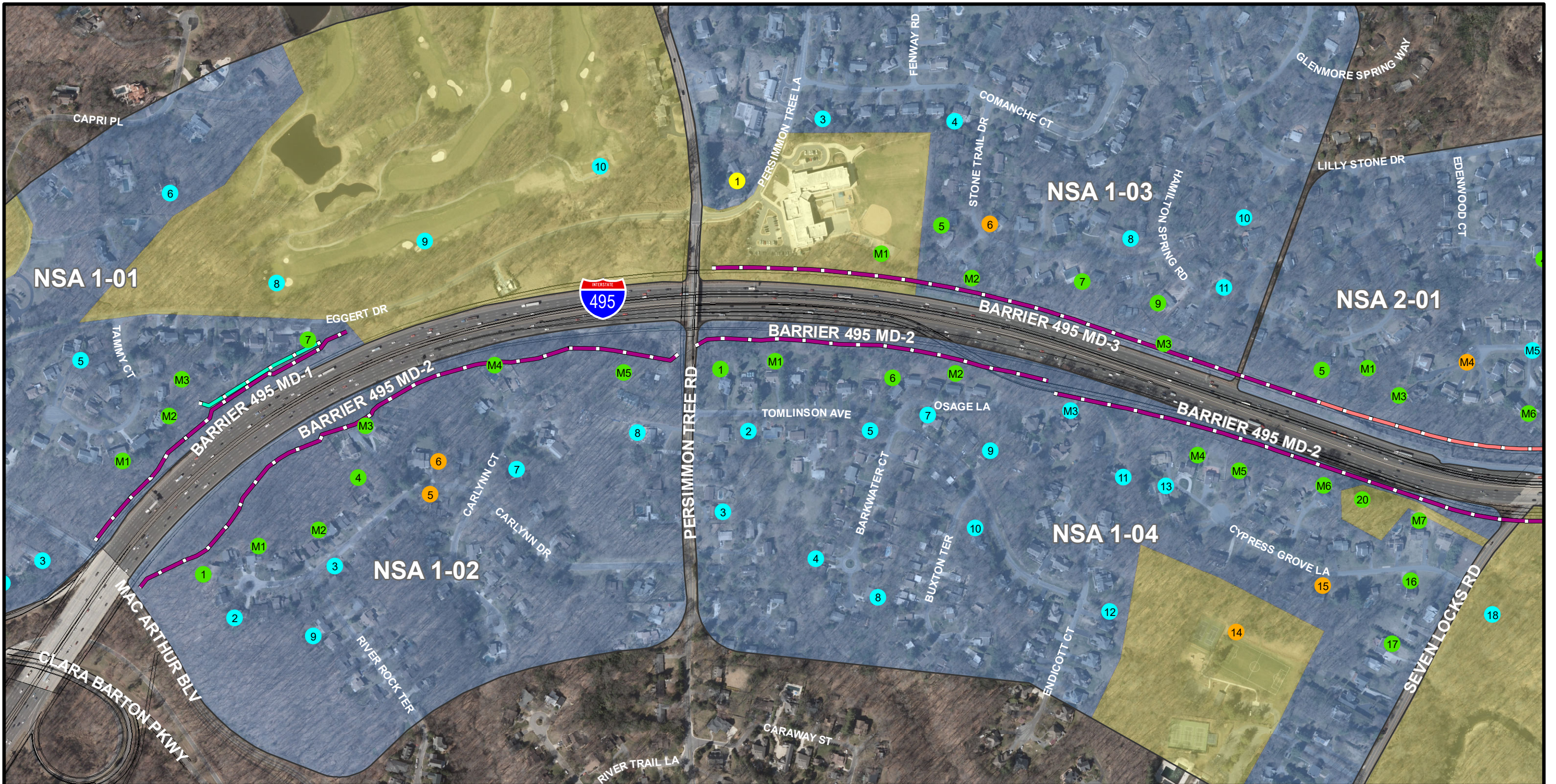
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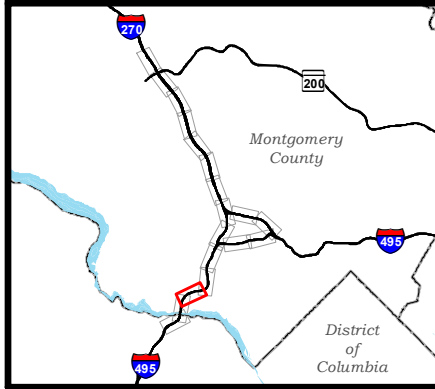
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Managed Lanes Study
Phase I South

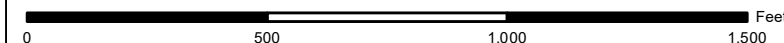
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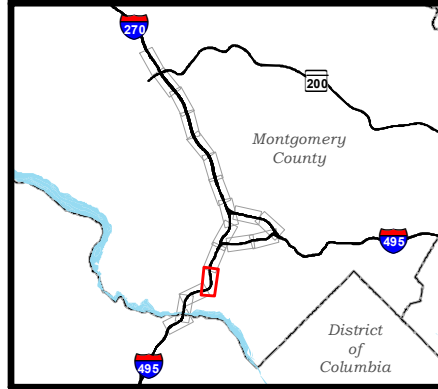
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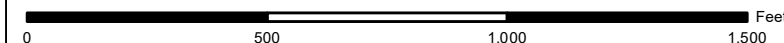
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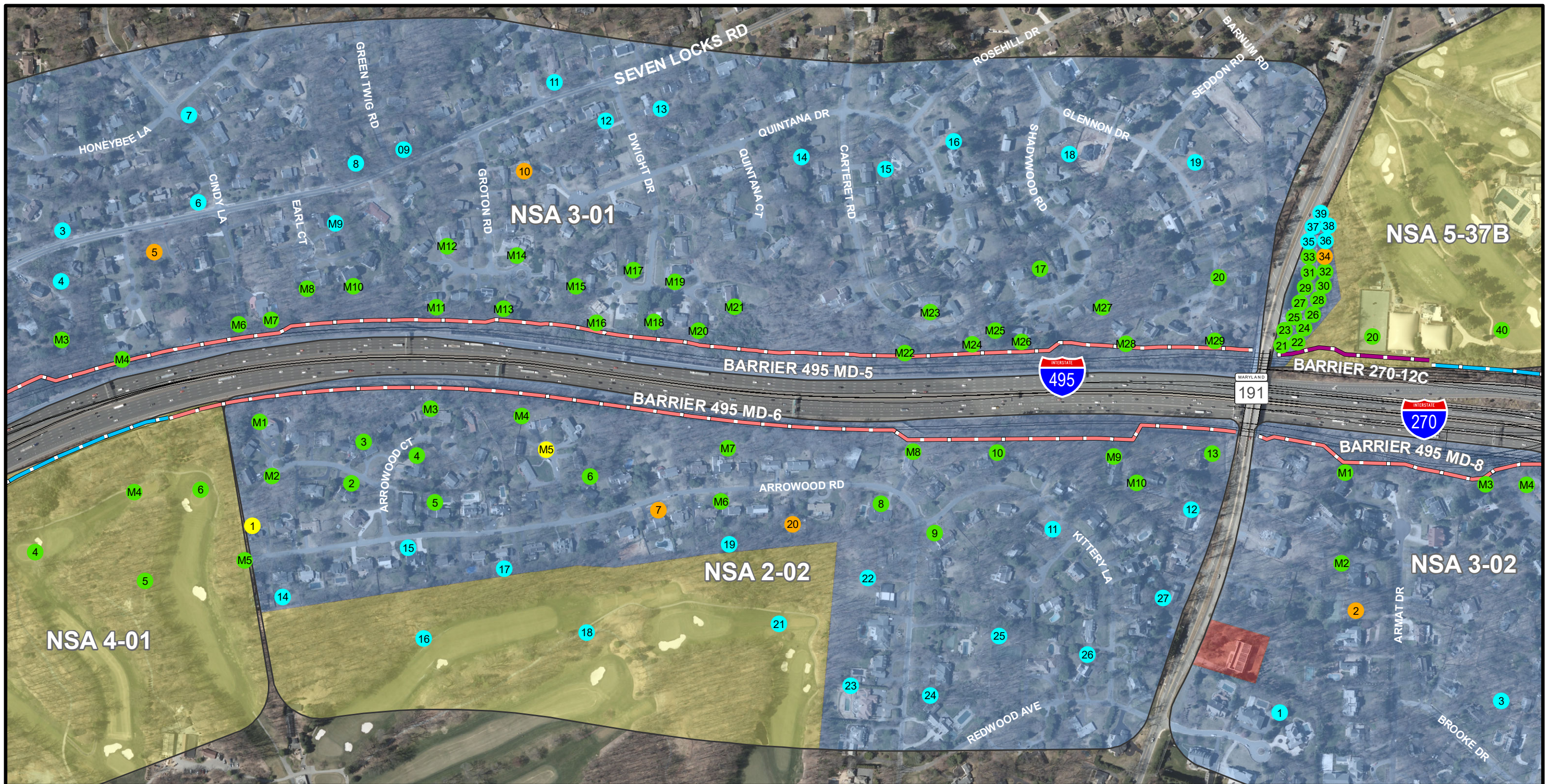


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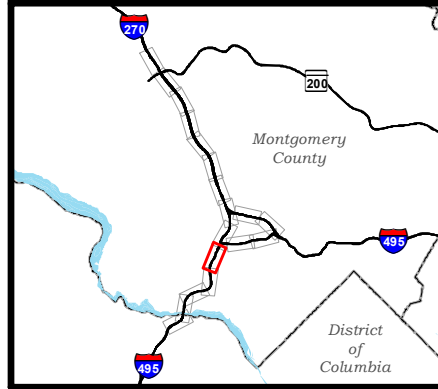
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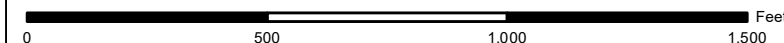
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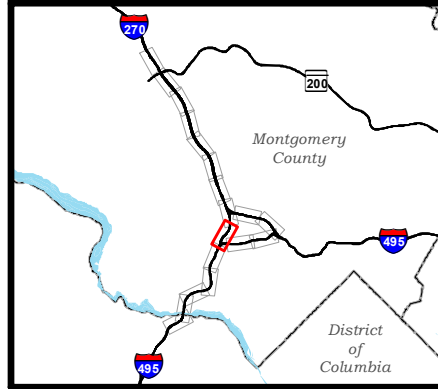
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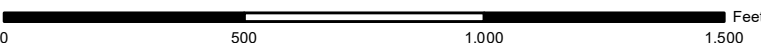
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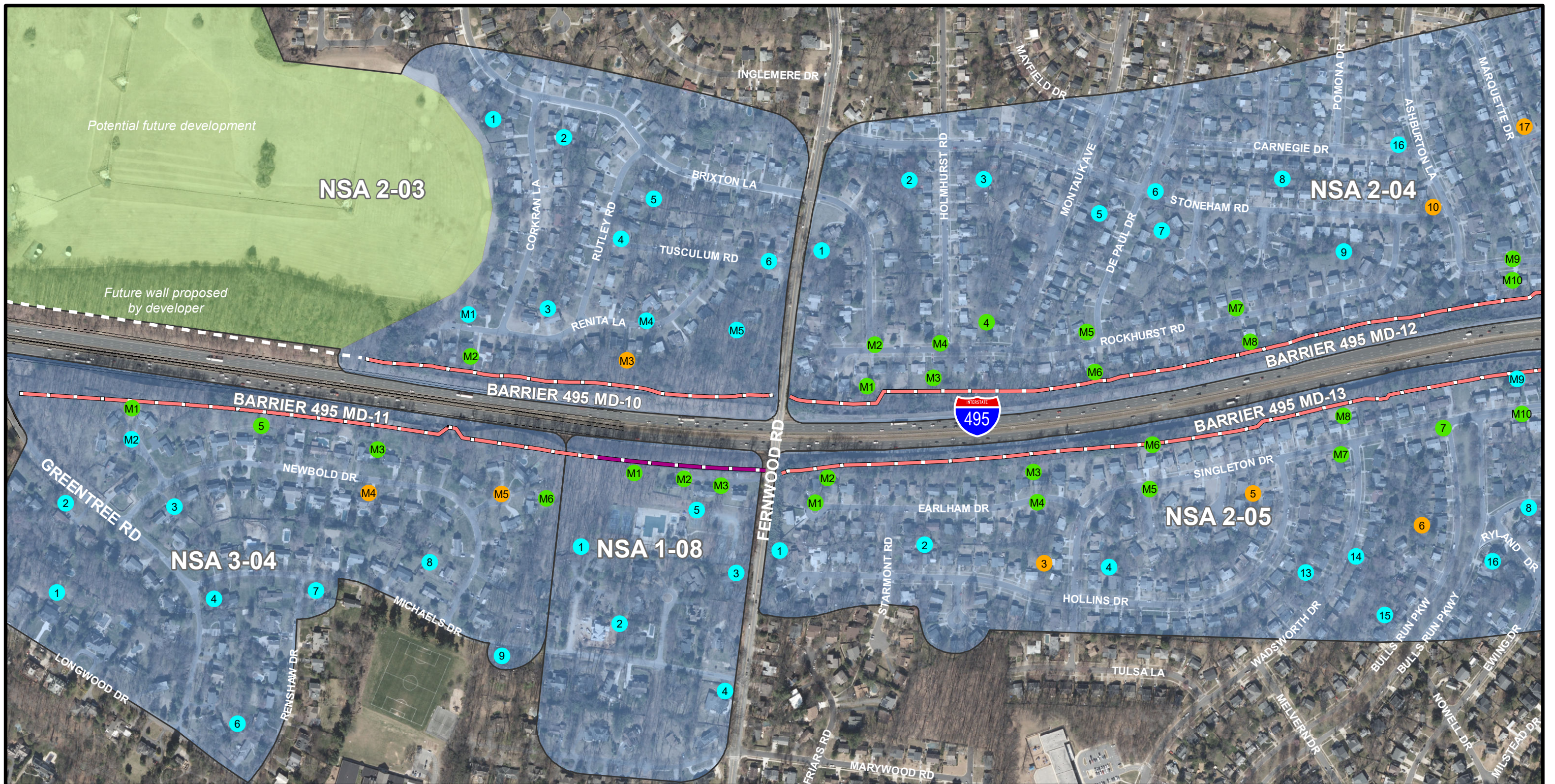
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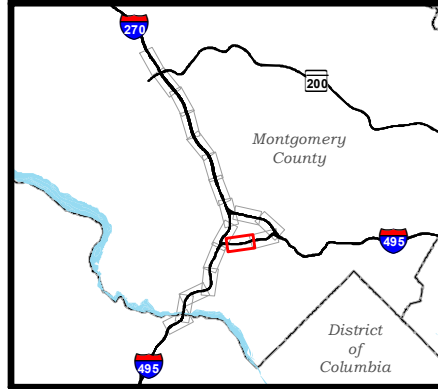
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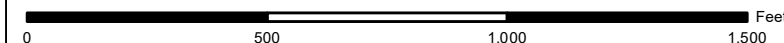
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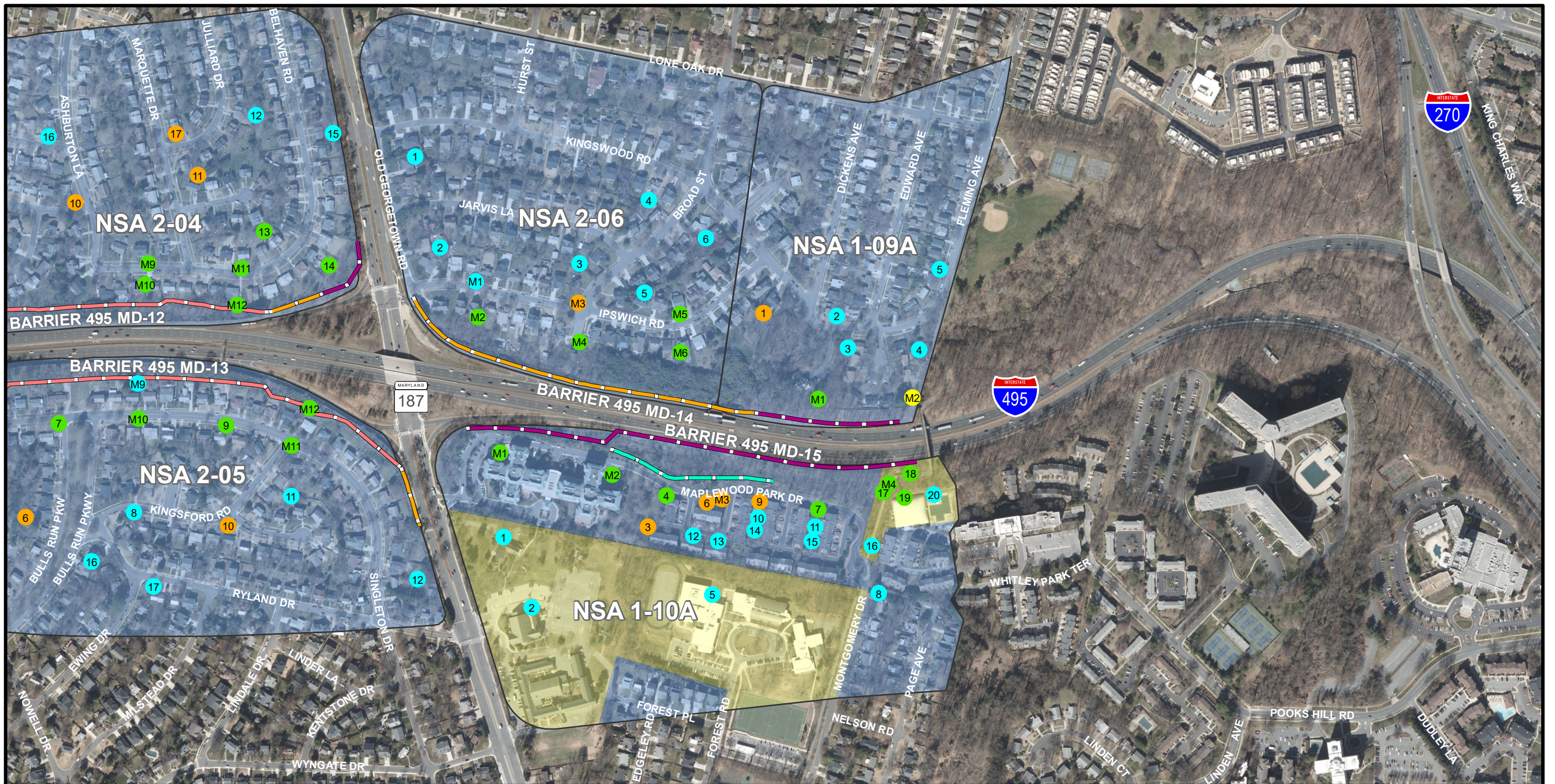




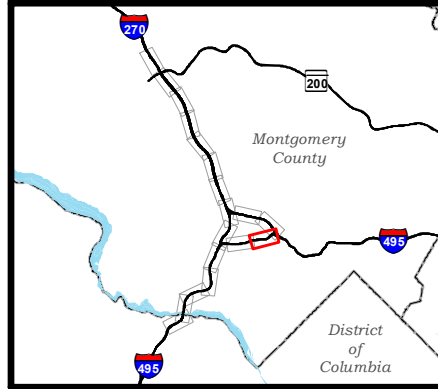
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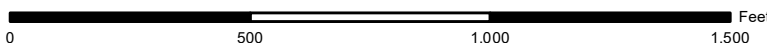

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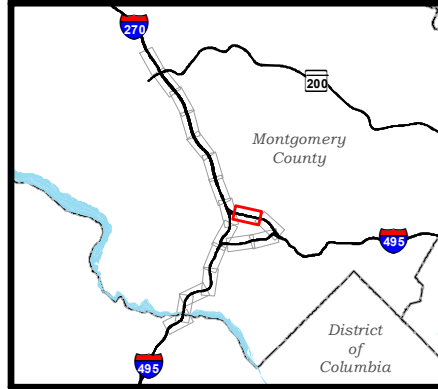
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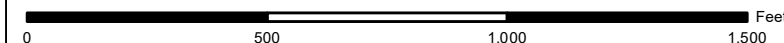
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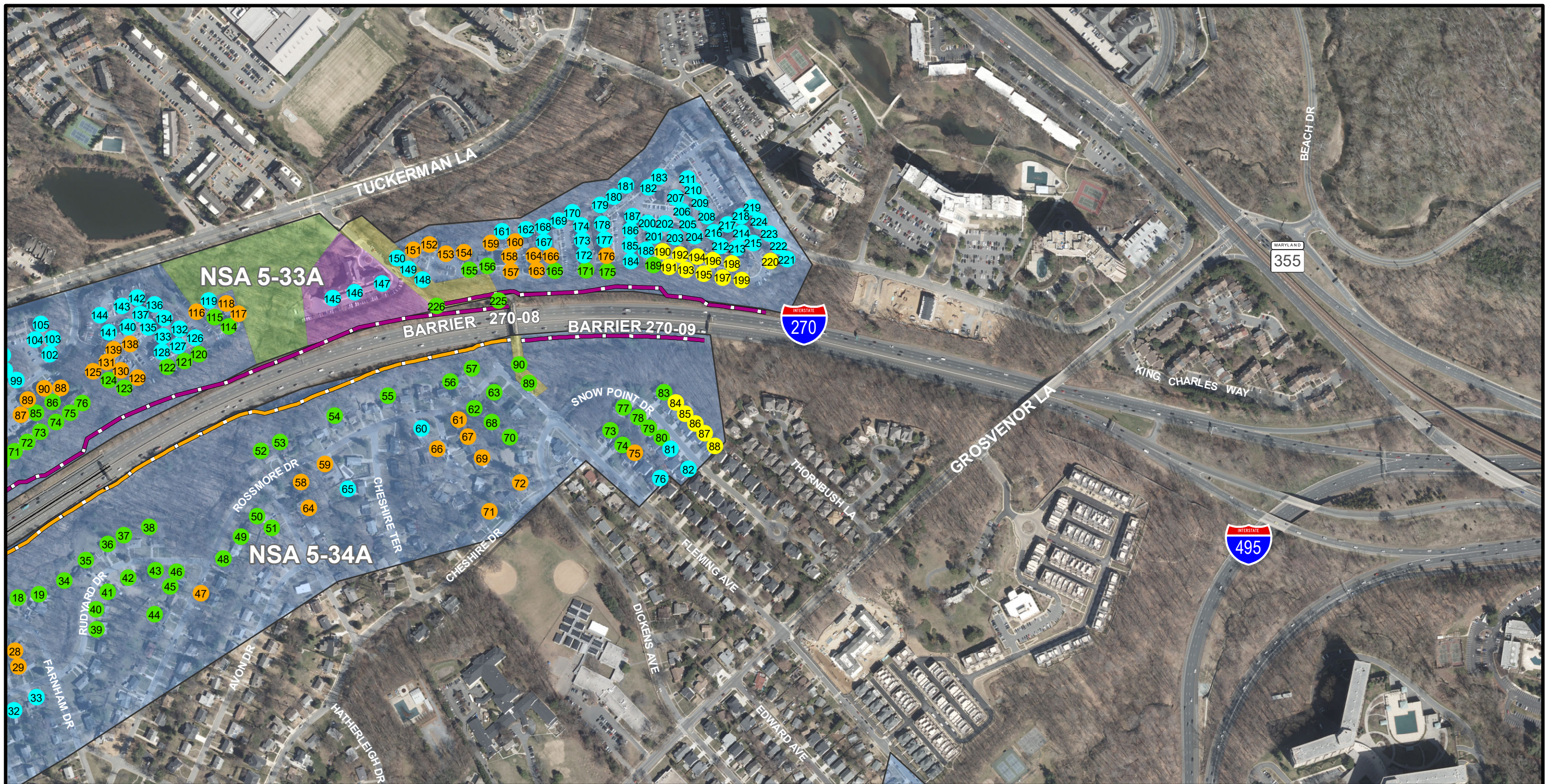


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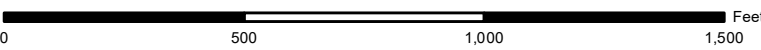
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Land Uses and Receptors Build Conditions



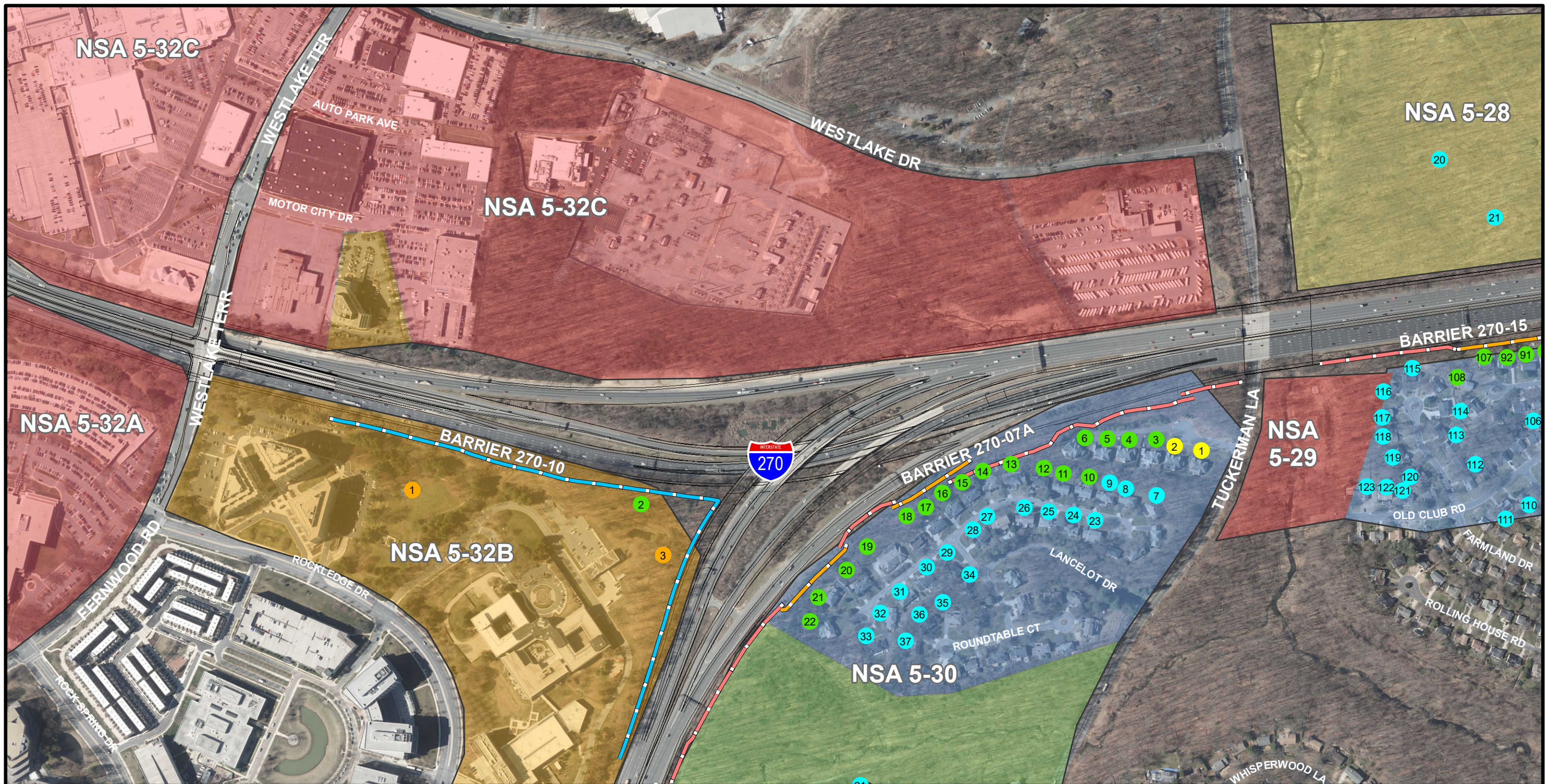
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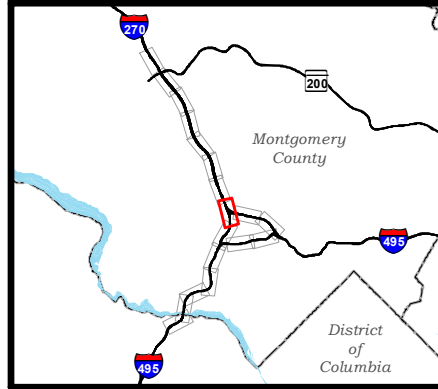

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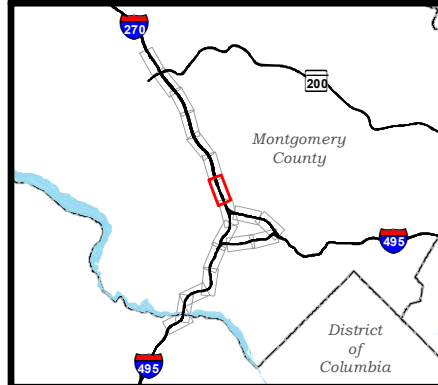
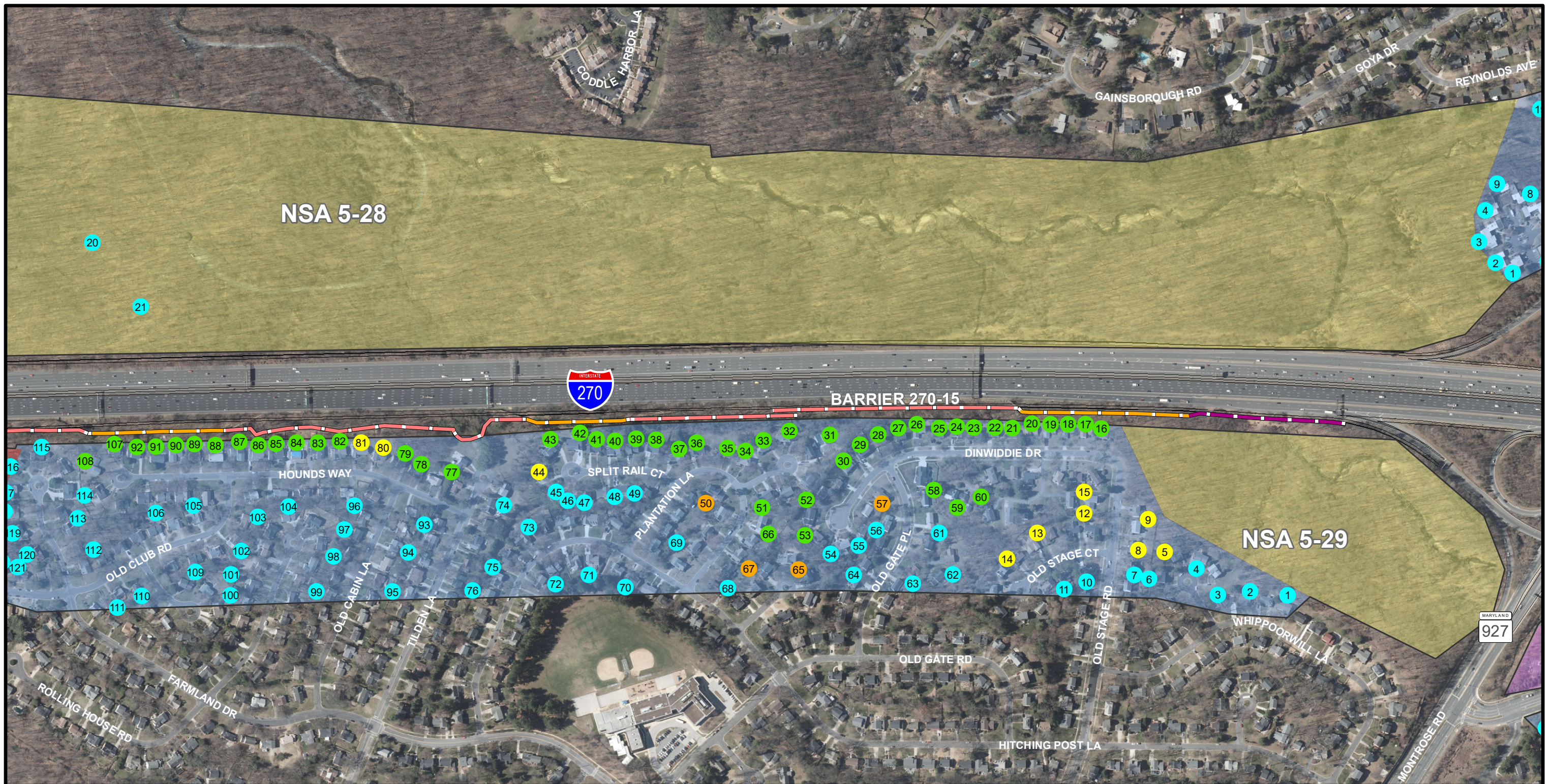
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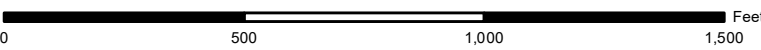

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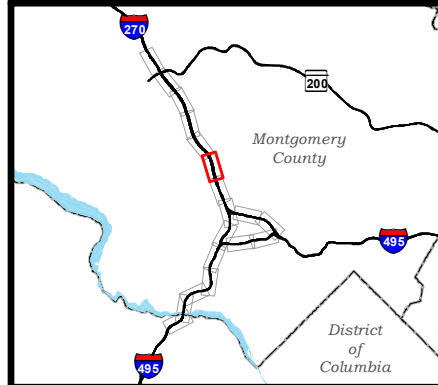
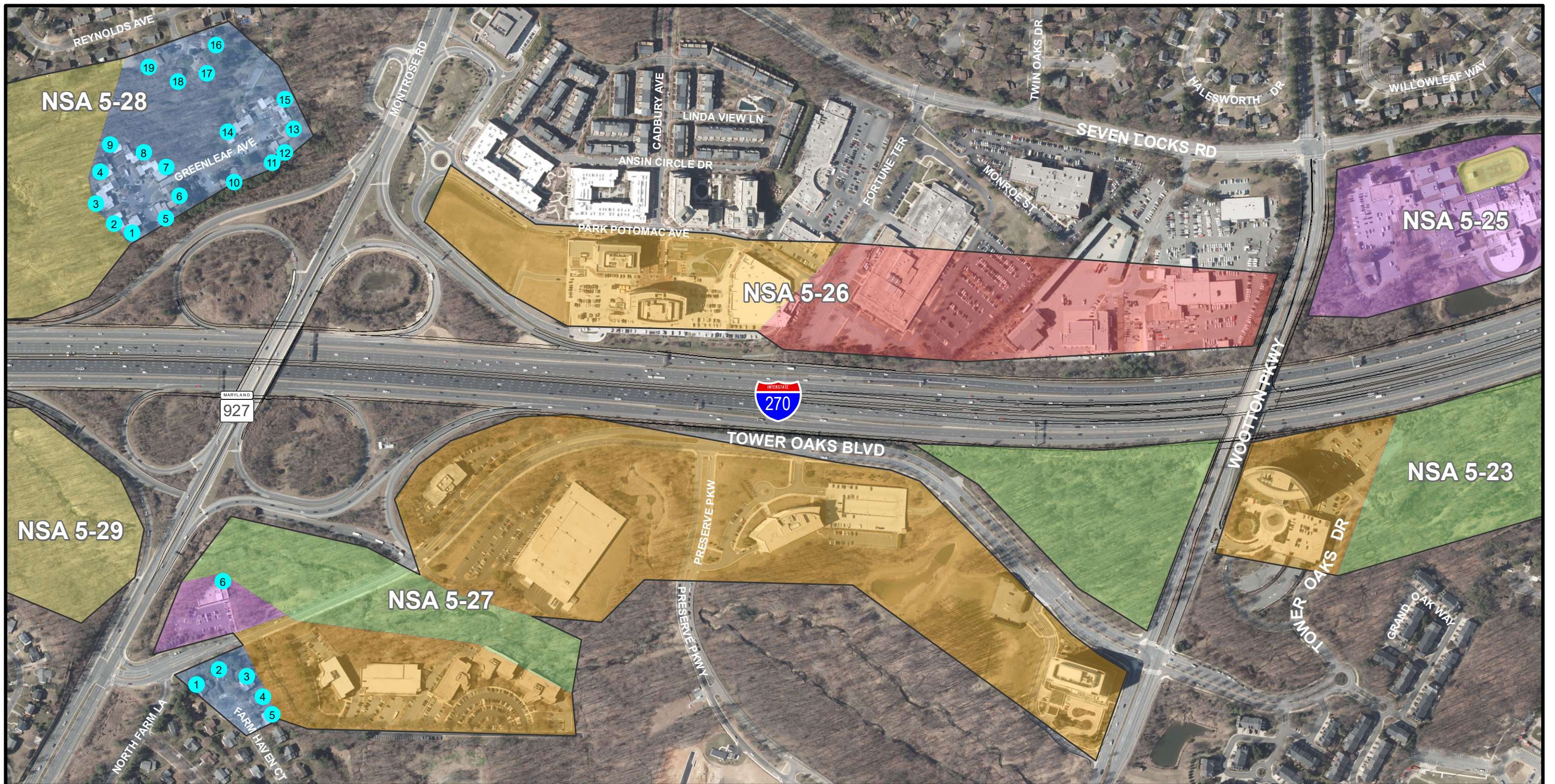
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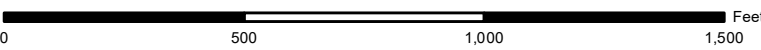

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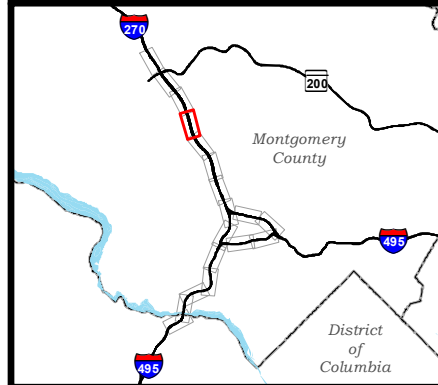
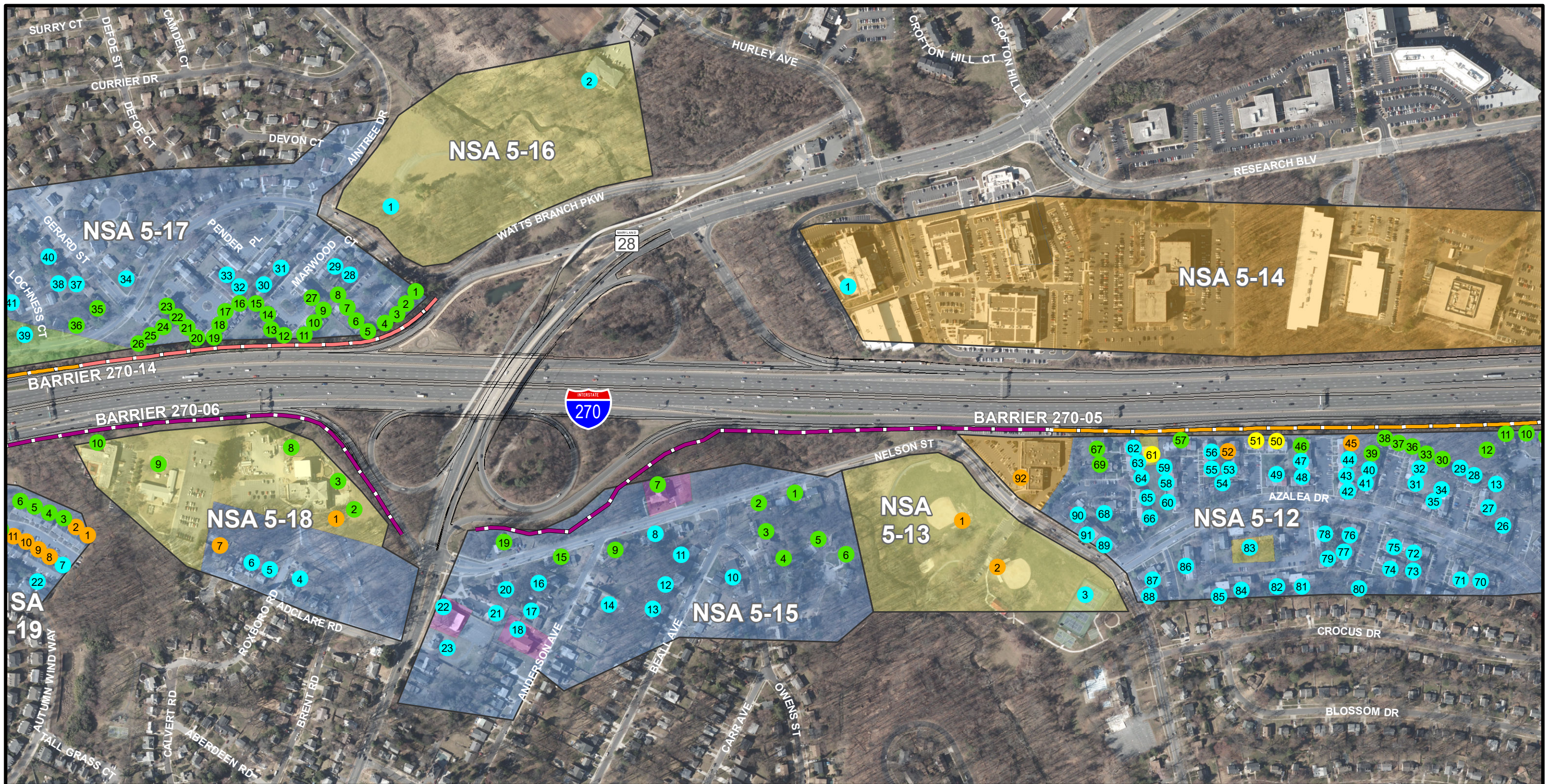
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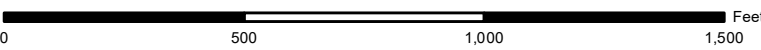
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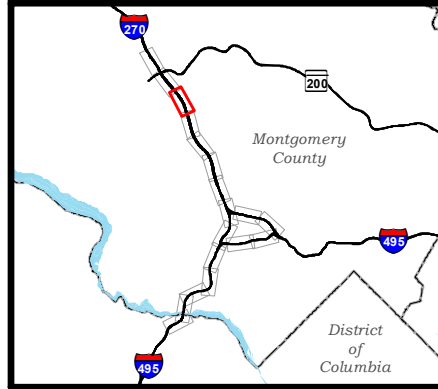

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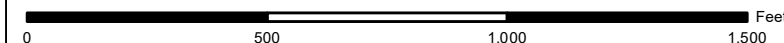
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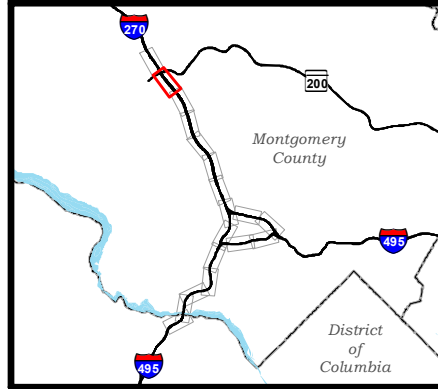
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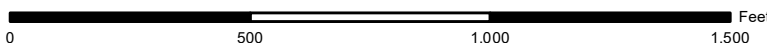
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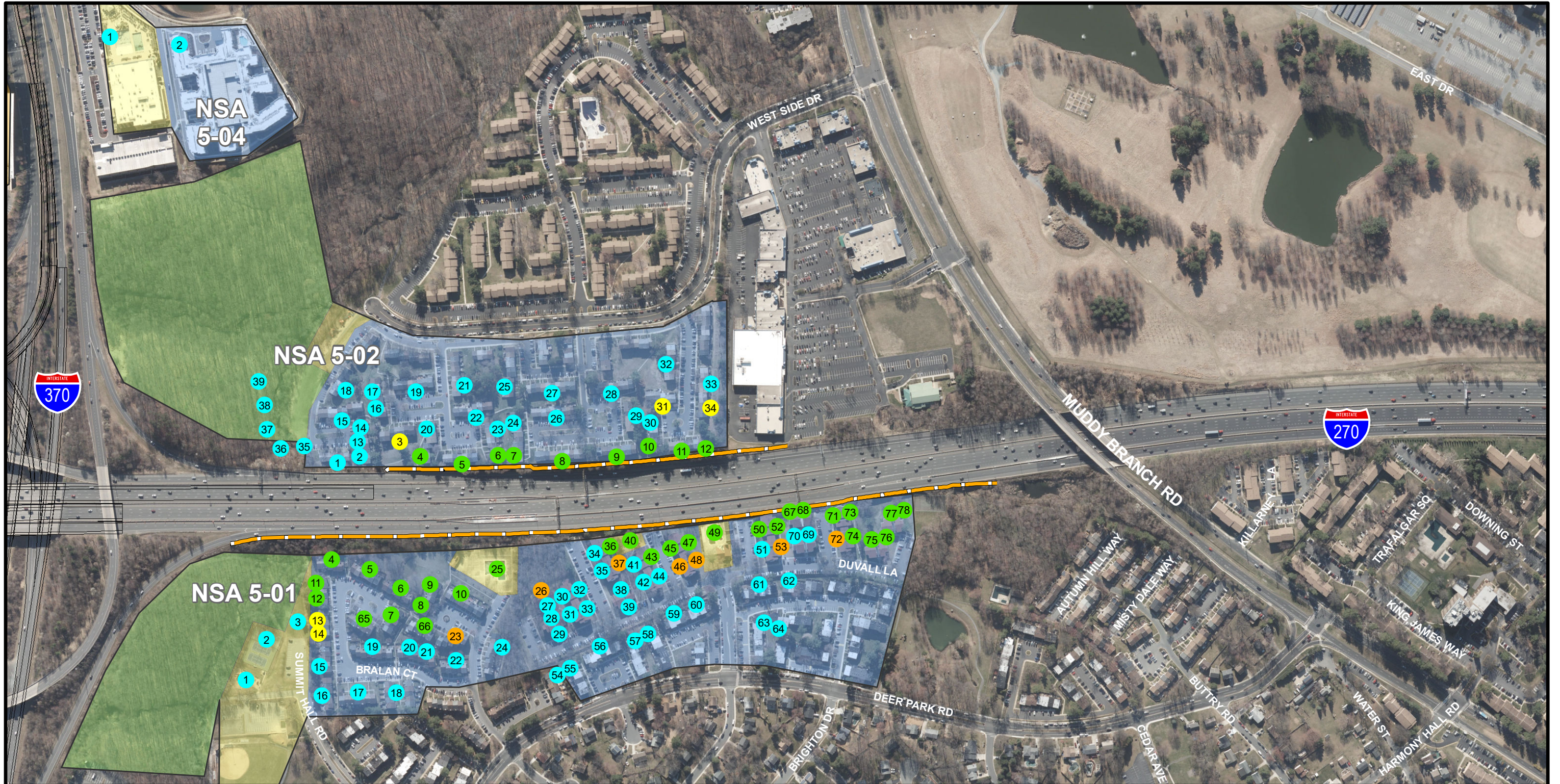


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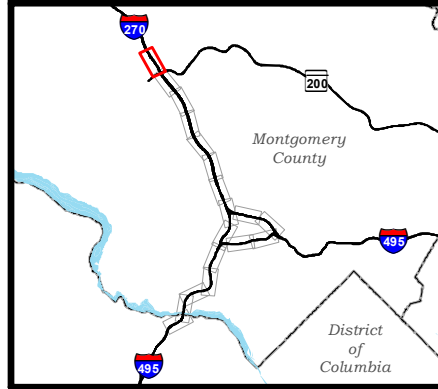



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Modeled Receptors

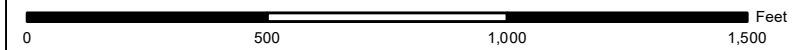
- Impacted, Benefited
- Impacted, Not Benefited
- Not Impacted, Benefited
- Not Impacted, Not Benefited
- M# Measurement Location

Barriers

- Existing to Remain
- New Alignment (Feasible & Reasonable)
- Existing to be Replaced
- New Alignment (Not Feasible and/or Reasonable)
- Private

Land Use Activity Category

- B: Noise Sensitive Area (EXTERIOR)
- E: Noise Sensitive Area (EXTERIOR)
- C: Noise Sensitive Area (EXTERIOR)
- F: Non-Noise Sensitive Area
- D: Noise Sensitive Area (INTERIOR)
- G: Non-Noise Sensitive Area



Maryland
 Department of Transportation
 State Highway Administration
 Office of
 Planning and Preliminary
 Engineering
 Environmental Planning
 Division
 Noise Abatement Design
 & Analysis Team

**I-495/I-270
 Managed Lanes Study
 Phase I South**

Land Uses and Receptors Build Conditions

APP A

APPENDIX A DESIGN TRAFFIC VOLUMES

NOISE ANALYSIS TECHNICAL REPORT ADDENDUM September 2021



U.S. Department
of Transportation

**Federal Highway
Administration**

M_{DOT} MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION



1. Introduction

The SDEIS noise models used the same LOS 'C/D' volumes per lane and truck percentages that were generated for the DEIS. The following table displays the number of lanes assumed per segment as well as truck percentages.

Additionally, vehicle volumes were added to major general purpose ramps and direct access ramps. For both the general purpose ramps and the direct access ramps the vehicle classification percentages were consistent with the adjacent general purpose or price managed lanes. For speeds, a conservative estimate of 50 mph for directional ramps and 30 mph for loop ramps was utilized. The following figures display the traffic volumes used for each ramp.

Loudest Noise Hour Volumes for Use in the SDEIS

NORTHBOUND

Segment	Direction	# PML	PML Volume	# GP	GP Volume	Total Lanes	Total Volume	Volume per lane
Tuckerman (I-270 Spur Merge) to Montrose	NB	3	4605	5	7425	8	12030	1504
Montrose to Wootton	NB	3	4605	5	7425	8	12030	1504
Wootton to Falls (MD 189)	NB	2	3070	5	7425	7	10495	1499
Falls (MD 189) to Montgomery (MD 28)	NB	2	3070	5	7425	7	10495	1499
Montgomery (MD 28) to Shady Grove	NB	2	3070	5	7425	7	10495	1499
Shady Grove to I-370	NB	1	1535	5	7425	6	8960	1493
N of I-370	NB	0	0	4	6025	4	6025	1506

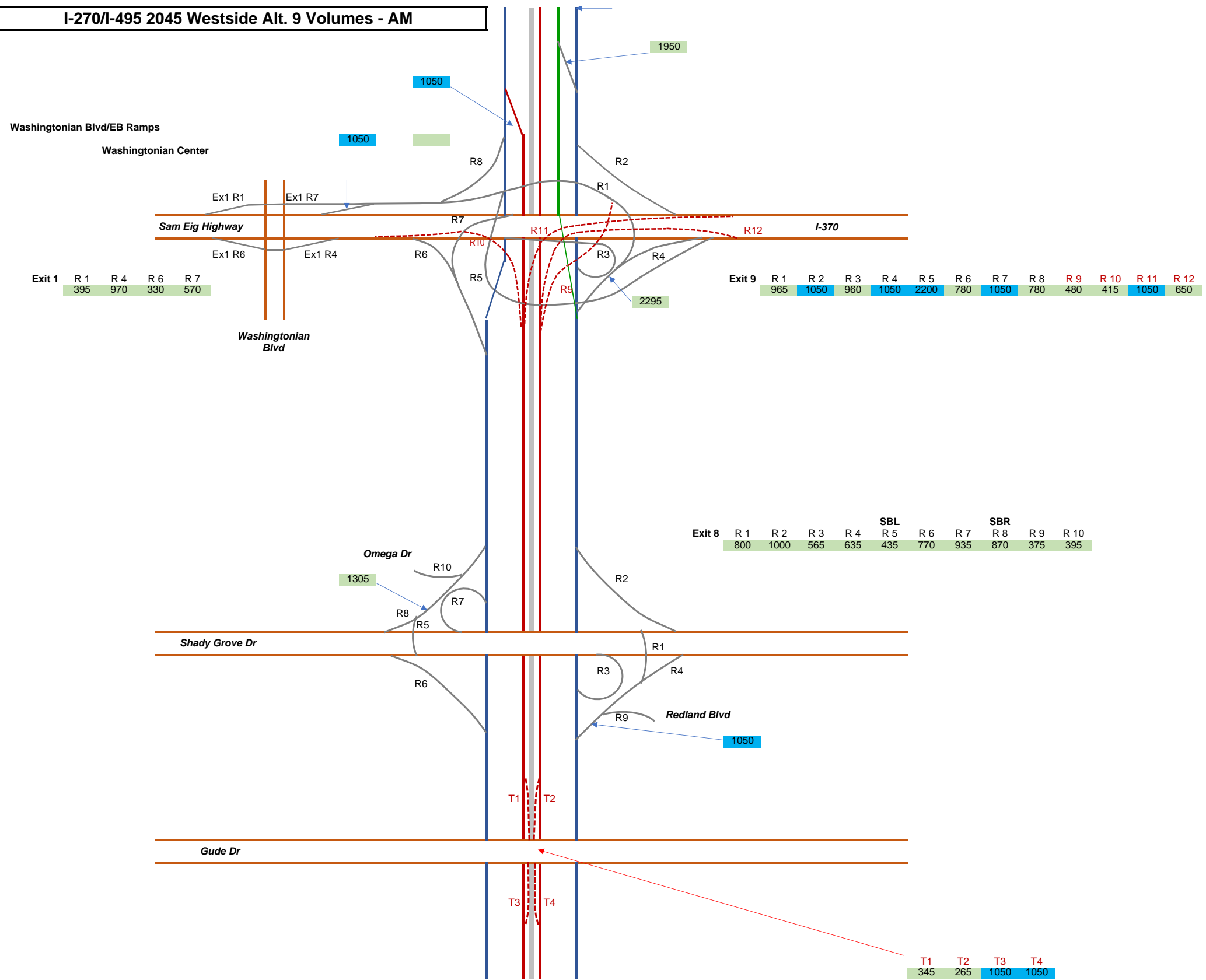
SOUTHBOUND

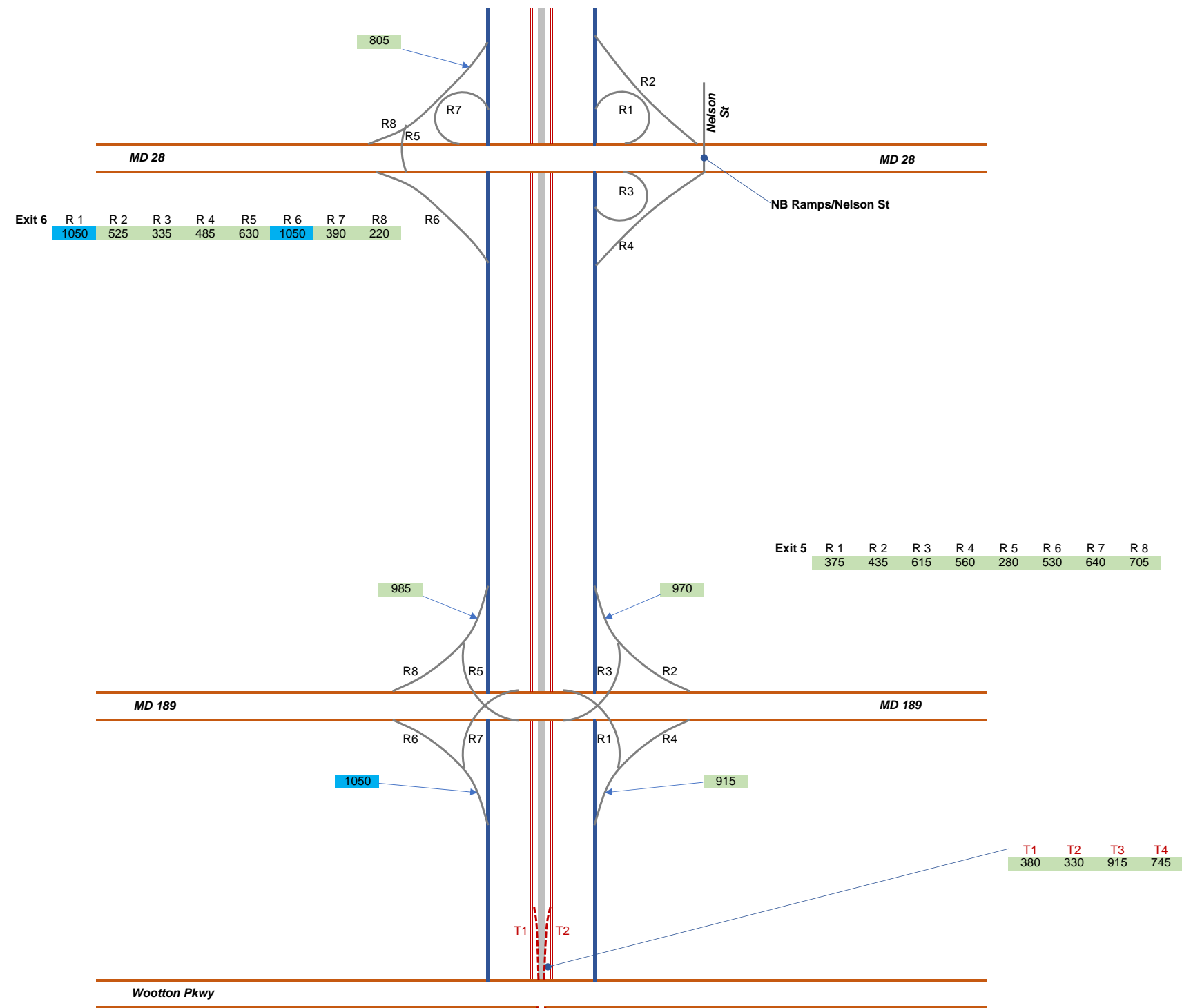
Segment	Direction	# PML	PML Volume	# GP	GP Volume	Total Lanes	Total Volume	Volume per lane
Tuckerman (I-270 Spur Merge) to Montrose	SB	3	4605	5	7425	8	12030	1504
Montrose to Wootton	SB	3	4605	5	7425	8	12030	1504
Wootton to Falls (MD 189)	SB	2	3070	5	7425	7	10495	1499
Falls (MD 189) to Montgomery (MD 28)	SB	2	3070	5	7425	7	10495	1499
Montgomery (MD 28) to Shady Grove	SB	2	3070	5	7425	7	10495	1499
Shady Grove to I-370	SB	1	1535	5	7425	6	8960	1493
N of I-370	SB	0	0	4	6025	4	6025	1506

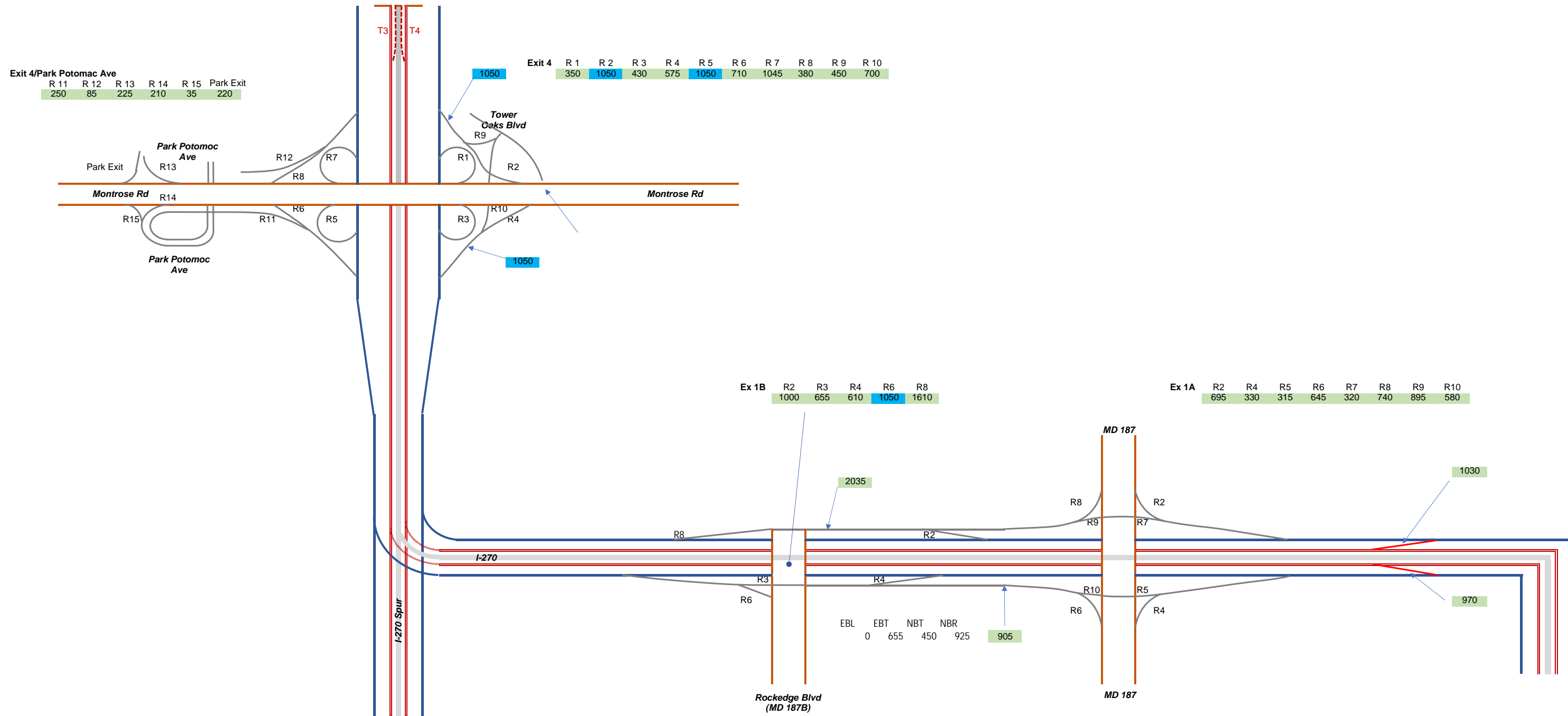
VEHICLE PERCENTAGES

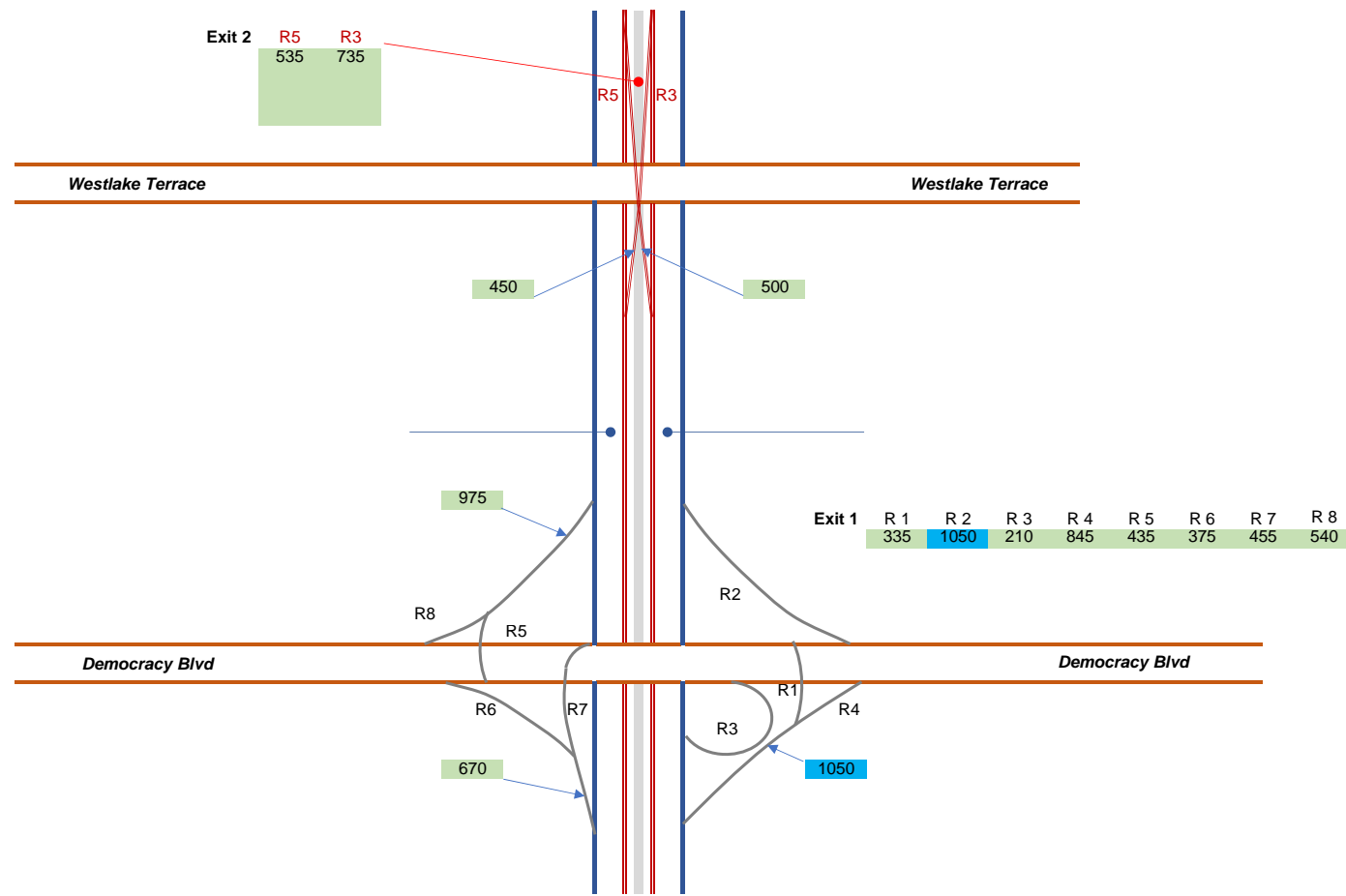
Segment	Motorcycles	Autos	Buses	Medium Tr	Heavy Trucks
Tuckerman (I-270 Spur Merge) to Montrose	0.14%	94.15%	0.66%	2.85%	2.20%
Montrose to Wootton	0.03%	94.41%	0.69%	2.57%	2.30%
Wootton to Falls (MD 189)	0.03%	94.41%	0.69%	2.57%	2.30%
Falls (MD 189) to Montgomery (MD 28)	0.03%	94.41%	0.69%	2.57%	2.30%
Montgomery (MD 28) to Shady Grove	0.03%	94.62%	0.67%	2.31%	2.37%
Shady Grove to I-370	0.27%	91.56%	0.82%	4.17%	3.18%
N of I-370	similar to above				
ETL Lanes	0.20%	97.80%	1.00%	0.50%	0.50%

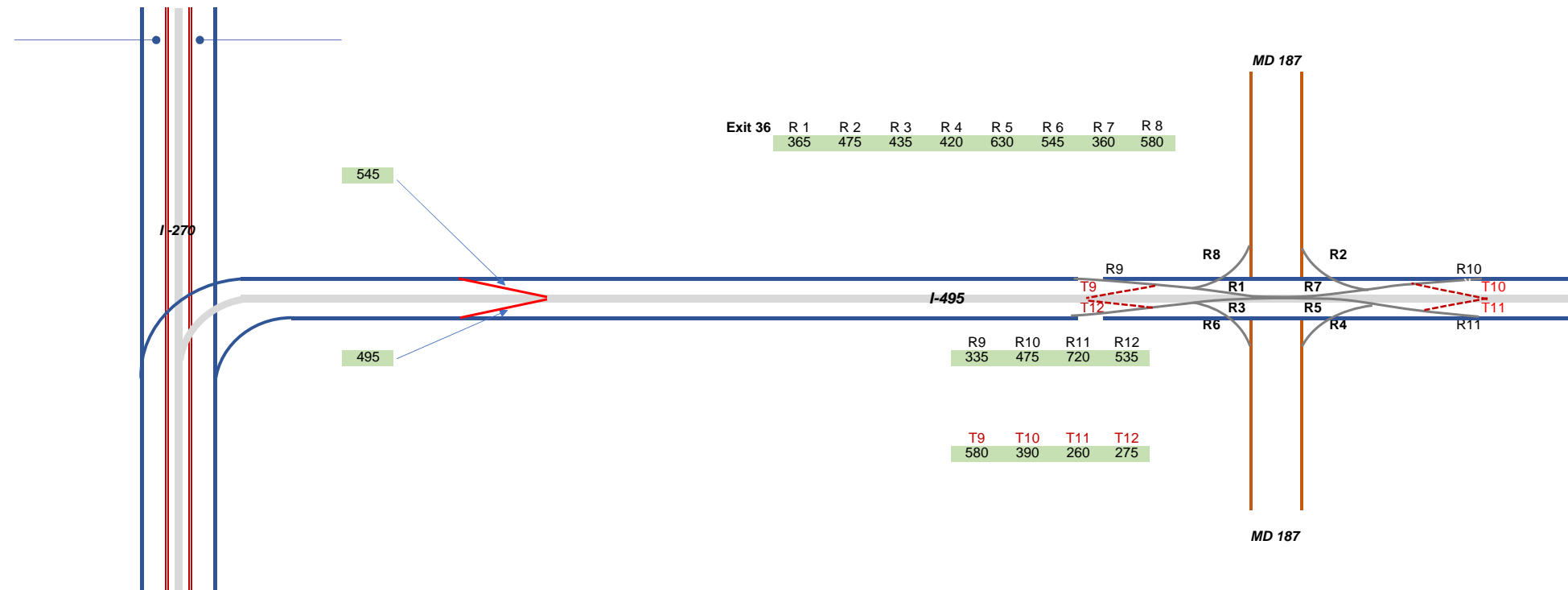
I-270/I-495 2045 Westside Alt. 9 Volumes - AM

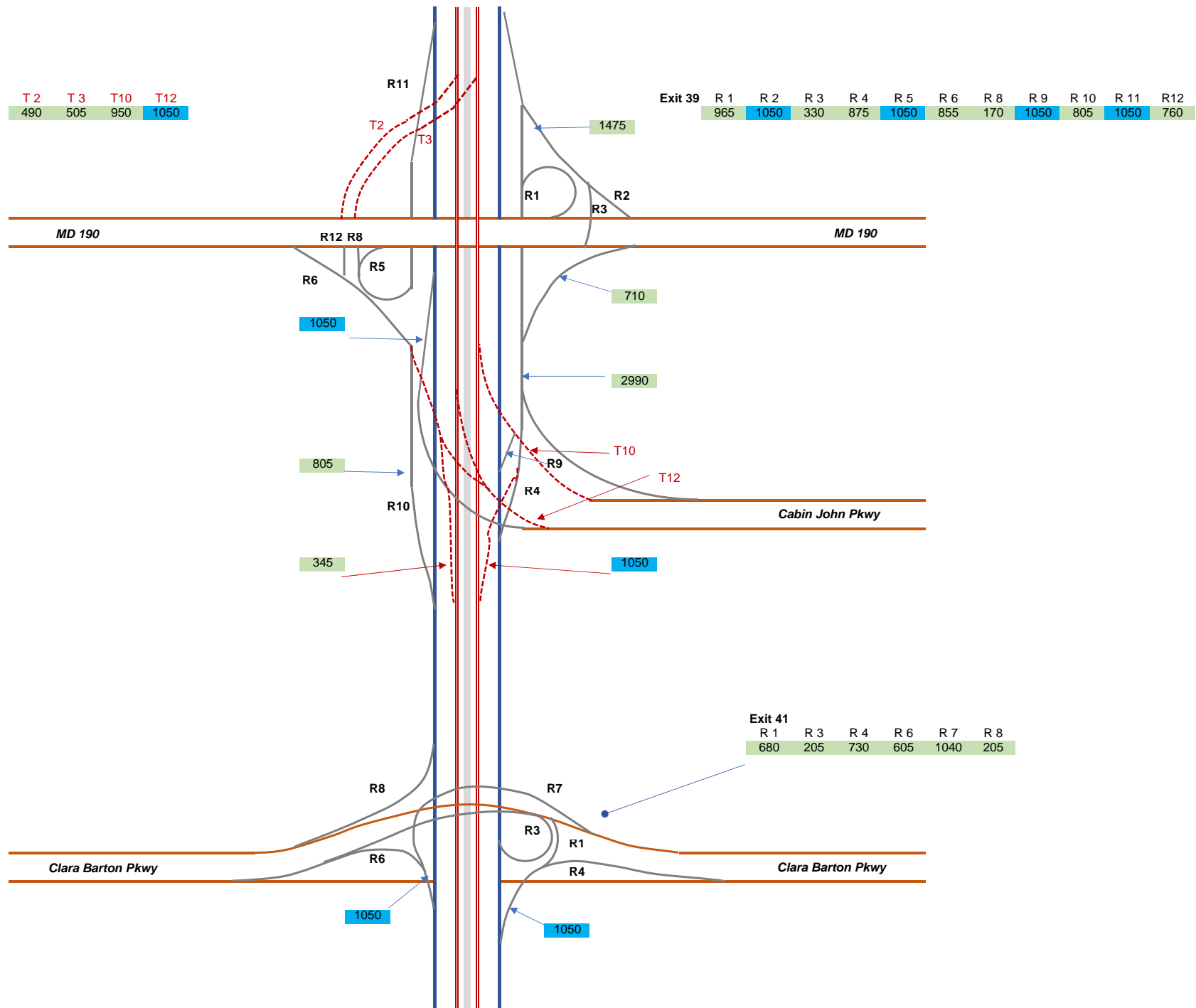


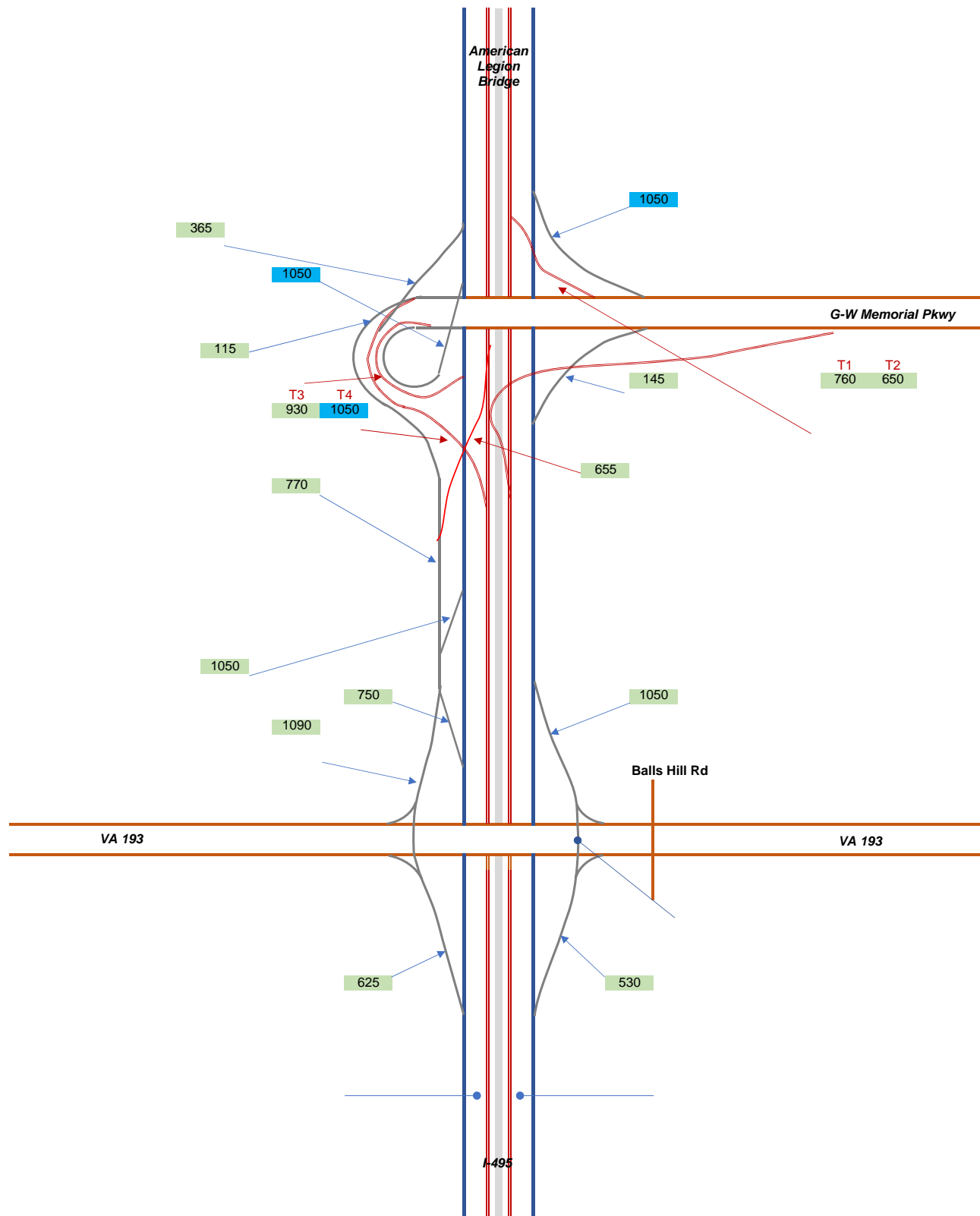












APP B

APPENDIX B IMPACT SOUND LEVELS

NOISE ANALYSIS TECHNICAL REPORT ADDENDUM September 2021



U.S. Department
of Transportation

**Federal Highway
Administration**

MOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION



1. Introduction

This appendix summarizes the receptor data for the Preferred Alternative study area. Table B-1 lists the predicted noise levels and it also indicates in **bold red font** if the level is impacted by noise for the particular land use and **highlights** that level if it equals or exceeds 75 dB(A). The table shows when a receptor has the maximum noise level within an NSA, and if the receptor was elevated to model multi-story balconies. Additionally, the table shows the sound levels with the analyzed noise barriers in place (including barriers considered Reasonable and Feasible and barriers considered NOT Reasonable and/or Feasible). The following information applies to the results in the table:

- A Receptor Number beginning with “M” represents a measured location and a Receptor Number beginning with “R” represents a modeled receptor only.
- Interior sound levels are shown in parenthesis () where applicable.
- A background sound level of 55 dB(A) was added to the TNM results, since TNM does not account for background noise.
- An asterisk (*) represents an elevated receptor.

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
VA-1	1	VA-01-1	63	59	
	2	VA-01-2	74	63	✓
	3	VA-01-3	68	61	
	4	VA-01-4	65	61	
	5	VA-01-5	65	60	
	6	VA-01-6	66	62	
	7	VA-01-7	69	64	
	8	VA-01-8	68	63	
	9	VA-01-9	59	58	
	10	VA-01-10	73	65	
	11	VA-01-11	66	62	
	12	VA-01-12	62	59	
	13	VA-01-13	71	65	
	14	VA-01-14	70	64	
	15	VA-01-15	63	60	
	16	VA-01-16	61	60	
	17	VA-01-17	64	63	
	18	VA-01-18	65	65	
	19	VA-01-19	66	65	
	20	VA-01-20	67	66	
	21	VA-01-21	67	66	
	22	VA-01-22	68	68	
VA-2	1	VA-02-1	80	71	
	2	VA-02-2	78	72	
	3	VA-02-3	75	69	
	4	VA-02-4	75	72	
	5	VA-02-5	75	70	
	6	VA-02-6	74	68	
	7	VA-02-7	71	70	
	8	VA-02-8	70	66	
	9	VA-02-9	62	60	
	10	VA-02-10	70	70	
	11	VA-02-11	69	68	
	12	VA-02-12	66	65	
	13	VA-02-13	67	67	
	14	VA-02-14	64	64	
	15	VA-02-15	57	57	
	16	VA-02-16	56	56	
	17	VA-02-17	56	56	
	18	VA-02-18	56	56	
	19	VA-02-19	60	59	
	20	VA-02-20	56	56	
	21	VA-02-21	55	56	
	22	VA-02-22	58	57	
	23	VA-02-23	57	57	
	24	VA-02-24	62	59	
	25	VA-02-25	59	59	
	26	VA-02-26	56	56	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	27	VA-02-27	63	59	
	28	VA-02-28	65	65	
	29	VA-02-29	63	59	
	30	VA-02-30	70	60	
	31	VA-02-31	61	59	
	32	VA-02-32	62	62	
	33	VA-02-33	81	71	✓
	34	VA-02-34	81	77	✓
	35	VA-02-35	80	72	
	36	VA-02-36	74	67	
	37	VA-02-37	65	63	
	38	VA-02-38	65	62	
	39	VA-02-39	69	61	
	40	VA-02-40	76	61	
	41	VA-02-41	74	59	
	42	VA-02-42	71	61	
	43	VA-02-43	71	66	
	44	VA-02-44	59	58	
	45	VA-02-45	60	58	
	46	VA-02-46	60	58	
	47	VA-02-47	63	59	
	48	VA-02-48	70	62	
	49	VA-02-49	72	63	
VA-3	1	VA-03-01	62	62	
	2	VA-03-02	63	63	
	3	VA-03-03	60	59	
	4	VA-03-04	57	57	
	5	VA-03-05	65	64	
	6	VA-03-06	66	65	
	7	VA-03-07	63	63	
	8	VA-03-08	63	62	
	9	VA-03-09	65	64	
	10	VA-03-10	64	63	
	11	VA-03-11	62	59	
	12	VA-03-12	58	58	
	13	VA-03-13	61	57	
	14	VA-03-14	60	60	
	15	VA-03-15	61	60	
	16	VA-03-16	60	59	
	17	VA-03-17	57	56	
	18	VA-03-18	58	56	
	19	VA-03-19	60	57	
	20	VA-03-20	62	58	
	21	VA-03-21	66	60	
	22	VA-03-22	66	59	
	23	VA-03-23	64	58	
	24	VA-03-24	67	59	
	25	VA-03-25	58	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA	
	26	VA-03-26	61	56		
	27	VA-03-27	73	62		
	28	VA-03-28	69	60		
	29	VA-03-29	64	58		
	30	VA-03-30	68	59		
	31	VA-03-31	72	61		
	32	VA-03-32	70	61		
	33	VA-03-33	71	62		
	34	VA-03-34	66	59		
	35	VA-03-35	67	59		
	36	VA-03-36	74	62	✓	
	37	VA-03-37	70	59		
	38	VA-03-38	65	57		
	39	VA-03-39	72	61		
	40	VA-03-40	68	58		
	41	VA-03-41	69	60		
	42	VA-03-42	69	60		
	43	VA-03-43	64	57		
	44	VA-03-44	66	58		
	45	VA-03-45	66	59		
	46	VA-03-46	66	59		
	47	VA-03-47	71	61		
	48	VA-03-48	63	58		
	49	VA-03-49	67	60		
	50	VA-03-50	61	57		
	51	VA-03-51	61	59		
	52	VA-03-52	63	60		
	VA-4	1	VA-04-01	62	62	✓
		2	VA-04-02	62	62	✓
		3	VA-04-03	60	60	
		4	VA-04-04	60	60	
	1-01	M1	M1-1-1	76	69	✓
M2		M1-1-2	73	62		
M3		M1-1-3	67	60		
1		R1-01-01	60	60		
2		R1-01-02	64	64		
3		R1-01-03	63	63		
4		R1-01-04	61	61		
5		R1-01-05	57	56		
6		R1-01-06	57	57		
7		R1-01-07	72	64		
8		R1-01-08	59	59		
9		R1-01-09	65	65		
10		R1-01-10	62	62		
11	R1-01-11	69	69			
12	R1-01-12	68	68			
13	R1-01-13	65	65			
1-02	M1	M1-02-01	67	62		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	M2	M1-02-02	66	58	
	M3	M1-02-03	78	63	✓
	M4	M1-2-4	78	61	✓
	M5	M1-2-5	70	61	
	1	R1-02-01	73	67	
	2	R1-02-02	64	64	
	3	R1-02-03	59	57	
	4	R1-02-04	66	59	
	5	R1-02-05	64	58	
	6	R1-02-06	65	58	
	7	R1-02-07	61	57	
	8	R1-02-08	63	59	
	9	R1-02-09	64	64	
	10	R1-02-10	67	65	
11	R1-02-11	64	64		
12	R1-02-12	62	63		
1-04	M1	M1-4-1	74	63	
	M2	M1-4-2	76	67	✓
	M3	M1-4-3	61	60	
	M4	M1-4-4	67	60	
	M5	M1-4-5	70	61	
	M6	M1-4-6	73	61	
	M7	M1-4-7	67	61	
	1	R1-04-01	69	64	
	2	R1-04-02	62	59	
	3	R1-04-03	61	58	
	4	R1-04-04	57	56	
	5	R1-04-05	61	58	
	6	R1-04-06	71	63	
	7	R1-04-07	63	60	
	8	R1-04-08	56	55	
	9	R1-04-09	64	61	
	10	R1-04-10	59	57	
	11	R1-04-11	59	58	
	12	R1-04-12	57	56	
	13	R1-04-13	60	58	
14	R1-04-14	62	57		
15	R1-04-15	64	58		
16	R1-04-16	66	59		
17	R1-04-17	68	60		
18	R1-04-18	63	61		
19	R1-04-19	65	65		
20	R1-04-20	70	60		
1-05	M1	M1-05-01	72	66	
	M2	M1-05-02	73	66	
	M3	M1-05-03	76	62	✓
	M4	M1-05-04	72	62	
	M5	M1-05-05	76	64	✓

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	M6	M1-05-06	68	61	
	1	R1-05-01	69	59	
	2	R1-05-02	64	63	
	3	R1-05-03	68	67	
	4	R1-05-04	67	66	
	5	R1-05-05	56	56	
	7	R1-05-07	67	60	
	8	R1-05-08	64	61	
	9	R1-05-09	66	61	
	10	R1-05-10	63	62	
	11	R1-05-11	67	60	
1-03	M1	M1-03-01	78	63	
	M2	M1-03-02	80	66	
	M3	M1-03-03	82	64	✓
	1	R1-03-01	66	64	
	3	R1-03-03	62	59	
	4	R1-03-04	62	58	
	5	R1-03-05	71	61	
	6	R1-03-06	65	60	
	7	R1-03-07	70	62	
	8	R1-03-08	63	59	
	9	R1-03-09	68	61	
10	R1-03-10	57	56		
11	R1-03-11	63	60		
2-01	M1	M2-01-01	73	62	✓
	M3	M2-01-03	71	62	
	M4	M2-01-04	65	59	
	M5	M2-01-05	63	60	
	M6	M2-01-06	70	62	
	1	R2-01-01	63	61	
	2	R2-01-02	64	60	
	3	R2-01-03	62	59	
	4	R2-01-04	69	64	
	5	R2-01-05	68	62	
	6	R2-01-06	66 (56)	61 (51)	
	7	R2-01-07	65	59	
	8	R2-01-08	63	60	
	9	R2-01-09	64	62	
	10	R2-01-10	62	61	
	11	R2-01-11	61	60	
	12	R2-01-12	58	57	
	13	R2-01-13	57	56	
	14	R2-01-14	57	56	
15	R2-01-15	57	56		
16	R2-01-16	57	57		
17	R2-01-17	58	58		
18	R2-01-18	58	58		
19	R2-01-19	57	57		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	20	R2-01-20	57	57	
	21	R2-01-21	57	57	
	22	R2-01-22	57	56	
1-06	M1	M1-06-01	77	61	✓
	M2	M1-06-02	75	64	
	M3	M1-06-03	75	68	
	1	R1-06-01	59	59	
	2	R1-06-02	63	62	
	3	R1-06-03	58	56	
	4	R1-06-04	56	56	
	5	R1-06-05	63	61	
	6	R1-06-06	56	56	
3-01	M1	M3-01-01	72	63	
	M2	M3-01-02	73	67	
	M3	M3-01-03	77	63	
	M4	M3-01-04	83	62	✓
	M6	M3-01-06	76	62	
	M7	M3-01-07	81	65	
	M8	M3-01-08	77	69	
	M9	M3-01-09	61	58	
	M10	M3-01-10	77	66	
	M11	M3-01-11	80	67	
	M12	M3-01-12	68	60	
	M13	M3-01-13	79	62	
	M14	M3-01-14	70	60	
	M15	M3-01-15	76	63	
	M16	M3-01-16	80	63	
	M17	M3-01-17	69	61	
	M18	M3-01-18	78	66	
	M19	M3-01-19	72	62	
	M20	M3-01-20	78	63	
	M21	M3-01-21	76	64	
	M22	M3-01-22	82	63	
	M23	M3-01-23	73	64	
	M24	M3-01-24	81	66	
	M25	M3-01-25	79	70	
	M26	M3-01-26	81	66	
	M27	M3-01-27	77	67	
	M28	M3-01-28	82	62	
	M29	M3-01-29	82	71	
		1	R3-01-01	58	57
	2	R3-01-02	57	56	
	3	R3-01-03	60	57	
	4	R3-01-04	61	57	
	5	R3-01-05	65	58	
	6	R3-01-06	61	57	
	7	R3-01-07	57	56	
	8	R3-01-08	62	58	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	09	R3-01-09	60	57	
	10	R3-01-10	63	57	
	11	R3-01-11	58	56	
	12	R3-01-12	58	56	
	13	R3-01-13	57	56	
	14	R3-01-14	57	56	
	15	R3-01-15	56	56	
	16	R3-01-16	58	57	
	17	R3-01-17	66	60	
	18	R3-01-18	60	58	
	19	R3-01-19	59	58	
1-38	20	R3-01-20	68	62	
	1	R1-38-01	68	60	
	2	R1-38-02*	71	61	
	3	R1-38-03*	71	64	
	4	R1-38-04	68	61	
	5	R1-38-05*	70	64	
	6	R1-38-06*	71	67	
	7	R1-38-07	69	60	
	8	R1-38-08*	71	62	
	9	R1-38-09*	72	64	✓
	10	R1-38-10	65	59	
	11	R1-38-11*	68	61	
12	R1-38-12*	70	61		
4-01	M1	M4-01-01	64	60	
	M2	M4-01-02	71	63	
	M3	M4-01-03	75	61	✓
	M4	M4-01-04	75	62	✓
	M5	M4-01-05	67	58	
	1	R4-01-01	63	61	
	2	R4-01-02	66	59	
	3	R4-01-03	66	58	
	4	R4-01-04	72	60	
	5	R4-01-05	68	59	
	6	R4-01-06	73	61	
2-02	M1	M2-02-01	80	67	✓
	M2	M2-02-02	69	63	
	M3	M2-02-03	80	64	✓
	M4	M2-02-04	80	71	✓
	M5	M2-02-05	67	64	
	M6	M2-02-06	68	62	
	M7	M2-02-07	79	67	
	M8	M2-02-08	79	63	
	M9	M2-02-09	79	68	
	M10	M2-02-10	73	63	
	1	R2-02-01	70	66	
	2	R2-02-02	73	65	
	3	R2-02-03	76	63	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA	
	4	R2-02-04	74	63		
	5	R2-02-05	66	58		
	6	R2-02-06	73	61		
	7	R2-02-07	65	59		
	8	R2-02-08	70	59		
	9	R2-02-09	67	59		
	10	R2-02-10	78	62		
	11	R2-02-11	62	58		
	12	R2-02-12	65	64		
	13	R2-02-13	79	72		
	14	R2-02-14	60	60		
	15	R2-02-15	63	60		
	16	R2-02-16	59	58		
	17	R2-02-17	58	57		
	18	R2-02-18	58	56		
	19	R2-02-19	62	58		
	20	R2-02-20	61	57		
	21	R2-02-21	58	56		
	22	R2-02-22	61	57		
	23	R2-02-23	58	56		
	24	R2-02-24	58	56		
	25	R2-02-25	60	57		
	26	R2-02-26	58	58		
	27	R2-02-27	61	60		
	3-02	M1	M3-02-01	79	64	✓
		M2	M3-02-02	66	61	
		M3	M3-02-03	79	62	✓
M4		M3-02-04	77	62		
M5		M3-02-05	79	63	✓	
M6		M3-02-06	69	62		
M7		M3-02-07	75	68		
M8		M3-02-08	76	69		
	1	R3-02-01	62	61		
	2	R3-02-02	63	58		
	3	R3-02-03	60	58		
	4	R3-02-04	64	64		
3-04	M1	M3-04-01	72	63		
	M2	M3-04-02	61	59		
	M3	M3-04-03	68	61		
	M4	M3-04-04	63	58		
	M5	M3-04-05	64	59		
	M6	M3-04-06	67	59		
	1	R3-04-01	61	58		
	2	R3-04-02	62	59		
	3	R3-04-03	59	58		
	4	R3-04-04	58	56		
	5	R3-04-05	74	61	✓	
	6	R3-04-06	56	56		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
1-08	7	R3-04-07	57	56	
	8	R3-04-08	61	57	
	9	R3-04-09	58	56	
	M1	M1-08-01	70	61	
	M2	M1-08-02	75	62	✓
	M3	M1-08-03	70	65	
	1	R1-08-01	60	57	
	2	R1-08-02	57	56	
	3	R1-08-03	60	60	
2-03	4	R1-08-04	58	58	
	5	R1-08-05	62	59	
	M1	M2-03-01	60	60	
	M2	M2-03-02	78	63	✓
	M3	M2-03-03	65	60	
	M4	M2-03-04	60	57	
	M5	M2-03-05	64	61	
	1	R2-03-01	56	56	
	2	R2-03-02	56	56	
	3	R2-03-03	58	57	
	4	R2-03-04	56	56	
2-04	5	R2-03-05	56	56	
	6	R2-03-06	57	57	
	M1	M2-04-01	78	63	
	M2	M2-04-02	68	60	
	M3	M2-04-03	76	62	
	M4	M2-04-04	67	60	
	M5	M2-04-05	70	62	
	M6	M2-04-06	79	64	
	M7	M2-04-07	67	60	
	M8	M2-04-08	77	62	
	M9	M2-04-09	69	60	
	M10	M2-04-10	70	60	
	M11	M2-04-11	71	61	
	M12	M2-04-12	81	62	✓
	1	R2-04-01	58	57	
	2	R2-04-02	58	56	
	3	R2-04-03	58	56	
	4	R2-04-04	66	59	
	5	R2-04-05	57	56	
	6	R2-04-06	58	56	
	7	R2-04-07	58	56	
	8	R2-04-08	59	56	
	9	R2-04-09	61	57	
10	R2-04-10	63	57		
11	R2-04-11	63	57		
12	R2-04-12	62	58		
13	R2-04-13	68	59		
14	R2-04-14	69	60		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	15	R2-04-15	62	61	
	16	R2-04-16	59	56	
	17	R2-04-17	63	57	
2-05	M1	M2-05-01	70	62	
	M2	M2-05-02	76	64	
	M3	M2-05-03	75	63	
	M4	M2-05-04	68	61	
	M5	M2-05-05	72	62	
	M6	M2-05-06	80	66	✓
	M7	M2-05-07	73	62	
	M8	M2-05-08	78	64	
	M9	M2-05-09	64	61	
	M10	M2-05-10	68	60	
	M11	M2-05-11	66	61	
	M12	M2-05-12	69	62	
	1	R2-05-01	62	60	
	2	R2-05-02	62	58	
	3	R2-05-03	63	58	
	4	R2-05-04	60	57	
	5	R2-05-05	63	58	
	6	R2-05-06	62	57	
	7	R2-05-07	67	60	
	8	R2-05-08	61	57	
	9	R2-05-09	68	61	
	10	R2-05-10	63	58	
	11	R2-05-11	64	60	
	12	R2-05-12	64	63	
	13	R2-05-13	60	56	
	14	R2-05-14	60	57	
	15	R2-05-15	58	56	
	16	R2-05-16	59	56	
	17	R2-05-17	61	57	
2-06	M1	M2-06-01	64	60	
	M2	M2-06-02	71	61	✓
	M3	M2-06-03	64	58	
	M4	M2-06-04	69	61	
	M5	M2-06-05	66	59	
	M6	M2-06-06	71	61	✓
	1	R2-06-01	58	58	
	2	R2-06-02	64	63	
	3	R2-06-03	61	57	
	4	R2-06-04	57	56	
	5	R2-06-05	60	57	
	6	R2-06-06	57	56	
1-09A	M1	M1-09-01	69	62	✓
	M2	M1-09-02	68	65	
	1	R1-09-01	63	58	
	2	R1-09-02	60	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	3	R1-09-03	60	58	
	4	R1-09-04	58	57	
	5	R1-09-05	60	59	
1-10A	M1	M1-10-01	71	61	
	M2	M1-10-02	70	58	
	M3	M1-10-03	64	59	
	M4	M1-10-04	75	67	
	1	R1-10-01	62	61	
	2	R1-10-02	58	57	
	3	R1-10-03	62	57	
	4	R1-10-04	66	58	
	5	R1-10-05	61	57	
	6	R1-10-06	63	58	
	7	R1-10-07	66	59	
	8	R1-10-08	61	57	
	9	R1-10-09	64	58	
	10	R1-10-10	60	56	
	11	R1-10-11	60	56	
	12	R1-10-12	60	56	
	13	R1-10-13	60	56	
	14	R1-10-14	59	56	
	15	R1-10-15	58	56	
	16	R1-10-16	62	58	
17	R1-10-17	67	61		
18	R1-10-18	78	72	✓	
19	R1-10-19	68	61		
20	R1-10-20	62	60		
5-36	1	R 5-36-01	79	65	✓
	2	R 5-36-02	78	65	
	3	R 5-36-03	76	64	
	4	R 5-36-04	74	64	
	5	R 5-36-05	71	63	
	6	R 5-36-06	68	62	
	7	R 5-36-07	68	62	
	8	R 5-36-08	66	63	
	9	R 5-36-09	69	66	
	10	R 5-36-10	63	60	
	11	R 5-36-11	62	59	
	12	R 5-36-12	64	59	
	13	R 5-36-13	66	60	
	14	R 5-36-14	66	60	
	15	R 5-36-15	70	62	
	16	R 5-36-16	76	68	
	17	R 5-36-17	79	68	✓
	18	R 5-36-18	73	60	
	19	R 5-36-19	66	58	
	20	R 5-36-20	63	57	
	21	R 5-36-21	59	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	22	R 5-36-22	59	57	
	23	R 5-36-23	62	58	
	24	R 5-36-24	62	58	
	25	R 5-36-25	62	58	
	26	R 5-36-26	64	59	
	27	R 5-36-27	63	59	
	28	R 5-36-28	65	59	
	29	R 5-36-29	66	60	
	30	R 5-36-30	67	61	
	31	R 5-36-31	67	61	
	32	R 5-36-32	67	60	
	33	R 5-36-33	67	60	
	34	R 5-36-34	67	60	
	35	R 5-36-35	66	60	
	36	R 5-36-36	67	60	
	37	R 5-36-37	67	59	
	38	R 5-36-38	64	58	
	39	R 5-36-39	61	57	
	40	R 5-36-40	61	57	
	41	R 5-36-41	59	57	
	42	R 5-36-42	58	56	
	43	R 5-36-43	58	57	
	44	R 5-36-44	58	57	
	45	R 5-36-45	58	57	
	46	R 5-36-46	59	57	
	47	R 5-36-47	60	57	
	48	R 5-36-48	62	57	
	49	R 5-36-49	65	58	
	50	R 5-36-50	64	58	
	51	R 5-36-51	68	59	
	52	R 5-36-52	68	62	
	53	R 5-36-53	68	62	
	54	R 5-36-54	68	61	
	55	R 5-36-55	69	61	
	56	R 5-36-56	69	61	
	57	R 5-36-57	70	61	
	58	R 5-36-58	70	61	
	59	R 5-36-59	71	61	
	60	R 5-36-60	74	62	
	61	R 5-36-61	75	63	
	62	R 5-36-62	75	62	
	63	R 5-36-63	75	62	
	64	R 5-36-64	75	61	
	65	R 5-36-65	76	61	
	66	R 5-36-66	76	63	
	67	R 5-36-67	74	62	
	68	R 5-36-68	71	61	
	69	R 5-36-69	68	60	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	70	R 5-36-70	64	58	
	71	R 5-36-71	63	58	
	72	R 5-36-72	72	62	
	73	R 5-36-73	66	59	
	74	R 5-36-74	64	58	
	75	R 5-36-75	66	58	
	76	R 5-36-76	63	57	
	77	R 5-36-77	63	57	
	78	R 5-36-78	62	56	
	79	R 5-36-79	61	56	
	80	R 5-36-80	61	56	
	81	R 5-36-81	61	57	
	82	R 5-36-82	62	57	
	83	R 5-36-83	62	57	
	84	R 5-36-84	62	57	
	85	R 5-36-85	62	57	
	86	R 5-36-86	62	57	
	87	R 5-36-87	62	57	
	88	R 5-36-88	62	57	
	89	R 5-36-89	63	58	
	90	R 5-36-90	64	58	
	91	R 5-36-91	64	58	
	92	R 5-36-92	65	58	
	93	R 5-36-93	65	58	
	94	R 5-36-94	66	58	
	95	R 5-36-95	67	58	
	96	R 5-36-96	63	57	
	97	R 5-36-97	63	57	
	98	R 5-36-98	63	57	
	99	R 5-36-99	63	57	
	100	R 5-36-100	63	57	
	101	R 5-36-101	62	57	
	102	R 5-36-102	62	57	
	103	R 5-36-103	63	57	
	104	R 5-36-104	62	57	
	105	R 5-36-105	62	57	
	106	R 5-36-106	62	57	
	107	R 5-36-107	62	57	
	108	R 5-36-108	62	57	
	109	R 5-36-109	62	57	
	110	R 5-36-110	66	58	
	111	R 5-36-111	63	59	
	112	R 5-36-112	61	58	
5-37A	1	R 5-37-01	66	59	
	2	R 5-37-02	67	60	
	3	R 5-37-03	67	61	
	4	R 5-37-04	68	61	
	5	R 5-37-05	64	59	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA	
	6	R 5-37-06	71	61		
	7	R 5-37-07	72	60	✓	
	8	R 5-37-08	70	60		
	9	R 5-37-09	71	62		
	10	R 5-37-10	63	60		
	11	R 5-37-11	64	59		
	12	R 5-37-12	62	59		
	13	R 5-37-13	63	59		
	14	R 5-37-14	60	58		
	15	R 5-37-15	61	59		
	16	R 5-37-16	58	57		
	17	R 5-37-17	59	57		
	18	R 5-37-18	60	58		
	19	R 5-37-19	62	59		
	5-37B	20	R 5-37-20	71	66	
		21	R 5-37-21	80	67	✓
		22	R 5-37-22	79	63	
		23	R 5-37-23	79	63	
		24	R 5-37-24	77	62	
25		R 5-37-25	77	62		
26		R 5-37-26	76	62		
27		R 5-37-27	75	62		
28		R 5-37-28	72	60		
29		R 5-37-29	72	61		
30		R 5-37-30	71	61		
31		R 5-37-31	70	61		
32		R 5-37-32	69	60		
33		R 5-37-33	66	60		
34		R 5-37-34	65	60		
35		R 5-37-35	64	61		
36		R 5-37-36	65	62		
37		R 5-37-37	64	61		
38		R 5-37-38	64	61		
39		R 5-37-39	63	61		
40		R 5-37-40	73	65		
41		R 5-37-41	75	68		
42		R 5-37-42	71	64		
43		R 5-37-43	69	64		
5-33A	1	R 5-33-1	65	64		
	2	R 5-33-2	71	59		
	3	R 5-33-3	68	59		
	4	R 5-33-4	68	59		
	5	R 5-33-5	71	60		
	6	R 5-33-6	69	58		
	7	R 5-33-7	70	59		
	8	R 5-33-8	64	59		
	9	R 5-33-9	65	59		
	10	R 5-33-10	65	59		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	11	R 5-33-11	66	58	
	12	R 5-33-12	65	58	
	13	R 5-33-13	66	58	
	14	R 5-33-14	61	59	
	15	R 5-33-15	61	57	
	16	R 5-33-16	60	57	
	17	R 5-33-17	61	57	
	18	R 5-33-18	64	58	
	19	R 5-33-19	60	58	
	20	R 5-33-20	59	57	
	21	R 5-33-21	59	57	
	22	R 5-33-22	58	56	
	23	R 5-33-23	59	57	
	24	R 5-33-24	60	57	
	25	R 5-33-25	58	57	
	26	R 5-33-26	58	56	
	27	R 5-33-27	58	56	
	28	R 5-33-28	58	56	
	29	R 5-33-29	58	56	
	30	R 5-33-30	57	56	
	31	R 5-33-31	57	56	
	32	R 5-33-32	57	56	
	33	R 5-33-33	57	56	
	34	R 5-33-34	65	58	
	35	R 5-33-35	64	59	
	36	R 5-33-36	62	57	
	37	R 5-33-37	63	57	
	38	R 5-33-38	64	57	
	39	R 5-33-39	61	57	
	40	R 5-33-40	62	57	
	41	R 5-33-41	65	58	
	42	R 5-33-42	71	60	
	43	R 5-33-43	68	59	
	44	R 5-33-44	65	58	
	45	R 5-33-45	66	59	
	46	R 5-33-46	62	57	
	47	R 5-33-47	62	56	
	48	R 5-33-48	60	56	
	49	R 5-33-49	60	56	
	50	R 5-33-50	59	56	
	51	R 5-33-51	59	56	
	52	R 5-33-52	60	56	
	53	R 5-33-53	60	56	
	54	R 5-33-54	60	56	
	55	R 5-33-55	62	57	
	56	R 5-33-56	59	56	
	57	R 5-33-57	64	58	
	58	R 5-33-58	65	58	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	59	R 5-33-59	65	58	
	60	R 5-33-60	65	58	
	61	R 5-33-61	59	56	
	62	R 5-33-62	58	56	
	63	R 5-33-63	58	56	
	64	R 5-33-64	58	56	
	65	R 5-33-65	57	56	
	66	R 5-33-66	59	56	
	67	R 5-33-67	59	56	
	68	R 5-33-68	59	56	
	69	R 5-33-69	58	56	
	70	R 5-33-70	68	60	
	71	R 5-33-71	69	60	
	72	R 5-33-72	70	60	
	73	R 5-33-73	70	61	
	74	R 5-33-74	70	61	
	75	R 5-33-75	69	61	
	76	R 5-33-76	68	60	
	77	R 5-33-77	65	58	
	78	R 5-33-78	64	58	
	79	R 5-33-79	66	59	
	80	R 5-33-80	62	57	
	81	R 5-33-81	60	57	
	82	R 5-33-82	65	58	
	83	R 5-33-83	60	57	
	84	R 5-33-84	64	58	
	85	R 5-33-85	66	58	
	86	R 5-33-86	66	58	
	87	R 5-33-87	64	58	
	88	R 5-33-88	65	58	
	89	R 5-33-89	62	57	
	90	R 5-33-90	62	57	
	91	R 5-33-91	60	57	
	92	R 5-33-92	59	56	
	93	R 5-33-93	58	56	
	94	R 5-33-94	57	56	
	95	R 5-33-95	59	57	
	96	R 5-33-96	59	56	
	97	R 5-33-97	58	56	
	98	R 5-33-98	58	56	
	99	R 5-33-99	61	57	
	100	R 5-33-100	60	57	
	101	R 5-33-101	59	57	
	102	R 5-33-102	60	57	
	103	R 5-33-103	59	57	
	104	R 5-33-104	58	56	
	105	R 5-33-105	58	56	
	106	R 5-33-106	59	56	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	107	R 5-33-107	59	56	
	108	R 5-33-108	58	56	
	109	R 5-33-109	60	56	
	110	R 5-33-110	59	56	
	111	R 5-33-111	57	56	
	112	R 5-33-112	57	56	
	113	R 5-33-113	58	56	
	114	R 5-33-114	68	58	
	115	R 5-33-115	67	57	
	116	R 5-33-116	65	57	
	117	R 5-33-117	64	57	
	118	R 5-33-118	61	56	
	119	R 5-33-119	60	56	
	120	R 5-33-120	69	60	
	121	R 5-33-121	69	60	
	122	R 5-33-122	68	60	
	123	R 5-33-123	68	60	
	124	R 5-33-124	66	59	
	125	R 5-33-125	63	58	
	126	R 5-33-126	61	57	
	127	R 5-33-127	56	56	
	128	R 5-33-128	59	57	
	129	R 5-33-129	65	58	
	130	R 5-33-130	63	57	
	131	R 5-33-131	61	56	
	132	R 5-33-132	62	58	
	133	R 5-33-133	59	57	
	134	R 5-33-134	61	57	
	135	R 5-33-135	59	57	
	136	R 5-33-136	60	57	
	137	R 5-33-137	60	57	
	138	R 5-33-138	61	56	
	139	R 5-33-139	61	56	
	140	R 5-33-140	59	57	
	141	R 5-33-141	59	57	
	142	R 5-33-142	59	57	
	143	R 5-33-143	59	57	
	144	R 5-33-144	59	57	
	145	R 5-33-145	61 (36)	58 (33)	
	146	R 5-33-146	61 (36)	58 (33)	
	147	R 5-33-147	62 (37)	58 (33)	
	148	R 5-33-148	61	59	
	149	R 5-33-149	61	58	
	150	R 5-33-150	60	57	
	151	R 5-33-151	63	58	
	152	R 5-33-152	62	57	
	153	R 5-33-153	63	58	
	154	R 5-33-154	64	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	155	R 5-33-155	68	59	
	156	R 5-33-156	68	58	
	157	R 5-33-157	63	57	
	158	R 5-33-158	62	57	
	159	R 5-33-159	62	57	
	160	R 5-33-160	61	56	
	161	R 5-33-161	58	56	
	162	R 5-33-162	58	56	
	163	R 5-33-163	65	57	
	164	R 5-33-164	63	56	
	165	R 5-33-165	66	57	
	166	R 5-33-166	61	56	
	167	R 5-33-167	60	56	
	168	R 5-33-168	60	56	
	169	R 5-33-169	59	56	
	170	R 5-33-170	60	56	
	171	R 5-33-171	66	60	
	172	R 5-33-172	59	56	
	173	R 5-33-173	58	56	
	174	R 5-33-174	57	55	
	175	R 5-33-175	67	60	
	176	R 5-33-176	62	56	
	177	R 5-33-177	59	56	
	178	R 5-33-178	57	56	
	179	R 5-33-179	57	56	
	180	R 5-33-180	58	56	
	181	R 5-33-181	58	56	
	182	R 5-33-182	57	56	
	183	R 5-33-183	57	56	
	184	R 5-33-184	65	61	
	185	R 5-33-185	64	61	
	186	R 5-33-186	57	56	
	187	R 5-33-187	57	56	
	188	R 5-33-188	65	62	
	189	R 5-33-189	67	62	
	190	R 5-33-190	67	63	
	191	R 5-33-191	67	63	
	192	R 5-33-192	67	63	
	193	R 5-33-193	67	63	
	194	R 5-33-194	67	64	
	195	R 5-33-195	68	64	
	196	R 5-33-196	68	64	
	197	R 5-33-197	68	65	
	198	R 5-33-198	68	65	
	199	R 5-33-199	68	66	
	200	R 5-33-200	57	56	
	201	R 5-33-201	56	56	
	202	R 5-33-202	57	56	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	203	R 5-33-203	57	56	
	204	R 5-33-204	57	55	
	205	R 5-33-205	57	55	
	206	R 5-33-206	57	55	
	207	R 5-33-207	57	55	
	208	R 5-33-208	57	56	
	209	R 5-33-209	57	56	
	210	R 5-33-210	57	57	
	211	R 5-33-211	57	56	
	212	R 5-33-212	56	56	
	213	R 5-33-213	57	56	
	214	R 5-33-214	62	62	
	215	R 5-33-215	65	63	
	216	R 5-33-216	57	56	
	217	R 5-33-217	57	56	
	218	R 5-33-218	57	56	
	219	R 5-33-219	61	61	
	220	R 5-33-220	66	64	
	221	R 5-33-221	65	63	
	222	R 5-33-222	65	63	
	223	R 5-33-223	64	62	
	224	R 5-33-224	64	62	
	225	R 5-33-225	80	72	✓
	226	R 5-33-226	77	60	
5-34A	1	R 5-34-1	63	63	
	2	R 5-34-2	64	63	
	3	R 5-34-3	62	62	
	4	R 5-34-4	63	62	
	5	R 5-34-5	62	60	
	6	R 5-34-6	61	58	
	7	R 5-34-7	63	63	
	8	R 5-34-8	62	62	
	9	R 5-34-9	60	60	
	10	R 5-34-10	60	59	
	11	R 5-34-11	59	59	
	12	R 5-34-12	59	58	
	13	R 5-34-13	66	60	
	14	R 5-34-14	71	62	
	15	R 5-34-15	72	62	
	16	R 5-34-16	73	63	
	17	R 5-34-17	72	61	
	18	R 5-34-18	71	61	
	19	R 5-34-19	70	60	
	20	R 5-34-20	62	59	
	21	R 5-34-21	62	59	
	22	R 5-34-22	66	59	
	23	R 5-34-23	66	59	
	24	R 5-34-24	61	58	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	25	R 5-34-25	60	58	
	26	R 5-34-26	59	57	
	27	R 5-34-27	62	58	
	28	R 5-34-28	64	59	
	29	R 5-34-29	63	58	
	30	R 5-34-30	59	57	
	31	R 5-34-31	59	57	
	32	R 5-34-32	60	57	
	33	R 5-34-33	61	57	
	34	R 5-34-34	69	60	
	35	R 5-34-35	72	61	
	36	R 5-34-36	72	62	
	37	R 5-34-37	72	61	
	38	R 5-34-38	70	60	
	39	R 5-34-39	66	59	
	40	R 5-34-40	67	59	
	41	R 5-34-41	68	60	
	42	R 5-34-42	69	60	
	43	R 5-34-43	68	59	
	44	R 5-34-44	66	59	
	45	R 5-34-45	67	59	
	46	R 5-34-46	67	59	
	47	R 5-34-47	65	58	
	48	R 5-34-48	66	59	
	49	R 5-34-49	67	59	
	50	R 5-34-50	67	59	
	51	R 5-34-51	66	59	
	52	R 5-34-52	71	60	
	53	R 5-34-53	70	61	
	54	R 5-34-54	68	60	
	55	R 5-34-55	69	60	
	56	R 5-34-56	70	62	
	57	R 5-34-57	73	63	
	58	R 5-34-58	65	59	
	59	R 5-34-59	64	59	
	60	R 5-34-60	63	59	
	61	R 5-34-61	65	59	
	62	R 5-34-62	66	60	
	63	R 5-34-63	70	62	
	64	R 5-34-64	65	58	
	65	R 5-34-65	62	58	
	66	R 5-34-66	65	58	
	67	R 5-34-67	65	59	
	68	R 5-34-68	68	61	
	69	R 5-34-69	65	59	
	70	R 5-34-70	67	60	
	71	R 5-34-71	62	57	
	72	R 5-34-72	63	58	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	73	R 5-34-73	68	59	
	74	R 5-34-74	66	58	
	75	R 5-34-75	65	58	
	76	R 5-34-76	61	57	
	77	R 5-34-77	71	64	
	78	R 5-34-78	69	62	
	79	R 5-34-79	67	62	
	80	R 5-34-80	66	61	
	81	R 5-34-81	64	61	
	82	R 5-34-82	62	59	
	83	R 5-34-83	73	68	
	84	R 5-34-84	72	68	
	85	R 5-34-85	71	68	
	86	R 5-34-86	70	68	
	87	R 5-34-87	69	67	
	88	R 5-34-88	68	66	
	89	R 5-34-89	72	64	
90	R 5-34-90	74	67	✓	
5-32A	1	R 5-32A-1	68	68	✓
	2	R 5-32A-2	65	65	
	3	R 5-32A-3	63	63	
5-32B	1	R 5-32-1	69	62	
	2	R 5-32-2	71	62	✓
	3	R 5-32-3	67	62	
5-31	1	R 5-31-01	62	60	
	2	R 5-31-02	62	60	
	3	R 5-31-03	62	60	
	4	R 5-31-04	63	60	
	5	R 5-31-05	63	60	
	6	R 5-31-06	64	61	
	7	R 5-31-07	66	62	
	8	R 5-31-08	67	62	
	9	R 5-31-09	70	63	
	10	R 5-31-10	69	62	
	11	R 5-31-11	71	62	✓
	12	R 5-31-12	70	61	
	13	R 5-31-13	68	60	
	14	R 5-31-14	67	60	
	15	R 5-31-15	66	60	
	16	R 5-31-16	65	59	
	17	R 5-31-17	66	59	
18	R 5-31-18	67	59		
19	R 5-31-19	66	59		
20	R 5-31-20	64	59		
21	R 5-31-21	62	59		
22	R 5-31-22	63	58		
23	R 5-31-23	65	58		
24	R 5-31-24	64	58		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	25	R 5-31-25	62	58	
	26	R 5-31-26	64	58	
	27	R 5-31-27	67	60	
	28	R 5-31-28	65	60	
	29	R 5-31-29	61	59	
	30	R 5-31-30	62	59	
	31	R 5-31-31	61	59	
	32	R 5-31-32	68	61	
	33	R 5-31-33	68	62	
	34	R 5-31-34	66	61	
	35	R 5-31-35	65	60	
	36	R 5-31-36	64	60	
	37	R 5-31-37	62	58	
	38	R 5-31-38	61	59	
	39	R 5-31-39	62	59	
	40	R 5-31-40	66	59	
	41	R 5-31-41	67	64	
	42	R 5-31-42	68	64	
	43	R 5-31-43	65	63	
	44	R 5-31-44	64	62	
	45	R 5-31-45	63	61	
	46	R 5-31-46	62	60	
	47	R 5-31-47	61	59	
	48	R 5-31-48	62	60	
	49	R 5-31-49	61	59	
	50	R 5-31-50	61	59	
	51	R 5-31-51	62	59	
	52	R 5-31-52	62	60	
	53	R 5-31-53	61	59	
5-30	1	R 5-30-01	71	67	
	2	R 5-30-02	70	66	
	3	R 5-30-03	72	67	
	4	R 5-30-04	74	67	
	5	R 5-30-05	77	67	
	6	R 5-30-06	78	68	✓
	7	R 5-30-07	62	60	
	8	R 5-30-08	63	59	
	9	R 5-30-09	64	61	
	10	R 5-30-10	66	61	
	11	R 5-30-11	67	60	
	12	R 5-30-12	71	62	
	13	R 5-30-13	76	64	
	14	R 5-30-14	77	62	
	15	R 5-30-15	75	62	
	16	R 5-30-16	73	63	
	17	R 5-30-17	73	64	
	18	R 5-30-18	74	65	
	19	R 5-30-19	73	63	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	20	R 5-30-20	72	63	
	21	R 5-30-21	70	62	
	22	R 5-30-22	70	62	
	23	R 5-30-23	57	56	
	24	R 5-30-24	57	56	
	25	R 5-30-25	58	57	
	26	R 5-30-26	59	57	
	27	R 5-30-27	60	58	
	28	R 5-30-28	60	58	
	29	R 5-30-29	61	60	
	30	R 5-30-30	63	62	
	31	R 5-30-31	65	63	
	32	R 5-30-32	63	61	
	33	R 5-30-33	65	61	
	34	R 5-30-34	61	59	
	35	R 5-30-35	63	61	
	36	R 5-30-36	64	62	
37	R 5-30-37	64	62		
5-29	1	R 5-29-1	65	63	
	2	R 5-29-2	64	62	
	3	R 5-29-3	64	62	
	4	R 5-29-4	65	62	
	5	R 5-29-5	66	63	
	6	R 5-29-6	65	62	
	7	R 5-29-7	65	63	
	8	R 5-29-8	67	65	
	9	R 5-29-9	69	68	
	10	R 5-29-10	65	63	
	11	R 5-29-11	65	62	
	12	R 5-29-12	69	67	
	13	R 5-29-13	68	64	
	14	R 5-29-14	67	63	
	15	R 5-29-15	69	68	
	16	R 5-29-16	77	69	
	17	R 5-29-17	78	69	
	18	R 5-29-18	79	69	✓
	19	R 5-29-19	79	69	✓
	20	R 5-29-20	78	67	
	21	R 5-29-21	78	66	
	22	R 5-29-22	78	65	
	23	R 5-29-23	78	64	
	24	R 5-29-24	76	63	
	25	R 5-29-25	75	62	
	26	R 5-29-26	72	62	
	27	R 5-29-27	71	62	
	28	R 5-29-28	70	61	
	29	R 5-29-29	72	61	
	30	R 5-29-30	72	60	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	31	R 5-29-31	75	62	
	32	R 5-29-32	76	61	
	33	R 5-29-33	73	61	
	34	R 5-29-34	73	60	
	35	R 5-29-35	73	61	
	36	R 5-29-36	74	62	
	37	R 5-29-37	72	61	
	38	R 5-29-38	73	62	
	39	R 5-29-39	73	64	
	40	R 5-29-40	71	63	
	41	R 5-29-41	70	63	
	42	R 5-29-42	72	66	
	43	R 5-29-43	72	68	
	44	R 5-29-44	67	65	
	45	R 5-29-45	65	63	
	46	R 5-29-46	64	63	
	47	R 5-29-47	63	61	
	48	R 5-29-48	62	60	
	49	R 5-29-49	61	59	
	50	R 5-29-50	65	59	
	51	R 5-29-51	67	60	
	52	R 5-29-52	68	60	
	53	R 5-29-53	66	60	
	54	R 5-29-54	63	59	
	55	R 5-29-55	63	59	
	56	R 5-29-56	63	59	
	57	R 5-29-57	64	59	
	58	R 5-29-58	68	61	
	59	R 5-29-59	68	62	
	60	R 5-29-60	70	63	
	61	R 5-29-61	64	60	
	62	R 5-29-62	64	60	
	63	R 5-29-63	62	59	
	64	R 5-29-64	62	59	
	65	R 5-29-65	64	60	
	66	R 5-29-66	66	60	
	67	R 5-29-67	64	59	
	68	R 5-29-68	63	59	
	69	R 5-29-69	62	58	
	70	R 5-29-70	61	58	
	71	R 5-29-71	60	58	
	72	R 5-29-72	60	58	
	73	R 5-29-73	62	60	
	74	R 5-29-74	62	60	
	75	R 5-29-75	61	59	
	76	R 5-29-76	60	59	
	77	R 5-29-77	66	61	
	78	R 5-29-78	70	64	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	79	R 5-29-79	72	65	
	80	R 5-29-80	74	71	
	81	R 5-29-81	75	71	
	82	R 5-29-82	75	68	
	83	R 5-29-83	70	63	
	84	R 5-29-84	72	63	
	85	R 5-29-85	75	66	
	86	R 5-29-86	74	65	
	87	R 5-29-87	75	66	
	88	R 5-29-88	74	66	
	89	R 5-29-89	73	64	
	90	R 5-29-90	71	63	
	91	R 5-29-91	69	63	
	92	R 5-29-92	67	63	
	93	R 5-29-93	60	59	
	94	R 5-29-94	60	58	
	95	R 5-29-95	59	58	
	96	R 5-29-96	62	61	
	97	R 5-29-97	62	61	
	98	R 5-29-98	60	60	
	99	R 5-29-99	59	58	
	100	R 5-29-100	58	57	
	101	R 5-29-101	58	58	
	102	R 5-29-102	60	59	
	103	R 5-29-103	61	60	
	104	R 5-29-104	61	59	
	105	R 5-29-105	60	60	
	106	R 5-29-106	59	59	
	107	R 5-29-107	69	64	
	108	R 5-29-108	66	61	
	109	R 5-29-109	59	58	
	110	R 5-29-110	58	58	
	111	R 5-29-111	58	58	
	112	R 5-29-112	59	59	
	113	R 5-29-113	59	58	
	114	R 5-29-114	60	59	
	115	R 5-29-115	64	62	
	116	R 5-29-116	65	64	
	117	R 5-29-117	65	64	
	118	R 5-29-118	64	63	
	119	R 5-29-119	62	62	
	120	R 5-29-120	61	60	
	121	R 5-29-121	60	60	
	122	R 5-29-122	61	61	
	123	R 5-29-123	62	62	
5-28	1	R 5-28-1	64	64	
	2	R 5-28-2	64	64	
	3	R 5-28-3	64	64	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA	
	4	R 5-28-4	62	62		
	5	R 5-28-5	61	61		
	6	R 5-28-6	59	59		
	7	R 5-28-7	59	59		
	8	R 5-28-8	59	59		
	9	R 5-28-9	61	61		
	10	R 5-28-10	60	60		
	11	R 5-28-11	59	59		
	12	R 5-28-12	59	59		
	13	R 5-28-13	59	59		
	14	R 5-28-14	58	58		
	15	R 5-28-15	60	60		
	16	R 5-28-16	58	58		
	17	R 5-28-17	58	58		
	18	R 5-28-18	59	59		
	19	R 5-28-19	59	59		
	20	R 5-28-20	64	64		
	21	R 5-28-21	65	65	✓	
	5-27	1	R-5-27-1	64	64	✓
		2	R-5-27-2	64	64	✓
		3	R-5-27-3	63	63	
4		R-5-27-4	62	62		
5		R-5-27-5	63	63		
6		R-5-27-6	61 (36)	61 (36)		
5-24	1	R 5-24-1	63	57		
	2	R 5-24-2	66	57		
	3	R 5-24-3	67	57	✓	
	4	R 5-24-4	66	60		
	5	R 5-24-5	66	60		
	6	R 5-24-6	63	57		
	7	R 5-24-7	61	57		
	8	R 5-24-8	65	59		
	9	R 5-24-9	65	60		
	10	R 5-24-10	66	60		
	11	R 5-24-11	67	60	✓	
	12	R 5-24-12	63	58		
	13	R 5-24-13	66	60		
	14	R 5-24-14	67	60	✓	
	15	R 5-24-15	60	58		
	16	R 5-24-16	61	58		
	17	R 5-24-17	66	60		
	18	R 5-24-18	66	60		
	19	R 5-24-19	66	61		
	20	R 5-24-20	65	59		
5-23	1	R 5-23-1	58	58		
	2	R 5-23-2	59	59		
	3	R 5-23-3	59	59		
	4	R 5-23-4	63	63		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	5	R 5-23-5	64	64	
	6	R 5-23-6	64	64	
	7	R 5-23-7	65	65	✓
	8	R 5-23-8	65	65	✓
	9	R 5-23-9	65	65	✓
	10	R 5-23-10	60	60	
	11	R 5-23-11	59	59	
	12	R 5-23-12	60	60	
5-22	13	R 5-23-13	58	58	
	1	R 5-22-1	65	59	
	2	R 5-22-2	66	58	
	3	R 5-22-3	71	60	✓
	4	R 5-22-4	64	58	
	5	R 5-22-5	61	57	
	6	R 5-22-6	62	58	
	7	R 5-22-7	64	58	
	8	R 5-22-8	60	58	
	9	R 5-22-9	62	58	
	10	R 5-22-10	61	58	
5-19	11	R 5-22-11	63	58	
	1	R 5-19-1	65	58	
	2	R 5-19-2	65	58	
	3	R 5-19-3	66	59	
	4	R 5-19-4	67	59	
	5	R 5-19-5	68	59	
	6	R 5-19-6	69	60	✓
	7	R 5-19-7	61	57	
	8	R 5-19-8	62	57	
	9	R 5-19-9	62	57	
	10	R 5-19-10	62	57	
	11	R 5-19-11	65	58	
	12	R 5-19-12	66	58	
	13	R 5-19-13	68	59	
	14	R 5-19-14	66	58	
	15	R 5-19-15	63	58	
	16	R 5-19-16	59	57	
	17	R 5-19-17	59	57	
	18	R 5-19-18	59	57	
	19	R 5-19-19	63	57	
	20	R 5-19-20	61	57	
	21	R 5-19-21	60	57	
	22	R 5-19-22	57	56	
	23	R 5-19-23	61	57	
	24	R 5-19-24	62	57	
	25	R 5-19-25	61	57	
	26	R 5-19-26	59	57	
	27	R 5-19-27	60	57	
28	R 5-19-28	60	57		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	29	R 5-19-29	62	57	
	30	R 5-19-30	62	58	
	31	R 5-19-31	63	58	
	32	R 5-19-32	64	59	
	33	R 5-19-33	60	57	
	34	R 5-19-34	60	57	
	35	R 5-19-35	61	57	
	36	R 5-19-36	59	57	
	37	R 5-19-37	60	57	
	38	R 5-19-38	62	57	
	39	R 5-19-39	61	57	
	40	R 5-19-40	60	56	
	41	R 5-19-41	60	56	
	42	R 5-19-42	59	57	
	43	R 5-19-43	59	57	
	44	R 5-19-44	59	57	
	45	R 5-19-45	63	58	
	46	R 5-19-46	64	58	
	47	R 5-19-47	66	60	
	48	R 5-19-48	67	60	
	49	R 5-19-49	68	60	
	50	R 5-19-50	67	60	
	51	R 5-19-51	65	60	
	52	R 5-19-52	69	59	✓
53	R 5-19-53	63	58		
5-18	1	R 5-18-1	64	58	
	2	R 5-18-2	67	59	
	3	R 5-18-3	69	60	
	4	R 5-18-4	59	57	
	5	R 5-18-5	60	57	
	6	R 5-18-6	62	58	
	7	R 5-18-7	63	58	
	8	R 5-18-8	73	62	
	9	R 5-18-9	67	60	
	10	R 5-18-10	75	62	✓
5-21	1	R 5-21-1	69	63	
	2	R 5-21-2	67	62	
	3	R 5-21-3	62	60	
	4	R 5-21-4	69	64	
	5	R 5-21-5	75	66	
	6	R 5-21-6	75	66	
	7	R 5-21-7	78	66	✓
	8	R 5-21-8	77	66	
	9	R 5-21-9	76	66	
	10	R 5-21-10	74	65	
	11	R 5-21-11	69	61	
	12	R 5-21-12	75	64	
	13	R 5-21-13	67	60	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	14	R 5-21-14	63	59	
	15	R 5-21-15	62	60	
	16	R 5-21-16	65	60	
	17	R 5-21-17	65	60	
	18	R 5-21-18	62	60	
	19	R 5-21-19	61	59	
	20	R 5-21-20	60	58	
	21	R 5-21-21	59	59	
5-20	22	R 5-21-22	62	62	
	1	R 5-20-1	69	63	
	2	R 5-20-2	71	63	
	3	R 5-20-3	74	64	
	4	R 5-20-4	75	65	
	5	R 5-20-5	76	65	✓
	6	R 5-20-6	76	66	✓
	7	R 5-20-7	76	66	✓
	8	R 5-20-8	64	60	
	9	R 5-20-9	62	59	
	10	R 5-20-10	61	59	
	11	R 5-20-11	63	60	
	12	R 5-20-12	63	60	
	13	R 5-20-13	67	61	
	14	R 5-20-14	66	60	
	15	R 5-20-15	63	59	
	16	R 5-20-16	61	59	
17	R 5-20-17	68	63		
5-17	1	R 5-17-1	73	65	
	2	R 5-17-2	74	66	
	3	R 5-17-3	75	66	
	4	R 5-17-4	77	66	
	5	R 5-17-5	80	71	✓
	6	R 5-17-6	77	66	
	7	R 5-17-7	75	64	
	8	R 5-17-8	72	62	
	9	R 5-17-9	74	63	
	10	R 5-17-10	76	64	
	11	R 5-17-11	78	65	
	12	R 5-17-12	78	64	
	13	R 5-17-13	75	63	
	14	R 5-17-14	72	62	
	15	R 5-17-15	69	61	
	16	R 5-17-16	68	61	
	17	R 5-17-17	69	62	
	18	R 5-17-18	71	63	
	19	R 5-17-19	77	63	
	20	R 5-17-20	72	63	
	21	R 5-17-21	72	62	
	22	R 5-17-22	70	61	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	23	R 5-17-23	69	61	
	24	R 5-17-24	72	63	
	25	R 5-17-25	74	63	
	26	R 5-17-26	76	64	
	27	R 5-17-27	67	60	
	28	R 5-17-28	62	59	
	29	R 5-17-29	62	59	
	30	R 5-17-30	62	58	
	31	R 5-17-31	61	58	
	32	R 5-17-32	62	58	
	33	R 5-17-33	61	58	
	34	R 5-17-34	63	60	
	35	R 5-17-35	66	60	
	36	R 5-17-36	67	62	
	37	R 5-17-37	64	60	
	38	R 5-17-38	61	58	
	39	R 5-17-39	65	61	
	40	R 5-17-40	62	59	
	41	R 5-17-41	62	59	
	42	R 5-17-42	61	58	
5-16	1	R 5-16-1	62	61	✓
	2	R 5-16-2	62	62	✓
5-15	1	R 5-15-1	69	61	
	2	R 5-15-2	68	61	
	3	R 5-15-3	68	61	
	4	R 5-15-4	68	62	
	5	R 5-15-5	68	61	
	6	R 5-15-6	66	60	
	7	R 5-15-7	71 (46)	62 (37)	✓
	8	R 5-15-8	63	60	
	9	R 5-15-9	66	60	
	10	R 5-15-10	64	60	
	11	R 5-15-11	63	59	
	12	R 5-15-12	63	59	
	13	R 5-15-13	63	59	
	14	R 5-15-14	59	57	
	15	R 5-15-15	67	60	
	16	R 5-15-16	60	58	
	17	R 5-15-17	59	57	
	18	R 5-15-18	59 (34)	59 (34)	
	19	R 5-15-19	68	60	
	20	R 5-15-20	60	59	
	21	R 5-15-21	60	58	
	22	R 5-15-22	65 (40)	65 (40)	
	23	R 5-15-23	62	61	
5-13	1	R 5-13-1	65	59	✓
	2	R 5-13-2	64	59	
	3	R 5-13-3	62	59	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
5-12	1	R 5-12-1	58	57	
	2	R 5-12-2	79	62	✓
	3	R 5-12-3	78	62	
	4	R 5-12-4	77	62	
	5	R 5-12-5	77	62	
	6	R 5-12-6	77	63	
	7	R 5-12-7	77	63	
	8	R 5-12-8	78	64	
	9	R 5-12-9	77	64	
	10	R 5-12-10	79	65	✓
	11	R 5-12-11	78	64	
	12	R 5-12-12	67	61	
	13	R 5-12-13	59	58	
	14	R 5-12-14	73	61	
	15	R 5-12-15	68	59	
	16	R 5-12-16	64	58	
	17	R 5-12-17	61	57	
	18	R 5-12-18	57	56	
	19	R 5-12-19	59	57	
	20	R 5-12-20	63	58	
	21	R 5-12-21	59	57	
	22	R 5-12-22	61	57	
	23	R 5-12-23	58	57	
	24	R 5-12-24	58	57	
	25	R 5-12-25	58	57	
	26	R 5-12-26	57	56	
	27	R 5-12-27	57	56	
	28	R 5-12-28	61	59	
	29	R 5-12-29	63	60	
	30	R 5-12-30	66	61	
	31	R 5-12-31	58	57	
	32	R 5-12-32	60	58	
	33	R 5-12-33	66	61	
	34	R 5-12-34	58	57	
	35	R 5-12-35	58	57	
	36	R 5-12-36	72	63	
	37	R 5-12-37	73	64	
	38	R 5-12-38	73	65	
	39	R 5-12-39	68	61	
	40	R 5-12-40	64	60	
	41	R 5-12-41	61	59	
	42	R 5-12-42	60	58	
	43	R 5-12-43	60	57	
	44	R 5-12-44	62	58	
	45	R 5-12-45	65	60	
	46	R 5-12-46	69	62	
	47	R 5-12-47	65	61	
	48	R 5-12-48	63	60	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	49	R 5-12-49	62	60	
	50	R 5-12-50	67	63	
	51	R 5-12-51	66	63	
	52	R 5-12-52	65	60	
	53	R 5-12-53	62	59	
	54	R 5-12-54	61	58	
	55	R 5-12-55	61	58	
	56	R 5-12-56	64	60	
	57	R 5-12-57	68	63	
	58	R 5-12-58	60	58	
	59	R 5-12-59	62	59	
	60	R 5-12-60	60	58	
	61	R 5-12-61	66	62	
	62	R 5-12-62	60	56	
	63	R 5-12-63	59	57	
	64	R 5-12-64	58	56	
	65	R 5-12-65	61	59	
	66	R 5-12-66	61	59	
	67	R 5-12-67	68	62	
	68	R 5-12-68	62	59	
	69	R 5-12-69	68	63	
	70	R 5-12-70	58	57	
	71	R 5-12-71	59	57	
	72	R 5-12-72	59	57	
	73	R 5-12-73	59	57	
	74	R 5-12-74	59	57	
	75	R 5-12-75	59	58	
	76	R 5-12-76	60	59	
	77	R 5-12-77	60	58	
	78	R 5-12-78	61	59	
	79	R 5-12-79	60	59	
	80	R 5-12-80	59	58	
	81	R 5-12-81	60	58	
	82	R 5-12-82	60	59	
	83	R 5-12-83	62	60	
	84	R 5-12-84	61	59	
	85	R 5-12-85	62	59	
	86	R 5-12-86	62	60	
	87	R 5-12-87	61	59	
	88	R 5-12-88	62	59	
	89	R 5-12-89	62	59	
	90	R 5-12-90	63	59	
	91	R 5-12-91	62	59	
	92	R 5-12-92	66	60	
5-14	1	R 5-14-1	70	70	✓
5-11	1	R 5-11-01	58	58	
	2	R 5-11-02	76 (41)	76 (41)	✓
	3	R 5-11-03	77 (42)	77 (42)	✓

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	4	R 5-11-04	74	67	
5-10	1	R 5-10-01	69	63	
	2	R 5-10-02	73	65	✓
	3	R 5-10-03	68 (33)	67 (32)	
5-09	1	R 5-09-1	61	58	
	2	R 5-09-2	58	57	
	3	R 5-09-3	56	56	
	4	R 5-09-4	56	56	
	5	R 5-09-5	57	57	
	6	R 5-09-6	58	58	
	7	R 5-09-7	56	56	
	8	R 5-09-8	56	56	
	9	R 5-09-9	58	57	
	10	R 5-09-10	60	60	
	11	R 5-09-11	67	61	✓
	12	R 5-09-12	65	60	
	13	R 5-09-13	62	59	
	14	R 5-09-14	60	56	
	15	R 5-09-15	57	55	
	16	R 5-09-16	59	56	
	17	R 5-09-17	67	60	✓
	18	R 5-09-18	63	57	
	19	R 5-09-19	55	55	
	20	R 5-09-20	55	55	
	21	R 5-09-21	55	55	
	22	R 5-09-22	55	55	
	23	R 5-09-23	55	55	
	24	R 5-09-24	55	55	
	25	R 5-09-25	55	55	
	26	R 5-09-26	56	55	
	27	R 5-09-27	55	55	
	28	R 5-09-28	55	55	
	29	R 5-09-29	55	55	
	30	R 5-09-30	55	55	
	31	R 5-09-31	55	55	
	32	R 5-09-32	56	55	
	33	R 5-09-33	56	55	
5-08	1	R 5-08-1	64	57	
	2	R 5-08-2*	65	57	
	3	R 5-08-3*	66	60	
	4	R 5-08-4*	67	66	
	5	R 5-08-5*	67	66	
	6	R 5-08-6	59	56	
	7	R 5-08-7	60	56	
	8	R 5-08-8*	63	57	
	9	R 5-08-9*	64	57	
	10	R 5-08-10*	65	59	
	11	R 5-08-11*	66	65	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	12	R 5-08-12	61	57	
	13	R 5-08-13*	62	56	
	14	R 5-08-14*	64	57	
	15	R 5-08-15*	64	58	
	16	R 5-08-16*	65	64	
	17	R 5-08-17	63	58	
	18	R 5-08-18	55	55	
	19	R 5-08-19*	66	63	
	20	R 5-08-20*	66	64	
	21	R 5-08-21*	66	65	
	22	R 5-08-22*	68	67	
	23	R 5-08-23*	69	68	✓
5-07	1	R 5-07-1	74	62	
	2	R 5-07-2	70	60	
	3	R 5-07-3	76	64	✓
	4	R 5-07-4	61	57	
	5	R 5-07-5	63	58	
	6	R 5-07-6	60	58	
	7	R 5-07-7	60	58	
	8	R 5-07-8	59	57	
	9	R 5-07-9	62	58	
	10	R 5-07-10	61	58	
	11	R 5-07-11	59	57	
	12	R 5-07-12	60	57	
	13	R 5-07-13	58	56	
	14	R 5-07-14	59	57	
	15	R 5-07-15	60	57	
	16	R 5-07-16*	62	57	
	17	R 5-07-17*	63	58	
	18	R 5-07-18	59	56	
	19	R 5-07-19*	60	57	
	20	R 5-07-20*	61	57	
	21	R 5-07-21*	61	58	
	22	R 5-07-22	57	56	
	23	R 5-07-23*	58	56	
	24	R 5-07-24*	58	57	
	25	R 5-07-25*	59	57	
	26	R 5-07-26	60	57	
	27	R 5-07-27*	61	57	
	28	R 5-07-28	66	60	
5-06	1	R 5-06-1	58	56	
	2	R 5-06-2	62	58	
	3	R 5-06-3	67	59	✓
	4	R 5-06-4	65	59	
	5	R 5-06-5	60	57	
	6	R 5-06-6	64	58	
	7	R 5-06-7	66	58	
	8	R 5-06-8	65	59	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	9	R 5-06-9	61	57	
	10	R 5-06-10	62	58	
	11	R 5-06-11	65	58	
	12	R 5-06-12	65	59	
	14	R 5-06-14	57	56	
	15	R 5-06-15	66	59	
	16	R 5-06-16*	67	59	
	17	R 5-06-17*	68	61	
	18	R 5-06-18*	68	62	
	19	R 5-06-19*	69	64	
	20	R 5-06-20*	69	65	
	21	R 5-06-21*	70	66	
	22	R 5-06-22	66	59	
	23	R 5-06-23*	67	59	
	24	R 5-06-24*	68	61	
	25	R 5-06-25*	69	62	
	26	R 5-06-26*	69	64	
	27	R 5-06-27*	70	65	
	28	R 5-06-28*	70	66	
	29	R 5-06-29*	70	67	
5-03	1	R 5-03-1	75 (40)	75 (40)	✓
5-04	1	R 5-04-01	65	65	✓
	2	R 5-04-02	61	61	
5-02	1	R 5-02-1	62	62	
	2	R 5-02-2	61	61	
	3	R 5-02-3	67	62	
	4	R 5-02-4	70	63	
	5	R 5-02-5	80	65	✓
	6	R 5-02-6	67	60	
	7	R 5-02-7	74	61	
	8	R 5-02-8	75	63	
	9	R 5-02-9	78	65	
	10	R 5-02-10	69	59	
	11	R 5-02-11	80	66	✓
	12	R 5-02-12	80	67	✓
	13	R 5-02-13	62	62	
	14	R 5-02-14	62	62	
	15	R 5-02-15	63	63	
	16	R 5-02-16	64	63	
	17	R 5-02-17	64	64	
	18	R 5-02-18	59	59	
	19	R 5-02-19	64	63	
	20	R 5-02-20	65	62	
	21	R 5-02-21	56	56	
	22	R 5-02-22	63	60	
	23	R 5-02-23	59	57	
	24	R 5-02-24	60	58	
	25	R 5-02-25	60	60	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	26	R 5-02-26	60	59	
	27	R 5-02-27	57	57	
	28	R 5-02-28	62	61	
	29	R 5-02-29	62	58	
	30	R 5-02-30	61	58	
	31	R 5-02-31	66	63	
	32	R 5-02-32	56	56	
	33	R 5-02-33	65	64	
	34	R 5-02-34	69	67	
	35	R 5-02-35	62	62	
	36	R 5-02-36	62	62	
	37	R 5-02-37	63	63	
	38	R 5-02-38	62	62	
	39	R 5-02-39	62	61	
5-01	1	R 5-01-1	62	60	
	2	R 5-01-2	63	60	
	3	R 5-01-3	64	60	
	4	R 5-01-4	68	62	
	5	R 5-01-5	69	62	
	6	R 5-01-6	68	61	
	7	R 5-01-7	69	62	
	8	R 5-01-8	67	61	
	9	R 5-01-9	69	62	
	10	R 5-01-10	67	61	
	11	R 5-01-11	68	62	
	12	R 5-01-12	67	62	
	13	R 5-01-13	66	62	
	14	R 5-01-14	66	62	
	15	R 5-01-15	64	61	
	16	R 5-01-16	63	61	
	17	R 5-01-17	64	61	
	18	R 5-01-18	64	61	
	19	R 5-01-19	64	61	
	20	R 5-01-20	65	61	
	21	R 5-01-21	64	60	
	22	R 5-01-22	62	59	
	23	R 5-01-23	65	60	
	24	R 5-01-24	58	57	
	25	R 5-01-25	69	62	
	26a	R 5-01-26a	65	60	
	26b	R 5-01-26b*	69	62	
	26c	R 5-01-26c*	71	63	
27a	R 5-01-27a	57	56		
27b	R 5-01-27b*	57	56		
27c	R 5-01-27c*	60	57		
28a	R 5-01-28a	61	58		
28b	R 5-01-28b*	63	59		
28c	R 5-01-28c*	64	60		

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	29a	R 5-01-29a	57	56	
	29b	R 5-01-29b*	58	57	
	29c	R 5-01-29c*	64	60	
	30a	R 5-01-30a	61	57	
	30b	R 5-01-30b*	65	58	
	30c	R 5-01-30c*	67	59	
	30d	R 5-01-30d*	70	64	
	31a	R 5-01-31a	58	56	
	31b	R 5-01-31b*	60	57	
	31c	R 5-01-31c*	62	58	
	31d	R 5-01-31d*	67	62	
	32a	R 5-01-32a	56	56	
	32b	R 5-01-32b*	59	57	
	32c	R 5-01-32c*	62	57	
	32d	R 5-01-32d*	65	58	
	33a	R 5-01-33a	56	56	
	33b	R 5-01-33b*	57	56	
	33c	R 5-01-33c*	58	56	
	33d	R 5-01-33d*	60	57	
	34a	R 5-01-34a	61	58	
	34b	R 5-01-34b*	69	63	
	34c	R 5-01-34c*	73	65	
	34d	R 5-01-34d*	74	68	
	35a	R 5-01-35a	59	58	
	35b	R 5-01-35b*	67	61	
	35c	R 5-01-35c*	70	64	
	35d	R 5-01-35d*	71	66	
	36a	R 5-01-36a	71	62	
	36b	R 5-01-36b*	76	64	
	36c	R 5-01-36c*	77	69	
	36d	R 5-01-36d*	78	75	
	37a	R 5-01-37a	64	59	
	37b	R 5-01-37b*	70	60	
	37c	R 5-01-37c*	73	62	
	37d	R 5-01-37d*	74	66	
	38a	R 5-01-38a	60	57	
	38b	R 5-01-38b*	65	59	
	38c	R 5-01-38c*	67	61	
	39a	R 5-01-39a	57	56	
	39b	R 5-01-39b*	57	56	
	39c	R 5-01-39c*	59	58	
	40	R 5-01-40	75	64	
	41a	R 5-01-41a	61	57	
	41b	R 5-01-41b*	66	58	
	41c	R 5-01-41c*	69	59	
	41d	R 5-01-41d*	71	61	
	42a	R 5-01-42a	58	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	42b	R 5-01-42b*	60	57	
	42c	R 5-01-42c*	63	57	
	42d	R 5-01-42d*	65	58	
	43a	R 5-01-43a	66	59	
	43b	R 5-01-43b*	71	61	
	43c	R 5-01-43c*	74	63	
	43d	R 5-01-43d*	74	70	
	44a	R 5-01-44a	61	57	
	44b	R 5-01-44b*	66	58	
	44c	R 5-01-44c*	68	59	
	44d	R 5-01-44d*	70	61	
	45a	R 5-01-45a	67	60	
	45b	R 5-01-45b*	72	61	
	45c	R 5-01-45c*	74	64	
	45d	R 5-01-45d*	75	71	
	46a	R 5-01-46a	62	58	
	46b	R 5-01-46b*	67	58	
	46c	R 5-01-46c*	69	59	
	46d	R 5-01-46d*	70	62	
	47a	R 5-01-47a	71	61	
	47b	R 5-01-47b*	75	63	
	47c	R 5-01-47c*	76	68	
	47d	R 5-01-47d*	77	74	
	48a	R 5-01-48a	64	59	
	48b	R 5-01-48b*	70	60	
	48c	R 5-01-48c*	72	62	
	48d	R 5-01-48d*	73	66	
	49	R 5-01-49	75	64	
	50a	R 5-01-50a	67	60	
	50b	R 5-01-50b*	74	61	
	50c	R 5-01-50c*	76	65	
	50d	R 5-01-50d*	77	74	
	51a	R 5-01-51a	61	58	
	51b	R 5-01-51b*	66	59	
	51c	R 5-01-51c*	70	60	
	51d	R 5-01-51d*	72	64	
	52a	R 5-01-52a	71	59	
	52b	R 5-01-52b*	74	60	
	52c	R 5-01-52c*	74	64	
	52d	R 5-01-52d*	75	73	
	53a	R 5-01-53a	63	58	
	53b	R 5-01-53b*	67	58	
	53c	R 5-01-53c*	68	59	
	53d	R 5-01-53d*	70	64	
	54	R 5-01-54	60	57	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	55	R 5-01-55	60	57	
	56	R 5-01-56	57	57	
	57	R 5-01-57	57	57	
	58	R 5-01-58	58	57	
	59	R 5-01-59	60	58	
	60	R 5-01-60	62	59	
	61	R 5-01-61	59	59	
	62	R 5-01-62	60	59	
	63	R 5-01-63	58	58	
	64	R 5-01-64	58	58	
	65	R 5-01-65	69	62	
	66	R 5-01-66	67	61	
	67a	R 5-01-67a	66	61	
	67b	R 5-01-67b*	80	61	
	67c	R 5-01-67c*	81	67	✓
	67d	R 5-01-67d*	81	78	✓
	68a	R 5-01-68a	68	61	
	68b	R 5-01-68b*	81	62	✓
	68c	R 5-01-68c*	81	67	✓
	68d	R 5-01-68d*	81	80	✓
	69a	R 5-01-69a	63	59	
	69b	R 5-01-69b*	69	59	
	69c	R 5-01-69c*	70	60	
	69d	R 5-01-69d*	71	65	
	70a	R 5-01-70a	59	58	
	70b	R 5-01-70b*	61	58	
	70c	R 5-01-70c*	65	59	
	70d	R 5-01-70d*	67	60	
	71a	R 5-01-71a	68	60	
	71b	R 5-01-71b*	75	61	
	71c	R 5-01-71c*	76	65	
	71d	R 5-01-71d*	77	74	
	72a	R 5-01-72a	63	58	
	72b	R 5-01-72b*	68	58	
	72c	R 5-01-72c*	70	59	
	72d	R 5-01-72d*	71	62	
	73a	R 5-01-73a	75	62	
	73b	R 5-01-73b*	77	65	
	73c	R 5-01-73c*	77	73	
	73d	R 5-01-73d*	77	76	
	74a	R 5-01-74a	70	60	
	74b	R 5-01-74b*	72	61	
	74c	R 5-01-74c*	73	65	
	74d	R 5-01-74d*	74	70	
	75a	R 5-01-75a	70	61	

Table B-1: Predicted Noise Levels

NSA	Map Receptor Number	TNM Receptor Number ^{1,6}	2045 Preferred Alternative Sound Levels (dB(A)) (assuming no existing or proposed noise barriers) ^{2,3,4,5}	2045 Preferred Alternative Sound Levels (dB(A)) (with existing and analyzed noise barriers) ^{2,3,4,5}	Maximum Noise Level within NSA
	75b	R 5-01-75b*	72	63	
	75c	R 5-01-75c*	73	65	
	75d	R 5-01-75d*	73	69	
	76a	R 5-01-76a	70	62	
	76b	R 5-01-76b*	71	63	
	76c	R 5-01-76c*	72	66	
	76d	R 5-01-76d*	73	70	
	77a	R 5-01-77a	76	64	
	77b	R 5-01-77b*	78	66	
	77c	R 5-01-77c*	78	73	
	77d	R 5-01-77d*	78	77	
	78a	R 5-01-78a	76	65	
	78b	R 5-01-78b*	78	67	
	78c	R 5-01-78c*	79	73	
	78d	R 5-01-78d*	79	77	

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.
2. Build noise levels in bold and colored red are impacted for the specific land use category.
3. Build noise levels highlighted are greater than or equal to 75 dB(A)
4. Interior sound levels are shown in parenthesis () where applicable.
5. A background sound level of 55 dB(A) was added to the TNM results, since TNM does not account for background noise.
6. Asterisk (*) represents an elevated receptor.