

NOISE ANALYSIS TECHNICAL REPORT



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INTERSTATE 95 EXPRESS LANES FREDERICKSBURG EXTENSION STUDY



Prepared in support of the Revised Environmental Assessment

VDOT Project #: 0095-969-739

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Noise Analysis Technical Report, v.2

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This document is an updated Noise Analysis Technical Report and replaces the previous version issued in August 2017. Updates have been made to the document at the following locations:

Page Number	Change made
i	Updated summary table of feasible and reasonable noise barriers.
16 – 34 (Figure 5-1)	Updated mapping to reflect changes to three barriers.
50	Text for CNE UU was added.
50 - 51	Updates were made to the description of CNE OO.
51	Updates were made to the description of CNE QQ .
52 (Table 7-1)	Updated table to reflect changes to three barriers.
54	Text for CNE SS was updated.
55 - 56	Text for CNE UU was updated.

Following the release of the preliminary Noise Analysis Technical report and Revised Environmental Assessment in August 2017, the noise analysis was updated. The status of three barriers has changed:

- Barrier UU2, which was originally considered feasible but not reasonable, is now considered both feasible and reasonable.
- Barrier QQ, which was originally considered feasible but not reasonable, is now considered not feasible.
- Barrier OO, which was originally considered feasible but not reasonable, is now considered both feasible and reasonable.

Previously, only one barrier system was found to be warranted, feasible, and reasonable (Barrier PP). After the updated noise analysis, there are three.

EXECUTIVE SUMMARY

This report for the I-95 Express Lanes Fredericksburg Extension Study (or the “Fredericksburg Extension Study”) details the noise impact assessment for the Existing (2016) conditions, and the future Design-Year (2042) No-Build and Build Alternatives. All analysis was performed in accordance with current Federal Highway Administration (FHWA) regulations contained in 23 CFR 772 and Virginia Department of Transportation (VDOT) Noise Abatement Policy.

The study involved monitoring of existing noise conditions and modeling of existing and future Design-Year noise conditions in the study area with the FHWA-approved computerized Traffic Noise Model (TNM). Modeling accounted for the existing terrain and buildings, and for existing and proposed roadways with projected loudest-hour traffic. Noise impact was assessed for all project alternatives and is summarized by the FHWA land use activity category in the table below. Traffic projections are preliminary and will be reevaluated during the final design noise analysis, accounting for final lane configuration that will be part of the design.

Table ES-1: Noise Impact Summary

Alternative	Impact Type	Land Use and NAC Activity Category				
		Residential Exterior (B)	Recreational Exterior (C)	Institutional Interior (D)	Commercial Exterior (E)	Total
Existing	NAC	130	21	0	0	151
No-Build	NAC	129	34	0	0	163
Build	NAC	153	37	0	0	190

Source: RK&K, 2017

Noise abatement must be considered where noise impact is predicted. Noise abatement is evaluated to determine if it is warranted, feasible, and reasonable. The following table summarizes the total length, estimated cost, and benefits that would be provided by the barriers evaluated that were found to be warranted, feasible, and reasonable in the section of the project where detailed noise analysis was performed, between Exit 133 (Route 17) and Exit 143 (Garrisonville Road). Noise barriers have already been designed and approved by the community in the section of the project between Exit 143 and Exit 148 (Russell Road). Details of those barriers are taken from the noise abatement design report for the I-95 Express Lanes Project, Segments I-III, and are included in **Appendix G** herein.

Table ES-1-2: Summary of Feasible and Reasonable Noise Barriers

Location	Length (mi.)	Estimated Cost (\$42/sq. ft.)	Number of Benefited Receptors		
			Impacted	Not impacted	Total
CNE OO	0.27	\$1,633,086	14	12	26
CNE PP	1.20	\$6,804,000	56	47	103
CNE UU	0.47	\$1,612,632	12	12	24

This noise evaluation is preliminary; a more detailed review will be completed during final design. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis. Similarly, noise barriers that were not considered feasible and reasonable may be found to meet established criteria and be recommended for construction. If a noise barrier is determined to be feasible and reasonable in final design, the affected public will be given an opportunity to decide whether they are in favor of construction of the noise barrier.

The need for an analysis of reflected sound and the potential use of sound absorbing materials will be evaluated during the noise barrier analysis conducted during the final design phase of the project.

Construction activity may cause intermittent fluctuations in noise levels. During the construction phase of the project, all reasonable measures will be taken to minimize noise impact from these activities.

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LIST OF ACRONYMS

CFR	Code of Federal Regulations
CNE	Common Noise Environment
CNE NN	Common Noise Environment Noise and Nuisance
dB(A)	A-weighted Sound Decibel
DOT	Department of Transportation
EA	Environmental Assessment
ENTRADA	Environmental Traffic Data
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle
Leq	Equivalent Sound Level
Mph	Miles per Hour
NAC	Noise Abatement Criteria
NB	Northbound
NEPA	National Environmental Policy Act
SB	Southbound
TNM	Traffic Noise Model
VDOT	Virginia Department of Transportation

1. INTRODUCTION

1.1 NOISE STUDY OVERVIEW

The Federal Highway Administration (FHWA) regulations for assessment and mitigation of highway traffic noise in the planning and design of federally-aided highway projects are contained in Title 23 of the United States Code of Federal Regulations Part 772 (23 CFR 772). These regulations state that a “Type I” traffic noise impact analysis is required where through travel lanes or interchange ramps are added. This report details the noise impact analysis conducted for the Interstate 95 (I-95) Express Lanes Fredericksburg Extension Study (or the “Fredericksburg Extension Study”). This noise analysis was conducted in accordance with FHWA and VDOT noise assessment regulations and guidelines.

This report presents a summary of the following: the roadway improvements in the study area, description of noise terminology, the applicable standards and criteria, an evaluation of the existing noise conditions, a description of the computations of existing and future noise levels, a prediction of future noise impact, an evaluation of potential noise abatement measures, construction noise considerations, and information for local government officials. **Appendix A** presents the list of preparers, **Appendix B** tabulates the traffic data used in the noise modeling, **Appendix C** presents predicted noise levels, **Appendix D** presents all noise measurement data, **Appendix E** provides a response from the Virginia Department of Transportation’s (VDOT) project management on alternative noise abatement measures, **Appendix F** presents VDOT’s Warranted, Feasible, and Reasonable barrier worksheets, and **Appendix G** presents the figures from the final design noise studies conducted south of Seminary Road.

1.2 PROJECT DESCRIPTION

The Virginia Department of Transportation (VDOT), in coordination with the Federal Highway Administration (FHWA) as the lead federal agency, is preparing a Revised Environmental Assessment (Revised EA) for the Interstate 95 (I-95) HOT Lanes Project, for which a Finding of No Significant Impact (FONSI) was issued by FHWA in 2011. The Revised EA, which is being completed for the I-95 Express Lanes Fredericksburg Extension Study (or the “Fredericksburg Extension Study”), presents improvements identified in a portion of the 2011 FONSI-selected Alternative, from the I-95 / US 17 North interchange at Warrenton Road (Exit 133) to south of the I-95 / Russell Road interchange (Exit 148). The Revised EA also includes new access points along this portion of the 2011 FONSI-selected Alternative. As part of the current study, environmental resources along the corridor were updated according to the latest available data and information.

1.2.1 Purpose and Need

The purpose of the Fredericksburg Extension Study is to:

- Reduce daily congestion and accommodate travel demands more efficiently. Existing traffic volumes exceed available highway capacity, and the forecasts prepared using the regional travel demand models show continuing traffic growth in the corridor, with much of the Fredericksburg region’s workforce continuing to commute north.
- Provide higher reliability of travel times. People place a high value on reaching their destinations in a timely manner, and in recent years, I-95 has become so congested that the existing I-95 facilities cannot provide reliable travel times during the peak periods.

- Expand travel choices by increasing the attractiveness and utility of ridesharing and transit usage while also providing an option for single-occupant vehicles to bypass congested conditions.

1.2.2 Alternatives

The proposed Build Alternative and the No-Build Alternative are under consideration. The proposed limits of the Build Alternative and areas identified for access improvements are shown on **Figure 1-1**. Additional information on the alternatives is included in the *Fredericksburg Extension Study Alternatives Technical Report* (VDOT, 2017b), and in the Revised EA (VDOT, 2017a).

No-Build Alternative

Under the No-Build Alternative, the Express Lanes would not be extended beyond the southern terminus of the Southern Extension project, which is currently under construction south of VA 610 / Garrisonville Road (Exit 143). There would be no change to existing access points, and I-95 would remain in its present configuration. VDOT would continue maintenance and repairs of the existing roadway, as needed, with no substantial changes to current capacity or management activities. The No-Build Alternative was not identified as the Preferred Alternative in the 2011 EA and subsequent FONSI, but is retained as a baseline for comparison in this technical report.

Build Alternative

The Build Alternative would extend two reversible Express Lanes in the median of I-95 from the vicinity of the I-95 / US 17 North Interchange at Warrenton Road (Exit 133) to south of the I-95 / VA 610 Interchange at Garrisonville Road (Exit 143) to tie into the Southern Extension Project. It would also provide Express Lane access in the vicinity of the I-95 / US 17 North Interchange at Warrenton Road (Exit 133), the I-95 / VA 630 Interchange at Courthouse Road (Exit 140), and the I-95 / Russell Road Interchange (Exit 148). The Build Alternative is consistent with the 2011 FONSI-selected alternative.

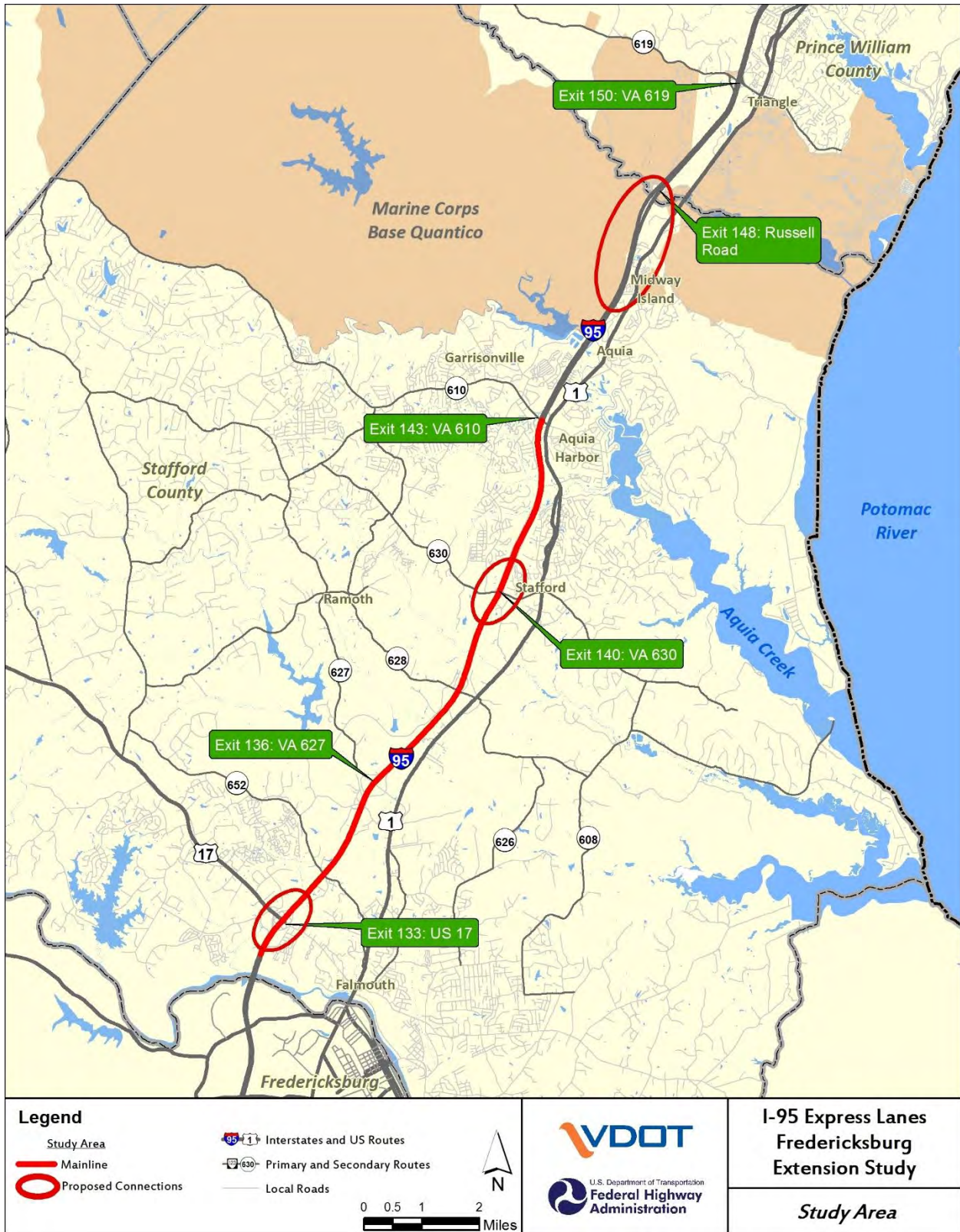
1.3 NOISE ANALYSIS STUDY AREA BOUNDARIES

For the purposes of this noise analysis, the study area for detailed evaluation is generally defined as approximately 500 feet on either side of the edge of pavement of the roadways where improvements are proposed for the Build Alternative. The detailed analysis in this report addresses the section of I-95 where new Express Lanes are proposed to be constructed, between Garrisonville Road (Exit 143) and Route 17 (Exit 133). Detailed noise analysis and noise abatement design already has been conducted for the section of the project between Exit 143 and Russell Road (Exit 148). Therefore, this northern section of the project has been addressed separately in Section 2.1.

1.4 STUDY PARTICIPANTS

Rummel Klepper & Kahl, LLP (RK&K) was retained by VDOT to evaluate the projected environmental impacts associated with the proposed improvements to the Fredericksburg Extension Study. RK&K performed all noise monitoring, field work and land use reconnaissance, noise modeling, impact analysis, and noise abatement analysis for the noise analysis for this study. Additionally, HMMH was retained by RK&K to perform loudest hour evaluations, prepare technical report documents and figures, conduct a qualitative evaluation of the preceding noise study, and provide quality assurance oversight with the noise analysis for this study. **Appendix A** provides a list of preparers.

Figure 1-1: Study Area



2. NOISE STUDY BACKGROUND

The FHWA regulations for assessment and mitigation of highway traffic noise in the planning and design of federally-aided highway projects are contained in Title 23 of the United States Code of Federal Regulations Part 772 (23 CFR 772). These regulations state that a “Type I” traffic noise impact analysis is required where through travel lanes or interchange ramps are added. This report details the noise impact analysis for the Fredericksburg Extension Study. This noise analysis was conducted in accordance with FHWA’s and VDOT’s noise assessment regulations and guidelines.

This report presents a summary of the following: the proposed roadway improvements in the study area, description of noise terminology, the applicable standards and criteria, an evaluation of the existing noise conditions, a description of the computations of existing and future noise levels, a prediction of future noise impact, an evaluation of potential noise abatement measures, construction noise considerations, and information for local government officials. **Appendix A** presents the list of preparers, **Appendix B** tabulates the traffic data used in the noise modeling, **Appendix C** presents predicted noise levels, **Appendix D** presents all noise measurement data, **Appendix E** provides a response from the VDOT project management on alternative noise abatement measures, **Appendix F** presents VDOT’s Warranted, Feasible and Reasonable barrier worksheets, and **Appendix G** presents the figures from the final design noise studies conducted south of Seminary Road, discussed in the next section.

2.1 NOISE ANALYSIS FOR I-95 BETWEEN GARRISONVILLE ROAD (EXIT 143) AND RUSSELL ROAD (EXIT 148)

A final noise abatement design study was conducted in 2013¹ in conjunction with the I-95 Express Lanes Southern Extension roadway design project that overlaps with the current Project’s study area, between VA 610 / Garrisonville Road (Exit 143) and Russell Road (Exit 148). The 2013 study predicted design-year 2035 Build case noise impacts in many noise-sensitive areas on the northbound (NB) and southbound (SB) sides of I-95 between Exits 143 and 148. Also, the 2013 study found noise barriers to be feasible and reasonable in many of the impacted areas, and as a result, many noise barriers have been through the final acoustical and engineering design, completed the voting process and have already been constructed.

The noise study team was tasked with comparing the Design-Year 2035 Build case traffic used for the 2013 design noise studies with the Design-Year 2042 traffic being developed for the current (2017) study, and determining the noise implications of the differences. The expectation was that the differences would be small enough such that detailed re-analysis of the study areas on both sides of I-95 between Exits 143 and 148 would not be necessary for the 2017 noise study to make an informed NEPA decision.

Using the VDOT-approved loudest-hour assessment spreadsheet, reference loudest-hour noise levels were computed for the section of I-95 between VA 610 / Garrisonville Road (Exit 143) and Russell Road (Exit 148) with the current Project’s loudest-hour traffic and the traffic used for the 2013 noise abatement design studies. This analysis determined that the differences in traffic volumes used for noise prediction and the resulting noise levels are small enough such that the conclusions reached about noise impact and noise barriers in the noise abatement design studies would not change if this section of I-95 were to be studied in detail using current project’s traffic projections. Therefore, VDOT and FHWA

¹ Final Design Noise Analysis Report (Segment I-III), Interstate-95 Express Lanes Project, State Project No.: 0095-96A-1077, PE-101; UPC 70849, June 2013.

concluded that this qualitative assessment section of I-95 between VA 610 / Garrisonville Road and Russell Road was sufficient, and the results of the final design noise analysis can be used for the I-95 Express Lanes Fredericksburg Extension project for purposes of allowing FHWA to make an informed NEPA decision. The memorandum detailing the qualitative assessment is provided in **Appendix B**. Tables and figures from the final design noise report that show predicted impacts and the four potential noise barriers found to be reasonable and feasible are provided in **Appendix G**.

3. NOISE TERMINOLOGY AND CRITERIA

3.1 REGULATIONS AND GUIDELINES

The noise impact of the existing and future I-95 Express Lanes Project was assessed in accordance with FHWA and VDOT noise assessment regulations and guidelines. The FHWA regulations are set forth in 23 CFR Part 772. On July 13, 2010, FHWA published revised noise regulations which became effective on July 13, 2011. FHWA has also published a guidance document to support the new regulations. VDOT prepared revisions to its noise policy in accordance with FHWA's requirements and revised policy. VDOT's revised policy has received approval from FHWA, and was updated on July 14, 2015.

3.2 NOISE ABATEMENT CRITERIA

To assess the degree of impact of highway traffic and noise on human activity, the FHWA established Noise Abatement Criteria (NAC) for different categories of land use activity (see **Table 3-1**). The NAC are given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The A-weighted sound level is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response to noise because the sensitivity of human hearing varies with frequency. The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise. Most environmental noise (and the A-weighted sound level) fluctuates from moment to moment, and it is common practice to characterize the fluctuating level by a single number called the equivalent sound level (Leq). The Leq is the value or level of a steady, non-fluctuating sound that represents the same sound energy as the actual time-varying sound evaluated over the same time period. For traffic noise assessment, Leq is typically evaluated over a one-hour period, and may be denoted as Leq(h).

In this study, residential (Category B), recreational (Category C), interior (Category D) and commercial (Category E) land uses were evaluated for noise impact. For Categories B and C, noise impact is assumed to occur when predicted exterior noise levels approach or exceed 67 dBA in terms of Leq(h) during the loudest hour of the day. For Category D land use, noise impact is assumed to occur when predicted interior noise levels due to the Project approach or exceed 52 dBA in terms of Leq(h) during the loudest hour of the day. For Category E land use, noise impact is assumed to occur when predicted exterior noise levels due to the Project approach or exceed 72 dBA in terms of Leq(h) during the loudest hour of the day. VDOT defines the word "approach" in "approach or exceed" as within 1 decibel. Therefore, the threshold for noise impact for Categories B and C is where exterior noise levels are within 1 decibel of 67 dBA Leq(h), or 66 dBA. The threshold for noise impact for Category E is where exterior noise levels are within one decibel of 72 dBA Leq(h), or 71 dBA. Noise impact also would occur wherever Project noise causes a substantial increase over existing noise levels. VDOT defines a substantial increase as an increase of 10 decibels or more above existing noise levels.

When the predicted Design-Year Build Alternative noise levels approach or exceed the Noise Abatement Criteria (NAC) during the loudest hour of the day or cause a substantial increase in existing noise, consideration of traffic noise reduction measures is warranted. If it is found that such mitigation measures will cause adverse social, economic, or environmental effects that outweigh the benefits

received, they may be dismissed from consideration. For this study, noise levels throughout the study area were determined for Existing (2016) conditions and for the Design-Year (2042) Build Alternatives.

All noise-sensitive land uses potentially affected by the project are near roads for which traffic data were developed as part of the environmental study. Therefore, all noise levels were predicted from the appropriate loudest-hour traffic data. The prediction methods and predicted noise levels appear in Section 5.

Table 3-1: FHWA Noise Abatement Criteria

Activity Category	Leq(h) ¹	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B ²	67 (Exterior)	Residential
C ²	67 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G ²	–	Undeveloped lands that are not permitted (without building permits)

1 Hourly Equivalent A-weighted Sound Level (dBA).

2 Includes undeveloped lands permitted for this activity category.

Source: 23 CFR Part 772.

3.3 UNDEVELOPED LANDS AND PERMITTED DEVELOPMENTS

Highway traffic noise analyses are (and will be) performed for developed lands as well as undeveloped lands if they are considered “permitted.” Undeveloped lands are deemed to be permitted when there is a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of at least one building permit.

In accordance with the VDOT Traffic Noise Policy, an undeveloped lot is considered to be planned, designed, and programmed if a building permit has been issued by the local authorities prior to the Date of Public Knowledge for the relevant project. VDOT considers the “Date of Public Knowledge” as the date that the final NEPA approval is made. VDOT has no obligation to provide noise mitigation for any undeveloped land that is permitted or constructed after this date.

Stafford County maintains an online database of all building permits available through its Geographic Information System (GIS) system. The database was mined for all active building permits and planned future land uses, and evaluated for noise-sensitivity (residential, schools, churches, etc.) and proximity to the Fredericksburg Extension study area. In addition, during field reconnaissance, the study team investigated the permitting status of three areas in the study area with active development of noise-sensitive residential land use. The Stafford County database was checked regularly for updated permits in these areas during the study. The three areas studied were as follows:

- Corin Way has constructed single-family homes in CNE PP, all of which were included in the noise analysis;
- Doria Hill Drive in CNE PP shows some preliminary grading and street development, but no building permits, to date. On-site personnel stated construction won't start right away, and the county GIS database indicates no recording of individual parcel plats yet, so this area was not included in the noise analysis.
- Residences have been constructed and continue to be constructed on Echols Lane and Mahone Drive in CNE QQ.

All parcels in this development with building permits were included in the noise analysis. A final review of the Stafford County online GIS database was conducted to search for any new building permits throughout the entire project corridor prior to completion of this study.

4. EXISTING NOISE CONDITIONS

A noise monitoring program was conducted along the Fredericksburg Extension study area, consistent with FHWA- and VDOT-recommended procedures to document existing ambient noise levels in noise-sensitive locations in the study corridor, and to provide a means for validation of the Traffic Noise Model (TNM) noise prediction model.

4.1 MONITORING OF EXISTING NOISE LEVELS

Noise monitoring was conducted at 30 short-term (30 minutes in duration) sites during the time period from March 21 to 23, 2017. Traffic classification counts on the roadways nearest each measurement site were conducted simultaneously with each noise measurement. The short-term measurements characterized existing noise levels in the study area but were not necessarily conducted during the loudest hour of the day. They included contributions from sources other than traffic, such as aircraft. **Figure 5-1**, presented later in the report, shows the locations of the noise measurement sites within the project study area. The monitoring locations are shown in the study area graphic, and numbered with the prefix "M."

Short-term noise monitoring is not a process to determine design-year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Monitoring does not need to occur within every Common Noise Environment (CNE) to validate the computer noise model.

The monitoring was conducted using RK&K-owned Soundpro DL-1-1/3 and DL-2-1/3 integrating sound level meters and Quest QC-10 and QC-20 acoustic calibrators. All of RK&K's noise measurement instruments are calibrated annually at a certification laboratory, with calibrations traceable to the National Institute of Standards and Technology. During the monitoring program, the sound-level meters were calibrated in the field using the handheld acoustic calibrator periodically during the measurement program.

The short-term data collection procedure involved measurements of individual, one-minute equivalent sound levels (Leqs), so that periods, including events that were not representative of the ambient noise environment nor were traffic-related, could be excluded later. Specifically, minutes that included such events were logged, and values of the measurement period Leq were determined, both with and without the minutes that included such events. By comparing the two totals, the significance of non-traffic events (such as aircraft operations) to the overall noise level can be determined for the measurement period. During the measurement program, the temperatures ranged between 30 and 65 degrees Fahrenheit and winds were calm to light near the microphones.

The measured noise levels appear in **Table 4-1** as Leq. As described above, the Leq is a sound-energy average of the fluctuating sound level (in A-weighted decibels, dBA) measured over a specified period of time. **Table 4-1** provides the site address, as well as the date, start time, and duration of each measurement. Measured noise levels are presented both in terms of the “Total” which includes noise level contributions from every one-minute period, and the “Traffic-only” which excludes those one-minute periods that contained noise events unrelated to roadway traffic.

Table 4-1: Summary of Noise Measurement Data

Site No.	CNE	Address	Date	Time Start	Duration (mins.)	Measured Leq (dBA)	
						Total	Traffic Only
M-1.1	XX	95 Riverside Pkwy - S. Entrance	3/21/2017	10:20	30	67	66
M-1.2	XX	150 Riverside Pkwy - S. Entrance	3/21/2017	10:20	30	70	70
M-1.3	XX	95 Riverside Pkwy - W. Entrance	3/21/2017	10:20	30	62	61
M-2.1	YY	100 Musselman Rd	3/21/2017	11:45	30	73	73
M-2.2	YY	S. Corner Musselman & Krieger Ln.	3/21/2017	11:45	30	67	66
M-2.3	YY	117 Musselman Rd - SE of mailbox	3/21/2017	11:45	30	65	63
M-3.1	UU	125 Ralph Wms. Dr. sidewlk N. end	3/21/2017	13:05	30	67	67
M-3.2	UU	125 Ralph Wms. Dr. field bollards	3/21/2017	13:05	30	64	64
M-3.3	UU	125 Ralph Wms. Dr. ut.pole btwn N&W fld	3/21/2017	13:05	30	62	62
M-4.1	TT	R/W fence E of 50 Pine View Dr.	3/21/2017	15:05	30	65	65
M-4.2	TT	R/W fence SE of 46 Pine View Dr.	3/21/2017	15:05	30	65	65
M-4.3	TT	R/W fence E of 9 Pine View Ct	3/21/2017	15:05	30	69	69
M-5.1	SS	53 Ellison Ct - NE lot corner	3/21/2017	16:05	30	69	69
M-5.2	SS	53 Ellison Ct - Driveway apron	3/21/2017	16:05	30	63	63
M-5.3	SS	38 Ellison Ct - Electrical box	3/21/2017	16:05	30	62	62
M-6.1	RR	Berm top N of 61 Bass Dr.	3/21/2017	17:05	30	75	75
M-6.2	RR	Berm bottom NE of #17 Chichester Dr. ¹	3/21/2017	17:05	30	73	73
M-6.3	RR	Fire hydrant @ #83 Bass Dr. ¹	3/21/2017	17:05	30	61	61
M-7.1	PP	Lot Line NW end Doria Hill Dr. ²	3/21/2017	18:10	30	69	69
M-7.2	PP	Fire hydrant @ NW end Doria Hill Dr. ²	3/21/2017	18:10	30	69	67
M-7.3	PP	E corner Doria Hill Dr. & Capri Ct ²	3/21/2017	18:10	30	59	59
M-8.1	NN	243 Whitsons Run	3/23/2017	8:10	30	68	68
M-8.2	NN	245 Whitsons Run	3/23/2017	8:10	30	68	68

Site No.	CNE	Address	Date	Time Start	Duration (mins.)	Measured Leq (dBA)	
						Total	Traffic Only
M-8.3	NN	252 Whitsons Run NW lot corner	3/23/2017	8:10	30	59	58
M-9.1	QQ	1st-row hiking trl E of 28 Banner Spr. Cir.	3/23/2017	9:10	30	69	69
M-9.2	QQ	28 Banner Spring Cir. S. lot corner	3/23/2017	9:10	30	67	67
M-9.3	QQ	2nd-row N corner 24 Banner Spr. Cir.	3/23/2017	9:10	30	55	55
M-10.1	PP	Cul-de-sac N of 114 Belladonna Ln.	3/23/2017	10:30	30	63	63
M-10.2	PP	N. corner playgnd N of 17 Belladonna Ln.	3/23/2017	10:30	30	68	68
M-10.3	PP	Cul-de-sac N of 31 Green Bell Ln.	3/23/2017	10:30	30	66	66

Notes:

1. Building number corrected from field notes, per Stafford County, VA online GIS data.
2. Monitoring locations 7.1, 7.2, and 7.3 selected to acquire representative traffic noise without home construction noise interference.

As shown in **Table 4-1**, the Total Leq ranged from a low of 55 dBA at a second-row home at 24 Banner Spring Circle, Stafford (Site M-9.3) to a high of 75 dBA near 61 Bass Drive, Stafford (Site M-6.1). In general, values of the Traffic-only Leq were the same as or very similar to the measured Total Leqs at each of the measurement sites, which is an indication that roadway traffic was the dominant source of noise in spite of the presence of other sporadic and occasional noise events due to human-related activity.

Other sources of noise in the existing environment included, but were not limited to aircraft overflights, including, lawn equipment, biogenic sounds (birds and insects), wind in the trees, and other human-related activity. **Appendix D** provides details of the data acquired during the noise measurement program, including noise monitor output, site photographs, noise level data with site summary results, and traffic counts.

4.2 PREDICTED EXISTING NOISE LEVELS

For calculation of loudest-hour noise levels throughout the study area in the TNM noise-prediction computer model, many additional receiver locations were added to the measurement sites to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-hour traffic data, existing and future traffic noise levels were predicted for the measurement sites and the additional receiver locations. The computation methods and predicted noise levels are presented in the next section of this report.

The noise measurements provided valuable information on current noise conditions and the effects of terrain and shielding on sound propagation from the roadway to the nearby residential land uses. However, because existing noise levels are not always measured during the loudest hour of the day, estimates of the loudest-hour existing noise levels were computed with an FHWA-approved noise prediction model using the appropriate traffic data as input. These predicted estimates of existing noise levels for the loudest hour of the day are then used as the baseline against which probable future noise levels are compared and potential noise impacts assessed. Additional information on the computation methods and computed levels used in this study are provided in Section 5.

5. NOISE PREDICTION

5.1 NOISE PREDICTION MODEL

All traffic noise computations for this study were conducted using the latest version of the FHWA TNM, version 2.5. TNM incorporates state-of-the-art sound emissions and sound propagation algorithms, based on well-established theory or on accepted international standards. The acoustical algorithms contained within the FHWA TNM have been validated with respect to carefully conducted noise measurement programs, and show excellent agreement in most cases for sites with and without noise barriers.

Available project engineering plans, aerial photography, topographic contours, and building information are used to create a three-dimensional model in the TNM of the geometry of the existing and expected future roadway configurations and the surrounding terrain and buildings. The noise modeling also accounts for such factors as propagation over different types of ground (acoustically soft and hard ground), elevated roadway sections, significant shielding effects from local terrain and structures, distance from the road, traffic speed, and hourly traffic volumes including percentage of medium and heavy trucks. To fully characterize existing and future noise levels at all noise-sensitive land uses in the study area, many noise prediction receivers (also called “receptors” and “sites”) were added to the measurement sites in the modeling. TNM runs are available upon request.

Information on noise-sensitive residential land use in the study area (Activity Category B) includes the number of dwelling units, identified from existing mapping and field verification.

5.2 NOISE MODEL VALIDATION

According to FHWA and VDOT policies, the accuracy of the noise prediction model must be verified on a project-by-project basis. The noise model validation process compares existing noise levels monitored in the field with predicted noise levels from the FHWA TNM using the traffic conditions during the monitoring period as input to the model. The purpose of the noise model validation is to evaluate the success of the model in representing the important acoustical characteristics of the study area. This is determined by examining the overall trend of the differences between measured and predicted noise levels at each measurement site. Individual site to site differences may vary significantly, depending on factors that may affect either the measured noise level or the predicted noise level at a given site. Examples of factors that affect noise levels are provided below:

- Factors affecting measured noise levels include: atmospheric conditions (upwind, neutral or downwind conditions), shielding by structures that are difficult to model, and/or the presence of “loud” vehicle pass-bys during the measurement.
- Factors affecting predicted noise levels include: the level of detail in modeling terrain features and locating receptors, as well as the degree to which ground zones, tree zones, and sparse rows of buildings are incorporated into the model.

FHWA and VDOT consider the noise model to be validated when measured noise levels are within +/- 3 dBA of predicted noise levels for existing conditions.

FHWA discourages the “calibration” of a noise model through the use of adjustment factors within the noise model to better match measured and predicted levels. FHWA recognizes that many factors are present both in the measurement of noise and in the development of a model that can lead to variability. Differences between measured and predicted levels that are outside the accepted accuracy of the model are likely due to unusual circumstances during the measurements, or to insufficient detail or inaccurate assumptions in the model. Only after a thorough examination of the measurement

conditions and the modeling assumptions has been completed should the highway noise analyst consider the use of adjustment factors in the model. FHWA recognizes that in some cases, it may not be possible to identify a specific reason for not validating a specific measurement site. Any such cases are to be documented in the noise study report.

Table 5-1 presents a site-by-site comparison of measured noise levels and the corresponding TNM-computed noise levels. With two exceptions, the differences between measured and predicted noise levels fall within three decibels, which is the accepted level of accuracy in the noise model. Over the 30 measurement sites, the average difference between measured and predicted noise levels for existing conditions is 0.4 decibels, with a standard deviation of 1.9, indicating very good agreement. For Site M-2.3, the predicted sound level is 3.9 decibels lower than the measured level, because non-traffic noise sources present in the environment could not be effectively excluded from the measurement data, and increased the measured sound level. This situation also existed at Site M-9.3, where the predicted sound level is 6.0 decibels lower than the measured value. These sites or sites nearby should be monitored again during the final design noise analysis.

Table 5-1: Noise Model Validation Results

Site No.	Location	Measured Leq (dBA) (Traffic Only)	Predicted Leq (dBA)	Difference (decibels)
M-1.1	95 Riverside Pkwy - S. Entrance	66.3	67.3	1.0
M-1.2	150 Riverside Pkwy - S. Entrance	69.9	71.5	1.6
M-1.3	95 Riverside Pkwy - W. Entrance	61.2	60.6	-0.6
M-2.1	100 Musselman Rd	73.0	74.6	1.6
M-2.2	S. Corner Musselman & Krieger Ln.	65.5	63.9	-1.6
M-2.3	117 Musselman Rd - SE of mailbox	63.0	59.1	-3.9
M-3.1	125 Ralph Wms. Dr. sidewlk N. end	66.7	68.1	1.4
M-3.2	125 Ralph Wms. Dr. field bollards	64.0	65.9	1.9
M-3.3	125 Ralph Wms. Dr. ut.pole btwn N&W fld	61.7	64.1	2.4
M-4.1	R/W fence E of 50 Pine View Dr.	65.4	65.7	0.3
M-4.2	R/W fence SE of 46 Pine View Dr.	64.9	66.6	1.7
M-4.3	R/W fence E of 9 Pine View Ct	68.7	70.1	1.4
M-5.1	53 Ellison Ct - NE lot corner	68.5	71.1	2.6
M-5.2	53 Ellison Ct - Driveway apron	63.2	63.5	0.3
M-5.3	38 Ellison Ct - Electrical box	62.3	62.4	0.1
M-6.1	Berm top N of 61 Bass Dr.	74.6	74.3	-0.3
M-6.2	Berm bottom NE of #17 Chichester Dr.	73.1	73.1	0.0
M-6.3	Fire hydrant @ #83 Bass Dr.	61.1	59.4	-1.7
M-7.1	Lot Line NW end Doria Hill Dr.	69.3	68.3	-1.0
M-7.2	Fire hydrant @ NW end Doria Hill Dr.	67.2	67.1	-0.1
M-7.3	E corner Doria Hill Dr. & Capri Ct	58.6	57.7	-0.9
M-8.1	243 Whitsons Run	68.2	70.0	1.8
M-8.2	245 Whitsons Run	67.5	69.5	2.0
M-8.3	252 Whitsons Run NW lot corner	57.6	60.4	2.8

Site No.	Location	Measured Leq (dBA) (Traffic Only)	Predicted Leq (dBA)	Difference (decibels)
M-9.1	1st-row hiking trl E of 28 Banner Spr. Cir.	68.6	69.2	0.6
M-9.2	28 Banner Spring Cir. S. lot corner	67.2	68.2	1.0
M-9.3	2nd-row N corner 24 Banner Spr. Cir.	55.4	49.4	-6.0
M-10.1	Cul-de-sac N of 114 Belladonna Ln.	63.0	65.7	2.7
M-10.2	N. corner playgnd N of 17 Belladonna Ln.	68.0	69.2	1.2
M-10.3	Cul-de-sac N of 31 Green Bell Ln.	66.3	67.4	1.1
Average				0.4
<i>Notes: -M-2.3 influenced by few local traffic pass-bys and human activity. Non-traffic noise sources typically present. M-9.3 influenced from human activity typically present in residential area.</i>				

5.3 TRAFFIC DATA FOR NOISE PREDICTION

Traffic data for traffic noise computations were developed for the project and are detailed in the Traffic Technical Report. For the noise analysis, the data in the 2016 Existing and 2042 future cases included hourly volumes, vehicle classification and speed data for the I-95 general purpose and high-occupancy vehicle (HOV)/HOT lanes, all intersecting roadways, and their associated ramps. The data was provided in the form of VDOT-format Environmental Traffic Data (ENTRADA) spreadsheets. As required by FHWA and VDOT, the noise analysis was performed for the loudest hour of the day. The traffic conditions for the loudest hour are dependent upon the combination of both relatively high (total) volumes and speeds, as well as the percentage of heavy trucks in the vehicle mix.

The loudest hour of the day for each project alternative determined by using TNM to compute the overall traffic noise level at a reference distance on each side of I-95, for each project segment between interchanges, for each hour of the day. The noise levels computed for the general-purpose lanes were combined with the noise from the HOV/HOT lanes for a total along each section of the mainline. The loudest hour evaluation was finalized and confirmed using the TNM runs for the three alternatives at a subset of receivers along the mainline sections of I-95. Different loudest hours were found for the section of I-95 between Courthouse Road (Exit 140) and Garrisonville Road (Exit 143) as compared to the sections south of Exit 140, due to the wide separation of the NB and SB travel lanes in that section. The evaluation suggested different loudest hours for the NB and SB sides of I-95 between Exits 140 and 143. **Table 5-2** lists the loudest hours modeled in each section of the project for each project alternative. Details of the development of the loudest hours for the noise analysis are provided in a memorandum submitted to VDOT for review, and is included in **Appendix B**. Traffic data for the same loudest hours were used in the final TNM for adjacent intersecting roads, crossing arterials, and ramps. The traffic data used for these roadways is provided in **Appendix B**.

Table 5-2: Loudest Hours of the Day Used in Noise Modeling

Roadway Section	Loudest hour Start Time		
	2016 Existing	2042 No-build	2042 Build
I-95: US 17 (Exit 133) to Centreport Pkwy (Exit 136)	15:00	9:00	15:00
I-95: Centreport Pkwy (Exit 136) (Centreport Pkwy) to Courthouse Rd (Exit 140)	15:00	9:00	15:00

I-95 SB side: Courthouse Rd (Exit 140) to Garrisonville Rd (Exit 143)	15:00	18:00	15:00
I-95 NB side: Courthouse Rd (Exit 140) to Garrisonville Rd (Exit 143)	9:00	9:00	9:00

5.4 PRESENTATION OF RESULTS

The study area includes mostly residential land use and development, as well as some recreational, institutional, and exterior commercial land use.

5.4.1 Common Noise Environment (CNE) Descriptions

Table 5-3 presents a list of the CNEs in the study area with FHWA Activity categories, general location for each CNE, and brief descriptions of the noise-sensitive land use within. More detailed descriptions of the CNEs are provided below. CNE boundaries are shown in **Figure 5-1** for areas with noise-sensitive land use. Areas that do not have noise-sensitive land uses are not identified with CNE boundaries; such land use is Activity Category E, F, or G, that is commercial with no exterior activity areas, industrial, or undeveloped, respectively.

CNE NN - Common Noise Environment NN consists of the noise-sensitive residential exterior areas of frequent human use and one hiking trail adjacent to I-95 SB, south of Route 610 / Garrisonville Road to the overhead electrical transmission line easement south of Whitson’s Run. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for the hiking trail south of Whitsons Run, and 275 single-family residential receptors, including townhomes on Cross Ridge Court, Stafford Glen Court, Barksdale Place, Tanglewood Lane, Whitsons Run, Fallsway Lane, Coldspring Drive, Fairfield Court, Willingham Court, Ryan Way, Vine Place.

CNE OO - Common Noise Environment OO consists of the noise-sensitive residential exterior areas of frequent human use and one hiking trail adjacent to I-95 SB, south of the overhead electrical transmission line easement north of Brush Everard Court to Tavern Road. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for the hiking trail south of Tavern Road and 78 single-family residential receptors on Brush Everard Court, Tavern Road, and Goal Court.

Table 5-3: Common Noise Environment (CNE) Descriptions

CNE	FHWA Activity Categories*	Description of Land Use and Location
NN	B, C	Single-family residences on Cross Ridge Court, Stafford Glen Court, Tanglewood Lane, Whitsons Run, Cross Ridge Court, Barksdale Place, Fallsway Lane, Coldspring Drive, Fairfield Court, Ryan Way, Willingham Court, and Vine Place; and one hiking trail south of Whitsons Run adjacent to I-95 SB, south of Route 610 / Garrisonville Road to south of Whitson’s Run
OO	B, C	Single-family residences on Brush Everard Court, Tavern Road, and Goal Court; and one hiking trail south of Tavern Road adjacent to I-95 SB, from Brush Everard Court to Tavern Road
PP	B, C, D, E	Single-family residences, playgrounds, residential community and hotel pools, places of worship with exterior areas of frequent human use, educational facilities, and daycare on US 1 (Jefferson Davis Highway), Bell Tower Court, Belladonna Lane, Green Bell Lane, Bells Ridge Drive, Bells Hill Road, Shannon Court, Galway Lane, Cork Street, Corin Way, and Daffodil Lane adjacent to I-95 NB, from south of Route 610 / Washington Drive to the residential neighborhood on Daffodil Lane
QQ	B, C, D	Anthony Burns Elementary School; single-family residences; and a hiking trail north of Banner Spring Circle adjacent to I-95 SB, from Anthony Burns Elementary School to north of Route 630 / Courthouse Road
RR	B, C	Multi-story multi-family residences and community pool in the Ultris Courthouse Square community on Bass Drive, Chichester Drive, Cummings Drive, and Davenport Drive; and single-family residences on Appletree Lane, Beech Tree Court, and Willow Lane adjacent to I-95 NB, from Bass Drive to north of Route 630 / Courthouse Road
SS	B	Single-family residences on Bishop Lane, Rehoboth Drive, Wyche Road, Buttercup Lane, Ellison Court, American Legion Road, and Nats Court Road adjacent to I-95 NB, from Route 630 / Courthouse Road to Centreport Parkway
TT	B	Single-family residences on Bowers Lane, Ramoth Church Road, Ravenwood Drive, Pine View Drive, Pine View Court, Old Enon Road, Bear Mountain Lane, Allison Drive, and Wyatt Lane adjacent to I-95 SB, from Route 630 / Courthouse Road to Enon Road south of Centreport Parkway
UU	B; C	Single-family residences on Beauregard Drive, Enon Road, and Stafford Indians Lane; and Chichester Park athletic fields adjacent to I-95 NB, from Centreport Parkway to Chichester Park
VV	B	Single-family residences on Samuels Lane and Truslow Road adjacent to I-95 SB, from Enon Road to north of US 17 Business

CNE	FHWA Activity Categories*	Description of Land Use and Location
WW	B	Single-family residences on Truslow Road, Beagle Road, Old Falls Road, Virginia Avenue, Pitt Road, and Limerick Lane adjacent to I-95 NB, from Truslow Road to north of US 17 Business
XX	B, D, E	Single-family residences, one theater with no exterior areas of frequent human use, and one hotel pool on Simpson Road and Riverside Parkway adjacent to I-95 SB, from US 17 Business to the southern project limits
YY	B, E	Hotel Pools on US 17 Business / Warrenton Road, and single-family residences on Musselman Road and Krieger Lane adjacent to I-95 NB, from US 17 Business to the southern project limits

* Note: Activity Category B is exterior residential, C - exterior recreational or institutional, D - interior institutional, E - exterior commercial. Table 3-1 provides detailed descriptions of the land uses included in the categories.

Source: HMMH, 2016.

CNE PP - Common Noise Environment PP consists of the noise-sensitive residential exterior areas of frequent human use, playgrounds, pools, places of worship, educational facilities, and daycare adjacent to I-95 NB, from south of Route 610 / Washington Drive to the residential neighborhood on Daffodil Lane. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 224 single-family residential receptors, two educational facilities; one hotel pool; one daycare facility; two places of worship – both with exterior areas of frequent human use; one residential community playground; and one residential community pool on US 1 / Jefferson Davis Highway), Bell Tower Court, Belladonna Lane, Green Bell Lane, Bells Ridge Drive, Bells Hill Road, Shannon Court, Galway Lane, Cork Street, Corin Way, and Daffodil Lane.

CNE QQ - Common Noise Environment QQ consists of the noise-sensitive residential exterior areas of frequent human use, schools, and a hiking trail adjacent to I-95 SB, from Anthony Burns Elementary School to north of Route 630 / Courthouse Road. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 45 single-family residential receptors and one school on Gallery Road, Banner Spring Circle, Dalthan Court, Echols Lane, and Mahone Drive, and the hiking trail north of Banner Spring Circle.

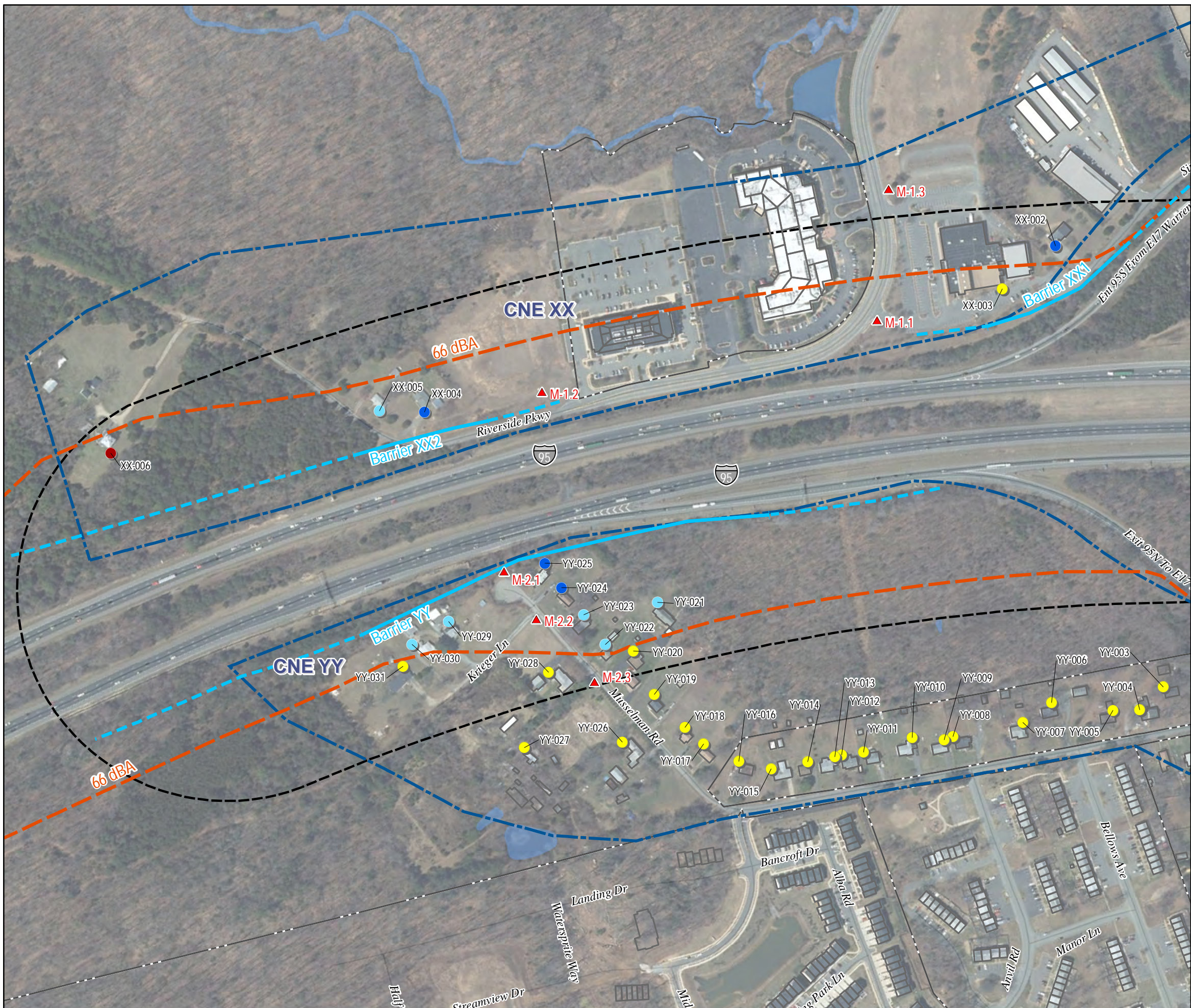
CNE RR - Common Noise Environment RR consists of the noise-sensitive residential exterior areas of frequent human use and one community pool adjacent to I-95 NB, from Bass Drive to north of Route 630 / Courthouse Road. Traffic noise levels were predicted for Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 206 apartment residence balcony and patio exterior areas of frequent human use and one community pool on Bass Drive, Chichester Drive, Cummings Drive, and Davenport Drive, and 60-single-family residential receptors on Appletree Lane, Beech Tree Court, and Willow Lane.

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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

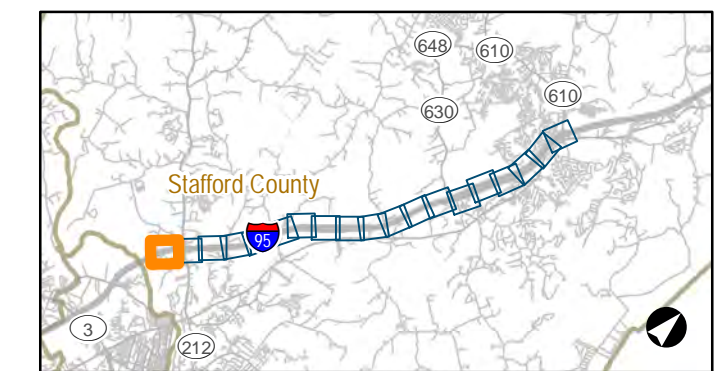


- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- ▤ Feasible and Reasonable
 - ▤ Feasible and Not Reasonable - Most Reasonable
 - ▤ Feasible and Not Reasonable - Full Extent
 - ▤ Not Feasible
 - ▤ Future
 - ▤ Existing
- ▲ M# Measurement Site
 CNE Boundary
 66 dBA Noise Contour
 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

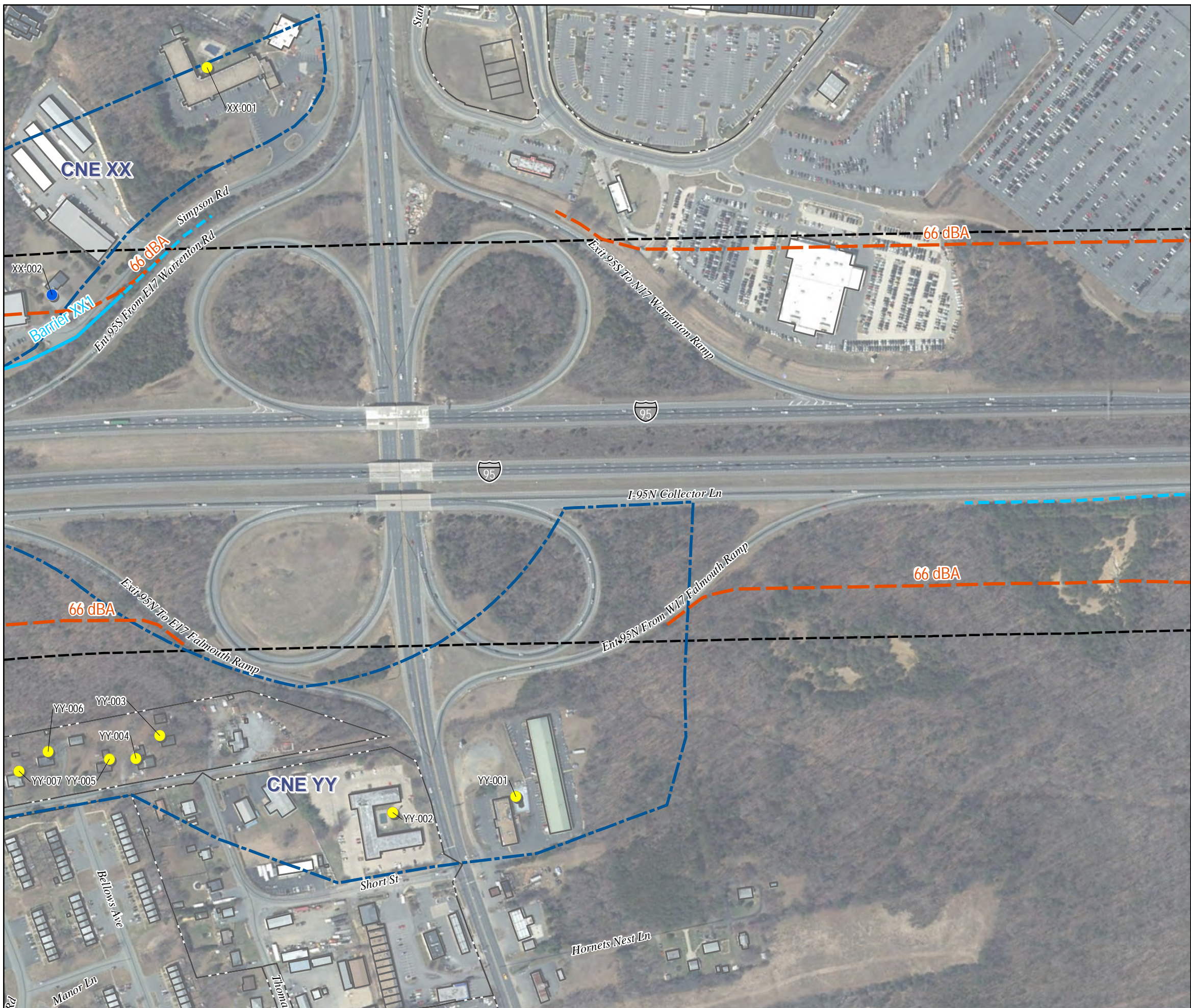


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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

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VDOT Project No. 0095-969-739; UPC No. 110527

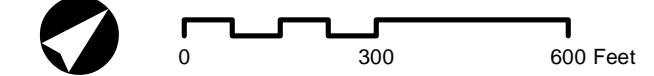


- Receiver Site and Number**
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

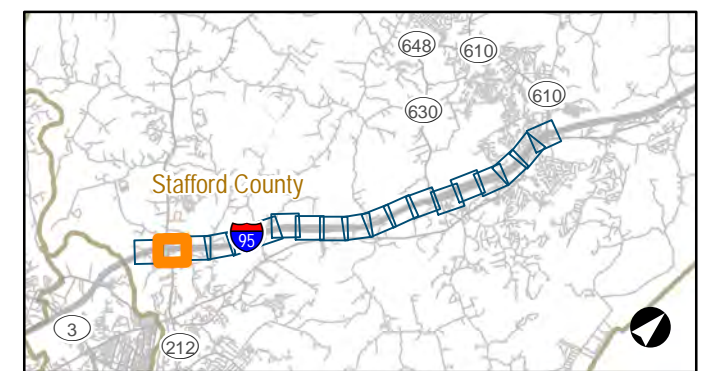
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers**
- ▬ Feasible and Reasonable
 - ▬ Feasible and Not Reasonable - Most Reasonable
 - ▬ Feasible and Not Reasonable - Full Extent
 - ▬ Not Feasible
 - ▬ Future
 - ▬ Existing
- ▲ M# Measurement Site
 - CNE Boundary
 - 66 dBA Noise Contour
 - 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

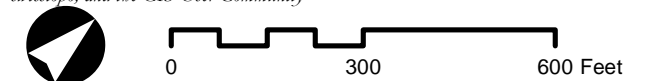
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

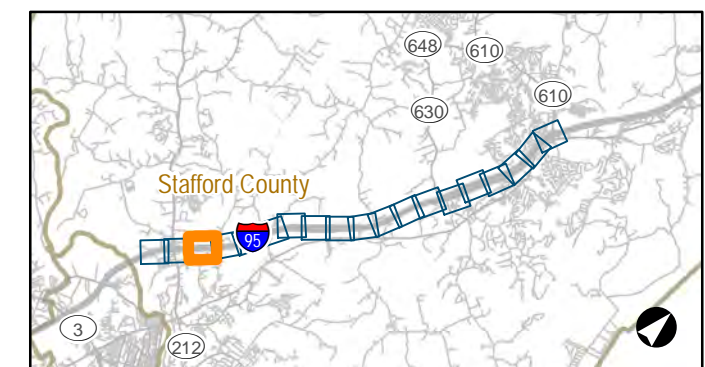
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

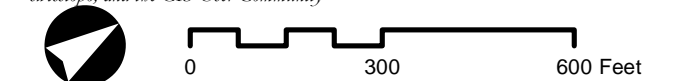
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

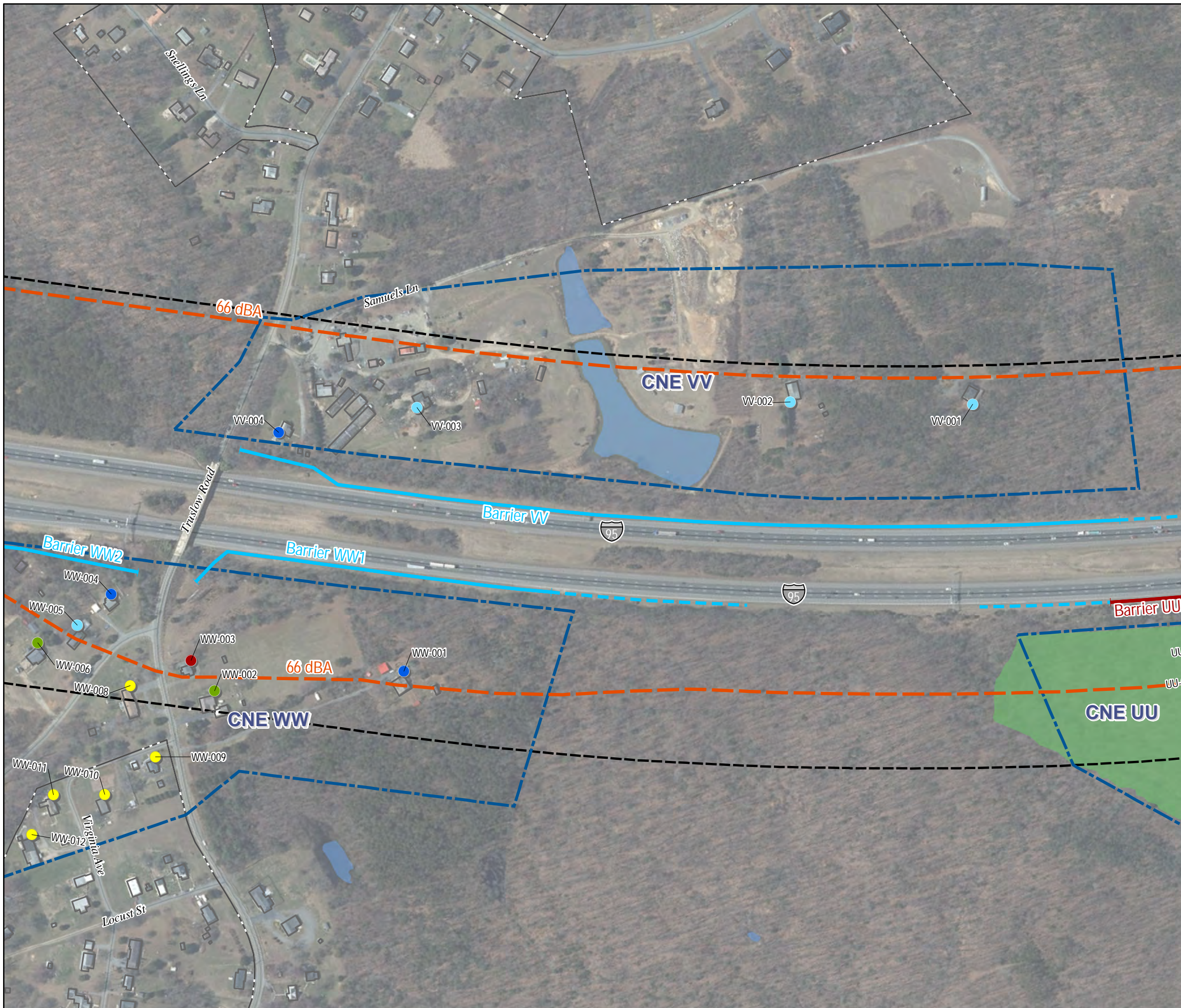
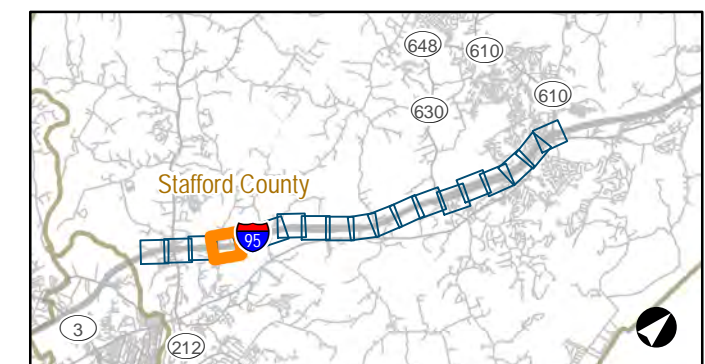
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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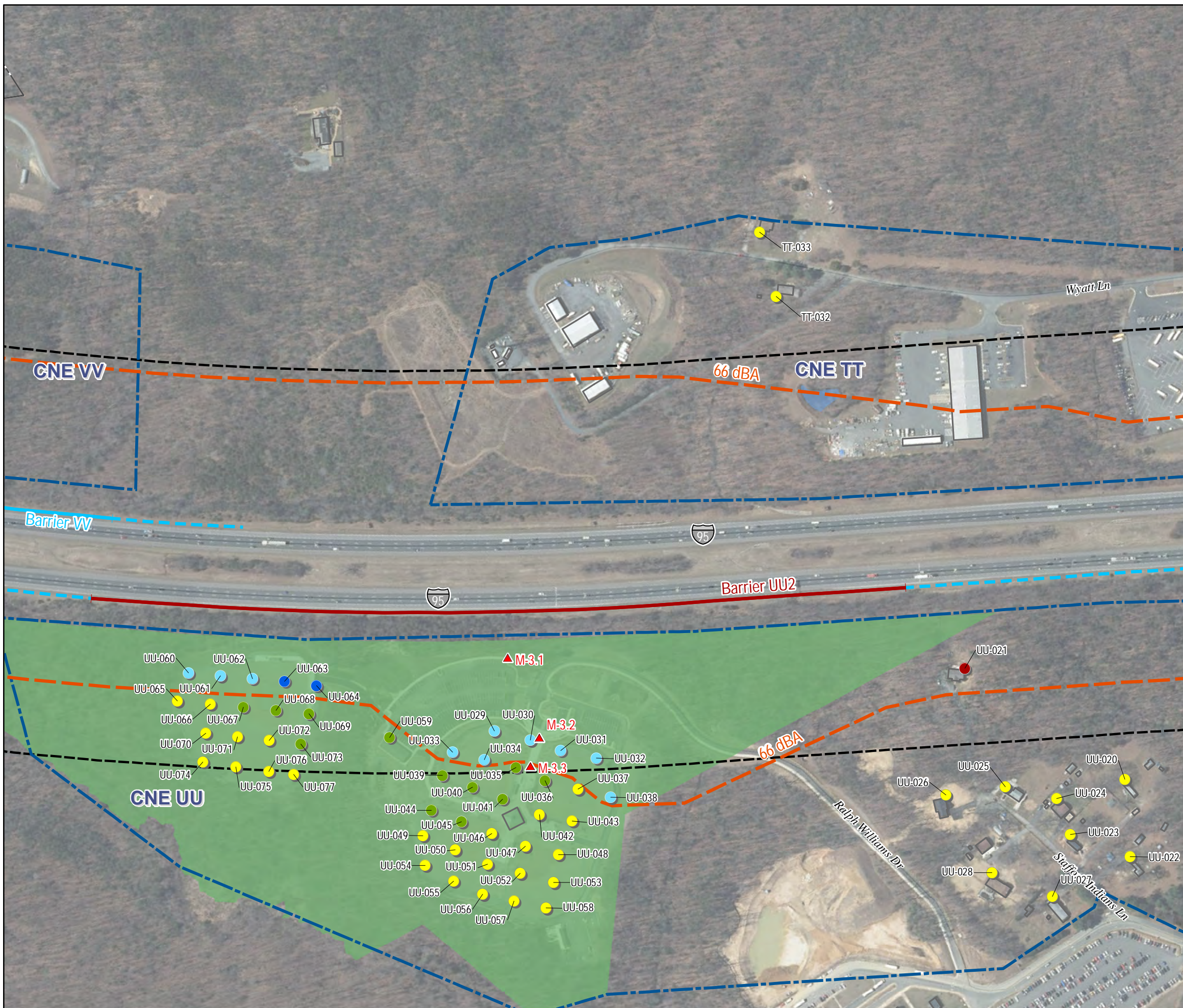


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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

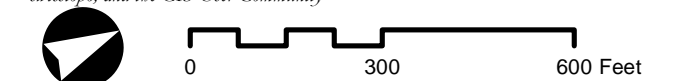
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

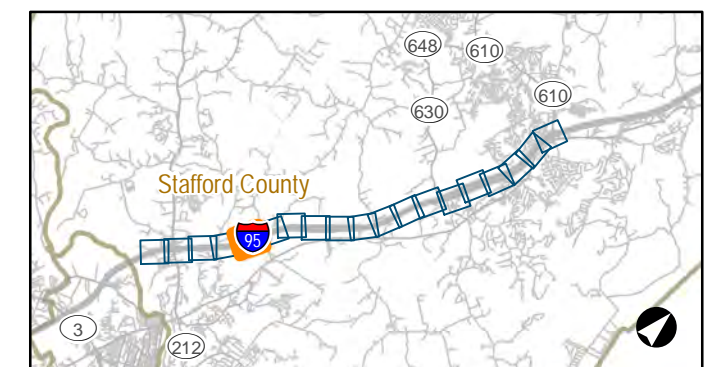
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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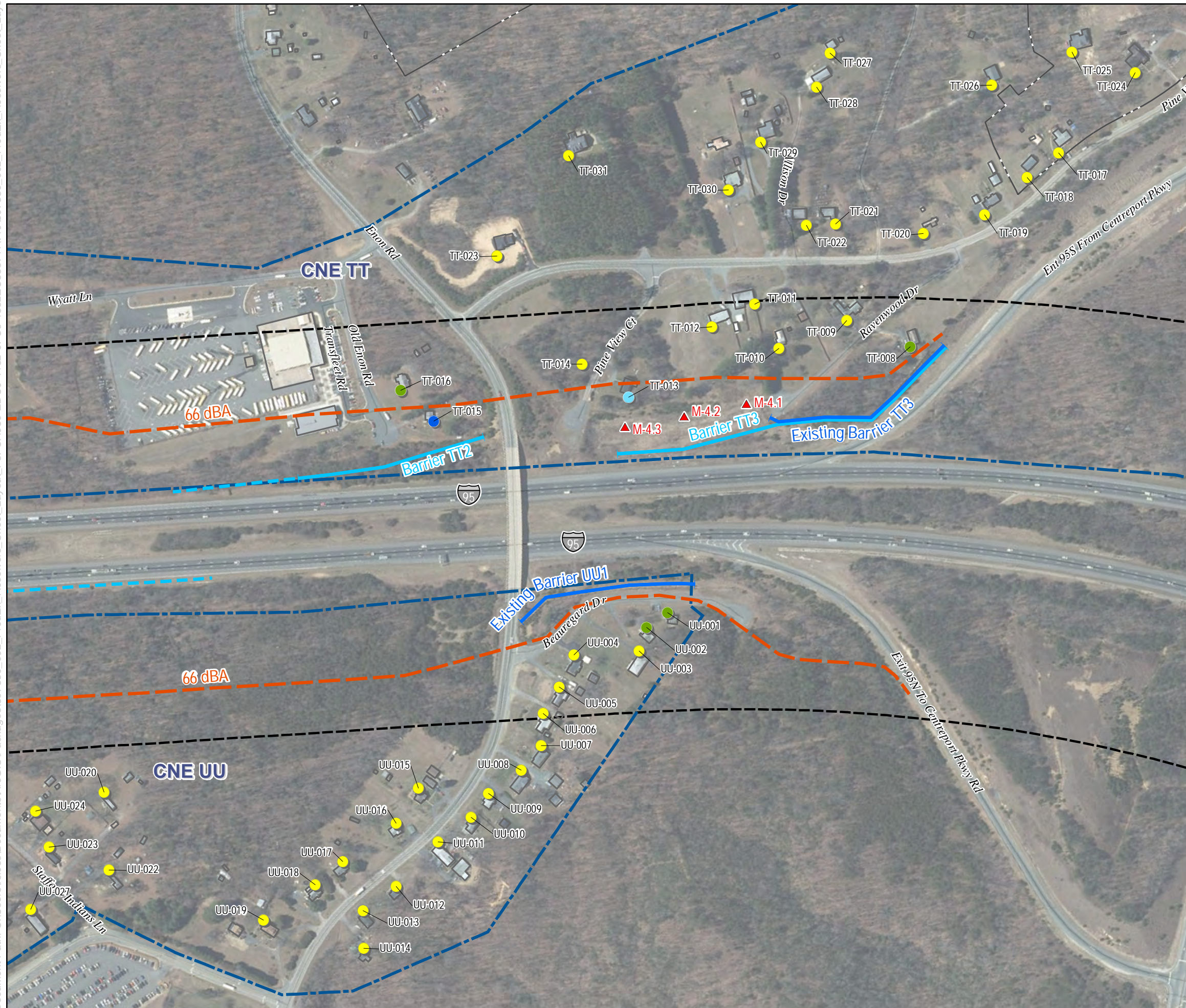


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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

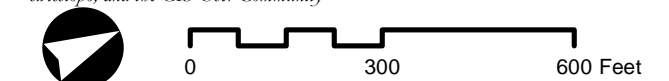
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

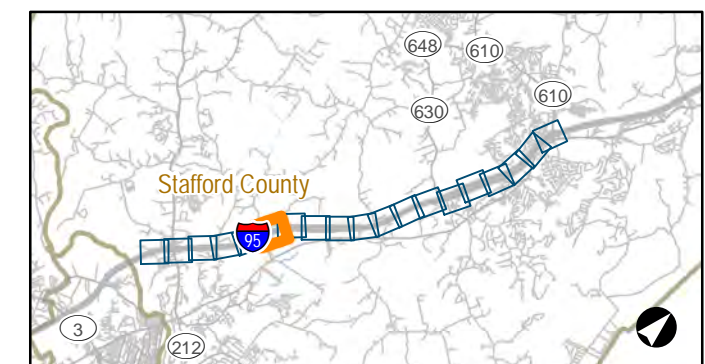
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

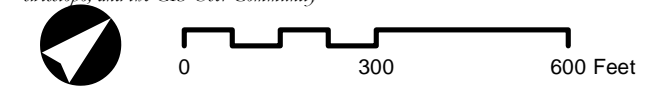
VDOT Project No. 0095-969-739; UPC No. 110527

- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

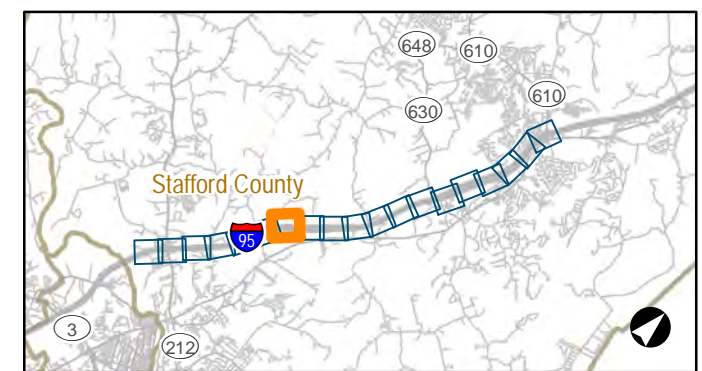
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- Feasible and Reasonable
 - Feasible and Not Reasonable - Most Reasonable
 - Feasible and Not Reasonable - Full Extent
 - Not Feasible
 - Future
 - Existing
 - M# Measurement Site
 - CNE Boundary
 - 66 dBA Noise Contour
 - 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

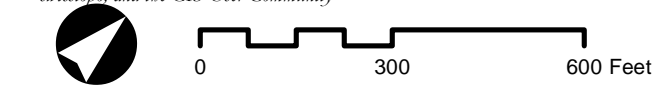


- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

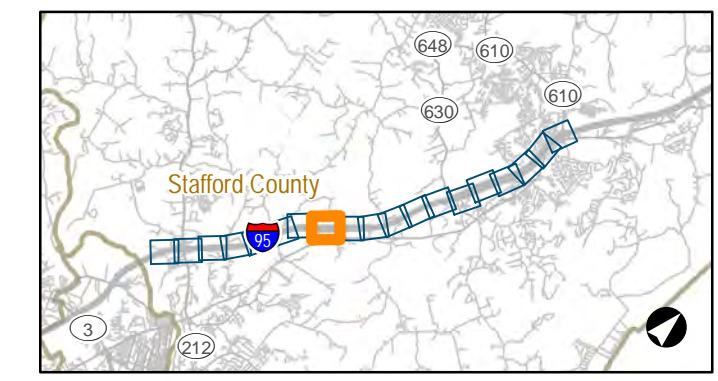
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- Feasible and Reasonable
 - Feasible and Not Reasonable - Most Reasonable
 - Feasible and Not Reasonable - Full Extent
 - Not Feasible
 - Future
 - Existing
 - Measurement Site
 - CNE Boundary
 - 66 dBA Noise Contour
 - 500' Noise Study Area

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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

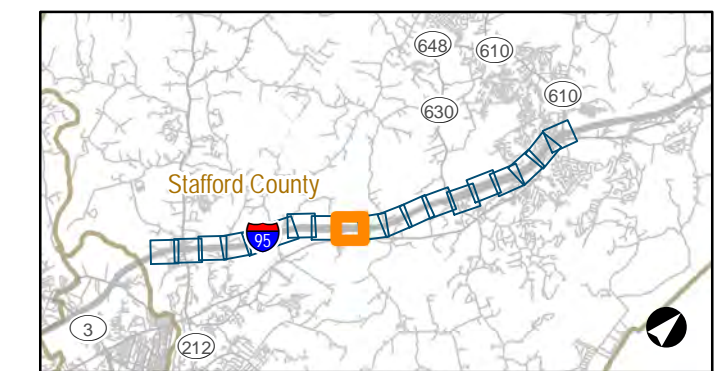
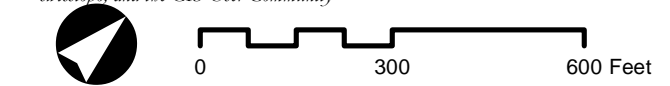


- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- Feasible and Reasonable
 - Feasible and Not Reasonable - Most Reasonable
 - Feasible and Not Reasonable - Full Extent
 - Not Feasible
 - Future
 - Existing
 - ▲ M# Measurement Site
 - CNE Boundary
 - 66 dBA Noise Contour
 - 500' Noise Study Area

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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

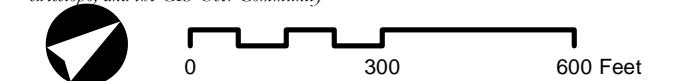
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

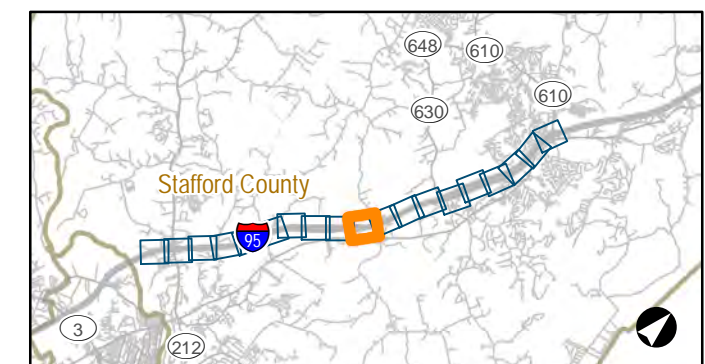
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

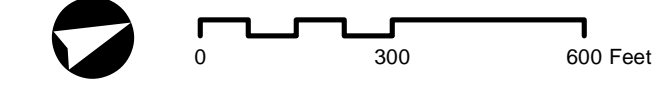


- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

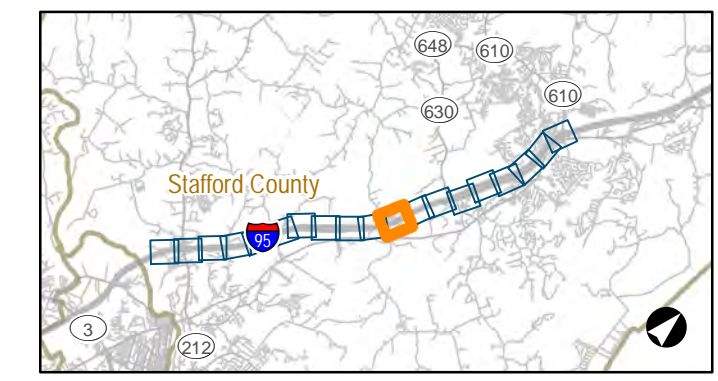
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- ▤ Feasible and Reasonable
 - ▤ Feasible and Not Reasonable - Most Reasonable
 - ▤ Feasible and Not Reasonable - Full Extent
 - ▤ Not Feasible
 - ▤ Future
 - ▤ Existing
- ▲ M# Measurement Site
 - ▬ CNE Boundary
 - ▬ 66 dBA Noise Contour
 - ▬ 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

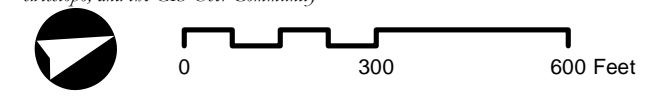
VDOT Project No. 0095-969-739; UPC No. 110527

- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

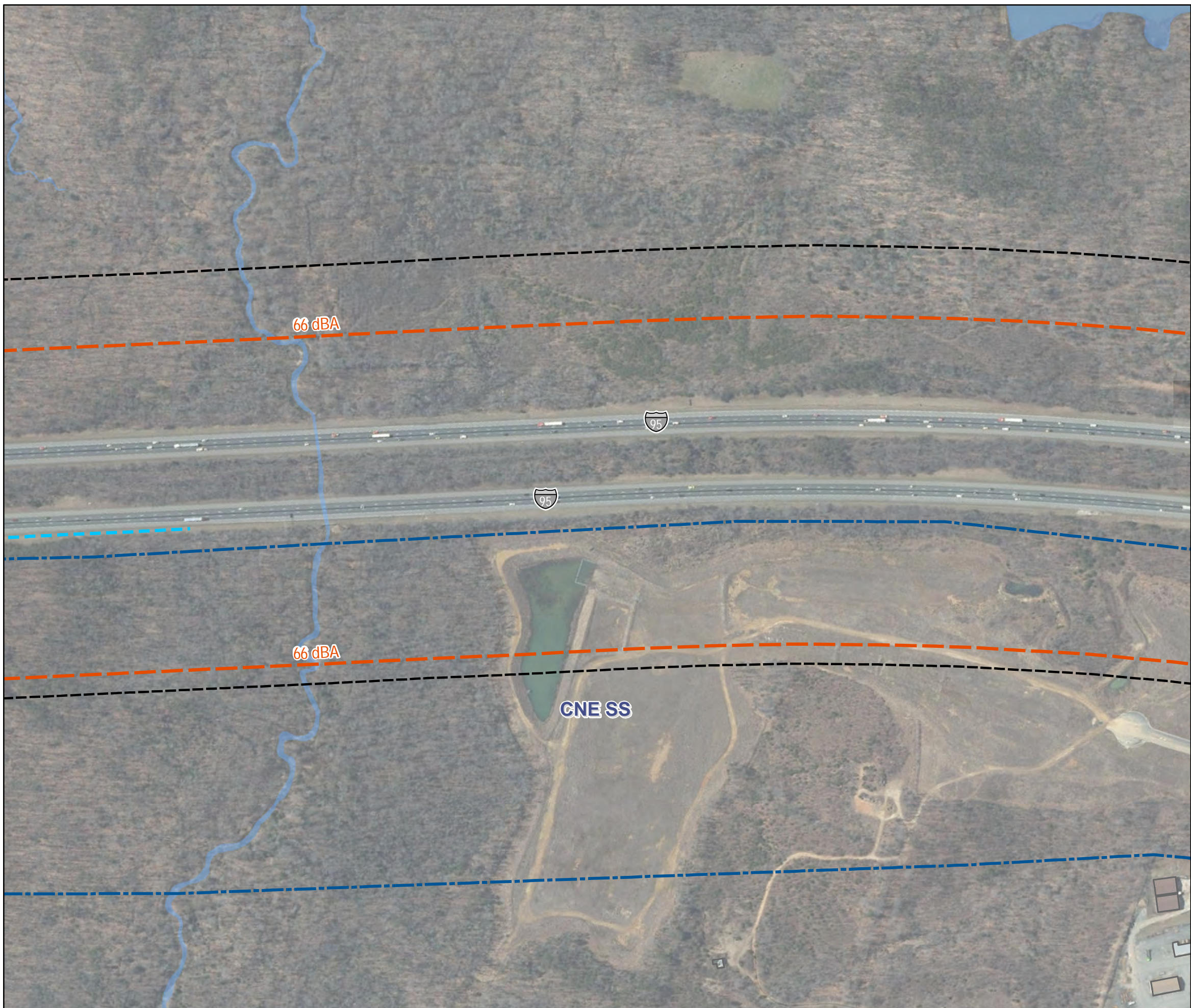
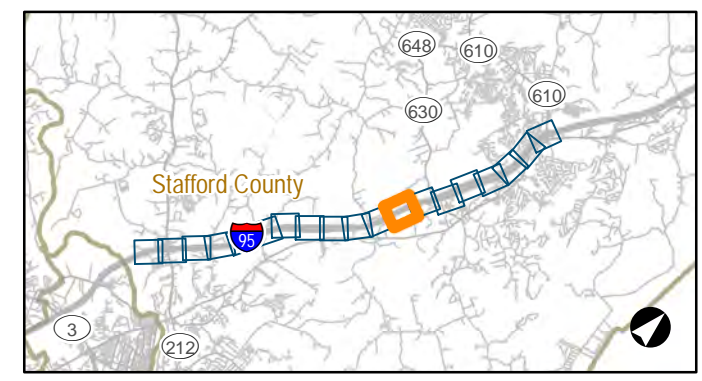
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- Feasible and Reasonable
 - Feasible and Not Reasonable - Most Reasonable
 - Feasible and Not Reasonable - Full Extent
 - Not Feasible
 - Future
 - Existing
- M# Measurement Site
 - CNE Boundary
 - 66 dBA Noise Contour
 - 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527

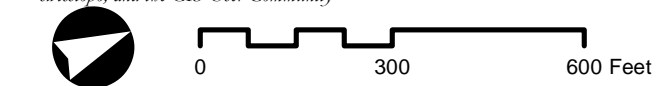


- Receiver Site and Number
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

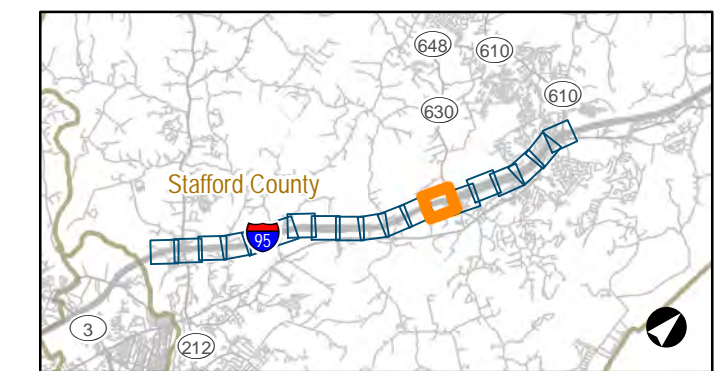
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers
- ▬ Feasible and Reasonable
 - ▬ Feasible and Not Reasonable - Most Reasonable
 - ▬ Feasible and Not Reasonable - Full Extent
 - ▬ Not Feasible
 - ▬ Future
 - ▬ Existing
 - ▲ M# Measurement Site
 - ▬ CNE Boundary
 - ▬ 66 dBA Noise Contour
 - ▬ 500' Noise Study Area

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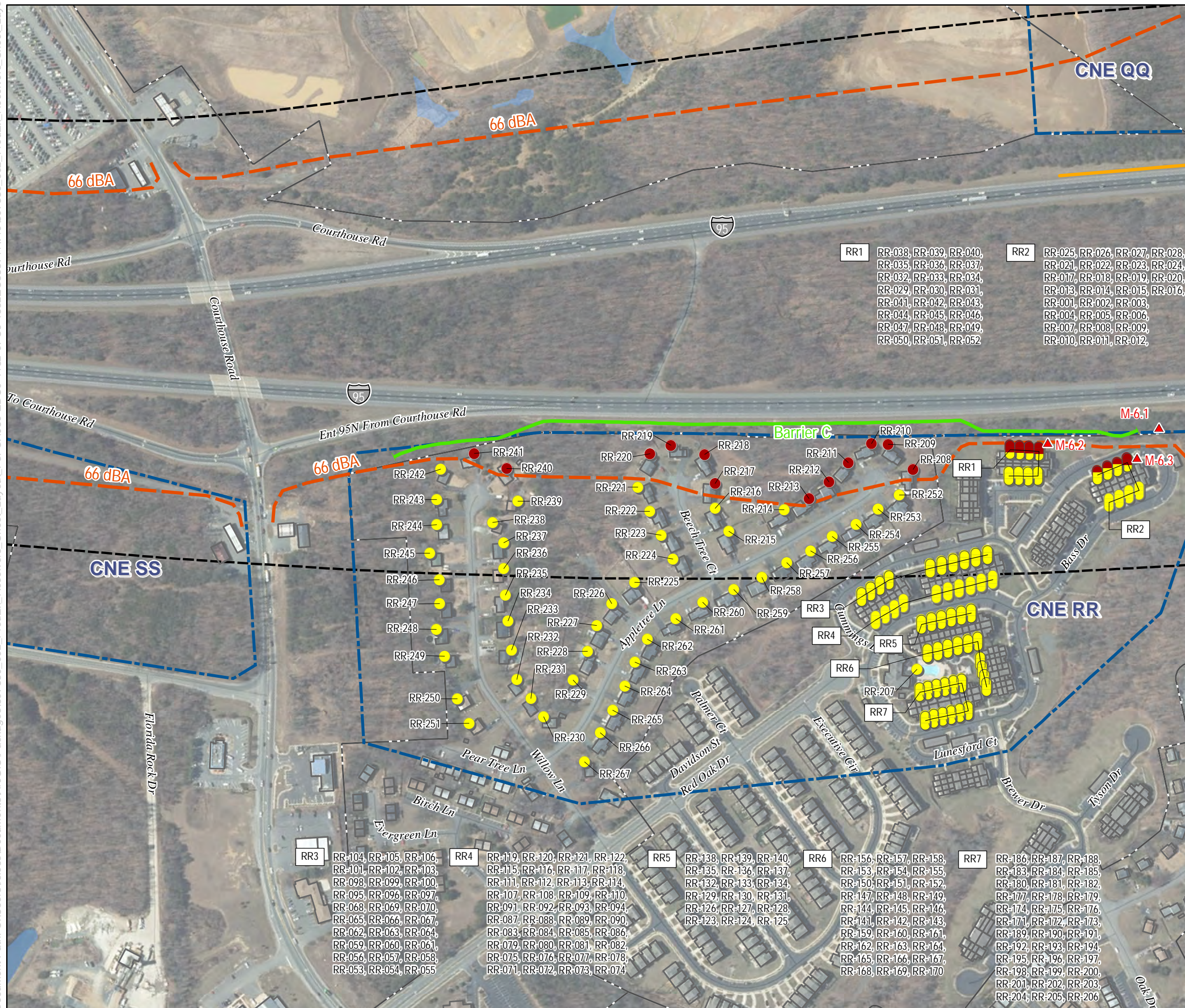


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**Figure 5-1
Location Map for Common Noise
Environments, Receptors,
Build Contours and Barriers**

**Interstate 95 Express Lanes
Fredericksburg Extension Study
Noise Analysis**

VDOT Project No. 0095-969-739; UPC No. 110527



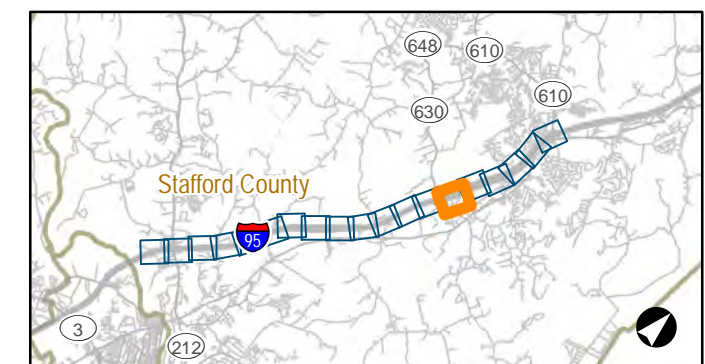
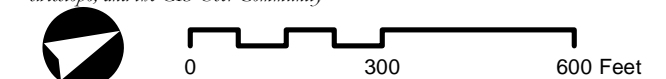
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|------------|--|------------|---|

- Receiver Site and Number**
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers**
- ▬ Feasible and Reasonable
 - ▬ Feasible and Not Reasonable - Most Reasonable
 - ▬ Feasible and Not Reasonable - Full Extent
 - ▬ Not Feasible
 - ▬ Future
 - ▬ Existing
 - ▲ M# Measurement Site
 - ▬ CNE Boundary
 - ▬ 66 dBA Noise Contour
 - ▬ 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

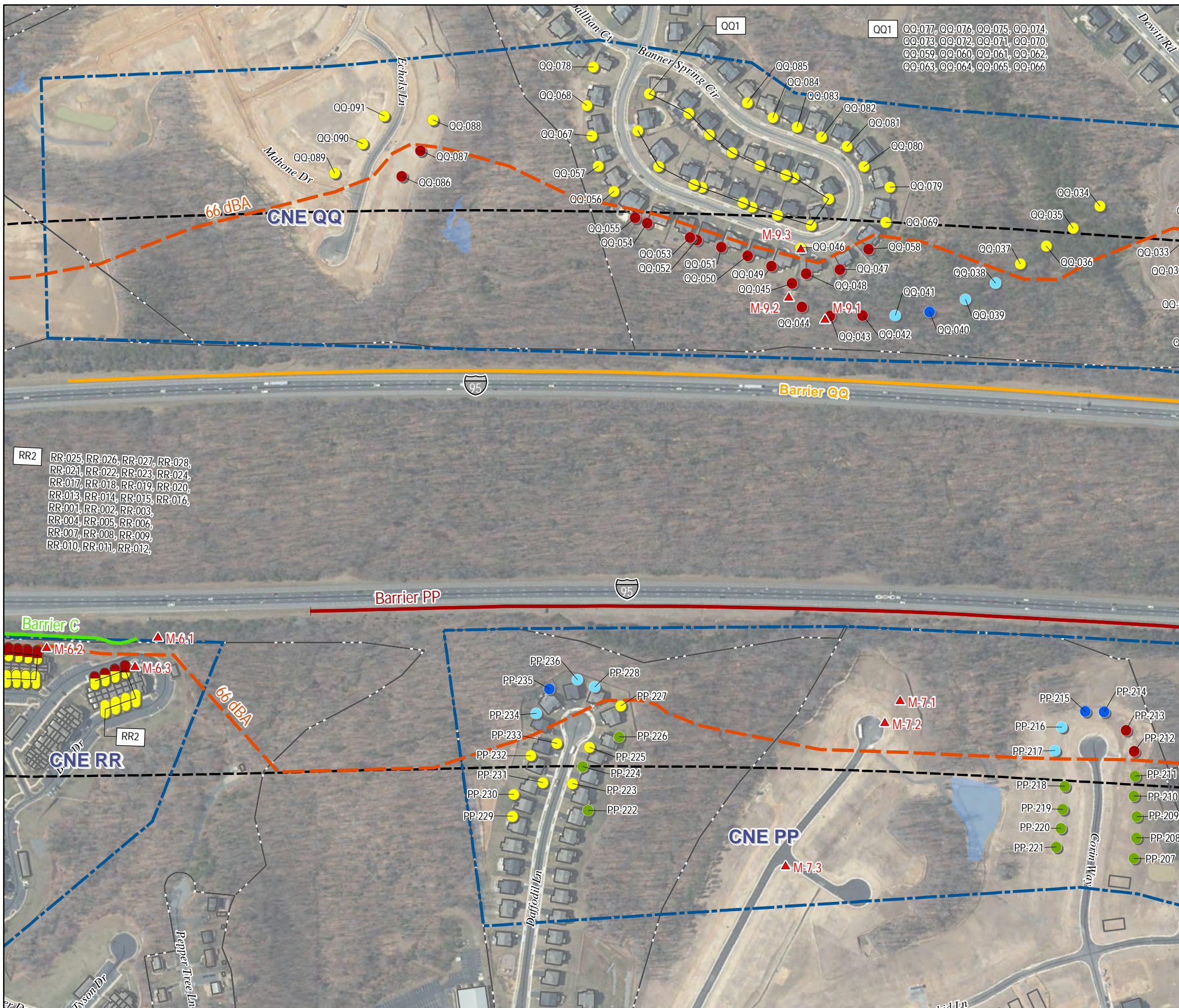


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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

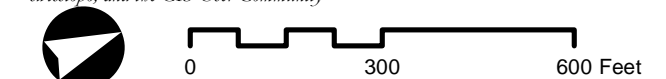
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

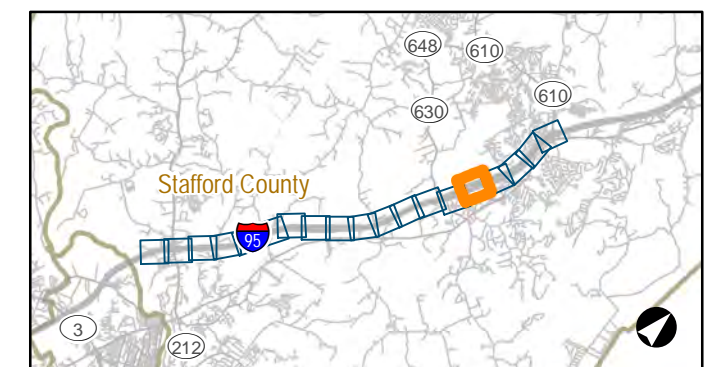
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
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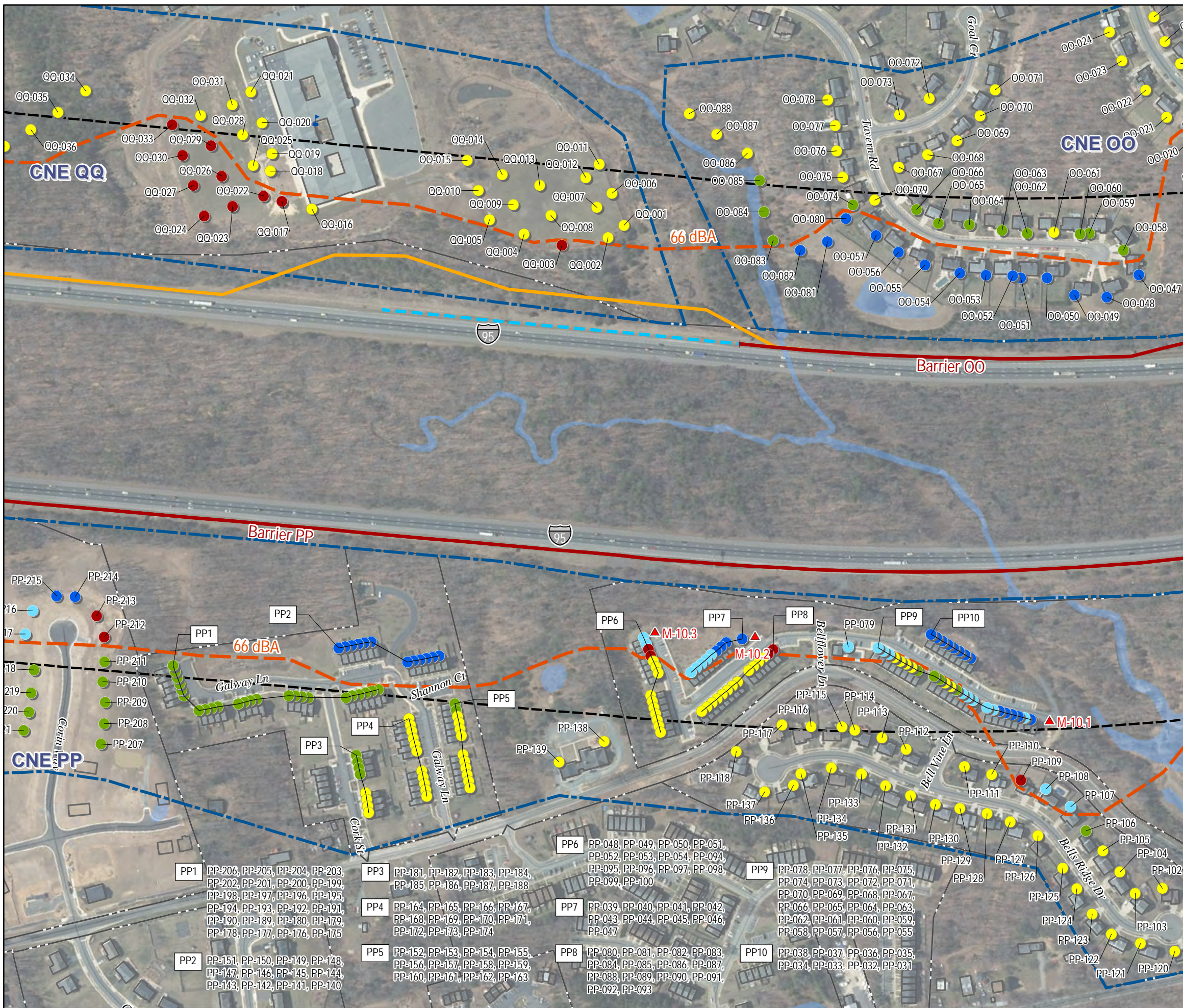


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**Figure 5-1
Location Map for Common Noise
Environments, Receptors,
Build Contours and Barriers**

**Interstate 95 Express Lanes
Fredericksburg Extension Study
Noise Analysis**

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

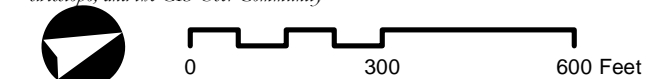
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

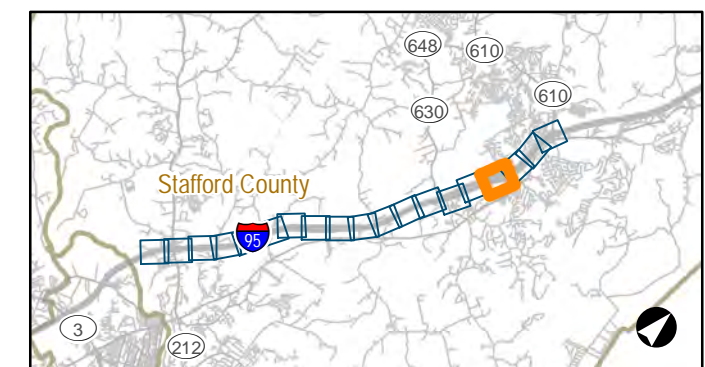
Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

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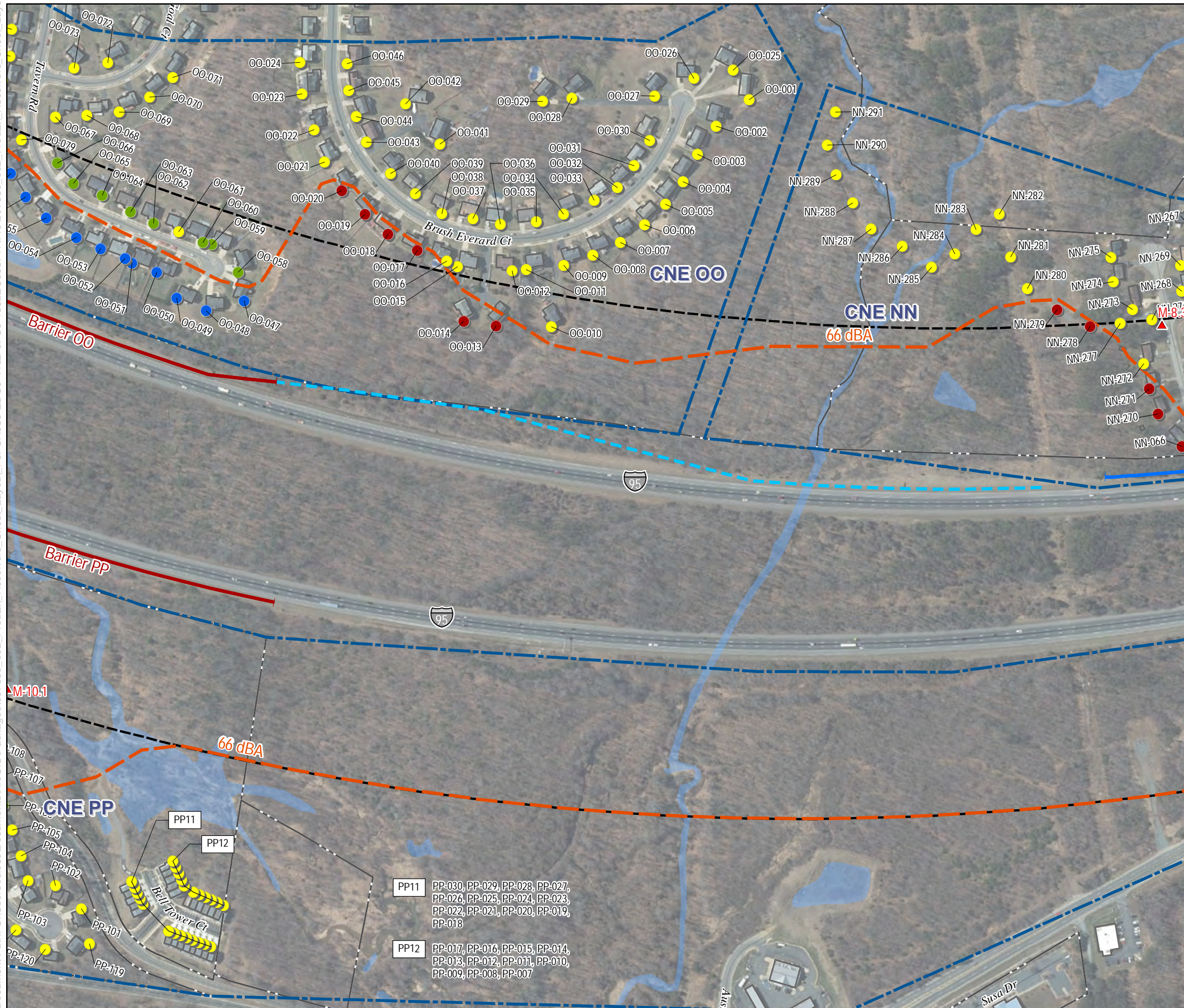
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<p>PP2 PP-151, PP-150, PP-149, PP-148, PP-147, PP-146, PP-145, PP-144, PP-143, PP-142, PP-141, PP-140</p>	<p>PP4 PP-164, PP-165, PP-166, PP-167, PP-168, PP-169, PP-170, PP-171, PP-172, PP-173, PP-174</p>	<p>PP7 PP-039, PP-040, PP-041, PP-042, PP-043, PP-044, PP-045, PP-046, PP-047</p>	<p>PP10 PP-038, PP-037, PP-036, PP-035, PP-034, PP-033, PP-032, PP-031</p>
<p>PP5 PP-152, PP-153, PP-154, PP-155, PP-156, PP-157, PP-158, PP-159, PP-160, PP-161, PP-162, PP-163</p>	<p>PP8 PP-080, PP-081, PP-082, PP-083, PP-084, PP-085, PP-086, PP-087, PP-088, PP-089, PP-090, PP-091, PP-092, PP-093</p>		

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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



- Receiver Site and Number**
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

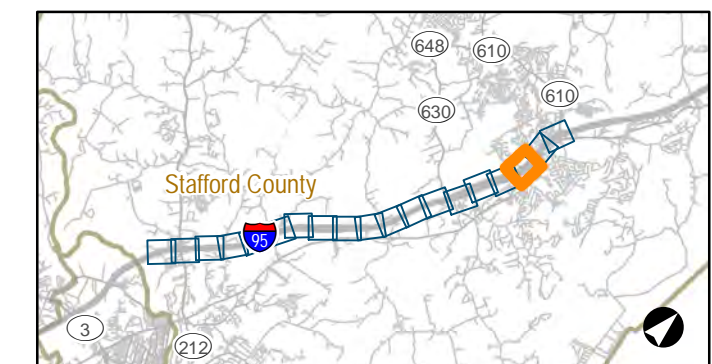
Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers**
- ▬ Feasible and Reasonable
 - ▬ Feasible and Not Reasonable - Most Reasonable
 - ▬ Feasible and Not Reasonable - Full Extent
 - ▬ Not Feasible
 - ▬ Future
 - ▬ Existing
- ▲ M# Measurement Site
 - ▬ CNE Boundary
 - ▬ 66 dBA Noise Contour
 - ▬ 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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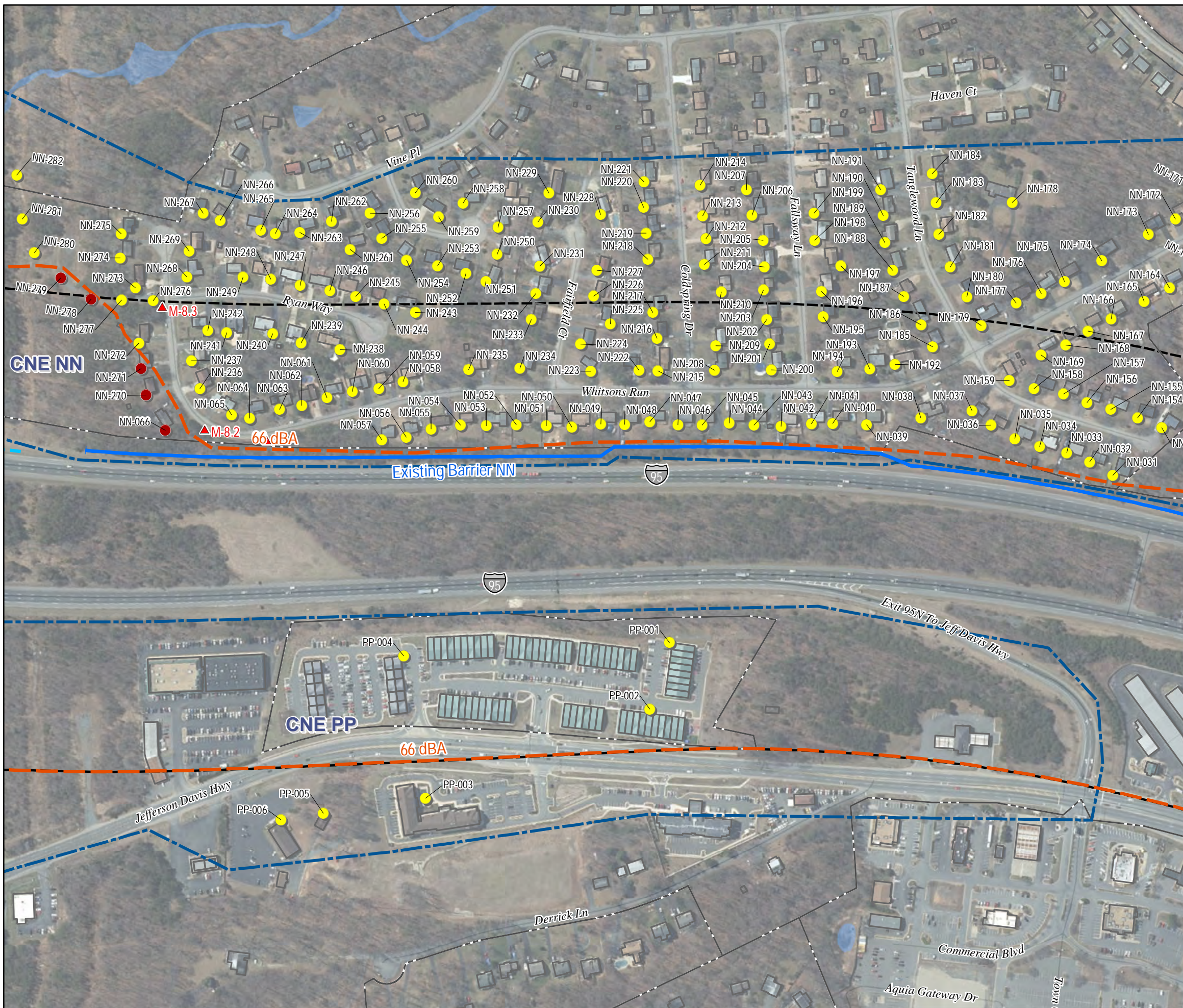


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Figure 5-1 Location Map for Common Noise Environments, Receptors, Build Contours and Barriers

Interstate 95 Express Lanes Fredericksburg Extension Study Noise Analysis

VDOT Project No. 0095-969-739; UPC No. 110527



Receiver Site and Number

- Impacted and 5 or 6 dBA Insertion Loss
- Impacted and 7 dBA or more Insertion Loss
- Impacted but Not Benefited
- Benefited but Not Impacted
- Not Benefited or Impacted

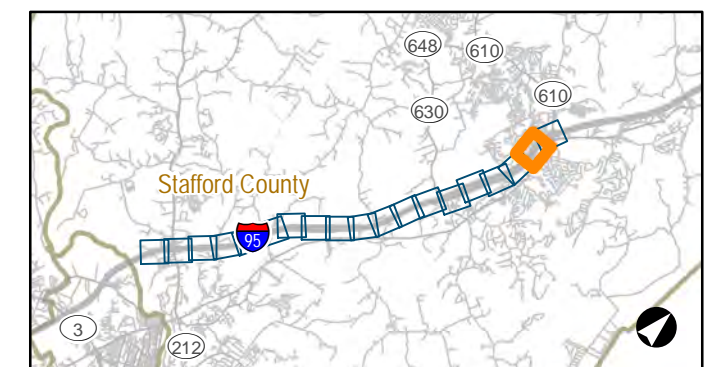
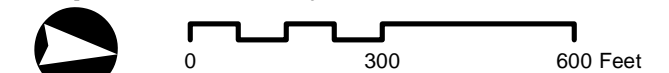
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

Noise Barriers

- Feasible and Reasonable
- Feasible and Not Reasonable - Most Reasonable
- Feasible and Not Reasonable - Full Extent
- Not Feasible
- Future
- Existing
- M# Measurement Site
- CNE Boundary
- 66 dBA Noise Contour
- 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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**Figure 5-1
Location Map for Common Noise
Environments, Receptors,
Build Contours and Barriers**

**Interstate 95 Express Lanes
Fredericksburg Extension Study
Noise Analysis**

VDOT Project No. 0095-969-739; UPC No. 110527

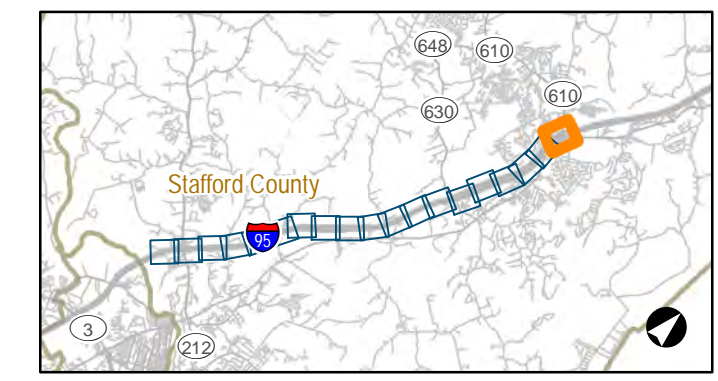
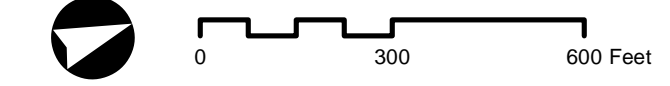


- Receiver Site and Number**
- Impacted and 5 or 6 dBA Insertion Loss
 - Impacted and 7 dBA or more Insertion Loss
 - Impacted but Not Benefited
 - Benefited but Not Impacted
 - Not Benefited or Impacted
- Top Floor Noise Prediction Result
 Bottom Floor Noise Prediction Result

Note: Grouped Receiver Labels are in order of Leader Occurrence.

- Noise Barriers**
- ▤ Feasible and Reasonable
 - ▤ Feasible and Not Reasonable - Most Reasonable
 - ▤ Feasible and Not Reasonable - Full Extent
 - ▤ Not Feasible
 - ▤ Future
 - ▤ Existing
 - ▲ M# Measurement Site
 - ▤ CNE Boundary
 - ▤ 66 dBA Noise Contour
 - ▤ 500' Noise Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



CNE SS - Common Noise Environment SS consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 NB, from Route 630 / Courthouse Road to Centreport Parkway. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 18 single-family residential receptors on Bishop Lane, Rehoboth Drive, Wyche Road, Buttercup Lane, Ellison Court, American Legion Road, and Nats Court Road.

CNE TT - Common Noise Environment TT consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 SB, from Route 630 / Courthouse Road to Enon Road south of Centreport Parkway. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 33 single-family residential receptors on Bowers Lane, Ramoth Church Road, Ravenwood Drive, Pine View Court, Old Enon Road, Pine View Drive, Bear Mountain Lane, Allison Drive, and Wyatt Lane.

CNE UU - Common Noise Environment UU consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 NB, from Centreport Parkway to Chichester Park, as well as the athletic fields at Chichester Park. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 28 single-family residential receptors on Beauregard Drive, Enon Road, and Stafford Indians Lane, as well as the exterior activity areas of Chichester Park.

CNE VV - Common Noise Environment VV consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 SB, from Enon Road to north of US 17 Business. Traffic noise levels were predicted for the Existing condition, Design-Year 2042 No-Build condition, and the Design-Year 2042 Build Alternative for four single-family residential receptors on Samuels Lane and Truslow Road.

CNE WW - Common Noise Environment WW consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 NB, from Truslow Road to north of US 17 Business. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for 25 single-family residential receptors on Truslow Road, Beagle Road, Old Falls Road, Virginia Avenue, Pitt Road, and Limerick Lane.

CNE XX - Common Noise Environment XX consists of residential land use adjacent to I-95 SB, from US 17 Business to the southern project limits. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition; and the Design-Year 2042 Build Alternative for four single-family residential receptors, one theater with no exterior areas of frequent human use, and one hotel pool on Simpson Road and Riverside Parkway.

CNE YY - Common Noise Environment YY consists of the noise-sensitive residential exterior areas of frequent human use adjacent to I-95 NB, from US 17 Business to the southern project limits. Traffic noise levels were predicted for the Existing condition; Design-Year 2042 No-Build condition and the Design-Year 2042 Build Alternative for 29 single-family residential receptors, and two hotel pools on US 17 Business /Warrenton Road, Musselman Road, and Krieger Lane.

5.4.2 Predicted Noise Levels

To fully characterize existing and future noise levels at all noise-sensitive land uses in the study area, many additional noise prediction receptors (also called “receivers” and “sites”) were modeled in the TNM in addition to the 30 measurement sites. Each of these receptors represented exterior noise-sensitive land use or the interiors of institutional land uses such as schools, places of worship, and assisted living facilities.

All noise levels predicted were the A-weighted equivalent sound level, or Leq, in dBA. Loudest-hour noise levels were predicted for the Existing 2016 and the Design-Year 2042 No-Build and Build Alternatives.

Table 5-4 presents ranges of the predicted sound levels at the receptors in each CNE for each alternative. Predicted interior sound levels are shown for Category D institutional land use. Since all of the noise-sensitive institutional facilities identified in the study area have air conditioning and masonry construction, an outside-to-inside noise reduction value of 25 decibels is used to determine the interior sound levels from the exterior sound levels predicted by TNM. **Appendix C** provides a table that lists the predicted sound levels at all of the receptors for each alternative. Each receptor is given an identifier with the CNE ID followed by a number. The receptor IDs are also displayed in **Figure 5-1**.

Figure 5-1 shows the location and predicted noise impact and barrier benefit status for all receptors in the Build Alternative in graphical form. For the receptors in **Figure 5-1** depicting impact, predicted 2042 Build noise levels would approach or exceed the NAC for the associated land use category. The NAC is 67 dBA Leq at all residential and recreational receptors, and 72 dBA Leq at commercial land uses. These receptor locations are shown with either a light blue, dark blue, or red dot indicating impact with 5 or 6 dBA insertion loss, impact with 7 dBA or more of insertion loss, and impact with less than 5 dBA of insertion loss from a noise barrier, respectively. Receptors represented by green dots are not predicted to be impacted by project noise but would be benefited and receive at least 5 dB of insertion loss from a barrier. The yellow dots indicate sites that would be neither impacted by highway traffic noise nor benefited by the proposed noise mitigation. Some of the receptor dots (in CNE RR only) have more than one section, representing upper- and lower-floor receptors at the same location on a building. Where there are up to four floors, the graphical dots show up to four sections. Traffic noise levels are generally higher at the upper floors of multi-story buildings than at the lower floors, due to reduced noise shielding by terrain and other buildings, and less noise-reduction benefit from the proximity of soft ground near the sound propagation path. Section 7 discusses the details of the barriers.

Overall, predicted exterior noise levels range from 34 to 77 dBA Leq at the receptors for the three alternatives. On average, No-Build sound levels are predicted to increase by approximately 0.5 decibels during the loudest hour of the day relative to the Existing levels. Predicted 2042 Build Alternative exterior Leqs are predicted to average about 1 to 1.5 decibels higher than the Existing levels. This increase is primarily due to the roadway improvements allowing slightly higher traffic volumes in the loudest-hour periods, and projected increases in heavy truck traffic.

A table in **Appendix C** presents the predicted sound levels for all receptors under all project alternatives.

Table 5-4: Ranges of Predicted Loudest-hour Leq Noise Levels by CNE

CNE ID	Area Land Use and Description	Ranges of Predicted Loudest-hour Leq Noise Levels, dBA		
		Existing	No-Build	Build
NN	Single-family residences on Cross Ridge Court, Stafford Glen Court, Tanglewood Lane, Whitsons Run, Cross Ridge Court, Barksdale Place, Fallsway Lane, Coldspring Drive, Fairfield Court, Ryan Way, Willingham Court, and Vine Place; and one hiking trail south of Whitsons Run adjacent to I-95 SB, south of Route 610 / Garrisonville Road to south of Whitson's Run	46 – 67	46 – 67	47 – 67
OO	Single-family residences on Brush Everard Court, Tavern Road, and Goal Court; and one hiking trail south of Tavern Road adjacent to I-95 SB, from Brush Everard Court to Tavern Road	37 – 71	38 – 72	39 – 72
PP	Single-family residences, playgrounds, residential community and hotel pools, places of worship with exterior areas of frequent human use, educational facilities, and daycare on US 1 / Jefferson Davis Highway), Bell Tower Court, Belladonna Lane, Green Bell Lane, Bells Ridge Drive, Bells Hill Road, Shannon Court, Galway Lane, Cork Street, Corin Way, and Daffodil Lane adjacent to I-95 NB, from south of Route 610 / Washington Drive to the residential neighborhood on Daffodil Lane	33 – 72	34 – 72	34 – 72
QQ	Anthony Burns Elementary School, single-family residences, and a hiking trail north of Banner Spring Circle adjacent to I-95 SB, from Anthony Burns Elementary School to north of Route 630 / Courthouse Road	39 – 72	39 – 72	40 – 72
RR	Multi-story, multi-family residences and community pool in the Ultris Courthouse Square community on Bass Drive, Chichester Drive, Cummings Drive, and Davenport Drive; and single-family residences on Appletree Lane, Beech Tree Court, and Willow Lane adjacent to I-95 NB, from Bass Drive to north of Route 630 / Courthouse Road	39 – 77	40 – 74	41 – 75

CNE ID	Area Land Use and Description	Ranges of Predicted Loudest-hour Leq Noise Levels, dBA		
		Existing	No-Build	Build
SS	Single-family residences on Bishop Lane, Rehoboth Drive, Wyche Road, Buttercup Lane, Ellison Court, American Legion Road, and Nats Court Road adjacent to I-95 NB, from Route 630 / Courthouse Road to Centreport Parkway	56 – 70	58 – 71	59 – 71
TT	Single-family residences on Bowers Lane, Ramoth Church Road, Ravenwood Drive, Pine View Drive, Pine View Court, Old Enon Road, Bear Mountain Lane, Allison Drive, and Wyatt Lane adjacent to I-95 SB, from Route 630 / Courthouse Road to Enon Road south of Centreport Parkway	44 – 68	45 – 69	46 – 68
UU	Single-family residences on Beauregard Drive, Enon Road, and Stafford Indians Lane; and Chichester Park athletic fields adjacent to I-95 NB, from Centreport Parkway to Chichester Park	49 – 66	51 – 67	51 – 68
VV	Single-family residences on Samuels Lane and Truslow Road adjacent to I-95 southbound from Enon Road to north of US 17 Business	69 – 71	70 – 72	70 – 72
WW	Single-family residences on Truslow Road, Beagle Road, Old Falls Road, Virginia Avenue, Pitt Road, and Limerick Lane adjacent to I-95 NB, from Truslow Road to north of US 17 Business	50 – 72	52 – 73	51 – 73
XX	Single-family residences, one theater with no exterior areas of frequent human use, and one hotel pool on Simpson Road and Riverside Parkway adjacent to I-95 SB, from US 17 Business to the southern project limits	44 – 68	42 – 71	43 – 71
YY	Hotel Pools on US 17 Business (Warrenton Road), and single-family residences on Musselman Road and Krieger Lane adjacent to I-95 NB, from US 17 Business to the southern project limits	55 – 76	58 – 77	58 – 76

6. NOISE IMPACT ASSESSMENT

The potential noise impact of the Fredericksburg Extension Study was assessed according to FHWA and VDOT noise assessment criteria and guidelines, described in detail in Section 3. In summary, noise impact would occur wherever noise levels are expected to approach within one decibel or exceed 67 dBA Leq at noise-sensitive land uses in Activity Categories B (residential) and C (recreational), and approach within one decibel or exceed 72 dBA Leq at noise-sensitive land uses in Activity Category E (outdoor commercial) during the loudest hour of the day. Noise impact also would occur wherever noise levels cause a substantial increase over existing noise levels—an increase of ten dB or more is considered substantial by VDOT. However, there are no impacts predicted due to substantial increases in existing noise levels for the Fredericksburg Extension Study.

Figure 5-1, the study area graphic presented in the previous section, shows the locations of individual receptors where noise impacts are predicted to occur in the Build Alternative. **Figure 5-1** also includes a noise impact contour for the Build Alternative without abatement in the residential and recreational areas (at the applicable NAC, Categories B and C of 67 dBA, which is represented by 66 dBA Leq for ground-floor receptors).

Table 6-1 presents a summary of the predicted noise impact for the 2016 Existing and 2042 No-Build and Build Alternatives. The impacts are summarized for the entire study area and separated by NAC-activity categories. All impact shown is where the NAC is predicted to be approached or exceeded. No impacts due to substantial increases in existing noise levels were identified in this study.

Table 6-1: Noise Impact Summary

Alternative	Impact Type	Land Use and NAC Activity Category				
		Residential Exterior (B)	Recreational Exterior (C)	Institutional Interior (D)	Commercial Exterior (E)	Total
Existing	NAC	130	21	0	0	151
No-Build	NAC	129	34	0	0	163
Build	NAC	153	37	0	0	190

Source: RK&K, 2017.

Overall, residential and recreational impacts are predicted to occur under the Build Alternatives. Existing alternative noise impacts are predicted to total 151. Design-Year 2042 No-Build condition traffic is predicted to create 163 total impacts. Receptors where noise levels exceed the NAC are predominantly residential dwelling units, but several recreational receptors exceed the NAC under all three project alternatives. A total of 190 impacted receptors are predicted for the Build Alternative, comprised of 153 residential dwelling units (Category B), and 37 receptors representing one school’s recreational areas and six other recreational receptors (Cat. C). No commercial (exterior, Cat. E) receptors and no institutional (interior, Cat. D) receptors are predicted to be impacted under any of the alternatives.

Table 6-2 summarizes the residential and recreational noise impacts by CNE. Residential impacts are predicted to occur along the project corridor wherever residential land use is adjacent to I-95. The color-coding of the receptors and the noise contour shown in **Figure 5-1** for the Build Alternative enables a quick visual determination of where the residential noise impacts are predicted. As mentioned in Section 5, traffic noise levels are generally higher at the upper floors of multi-story buildings than at the lower floors, so upper floors are more likely to be impacted.

A narrative description of the areas and land uses predicted to be impacted by noise follows **Table 6-2**.

Table 6-2: Noise Impact by Common Noise Environment

CNE ID	Area Land Use and Description	Residential Dwelling Units Impacted by Noise			Recreational Receptors Impacted by Noise		
		Existing	No-Build	Build	Existing	No-Build	Build
NN	Single-family residences on Cross Ridge Court, Stafford Glen Court, Tanglewood Lane, Whitsons Run, Cross Ridge Court, Barksdale Place, Fallsway Lane, Coldspring Drive, Fairfield Court, Ryan Way, Willingham Court, and Vine Place; and one hiking trail south of Whitsons Run adjacent to I-95 SB, south of Route 610 / Garrisonville Road to south of Whitson’s Run	3	3	3	1	3	2
OO	Single-family residences on Brush Everard Court, Tavern Road, and Goal Court; and one hiking trail south of Tavern Road adjacent to I-95 SB, from Brush Everard Court to Tavern Road	11	12	17	3	3	3
PP	Single-family residences, playgrounds, residential community and hotel pools, places of worship with exterior areas of frequent human use, educational facilities, and daycare on US 1 (Jefferson Davis Highway), Bell Tower Court, Belladonna Lane, Green Bell Lane, Bells Ridge Drive, Bells Hill Road, Shannon Court, Galway Lane, Cork Street, Corin Way, and Daffodil Lane adjacent to I-95 NB, from south of Route 610 / Washington Drive to the residential neighborhood on Daffodil Lane	43	49	61	2	2	2
QQ	Anthony Burns Elementary School; single-family residences; and a hiking trail north of Banner Spring Circle adjacent to I-95 SB, from Anthony Burns Elementary School to north of Route 630 / Courthouse Road	9	12	12	13	16	18

CNE ID	Area Land Use and Description	Residential Dwelling Units Impacted by Noise			Recreational Receptors Impacted by Noise		
		Existing	No-Build	Build	Existing	No-Build	Build
RR	Multi-story, multi-family residences and community pool in the Ultris Courthouse Square community on Bass Drive, Chichester Drive, Cummings Drive, and Davenport Drive; and single-family residences on Appletree Lane, Beech Tree Court, and Willow Lane adjacent to I-95 NB, from Bass Drive to north of Route 630 / Courthouse Road	38	22	25	0	0	0
SS	Single-family residences on Bishop Lane, Rehoboth Drive, Wyche Road, Buttercup Lane, Ellison Court, American Legion Road, and Nats Court Road adjacent to I-95 NB, from Route 630 / Courthouse Road to Centreport Parkway	7	7	8	0	0	0
TT	Single-family residences on Bowers Lane, Ramoth Church Road, Ravenwood Drive, Pine View Drive, Pine View Court, Old Enon Road, Bear Mountain Lane, Allison Drive, and Wyatt Lane adjacent to I-95 SB, from Route 630 / Courthouse Road to Enon Road south of Centreport Parkway	2	2	3	0	0	0
UU	Single-family residences on Beauregard Drive, Enon Road, and Stafford Indians Lane; and Chichester Park athletic fields adjacent to I-95 NB, from Centreport Parkway to Chichester Park	0	1	1	2	10	12
VV	Single-family residences on Samuels Lane and Truslow Road adjacent to I-95 SB from Enon Road to north of US 17 Business	4	4	4	0	0	0

CNE ID	Area Land Use and Description	Residential Dwelling Units Impacted by Noise			Recreational Receptors Impacted by Noise		
		Existing	No-Build	Build	Existing	No-Build	Build
WW	Single-family residences on Truslow Road, Beagle Road, Old Falls Road, Virginia Avenue, Pitt Road, and Limerick Lane adjacent to I-95 NB, from Truslow Road to north of US 17 Business	6	7	8	0	0	0
XX	Single-family residences, one theater with no exterior areas of frequent human use, and one hotel pool on Simpson Road and Riverside Parkway adjacent to I-95 SB, from US 17 Business to the southern project limits	2	4	4	0	0	0
YY	Hotel Pools on US 17 Business / Warrenton Road, and single-family residences on Musselman Road and Krieger Lane adjacent to I-95 NB, from US 17 Business to the southern project limits	5	6	7	0	0	0
Totals		130	129	153	21	34	37

Source: RK&K, 2017.

CNE NN – Barrier NN was evaluated under the Final Noise Analysis for the I-95 Southern Extension Express Lanes Project (UPC 108315); the barrier will be constructed under the UPC 108315 project. As such, the barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual. Barrier NN was found to be feasible and reasonable and no further modification for this barrier is required as part of this project. Due to existing Barrier NN, Existing traffic noise is predicted to impact three residences and one representative receptor on the hiking trail south of Whitsons Run; Design-Year 2042 No-Build traffic noise is predicted to impact three residences and three representative receptors on the hiking trail south of Whitsons Run; and Design-Year 2042 Build condition traffic noise is predicted to impact three residences and two representative receptors on the hiking trail south of Whitsons Run. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE NN, predicted Existing traffic noise levels range from 46 – 67 decibels (dB(A)); predicted Design-Year 2042 No-Build traffic noise levels range from 46 – 67 decibels (dB(A)); and predicted Design-Year 2042 Build condition traffic noise levels range from 47 – 67 decibels (dB(A)).

CNE OO - Existing traffic noise levels are predicted to impact 11 residences and one representative receptor on the hiking trail south of Tavern Road; Design-Year 2042 No-Build traffic noise levels are predicted to impact 12 residences and three representative receptors on the hiking trail south of Tavern

Road; and Design-Year 2042 Build condition traffic noise are predicted to impact 17 residences and three representative receptors on the hiking trail south of Tavern Road in CNE OO. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE OO, predicted Existing traffic noise levels range from 37 – 71 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 38 – 72 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 39 – 72 dBA.

CNE PP - Existing traffic noise levels are predicted to impact 43 residences, one residential community pool, and one residential community playground in CNE PP. Design-Year 2042 No-Build traffic noise levels are predicted to impact 49 residences, one residential community pool, and one residential community playground. Design-Year 2042 Build condition traffic noise levels are predicted to impact 61 residences, one residential community pool, and one residential community playground. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE PP, predicted Existing traffic noise levels range from 33 – 72 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 34 – 72 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 34 – 72 dBA.

CNE QQ - Existing traffic noise levels are predicted to impact nine residences, 13 representative receptors at Anthony Burns Elementary School, and the hiking trail north of Banner Spring Circle. Design-Year 2042 No-Build traffic noise levels are predicted to impact 12 residences, 16 representative receptors at Anthony Burns Elementary School; and the hiking trail north of Banner Spring Circle. Design-Year 2042 Build condition traffic noise levels are predicted to impact 12 residences; 18 representative receptors at Anthony Burns Elementary School; and the hiking trail north of Banner Spring Circle, north of the hiking trail in CNE QQ. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE QQ, predicted Existing traffic noise levels range from 39 – 72 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 39 – 72 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 40 – 72 dBA.

CNE RR - Existing traffic noise levels are predicted to impact 38 residences. Barrier C will be constructed in CNE RR prior to Design-Year 2042; the barrier was evaluated under the Route 630 Interchange Stafford County (UPC 13558), and will be constructed as part of the Route 630 project. Therefore, in the Design-Year No-Build and Build Alternatives, the barrier is considered to be constructed. As a result, predicted Design-Year 2042 traffic noise levels and number of impacts will generally be lower than in the Existing condition. Design-Year 2042 No-Build traffic noise levels are predicted to impact 22 residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact 25 residences in CNE RR. Since the Final Noise Study for the Route 630 Interchange Stafford County was completed, and the majority of the benefitted receptors voted in favor of the noise barrier, the barrier was evaluated as an existing noise barrier. Barrier C was found to be feasible and reasonable according to VDOT's noise abatement policies; therefore, construction of future Barrier C can continue as planned and no further evaluation or modification for this barrier is required as part of this project. None of the predicted traffic

noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE RR, predicted Existing traffic noise levels range from 39 – 77 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 40 – 74 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 41 – 75 dBA.

CNE SS - Existing traffic noise levels are predicted to impact seven residences. Design-Year 2042 No-Build traffic noise levels are predicted to impact seven residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact eight residences in CNE SS. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE SS, predicted Existing traffic noise levels range from 56 – 70 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 58 – 71 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 59 – 71 dBA.

CNE TT - There is an existing noise wall in CNE TT, adjacent to the on-ramp from Centreport Parkway to I-95 SB in the southwest quadrant of the interchange. Existing traffic noise levels are predicted to impact two residences. Design-Year 2042 No-Build traffic noise levels are predicted to impact two residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact three residences in CNE TT. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE TT, predicted Existing traffic noise levels range from 44 – 68 dBA; predicted Design-Year 2042 No-build traffic noise levels range from 45 – 69 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 46 – 68 dBA.

CNE UU - There is an existing noise wall in CNE UU, adjacent to I-95 NB at Beauregard Drive, beginning north of Enon Road and ending just south of the start of the off-ramp from I-95 NB to Centreport Parkway. Existing traffic noise levels are predicted to impact two representative receptors at Chichester Park. Design-Year 2042 No-Build traffic noise levels are predicted to impact one residence and ten representative receptors at Chichester Park. Design-Year 2042 Build condition traffic noise levels are predicted to impact one residence and 12 representative receptors at Chichester Park in CNE UU. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE UU, predicted Existing traffic noise levels range from 49 – 66 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 51 – 67 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 51 – 68 dBA.

CNE VV - Existing, Design-Year 2042 No-Build, and Design-Year 2042 Build condition traffic noise levels are all predicted to impact four residences in CNE VV. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE VV, predicted Existing traffic noise levels range from 69 – 71 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 70 – 72 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 70 – 72 dBA.

CNE WW - Existing traffic noise levels are predicted to impact six residences. Design-Year 2042 No-build traffic noise levels are predicted to impact seven residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact eight residences in CNE WW. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE WW, predicted Existing traffic noise levels range from 50 – 72 dBA; predicted Design-Year 2042 No-build traffic noise levels range from 52 – 73 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 51 – 73 dBA.

CNE XX - Existing traffic noise levels are predicted to impact two residences. Design-Year 2042 No-Build traffic noise levels are predicted to impact four residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact four residences in CNE XX. The Riverside Center for the Performing Arts has no exterior areas of frequent human use and was evaluated as a NAC D interior noise-sensitive land use. The smallest building reduction factor for masonry buildings of 25 decibels (25 dBA) was applied to predicted exterior traffic noise levels to provide the most conservative (loudest) estimation of interior noise levels from exterior traffic sources. At 43 decibels (43 dBA), predicted interior noise levels from exterior traffic sources do not approach or exceed the 51 decibel (51 dBA) NAC D impact criteria; therefore, traffic noise abatement is not warranted for the Riverside Center for the Performing Arts. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE XX, predicted Existing traffic noise levels range from 44 – 68 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 42 – 71 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 43 – 71 dBA.

CNE YY - Existing traffic noise levels are predicted to impact five residences. Design-Year 2042 No-build traffic noise levels are predicted to impact six residences. Design-Year 2042 Build condition traffic noise levels are predicted to impact seven residences in CNE YY. None of the predicted traffic noise impacts were due to a substantial increase in Design-Year 2042 Build condition alternative traffic noise levels over Existing traffic noise levels. All predicted traffic noise impacts are due to predicted traffic noise levels that approach or exceed NAC criteria levels. In CNE YY, predicted Existing traffic noise levels range from 55 – 76 dBA; predicted Design-Year 2042 No-Build traffic noise levels range from 58 – 77 dBA; and predicted Design-Year 2042 Build condition traffic noise levels range from 58 – 76 dBA.

6.1 SECTION 4(F) AND HISTORIC PROPERTIES EVALUATION

Section 4(f) refers to a provision of the Department of Transportation Act (DOT Act) of 1966 that prohibited FHWA and other DOT agencies from approving the use of certain environmental resources such as, historical sites, and publicly-owned lands for highway projects unless “there is no prudent and feasible alternative” and actions are taken to minimize harm to those properties. Use includes “constructive use,” which impacts a 4(f) resource such that the protected activities, features, and attributes would be substantially impaired, even if it does not involve physical use of the property.

Noise can be a Section 4(f) constructive use issue if predicted noise levels from a project in proximity to a Section 4(f) resource interfere with the use and enjoyment of a noise-sensitive facility or exterior activity associated with that resource. Examples of noise-sensitive activities that may invoke Section 4(f) protection include:

- Hearing performances at an outdoor amphitheater,
- Sleeping in the sleeping area of a campground,
- Enjoyment of a historic site where a quiet setting is a generally recognized feature or attribute of the site's significance,
- Enjoyment of an urban park where serenity and quiet are significant attributes, or
- Viewing wildlife in an area of a wildlife and waterfowl refuge intended for such viewing.

When these types of facilities and activities are present adjacent to a project, it is important that these facilities and activities be modeled so that FHWA can determine whether or not a Section 4(f) constructive use is going to occur because of noise increases on the project.

Noise-sensitive Section 4(f) resources are evaluated under the appropriate NAC activity category in 23 CFR 772 (usually Activity Category C). In order for FHWA to begin considering whether or not a highway traffic noise increase may constitute a constructive use under Section 4(f), there must be:

1. A future highway traffic noise level that approaches or exceeds 67 dBA, or
2. Existing noise levels which approach or exceed 67 dBA and a predicted increase with the future Build Alternative greater than 3 dBA or more above the predicted No-Build alternative noise level.

Two public land uses in the study corridor have been identified as 4(f) resources within the study corridor and with the potential for noise impact. Both are Socioeconomic Resources addressed as Activity Category C exterior uses. Predicted future noise levels for the Build Alternative have been modeled at the receptor nearest the project roadways for each of these resources. One resource is the Chichester Park ball fields. A baseball field is approximately 170 feet from the I-95 NB lanes. The predicted Build case Leq noise level at the closest point on this ball field to the highway is 67 dBA, at Receptor UU-060. The second resource is the athletic fields adjacent to the Anthony Burns Elementary School, which are within approximately 250 feet of I-95 SB lanes. The predicted Build case Leq noise level at the closest point on this field to the highway is 72 dBA, at Receptor QQ-024.

There is no additional impact predicted at 4(f) properties from the second criterion listed above, a 3 dB or more increase over the No-Build sound level. Also, properties that are so far away from the Build Alternatives that there is no potential for noise impact were not evaluated. The noise impact zone (defined by the 66 dBA noise contour shown in **Figure 5-1** for the Build Alternative extends up to 800 feet from the edge of I-95 in some areas of the project corridor.

7. NOISE ABATEMENT MEASURES

FHWA has identified certain noise abatement measures that may be incorporated in projects to reduce traffic noise impact. In general, mitigation measures can include alternative measures (traffic management, the alteration of horizontal and vertical alignment, and low-noise pavement), in addition to the construction of noise barriers.

7.1 ALTERNATIVE NOISE ABATEMENT MEASURES

VDOT guidelines recommend a variety of mitigation measures that should be considered in response to transportation-related noise impacts. While noise barriers and/or earth berms are generally the most effective form of noise mitigation, additional mitigation measures exist that have the potential to provide considerable noise reductions under certain circumstances. Mitigation measures considered for this project include:

- Traffic management measures,
- Alteration of horizontal and vertical alignments,
- Acoustical insulation of public-use and non-profit facilities,
- Acquisition of buffer land,
- Construction of earth berms, and
- Construction of noise barriers.

Traffic management measures normally considered for noise abatement include reduced speeds and truck restrictions. Reduced speeds would not be an effective noise mitigation measure alone since a substantial decrease in speed is necessary to provide a significant noise reduction. Typically, a 10 miles per hour (mph) reduction in speed will result in only a 2 dBA decrease in noise level, which is not considered a sufficient level of attenuation to be considered feasible. Further, a 2 dBA change in noise level is not considered to be generally perceptible. Restricting truck usage on I-95 is not practical since one of the primary purposes of this facility is to accommodate trucks. Diversion of truck traffic to other roadways would increase noise levels in heavily developed residential areas.

A significant alteration of the horizontal alignment of I-95 would be necessary to make such a measure effective in reducing noise, since a doubling of distance to the highway is usually needed to effect a 5-decibel reduction. However, such shifts would create undesirable impacts by increasing right-of-way acquisitions and relocations. Also, shifting the horizontal alignment is not practical since there are impacted receptors on both sides of the corridor throughout the study area. Shifting the alignment away from receptors on one side of the road would bring it closer to receptors on the other side of the road. Further alteration of the vertical alignment would not be feasible since the project involves minor modifications to an existing facility. Particularly given the complexity of the interchanges, raising or lowering the I-95 vertical alignment would result in significant environmental impacts to the surrounding environment and costly engineering challenges.

Acoustical Insulation of public-use and non-profit facilities applies only to public and institutional use buildings. Since no public use or institutional structures are anticipated to have interior noise levels exceeding FHWA's interior NAC, this noise abatement option will not be applied.

The purchase of property for the creation of a "buffer zone" to reduce noise impacts is only considered for predominantly unimproved properties because the amount of property required for this option to be effective would create significant additional impacts (e.g., in terms of residential displacements), which were determined to outweigh the benefits of land acquisition.

Berms are considered a more attractive alternative to noise walls where there is sufficient land and fill available for them. However, berms do not appear feasible for I-95 because they would greatly increase the cost and the footprint of the project by substantially increasing the amount of right-of-way required to accommodate the berms. Since all of the study corridor is densely developed, many costly and disruptive residential displacements necessarily would result from acquiring the needed right-of-way.

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise-reducing design and low-noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required. Consideration would be given to

these measures during the final design stage, where feasible. The response to this requirement from project management is included **Appendix E**.

7.2 NOISE BARRIERS

The only remaining abatement measure for consideration is the construction of noise barriers. The feasibility of noise barriers is evaluated for locations where noise impact is predicted to occur in the Build condition. Where the construction of noise barriers is found to be physically practical, barrier noise reduction is estimated based on roadway, barrier, and receiver geometry as described below.

To be constructed, any noise barriers identified in this document must satisfy VDOT's feasibility and reasonableness criteria. Therefore, the noise barrier design parameters and cost identified in this document are preliminary and should not be considered final. A final decision on the feasibility and reasonableness of noise barriers would be made during the noise barrier analysis conducted during the final design phase of the project after the project design is developed and traffic is updated. Also, the need for an analysis of reflected sound and the potential use of sound absorbing materials will be evaluated during this final design analysis. If a noise barrier is determined to be feasible and reasonable, the affected public would be given an opportunity to decide whether they are in favor of construction of the noise barrier. VDOT's formal policies for involving the public in noise abatement decisions are described in their Guidance Manual, in section 7.3.10.1 *Viewpoints of the benefited receptors*, section 12.3 *Affected Receptors/Community*, and section 12.4 *Voting Procedures*.

7.2.1 Feasibility and Reasonableness

FHWA and VDOT require that noise barriers be both "feasible" and "reasonable" to be recommended for construction.

To be feasible, a barrier must be effective – it must reduce noise levels at noise-sensitive locations by at least five decibels, thereby "benefiting" the property. VDOT requires that at least 50 percent of the impacted receptors receive five decibels or more of insertion loss from the proposed barrier for it to be feasible.

A second feasibility criterion is that it must be possible to design and construct the barrier. Factors that enter into constructability include safety, barrier height, topography, drainage, utilities, maintenance of the barrier, and access to adjacent properties. VDOT has a maximum allowable height of 30 feet for noise barriers.

Barrier reasonableness is based on three factors: cost-effectiveness, ability to achieve VDOT's insertion loss design goal, and views of the benefited receptors. To be "cost-effective," a barrier cannot require more than 1600 square feet per benefited receptor. VDOT's maximum barrier height of 30 feet figures into the assessment of benefited receptors. Where multi-family housing includes balconies at elevations above 30 feet, these receptors are not assessed and included in the determination of a barrier's feasibility or reasonableness.

The second reasonableness criterion is VDOT's noise reduction design goal of seven decibels. This goal must be achieved for at least one of the impacted receptors, for the barrier to be considered reasonable.

The third reasonableness criterion relates to the views of the owners and residents of the potentially benefited properties. A majority of the benefited receptors must favor the barrier for it to be considered reasonable to construct. Community views would be surveyed in the final design phase of projects.

Section 7.3, Noise Abatement Determination in VDOT's Guidance Manual discusses the maximum height that VDOT considers for building noise barriers. VDOT has found that costs increase substantially for noise barriers that are taller than 30 feet, so they have established 30 feet as a maximum statewide. Further, VDOT has established a policy to ensure equitable evaluations of the Feasibility and Reasonableness of noise barriers that would benefit multistory residential building units with individual outdoor usage such as balconies and patios. This policy requires the noise analyst to draw a horizontal line from the top of a 30-foot tall noise barrier perpendicular to the highway to the multi-story building. Where the line meets the building is called the "point of intersection." This also can be thought of as the elevation of a 30-foot barrier opposite the building. Only noise-sensitive sites that meet or are below the point of intersection may be considered in the feasibility and reasonableness determinations.

7.2.2 Existing and Future Barriers to Remain in Place

One significant noise barrier exists for CNE NN, and another one will be constructed for the impacts in CNE RR prior to Design-Year 2042. Barrier C was designed in a previous study for CNE RR and is treated in this report as a future barrier that will exist in 2042. Both barriers were evaluated in the current study to determine if they meet VDOT's feasibility and reasonableness criteria. Details of each of these barriers are given in **Table 7-1** and described in the following narratives. Each of the barriers is also shown in **Figure 5-1** as a solid line.

CNE NN consists of the noise-sensitive residential exterior areas of frequent human use and one hiking trail adjacent to I-95 southbound south of Route 610 / Garrisonville Road to the overhead electrical transmission line easement south of Whitson's Run. **Barrier NN was evaluated under the Final Noise Analysis for the I-95 Southern Extension Express Lanes Project (UPC 108315); the barrier will be constructed under the UPC 108315 project. As such, the barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual. Barrier NN was found to be feasible and reasonable and no further modification for this barrier is required as part of this project.** At an area of 62,930 square feet, a length of 4,033 feet, 12 to 19 feet in height with an average height of 15.6 feet, existing Barrier NN would benefit 92 receptors in the Design-Year 2042 Build condition alternative, at an average of 684 square feet per benefit. Barrier NN would benefit 31 of 35 impacted receptors (89 percent) with five to 11 decibels of noise level reduction, as well as 61 additional non-impacted receptors with five to eight decibels of noise reduction. Including 28 impacted and benefited receptors, 37 benefited receptors would receive at least a seven dBA noise level reduction. Barrier NN meets VDOT's 1,600 square feet per benefit reasonableness criterion; therefore, further evaluation of existing Barrier NN in conjunction with this project is not required.

CNE RR consists of the noise-sensitive residential exterior areas of frequent human use and one community pool adjacent to I-95 NB from Bass Drive to north of Route 630 / Courthouse Road. **Barrier C was evaluated under the Final Noise Analysis for the Route 630 Interchange Stafford County (UPC 13558); the barrier will be constructed under the Route 630 Interchange Stafford County. As such, the barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual. Barrier C was found to be feasible and reasonable and no further modification for this barrier is required as part of this project.** At an area of 38,131 square feet, nine to 29 feet in height with an average height of 16.5 feet, future Barrier C would benefit 36 receptors in CNE RR in the Design Year 2042 Build condition alternative at an average of 1,059 square feet per benefit. Barrier C would benefit 21 of 42 impacted receptors (50 percent) with five to 13 decibels of noise level reduction, as well as 15 additional non-impacted receptors with five to 11 decibels of noise reduction. Including 7 impacted and benefited receptors, 17 benefited receptors would receive at least a seven dBA noise level reduction.

Barrier C meets VDOT's 1,600 square feet per benefit reasonableness criterion; therefore, further evaluation of future Barrier C in conjunction with this project is not required.

CNE UU includes residential exterior areas adjacent to I-95 NB, from Centreport Parkway to Chichester Park, as well as the athletic fields at Chichester Park. There is a small existing noise wall in CNE UU, where Existing Barrier UU1 was evaluated, adjacent to I-95 NB at Beauregard Drive, beginning north of Enon Road and ending just south of the start of the off-ramp from I-95 NB to Centreport Parkway. The barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual. With existing Barrier UU1 modeled in the build condition, no noise impacts were identified for noise sensitive receptors behind the existing barrier. Therefore, per VDOT Policy, no further action is required.

7.2.3 Details of Potential and Replacement Feasible Barriers

Details of each of the evaluated barriers are given in **Table 7-1** and described in narratives following the table. Each of the barriers is also shown in **Figure 5-1** as a solid line. The color of the line indicates whether it would be reasonable and feasible (red) or feasible and not reasonable (light blue); no barriers were found to be not feasible in this study. **Appendix F** presents the preliminary Warranted, Feasible, and Reasonable Worksheets for all barriers. The table of predicted sound levels for all receivers in **Appendix C** includes the computed noise levels with the evaluated barriers and the computed barrier insertion loss values. Whether each receiver is below the point of intersection is also indicated in the table.

The potential barriers evaluated and shown in the graphics have not been intentionally placed outside of VDOT's right-of-way. While the need for right-of-way to construct some barriers for this project is not anticipated, it also cannot be precluded in the future, given the limited information available for this noise analysis. Final placement of barriers and determination of additional right-of-way needed will occur during the project's final design phase.

CNE OO consists of the noise-sensitive residential exterior areas of frequent human use and one hiking trail adjacent to I-95 SB, south of the overhead electrical transmission line easement north of Brush Everard Court to Tavern Road. Beginning with an initial length of 4,900 feet at a maximum height of 30 feet, Barrier OO was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts to the six Brush Everard Court residences, 11 Tavern Road residences, and the hiking trail south of Tavern Road. Brush Everard Court is elevated approximately 70 to 100 feet above I-95 SB, and the I-95 right-of-way is more than halfway down the slope between the neighborhood and the roadway. In the vicinity of Brush Everard Court, Barrier OO was evaluated with a horizontal alignment along the I-95 SB edge of pavement, and also with a horizontal alignment along the existing I-95 right-of-way. For both potential Barrier OO horizontal alignments, a maximum 30 feet tall Barrier OO would not provide at least a five dBA noise level reduction to meet VDOT's acoustical feasibility criterion for any predicted impacts on Brush Everard Court. The Tavern Road residences closest to I-95 SB are elevated approximately ten to 25 feet above the roadway, with a vertical depression between the roadway and the neighborhood. The optimal Barrier OO horizontal alignment in the vicinity of Tavern Road would be along the I-95 southbound outside edge of pavement. Numerous configurations of Barrier OO were evaluated to determine if Barrier OO could potentially meet VDOT feasibility and reasonableness criteria. At 1,410 feet in length and an area of 38,883 square feet, 14 to 30 feet in height with an average height of 27.6 feet, the optimized Barrier OO to maximize benefits while minimizing cost would benefit 20 residences on Tavern Road and six impacted representative receptors on the trail south of Tavern Road in the Design-Year 2042 Build condition alternative, at an average of 1,496 square feet per benefit. Barrier OO would

benefit 14 of 20 (70 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with seven to 11 decibels of noise level reduction, as well as 12 additional non-impacted receptors with five to nine decibels of noise reduction. Eighteen benefited receptors and at least one impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier OO would meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE PP includes noise-sensitive residential exterior areas, playgrounds, pools, places of worship, educational facilities, and daycare adjacent to I-95 NB, from south of Route 610 / Washington Drive to the residential neighborhood on Daffodil Lane. Beginning with an initial length of 6,900 feet at a maximum height of 30 feet, Barrier PP was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts. The noise-sensitive receptors closest to I-95 NB in CNE PP are elevated approximately 20 to 60 feet above the roadway, with a vertical depression between the roadway and the neighborhoods. The optimal Barrier PP horizontal alignment would be along the I-95 NB outside edge of pavement. Numerous configurations of Barrier PP were evaluated to determine if Barrier PP could potentially meet VDOT feasibility and reasonableness criteria. At 6,100 feet in length, an area of 207,006 square feet, and 12 to 30 feet in height with an average height of 26.6 feet, the optimized Barrier PP to maximize benefits while minimizing cost would benefit 101 residences, one residential community pool, and one residential community playground in the Design-Year 2042 Build condition alternative, at an average of 1,573 square feet per benefit. Barrier PP would benefit 56 of 63 (89 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with 5 to 11 decibels of noise level reduction, as well as 47 additional non-impacted receptors with 5 to 11 decibels of noise reduction. Including 32 impacted and benefited receptors, 53 benefited receptors would receive at least a seven dBA noise level reduction. Potential Barrier PP would meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE QQ consists of the noise-sensitive residential exterior areas of frequent human use, school, and hiking trail adjacent to I-95 SB, from Anthony Burns Elementary School to north of Route 630 / Courthouse Road. Beginning with an initial length of 5,400 feet at a maximum height of 30 feet, Barrier QQ was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts to ten Banner Spring Circle residences, two Echols Lane residences, the exterior use areas of the Anthony Burns Elementary School, and the hiking trail east and north of Banner Spring Circle. The Anthony Burns Elementary School property is elevated approximately 40 to 50 feet above I-95 SB. The school building and the northern activity field are shielded by a cut-section slope; however, the playgrounds and athletic field south of the school building have an exposed elevated line-of-sight to I-95 SB. Banner Spring Circle is elevated approximately 50 to 65 feet above I-95, with a vertical depression between the roadway and the neighborhood. The optimal Barrier QQ horizontal alignment would be at the top of the cut-slope east of Anthony Burns Elementary School, transitioning to the I-95 SB outside edge of pavement along the ridge of the cut slope, and remain along the I-95 SB outside edge of pavement adjacent to Banner Spring Circle and Echols Lane. Numerous configurations of Barrier QQ were evaluated to determine if Barrier QQ could potentially meet VDOT feasibility and reasonableness criteria. A maximum height 30-foot tall barrier would provide at least a five dBA noise level reduction for only 12 of 30 impacted receptors and representative receptor locations; therefore, Barrier QQ would not meet VDOT's feasibility criterion for the entirety of CNE QQ that 50 percent of all impacts must be benefited.

Table 7-1: Details of Potential and Replacement Noise Barriers

Barrier ID and Type (E/F/R/P) ¹	Barrier Data						Total Number of Impacted Receptors ²	Impacted and Benefited Receptors	Non-Impacted and Benefited Receptors	Total Benefited Receptors	Barrier Surface Area per Benefited Receptor (SF/BR) ^{1,3}	Barrier Status ⁴
	Noise Reduction (dBA)		Length (ft)	Height Range (ft)	Surface Area (sq ft) ¹	Cost at \$42/sq ft						
	Range	Avg.										
C – F (CNE RR)	5 – 13	7.0	2,304	9 – 29	38,131	N/A	42	21	15	36	1,059	F & R
NN- E	5 – 11	6.4	4,033	12 – 19	62,930	N/A	38	31	61	92	684	F & R
OO – P	5 - 11	7.9	1,410	14 - 30	38,883	\$1,633,086	20	14	12	26	1,496	F & R
PP – P	5 - 11	7.1	6,100	12 - 30	162,003	\$6,804,126	63	56	47	103	1,573	F & R
QQ – P	5 – 10	7.9	5,461	30	163,833	\$6,880,986	30	12	9	21	N/A	NF
SS1 – P	6 – 7	6.4	600	10	6,001	\$252,042	1	1	1	2	3,001	F & NR
SS2 – P	5 – 9	5.9	1,300	20 - 22	27,404	\$1,150,968	4	3	7	10	2,740	F & NR
SS3 – P	5 - 7	5.8	500	12	5,998	\$251,916	3	3	0	3	1,999	F & NR
TT1 – P	7	6.5	1,400	30	42,006	\$1,764,252	1	1	0	1	42,006	F & NR
TT2 – P	5 – 7	5.5	584	12	7,011	\$294,462	1	1	1	2	3,506	F & NR
TT3 – R	5 – 7	6.0	1,107	10 – 18	T: 17,349 N: 16,535	T:\$728,658 N:\$694,470	2	2	0	2	T: 8,675 N: 8,268	F & NR
UU2 – P	5 – 7	5.4	2,500	10 – 16	38,396	\$1,612,632	13	12	12	24	1,600	F & R
VV – P	5 – 7	5.3	2,723	10 – 14	30,705	\$1,289,610	4	4	0	4	7,676	F & NR
WW1 – P	5 – 7	5.5	1,134	10 – 24	22,029	\$925,218	2	1	1	2	11,015	F & NR
WW2 – P	5 – 7	5.8	2,924	18 – 22	57,975	\$2,434,950	6	6	4	10	5,798	F & NR

Barrier ID and Type (E/F/R/P) ¹	Barrier Data						Total Number of Impacted Receptors ²	Impacted and Benefited Receptors	Non-Impacted and Benefited Receptors	Total Benefited Receptors	Barrier Surface Area per Benefited Receptor (SF/BR) ^{1,3}	Barrier Status ⁴
	Noise Reduction (dBA)		Length (ft)	Height Range (ft)	Surface Area (sq ft) ¹	Cost at \$42/sq ft						
	Range	Avg.										
XX1 – P	7	6.5	501	14 – 18	8,004	\$336,168	1	1	0	1	8,004	F & NR
XX2 – P	6 – 7	6.2	425	10	4,252	\$178,584	3	2	0	2	2,126	F & NR
YY – P	5 – 15	7.0	1,314	10 – 22	22,437	\$942,354	7	7	0	7	3,205	F & NR

Notes: 1. Barrier type E is Existing, F is Future, R is Replacement, type P is Potential. Replacement barriers show T = Total surface area and SF/BR, and N = Net surface area and SF/BR, which excludes the existing barrier surface area

2. Total number of impacted receptors first lists those below the point of intersection with a 30-ft tall noise barrier that are eligible to be counted as benefited. The second number in parentheses is the total number of impacted receptors behind the barrier, regardless of elevation.

3. Where SF/BR exceeds VDOT's maximum of 1600, a barrier would not be considered cost-reasonable

4. Barrier Status: F & R – Feasible and Reasonable; F & NR – Feasible and Not Reasonable; NF – Not Feasible.

Source: RK&K, 2017

CNE SS includes residential exterior areas adjacent to I-95 NB, from Route 630 / Courthouse Road to Centreport Parkway. Barriers in CNE SS were evaluated in three areas. Beginning with an initial length of 1,899 feet at a maximum height of 30 feet, Barrier SS1 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impact on Rehoboth Drive. Numerous configurations of Barrier SS1 were evaluated to determine if Barrier SS1 could potentially meet VDOT's feasibility and reasonableness criteria. At 600 feet in length, an area of 6,001 square feet, and a consistent 10 feet in height, the optimized Barrier SS1 to maximize benefits while minimizing cost would benefit two residences in the Design-Year 2042 Build condition alternative, at an average of 3,001 square feet per benefit. Barrier SS1 would benefit one of one (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts, with seven decibels of noise level reduction, as well as one additional non-impacted receptor with six decibels of noise reduction. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier SS1 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Beginning with an initial length of 3,300 feet at a maximum height of 30 feet, Barrier SS2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Buttercup Lane, Ellison Court, and American Legion Road. Numerous configurations of Barrier SS2 were evaluated to determine if Barrier SS2 could potentially meet VDOT's feasibility and reasonableness criteria. At 1,300 feet in length, an area of 27,404 square feet, and 20 to 22 feet in height with an average height of 21.1 feet, the optimized Barrier SS2 to maximize benefits while minimizing cost would benefit 10 residences in the Design-Year-2042 Build condition alternative, at an average of 2,740 square feet per benefit. Barrier SS2 would benefit three of four (75 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts, with six to nine decibels of noise level reduction, as well as seven additional non-impacted receptors with five to seven decibels of noise reduction. Three benefited receptors, including two impacted and benefited receptors, would receive at least a seven dBA noise level reduction. Potential Barrier SS2 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Beginning with a maximum length of 1,900 feet at a maximum height of 30 feet, Noise Wall SS3 was evaluated as a potential noise abatement measure for the benefit of predicted Design Year 2042 Build condition alternative impacts on Nats Court Road. Numerous configurations of Noise Wall SS3 were evaluated to determine if Noise Wall SS3 could potentially meet VDOT feasibility and reasonableness criteria. At 500 feet in length and an area of 5,998 square feet, a consistent 12 feet in height, the optimal configuration of Noise Wall SS3 would benefit three residences in the Design Year 2042 Build condition alternative, at an average of 1,999 square feet per benefit. Noise Wall SS3 would benefit three of three (100%) of the predicted Design Year 2042 Build condition traffic noise impacts, with 5 to 7 decibels of noise level reduction, and zero additional non-impacted receptors. One impacted and benefited receptor would receive at least a seven decibel (7 dB(A)) noise level reduction. Potential Noise Wall SS3 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE TT consists of the residential exterior areas adjacent to I-95 SB, from Route 630 / Courthouse Road to Enon Road south of Centreport Parkway. Barriers for CNE TT were evaluated in three areas. Beginning with an initial length of 2,600 feet at a maximum height of 30 feet, Barrier TT1 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impact on Bowers Lane. Numerous configurations of Barrier TT1 were evaluated to determine if Barrier TT1 could potentially meet VDOT's feasibility and reasonableness criteria. At 1,400 feet in length, an area of 42,006 square feet, and 30 feet in height, the optimized Barrier TT1 to maximize benefits while minimizing cost would benefit one residence in the Design-Year 2042 Build condition alternative, at an average of 42,006 square feet per benefit. Barrier TT1 would benefit one of

one (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts, with seven decibels of noise level reduction, and zero additional non-impacted receptors. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier TT1 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Beginning with an initial length of 1,069 feet at a maximum height of 30 feet, Barrier TT2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impact on Old Enon Road. Numerous configurations of Barrier TT2 were evaluated to determine if Barrier TT2 could potentially meet VDOT's feasibility and reasonableness criteria. At 584 feet in length, an area of 7,011 square feet, and a consistent 12 feet in height, the optimized Barrier TT2 to maximize benefits while minimizing cost would benefit two residences in the Design-Year 2042 Build condition alternative, at an average of 3,506 square feet per benefit. Barrier TT2 would benefit one of one (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impact with seven decibels of noise level reduction, as well as one additional non-impacted receptor with five decibels of noise reduction. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier TT2 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

There is a small existing noise wall in CNE TT, where TT3 was evaluated, adjacent to the on-ramp from Centreport Parkway to I-95 SB in the southwest quadrant of the interchange. The barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual. The wall has a length of approximately 638 feet and an area of approximately 10,515 square feet, and the existing barrier provides a six dBA noise level reduction benefit to one residence. At 10,515 square feet per benefit the existing barrier does not meet VDOT's 1,600 square feet per benefit reasonableness criterion, and does not meet VDOT's minimum design goal requirement of at least a seven dBA noise level reduction for at least one impacted receptor. Since the existing noise barrier was shown to be feasible but not reasonable, a new replacement barrier was evaluated.

Beginning with an initial length of 1,537 feet at a maximum height of 30 feet, replacement Barrier TT3 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Ravenwood Drive and Pine View Court. Numerous configurations of Barrier TT3 were evaluated to determine if Barrier TT3 could potentially meet VDOT's feasibility and reasonableness criteria. At 1,107 feet in length, an area of 16,535 square feet, and ten to 18 feet in height with an average height of 14.9 feet, plus an additional 814 square feet to account for the demolition cost² of the existing barrier, the optimized Barrier TT3 to maximize benefits while minimizing cost would benefit two residences in the Design-Year 2042 Build condition alternative, at an average of 8,675 square feet per benefit. Barrier TT3 would benefit 2 of 2 (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with five to seven decibels of noise level reduction, and zero non-impacted receptors. Two benefited receptors, including one impacted and benefited receptor, would receive at least a seven dBA noise level reduction. Potential Barrier TT3 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion. Since the replacement barrier does not meet VDOT's reasonable criteria, the existing noise barrier would remain with no modifications.

CNE UU includes residential exterior areas adjacent to I-95 NB, from Centreport Parkway to Chichester Park, as well as the athletic fields at Chichester Park. Barriers in CNE UU were evaluated in two locations.

² The additional 814 square feet area added to Barrier TT3 to account for the cost of the existing barrier demolition was calculated per §7.3.10.2 of VDOT Highway Traffic Noise Impact Analysis Guidance Manual (Version 7) for concrete noise walls as $\$3.25 \text{ per SF Demolition} \div \$42 \text{ per square foot cost} = 0.0774 \text{ Demolition Factor} \times 10,515 \text{ square feet of noise wall to be demolished} = 814 \text{ square feet}$.

There is a small existing noise wall in CNE UU, where Barrier UU1 was evaluated, adjacent to I-95 NB at Beauregard Drive, beginning north of Enon Road and ending just south of the start of the off-ramp from I-95 NB to Centreport Parkway. The barrier was evaluated as an existing noise barrier as outlined in the VDOT Noise Guidance Manual, and will remain in place.

Beginning with an initial length of 3,900 feet at a maximum height of 30 feet, Barrier UU2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impact to Chichester Park. Numerous configurations of Barrier UU2 were evaluated to determine if Barrier UU2 could potentially meet VDOT's feasibility and reasonableness criteria. At 2,500 feet in length, an area of 38,396 square feet, and ten to 16 feet in height with an average height of 15.4 feet, the optimized Barrier UU2 to maximize benefits while minimizing cost would benefit 12 impacted representative receptor locations in the Design-Year 2042 Build condition alternative, at an average of 3,200 square feet per benefit. Barrier UU2 would benefit 12 of 13 (92 percent) of the predicted Design-Year 2042 Build condition traffic noise impacted representative receptor locations with five to seven decibels of noise level reduction, as well as 12 additional non-impacted receptors. Two impacted and benefited representative receptor locations would receive at least a seven dBA noise level reduction. Potential Barrier UU2 would meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE VV consists of residential exterior areas adjacent to I-95 SB from Enon Road to north of US 17 Business. Beginning with an initial length of 3,900 feet at a maximum height of 30 feet, Barrier VV was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Samuels Lane and Truslow Road. Numerous configurations of Barrier VV were evaluated to determine if Barrier VV could potentially meet VDOT's feasibility and reasonableness criteria. At 2,723 feet in length, an area of 30,705 square feet, and ten to 14 feet in height with an average height of 11.3 feet, the optimized Barrier VV to maximize benefits while minimizing cost would benefit four residences in the Design-Year 2042 Build condition alternative, at an average of 7,676 square feet per benefit. Barrier VV would benefit four of four (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with five to seven decibels of noise level reduction, and zero additional non-impacted receptors. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier VV would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE WW includes residential exterior areas adjacent to I-95 NB, from Truslow Road to north of US 17 Business. Barriers for CNE WW were evaluated in two locations. Beginning with an initial length of 1,734 feet at a maximum height of 30 feet, Barrier WW1 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Truslow Road. Numerous configurations of Barrier WW1 were evaluated to determine if Barrier WW1 could potentially meet VDOT's feasibility and reasonableness criteria. At 1,134 feet in length, an area of 22,029 square feet, and ten to 24 feet in height with an average height of 19.4 feet, the optimized Barrier WW1 to maximize benefits while minimizing cost would benefit two residences in the Design-Year 2042 Build condition alternative, at an average of 11,015 square feet per benefit. Barrier WW1 would benefit one of two (50 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with seven decibels of noise level reduction, as well as one additional non-impacted receptors with five decibels of noise reduction. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier WW1 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Beginning with an initial length of 3,762 feet at a maximum height of 30 feet, Barrier WW2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Beagle Road, Old Falls Road, Pitt Road, and Limerick Lane. Numerous

configurations of Barrier WW2 were evaluated to determine if Barrier WW2 could potentially meet VDOT's feasibility and reasonableness criteria. At 2,924 feet in length, an area of 57,975 square feet, and 18 to 22 feet in height with an average height of 19.8 feet, the optimized Barrier WW2 to maximize benefits while minimizing cost would benefit ten residences in the Design-Year 2042 Build condition alternative, at an average of 5,798 square feet per benefit. Barrier WW2 would benefit six of six (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with five to seven decibels of noise level reduction, as well as four additional non-impacted receptors with five to six decibels of noise reduction. Three impacted and benefited receptors would receive at least a seven dBA noise level reduction. Potential Barrier WW2 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Due to the distance between the predicted CNE WW impacts to 8 Beagle Road and 69 Old Falls Road, an alternate WW2 configuration was evaluated discarding consideration for benefiting the two predicted impacts to the residences on Beagle Road. Beginning with an initial length of 3,762 feet at a maximum height of 30 feet, Barrier WW2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Old Falls Road, Pitt Road, and Limerick Lane. At 1,639 feet in length, an area of 34,779 square feet, and 16 to 24 feet in height with an average height of 21.2 feet, the optimized shorter-length Barrier WW2 to maximize benefits while minimizing cost would benefit six residences in the Design-Year 2042 Build condition alternative, at an average of 5,797 square feet per benefit. Barrier WW2 would benefit four of six (67 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with six to seven decibels of noise level reduction, as well as two additional non-impacted receptors with five to six decibels of noise reduction. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier WW2 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE XX consists of residential land use adjacent to I-95 SB, from US 17 Business to the southern project limits. Barriers were evaluated in two locations in CNE XX. Beginning with an initial length of 1,095 feet at a maximum height of 30 feet, Barrier XX1 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impact on Simpson Road. Numerous configurations of Barrier XX1 were evaluated to determine if Barrier XX1 could potentially meet VDOT's feasibility and reasonableness criteria. At 501 feet in length, an area of 8,004 square feet, and 14 to 18 feet in height with an average height of 16.0 feet, the optimized Barrier XX1 to maximize benefits while minimizing cost would benefit one residence in the Design-Year 2042 Build condition alternative, at an average of 8,004 square feet per benefit. Barrier XX1 would benefit one of one (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with seven decibels of noise level reduction, and no additional non-impacted receptors. One impacted and benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier XX1 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

Beginning with a maximum length of 1,746 feet at a maximum height of 30 feet, Barrier XX2 was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Riverside Parkway. Numerous configurations of Barrier XX2 were evaluated to determine if Barrier XX2 could potentially meet VDOT's feasibility and reasonableness criteria. At 425 feet in length, an area of 4,252 square feet, and a consistent ten feet in height, the optimal configuration of Barrier XX2 would benefit two residences in the Design-Year 2042 Build condition alternative, at an average of 2,126 square feet per benefit. Barrier XX2 would benefit two of three (67 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with six to seven decibels of noise level reduction, and no additional non-impacted receptors. One impacted and

benefited receptor would receive at least a seven dBA noise level reduction. Potential Barrier XX2 would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

CNE YY consists of residential land use adjacent to I-95 NB, from US 17 Business to the southern project limits. Beginning with an input length of 2,727 feet at a maximum height of 30 feet, Barrier YY was evaluated as a potential noise abatement measure for the benefit of predicted Design-Year 2042 Build condition alternative impacts on Musselman Road and Krieger Lane. Numerous configurations of Barrier YY were evaluated to determine if Barrier YY could potentially meet VDOT's feasibility and reasonableness criteria. At 1,314 feet in length, an area of 22,437 square feet, and ten to 22 feet in height with an average height of 17.1 feet, the optimized Barrier YY to maximize benefits while minimizing cost would benefit seven residences in the Design-Year 2042 Build condition alternative, at an average of 3,205 square feet per benefit. Barrier YY would benefit seven of seven (100 percent) of the predicted Design-Year 2042 Build condition traffic noise impacts with five to 15 decibels of noise level reduction, and zero additional non-impacted receptors. Two impacted and benefited receptors would receive at least a seven dBA noise level reduction. Potential Barrier YY would not meet VDOT's 1,600 square feet per benefit reasonableness criterion.

8. CONSTRUCTION NOISE CONSIDERATION

Construction noise provisions are contained in the 2007 VDOT Road and Bridge Specifications, Section 107.16(b)3, Noise. The specifications have been reproduced below:

- The Contractor's operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels. Such noise level measurements shall be taken at a point on the perimeter of the construction limit that is closest to the adjoining property on which a noise-sensitive activity is occurring. A noise-sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose and not present an unreasonable public nuisance. Such activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.
- The Department may monitor construction-related noise. If construction noise levels exceed 80 decibels during noise-sensitive activities, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.
- The Department may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 PM and 6 AM. If other hours are established by local ordinance, the local ordinance shall govern.
- Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.
- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.
- These requirements shall not be applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.

9. INFORMATION FOR LOCAL GOVERNMENT OFFICIALS

FHWA and VDOT policies require that VDOT provides certain information to local officials within whose jurisdiction the highway project is located, to minimize future traffic noise impacts of Type I projects on currently undeveloped lands. (Type I projects involve highway improvements with noise analysis.) This information must include information on noise-compatible land-use planning, noise impact zones in undeveloped land in the highway project corridor, and federal participation in Type II projects (noise abatement only). This section of the report provides that information, as well as information about VDOT's noise abatement program.

9.1 NOISE-COMPATIBLE LAND-USE PLANNING

Section 9.0 of VDOT's 2011 noise policy outlines VDOT's approach to communication with local officials and provides information and resources on highway noise and noise-compatible land-use planning. VDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize the potential impacts of highway traffic noise. **Figure 5-1** includes a noise contour that depicts the zone where noise impact would occur adjacent to the highway under the 2042 Build Alternative for exterior first-floor residential and recreational land uses.

Entering the Quiet Zone is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. A link to this brochure on FHWA's website is provided:

http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/qz00.cfm

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures such as noise barriers in future years. There are five broad categories of such strategies:

- Zoning,
- Other legal restrictions (subdivision control, building codes, health codes),
- Municipal ownership or control of the land,
- Financial incentives for compatible development, and
- Educational and advisory services.

The Audible Landscape: A Manual for Highway and Land Use is a very well-written and comprehensive guide addressing these noise-compatible land-use planning strategies, with significant detailed information. This document is available through FHWA's Website, at http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/al00.cfm

9.2 VDOT'S NOISE ABATEMENT PROGRAM

Information on VDOT's noise program is provided in *Highway Traffic Noise Impact Analysis Guidance Manual* (Version 7), updated July 14, 2015. This document is available from VDOT's Noise Abatement Section, Virginia Department of Transportation, 1401 E. Broad St., Richmond, VA 23219 and at http://www.virginia.gov/projects/resources/noisewalls/Highway_Traffic_Noise_impact_Analysis_Guidance_Manual.pdf.

10. REFERENCES

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APPENDIX A:
List of Preparers

LIST OF PREPARERS

This appendix lists the preparers of this Noise Analysis Technical Report.

Preparers with RK&K are as follows:

- Joseph Rauseo, noise measurements, analysis, and reporting (TNM certification attached to this appendix)
- Kevin Hughes, noise analysis (TNM certification attached to this appendix)
- David Ward, GIS support, noise analysis
- William Parrish, GIS support
- Angel Guzman, noise measurements

Preparers with HMMH are as follows:

- Christopher Menge, loudest-hour analysis, reporting (TNM certification on file in VDOT's offices)
- Zachary Weiss, loudest-hour analysis
- Michael Hamilton, report graphics

Reviewers with VDOT:

- T. Ross Hudnall
- Lovejoy Muchenje, PE

Certificate of Continuing Education

This is to certify that

Joseph Rauseo

has satisfactorily completed 32 hours of training on

FHWA Traffic Noise Model 1.0b and 1.1®

conducted by

Bowlby & Associates, Inc.

Franklin, Tennessee

12-15, 2002

William Bowlby

**William Bowlby, Ph.D., P.E.
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DIVISION OF CONTINUING EDUCATION

Hereby Awards This Certificate To

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For successful completion of

FHWA Traffic Noise Modeling


32 contact hours (3.2 CEU)

February 23 - 26, 1999

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Dr. Roger L. Watson

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Instructor

APPENDIX B:
Traffic Data Used for Noise Computations

TRAFFIC DATA USED FOR NOISE COMPUTATIONS

This appendix lists all of the roadway traffic data used in the noise analysis. The vehicle volumes and speeds shown in three tables are those used in the TNM runs for the three alternatives, Existing, No-Build, and Build. After the traffic data tables, two memoranda are provided. The first details the qualitative analysis of the section of the project between Turkeycock Run and Seminary Road. The second memorandum provides the details of the loudest-hour analysis for the section of the project where detailed analysis was performed, and provides the results for each alternative.

Table B-1: Traffic Data Used in 2016 Existing Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM130-MM133 NB Ln1	1198	54	108	69
Ex I-95 MM130-MM133 NB Ln2	1198	54	108	69
Ex I-95 MM130-MM133 NB Ln3	1198	54	108	69
Ex I-95 NB CD Exit 133 - Ramp5&7	970	16	91	67
Ex. I-95 Exit133 Ramp7	841	15	89	65
Ex. I-95 Exit133 Ramp1	437	12	23	67
Ex. I-95 Exit133 Ramp4	1519	13	180	67
Ex. I-95 Exit133 Ramp3	470	7	12	65
Ex. I-95 Exit133 Ramp2	139	4	3	65
Ex. I-95 Exit133 Ramp5	129	1	2	69
Ex. I-95 Exit133 Ramp6	281	14	12	65
Ex. US 17 Bus. E of I-95 WB Ln3	198	2	4	45
Ex. US 17 Bus. E of I-95 WB Ln2	198	2	4	45
Ex. US 17 Bus. E of I-95 WB Ln1	198	2	4	45
Ex. I-95 Exit133 Ramp8	324	3	6	70
Ex I-95 Exit133 NB Ln3-1	875	49	77	69
Ex I-95 Exit133 NB Ln2-1	875	49	77	69
Ex I-95 Exit133 NB Ln1-1	875	49	77	69
Ex I-95 MM130-MM133 SB Ln3	1511	38	88	67
Ex I-95 MM130-MM133 SB Ln2	1511	38	88	67
Ex I-95 MM130-MM133 SB Ln1	1511	38	88	67
Ex I-95 MM133-MM136 NB Ln3	1010	45	91	70
Ex I-95 MM133-MM136 NB Ln2	1010	45	91	70
Ex I-95 MM133-MM136 NB Ln1	1010	45	91	70
Ex I-95 MM133-MM136 SB Ln3	1527	39	89	67
Ex I-95 MM133-MM136 SB Ln2	1527	39	89	67

Table B-1: Traffic Data Used in 2016 Existing Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM133-MM136 SB Ln1	1527	39	89	67
Ex I-95 Exit133 SB Ln3-1	1381	35	81	67
Ex I-95 Exit133 SB Ln2-1	1381	35	81	67
Ex I-95 Exit133 SB Ln1-1	1381	35	81	67
Ex I-95 NB CD Exit 133 - Ramp6	281	14	12	70
Ex I-95 NB CD Exit 133 - Ramp7	841	15	89	67
Ex I-95 NB CD Exit 133 - Ramp6&8	605	17	18	70
Ex. US 17 Bus. E of I-95 EB Ln3	198	2	4	45
Ex. US 17 Bus. E of I-95 EB Ln2	198	2	4	45
Ex. US 17 Bus. E of I-95 EB Ln1	198	2	4	45
Ex I-95 Exit133 NB Ln3-2	808	40	85	70
Ex I-95 Exit133 NB Ln2-2	808	40	85	70
Ex I-95 Exit133 NB Ln1-2	808	40	85	70
Ex I-95 Exit133 SB Ln1-2	1005	34	28	67
Ex I-95 Exit133 SB Ln2-2	1005	34	28	67
Ex I-95 Exit133 SB Ln3-2	1005	34	28	67
Ex. I-95 Exit140 Ramp3	413	5	11	70
Ex I-95 Exit140 NB Ln3	869	44	87	70
Ex I-95 Exit140 NB Ln2	869	44	87	70
Ex I-95 Exit140 NB Ln1	869	44	87	70
Ex I-95 MM136-MM140 SB Ln3	1527	39	89	67
Ex I-95 MM136-MM140 SB Ln2	1527	39	89	67
Ex I-95 MM136-MM140 SB Ln1	1527	39	89	67
Ex. I-95 Exit140 Ramp2	468	6	6	67
Ex I-95 Exit 140 SB Ln3	1371	37	81	67
Ex I-95 Exit 140 SB Ln2	1371	37	81	67
Ex I-95 Exit 140 SB Ln1	1371	37	81	67
Ex I-95 MM136-MM140 NB Ln3-2	1007	45	90	70
Ex I-95 MM136-MM140 NB Ln2-2	1007	45	90	70
Ex I-95 MM136-MM140 NB Ln1-2	1007	45	90	70
Ex. Rte 630 (Courthouse Rd) WB (140-143 NB Hour)	169	3	5	45
Ex. I-95 Exit 140 Ramp4 (140-143 NB Hour)	413	6	18	70
Ex. I-95 Exit140 Ramp1 (140-143 NB Hour)	194	5	12	70
I-95 Exit 143 Ramp6 (140-143 NB Hour)	280	6	7	70

Table B-1: Traffic Data Used in 2016 Existing Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM140-MM143 NB Ln3 (140-143 NB Hour)	936	46	141	70
Ex I-95 MM140-MM143 NB Ln2 (140-143 NB Hour)	936	46	141	70
Ex I-95 MM140-MM143 NB Ln1 (140-143 NB Hour)	936	46	141	70
I-95 Exit 143 Ramp4 (140-143 NB Hour)	409	9	10	70
Ex I-95 Exit143 SB Ln3 (140-143 NB Hour)	719	38	83	70
Ex I-95 Exit143 SB Ln2 (140-143 NB Hour)	719	38	83	70
Ex I-95 Exit143 SB Ln1 (140-143 NB Hour)	719	38	83	70
Ex I-95 Exit143 NB Ln3 (140-143 NB Hour)	843	44	138	70
Ex I-95 Exit143 NB Ln2 (140-143 NB Hour)	843	44	138	70
Ex I-95 Exit143 NB Ln1 (140-143 NB Hour)	843	44	138	70
Ex I-95 MM140-MM143 SB Ln3 (140-143 NB Hour)	855	41	86	70
Ex I-95 MM140-MM143 SB Ln2 (140-143 NB Hour)	855	41	86	70
Ex I-95 MM140-MM143 SB Ln1 (140-143 NB Hour)	855	41	86	70
Ex I-95 Exit140 SB Ln3 (140-143 NB Hour)	791	39	82	70
Ex I-95 Exit140 SB Ln2 (140-143 NB Hour)	791	39	82	70
Ex I-95 Exit140 SB Ln1 (140-143 NB Hour)	791	39	82	70
Ex. Rte 630 - Courthouse Rd EB (140-143 NB Hour)	169	3	5	45
Ex I-95 Exit140 NB Ln1 (140-143 NB Hour)	799	44	135	70
Ex I-95 Exit140 NB Ln2 (140-143 NB Hour)	799	44	135	70
Ex I-95 Exit140 NB Ln3 (140-143 NB Hour)	799	44	135	70
Ex. Rte. 610 EB Ln1 (140-143 SB Hour)	510	2	4	45
Ex. Rte. 610 EB Ln2 (140-143 SB Hour)	510	2	4	45
I-95 Exit 143 Ramp4 (140-143 SB Hour)	645	6	5	67
I-95 Exit 143 Ramp3 (140-143 SB Hour)	300	5	0	67
I-95 Exit 143 Ramp5 (140-143 SB Hour)	300	5	0	67
Ex I-95 Exit143 SB Ln3 (140-143 SB Hour)	1278	36	85	67
Ex I-95 Exit143 SB Ln2 (140-143 SB Hour)	1278	36	85	67
Ex I-95 Exit143 SB Ln1 (140-143 SB Hour)	1278	36	85	67
Ex. Rte. 610 WB Ln1 (140-143 SB Hour)	510	2	4	45
Ex. Rte. 610 WB Ln2 (140-143 SB Hour)	510	2	4	45
Ex I-95 NB Ln3 (140-143 SB Hour)	991	45	89	70
Ex I-95 NB Ln2 (140-143 SB Hour)	991	45	89	70
Ex I-95 NB Ln1 (140-143 SB Hour)	991	45	89	70
Ex I-95 SB Ln3 (140-143 SB Hour)	1493	38	87	67

Table B-1: Traffic Data Used in 2016 Existing Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 SB Ln2 (140-143 SB Hour)	1493	38	87	67
Ex I-95 SB Ln1 (140-143 SB Hour)	1493	38	87	67

Table B-2: Traffic Data Used in 2042 No-Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM130-133NB Ln1	1473	72	222	65
Ex I-95 MM130-133NB Ln2	1473	72	222	65
Ex I-95 MM130-133NB Ln3	1473	72	222	65
Ex I-95 NB CD Exit 133 Ramp5&7	1344	20	162	65
Ex. I-95 Exit133 Ramp7	1082	14	152	65
Ex. I-95 Exit133 Ramp5	262	6	10	65
Ex. US 17 Bus. WB Ln1	209	2	4	45
Ex. US 17 Bus. WB Ln2	209	2	4	45
Ex. US 17 Bus. WB Ln3	209	2	4	45
Ex. I-95 Exit133 Ramp8	305	8	18	65
Ex I-95 Exit133SB Ln1	915	50	90	69
Ex I-95 Exit133SB Ln2	915	50	90	69
Ex I-95 Exit133SB Ln3	915	50	90	69
Ex. I-95 Exit133 Ramp6-2	366	19	17	65
Roadway249Exit 133 Ramp4 Ln2 ext	348	6	38	69
Ex. US 17 Bus. EB Ln3-2	209	2	4	45
Ex. US 17 Bus. EB Ln2-2	209	2	4	45
Ex. US 17 Bus. EB Ln1-2	209	2	4	45
Exit 133 Ramp2 (mod)	159	4	1	69
Exit 133 Ramp 4 Ln1	348	6	38	69
Exit 133 Ramp2 (mod)	507	10	39	69
Ex I-95 Exit133NB Ln3	1025	66	168	65
Ex I-95 Exit133NB Ln2	1025	66	168	65
Ex I-95 Exit133NB Ln1	1025	66	168	65
Ex I-95 NB CD Exit 133 Ramp7 Ext	1082	14	152	65
Ex I-95 NB CD Exit Ramp6 Ext.	366	19	17	65
Ex. US 17 Bus. EB Ln2-2-2	418	4	8	45

Table B-2: Traffic Data Used in 2042 No-Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex. I-95 Exit136 Ramp3	775	14	29	66
Ex I-95 MM133-MM136 NB Ln3	1241	61	187	66
Ex I-95 MM133-MM136 NB Ln2	1241	61	187	66
Ex I-95 MM133-MM136 NB Ln1	1241	61	187	66
Ex I-95 Exit136SB Ln3	966	47	104	70
Ex I-95 Exit136SB Ln2	966	47	104	70
Ex I-95 Exit136SB Ln1	966	47	104	70
Ex. I-95 Exit136 Ramp2-2	351	13	16	70
Ex I-95 Exit136 NB Ln3	982	56	177	66
Ex I-95 Exit136 NB Ln2	982	56	177	66
Ex I-95 Exit136 NB Ln1	982	56	177	66
Ex I-95 MM133-MM136 SB Ln3	1083	51	109	70
Ex I-95 MM133-MM136 SB Ln2	1083	51	109	70
Ex I-95 MM133-MM136 SB Ln1	1083	51	109	70
Rte 630 WB Seg2 Ln1 (140-143 NB Hour)	96	1	3	45
Rte 630 WB Seg2 Ln2 (140-143 NB Hour)	96	1	3	45
Rte 630 WB Seg2 Ln3 (140-143 NB Hour)	96	1	3	45
Rte 630 EB Seg3 Ln3 (140-143 NB Hour)	96	1	3	45
Rte 630 EB Seg3 Ln2 (140-143 NB Hour)	96	1	3	45
Rte 630 EB Seg3 Ln1 (140-143 NB Hour)	96	1	3	45
Rte 630 WB Seg3 Ln1 (140-143 NB Hour)	96	1	3	45
Rte 630 WB Seg3 Ln2 (140-143 NB Hour)	96	1	3	45
Rte 630 WB Seg3 Ln3 (140-143 NB Hour)	96	1	3	45
Rte 630 Ramp4 Ln1 (140-143 NB Hour)	421	6	18	66
Rte 630 Ramp1 Ln1 (140-143 NB Hour)	291	8	18	70
Rte 630 Ramp4 Ln2 (140-143 NB Hour)	421	6	18	66
Rte 630 EB Seg2 Ln3-2 (140-143 NB Hour)	96	1	3	45
Rte 630 EB Seg2 Ln2-2 (140-143 NB Hour)	96	1	3	45
Rte 630 EB Seg2 Ln1-2 (140-143 NB Hour)	96	1	3	45
Ex I-95 Exit140 NB Ln3 (140-143 NB Hour)	971	57	176	66
Ex I-95 Exit140 NB Ln2 (140-143 NB Hour)	971	57	176	66
Ex I-95 Exit140 NB Ln1 (140-143 NB Hour)	971	57	176	66
Ex I-95 MM140-MM143 NB Ln3 (140-143 NB Hour)	1251	61	188	66
Ex I-95 MM140-MM143 NB Ln2 (140-143 NB Hour)	1251	61	188	66

Table B-2: Traffic Data Used in 2042 No-Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM140-MM143 NB Ln1 (140-143 NB Hour)	1251	61	188	66
Ex I-95 Exit140 SB Ln3 (140-143 NB Hour)	978	48	102	70
Ex I-95 Exit140 SB Ln2 (140-143 NB Hour)	978	48	102	70
Ex I-95 Exit140 SB Ln1 (140-143 NB Hour)	978	48	102	70
Ex I-95 MM140-MM143 SB Ln3-2 (140-143 NB Hour)	1075	51	108	70
Ex I-95 MM140-MM143 SB Ln2-2 (140-143 NB Hour)	1075	51	108	70
Ex I-95 MM140-MM143 SB Ln1-2 (140-143 NB Hour)	1075	51	108	70
Ex. Rte. 610 EB Ln1 (140-143 SB Hour)	353	1	2	45
Ex. Rte. 610 EB Ln2 (140-143 SB Hour)	353	1	2	45
I-95 Exit 143 Ramp4 (140-143 SB Hour)	563	2	1	68
I-95 Exit 143 Ramp5 (140-143 SB Hour)	482	4	0	45
Ex. Rte. 610 EB Ln3 (140-143 SB Hour)	353	1	2	45
Rte 630 Ramp1 Ln2 (140-143 SB Hour)	580	3	7	68
Ex I-95 MM140-MM143 NB Ln1 (140-143 SB Hour)	1136	34	145	70
Ex I-95 MM140-MM143 NB Ln2 (140-143 SB Hour)	1136	34	145	70
Ex I-95 MM140-MM143 NB Ln3 (140-143 SB Hour)	1136	34	145	70
I-95 Exit 143 Ramp3-2 (140-143 SB Hour)	482	4	0	65
Ex I-95 Exit143 SB Ln3 (140-143 SB Hour)	1273	32	84	68
Ex I-95 Exit143 SB Ln2 (140-143 SB Hour)	1273	32	84	68
Ex I-95 Exit143 SB Ln1 (140-143 SB Hour)	1273	32	84	68
Ex. Rte. 610 WB Ln1-2 (140-143 SB Hour)	353	1	2	45
Ex. Rte. 610 WB Ln2-2 (140-143 SB Hour)	353	1	2	45
Ex I-95 MM140-MM143 SB Ln3 (140-143 SB Hour)	1461	33	84	68
Ex I-95 MM140-MM143 SB Ln2 (140-143 SB Hour)	1461	33	84	68
Ex I-95 MM140-MM143 SB Ln1 (140-143 SB Hour)	1461	33	84	68
Ex I-95 Exit140 SB Ln3 (140-143 SB Hour)	1268	32	82	68
Ex I-95 Exit140 SB Ln2 (140-143 SB Hour)	1268	32	82	68
Ex I-95 Exit140 SB Ln1 (140-143 SB Hour)	1268	32	82	68

Table B-3: Traffic Data Used in 2042 Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Ex I-95 MM130-133NB Ln1	1581	71	142	65
Ex I-95 MM130-133NB Ln2	1581	71	142	65
Ex I-95 MM130-133NB Ln3	1581	71	142	65
Ex I-95 NB CD Exit 133 Ramp5&7	1245	21	117	65
Ex. I-95 Exit133 Ramp7	1080	20	115	65
Ex. I-95 Exit133 Ramp5	165	1	2	65
Ex. US 17 Bus. WB Ln1	209	2	4	45
Ex. US 17 Bus. WB Ln2	209	2	4	45
Ex. US 17 Bus. WB Ln3	209	2	4	45
Ex. I-95 Exit133 Ramp8	429	4	7	65
Ex I-95 Exit133SB Ln1	976	44	56	65
Ex I-95 Exit133SB Ln2	976	44	56	65
Ex I-95 Exit133SB Ln3	976	44	56	65
Ex. I-95 Exit133 Ramp6-2	416	21	17	65
Ex. US 17 Bus. EB Ln3-2	209	2	4	45
Ex. US 17 Bus. EB Ln2-2	209	2	4	45
Ex. US 17 Bus. EB Ln1-2	209	2	4	45
Roadway249Exit 133 Ramp4 Ln2 ext	991	7	90	65
Ex. I-95 Exit133 Ramp6-2	416	21	17	65
Ex. US 17 Bus. EB Ln3-2	209	2	4	45
Ex. US 17 Bus. EB Ln2-2	209	2	4	45
Ex. US 17 Bus. EB Ln1-2	209	2	4	45
Exit 133 Ramp2 (mod)	179	5	3	65
Exit 133 Ramp 4 Ln1-2-2	179	5	3	65
Exit 133 Ramp 4 Ln1	991	7	90	65
Exit 133 Ramp2 (mod)-2-2	1982	14	180	65
Ex I-95 Exit133NB Ln3	1166	64	103	65
Ex I-95 Exit133NB Ln2	1166	64	103	65
Ex I-95 Exit133NB Ln1	1166	64	103	65
Ex I-95 NB CD Exit 133 Ramp7 Ext	1080	20	115	65
Ex I-95 NB CD Exit Ramp6 Ext.	416	21	17	65
Ex. US 17 Bus. EB Ln2-2-2	418	4	8	45
Expy - Exit 133 SB Of-Ramp	1038	4	1	71
Expy Exit 133 NB On + SB Off	1038	4	1	71
Ex I-95 Exit133 SB less Ramp2&4 Ln1	1322	45	56	65
Ex I-95 Exit133 SB less Ramp2&4 Ln2	1322	45	56	65
Ex I-95 Exit133 SB less Ramp2&4 Ln3	1322	45	56	65

Table B-3: Traffic Data Used in 2042 Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Exit 133 Ramp2 (mod)-2	991	7	90	65
Ex I-95 Exit133NB Ln3	1166	64	103	65
Ex. US 17 Bus. WB Ln3-2	197	13	25	45
Ex. US 17 Bus. WB Ln2-2	197	13	25	45
Ex. US 17 Bus. WB Ln1-2	197	13	25	45
Ex I-95 MM136-MM140 SB Ln1-2	1654	42	97	65
Ex I-95 MM136-MM140 SB Ln2-2	1654	42	97	65
Ex I-95 MM136-MM140 SB Ln3-2	1654	42	97	65
Expy Ln2-2	1043	4	1	71
Expy Ln1-2	1043	4	1	71
Ex I-95 MM136-MM140 NB Ln1-2	1236	56	111	69
Ex I-95 MM136-MM140 NB Ln2-2	1236	56	111	69
Ex I-95 MM136-MM140 NB Ln3-2	1236	56	111	69
I-95 Exit 143 Ramp6 (140-143 NB Hour)	386	8	9	69
Rte 630 Ramp4 Ln1 (140-143 NB Hour)	421	6	18	69
Rte 630 Ramp1 Ln1 (140-143 NB Hour)	291	8	18	70
Rte 630 Ramp4 Ln2 (140-143 NB Hour)	421	6	18	69
Expy MM140-MM143 Ln1 (140-143 NB Hour)	1034	10	3	71
Expy MM140-MM143 Ln2 (140-143 NB Hour)	1034	10	3	71
Ex I-95 Exit140 NB Ln3 (140-143 NB Hour)	893	54	165	69
Ex I-95 Exit140 NB Ln2 (140-143 NB Hour)	893	54	165	69
Ex I-95 Exit140 NB Ln1 (140-143 NB Hour)	893	54	165	69
Ex I-95 MM140-MM143 NB Ln3 (140-143 NB Hour)	1174	58	177	69
Ex I-95 MM140-MM143 NB Ln2 (140-143 NB Hour)	1174	58	177	69
Ex I-95 MM140-MM143 NB Ln1 (140-143 NB Hour)	1174	58	177	69
Ex I-95 Exit143 NB Ln1 (140-143 NB Hour)	1045	40	122	69
Ex I-95 Exit143 NB Ln2 (140-143 NB Hour)	1045	40	122	69
Ex I-95 Exit143 NB Ln3 (140-143 NB Hour)	1045	40	122	69
Ex I-95 MM140-MM143 SB Ln1 (140-143 NB Hour)	953	45	96	70
Ex I-95 MM140-MM143 SB Ln2 (140-143 NB Hour)	953	45	96	70
Ex I-95 MM140-MM143 SB Ln3 (140-143 NB Hour)	953	45	96	70
Ex I-95 Exit140 SB Ln3 (140-143 NB Hour)	856	42	90	70
Ex I-95 Exit140 SB Ln2 (140-143 NB Hour)	856	42	90	70
Ex I-95 Exit140 SB Ln1 (140-143 NB Hour)	856	42	90	70
Ex. Rte. 610 EB Ln1 (140-143 SB Hour)	392	1	3	45
Ex. Rte. 610 EB Ln2 (140-143 SB Hour)	392	1	3	45
I-95 Exit 143 Ramp4 (140-143 SB Hour)	686	6	5	65

Table B-3: Traffic Data Used in 2042 Build Case Noise Analysis

Roadway Name and Location	Vehicle Volume in Loudest Hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
I-95 Exit 143 Ramp3 (140-143 SB Hour)	383	7	0	65
I-95 Exit 143 Ramp5 (140-143 SB Hour)	383	7	0	65
Ex. Rte. 610 EB Ln3 (140-143 SB Hour)	392	1	3	45
Ex I-95 MM140-MM143 NB Ln1 (140-143 SB Hour)	1242	56	111	69
Ex I-95 MM140-MM143 NB Ln2 (140-143 SB Hour)	1242	56	111	69
Ex I-95 MM140-MM143 NB Ln3 (140-143 SB Hour)	1242	56	111	69
Ex. Rte. 610 WB Ln1-2 (140-143 SB Hour)	392	1	3	45
Ex. Rte. 610 WB Ln2-2 (140-143 SB Hour)	392	1	3	45
Expy Ln2-2 (140-143 SB Hour)	1261	5	1	70
Expy Ln1-2 (140-143 SB Hour)	1261	5	1	70
Ex I-95 Exit143 SB Ln3 (140-143 SB Hour)	1434	40	95	65
Ex I-95 Exit143 SB Ln2 (140-143 SB Hour)	1434	40	95	65
Ex I-95 Exit143 SB Ln1 (140-143 SB Hour)	1434	40	95	65
Ex I-95 MM140-MM143 SB Ln3 (140-143 SB Hour)	1663	42	97	65
Ex I-95 MM140-MM143 SB Ln2 (140-143 SB Hour)	1663	42	97	65
Ex I-95 MM140-MM143 SB Ln1 (140-143 SB Hour)	1663	42	97	65

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MEMORANDUM

To: Jim Ponticello, LJ Muchenje, VDOT
From: Chris Menge & Zachary Weiss, HMMH, Joe Rauseo & Kevin Hughes, RK&K
Subject: I-95 Fredericksburg Extension Project EA Noise Study – Loudest-Hour
Comparison of I-95 Traffic in 2017 and 2013 Noise Studies Between Exits 143
and 148
Reference: UPC 110527
Date: May 10, 2017



This memorandum describes a comparison of the loudest-hour Build alternative traffic data used in the most recent 2013 noise abatement design study for modeling the I-95 Build alternatives between Exits 143 and 148 to traffic developed for the current (2017) I-95 Fredericksburg Extension study for the same section of I-95. The noise levels generated by the traffic used in this and previous noise studies is compared, and support is given for relying on the findings from previous studies to make an informed NEPA decision.

HMMH and RK&K are currently conducting a preliminary noise study (2017 study) for the I-95 Fredericksburg Extension Project Environmental Assessment between the interchanges at Exit 133 (Route 17) and Exit 148 (Russell Road). A detailed noise analysis is being conducted between Exit 133 and Exit 143 (Garrisonville Road). A limited loudest-hour traffic comparison for noise is being conducted for the section between Exit 143 (Garrisonville Road) and Exit 148; that limited evaluation is described in this memorandum. A final design noise study was conducted in 2013¹ in conjunction with the I-95 Express Lanes Project roadway design project that overlaps with the current study area between Exits 143 and 148. The 2013 study predicted design year 2035 Build case noise impacts in many noise-sensitive areas on the NB and SB sides of I-95 between Exits 143 and 148. Also, the 2013 study found noise barriers to be feasible and reasonable in many of the impacted areas, and as a result, many noise barriers have been through the final acoustical and engineering design, completed the voting process and have already been constructed.

HMMH and RK&K have been tasked with comparing the design year 2035 Build case traffic used for the 2013 design noise studies with the design year 2042 traffic being developed for the current (2017) study, and determining the noise implications of the differences. The expectation was that the differences would be small enough such that detailed re-analysis

¹ Final Design Noise Analysis Report (Segment I-III), Interstate-95 Express Lanes Project, State Project No.: 0095-96A-1077, PE-101; UPC 70849, June 2013.

of the study areas on both sides of I-95 between Exits 143 and 148 would not be necessary for the 2017 noise study to make an informed NEPA decision. To compare the noise levels generated by the loudest-hour traffic used in the two different noise studies, HMMH used the loudest-hour computation spreadsheet. This spreadsheet uses reference Leqs at 200 feet for each vehicle type calculated with TNM models using a simple roadway with the posted speed and typical width of one direction of I-95. The Leqs were then calculated using the reference Leqs and the hourly vehicle volumes for the section of I-95 between Exits 143 and 148. Vehicle speeds used in the noise modeling for the 2013 noise study are not referenced in the noise study report or the appendix that cites all traffic data used; only vehicle volumes are given. Therefore, the use of posted speeds for both the 2013 and 2017 traffic volumes in the loudest-hour analysis provides an equal basis for comparing the significance of the noise level differences resulting from the volume differences.

Table 1 below presents the results of the loudest-hour analysis for this and the 2013 noise study. The table shows the hours for which the traffic was developed and reported, which are AM and PM peak hours for the 2013 study, and 15:00, the design year build condition hour determined to be the loudest for the 2017 study where both NB and SB lanes are in close proximity (between Exits 133 and 140), as they are between Exits 143 and 148. The tables show the hourly traffic volumes separately for the I-95 northbound and southbound general purpose lanes and the HOT lanes. On the right of the table, the computed Leqs for each of the roadways is shown along with the total with all of them combined.

The traffic developed for the I-95 Fredericksburg Extension project 2017 noise study and the resultant noise levels are slightly higher by 0.6 decibels than the PM peak hour in the 2013 study, which is louder of the two peak periods by 0.1 decibels. A 0.6-decibel difference is not considered substantial, suggesting that the results of the two studies would be essentially identical. Therefore, we conclude that no changes to noise barriers evaluated in the 2013 noise study would be anticipated to result from such a small change in noise levels.

The study team searched Stafford County databases to determine if newly constructed and/or permitted noise-sensitive land uses are or will be present in the study corridor since the 2013 study. With the exception of CNE LL, no additional such land uses were found. In CNE LL between Short Branch Road and Smith Lake Park, 33 additional homes have been permitted and added in the community that was under development at the time, since the 2013 study was conducted. The 2013 study had receptors modeled in all locations where the 33 additional homes have been constructed, so the noise barrier that was designed for the community would benefit all 33 additional homes as well as the homes that were included in the 2013 study. The barrier that was designed for CNE LL was originally predicted to benefit 152 homes with a surface area per benefited receptor of 735 square feet. With the 33 additional homes that would also be benefited by this barrier, the total benefits would rise to 185 homes, with a new surface area per benefited receptor of 604 square feet. The barrier remains feasible and reasonable per VDOT criteria.

Having reviewed these traffic and noise results, as well as the results and conclusions of the previous noise abatement design study, we conclude that the results of the 2013 design

study remain valid, in the context of revised traffic developed for the current study. As a result of this analysis, we recommend that the findings from the 2013 final design noise analysis for the I-95 HOT lanes analysis are sufficient for the section of the I-95 Fredericksburg Extension Project between Exits 143 and 148 to make an informed NEPA decision. In addition, the entire project corridor will be evaluated in more detail during the final design noise analysis.

Table 1. Loudest-hour Comparison – 2017 I-95 Fredericksburg Extension Project and 2013 I-95 Express Lanes Project Noise Studies – I-95 between Exits 143 and 148

Noise Study - Future Build Case	Design Year	Loudest Hour	Northbound GP lanes			Southbound GP lanes			HOT Lanes			Computed Leq			
			Autos	Med Trucks	Heavy Trucks	Autos	Med Trucks	Heavy Trucks	Autos	Med Trucks	Heavy Trucks	NB Lanes	SB Lanes	HOT Lanes	Total
2013 I-95 Express Lanes	2035	PM	3282	73	304	6501	41	366	1107	23	0	72.4	72.9	65.5	76.1
2013 I-95 Express Lanes	2035	AM	6418	75	313	2894	58	264	1219	25	0	74.3	69.6	65.9	76.0
2017 Fredericksburg Extention	2042	15:00	3551	160	319	5201	132	303	3535	14	2	72.9	72.2	70.2	76.7

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MEMORANDUM

To: Jim Ponticello and LJ Muchenje, VDOT

From: Chris Menge and Zach Weiss, HMMH; Joe Rauseo and Kevin Hughes, RK&K

Subject: I-95 Fredericksburg Extension Project EA Noise Study
Loudest-Hour Recommendations for All Alternatives

Reference: UPC 110527

Date: April 27, 2017



This memorandum describes the approach that HMMH and RK&K are taking to determine the loudest hour for noise modeling of the alternatives for the noise analysis for the I-95 Fredericksburg Extension Project Environmental Analysis. We submitted a memorandum on March 15th for VDOT's review with our preliminary recommendations for the planned loudest-hour analysis approach based on spreadsheet analysis for the traffic in the Existing and No-build cases. We received approval for that approach, have completed the loudest-hour evaluations, and provide the complete results in this memorandum. In this memo, we first summarize the spreadsheet analysis for the two loudest hours and the rationale for the choices of those hours for detailed modeling. Second, we summarize the results of the TNM runs with the traffic for the two loudest hours with the representative receivers for each alternative, and our recommendation for the final loudest hours to be used in the noise modeling for the project for each alternative.

Loudest-Hour Determination Methodology

Traffic data were extracted from ENTRADA sheets provided by RK&K and processed to determine the hourly breakdown of vehicles for the I-95 northbound and southbound mainline lanes between Exit 133 (US 17 Business) and Exit 143 (Rte. 610 / Garrisonville Road). Reference L_{eq5} at 200 feet for each vehicle type were calculated with TNM models using a simple roadway with highway width. The speeds in this preliminary analysis were the posted speeds, since those speeds or speeds close to them will be used for the noise impact modeling in TNM. The L_{eq5} for all hours of the day between 6:00 AM and 9:00 PM were then calculated for both directions of travel in the three sections of I-95: Exit 133 to Exit 136, Exit 136 to Exit 140, and Exit 140 to Exit 143.

The spreadsheet analysis results for the combined NB and SB lane noise levels were then used to determine the two loudest hours for the sections of I-95 from Exit 133 to Exit 136, and from Exit 136 to Exit 140 for both the Existing and No-build cases. In the northernmost section between Exits 140 and 143, the northbound and southbound lanes are separated by a wide median of over 500 feet in some places. Therefore, between Exits 140 and 143 the traffic noise levels in the communities adjacent to the highway will be dominated by

near direction lanes, and influenced to a lesser degree by the far lanes. Between Exits 140 and 143, we recommend choosing the loudest hour for the NB (east) and SB (west) sides of the highway separately, based on the loudest hour for the near direction of traffic to adjacent receivers.

Table 1 shows the two loudest hours chosen to be modeled in TNM for each section of I-95 for the Existing, No-build and Build alternatives. Tables 2, 3 and 4 provide the computed loudest hours and the associated L_{eq} s for each hour from the loudest-hour spreadsheet as support for the hours chosen and shown in Table 1.

The choice of the two loudest hours under the Existing alternative is straightforward, since the 15:00 hour is the loudest and the 16:00 hour is the second loudest for the sections of I-95 from Exit 133 to Exit 136, and from Exit 136 to Exit 140 with NB and SB combined, and also for the SB side of the section of I-95 between Exits 140 and 143. Therefore, in TNM, we modeled the Existing traffic in the 15:00 and 16:00 hours in TNM for all receivers south of Exit 140 and for the receivers on the SB side of I-95 north of Exit 140. In the NB direction, the loudest hour is 9:00 and the second loudest is 11:00, so the Existing traffic in those hours was modeled for the receivers on the NB side of I-95 between Exits 140 and 143.

Table 1 Two Loudest Hours Modeled in TNM

Roadway Section	Existing Alternative		No-build Alternative		Build Alternative	
	Loudest Hr	2 nd Loudest	Loudest Hr	2 nd Loudest	Loudest Hr	2 nd Loudest
I-95: Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	15:00	16:00	17:00	9:00	16:00	15:00
I-95: Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	15:00	16:00	17:00	9:00	16:00	15:00
I-95 SB side: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	15:00	16:00	17:00	18:00	15:00	16:00
I-95 NB side: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	11:00	9:00	11:00	9:00	16:00

The selection of the loudest hour for the No-build alternative is less clear, because the loudest hours are different in different project sections of I-95. The 17:00 hour is the loudest in the project section from Exit 133 to Exit 136, and the second loudest (but at the same L_{eq} as the loudest) in the sections between Exit 136 and 140 and on the SB side between Exit 140 and 143. Therefore, we modeled in TNM the 17:00 hour as the loudest from Exit 133 to Exit 140 and for the SB side from Exit 140 to Exit 143. The 9:00 hour is the second loudest from Exit 133 to Exit 136 and the third loudest from Exit 136 to Exit 140, so we modeled the 9:00 hour as the second loudest from Exit 133 to Exit 140. The 18:00 hour

is the third loudest on the SB side from Exit 140 to Exit 143, so we modeled the 18:00 hour as the second loudest hour for the receivers on the SB side from Exit 140 to Exit 143. From Exit 140 to Exit 143 in the NB direction, the loudest hour is 9:00 and the second loudest is 11:00, so the traffic in those hours were modeled for the receivers on the NB side of I-95 between Exits 140 and 143.

The loudest-hour spreadsheet modeling for the Build case included the proposed HOT lanes in the analysis. The HOT lanes are proposed to be located near the NB general purpose lanes in the section of the project between Exits 140 and 143, where the NB and SB lanes are widely separated. Therefore, the HOT lanes would be important in influencing the loudest hour mostly on the NB side in that section, and the HOT lanes noise levels were added to the NB GP lanes in the loudest-hour analysis for determining loudest hour in that section of the project. The selection of the two loudest hours for analysis in the Build case was straightforward. Table 4 shows that between Exits 133 and 136 and between Exits 136 and 140, the loudest hour for the combined NB, SB and HOT lanes is 16:00 and the second loudest is 15:00. Therefore, those hours were modeled in TNM for I-95 between Exits 133 and 140. Between Exits 140 and 143 in the SB direction, the loudest hour is 15:00 and the second loudest is 16:00, so the traffic in those hours were modeled for the receivers on the SB side of I-95. Between Exits 140 and 143 in the NB direction, including the adjacent HOT lanes, the loudest hour is 9:00 and the second loudest is 11:00, so the traffic in those hours were modeled for the receivers on the NB side of I-95 between Exits 140 and 143.

We selected representative receivers for the loudest-hour runs in TNM, using mostly first-row receptors and a few set back. Per VDOT's direction, the speeds used in these final loudest-hour runs were the higher of the ENTRADA-computed speed for that hour and the posted speed. Table 5 lists the representative receptors and the Leq values computed for the two loudest hours with TNM for each roadway section and alternative. In most cases, the difference in the computed Leq between the two hours is very small, and zero in some cases. The louder of the two Leqs for the two hours is shown with yellow highlight. No highlight is shown where the Leqs are the same.

Table 6 presents the recommended loudest hours to be used in modeling with TNM for each section of I-95 and for each alternative. These recommended hours derive quite clearly and directly from the results shown in Table 5, except perhaps for the SB side of I-95 between Exits 140 and 143 in the Build case. For that segment, the majority of the receptors (5) show the 15:00 hour as the louder, but two have the 16:00 hour as the louder, by only 0.1 dB. Since the majority of receptors are louder during the 15:00 hour, and since that hour is the louder for the other sections of the highway south of Exit 140, we recommend the 15:00 hour be modeled as the loudest for the Build case on the SB side of I-95 between Exits 140 and 143.

Table 2 I-95 Fredericksburg HOT Lanes Extension Existing Loudest Hour Spreadsheet Results Summary

No.	Road Name	Loudest Hour						2nd Loudest Hour					
		NB		SB		Combined		NB		SB		Combined	
		Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq
1	I-95: Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	9:00	73.0	15:00	71.7	15:00	75.0	11:00	72.7	16:00	71.6	16:00	74.9
2	I-95: Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	9:00	72.9	15:00	71.7	15:00	75.0	11:00	72.6	16:00	71.6	16:00	74.9
3	I-95: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	72.9	15:00	71.6	15:00	74.9	11:00	72.6	16:00	71.5	16:00	74.8

Table 3 I-95 Fredericksburg HOT Lanes Extension No-Build Loudest Hour Spreadsheet Results Summary

No.	Road Name	Loudest Hour						2nd Loudest Hour						3rd Loudest Hour					
		NB		SB		Combined		NB		SB		Combined		NB		SB		Combined	
		Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq
1	I-95: Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	9:00	74.1	17:00	72.0	17:00	75.7	11:00	73.8	18:00	71.5	9:00	75.7	12:00	73.7	13:00	71.5	11:00	75.6
2	I-95: Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	9:00	74.0	14:00	72.0	14:00	75.8	11:00	73.7	17:00	72.0	17:00	75.6	12:00	73.5	18:00	71.4	9:00	75.6
3	I-95: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	74.1	14:00	72.0	14:00	75.9	11:00	73.8	17:00	72.0	17:00	75.7	12:00	73.7	18:00	71.5	9:00	75.7

Table 4 I-95 Fredericksburg HOT Lanes Extension Build Loudest Hour Spreadsheet Results Summary

Road Name	Loudest Hour						2nd Loudest Hour					
	NB+HOV		SB		Combined		NB+HOV		SB		Combined	
	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq	Hour	Leq
I-95 Combined: Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	9:00	74.7	15:00	72.1	16:00	76.4	6:00	74.4	16:00	72.0	15:00	76.3
I-95 Combined: Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	9:00	74.7	15:00	72.0	16:00	76.3	6:00	74.4	16:00	72.0	15:00	76.3
I-95 Combined: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	74.9	15:00	72.1	16:00	76.5	16:00	74.6	16:00	72.0	15:00	76.4

Table 5 TNM Results for Two Loudest Hours - Predicted Leq's at Representative Receptors

Roadway Section / CNE / Receptors	Existing Alternative		No-Build Alternative		Build Alternative	
	Loudest Hr.	2nd-Loudest Hr.	Loudest Hr.	2nd-Loudest Hr.	Loudest Hr.	2nd-Loudest Hr.
I-95 NB Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	15:00	16:00	17:00	9:00	16:00	15:00
I-95 NB CNE UU-021	64.6	64.5	65.1	66.4	65.6	65.7
I-95 NB CNE UU-025	60.9	60.8	61.3	62.4	62.4	62.5
I-95 NB CNE UU-027	57.9	57.8	58.2	59.2	59.3	59.4
I-95 NB CNE WW-015	67.2	67.1	67.4	68.1	67.9	68.0
I-95 NB CNE WW-018	65.8	65.7	66.0	66.6	66.6	66.7
I-95 NB CNE WW-024	56.9	56.7	57.1	57.7	57.6	57.7
I-95 NB CNE YY-025	74.7	74.6	75.2	75.6	75.5	75.7
I-95 NB CNE YY-023	65.4	65.2	65.7	66.5	66.7	67.0
I-95 NB CNE YY-020	62.1	62.0	62.3	63.3	63.7	64.0
I-95 NB CNE YY-018	58.5	58.4	58.8	59.8	60.1	60.4
I-95 SB Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	15:00	16:00	17:00	9:00	16:00	15:00
I-95 SB CNE TT-013	63.7	63.5	63.8	64.9	66.0	66.2
I-95 SB CNE TT-012	55.7	55.4	55.8	56.8	56.6	56.9
I-95 SB CNE TT-030	51.9	51.6	52.1	53.1	53.6	53.8
I-95 SB CNE VV-004	70.9	70.7	70.8	71.5	71.9	72.1
I-95 SB CNE VV-002	69.5	69.4	69.5	70.0	70.3	70.5
I-95 SB CNE XX-004	67.1	66.9	67.0	67.7	71.2	71.5
I-95 SB CNE XX-006	63.7	63.5	63.9	64.8	68.3	68.6
I-95 Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	15:00	16:00	17:00	9:00	16:00	15:00
I-95 NB CNE SS-006	69.9	69.8	70.2	70.9	70.8	70.9
I-95 NB CNE SS-008	65.9	65.8	66.0	66.7	67.0	67.0
I-95 NB CNE SS-007	61.1	61.0	61.2	61.9	62.2	62.2
I-95 SB Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	15:00	16:00	17:00	18:00	15:00	16:00
I-95 SB CNE NN-066	65.7	65.5	65.5	65.8	65.8	65.8
I-95 SB CNE NN-272	65.9	65.8	65.8	66.1	66.0	66.1
I-95 SB CNE NN-275	61.6	61.4	61.5	61.8	61.5	61.4
I-95 SB CNE OO-013	64.5	64.2	64.8	64.8	66.3	66.4

Table 5 TNM Results for Two Loudest Hours - Predicted Leq's at Representative Receptors

Roadway Section / CNE / Receptors	Existing Alternative		No-Build Alternative		Build Alternative	
	Loudest Hr.	2nd-Loudest Hr.	Loudest Hr.	2nd-Loudest Hr.	Loudest Hr.	2nd-Loudest Hr.
I-95 SB CNE OO-008	62.9	62.7	63.0	63.1	63.6	63.6
I-95 SB CNE OO-005	61.9	61.7	62.0	62.2	62.8	62.8
I-95 SB CNE QQ-043	71.0	70.8	70.9	71.1	71.5	71.4
I-95 SB CNE QQ-048	67.1	66.8	67.2	67.3	68.1	68.0
I-95 SB CNE QQ-058	65.5	65.2	65.5	65.7	66.3	66.2
I-95 SB CNE QQ-079	60.3	60.0	60.3	60.5	61.1	61.0
I-95 NB Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	11:00	9:00	11:00	9:00	16:00
I-95 NB CNE PP-235	69.8	69.5	70.2	70.1	71.3	71.1
I-95 NB CNE PP-232	64.0	63.7	64.3	64.2	65.2	64.9
I-95 NB CNE PP-229	62.2	62.0	62.5	62.5	63.3	63.0
I-95 NB CNE PP-038	71.9	71.6	72.3	72.3	73.5	73.2
I-95 NB CNE PP-055	66.3	66.0	66.7	66.6	67.7	67.3
I-95 NB CNE PP-017	58.4	57.9	59.0	58.7	59.5	58.5
I-95 NB CNE RR-219	76.3	76.0	71.4	71.1	72.5	71.7
I-95 NB CNE RR-214	69.6	69.3	64.4	64.3	64.8	64.3
I-95 NB CNE RR-258	60.8	60.5	57.5	57.4	58.6	58.1

Table 6 Recommended Loudest Hours for Modeling in TNM

Roadway Section	Existing	No-build	Build
I-95: Exit 133 (US 17) to Exit 136 (Centreport Pkwy)	15:00	9:00	15:00
I-95: Exit 136 (Centreport Pkwy) to Exit 140 (Courthouse Rd)	15:00	9:00	15:00
I-95 SB side: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	15:00	18:00	15:00
I-95 NB side: Exit 140 (Courthouse Rd) to Exit 143 (Garrisonville Rd)	9:00	9:00	9:00

APPENDIX C:
Predicted Noise Levels

PREDICTED NOISE LEVELS

This appendix provides the predicted noise levels at all of the receiver (receptor) locations shown in the study graphics for the 2016 Existing and future Design-Year 2042 Build Alternative. The receptor sites are organized by CNE number. Also provided are the name and location of each receiver site, the number of dwelling units or recreational units assigned, a description of the land use, the applicable Noise Abatement Criteria, and the computed loudest-hour Leq sound levels. Build alternative sound levels are shown both without and with the effects of potential noise abatement measures. No-barrier sound levels shown in red indicate impact due to NAC. A column also shows whether balcony receptors on multi-story buildings are above the point of intersection and not counted as benefited. Further, those receptors are shown with gray shading in the row.

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-001	310 Cross Ridge Ct	1	B	Res.	67	No	62	61	62	NA	NA
NN-002	308 Cross Ridge Ct	1	B	Res.	67	No	62	61	62	NA	NA
NN-003	306 Cross Ridge Ct	1	B	Res.	67	No	62	61	62	NA	NA
NN-004	304 Cross Ridge Ct	1	B	Res.	67	No	62	61	62	NA	NA
NN-005	302 Cross Ridge Ct	1	B	Res.	67	No	61	61	62	NA	NA
NN-006	300 Cross Ridge Ct	1	B	Res.	67	No	61	61	62	NA	NA
NN-007	210 Cross Ridge Ct	1	B	Res.	67	No	61	61	61	NA	NA
NN-008	208 Cross Ridge Ct	1	B	Res.	67	No	61	60	61	NA	NA
NN-009	206 Cross Ridge Ct	1	B	Res.	67	No	61	60	61	NA	NA
NN-010	204 Cross Ridge Ct	1	B	Res.	67	No	61	60	61	NA	NA
NN-011	202 Cross Ridge Ct	1	B	Res.	67	No	61	60	61	NA	NA
NN-012	200 Cross Ridge Ct	1	B	Res.	67	No	60	60	61	NA	NA
NN-013	110 Cross Ridge Ct	1	B	Res.	67	No	58	58	59	NA	NA
NN-014	108 Cross Ridge Ct	1	B	Res.	67	No	58	58	59	NA	NA
NN-015	106 Cross Ridge Ct	1	B	Res.	67	No	58	58	58	NA	NA
NN-016	104 Cross Ridge Ct	1	B	Res.	67	No	58	57	58	NA	NA
NN-017	102 Cross Ridge Ct	1	B	Res.	67	No	57	57	58	NA	NA
NN-018	100 Cross Ridge Ct	1	B	Res.	67	No	57	57	58	NA	NA
NN-019	301 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-020	303 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-021	305 Stafford Glen Ct	1	B	Res.	67	No	60	60	61	NA	NA
NN-022	307 Stafford Glen Ct	1	B	Res.	67	No	60	60	61	NA	NA
NN-023	309 Stafford Glen Ct	1	B	Res.	67	No	60	60	61	NA	NA
NN-024	311 Stafford Glen Ct	1	B	Res.	67	No	60	60	61	NA	NA
NN-025	401 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-026	403 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-027	405 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-028	407 Stafford Glen Ct	1	B	Res.	67	No	59	59	60	NA	NA
NN-029	409 Stafford Glen Ct	1	B	Res.	67	No	59	59	59	NA	NA
NN-030	411 Stafford Glen Ct	1	B	Res.	67	No	58	59	59	NA	NA
NN-031	186 Tanglewood Ln	1	B	Res.	67	No	60	60	61	NA	NA
NN-032	188 Tanglewood Ln	1	B	Res.	67	No	60	60	61	NA	NA
NN-033	190 Tanglewood Ln	1	B	Res.	67	No	59	60	61	NA	NA
NN-034	192 Tanglewood Ln	1	B	Res.	67	No	59	59	60	NA	NA
NN-035	194 Tanglewood Ln	1	B	Res.	67	No	59	59	60	NA	NA
NN-036	196 Tanglewood Ln	1	B	Res.	67	No	58	58	59	NA	NA
NN-037	200 Whitsons Run	1	B	Res.	67	No	56	56	57	NA	NA
NN-038	202 Whitsons Run	1	B	Res.	67	No	57	57	58	NA	NA
NN-039	204 Whitsons Run	1	B	Res.	67	No	61	61	62	NA	NA
NN-040	206 Whitsons Run	1	B	Res.	67	No	60	60	61	NA	NA
NN-041	208 Whitsons Run	1	B	Res.	67	No	59	60	60	NA	NA
NN-042	210 Whitsons Run	1	B	Res.	67	No	60	60	61	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-043	212 Whitsons Run	1	B	Res.	67	No	61	61	62	NA	NA
NN-044	214 Whitsons Run	1	B	Res.	67	No	61	61	62	NA	NA
NN-045	216 Whitsons Run	1	B	Res.	67	No	62	62	63	NA	NA
NN-046	218 Whitsons Run	1	B	Res.	67	No	62	62	63	NA	NA
NN-047	220 Whitsons Run	1	B	Res.	67	No	60	60	61	NA	NA
NN-048	222 Whitsons Run	1	B	Res.	67	No	59	59	60	NA	NA
NN-049	224 Whitsons Run	1	B	Res.	67	No	59	60	60	NA	NA
NN-050	226 Whitsons Run	1	B	Res.	67	No	60	60	60	NA	NA
NN-051	228 Whitsons Run	1	B	Res.	67	No	60	60	60	NA	NA
NN-052	230 Whitsons Run	1	B	Res.	67	No	58	59	59	NA	NA
NN-053	232 Whitsons Run	1	B	Res.	67	No	59	59	60	NA	NA
NN-054	234 Whitsons Run	1	B	Res.	67	No	60	60	60	NA	NA
NN-055	236 Whitsons Run	1	B	Res.	67	No	60	61	61	NA	NA
NN-056	238 Whitsons Run	1	B	Res.	67	No	63	63	64	NA	NA
NN-057	240 Whitsons Run	1	B	Res.	67	No	63	63	64	NA	NA
NN-058	231 Whitsons Run	1	B	Res.	67	No	59	59	60	NA	NA
NN-059	233 Whitsons Run	1	B	Res.	67	No	60	60	60	NA	NA
NN-060	235 Whitsons Run	1	B	Res.	67	No	59	60	60	NA	NA
NN-061	237 Whitsons Run	1	B	Res.	67	No	60	61	61	NA	NA
NN-062	239 Whitsons Run	1	B	Res.	67	No	61	61	61	NA	NA
NN-063	241 Whitsons Run	1	B	Res.	67	No	61	61	62	NA	NA
NN-064	243 Whitsons Run	1	B	Res.	67	No	62	62	63	NA	NA
NN-065	245 Whitsons Run	1	B	Res.	67	No	62	62	63	NA	NA
NN-066	246 Whitsons Run	1	B	Res.	67	No	66	66	66	NA	NA
NN-067	407 Cross Ridge Ct	1	B	Res.	67	No	58	58	59	NA	NA
NN-068	405 Cross Ridge Ct	1	B	Res.	67	No	58	57	58	NA	NA
NN-069	403 Cross Ridge Ct	1	B	Res.	67	No	57	57	58	NA	NA
NN-070	401 Cross Ridge Ct	1	B	Res.	67	No	57	57	57	NA	NA
NN-071	500 Cross Ridge Ct	1	B	Res.	67	No	56	55	56	NA	NA
NN-072	502 Cross Ridge Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-073	504 Cross Ridge Ct	1	B	Res.	67	No	55	54	55	NA	NA
NN-074	506 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-075	508 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-076	501 Cross Ridge Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-077	503 Cross Ridge Ct	1	B	Res.	67	No	51	51	52	NA	NA
NN-078	505 Cross Ridge Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-079	507 Cross Ridge Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-080	509 Cross Ridge Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-081	511 Cross Ridge Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-082	111 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-083	109 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-084	107 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-085	105 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-086	103 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-087	101 Cross Ridge Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-088	100 Barksdale Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-089	102 Barksdale Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-090	104 Barksdale Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-091	106 Barksdale Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-092	200 Barksdale Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-093	202 Barksdale Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-094	204 Barksdale Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-095	206 Barksdale Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-096	208 Barksdale Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-097	300 Barksdale Pl	1	B	Res.	67	No	50	50	51	NA	NA
NN-098	302 Barksdale Pl	1	B	Res.	67	No	50	50	51	NA	NA
NN-099	304 Barksdale Pl	1	B	Res.	67	No	50	50	51	NA	NA
NN-100	306 Barksdale Pl	1	B	Res.	67	No	50	50	51	NA	NA
NN-101	308 Barksdale Pl	1	B	Res.	67	No	50	50	51	NA	NA
NN-102	100 Stafford Glen Ct	1	B	Res.	67	No	51	51	52	NA	NA
NN-103	102 Stafford Glen Ct	1	B	Res.	67	No	52	51	53	NA	NA
NN-104	104 Stafford Glen Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-105	106 Stafford Glen Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-106	200 Stafford Glen Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-107	202 Stafford Glen Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-108	204 Stafford Glen Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-109	206 Stafford Glen Ct	1	B	Res.	67	No	54	53	54	NA	NA
NN-110	300 Stafford Glen Ct	1	B	Res.	67	No	54	53	54	NA	NA
NN-111	302 Stafford Glen Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-112	304 Stafford Glen Ct	1	B	Res.	67	No	55	55	55	NA	NA
NN-113	306 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-114	308 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-115	500 Stafford Glen Ct	1	B	Res.	67	No	54	54	54	NA	NA
NN-116	502 Stafford Glen Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-117	504 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-118	506 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-119	508 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-120	600 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-121	602 Stafford Glen Ct	1	B	Res.	67	No	49	49	50	NA	NA
NN-122	604 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-123	606 Stafford Glen Ct	1	B	Res.	67	No	50	50	50	NA	NA
NN-124	608 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-125	700 Stafford Glen Ct	1	B	Res.	67	No	49	49	50	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-126	702 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-127	704 Stafford Glen Ct	1	B	Res.	67	No	49	50	51	NA	NA
NN-128	706 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-129	708 Stafford Glen Ct	1	B	Res.	67	No	49	49	50	NA	NA
NN-130	800 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-131	802 Stafford Glen Ct	1	B	Res.	67	No	50	51	51	NA	NA
NN-132	804 Stafford Glen Ct	1	B	Res.	67	No	50	51	51	NA	NA
NN-133	806 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-134	808 Stafford Glen Ct	1	B	Res.	67	No	50	50	51	NA	NA
NN-135	810 Stafford Glen Ct	1	B	Res.	67	No	49	50	50	NA	NA
NN-136	711 Stafford Glen Ct	1	B	Res.	67	No	54	54	55	NA	NA
NN-137	709 Stafford Glen Ct	1	B	Res.	67	No	54	55	55	NA	NA
NN-138	707 Stafford Glen Ct	1	B	Res.	67	No	54	55	55	NA	NA
NN-139	705 Stafford Glen Ct	1	B	Res.	67	No	54	55	56	NA	NA
NN-140	703 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-141	701 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-142	609 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-143	607 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-144	605 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-145	603 Stafford Glen Ct	1	B	Res.	67	No	55	56	56	NA	NA
NN-146	601 Stafford Glen Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-147	511 Stafford Glen Ct	1	B	Res.	67	No	55	56	56	NA	NA
NN-148	509 Stafford Glen Ct	1	B	Res.	67	No	56	56	56	NA	NA
NN-149	507 Stafford Glen Ct	1	B	Res.	67	No	56	56	57	NA	NA
NN-150	505 Stafford Glen Ct	1	B	Res.	67	No	56	56	57	NA	NA
NN-151	503 Stafford Glen Ct	1	B	Res.	67	No	57	57	58	NA	NA
NN-152	501 Stafford Glen Ct	1	B	Res.	67	No	57	57	58	NA	NA
NN-153	187 Tanglewood Ln	1	B	Res.	67	No	57	57	58	NA	NA
NN-154	189 Tanglewood Ln	1	B	Res.	67	No	56	56	57	NA	NA
NN-155	191 Tanglewood Ln	1	B	Res.	67	No	55	55	56	NA	NA
NN-156	193 Tanglewood Ln	1	B	Res.	67	No	56	57	58	NA	NA
NN-157	195 Tanglewood Ln	1	B	Res.	67	No	56	57	58	NA	NA
NN-158	197 Tanglewood Ln	1	B	Res.	67	No	56	56	57	NA	NA
NN-159	199 Tanglewood Ln	1	B	Res.	67	No	55	55	56	NA	NA
NN-160	100 Whitsons Run	1	B	Res.	67	No	46	46	47	NA	NA
NN-161	102 Whitsons Run	1	B	Res.	67	No	47	48	49	NA	NA
NN-162	104 Whitsons Run	1	B	Res.	67	No	49	50	51	NA	NA
NN-163	106 Whitsons Run	1	B	Res.	67	No	51	52	53	NA	NA
NN-164	108 Whitsons Run	1	B	Res.	67	No	52	52	53	NA	NA
NN-165	110 Whitsons Run	1	B	Res.	67	No	51	52	52	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-166	112 Whitsons Run	1	B	Res.	67	No	52	52	53	NA	NA
NN-167	114 Whitsons Run	1	B	Res.	67	No	52	53	54	NA	NA
NN-168	116 Whitsons Run	1	B	Res.	67	No	52	53	54	NA	NA
NN-169	118 Whitsons Run	1	B	Res.	67	No	52	52	54	NA	NA
NN-170	101 Whitsons Run	1	B	Res.	67	No	47	47	48	NA	NA
NN-171	105 Whitsons Run	1	B	Res.	67	No	46	46	47	NA	NA
NN-172	107 Whitsons Run	1	B	Res.	67	No	47	48	49	NA	NA
NN-173	109 Whitsons Run	1	B	Res.	67	No	49	49	50	NA	NA
NN-174	111 Whitsons Run	1	B	Res.	67	No	48	48	49	NA	NA
NN-175	113 Whitsons Run	1	B	Res.	67	No	49	49	50	NA	NA
NN-176	115 Whitsons Run	1	B	Res.	67	No	50	51	52	NA	NA
NN-177	117 Whitsons Run	1	B	Res.	67	No	52	52	54	NA	NA
NN-178	121 Whitsons Run	1	B	Res.	67	No	53	54	55	NA	NA
NN-179	123 Whitsons Run	1	B	Res.	67	No	52	53	54	NA	NA
NN-180	203 Tanglewood Ln	1	B	Res.	67	No	50	51	52	NA	NA
NN-181	205 Tanglewood Ln	1	B	Res.	67	No	51	52	53	NA	NA
NN-182	207 Tanglewood Ln	1	B	Res.	67	No	50	50	51	NA	NA
NN-183	209 Tanglewood Ln	1	B	Res.	67	No	48	48	49	NA	NA
NN-184	211 Tanglewood Ln	1	B	Res.	67	No	47	47	48	NA	NA
NN-185	202 Tanglewood Ln	1	B	Res.	67	No	52	53	54	NA	NA
NN-186	204 Tanglewood Ln	1	B	Res.	67	No	49	50	51	NA	NA
NN-187	206 Tanglewood Ln	1	B	Res.	67	No	48	49	49	NA	NA
NN-188	208 Tanglewood Ln	1	B	Res.	67	No	47	48	49	NA	NA
NN-189	210 Tanglewood Ln	1	B	Res.	67	No	46	46	47	NA	NA
NN-190	212 Tanglewood Ln	1	B	Res.	67	No	46	46	47	NA	NA
NN-191	214 Tanglewood Ln	1	B	Res.	67	No	46	46	47	NA	NA
NN-192	203 Whitsons Run	1	B	Res.	67	No	54	55	56	NA	NA
NN-193	205 Whitsons Run	1	B	Res.	67	No	55	55	56	NA	NA
NN-194	207 Whitsons Run	1	B	Res.	67	No	55	55	56	NA	NA
NN-195	205 Fallsway Ln	1	B	Res.	67	No	50	51	52	NA	NA
NN-196	207 Fallsway Ln	1	B	Res.	67	No	51	51	53	NA	NA
NN-197	209 Fallsway Ln	1	B	Res.	67	No	51	51	52	NA	NA
NN-198	211 Fallsway Ln	1	B	Res.	67	No	48	49	50	NA	NA
NN-199	213 Fallsway Ln	1	B	Res.	67	No	46	47	48	NA	NA
NN-200	200 Fallsway Ln	1	B	Res.	67	No	55	56	56	NA	NA
NN-201	204 Fallsway Ln	1	B	Res.	67	No	52	53	53	NA	NA
NN-202	206 Fallsway Ln	1	B	Res.	67	No	51	52	52	NA	NA
NN-203	208 Fallsway Ln	1	B	Res.	67	No	54	54	55	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-204	210 Fallsway Ln	1	B	Res.	67	No	54	54	55	NA	NA
NN-205	212 Fallsway Ln	1	B	Res.	67	No	51	51	52	NA	NA
NN-206	214 Fallsway Ln	1	B	Res.	67	No	48	48	50	NA	NA
NN-207	216 Fallsway Ln	1	B	Res.	67	No	47	47	48	NA	NA
NN-208	201 Coldspring Dr	1	B	Res.	67	No	55	55	56	NA	NA
NN-209	203 Coldspring Dr	1	B	Res.	67	No	48	49	50	NA	NA
NN-210	207 Coldspring Dr	1	B	Res.	67	No	51	52	52	NA	NA
NN-211	209 Coldspring Dr	1	B	Res.	67	No	55	55	56	NA	NA
NN-212	211 Coldspring Dr	1	B	Res.	67	No	54	55	56	NA	NA
NN-213	213 Coldspring Dr	1	B	Res.	67	No	52	53	53	NA	NA
NN-214	215 Coldspring Dr	1	B	Res.	67	No	47	48	49	NA	NA
NN-215	200 Coldspring Dr	1	B	Res.	67	No	58	59	59	NA	NA
NN-216	202 Coldspring Dr	1	B	Res.	67	No	53	53	54	NA	NA
NN-217	204 Coldspring Dr	1	B	Res.	67	No	50	51	52	NA	NA
NN-218	208 Coldspring Dr	1	B	Res.	67	No	50	51	52	NA	NA
NN-219	210 Coldspring Dr	1	B	Res.	67	No	51	52	53	NA	NA
NN-220	212 Coldspring Dr	1	B	Res.	67	No	49	50	51	NA	NA
NN-221	214 Coldspring Dr	1	B	Res.	67	No	47	48	49	NA	NA
NN-222	219 Whitsons Run	1	B	Res.	67	No	58	59	59	NA	NA
NN-223	221 Whitsons Run	1	B	Res.	67	No	58	58	59	NA	NA
NN-224	2 Fairfield Ct	1	B	Res.	67	No	56	56	57	NA	NA
NN-225	3 Fairfield Ct	1	B	Res.	67	No	55	55	56	NA	NA
NN-226	4 Fairfield Ct	1	B	Res.	67	No	55	56	57	NA	NA
NN-227	5 Fairfield Ct	1	B	Res.	67	No	51	51	52	NA	NA
NN-228	6 Fairfield Ct	1	B	Res.	67	No	46	47	48	NA	NA
NN-229	7 Fairfield Ct	1	B	Res.	67	No	48	49	50	NA	NA
NN-230	8 Fairfield Ct	1	B	Res.	67	No	51	52	52	NA	NA
NN-231	9 Fairfield Ct	1	B	Res.	67	No	54	55	56	NA	NA
NN-232	10 Fairfield Ct	1	B	Res.	67	No	56	56	57	NA	NA
NN-233	11 Fairfield Ct	1	B	Res.	67	No	56	57	57	NA	NA
NN-234	13 Fairfield Ct	1	B	Res.	67	No	58	58	59	NA	NA
NN-235	227 Whitsons Run	1	B	Res.	67	No	56	56	57	NA	NA
NN-236	247 Whitsons Run	1	B	Res.	67	No	63	63	63	NA	NA
NN-237	249 Whitsons Run	1	B	Res.	67	No	59	59	60	NA	NA
NN-238	10 Ryan Way	1	B	Res.	67	No	55	56	56	NA	NA
NN-239	8 Ryan Way	1	B	Res.	67	No	57	57	58	NA	NA
NN-240	6 Ryan Way	1	B	Res.	67	No	57	57	58	NA	NA
NN-241	4 Ryan Way	1	B	Res.	67	No	57	57	58	NA	NA
NN-242	2 Ryan Way	1	B	Res.	67	No	58	58	59	NA	NA
NN-243	17 Ryan Way	1	B	Res.	67	No	53	54	54	NA	NA
NN-244	15 Ryan Way	1	B	Res.	67	No	53	54	55	NA	NA
NN-245	11 Ryan Way	1	B	Res.	67	No	55	56	56	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
NN-246	9 Ryan Way	1	B	Res.	67	No	56	57	57	NA	NA
NN-247	7 Ryan Way	1	B	Res.	67	No	55	56	56	NA	NA
NN-248	5 Ryan Way	1	B	Res.	67	No	55	55	56	NA	NA
NN-249	3 Ryan Way	1	B	Res.	67	No	54	55	55	NA	NA
NN-250	14 Willingham Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-251	12 Willingham Ct	1	B	Res.	67	No	55	56	57	NA	NA
NN-252	10 Willingham Ct	1	B	Res.	67	No	55	56	57	NA	NA
NN-253	8 Willingham Ct	1	B	Res.	67	No	54	55	55	NA	NA
NN-254	6 Willingham Ct	1	B	Res.	67	No	53	54	55	NA	NA
NN-255	4 Willingham Ct	1	B	Res.	67	No	53	53	54	NA	NA
NN-256	2 Willingham Ct	1	B	Res.	67	No	52	53	53	NA	NA
NN-257	9 Willingham Ct	1	B	Res.	67	No	52	52	53	NA	NA
NN-258	5 Willingham Ct	1	B	Res.	67	No	51	52	52	NA	NA
NN-259	3 Willingham Ct	1	B	Res.	67	No	51	52	53	NA	NA
NN-260	1 Willingham Ct	1	B	Res.	67	No	51	52	52	NA	NA
NN-261	254 Vine Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-262	256 Vine Pl	1	B	Res.	67	No	52	52	53	NA	NA
NN-263	258 Vine Pl	1	B	Res.	67	No	51	51	52	NA	NA
NN-264	260 Vine Pl	1	B	Res.	67	No	52	53	54	NA	NA
NN-265	262 Vine Pl	1	B	Res.	67	No	51	52	53	NA	NA
NN-266	264 Vine Pl	1	B	Res.	67	No	50	51	52	NA	NA
NN-267	266 Vine Pl	1	B	Res.	67	No	53	54	54	NA	NA
NN-268	255 Whitsons Run	1	B	Res.	67	No	59	60	60	NA	NA
NN-269	257 Whitsons Run	1	B	Res.	67	No	53	54	54	NA	NA
NN-270	248 Whitsons Run	1	B	Res.	67	No	67	67	67	NA	NA
NN-271	250 Whitsons Run	1	B	Res.	67	No	66	66	66	NA	NA
NN-272	252 Whitsons Run	1	B	Res.	67	No	65	65	65	NA	NA
NN-273	256 Whitsons Run	1	B	Res.	67	No	64	64	64	NA	NA
NN-274	258 Whitsons Run	1	B	Res.	67	No	61	62	62	NA	NA
NN-275	260 Whitsons Run	1	B	Res.	67	No	59	59	59	NA	NA
NN-276	1 Whitsons Run Hiking Trl	1	C	Rec.	67	No	64	64	64	NA	NA
NN-277	2 Whitsons Run Hiking Trl	1	C	Rec.	67	No	65	65	65	NA	NA
NN-278	3 Whitsons Run Hiking Trl	1	C	Rec.	67	No	65	66	66	NA	NA
NN-279	4 Whitsons Run Hiking Trl	1	C	Rec.	67	No	66	66	66	NA	NA
NN-280	5 Whitsons Run Hiking Trl	1	C	Rec.	67	No	65	66	65	NA	NA
NN-281	6 Whitsons Run Hiking Trl	1	C	Rec.	67	No	63	64	64	NA	NA
NN-282	7 Whitsons Run Hiking Trl	1	C	Rec.	67	No	55	55	56	NA	NA
NN-283	8 Whitsons Run Hiking Trl	1	C	Rec.	67	No	56	56	56	NA	NA
NN-284	9 Whitsons Run Hiking Trl	1	C	Rec.	67	No	58	58	58	NA	NA
NN-285	10 Whitsons Run Hiking Trl	1	C	Rec.	67	No	61	61	61	NA	NA
NN-286	11 Whitsons Run Hiking Trl	1	C	Rec.	67	No	60	61	61	NA	NA
NN-287	12 Whitsons Run Hiking Trl	1	C	Rec.	67	No	60	60	60	NA	NA
NN-288	13 Whitsons Run Hiking Trl	1	C	Rec.	67	No	59	60	60	NA	NA
NN-289	14 Whitsons Run Hiking Trl	1	C	Rec.	67	No	59	59	59	NA	NA
NN-290	15 Whitsons Run Hiking Trl	1	C	Rec.	67	No	58	59	59	NA	NA
NN-291	16 Whitsons Run Hiking Trl	1	C	Rec.	67	No	54	54	54	NA	NA
OO-001	136 Brush Everard Ct	1	B	Res.	67	No	59	60	60	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
OO-002	134 Brush Everard Ct	1	B	Res.	67	No	60	61	61	NA	NA
OO-003	128 Brush Everard Ct	1	B	Res.	67	No	60	61	61	NA	NA
OO-004	126 Brush Everard Ct	1	B	Res.	67	No	61	62	62	NA	NA
OO-005	124 Brush Everard Ct	1	B	Res.	67	No	61	62	63	63	0
OO-006	122 Brush Everard Ct	1	B	Res.	67	No	62	63	63	63	0
OO-007	120 Brush Everard Ct	1	B	Res.	67	No	63	63	64	64	0
OO-008	118 Brush Everard Ct	1	B	Res.	67	No	62	63	64	64	0
OO-009	116 Brush Everard Ct	1	B	Res.	67	No	62	63	63	63	0
OO-010	114 Brush Everard Ct	1	B	Res.	67	No	62	62	63	63	0
OO-011	112 Brush Everard Ct	1	B	Res.	67	No	61	62	63	63	0
OO-012	110 Brush Everard Ct	1	B	Res.	67	No	62	62	63	63	0
OO-013	108 Brush Everard Ct	1	B	Res.	67	No	65	65	67	67	0
OO-014	106 Brush Everard Ct	1	B	Res.	67	No	65	66	68	67	0
OO-015	104 Brush Everard Ct	1	B	Res.	67	No	63	64	65	65	1
OO-016	102 Brush Everard Ct	1	B	Res.	67	No	63	64	65	64	1
OO-017	100 Brush Everard Ct	1	B	Res.	67	No	64	64	66	65	1
OO-018	98 Brush Everard Ct	1	B	Res.	67	No	65	65	66	65	1
OO-019	96 Brush Everard Ct	1	B	Res.	67	No	65	65	66	65	2
OO-020	94 Brush Everard Ct	1	B	Res.	67	No	64	65	66	64	1
OO-021	92 Brush Everard Ct	1	B	Res.	67	No	63	64	65	63	2
OO-022	90 Brush Everard Ct	1	B	Res.	67	No	62	63	63	NA	NA
OO-023	88 Brush Everard Ct	1	B	Res.	67	No	61	62	63	NA	NA
OO-024	86 Brush Everard Ct	1	B	Res.	67	No	61	62	63	NA	NA
OO-025	137 Brush Everard Ct	1	B	Res.	67	No	52	53	54	NA	NA
OO-026	135 Brush Everard Ct	1	B	Res.	67	No	46	47	48	NA	NA
OO-027	133 Brush Everard Ct	1	B	Res.	67	No	40	41	41	NA	NA
OO-028	131 Brush Everard Ct	1	B	Res.	67	No	37	38	39	NA	NA
OO-029	129 Brush Everard Ct	1	B	Res.	67	No	39	40	40	NA	NA
OO-030	127 Brush Everard Ct	1	B	Res.	67	No	43	44	45	NA	NA
OO-031	123 Brush Everard Ct	1	B	Res.	67	No	51	52	52	NA	NA
OO-032	121 Brush Everard Ct	1	B	Res.	67	No	53	54	55	NA	NA
OO-033	119 Brush Everard Ct	1	B	Res.	67	No	55	56	56	56	0
OO-034	117 Brush Everard Ct	1	B	Res.	67	No	54	55	56	56	0
OO-035	111 Brush Everard Ct	1	B	Res.	67	No	55	56	57	57	0
OO-036	109 Brush Everard Ct	1	B	Res.	67	No	53	54	55	55	0
OO-037	103 Brush Everard Ct	1	B	Res.	67	No	51	52	53	52	0
OO-038	101 Brush Everard Ct	1	B	Res.	67	No	53	54	55	54	1
OO-039	99 Brush Everard Ct	1	B	Res.	67	No	54	55	55	54	1
OO-040	97 Brush Everard Ct	1	B	Res.	67	No	56	56	57	56	2
OO-041	95 Brush Everard Ct	1	B	Res.	67	No	40	40	41	NA	NA
OO-042	93 Brush Everard Ct	1	B	Res.	67	No	38	38	39	NA	NA
OO-043	91 Brush Everard Ct	1	B	Res.	67	No	53	54	55	NA	NA
OO-044	89 Brush Everard Ct	1	B	Res.	67	No	53	54	55	NA	NA
OO-045	87 Brush Everard Ct	1	B	Res.	67	No	53	54	55	NA	NA
OO-046	85 Brush Everard Ct	1	B	Res.	67	No	50	51	52	NA	NA
OO-047	90 Tavern Rd	1	B	Res.	67	No	66	66	67	59	8
OO-048	88 Tavern Rd	1	B	Res.	67	No	71	71	71	60	11
OO-049	86 Tavern Rd	1	B	Res.	67	No	71	72	72	60	11

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
OO-050	84 Tavern Rd	1	B	Res.	67	No	69	69	69	59	10
OO-051	82 Tavern Rd	1	B	Res.	67	No	69	69	70	59	11
OO-052	80 Tavern Rd	1	B	Res.	67	No	69	70	70	59	11
OO-053	78 Tavern Rd	1	B	Res.	67	No	69	70	70	59	11
OO-054	76 Tavern Rd	1	B	Res.	67	No	70	70	70	59	11
OO-055	74 Tavern Rd	1	B	Res.	67	No	69	70	70	59	11
OO-056	72 Tavern Rd	1	B	Res.	67	No	69	69	69	60	10
OO-057	70 Tavern Rd	1	B	Res.	67	No	68	69	69	60	9
OO-058	89 Tavern Rd	1	B	Res.	67	No	60	60	61	56	5
OO-059	87 Tavern Rd	1	B	Res.	67	No	59	59	60	54	6
OO-060	85 Tavern Rd	1	B	Res.	67	No	58	59	59	54	5
OO-061	83 Tavern Rd	1	B	Res.	67	No	56	57	57	53	4
OO-062	81 Tavern Rd	1	B	Res.	67	No	57	58	58	53	5
OO-063	79 Tavern Rd	1	B	Res.	67	No	57	58	58	53	5
OO-064	77 Tavern Rd	1	B	Res.	67	No	60	60	60	53	7
OO-065	73 Tavern Rd	1	B	Res.	67	No	61	62	62	55	7
OO-066	71 Tavern Rd	1	B	Res.	67	No	60	60	60	55	5
OO-067	2 Goal Ct	1	B	Res.	67	No	57	57	58	NA	NA
OO-068	4 Goal Ct	1	B	Res.	67	No	56	57	58	NA	NA
OO-069	6 Goal Ct	1	B	Res.	67	No	60	60	61	NA	NA
OO-070	8 Goal Ct	1	B	Res.	67	No	59	60	60	NA	NA
OO-071	10 Goal Ct	1	B	Res.	67	No	59	60	60	NA	NA
OO-072	7 Goal Ct	1	B	Res.	67	No	52	53	54	NA	NA
OO-073	1 Goal Ct	1	B	Res.	67	No	54	54	55	NA	NA
OO-074	68 Tavern Rd	1	B	Res.	67	No	65	65	65	60	5
OO-075	64 Tavern Rd	1	B	Res.	67	No	63	64	64	NA	NA
OO-076	62 Tavern Rd	1	B	Res.	67	No	62	63	63	NA	NA
OO-077	60 Tavern Rd	1	B	Res.	67	No	60	61	61	NA	NA
OO-078	58 Tavern Rd	1	B	Res.	67	No	58	59	60	NA	NA
OO-079	1 Tavern Rd Hiking Trl	1	C	Rec.	67	No	59	60	60	59	2
OO-080	2 Tavern Rd Hiking Trl	1	C	Rec.	67	No	66	67	67	60	7
OO-081	3 Tavern Rd Hiking Trl	1	C	Rec.	67	No	67	68	68	61	7
OO-082	4 Tavern Rd Hiking Trl	1	C	Rec.	67	No	66	66	66	58	8
OO-083	5 Tavern Rd Hiking Trl	1	C	Rec.	67	No	64	64	64	55	9
OO-084	6 Tavern Rd Hiking Trl	1	C	Rec.	67	No	61	61	61	54	8
OO-085	7 Tavern Rd Hiking Trl	1	C	Rec.	67	No	58	58	58	52	6
OO-086	8 Tavern Rd Hiking Trl	1	C	Rec.	67	No	57	57	57	NA	NA
OO-087	9 Tavern Rd Hiking Trl	1	C	Rec.	67	No	57	57	57	NA	NA
OO-088	10 Tavern Rd Hiking Trl	1	C	Rec.	67	No	55	55	55	NA	NA
PP-001	2781 Jefferson Davis Hwy	1	D	Int.	52	No	37	38	38	NA	NA
PP-002	2785 Jefferson Davis Hwy	1	D	Int.	52	No	33	34	34	NA	NA
PP-003	2772 Jefferson Davis Hwy	1	E	Com.	72	No	59	60	60	NA	NA
PP-004	2761 Jefferson Davis Hwy	1	D	Int.	52	No	46	47	48	NA	NA
PP-005	2726 Jefferson Davis Hwy	1	C	Rec.	67	No	63	64	64	NA	NA
PP-006	2726 Jefferson Davis Hwy	1	D	Int.	52	No	36	37	38	NA	NA
PP-007	211 Bell Tower Ct	1	B	Res.	67	No	58	59	60	NA	NA
PP-008	209 Bell Tower Ct	1	B	Res.	67	No	58	59	60	NA	NA
PP-009	207 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-010	205 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-011	203 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-012	201 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-013	109 Bell Tower Ct	1	B	Res.	67	No	58	59	60	NA	NA
PP-014	107 Bell Tower Ct	1	B	Res.	67	No	58	59	60	NA	NA
PP-015	105 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-016	103 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-017	101 Bell Tower Ct	1	B	Res.	67	No	58	59	60	NA	NA
PP-018	214 Bell Tower Ct	1	B	Res.	67	No	55	56	57	NA	NA
PP-019	212 Bell Tower Ct	1	B	Res.	67	No	54	55	55	NA	NA
PP-020	210 Bell Tower Ct	1	B	Res.	67	No	53	54	55	NA	NA
PP-021	208 Bell Tower Ct	1	B	Res.	67	No	53	54	55	NA	NA
PP-022	206 Bell Tower Ct	1	B	Res.	67	No	53	54	54	NA	NA
PP-023	204 Bell Tower Ct	1	B	Res.	67	No	54	54	55	NA	NA
PP-024	202 Bell Tower Ct	1	B	Res.	67	No	54	55	56	NA	NA
PP-025	200 Bell Tower Ct	1	B	Res.	67	No	55	56	56	NA	NA
PP-026	108 Bell Tower Ct	1	B	Res.	67	No	58	58	59	NA	NA
PP-027	106 Bell Tower Ct	1	B	Res.	67	No	58	59	59	NA	NA
PP-028	104 Bell Tower Ct	1	B	Res.	67	No	59	59	60	NA	NA
PP-029	102 Bell Tower Ct	1	B	Res.	67	No	59	60	60	NA	NA
PP-030	100 Bell Tower Ct	1	B	Res.	67	No	59	60	60	NA	NA
PP-031	85 Belladonna Ln	1	B	Res.	67	No	70	71	72	61	10
PP-032	83 Belladonna Ln	1	B	Res.	67	No	70	71	72	61	11
PP-033	81 Belladonna Ln	1	B	Res.	67	No	70	71	72	61	11
PP-034	79 Belladonna Ln	1	B	Res.	67	No	71	71	72	62	11
PP-035	77 Belladonna Ln	1	B	Res.	67	No	71	71	72	62	10
PP-036	75 Belladonna Ln	1	B	Res.	67	No	71	72	73	62	10
PP-037	73 Belladonna Ln	1	B	Res.	67	No	71	72	73	63	10
PP-038	71 Belladonna Ln	1	B	Res.	67	No	72	72	74	64	9
PP-039	50 Belladonna Ln	1	C	Rec.	67	No	70	70	72	65	7
PP-040	15 Belladonna Ln	1	B	Res.	67	No	71	71	72	65	7
PP-041	13 Belladonna Ln	1	B	Res.	67	No	70	70	71	64	7
PP-042	11 Belladonna Ln	1	B	Res.	67	No	69	69	71	64	7
PP-043	9 Belladonna Ln	1	B	Res.	67	No	68	69	70	64	6
PP-044	7 Belladonna Ln	1	B	Res.	67	No	67	68	69	63	6
PP-045	5 Belladonna Ln	1	B	Res.	67	No	66	67	68	63	5
PP-046	3 Belladonna Ln	1	B	Res.	67	No	66	67	68	63	5
PP-047	1 Belladonna Ln	1	B	Res.	67	No	65	66	67	62	5
PP-048	31 Green Bell Ln	1	B	Res.	67	No	64	65	66	61	5
PP-049	29 Green Bell Ln	1	B	Res.	67	No	64	65	66	62	5
PP-050	27 Green Bell Ln	1	B	Res.	67	No	64	65	66	62	4
PP-051	25 Green Bell Ln	1	B	Res.	67	No	64	65	66	62	4
PP-052	23 Green Bell Ln	1	B	Res.	67	No	64	64	65	61	4
PP-053	21 Green Bell Ln	1	B	Res.	67	No	63	64	64	61	4
PP-054	19 Green Bell Ln	1	B	Res.	67	No	62	63	64	61	3
PP-055	114 Belladonna Ln	1	B	Res.	67	No	66	67	68	61	7
PP-056	112 Belladonna Ln	1	B	Res.	67	No	66	67	68	61	6
PP-057	110 Belladonna Ln	1	B	Res.	67	No	66	67	68	61	7

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-058	108 Belladonna Ln	1	B	Res.	67	No	66	66	67	61	7
PP-059	106 Belladonna Ln	1	B	Res.	67	No	66	66	67	61	7
PP-060	104 Belladonna Ln	1	B	Res.	67	No	65	66	67	60	7
PP-061	102 Belladonna Ln	1	B	Res.	67	No	65	66	67	60	6
PP-062	100 Belladonna Ln	1	B	Res.	67	No	65	65	66	60	6
PP-063	94 Belladonna Ln	1	B	Res.	67	No	65	66	67	60	6
PP-064	92 Belladonna Ln	1	B	Res.	67	No	65	65	66	60	6
PP-065	90 Belladonna Ln	1	B	Res.	67	No	65	65	66	60	6
PP-066	88 Belladonna Ln	1	B	Res.	67	No	64	64	65	60	6
PP-067	86 Belladonna Ln	1	B	Res.	67	No	62	62	63	59	4
PP-068	84 Belladonna Ln	1	B	Res.	67	No	59	59	60	59	2
PP-069	82 Belladonna Ln	1	B	Res.	67	No	56	56	57	52	5
PP-070	80 Belladonna Ln	1	B	Res.	67	No	56	57	57	53	5
PP-071	74 Belladonna Ln	1	B	Res.	67	No	59	59	60	55	5
PP-072	72 Belladonna Ln	1	B	Res.	67	No	60	61	61	57	4
PP-073	70 Belladonna Ln	1	B	Res.	67	No	61	62	62	58	4
PP-074	68 Belladonna Ln	1	B	Res.	67	No	62	63	63	60	4
PP-075	66 Belladonna Ln	1	B	Res.	67	No	63	64	65	61	4
PP-076	64 Belladonna Ln	1	B	Res.	67	No	64	65	66	61	5
PP-077	62 Belladonna Ln	1	B	Res.	67	No	66	66	67	62	5
PP-078	60 Belladonna Ln	1	B	Res.	67	No	67	67	68	63	5
PP-079	50 Belladonna Ln	1	C	Rec.	67	No	67	68	69	65	5
PP-080	30 Belladonna Ln	1	B	Res.	67	No	65	66	66	63	3
PP-081	28 Belladonna Ln	1	B	Res.	67	No	64	65	66	63	3
PP-082	26 Belladonna Ln	1	B	Res.	67	No	64	65	65	62	3
PP-083	24 Belladonna Ln	1	B	Res.	67	No	63	64	65	62	2
PP-084	22 Belladonna Ln	1	B	Res.	67	No	63	63	64	62	2
PP-085	20 Belladonna Ln	1	B	Res.	67	No	62	63	63	61	2
PP-086	16 Belladonna Ln	1	B	Res.	67	No	60	61	61	NA	NA
PP-087	14 Belladonna Ln	1	B	Res.	67	No	59	60	60	NA	NA
PP-088	12 Belladonna Ln	1	B	Res.	67	No	58	59	59	NA	NA
PP-089	10 Belladonna Ln	1	B	Res.	67	No	58	59	59	NA	NA
PP-090	8 Belladonna Ln	1	B	Res.	67	No	57	58	58	NA	NA
PP-091	6 Belladonna Ln	1	B	Res.	67	No	57	58	58	NA	NA
PP-092	4 Belladonna Ln	1	B	Res.	67	No	56	57	57	NA	NA
PP-093	2 Belladonna Ln	1	B	Res.	67	No	56	57	57	NA	NA
PP-094	13 Green Bell Ln	1	B	Res.	67	No	58	59	59	NA	NA
PP-095	11 Green Bell Ln	1	B	Res.	67	No	48	49	50	NA	NA
PP-096	9 Green Bell Ln	1	B	Res.	67	No	47	48	48	NA	NA
PP-097	7 Green Bell Ln	1	B	Res.	67	No	46	47	47	NA	NA
PP-098	5 Green Bell Ln	1	B	Res.	67	No	46	46	47	NA	NA
PP-099	3 Green Bell Ln	1	B	Res.	67	No	45	46	47	NA	NA
PP-100	1 Green Bell Ln	1	B	Res.	67	No	45	46	46	NA	NA
PP-101	1 Bells Ridge Dr	1	B	Res.	67	No	61	61	62	59	3
PP-102	3 Bells Ridge Dr	1	B	Res.	67	No	61	62	63	60	3
PP-103	5 Bells Ridge Dr	1	B	Res.	67	No	61	61	62	60	3

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CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-104	7 Bells Ridge Dr	1	B	Res.	67	No	62	63	64	60	3
PP-105	9 Bells Ridge Dr	1	B	Res.	67	No	63	64	65	61	4
PP-106	11 Bells Ridge Dr	1	B	Res.	67	No	64	64	65	61	5
PP-107	15 Bells Ridge Dr	1	B	Res.	67	No	64	65	66	61	5
PP-108	17 Bells Ridge Dr	1	B	Res.	67	No	65	65	66	62	5
PP-109	19 Bells Ridge Dr	1	B	Res.	67	No	64	65	66	61	4
PP-110	21 Bells Ridge Dr	1	B	Res.	67	No	62	62	63	61	2
PP-111	23 Bells Ridge Dr	1	B	Res.	67	No	61	62	63	60	3
PP-112	27 Bells Ridge Dr	1	B	Res.	67	No	60	61	62	60	3
PP-113	29 Bells Ridge Dr	1	B	Res.	67	No	60	61	62	60	2
PP-114	31 Bells Ridge Dr	1	B	Res.	67	No	60	61	61	60	2
PP-115	33 Bells Ridge Dr	1	B	Res.	67	No	61	62	62	61	2
PP-116	35 Bells Ridge Dr	1	B	Res.	67	No	62	63	63	62	2
PP-117	37 Bells Ridge Dr	1	B	Res.	67	No	63	63	64	62	2
PP-118	39 Bells Ridge Dr	1	B	Res.	67	No	58	59	59	NA	NA
PP-119	2 Bells Ridge Dr	1	B	Res.	67	No	57	57	59	NA	NA
PP-120	4 Bells Ridge Dr	1	B	Res.	67	No	52	53	54	NA	NA
PP-121	6 Bells Ridge Dr	1	B	Res.	67	No	54	55	56	NA	NA
PP-122	8 Bells Ridge Dr	1	B	Res.	67	No	50	51	52	NA	NA
PP-123	10 Bells Ridge Dr	1	B	Res.	67	No	47	48	49	NA	NA
PP-124	12 Bells Ridge Dr	1	B	Res.	67	No	51	52	53	NA	NA
PP-125	14 Bells Ridge Dr	1	B	Res.	67	No	52	53	54	NA	NA
PP-126	16 Bells Ridge Dr	1	B	Res.	67	No	57	57	59	NA	NA
PP-127	18 Bells Ridge Dr	1	B	Res.	67	No	56	57	58	NA	NA
PP-128	20 Bells Ridge Dr	1	B	Res.	67	No	57	57	58	NA	NA
PP-129	22 Bells Ridge Dr	1	B	Res.	67	No	52	52	53	NA	NA
PP-130	24 Bells Ridge Dr	1	B	Res.	67	No	56	56	57	NA	NA
PP-131	26 Bells Ridge Dr	1	B	Res.	67	No	56	57	58	NA	NA
PP-132	28 Bells Ridge Dr	1	B	Res.	67	No	56	57	58	NA	NA
PP-133	30 Bells Ridge Dr	1	B	Res.	67	No	52	53	54	NA	NA
PP-134	32 Bells Ridge Dr	1	B	Res.	67	No	51	52	53	NA	NA
PP-135	34 Bells Ridge Dr	1	B	Res.	67	No	55	56	56	NA	NA
PP-136	36 Bells Ridge Dr	1	B	Res.	67	No	51	52	52	NA	NA
PP-137	38 Bells Ridge Dr	1	B	Res.	67	No	52	53	54	NA	NA
PP-138	279 Bells Hill Rd	1	C	Rec.	67	No	59	60	60	57	3
PP-139	279 Bells Hill Rd	1	D	Int.	52	No	34	35	35	35	0
PP-140	111 Shannon Ct	1	B	Res.	67	No	69	69	71	64	7
PP-141	109 Shannon Ct	1	B	Res.	67	No	69	69	71	64	7
PP-142	107 Shannon Ct	1	B	Res.	67	No	69	69	70	63	7
PP-143	105 Shannon Ct	1	B	Res.	67	No	68	69	70	63	7
PP-144	103 Shannon Ct	1	B	Res.	67	No	68	69	70	63	7
PP-145	101 Shannon Ct	1	B	Res.	67	No	68	69	70	63	7

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CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-146	300 Galway Ln	1	B	Res.	67	No	70	70	71	63	9
PP-147	302 Galway Ln	1	B	Res.	67	No	70	70	71	62	9
PP-148	304 Galway Ln	1	B	Res.	67	No	69	70	71	61	10
PP-149	306 Galway Ln	1	B	Res.	67	No	69	69	71	61	10
PP-150	308 Galway Ln	1	B	Res.	67	No	69	69	70	60	11
PP-151	310 Galway Ln	1	B	Res.	67	No	68	69	70	59	11
PP-152	210 Galway Ln	1	B	Res.	67	No	64	64	65	61	5
PP-153	208 Galway Ln	1	B	Res.	67	No	63	63	64	60	5
PP-154	206 Galway Ln	1	B	Res.	67	No	62	63	64	59	4
PP-155	204 Galway Ln	1	B	Res.	67	No	61	62	63	59	4
PP-156	202 Galway Ln	1	B	Res.	67	No	61	62	62	59	4
PP-157	200 Galway Ln	1	B	Res.	67	No	60	61	62	59	3
PP-158	110 Galway Ln	1	B	Res.	67	No	59	60	60	58	2
PP-159	108 Galway Ln	1	B	Res.	67	No	58	59	60	57	2
PP-160	106 Galway Ln	1	B	Res.	67	No	58	59	59	57	2
PP-161	104 Galway Ln	1	B	Res.	67	No	57	58	59	57	2
PP-162	102 Galway Ln	1	B	Res.	67	No	57	58	58	56	2
PP-163	100 Galway Ln	1	B	Res.	67	No	56	57	58	56	2
PP-164	211 Galway Ln	1	B	Res.	67	No	58	58	59	57	3
PP-165	209 Galway Ln	1	B	Res.	67	No	57	57	58	56	2
PP-166	207 Galway Ln	1	B	Res.	67	No	56	57	57	55	2
PP-167	205 Galway Ln	1	B	Res.	67	No	55	56	56	54	2
PP-168	203 Galway Ln	1	B	Res.	67	No	54	55	56	53	2
PP-169	201 Galway Ln	1	B	Res.	67	No	54	55	55	53	3
PP-170	109 Galway Ln	1	B	Res.	67	No	53	54	54	NA	NA
PP-171	107 Galway Ln	1	B	Res.	67	No	52	53	54	NA	NA
PP-172	105 Galway Ln	1	B	Res.	67	No	51	52	52	NA	NA
PP-173	103 Galway Ln	1	B	Res.	67	No	50	51	51	NA	NA
PP-174	101 Galway Ln	1	B	Res.	67	No	50	50	51	NA	NA
PP-175	301 Galway Ln	1	B	Res.	67	No	59	59	60	55	5
PP-176	303 Galway Ln	1	B	Res.	67	No	58	59	59	54	5
PP-177	305 Galway Ln	1	B	Res.	67	No	58	59	59	54	5
PP-178	307 Galway Ln	1	B	Res.	67	No	59	60	60	54	7
PP-179	309 Galway Ln	1	B	Res.	67	No	60	61	62	54	8
PP-180	311 Galway Ln	1	B	Res.	67	No	61	62	62	54	8
PP-181	206 Cork St	1	B	Res.	67	No	60	60	61	55	6
PP-182	204 Cork St	1	B	Res.	67	No	59	60	61	55	6
PP-183	202 Cork St	1	B	Res.	67	No	59	60	60	55	6
PP-184	200 Cork St	1	B	Res.	67	No	59	59	60	54	6
PP-185	106 Cork St	1	B	Res.	67	No	58	59	59	NA	NA
PP-186	104 Cork St	1	B	Res.	67	No	58	58	59	NA	NA
PP-187	102 Cork St	1	B	Res.	67	No	57	58	59	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-188	100 Cork St	1	B	Res.	67	No	57	58	58	NA	NA
PP-189	401 Galway Ln	1	B	Res.	67	No	62	63	63	53	11
PP-190	403 Galway Ln	1	B	Res.	67	No	62	63	63	54	10
PP-191	405 Galway Ln	1	B	Res.	67	No	62	63	63	53	10
PP-192	407 Galway Ln	1	B	Res.	67	No	62	62	63	52	11
PP-193	501 Galway Ln	1	B	Res.	67	No	61	62	62	52	10
PP-194	503 Galway Ln	1	B	Res.	67	No	61	61	62	52	10
PP-195	505 Galway Ln	1	B	Res.	67	No	61	61	62	52	10
PP-196	507 Galway Ln	1	B	Res.	67	No	60	61	62	52	10
PP-197	601 Galway Ln	1	B	Res.	67	No	60	60	61	51	10
PP-198	603 Galway Ln	1	B	Res.	67	No	59	60	61	51	10
PP-199	605 Galway Ln	1	B	Res.	67	No	59	60	61	51	10
PP-200	607 Galway Ln	1	B	Res.	67	No	59	60	60	51	10
PP-201	701 Galway Ln	1	B	Res.	67	No	59	60	61	51	10
PP-202	703 Galway Ln	1	B	Res.	67	No	59	60	61	51	9
PP-203	705 Galway Ln	1	B	Res.	67	No	59	60	61	52	9
PP-204	707 Galway Ln	1	B	Res.	67	No	59	60	61	52	9
PP-205	709 Galway Ln	1	B	Res.	67	No	59	59	60	52	9
PP-206	711 Galway Ln	1	B	Res.	67	No	58	59	60	51	8
PP-207	18 Corin Way	1	B	Res.	67	No	60	61	61	55	6
PP-208	20 Corin Way	1	B	Res.	67	No	61	62	62	56	6
PP-209	22 Corin Way	1	B	Res.	67	No	61	62	63	57	6
PP-210	24 Corin Way	1	B	Res.	67	No	61	61	62	57	5
PP-211	26 Corin Way	1	B	Res.	67	No	62	63	64	59	5
PP-212	28 Corin Way	1	B	Res.	67	No	65	66	66	63	3
PP-213	30 Corin Way	1	B	Res.	67	No	67	67	68	65	4
PP-214	32 Corin Way	1	B	Res.	67	No	70	71	72	65	7
PP-215	33 Corin Way	1	B	Res.	67	No	70	71	72	65	7
PP-216	31 Corin Way	1	B	Res.	67	No	68	69	70	64	6
PP-217	29 Corin Way	1	B	Res.	67	No	66	66	67	61	6
PP-218	25 Corin Way	1	B	Res.	67	No	63	64	65	59	6
PP-219	23 Corin Way	1	B	Res.	67	No	61	62	63	57	6
PP-220	21 Corin Way	1	B	Res.	67	No	61	62	62	56	6
PP-221	19 Corin Way	1	B	Res.	67	No	60	61	62	56	6
PP-222	34 Daffodil Ln	1	B	Res.	67	No	58	59	60	54	6
PP-223	36 Daffodil Ln	1	B	Res.	67	No	59	60	60	56	4
PP-224	38 Daffodil Ln	1	B	Res.	67	No	60	61	62	57	5
PP-225	40 Daffodil Ln	1	B	Res.	67	No	61	61	62	58	4
PP-226	42 Daffodil Ln	1	B	Res.	67	No	60	61	62	56	6
PP-227	44 Daffodil Ln	1	B	Res.	67	No	63	64	65	61	4
PP-228	46 Daffodil Ln	1	B	Res.	67	No	68	68	69	64	6
PP-229	33 Daffodil Ln	1	B	Res.	67	No	62	63	63	60	3

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
PP-230	35 Daffodil Ln	1	B	Res.	67	No	63	64	64	61	4
PP-231	37 Daffodil Ln	1	B	Res.	67	No	54	55	56	53	3
PP-232	39 Daffodil Ln	1	B	Res.	67	No	64	64	65	62	4
PP-233	41 Daffodil Ln	1	B	Res.	67	No	59	59	60	58	2
PP-234	43 Daffodil Ln	1	B	Res.	67	No	67	68	69	64	5
PP-235	45 Daffodil Ln	1	B	Res.	67	No	70	70	71	65	7
PP-236	47 Daffodil Ln	1	B	Res.	67	No	70	70	71	65	6
QQ-001	60 Gallery Rd	1	C	Rec.	67	No	56	56	56	NA	NA
QQ-002	60 Gallery Rd	1	C	Rec.	67	No	56	56	57	NA	NA
QQ-003	60 Gallery Rd	1	C	Rec.	67	No	65	65	66	NA	NA
QQ-004	60 Gallery Rd	1	C	Rec.	67	No	64	64	65	NA	NA
QQ-005	60 Gallery Rd	1	C	Rec.	67	No	64	64	65	NA	NA
QQ-006	60 Gallery Rd	1	C	Rec.	67	No	58	57	57	NA	NA
QQ-007	60 Gallery Rd	1	C	Rec.	67	No	62	61	62	NA	NA
QQ-008	60 Gallery Rd	1	C	Rec.	67	No	63	63	64	NA	NA
QQ-009	60 Gallery Rd	1	C	Rec.	67	No	56	55	56	NA	NA
QQ-010	60 Gallery Rd	1	C	Rec.	67	No	50	50	50	NA	NA
QQ-011	60 Gallery Rd	1	C	Rec.	67	No	58	56	56	NA	NA
QQ-012	60 Gallery Rd	1	C	Rec.	67	No	61	60	61	NA	NA
QQ-013	60 Gallery Rd	1	C	Rec.	67	No	53	52	52	NA	NA
QQ-014	60 Gallery Rd	1	C	Rec.	67	No	52	52	53	NA	NA
QQ-015	60 Gallery Rd	1	C	Rec.	67	No	50	50	51	NA	NA
QQ-016	60 Gallery Rd	1	D	Int.	52	No	39	39	40	NA	NA
QQ-017	60 Gallery Rd	1	C	Rec.	67	No	65	65	66	NA	NA
QQ-018	60 Gallery Rd	1	C	Rec.	67	No	62	63	63	NA	NA
QQ-019	60 Gallery Rd	1	C	Rec.	67	No	60	61	61	NA	NA
QQ-020	60 Gallery Rd	1	C	Rec.	67	No	57	58	58	NA	NA
QQ-021	60 Gallery Rd	1	C	Rec.	67	No	57	57	58	NA	NA
QQ-022	60 Gallery Rd	1	C	Rec.	67	No	65	66	66	NA	NA
QQ-023	60 Gallery Rd	1	C	Rec.	67	No	70	70	70	NA	NA
QQ-024	60 Gallery Rd	1	C	Rec.	67	No	72	72	72	NA	NA
QQ-025	60 Gallery Rd	1	C	Rec.	67	No	63	64	64	NA	NA
QQ-026	60 Gallery Rd	1	C	Rec.	67	No	66	66	67	NA	NA
QQ-027	60 Gallery Rd	1	C	Rec.	67	No	68	69	69	NA	NA
QQ-028	60 Gallery Rd	1	C	Rec.	67	No	59	60	61	NA	NA
QQ-029	60 Gallery Rd	1	C	Rec.	67	No	65	66	66	NA	NA
QQ-030	60 Gallery Rd	1	C	Rec.	67	No	66	67	67	NA	NA
QQ-031	60 Gallery Rd	1	C	Rec.	67	No	59	59	60	NA	NA
QQ-032	60 Gallery Rd	1	C	Rec.	67	No	63	63	64	NA	NA
QQ-033	60 Gallery Rd	1	C	Rec.	67	No	65	66	66	NA	NA
QQ-034	1 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	63	64	64	NA	NA
QQ-035	2 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	64	65	65	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
QQ-036	3 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	65	65	65	NA	NA
QQ-037	4 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	64	64	64	NA	NA
QQ-038	5 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	66	67	67	62	5
QQ-039	6 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	68	69	69	64	5
QQ-040	7 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	69	69	69	63	7
QQ-041	8 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	69	69	70	65	5
QQ-042	9 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	70	70	70	70	0
QQ-043	10 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	71	71	72	72	0
QQ-044	11 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	70	71	71	71	0
QQ-045	12 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	70	70	70	70	0
QQ-046	13 Banner Spring Circle Hiking Trl	1	C	Rec.	67	No	60	61	62	NA	NA
QQ-047	30 Banner Spring Circle	1	B	Res.	67	No	67	68	69	NA	NA
QQ-048	28 Banner Spring Circle	1	B	Res.	67	No	67	68	68	NA	NA
QQ-049	24 Banner Spring Circle	1	B	Res.	67	No	67	68	68	NA	NA
QQ-050	22 Banner Spring Circle	1	B	Res.	67	No	67	67	68	NA	NA
QQ-051	20 Banner Spring Circle	1	B	Res.	67	No	67	67	68	NA	NA
QQ-052	18 Banner Spring Circle	1	B	Res.	67	No	67	67	68	NA	NA
QQ-053	16 Banner Spring Circle	1	B	Res.	67	No	66	67	68	NA	NA
QQ-054	14 Banner Spring Circle	1	B	Res.	67	No	66	66	67	NA	NA
QQ-055	12 Banner Spring Circle	1	B	Res.	67	No	65	66	67	NA	NA
QQ-056	10 Banner Spring Circle	1	B	Res.	67	No	61	62	63	NA	NA
QQ-057	8 Banner Spring Circle	1	B	Res.	67	No	60	61	62	NA	NA
QQ-058	32 Banner Spring Circle	1	B	Res.	67	No	65	66	66	NA	NA
QQ-059	29 Banner Spring Circle	1	B	Res.	67	No	58	59	60	NA	NA
QQ-060	23 Banner Spring Circle	1	B	Res.	67	No	55	55	56	NA	NA
QQ-061	21 Banner Spring Circle	1	B	Res.	67	No	54	54	55	NA	NA
QQ-062	19 Banner Spring Circle	1	B	Res.	67	No	54	54	55	NA	NA
QQ-063	17 Banner Spring Circle	1	B	Res.	67	No	53	54	54	NA	NA
QQ-064	15 Banner Spring Circle	1	B	Res.	67	No	52	52	53	NA	NA
QQ-065	11 Banner Spring Circle	1	B	Res.	67	No	53	54	54	NA	NA
QQ-066	5 Banner Spring Circle	1	B	Res.	67	No	46	46	47	NA	NA
QQ-067	6 Banner Spring Circle	1	B	Res.	67	No	60	60	61	NA	NA
QQ-068	4 Banner Spring Circle	1	B	Res.	67	No	59	59	59	NA	NA
QQ-069	34 Banner Spring Circle	1	B	Res.	67	No	63	63	64	NA	NA
QQ-070	37 Banner Spring Circle	1	B	Res.	67	No	52	53	53	NA	NA
QQ-071	41 Banner Spring Circle	1	B	Res.	67	No	46	47	47	NA	NA
QQ-072	43 Banner Spring Circle	1	B	Res.	67	No	46	46	47	NA	NA
QQ-073	45 Banner Spring Circle	1	B	Res.	67	No	44	45	45	NA	NA
QQ-074	47 Banner Spring Circle	1	B	Res.	67	No	42	42	43	NA	NA
QQ-075	49 Banner Spring Circle	1	B	Res.	67	No	40	41	41	NA	NA
QQ-076	51 Banner Spring Circle	1	B	Res.	67	No	43	43	44	NA	NA
QQ-077	1 Banner Spring Circle	1	B	Res.	67	No	44	44	45	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
QQ-078	1 Dalthan Ct	1	B	Res.	67	No	57	57	57	NA	NA
QQ-079	36 Banner Spring Circle	1	B	Res.	67	No	60	61	61	NA	NA
QQ-080	38 Banner Spring Circle	1	B	Res.	67	No	46	47	47	NA	NA
QQ-081	40 Banner Spring Circle	1	B	Res.	67	No	45	46	46	NA	NA
QQ-082	42 Banner Spring Circle	1	B	Res.	67	No	46	46	47	NA	NA
QQ-083	44 Banner Spring Circle	1	B	Res.	67	No	45	45	46	NA	NA
QQ-084	46 Banner Spring Circle	1	B	Res.	67	No	44	45	45	NA	NA
QQ-085	48 Banner Spring Circle	1	B	Res.	67	No	44	44	45	NA	NA
QQ-086	11 Echols Ln	1	B	Res.	67	No	67	67	68	NA	NA
QQ-087	9 Echols Ln	1	B	Res.	67	No	65	66	66	NA	NA
QQ-088	7 Echols Ln	1	B	Res.	67	No	63	64	64	NA	NA
QQ-089	14 Mahone Dr	1	B	Res.	67	No	63	64	64	NA	NA
QQ-090	12 Echols Ln	1	B	Res.	67	No	64	64	65	NA	NA
QQ-091	8 Echols Ln	1	B	Res.	67	No	61	61	62	NA	NA
RR-001	#203 83 Bass Dr	1	B	Res.	67	No	62	61	63	NA	NA
RR-002	#303 83 Bass Dr	1	B	Res.	67	No	66	65	66	NA	NA
RR-003	#403 83 Bass Dr	1	B	Res.	67	No	70	69	70	NA	NA
RR-004	#204 83 Bass Dr	1	B	Res.	67	No	61	60	61	NA	NA
RR-005	#304 83 Bass Dr	1	B	Res.	67	No	66	64	65	NA	NA
RR-006	#404 83 Bass Dr	1	B	Res.	67	No	69	68	69	NA	NA
RR-007	#203 79 Bass Dr	1	B	Res.	67	No	59	59	59	NA	NA
RR-008	#303 79 Bass Dr	1	B	Res.	67	No	66	63	64	NA	NA
RR-009	#403 79 Bass Dr	1	B	Res.	67	No	69	67	67	NA	NA
RR-010	#204 79 Bass Dr	1	B	Res.	67	No	59	58	58	NA	NA
RR-011	#304 79 Bass Dr	1	B	Res.	67	No	65	62	63	NA	NA
RR-012	#404 79 Bass Dr	1	B	Res.	67	No	69	66	66	NA	NA
RR-013	#102 83 Bass Dr	1	B	Res.	67	No	58	58	59	NA	NA
RR-014	#202 83 Bass Dr	1	B	Res.	67	No	62	62	64	NA	NA
RR-015	#302 83 Bass Dr	1	B	Res.	67	No	63	64	65	NA	NA
RR-016	#402 83 Bass Dr	1	B	Res.	67	No	64	64	65	NA	NA
RR-017	#101 83 Bass Dr	1	B	Res.	67	No	56	56	57	NA	NA
RR-018	#201 83 Bass Dr	1	B	Res.	67	No	60	60	62	NA	NA
RR-019	#301 83 Bass Dr	1	B	Res.	67	No	61	62	63	NA	NA
RR-020	#401 83 Bass Dr	1	B	Res.	67	No	62	62	63	NA	NA
RR-021	#102 79 Bass Dr	1	B	Res.	67	No	55	55	56	NA	NA
RR-022	#202 79 Bass Dr	1	B	Res.	67	No	59	59	61	NA	NA
RR-023	#302 79 Bass Dr	1	B	Res.	67	No	60	61	62	NA	NA
RR-024	#402 79 Bass Dr	1	B	Res.	67	No	61	61	63	NA	NA
RR-025	#101 79 Bass Dr	1	B	Res.	67	No	54	55	56	NA	NA
RR-026	#201 79 Bass Dr	1	B	Res.	67	No	58	59	60	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-027	#301 79 Bass Dr	1	B	Res.	67	No	59	60	61	NA	NA
RR-028	#401 79 Bass Dr	1	B	Res.	67	No	60	61	62	NA	NA
RR-029	#103 17 Chichester Dr	1	B	Res.	67	No	74	61	62	NA	NA
RR-030	#203 17 Chichester Dr	1	B	Res.	67	No	75	67	68	NA	NA
RR-031	#303 17 Chichester Dr	1	B	Res.	67	No	76	74	75	NA	NA
RR-032	#104 17 Chichester Dr	1	B	Res.	67	No	73	62	63	NA	NA
RR-033	#204 17 Chichester Dr	1	B	Res.	67	No	75	67	68	NA	NA
RR-034	#304 17 Chichester Dr	1	B	Res.	67	No	76	74	75	NA	NA
RR-035	#103 15 Chichester Dr	1	B	Res.	67	No	73	62	63	NA	NA
RR-036	#203 15 Chichester Dr	1	B	Res.	67	No	76	67	68	NA	NA
RR-037	#303 15 Chichester Dr	1	B	Res.	67	No	76	74	75	NA	NA
RR-038	#104 15 Chichester Dr	1	B	Res.	67	No	72	62	63	NA	NA
RR-039	#204 15 Chichester Dr	1	B	Res.	67	No	76	67	68	NA	NA
RR-040	#304 15 Chichester Dr	1	B	Res.	67	No	76	74	75	NA	NA
RR-041	#102 17 Chichester Dr	1	B	Res.	67	No	54	54	54	NA	NA
RR-042	#202 17 Chichester Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-043	#302 17 Chichester Dr	1	B	Res.	67	No	58	58	58	NA	NA
RR-044	#101 17 Chichester Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-045	#201 17 Chichester Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-046	#301 17 Chichester Dr	1	B	Res.	67	No	58	58	59	NA	NA
RR-047	#102 15 Chichester Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-048	#202 15 Chichester Dr	1	B	Res.	67	No	54	54	54	NA	NA
RR-049	#302 15 Chichester Dr	1	B	Res.	67	No	58	58	59	NA	NA
RR-050	#101 15 Chichester Dr	1	B	Res.	67	No	54	54	54	NA	NA
RR-051	#201 15 Chichester Dr	1	B	Res.	67	No	55	54	55	NA	NA
RR-052	#301 15 Chichester Dr	1	B	Res.	67	No	58	58	59	NA	NA
RR-053	#203 15 Cummings Dr	1	B	Res.	67	No	55	55	55	NA	NA
RR-054	#303 15 Cummings Dr	1	B	Res.	67	No	58	57	58	NA	NA
RR-055	#403 15 Cummings Dr	1	B	Res.	67	No	59	58	59	NA	NA
RR-056	#204 15 Cummings Dr	1	B	Res.	67	No	55	54	55	NA	NA
RR-057	#304 15 Cummings Dr	1	B	Res.	67	No	57	56	57	NA	NA
RR-058	#404 15 Cummings Dr	1	B	Res.	67	No	59	58	59	NA	NA
RR-059	#203 19 Cummings Dr	1	B	Res.	67	No	55	54	55	NA	NA
RR-060	#303 19 Cummings Dr	1	B	Res.	67	No	58	57	57	NA	NA
RR-061	#403 19 Cummings Dr	1	B	Res.	67	No	60	59	59	NA	NA
RR-062	#204 19 Cummings Dr	1	B	Res.	67	No	55	54	54	NA	NA
RR-063	#304 19 Cummings Dr	1	B	Res.	67	No	58	57	57	NA	NA
RR-064	#404 19 Cummings Dr	1	B	Res.	67	No	60	59	60	NA	NA
RR-065	#203 23 Cummings Dr	1	B	Res.	67	No	54	53	54	NA	NA
RR-066	#303 23 Cummings Dr	1	B	Res.	67	No	57	56	56	NA	NA
RR-067	#403 23 Cummings Dr	1	B	Res.	67	No	59	59	59	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-068	#204 23 Cummings Dr	1	B	Res.	67	No	53	53	53	NA	NA
RR-069	#304 23 Cummings Dr	1	B	Res.	67	No	57	55	56	NA	NA
RR-070	#404 23 Cummings Dr	1	B	Res.	67	No	59	58	58	NA	NA
RR-071	#102 15 Cummings Dr	1	B	Res.	67	No	46	47	49	NA	NA
RR-072	#202 15 Cummings Dr	1	B	Res.	67	No	51	51	53	NA	NA
RR-073	#302 15 Cummings Dr	1	B	Res.	67	No	53	54	55	NA	NA
RR-074	#402 15 Cummings Dr	1	B	Res.	67	No	54	55	56	NA	NA
RR-075	#101 15 Cummings Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-076	#201 15 Cummings Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-077	#301 15 Cummings Dr	1	B	Res.	67	No	48	49	50	NA	NA
RR-078	#401 15 Cummings Dr	1	B	Res.	67	No	51	51	52	NA	NA
RR-079	#102 19 Cummings Dr	1	B	Res.	67	No	43	44	45	NA	NA
RR-080	#202 19 Cummings Dr	1	B	Res.	67	No	41	42	43	NA	NA
RR-081	#302 19 Cummings Dr	1	B	Res.	67	No	46	46	47	NA	NA
RR-082	#402 19 Cummings Dr	1	B	Res.	67	No	50	50	50	NA	NA
RR-083	#101 19 Cummings Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-084	#201 19 Cummings Dr	1	B	Res.	67	No	42	42	43	NA	NA
RR-085	#301 19 Cummings Dr	1	B	Res.	67	No	46	46	47	NA	NA
RR-086	#401 19 Cummings Dr	1	B	Res.	67	No	49	50	50	NA	NA
RR-087	#102 23 Cummings Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-088	#202 23 Cummings Dr	1	B	Res.	67	No	42	42	43	NA	NA
RR-089	#302 23 Cummings Dr	1	B	Res.	67	No	45	46	47	NA	NA
RR-090	#402 23 Cummings Dr	1	B	Res.	67	No	49	50	50	NA	NA
RR-091	#101 23 Cummings Dr	1	B	Res.	67	No	43	43	44	NA	NA
RR-092	#201 23 Cummings Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-093	#301 23 Cummings Dr	1	B	Res.	67	No	45	45	46	NA	NA
RR-094	#401 23 Cummings Dr	1	B	Res.	67	No	49	50	50	NA	NA
RR-095	#203 31 Cummings Dr	1	B	Res.	67	No	49	49	50	NA	NA
RR-096	#303 31 Cummings Dr	1	B	Res.	67	No	52	52	52	NA	NA
RR-097	#403 31 Cummings Dr	1	B	Res.	67	No	57	56	56	NA	NA
RR-098	#204 31 Cummings Dr	1	B	Res.	67	No	48	48	49	NA	NA
RR-099	#304 31 Cummings Dr	1	B	Res.	67	No	51	51	51	NA	NA
RR-100	#404 31 Cummings Dr	1	B	Res.	67	No	55	55	55	NA	NA
RR-101	#203 35 Cummings Dr	1	B	Res.	67	No	47	47	48	NA	NA
RR-102	#303 35 Cummings Dr	1	B	Res.	67	No	50	50	50	NA	NA
RR-103	#403 35 Cummings Dr	1	B	Res.	67	No	54	54	54	NA	NA
RR-104	#204 35 Cummings Dr	1	B	Res.	67	No	47	47	47	NA	NA
RR-105	#304 35 Cummings Dr	1	B	Res.	67	No	49	49	49	NA	NA
RR-106	#404 35 Cummings Dr	1	B	Res.	67	No	52	52	52	NA	NA
RR-107	#102 31 Cummings Dr	1	B	Res.	67	No	41	42	42	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-108	#202 31 Cummings Dr	1	B	Res.	67	No	41	42	42	NA	NA
RR-109	#302 31 Cummings Dr	1	B	Res.	67	No	45	45	46	NA	NA
RR-110	#402 31 Cummings Dr	1	B	Res.	67	No	49	49	50	NA	NA
RR-111	#101 31 Cummings Dr	1	B	Res.	67	No	43	43	44	NA	NA
RR-112	#201 31 Cummings Dr	1	B	Res.	67	No	42	42	43	NA	NA
RR-113	#301 31 Cummings Dr	1	B	Res.	67	No	46	47	47	NA	NA
RR-114	#401 31 Cummings Dr	1	B	Res.	67	No	50	50	51	NA	NA
RR-115	#102 35 Cummings Dr	1	B	Res.	67	No	43	44	45	NA	NA
RR-116	#202 35 Cummings Dr	1	B	Res.	67	No	42	43	45	NA	NA
RR-117	#302 35 Cummings Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-118	#402 35 Cummings Dr	1	B	Res.	67	No	50	51	51	NA	NA
RR-119	#101 35 Cummings Dr	1	B	Res.	67	No	43	44	45	NA	NA
RR-120	#201 35 Cummings Dr	1	B	Res.	67	No	44	45	46	NA	NA
RR-121	#301 35 Cummings Dr	1	B	Res.	67	No	47	48	49	NA	NA
RR-122	#401 35 Cummings Dr	1	B	Res.	67	No	51	51	52	NA	NA
RR-123	#102 46 Davenport Dr	1	B	Res.	67	No	51	51	53	NA	NA
RR-124	#202 46 Davenport Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-125	#302 46 Davenport Dr	1	B	Res.	67	No	56	57	58	NA	NA
RR-126	#101 46 Davenport Dr	1	B	Res.	67	No	51	51	52	NA	NA
RR-127	#201 46 Davenport Dr	1	B	Res.	67	No	54	54	55	NA	NA
RR-128	#301 46 Davenport Dr	1	B	Res.	67	No	56	56	58	NA	NA
RR-129	#102 42 Davenport Dr	1	B	Res.	67	No	51	51	52	NA	NA
RR-130	#202 42 Davenport Dr	1	B	Res.	67	No	53	54	55	NA	NA
RR-131	#302 42 Davenport Dr	1	B	Res.	67	No	56	56	57	NA	NA
RR-132	#101 42 Davenport Dr	1	B	Res.	67	No	50	50	51	NA	NA
RR-133	#201 42 Davenport Dr	1	B	Res.	67	No	53	53	54	NA	NA
RR-134	#301 42 Davenport Dr	1	B	Res.	67	No	55	56	57	NA	NA
RR-135	#102 38 Davenport Dr	1	B	Res.	67	No	49	50	51	NA	NA
RR-136	#202 38 Davenport Dr	1	B	Res.	67	No	53	53	54	NA	NA
RR-137	#302 38 Davenport Dr	1	B	Res.	67	No	55	55	57	NA	NA
RR-138	#101 38 Davenport Dr	1	B	Res.	67	No	49	49	51	NA	NA
RR-139	#201 38 Davenport Dr	1	B	Res.	67	No	52	52	53	NA	NA
RR-140	#301 38 Davenport Dr	1	B	Res.	67	No	54	55	56	NA	NA
RR-141	#103 46 Davenport Dr	1	B	Res.	67	No	43	44	45	NA	NA
RR-142	#203 46 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-143	#303 46 Davenport Dr	1	B	Res.	67	No	49	50	51	NA	NA
RR-144	#104 46 Davenport Dr	1	B	Res.	67	No	41	42	43	NA	NA
RR-145	#204 46 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-146	#304 46 Davenport Dr	1	B	Res.	67	No	46	47	47	NA	NA
RR-147	#103 42 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-148	#203 42 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-149	#303 42 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-150	#104 42 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-151	#204 42 Davenport Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-152	#304 42 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-153	#103 38 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-154	#203 38 Davenport Dr	1	B	Res.	67	No	43	44	45	NA	NA
RR-155	#303 38 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-156	#104 38 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-157	#204 38 Davenport Dr	1	B	Res.	67	No	44	45	45	NA	NA
RR-158	#304 38 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-159	#203 15 Davenport Dr	1	B	Res.	67	No	39	40	41	NA	NA
RR-160	#303 15 Davenport Dr	1	B	Res.	67	No	41	42	42	NA	NA
RR-161	#403 15 Davenport Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-162	#204 15 Davenport Dr	1	B	Res.	67	No	39	41	41	NA	NA
RR-163	#304 15 Davenport Dr	1	B	Res.	67	No	41	42	42	NA	NA
RR-164	#404 15 Davenport Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-165	#203 11 Davenport Dr	1	B	Res.	67	No	39	41	41	NA	NA
RR-166	#303 11 Davenport Dr	1	B	Res.	67	No	41	42	42	NA	NA
RR-167	#403 11 Davenport Dr	1	B	Res.	67	No	44	45	45	NA	NA
RR-168	#204 11 Davenport Dr	1	B	Res.	67	No	40	41	41	NA	NA
RR-169	#304 11 Davenport Dr	1	B	Res.	67	No	41	42	42	NA	NA
RR-170	#404 11 Davenport Dr	1	B	Res.	67	No	44	45	45	NA	NA
RR-171	#104 2 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-172	#204 2 Davenport Dr	1	B	Res.	67	No	43	43	43	NA	NA
RR-173	#304 2 Davenport Dr	1	B	Res.	67	No	45	46	46	NA	NA
RR-174	#103 2 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-175	#203 2 Davenport Dr	1	B	Res.	67	No	43	43	44	NA	NA
RR-176	#303 2 Davenport Dr	1	B	Res.	67	No	45	46	46	NA	NA
RR-177	#104 6 Davenport Dr	1	B	Res.	67	No	44	45	45	NA	NA
RR-178	#204 6 Davenport Dr	1	B	Res.	67	No	45	45	46	NA	NA
RR-179	#304 6 Davenport Dr	1	B	Res.	67	No	47	47	47	NA	NA
RR-180	#103 6 Davenport Dr	1	B	Res.	67	No	46	46	47	NA	NA
RR-181	#203 6 Davenport Dr	1	B	Res.	67	No	47	48	48	NA	NA
RR-182	#303 6 Davenport Dr	1	B	Res.	67	No	49	50	50	NA	NA
RR-183	#104 10 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-184	#204 10 Davenport Dr	1	B	Res.	67	No	49	50	50	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-185	#304 10 Davenport Dr	1	B	Res.	67	No	51	52	52	NA	NA
RR-186	#103 10 Davenport Dr	1	B	Res.	67	No	46	47	48	NA	NA
RR-187	#203 10 Davenport Dr	1	B	Res.	67	No	49	50	50	NA	NA
RR-188	#303 10 Davenport Dr	1	B	Res.	67	No	52	52	53	NA	NA
RR-189	#101 2 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-190	#201 2 Davenport Dr	1	B	Res.	67	No	42	43	44	NA	NA
RR-191	#301 2 Davenport Dr	1	B	Res.	67	No	45	46	46	NA	NA
RR-192	#102 2 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-193	#202 2 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-194	#302 2 Davenport Dr	1	B	Res.	67	No	45	45	46	NA	NA
RR-195	#101 6 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-196	#201 6 Davenport Dr	1	B	Res.	67	No	43	43	44	NA	NA
RR-197	#301 6 Davenport Dr	1	B	Res.	67	No	45	45	46	NA	NA
RR-198	#102 6 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-199	#202 6 Davenport Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-200	#302 6 Davenport Dr	1	B	Res.	67	No	45	46	46	NA	NA
RR-201	#101 10 Davenport Dr	1	B	Res.	67	No	42	43	43	NA	NA
RR-202	#201 10 Davenport Dr	1	B	Res.	67	No	43	44	44	NA	NA
RR-203	#301 10 Davenport Dr	1	B	Res.	67	No	45	46	46	NA	NA
RR-204	#102 10 Davenport Dr	1	B	Res.	67	No	43	43	44	NA	NA
RR-205	#202 10 Davenport Dr	1	B	Res.	67	No	44	44	45	NA	NA
RR-206	#302 10 Davenport Dr	1	B	Res.	67	No	46	46	46	NA	NA
RR-207	26 Davenport Dr	1	C	Rec.	67	No	44	45	46	NA	NA
RR-208	34 Appletree Ln	1	B	Res.	67	No	73	67	68	NA	NA
RR-209	33 Appletree Ln	1	B	Res.	67	No	77	66	67	NA	NA
RR-210	31 Appletree Ln	1	B	Res.	67	No	77	66	67	NA	NA
RR-211	29 Appletree Ln	1	B	Res.	67	No	73	66	67	NA	NA
RR-212	27 Appletree Ln	1	B	Res.	67	No	72	65	66	NA	NA
RR-213	25 Appletree Ln	1	B	Res.	67	No	70	66	66	NA	NA
RR-214	23 Appletree Ln	1	B	Res.	67	No	69	65	65	NA	NA
RR-215	21 Appletree Ln	1	B	Res.	67	No	67	63	64	NA	NA
RR-216	4 Beech Tree Ct	1	B	Res.	67	No	68	65	65	NA	NA
RR-217	6 Beech Tree Ct	1	B	Res.	67	No	71	67	67	NA	NA
RR-218	8 Beech Tree Ct	1	B	Res.	67	No	76	73	74	NA	NA
RR-219	10 Beech Tree Ct	1	B	Res.	67	No	76	72	73	NA	NA
RR-220	9 Beech Tree Ct	1	B	Res.	67	No	75	67	68	NA	NA
RR-221	7 Beech Tree Ct	1	B	Res.	67	No	70	65	65	NA	NA
RR-222	5 Beech Tree Ct	1	B	Res.	67	No	67	62	63	NA	NA
RR-223	3 Beech Tree Ct	1	B	Res.	67	No	65	61	62	NA	NA
RR-224	1 Beech Tree Ct	1	B	Res.	67	No	63	60	60	NA	NA
RR-225	17 Appletree Ln	1	B	Res.	67	No	64	58	59	NA	NA
RR-226	15 Appletree Ln	1	B	Res.	67	No	63	56	57	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
RR-227	11 Appletree Ln	1	B	Res.	67	No	62	55	55	NA	NA
RR-228	9 Appletree Ln	1	B	Res.	67	No	60	54	55	NA	NA
RR-229	7 Appletree Ln	1	B	Res.	67	No	58	53	53	NA	NA
RR-230	3 Willow Ln	1	B	Res.	67	No	55	52	52	NA	NA
RR-231	4 Willow Ln	1	B	Res.	67	No	57	52	53	NA	NA
RR-232	5 Willow Ln	1	B	Res.	67	No	57	51	52	NA	NA
RR-233	6 Willow Ln	1	B	Res.	67	No	58	52	53	NA	NA
RR-234	7 Willow Ln	1	B	Res.	67	No	58	52	52	NA	NA
RR-235	8 Willow Ln	1	B	Res.	67	No	59	55	55	NA	NA
RR-236	9 Willow Ln	1	B	Res.	67	No	62	57	58	NA	NA
RR-237	10 Willow Ln	1	B	Res.	67	No	63	59	59	NA	NA
RR-238	11 Willow Ln	1	B	Res.	67	No	60	58	58	NA	NA
RR-239	12 Willow Ln	1	B	Res.	67	No	68	65	65	NA	NA
RR-240	13 Willow Ln	1	B	Res.	67	No	73	67	68	NA	NA
RR-241	14 Willow Ln	1	B	Res.	67	No	74	65	66	NA	NA
RR-242	15 Willow Ln	1	B	Res.	67	No	66	60	61	NA	NA
RR-243	16 Willow Ln	1	B	Res.	67	No	58	59	59	NA	NA
RR-244	17 Willow Ln	1	B	Res.	67	No	55	55	56	NA	NA
RR-245	18 Willow Ln	1	B	Res.	67	No	50	51	52	NA	NA
RR-246	19 Willow Ln	1	B	Res.	67	No	50	50	51	NA	NA
RR-247	20 Willow Ln	1	B	Res.	67	No	48	49	50	NA	NA
RR-248	21 Willow Ln	1	B	Res.	67	No	48	49	50	NA	NA
RR-249	22 Willow Ln	1	B	Res.	67	No	49	49	49	NA	NA
RR-250	23 Willow Ln	1	B	Res.	67	No	50	49	49	NA	NA
RR-251	24 Willow Ln	1	B	Res.	67	No	48	47	48	NA	NA
RR-252	32 Appletree Ln	1	B	Res.	67	No	64	61	62	NA	NA
RR-253	30 Appletree Ln	1	B	Res.	67	No	65	62	62	NA	NA
RR-254	28 Appletree Ln	1	B	Res.	67	No	63	60	61	NA	NA
RR-255	26 Appletree Ln	1	B	Res.	67	No	61	58	59	NA	NA
RR-256	24 Appletree Ln	1	B	Res.	67	No	60	57	58	NA	NA
RR-257	22 Appletree Ln	1	B	Res.	67	No	60	58	59	NA	NA
RR-258	20 Appletree Ln	1	B	Res.	67	No	61	58	59	NA	NA
RR-259	18 Appletree Ln	1	B	Res.	67	No	60	58	58	NA	NA
RR-260	16 Appletree Ln	1	B	Res.	67	No	60	57	58	NA	NA
RR-261	14 Appletree Ln	1	B	Res.	67	No	61	58	58	NA	NA
RR-262	12 Appletree Ln	1	B	Res.	67	No	55	52	52	NA	NA
RR-263	10 Appletree Ln	1	B	Res.	67	No	51	49	49	NA	NA
RR-264	8 Appletree Ln	1	B	Res.	67	No	46	46	47	NA	NA
RR-265	6 Appletree Ln	1	B	Res.	67	No	47	47	47	NA	NA
RR-266	4 Appletree Ln	1	B	Res.	67	No	47	48	48	NA	NA
RR-267	2 Willow Ln	1	B	Res.	67	No	47	48	49	NA	NA
SS-001	16 Bishop Ln	1	B	Res.	67	No	59	62	63	62	0

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CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
SS-002	18 Rehoboth Dr	1	B	Res.	67	No	56	62	64	58	6
SS-003	29 Rehoboth Dr	1	B	Res.	67	No	68	68	69	62	7
SS-004	68 Wyche Rd	1	B	Res.	67	No	58	59	61	58	3
SS-005	76 Buttercup Ln	1	B	Res.	67	No	69	70	70	70	0
SS-006	53 Ellison Ct	1	B	Res.	67	No	70	71	71	62	9
SS-007	68 Buttercup Ln	1	B	Res.	67	No	61	62	63	58	5
SS-008	48 Ellison Ct	1	B	Res.	67	No	66	67	67	59	8
SS-009	38 Ellison Ct	1	B	Res.	67	No	62	64	64	57	7
SS-010	1231 American Legion Rd	1	B	Res.	67	No	65	65	66	61	6
SS-011	1241 American Legion Rd	1	B	Res.	67	No	57	58	59	53	6
SS-012	1249 American Legion Rd	1	B	Res.	67	No	57	58	59	54	5
SS-013	1251 American Legion Rd	1	B	Res.	67	No	58	58	59	54	5
SS-014	1210 American Legion Rd	1	B	Res.	67	No	64	65	65	61	5
SS-015	1222 American Legion Rd	1	B	Res.	67	No	64	65	65	60	5
SS-016	52 Nats Court Rd	1	B	Res.	67	No	67	69	68	62	6
SS-017	49 Nats Court Rd	1	B	Res.	67	No	67	69	68	61	7
SS-018	47 Nats Court Rd	1	B	Res.	67	No	66	68	67	62	5
TT-001	86 Bowers Ln	1	B	Res.	67	No	68	69	68	62	7
TT-002	59 Bowers Ln	1	B	Res.	67	No	59	60	60	58	2
TT-003	45 Bowers Ln	1	B	Res.	67	No	61	62	61	60	1
TT-004	29 Bowers Ln	1	B	Res.	67	No	63	63	63	63	0
TT-005	17 Bowers Ln	1	B	Res.	67	No	58	59	59	59	0
TT-006	1183 Ramoth Church Rd	1	B	Res.	67	No	62	63	62	62	0
TT-007	1189 Ramoth Church Rd	1	B	Res.	67	No	63	64	64	64	0
TT-008	23 Ravewood Dr	1	B	Res.	67	No	62	63	64	64	7
TT-009	30 Ravewood Dr	1	B	Res.	67	No	54	55	56	55	1
TT-010	44 Ravewood Dr	1	B	Res.	67	No	57	58	59	58	2
TT-011	50 Pine View Dr	1	B	Res.	67	No	54	56	56	55	2
TT-012	46 Pine View Dr	1	B	Res.	67	No	55	57	56	55	1
TT-013	9 Pine View Ct	1	B	Res.	67	No	64	65	66	61	5
TT-014	10 Pine View Ct	1	B	Res.	67	No	60	62	62	60	2
TT-015	20 Old Enon Rd	1	B	Res.	67	No	66	67	68	62	7
TT-016	36 Old Enon Rd	1	B	Res.	67	No	63	64	65	61	5
TT-017	145 Pine View Dr	1	B	Res.	67	No	52	53	54	NA	NA
TT-018	135 Pine View Dr	1	B	Res.	67	No	53	54	55	NA	NA
TT-019	125 Pine View Dr	1	B	Res.	67	No	50	51	51	NA	NA
TT-020	97 Pine View Dr	1	B	Res.	67	No	47	48	49	NA	NA
TT-021	79 Pine View Dr	1	B	Res.	67	No	48	49	49	NA	NA
TT-022	75 Pine View Dr	1	B	Res.	67	No	49	50	50	NA	NA
TT-023	25 Pine View Dr	1	B	Res.	67	No	47	48	48	NA	NA
TT-024	175 Pine View Dr	1	B	Res.	67	No	47	48	49	NA	NA
TT-025	159 Pine View Dr	1	B	Res.	67	No	44	45	46	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
TT-026	24 Bear Mountain Ln	1	B	Res.	67	No	45	47	47	NA	NA
TT-027	25 Allison Dr	1	B	Res.	67	No	46	47	47	NA	NA
TT-028	32 Allison Dr	1	B	Res.	67	No	47	48	48	NA	NA
TT-029	71 Pine View Dr	1	B	Res.	67	No	48	49	50	NA	NA
TT-030	61 Pine View Dr	1	B	Res.	67	No	52	53	53	NA	NA
TT-031	45 Pine View Dr	1	B	Res.	67	No	46	47	47	NA	NA
TT-032	89 Wyatt Ln	1	B	Res.	67	No	58	59	59	NA	NA
TT-033	90 Wyatt Ln	1	B	Res.	67	No	55	57	57	NA	NA
UU-001	28 Beauregard Dr	1	B	Res.	67	No	63	64	65	64	7
UU-002	8 Beauregard Dr	1	B	Res.	67	No	61	62	62	63	5
UU-003	4 Beauregard Dr	1	B	Res.	67	No	59	60	60	62	2
UU-004	190 Enon Rd	1	B	Res.	67	No	57	59	59	61	1
UU-005	184 Enon Rd	1	B	Res.	67	No	56	57	58	59	1
UU-006	176 Enon Rd	1	B	Res.	67	No	57	58	59	59	1
UU-007	170 Enon Rd	1	B	Res.	67	No	57	59	59	58	2
UU-008	162 Enon Rd	1	B	Res.	67	No	57	59	59	58	2
UU-009	154 Enon Rd	1	B	Res.	67	No	57	59	59	NA	NA
UU-010	150 Enon Rd	1	B	Res.	67	No	57	58	58	NA	NA
UU-011	146 Enon Rd	1	B	Res.	67	No	55	56	57	NA	NA
UU-012	140 Enon Rd	1	B	Res.	67	No	54	55	55	NA	NA
UU-013	136 Enon Rd	1	B	Res.	67	No	53	54	55	NA	NA
UU-014	122 Enon Rd	1	B	Res.	67	No	49	51	51	NA	NA
UU-015	155 Enon Rd	1	B	Res.	67	No	58	59	59	NA	NA
UU-016	149 Enon Rd	1	B	Res.	67	No	57	58	58	NA	NA
UU-017	131 Enon Rd	1	B	Res.	67	No	59	60	60	NA	NA
UU-018	119 Enon Rd	1	B	Res.	67	No	59	60	60	NA	NA
UU-019	109 Enon Rd	1	B	Res.	67	No	58	60	60	NA	NA
UU-020	44 Stafford Indians Ln	1	B	Res.	67	No	63	64	64	63	1
UU-021	60 Stafford Indians Ln	1	B	Res.	67	No	65	67	66	65	1
UU-022	32 Stafford Indians Ln	1	B	Res.	67	No	59	60	61	59	1
UU-023	42 Stafford Indians Ln	1	B	Res.	67	No	60	61	61	59	2
UU-024	48 Stafford Indians Ln	1	B	Res.	67	No	62	63	63	62	2
UU-025	65 Stafford Indians Ln	1	B	Res.	67	No	61	63	63	61	1
UU-026	59 Stafford Indians Ln	1	B	Res.	67	No	62	63	63	61	2
UU-027	37 Stafford Indians Ln	1	B	Res.	67	No	58	60	60	58	2
UU-028	49 Stafford Indians Ln	1	B	Res.	67	No	59	60	61	59	2
UU-029	125 Ralph Williams Dr	1	C	Rec.	67	No	66	67	68	61	6
UU-030	125 Ralph Williams Dr	1	C	Rec.	67	No	65	66	67	61	6
UU-031	125 Ralph Williams Dr	1	C	Rec.	67	No	65	66	66	61	5
UU-032	125 Ralph Williams Dr	1	C	Rec.	67	No	65	66	66	61	5
UU-033	125 Ralph Williams Dr	1	C	Rec.	67	No	64	66	66	60	6
UU-034	125 Ralph Williams Dr	1	C	Rec.	67	No	64	65	66	60	6

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
UU-035	125 Ralph Williams Dr	1	C	Rec.	67	No	63	65	65	60	5
UU-036	125 Ralph Williams Dr	1	C	Rec.	67	No	63	64	64	60	5
UU-037	125 Ralph Williams Dr	1	C	Rec.	67	No	63	64	65	60	4
UU-038	125 Ralph Williams Dr	1	C	Rec.	67	No	64	65	66	61	5
UU-039	125 Ralph Williams Dr	1	C	Rec.	67	No	63	64	65	59	6
UU-040	125 Ralph Williams Dr	1	C	Rec.	67	No	61	63	63	58	6
UU-041	125 Ralph Williams Dr	1	C	Rec.	67	No	60	61	62	57	5
UU-042	125 Ralph Williams Dr	1	C	Rec.	67	No	61	63	63	59	4
UU-043	125 Ralph Williams Dr	1	C	Rec.	67	No	61	63	63	59	4
UU-044	125 Ralph Williams Dr	1	C	Rec.	67	No	60	61	62	57	5
UU-045	125 Ralph Williams Dr	1	C	Rec.	67	No	60	61	62	57	5
UU-046	125 Ralph Williams Dr	1	C	Rec.	67	No	59	60	61	57	4
UU-047	125 Ralph Williams Dr	1	C	Rec.	67	No	58	60	60	57	4
UU-048	125 Ralph Williams Dr	1	C	Rec.	67	No	59	60	61	57	4
UU-049	125 Ralph Williams Dr	1	C	Rec.	67	No	59	60	61	56	4
UU-050	125 Ralph Williams Dr	1	C	Rec.	67	No	58	60	60	56	4
UU-051	125 Ralph Williams Dr	1	C	Rec.	67	No	57	59	59	55	4
UU-052	125 Ralph Williams Dr	1	C	Rec.	67	No	57	59	59	56	3
UU-053	125 Ralph Williams Dr	1	C	Rec.	67	No	58	60	60	57	3
UU-054	125 Ralph Williams Dr	1	C	Rec.	67	No	58	59	60	56	4
UU-055	125 Ralph Williams Dr	1	C	Rec.	67	No	57	58	58	55	4
UU-056	125 Ralph Williams Dr	1	C	Rec.	67	No	56	57	58	54	3
UU-057	125 Ralph Williams Dr	1	C	Rec.	67	No	56	58	58	55	3
UU-058	125 Ralph Williams Dr	1	C	Rec.	67	No	58	59	59	56	3
UU-059	125 Ralph Williams Dr	1	C	Rec.	67	No	63	65	65	60	5
UU-060	125 Ralph Williams Dr	1	C	Rec.	67	No	66	67	67	63	5
UU-061	125 Ralph Williams Dr	1	C	Rec.	67	No	65	66	66	61	5
UU-062	125 Ralph Williams Dr	1	C	Rec.	67	No	65	66	66	61	6
UU-063	125 Ralph Williams Dr	1	C	Rec.	67	No	65	67	67	60	7
UU-064	125 Ralph Williams Dr	1	C	Rec.	67	No	65	67	67	60	7
UU-065	125 Ralph Williams Dr	1	C	Rec.	67	No	64	65	65	61	4
UU-066	125 Ralph Williams Dr	1	C	Rec.	67	No	63	65	65	60	4
UU-067	125 Ralph Williams Dr	1	C	Rec.	67	No	63	64	64	60	5
UU-068	125 Ralph Williams Dr	1	C	Rec.	67	No	63	65	65	60	5
UU-069	125 Ralph Williams Dr	1	C	Rec.	67	No	64	65	65	59	6
UU-070	125 Ralph Williams Dr	1	C	Rec.	67	No	62	63	63	60	4
UU-071	125 Ralph Williams Dr	1	C	Rec.	67	No	62	63	63	59	4
UU-072	125 Ralph Williams Dr	1	C	Rec.	67	No	62	63	63	59	4
UU-073	125 Ralph Williams Dr	1	C	Rec.	67	No	62	64	64	59	5
UU-074	125 Ralph Williams Dr	1	C	Rec.	67	No	60	62	62	59	3
UU-075	125 Ralph Williams Dr	1	C	Rec.	67	No	61	62	62	58	4
UU-076	125 Ralph Williams Dr	1	C	Rec.	67	No	61	62	62	59	4

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
UU-077	125 Ralph Williams Dr	1	C	Rec.	67	No	61	63	63	58	4
VV-001	60 Samuels Ln	1	B	Res.	67	No	71	71	72	67	5
VV-002	54 Samuels Ln	1	B	Res.	67	No	70	70	71	65	5
VV-003	544 Truslow Rd	1	B	Res.	67	No	69	70	70	66	5
VV-004	536 Truslow Rd	1	B	Res.	67	No	71	72	72	65	7
WW-001	478 Truslow Rd	1	B	Res.	67	No	66	67	67	61	7
WW-002	484 Truslow Rd	1	B	Res.	67	No	62	63	64	59	5
WW-003	490 Truslow Rd	1	B	Res.	67	No	64	65	66	63	3
WW-004	2 Beagle Rd	1	B	Res.	67	No	72	73	73	66	7
WW-005	8 Beagle Rd	1	B	Res.	67	No	65	66	67	61	6
WW-006	10 Beagle Rd	1	B	Res.	67	No	61	62	63	58	6
WW-007	48 Old Falls Rd	1	B	Res.	67	No	64	65	64	60	5
WW-008	485 Truslow Rd	1	B	Res.	67	No	59	61	61	60	1
WW-009	477 Truslow Rd	1	B	Res.	67	No	56	58	58	58	0
WW-010	25 Virginia Ave	1	B	Res.	67	No	53	55	54	53	1
WW-011	24 Virginia Ave	1	B	Res.	67	No	52	53	53	51	2
WW-012	28 Virginia Ave	1	B	Res.	67	No	50	52	51	49	2
WW-013	42 Beagle Rd	1	B	Res.	67	No	54	56	55	54	1
WW-014	58 Beagle Rd	1	B	Res.	67	No	52	53	53	52	0
WW-015	69 Old Falls Rd	1	B	Res.	67	No	67	68	68	63	5
WW-016	37 Old Falls Rd	1	B	Res.	67	No	62	63	63	59	4
WW-017	27 Old Falls Rd	1	B	Res.	67	No	60	61	61	58	3
WW-018	31 Pitt Rd	1	B	Res.	67	No	66	67	67	61	6
WW-019	36 Limerick Ln	1	B	Res.	67	No	67	68	68	61	7
WW-020	56 Limerick Ln	1	B	Res.	67	No	68	68	69	62	7
WW-021	61 Limerick Ln	1	B	Res.	67	No	63	64	64	59	5
WW-022	70 Beagle Rd	1	B	Res.	67	No	55	56	56	55	1
WW-023	11 Old Falls Rd	1	B	Res.	67	No	56	57	57	56	1
WW-024	74 Beagle Rd	1	B	Res.	67	No	57	58	58	55	3
WW-025	76 Beagle Rd	1	B	Res.	67	No	60	61	61	55	5
XX-001	14 Simpson Rd	1	E	Com.	72	No	51	52	53	NA	NA
XX-002	74 Simpson Rd	1	B	Res.	67	No	68	68	69	63	7
XX-003	95 Riverside Pkwy	1	D	Int.	52	No	44	42	43	NA	NA
XX-004	184 Riverside Pkwy	1	B	Res.	67	No	67	71	72	66	7
XX-005	188 Riverside Pkwy	1	B	Res.	67	No	64	69	69	63	6
XX-006	251 Riverside Pkwy	1	B	Res.	67	No	64	68	68	68	0
YY-001	386 Warrenton Rd	1	E	Com.	72	No	59	60	60	NA	NA
YY-002	401 Warrenton Rd	1	E	Com.	72	No	60	62	62	NA	NA
YY-003	400 Musselman Rd	1	B	Res.	67	No	60	62	61	NA	NA
YY-004	402 Musselman Rd	1	B	Res.	67	No	59	61	60	NA	NA
YY-005	308 Musselman Rd	1	B	Res.	67	No	58	60	60	NA	NA
YY-006	304 Musselman Rd	1	B	Res.	67	No	60	62	61	NA	NA

Table C-1: Predicted Noise Levels for I-95 Fredericksburg Extension Study

CNE Site No.	Address	Recp. Unit	Cat.*	Land Use*	NAC Imp. Crit.	Above Point of Intersection?	Loudest-Hour Leq (dBA)**				
							Existing	No-Build	Build		
									No-Barrier	With-Barrier	IL
YY-007	302 Musselman Rd	1	B	Res.	67	No	59	61	60	NA	NA
YY-008	214 Musselman Rd	1	B	Res.	67	No	59	61	61	60	0
YY-009	212 Musselman Rd	1	B	Res.	67	No	58	60	60	60	0
YY-010	210 Musselman Rd	1	B	Res.	67	No	59	61	61	60	0
YY-011	208 Musselman Rd	1	B	Res.	67	No	58	60	60	60	1
YY-012	206 Musselman Rd	1	B	Res.	67	No	58	60	60	60	1
YY-013	204 Musselman Rd	1	B	Res.	67	No	58	60	60	59	1
YY-014	202 Musselman Rd	1	B	Res.	67	No	58	60	60	59	1
YY-015	200 Musselman Rd	1	B	Res.	67	No	57	59	60	59	1
YY-016	130 Musselman Rd	1	B	Res.	67	No	55	58	58	57	1
YY-017	124 Musselman Rd	1	B	Res.	67	No	58	60	60	59	1
YY-018	122 Musselman Rd	1	B	Res.	67	No	59	61	61	60	2
YY-019	120 Musselman Rd	1	B	Res.	67	No	60	62	62	60	2
YY-020	118 Musselman Rd	1	B	Res.	67	No	63	64	65	60	4
YY-021	118A Musselman Rd	1	B	Res.	67	No	67	69	69	64	5
YY-022	112 Musselman Rd	1	B	Res.	67	No	64	65	66	61	5
YY-023	110 Musselman Rd	1	B	Res.	67	No	66	68	68	62	6
YY-024	106 Musselman Rd	1	B	Res.	67	No	69	71	70	62	8
YY-025	100 Musselman Rd	1	B	Res.	67	No	76	77	76	62	15
YY-026	121 Musselman Rd	1	B	Res.	67	No	57	59	59	58	1
YY-027	117 Musselman Rd	1	B	Res.	67	No	59	61	61	59	2
YY-028	115 Musselman Rd	1	B	Res.	67	No	61	63	63	60	3
YY-029	8 Krieger Ln	1	B	Res.	67	No	67	68	68	62	6
YY-030	12 Krieger Ln	1	B	Res.	67	No	65	66	66	61	5
YY-031	16 Krieger Ln	1	B	Res.	67	No	59	61	61	59	2

* Cat. Refers to FHWA Activity Category. Res.= Residential, Rec.= Recreational, Mon.= Noise Monitoring Site, Com.= Commercial, Int.=Interior Institutional

** Red numbers indicate noise impact due to NAC or Substantial Increase in existing noise levels. Some subtractions may appear to be incorrect due to rounding of decibels. 0 or NA indicates receptors not behind barriers, or set back and not impacted where benefits were not determined. Shaded Rows are receptors above the point of intersection and not counted as benefited.

Source: RK&K, 2017

APPENDIX D:
Noise Monitoring Data

NOISE MONITORING DATA

This appendix includes data acquired during the noise measurement program, including site sketches, photographs, field noise and traffic data sheets, and noise monitor calibration data. Also included are noise measurement results spreadsheets, which include site summary results, noise monitor acoustic data with period Leq calculations, and traffic counts.

I-95 Fredericksburg Ext.
VDOT
UPC 110527



Noise Monitoring Data Summary

I-95 Fredericksburg Ext. Noise Monitoring Data Summary

Rec	Address	Date	Time Start	Duration	Leq-Tot	Leq-Traffic
M-1.1	95 Riverside Pkwy - S. Entrance	3/21/2017	10:20	30 min	67	66
M-1.2	150 Riverside Pkwy - S. Entrance	3/21/2017	10:20	30 min	70	70
M-1.3	95 Riverside Pkwy - W. Entrance	3/21/2017	10:20	30 min	62	61
M-2.1	100 Musselman Rd	3/21/2017	11:45	30 min	73	73
M-2.2	S. Corner Musselman & Krieger Ln.	3/21/2017	11:45	30 min	67	66
M-2.3	117 Musselman Rd - SE of mailbox	3/21/2017	11:45	30 min	65	63
M-3.1	125 Ralph Wms. Dr sidewlk N. end	3/21/2017	13:05	30 min	67	67
M-3.2	125 Ralph Wms. Dr field bollards	3/21/2017	13:05	30 min	64	64
M-3.3	125 Ralph Wms. Dr ut.pole btwn N&W fld	3/21/2017	13:05	30 min	62	62
M-4.1	R/W fence E of 50 Pine View Dr	3/21/2017	15:05	30 min	65	65
M-4.2	R/W fence SE of 46 Pine View Dr	3/21/2017	15:05	30 min	65	65
M-4.3	R/W fence E of 9 Pine View Ct	3/21/2017	15:05	30 min	69	69
M-5.1	53 Ellison Ct - NE lot corner	3/21/2017	16:05	30 min	69	69
M-5.2	53 Ellison Ct - Driveway apron	3/21/2017	16:05	30 min	63	63
M-5.3	38 Ellison Ct - Electrical box	3/21/2017	16:05	30 min	62	62
M-6.1	Berm top N of Bass Dr car wash	3/21/2017	17:05	30 min	75	75
M-6.2	Berm bottom NE of #17 Chichester Dr ¹	3/21/2017	17:05	30 min	73	73
M-6.3	Fire hydrant @ #83 Bass Dr ¹	3/21/2017	17:05	30 min	61	61
M-7.1	Lot Line NW end Doria Hill Dr ²	3/21/2017	18:10	30 min	69	69
M-7.2	Fire hydrant @ NW end Doria Hill Dr ²	3/21/2017	18:10	30 min	69	67
M-7.3	E corner Doria Hill Dr & Capri Ct ²	3/21/2017	18:10	30 min	59	59
M-8.1	243 Whitsons Run	3/23/2017	8:10	30 min	68	68
M-8.2	245 Whitsons Run	3/23/2017	8:10	30 min	68	68
M-8.3	252 Whitsons Run NW lot corner	3/23/2017	8:10	30 min	59	58
M-9.1	1st-row hiking trl E of 28 Banner Spr. Cir.	3/23/2017	9:10	30 min	69	69
M-9.2	28 Banner Spring Cir. S. lot corner	3/23/2017	9:10	30 min	67	67
M-9.3	2nd-row N corner 24 Banner Spr. Cir.	3/23/2017	9:10	30 min	55	55
M-10.1	Cul-de-sac N of 114 Belladonna Ln.	3/23/2017	10:30	30 min	63	63
M-10.2	N. corner playgnd N of 17 Belladonna Ln.	3/23/2017	10:30	30 min	68	68
M-10.3	Cul-de-sac N of 31 Green Bell Ln.	3/23/2017	10:30	30 min	66	66

Notes:

1. Building number corrected from field notes, per Stafford County, VA online GIS data.
2. Monitoring locations 7.1, 7.2, and 7.3 selected to acquire representative traffic noise without home construction noise interference.

I-95 Fredericksburg Ext.
 VDOT
 UPC 110527





Noise Monitoring Weather Data Summary

I-95 Fredericksburg Ext. Noise Monitoring Weather Data Summary

Rec	Temp. (F)	Dew Pt. (F)	Rel.Hum.	Pressure	Wind Dir.	Wind Spd.	Conditions
M-1.1, M-1.2, M-1.3	50.3	39.3	66%	29.99"	NNW	5.2 mph	Overcast
Start: 10:20							
Stop: 10:50							
M-2.1, M-2.2, M-2.3	54.0	41.9	64%	29.99"	NNW	4.6 mph	Mostly Cloudy
Start: 11:45							
Stop: 12:15							
M-3.1, M-3.2, M-3.3	54.0	39.9	59%	29.99"	NNW	5.8 mph	Overcast
Start: 13:05							
Stop: 13:35							
M-4.1, M-4.2, M-4.3	61.2	44.1	53%	29.94"	NNW	6.9 mph	Clear
Start: 15:05							
Stop: 15:35							
M-5.1, M-5.2, M-5.3	62.4	45.5	54%	29.93"	NNW	9.2 mph	Clear
Start: 16:05							
Stop: 16:35							
M-6.1, M-6.2, M-6.3	63.5	45.5	52%	29.91"	NNW	8.1 mph	Clear
Start: 17:05							
Stop: 17:35							
M-7.1, M-7.2, M-7.3	62.6	44.8	52%	29.91"	NNW	5.8 mph	Clear
Start: 18:10							
Stop: 18:40							
M-8.1, M-8.2, M-8.3	29.8	19.9	67%	30.64"	Calm	N/A	Clear
Start: 08:10							
Stop: 08:40							
M-9.1, M-9.2, M-9.3	34.2	9.1	36%	30.65"	ENE	7.5 mph	Clear
Start: 09:10							
Stop: 09:40							
M-10.1, M-10.2, M-10.3	36.9	10.3	33%	30.66"	NE	8.0 mph	Clear
Start: 10:30							
Stop: 11:00							

Notes:

- Monitoring for Setups #1 through #7 was performed on Tuesday, March 21, 2017
- Monitoring for Setups #8 through #10 was performed on Thursday, March 23, 2017

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 1	Noise Monitoring Data Sheet
I-95 SB / S. of Exit 133	Light Pole S. of E. Entrance to Riverside Theater

I-95 Fredericksburg Ext. Setup 1.1								
Date/Time	Raw Data				Calc:	66.3		73.3
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 10:20	69.1	64.4	66.8	70.0		66.8	4786301	70.0
3/21/2017 10:21	70.0	64.2	67.3	71.0		67.3	5370318	71.0
3/21/2017 10:22	68.8	62.6	65.9	69.5		65.9	3890451	69.5
3/21/2017 10:23	68.5	62.4	66.0	70.4		66.0	3981072	70.4
3/21/2017 10:24	67.4	61.7	64.5	70.6		64.5	2818383	70.6
3/21/2017 10:25	68.9	62.8	66.6	71.0		66.6	4570882	71.0
3/21/2017 10:26	67.1	63.7	65.3	68.9		65.3	3388442	68.9
3/21/2017 10:27	69.6	65.7	67.4	72.4		67.4	5495409	72.4
3/21/2017 10:28	70.3	64.9	68.0	73.3		68.0	6309573	73.3
3/21/2017 10:29	69.9	63.6	67.4	72.3		67.4	5495409	72.3
3/21/2017 10:30	68.4	65.4	66.7	69.9		66.7	4677351	69.9
3/21/2017 10:31	67.1	61.5	65.4	68.4		65.4	3467369	68.4
3/21/2017 10:32	67.2	63.0	65.2	69.2		65.2	3311311	69.2
3/21/2017 10:33	68.9	65.4	67.4	71.0		67.4	5495409	71.0
3/21/2017 10:34	67.0	63.5	65.5	68.3		65.5	3548134	68.3
3/21/2017 10:35	68.5	64.2	66.7	72.1		66.7	4677351	72.1
3/21/2017 10:36	67.8	62.8	66.1	69.3		66.1	4073803	69.3
3/21/2017 10:37	68.3	65.0	66.8	70.6		66.8	4786301	70.6
3/21/2017 10:38	68.6	64.9	66.9	69.6		66.9	4897788	69.6
3/21/2017 10:39	68.0	63.3	65.8	69.3		65.8	3801894	69.3
3/21/2017 10:40	67.4	63.1	65.7	68.8		65.7	3715352	68.8
3/21/2017 10:41	68.3	64.0	66.1	69.8		66.1	4073803	69.8
3/21/2017 10:42	66.9	62.2	64.7	67.7		64.7	2951209	67.7
3/21/2017 10:43	67.3	63.4	65.8	69.5		65.8	3801894	69.5
3/21/2017 10:44	68.4	64.5	66.5	69.4		66.5	4466836	69.4
3/21/2017 10:45	77.4	64.4	72.4	83.0	x			
3/21/2017 10:46	67.8	62.3	65.6	68.2		65.6	3630781	68.2
3/21/2017 10:47	67.5	64.2	65.8	68.7		65.8	3801894	68.7
3/21/2017 10:48	67.9	63.0	65.8	68.9		65.8	3801894	68.9
3/21/2017 10:49	67.4	64.2	65.8	68.1		65.8	3801894	68.1

Notes: -Soundpro DL-1 S/N BLH040011 -Bus backup alarm @ 10:45

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 1
I-95 SB / S. of Exit 133



Noise Monitoring Photograph



Light Pole S. of E. Entrance to Riverside Theater

I-95 Fredericksburg Ext. Setup 1.1





Notes:

- Soundpro DL-1 S/N BLH040011
- Bus backup alarm @ 10:45

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 1	Noise Monitoring Traffic Data
I-95 SB / S. of Exit 133	Light Pole S. of E. Entrance to Riverside Theater



I-95 Fredericksburg Ext. Setup 1.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
1	SB	10:30	11:00	1270	65	268	1
1	NB	10:30	11:00	1244	77	240	1
Conversion	Autos	MT	HT	M	VPH		
2.00	2540	130	536	2	3208		
2.00	2488	154	480	2	3124		
TOTAL	5028	284	1016	4	6332		
%DT	%TTST	TOTAL					
4.05%	16.71%	20.76%					
4.93%	15.36%	20.29%					
4.49%	16.05%	20.53%					
Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	847	43	179	0	1	66
NB	3	829	51	160	0	1	62

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 1	Noise Monitoring Data Sheet
I-95 SB / S. of Exit 133	Fire Hydrant W. of Riverside Pkwy. S. of S. Entrance to 150 Riverside Pkwy.

I-95 Fredericksburg Ext. Setup 1.2								
Date/Time	Raw Data				Calc:	69.9		76.3
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 10:20	71.7	67.1	69.5	73.1		69.5	8912509	73.1
3/21/2017 10:21	74.0	67.0	71.0	76.3		71.0	12589254	76.3
3/21/2017 10:22	72.9	65.3	69.6	74.1		69.6	9120108	74.1
3/21/2017 10:23	73.9	68.1	71.0	75.5		71.0	12589254	75.5
3/21/2017 10:24	70.4	65.4	68.5	72.6		68.5	7079458	72.6
3/21/2017 10:25	73.1	67.1	70.9	74.6		70.9	12302688	74.6
3/21/2017 10:26	71.2	66.1	68.9	73.8		68.9	7762471	73.8
3/21/2017 10:27	70.0	65.0	67.9	71.0		67.9	6165950	71.0
3/21/2017 10:28	72.1	66.2	69.5	74.3		69.5	8912509	74.3
3/21/2017 10:29	70.7	65.7	68.8	73.2		68.8	7585776	73.2
3/21/2017 10:30	73.4	67.9	70.8	74.7		70.8	12022644	74.7
3/21/2017 10:31	71.1	66.4	69.3	71.6		69.3	8511380	71.6
3/21/2017 10:32	70.8	66.7	68.9	72.6		68.9	7762471	72.6
3/21/2017 10:33	72.5	68.1	70.6	73.2		70.6	11481536	73.2
3/21/2017 10:34	70.5	66.7	68.9	73.1		68.9	7762471	73.1
3/21/2017 10:35	72.1	67.7	69.9	73.4		69.9	9772372	73.4
3/21/2017 10:36	72.3	65.9	69.8	73.4		69.8	9549926	73.4
3/21/2017 10:37	72.7	68.2	70.8	76.2		70.8	12022644	76.2
3/21/2017 10:38	72.8	67.3	70.3	74.0		70.3	10715193	74.0
3/21/2017 10:39	72.1	67.0	69.7	74.1		69.7	9332543	74.1
3/21/2017 10:40	72.6	65.7	69.8	74.9		69.8	9549926	74.9
3/21/2017 10:41	73.3	67.3	70.5	74.3		70.5	11220185	74.3
3/21/2017 10:42	70.4	65.6	68.4	71.8		68.4	6918310	71.8
3/21/2017 10:43	72.8	68.2	70.4	75.3		70.4	10964782	75.3
3/21/2017 10:44	72.5	68.9	70.7	73.0		70.7	11748976	73.0
3/21/2017 10:45	75.7	69.3	73.1	82.8	x			
3/21/2017 10:46	72.4	65.7	69.9	73.3		69.9	9772372	73.3
3/21/2017 10:47	71.7	68.1	70.2	74.4		70.2	10471285	74.4
3/21/2017 10:48	72.3	64.7	69.6	73.9		69.6	9120108	73.9
3/21/2017 10:49	72.4	68.3	70.6	73.7		70.6	11481536	73.7

Notes:
 -Soundpro DL-2 S/N BIJ030015
 -Heavy truck pass-by @ 10:45



I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 1	Noise Monitoring Photograph
I-95 SB / S. of Exit 133	Fire Hydrant W. of Riverside Pkwy. S. of S. Entrance to 150 Riverside Pkwy.

I-95 Fredericksburg Ext. Setup 1.2





Notes:

- Soundpro DL-2 S/N BIJ030015
- Heavy truck pass-by @ 10:45

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 1	Noise Monitoring Data Sheet
I-95 SB / S. of Exit 133	Light Pole W. of W. Entrance to Riverside Theater

I-95 Fredericksburg Ext. Setup 1.3								
Date/Time	Raw Data				Calc:	61.2		75.5
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 10:20	62.9	57.9	60.7	65.6		60.7	1174898	65.6
3/21/2017 10:21	62.7	58.0	60.2	63.5		60.2	1047129	63.5
3/21/2017 10:22	59.9	56.7	58.1	60.7		58.1	645654.2	60.7
3/21/2017 10:23	63.0	57.2	59.8	64.7		59.8	954992.6	64.7
3/21/2017 10:24	61.5	57.6	59.8	63.3		59.8	954992.6	63.3
3/21/2017 10:25	62.6	58.2	60.5	65.5		60.5	1122018	65.5
3/21/2017 10:26	70.3	60.3	66.2	72.8		66.2	4168694	72.8
3/21/2017 10:27	68.9	59.4	65.4	71.1		65.4	3467369	71.1
3/21/2017 10:28	68.7	58.4	64.8	73.7		64.8	3019952	73.7
3/21/2017 10:29	63.4	58.8	60.7	64.2		60.7	1174898	64.2
3/21/2017 10:30	61.6	55.8	59.0	64.0		59.0	794328.2	64.0
3/21/2017 10:31	64.4	57.2	61.4	65.3		61.4	1380384	65.3
3/21/2017 10:32	70.2	58.5	66.6	75.5		66.6	4570882	75.5
3/21/2017 10:33	63.6	57.3	60.3	66.0		60.3	1071519	66.0
3/21/2017 10:34	67.3	55.6	63.3	72.2		63.3	2137962	72.2
3/21/2017 10:35	60.6	56.3	58.7	61.5		58.7	741310.2	61.5
3/21/2017 10:36	61.9	56.9	60.2	67.3		60.2	1047129	67.3
3/21/2017 10:37	63.5	57.2	60.7	66.8		60.7	1174898	66.8
3/21/2017 10:38	58.2	55.2	56.7	59.7		56.7	467735.1	59.7
3/21/2017 10:39	59.5	55.7	57.8	60.9		57.8	602559.6	60.9
3/21/2017 10:40	60.7	56.4	58.2	62.1		58.2	660693.4	62.1
3/21/2017 10:41	60.7	54.9	58.0	65.4		58.0	630957.3	65.4
3/21/2017 10:42	59.1	55.2	57.3	62.1		57.3	537031.8	62.1
3/21/2017 10:43	63.2	55.5	59.4	64.8		59.4	870963.6	64.8
3/21/2017 10:44	66.7	55.6	62.7	74.1		62.7	1862087	74.1
3/21/2017 10:45	59.3	55.1	57.4	60.0		57.4	549540.9	60.0
3/21/2017 10:46	58.5	55.9	57.1	59.7		57.1	512861.4	59.7
3/21/2017 10:47	59.7	56.1	57.9	61.1		57.9	616595	61.1
3/21/2017 10:48	60.5	55.1	57.6	61.5		57.6	575439.9	61.5
3/21/2017 10:49	69.9	54.9	67.3	81.1	x			

Notes: -Soundpro DL-1 S/N BIH030023 -Bus idle @ 10:49



I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 1	Noise Monitoring Photograph
I-95 SB / S. of Exit 133	Light Pole W. of W. Entrance to Riverside Theater

I-95 Fredericksburg Ext. Setup 1.3



Notes:

- Soundpro DL-1 S/N BIH030023
- Bus idle @ 10:49

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 2	Noise Monitoring Data Sheet
I-95 NB / S. of Exit 133	N. Corner Cul-de-sac End of Mussleman Rd.

I-95 Fredericksburg Ext. Setup 2.1								
Date/Time	Raw Data				Calc:	73.0		82.8
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 11:45	73.9	68.4	71.6	74.9		71.6	14454398	74.9
3/21/2017 11:46	74.6	69.6	72.3	75.4		72.3	16982437	75.4
3/21/2017 11:47	74.2	69.5	72.0	74.6		72.0	15848932	74.6
3/21/2017 11:48	74.8	69.5	72.3	75.6		72.3	16982437	75.6
3/21/2017 11:49	75.1	71.6	73.4	76.6		73.4	21877616	76.6
3/21/2017 11:50	74.4	70.6	72.7	76.3		72.7	18620871	76.3
3/21/2017 11:51	75.1	68.6	72.3	76.4		72.3	16982437	76.4
3/21/2017 11:52	74.3	70.9	73.3	80.7		73.3	21379621	80.7
3/21/2017 11:53	75.3	67.6	72.5	77.4		72.5	17782794	77.4
3/21/2017 11:54	75.7	71.2	73.4	76.7		73.4	21877616	76.7
3/21/2017 11:55	74.4	70.3	72.4	75.1		72.4	17378008	75.1
3/21/2017 11:56	72.1	67.2	70.0	73.9		70.0	10000000	73.9
3/21/2017 11:57	75.6	69.1	73.1	78.0		73.1	20417379	78.0
3/21/2017 11:58	75.6	71.6	73.8	76.4		73.8	23988329	76.4
3/21/2017 11:59	74.9	70.4	72.8	75.2		72.8	19054607	75.2
3/21/2017 12:00	75.9	72.1	73.7	76.5		73.7	23442288	76.5
3/21/2017 12:01	76.8	71.9	75.2	82.8		75.2	33113112	82.8
3/21/2017 12:02	74.8	71.9	73.3	75.7		73.3	21379621	75.7
3/21/2017 12:03	73.6	70.9	72.1	74.1		72.1	16218101	74.1
3/21/2017 12:04	74.4	70.4	73.1	77.2		73.1	20417379	77.2
3/21/2017 12:05	74.9	68.6	72.9	78.4		72.9	19498446	78.4
3/21/2017 12:06	76.7	71.4	74.3	79.4		74.3	26915348	79.4
3/21/2017 12:07	74.8	70.2	72.3	76.5		72.3	16982437	76.5
3/21/2017 12:08	75.0	69.7	72.5	76.5		72.5	17782794	76.5
3/21/2017 12:09	76.3	70.3	73.4	77.3		73.4	21877616	77.3
3/21/2017 12:10	74.5	71.1	73.0	75.3		73.0	19952623	75.3
3/21/2017 12:11	74.1	70.4	72.6	76.6		72.6	18197009	76.6
3/21/2017 12:12	75.3	71.8	73.7	77.6		73.7	23442288	77.6
3/21/2017 12:13	74.5	71.6	73.0	76.1		73.0	19952623	76.1
3/21/2017 12:14	75.2	71.5	73.5	75.6		73.5	22387211	75.6

Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 2
I-95 NB / S. of Exit 133



Noise Monitoring Photograph

N. Corner Cul-de-sac End of Mussleman Rd.

I-95 Fredericksburg Ext. Setup 2.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
 VDOT
 UPC 110527
 Setup 2
 I-95 NB / S. of Exit 133



Noise Monitoring Traffic Data

N. Corner Cul-de-sac End of Mussleman Rd.

I-95 Fredericksburg Ext. Setup 2.1

Setup	Direction	Start	Finish	Autos	MT	HT	M
2	SB	11:45	12:15	1301	48	252	0
2	NB	11:45	12:15	1254	60	230	3



Conversion	Autos	MT	HT	M	VPH
2.00	2602	96	504	0	3202
2.00	2508	120	460	6	3094
TOTAL	5110	216	964	6	6296

%DT	%TTST	TOTAL
3.00%	15.74%	18.74%
3.88%	14.87%	18.75%
3.43%	15.31%	18.74%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	867	32	168	0	0	68
NB	3	836	40	153	0	2	60

Notes:

-Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 2	Noise Monitoring Data Sheet
I-95 NB / S. of Exit 133	S. Corner Musselman Rd. & Krieger Ln.

I-95 Fredericksburg Ext. Setup 2.2								
Date/Time	Raw Data				Calc:	65.5		73.3
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 11:45	64.8	62.1	63.5	65.6		63.5	2238721	65.6
3/21/2017 11:46	65.4	63.1	64.4	66.7		64.4	2754229	66.7
3/21/2017 11:47	66.1	62.6	64.3	66.8		64.3	2691535	66.8
3/21/2017 11:48	66.5	64.4	65.5	67.0		65.5	3548134	67.0
3/21/2017 11:49	67.2	64.9	66.0	68.2		66.0	3981072	68.2
3/21/2017 11:50	67.7	64.6	66.1	68.6		66.1	4073803	68.6
3/21/2017 11:51	67.2	63.6	65.2	67.6		65.2	3311311	67.6
3/21/2017 11:52	68.4	64.4	66.5	70.8		66.5	4466836	70.8
3/21/2017 11:53	78.8	66.2	74.2	82.1	x			
3/21/2017 11:54	67.0	64.0	65.4	68.0		65.4	3467369	68.0
3/21/2017 11:55	65.7	62.3	64.1	66.5		64.1	2570396	66.5
3/21/2017 11:56	67.4	62.7	65.1	69.7		65.1	3235937	69.7
3/21/2017 11:57	66.7	63.3	65.2	67.3		65.2	3311311	67.3
3/21/2017 11:58	66.6	63.8	65.0	66.9		65.0	3162278	66.9
3/21/2017 11:59	66.3	64.0	65.2	67.0		65.2	3311311	67.0
3/21/2017 12:00	70.5	65.6	67.9	73.3		67.9	6165950	73.3
3/21/2017 12:01	67.7	64.0	66.1	68.2		66.1	4073803	68.2
3/21/2017 12:02	66.9	64.3	65.6	67.4		65.6	3630781	67.4
3/21/2017 12:03	81.9	64.6	75.6	85.0	x			
3/21/2017 12:04	66.1	63.2	64.9	67.4		64.9	3090295	67.4
3/21/2017 12:05	68.6	63.8	66.3	71.3		66.3	4265795	71.3
3/21/2017 12:06	66.6	64.4	65.4	67.4		65.4	3467369	67.4
3/21/2017 12:07	67.3	64.3	65.6	68.3		65.6	3630781	68.3
3/21/2017 12:08	66.6	62.9	64.7	67.3		64.7	2951209	67.3
3/21/2017 12:09	68.2	63.8	66.2	69.2		66.2	4168694	69.2
3/21/2017 12:10	67.0	64.5	65.7	68.8		65.7	3715352	68.8
3/21/2017 12:11	66.7	62.9	64.8	68.0		64.8	3019952	68.0
3/21/2017 12:12	66.7	64.7	65.7	67.6		65.7	3715352	67.6
3/21/2017 12:13	66.4	63.6	65.2	67.1		65.2	3311311	67.1
3/21/2017 12:14	67.6	64.9	66.3	68.2		66.3	4265795	68.2

Notes:
-Soundpro DL-2 S/N BIJ030015
-Fuel oil delivery truck pass-by @ 11:53
-Fuel oil delivery truck pass-by (exit) @ 12:03

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 2
I-95 NB / S. of Exit 133



Noise Monitoring Photograph



S. Corner Musselman Rd. & Krieger Ln.

I-95 Fredericksburg Ext. Setup 2.2



Notes:

- Soundpro DL-2 S/N BIJ030015
- Fuel oil delivery truck pass-by @ 11:53
- Fuel oil delivery truck pass-by (exit) @ 12:03

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 2	Noise Monitoring Data Sheet
I-95 NB / S. of Exit 133	SE of Mailbox to #117 Musselman Rd.

I-95 Fredericksburg Ext. Setup 2.3								
Date/Time	Raw Data				Calc:	63.0		73.7
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 11:45	62.2	59.3	60.7	63.8		60.7	1174898	63.8
3/21/2017 11:46	63.2	60.8	62.0	63.9		62.0	1584893	63.9
3/21/2017 11:47	63.0	61.6	62.2	63.8		62.2	1659587	63.8
3/21/2017 11:48	65.6	63.2	64.4	66.4		64.4	2754229	66.4
3/21/2017 11:49	64.9	62.3	63.8	67.9		63.8	2398833	67.9
3/21/2017 11:50	65.3	61.1	63.3	66.8		63.3	2137962	66.8
3/21/2017 11:51	64.8	62.4	63.8	65.9		63.8	2398833	65.9
3/21/2017 11:52	70.8	61.7	69.1	80.8	x			
3/21/2017 11:53	64.0	61.2	63.1	73.7		63.1	2041738	73.7
3/21/2017 11:54	64.2	60.9	62.5	65.3		62.5	1778279	65.3
3/21/2017 11:55	63.7	61.1	62.5	64.4		62.5	1778279	64.4
3/21/2017 11:56	65.1	60.8	63.0	67.2		63.0	1995262	67.2
3/21/2017 11:57	63.4	61.2	62.4	65.2		62.4	1737801	65.2
3/21/2017 11:58	64.2	61.5	63.0	65.1		63.0	1995262	65.1
3/21/2017 11:59	64.4	62.1	63.1	64.8		63.1	2041738	64.8
3/21/2017 12:00	67.5	63.7	65.3	69.3		65.3	3388442	69.3
3/21/2017 12:01	64.8	61.8	63.6	65.5		63.6	2290868	65.5
3/21/2017 12:02	65.3	62.0	64.0	70.3		64.0	2511886	70.3
3/21/2017 12:03	74.2	61.5	73.3	86.9	x			
3/21/2017 12:04	63.7	61.0	62.5	64.3		62.5	1778279	64.3
3/21/2017 12:05	64.5	60.9	63.1	65.6		63.1	2041738	65.6
3/21/2017 12:06	63.1	60.9	61.9	64.1		61.9	1548817	64.1
3/21/2017 12:07	63.6	61.2	62.5	64.6		62.5	1778279	64.6
3/21/2017 12:08	62.2	59.9	61.1	63.4		61.1	1288250	63.4
3/21/2017 12:09	64.4	61.4	62.8	65.1		62.8	1905461	65.1
3/21/2017 12:10	64.6	62.4	63.3	65.1		63.3	2137962	65.1
3/21/2017 12:11	64.9	61.3	63.2	65.6		63.2	2089296	65.6
3/21/2017 12:12	64.3	62.1	63.0	64.7		63.0	1995262	64.7
3/21/2017 12:13	65.3	61.9	63.5	66.8		63.5	2238721	66.8
3/21/2017 12:14	64.4	61.2	63.1	64.8		63.1	2041738	64.8

Notes:
-Soundpro DL-1 S/N BIH030023
-Fuel oil delivery truck pass-by @ 11:52
-Fuel oil delivery truck pass-by (exit) @ 12:03

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 2
I-95 NB / S. of Exit 133



Noise Monitoring Photograph



SE of Mailbox to #117 Musselman Rd.

I-95 Fredericksburg Ext. Setup 2.3



Notes:

- Soundpro DL-1 S/N BIH030023
- Fuel oil delivery truck pass-by @ 11:52
- Fuel oil delivery truck pass-by (exit) @ 12:03

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 3	Noise Monitoring Data Sheet
I-95 NB / Ex.133-136	N.End of Sidewalk W. Border of Pkg. Lot facing I-95 NB

I-95 Fredericksburg Ext. Setup 3.1								
Date/Time	Raw Data				Calc:	66.7		73.4
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 13:05	67.3	64.5	66.2	71.3		66.2	4168694	71.3
3/21/2017 13:06	68.4	64.5	66.5	69.7		66.5	4466836	69.7
3/21/2017 13:07	69.7	65.3	67.4	70.8		67.4	5495409	70.8
3/21/2017 13:08	69.8	64.3	67.3	70.7		67.3	5370318	70.7
3/21/2017 13:09	69.6	66.0	67.9	70.2		67.9	6165950	70.2
3/21/2017 13:10	69.2	62.8	66.6	70.6		66.6	4570882	70.6
3/21/2017 13:11	68.2	63.1	65.8	69.1		65.8	3801894	69.1
3/21/2017 13:12	68.1	63.4	66.0	70.4		66.0	3981072	70.4
3/21/2017 13:13	69.9	65.3	68.0	70.8		68.0	6309573	70.8
3/21/2017 13:14	69.5	62.2	66.7	72.2		66.7	4677351	72.2
3/21/2017 13:15	68.8	65.2	67.0	70.0		67.0	5011872	70.0
3/21/2017 13:16	70.0	60.8	67.1	70.9		67.1	5128614	70.9
3/21/2017 13:17	68.5	64.6	66.6	69.6		66.6	4570882	69.6
3/21/2017 13:18	66.9	62.7	65.1	68.4		65.1	3235937	68.4
3/21/2017 13:19	68.2	64.0	66.6	70.2		66.6	4570882	70.2
3/21/2017 13:20	68.1	63.5	66.0	69.5		66.0	3981072	69.5
3/21/2017 13:21	68.3	63.8	66.3	69.2		66.3	4265795	69.2
3/21/2017 13:22	70.5	63.6	67.9	73.0		67.9	6165950	73.0
3/21/2017 13:23	68.3	64.1	66.3	70.0		66.3	4265795	70.0
3/21/2017 13:24	68.7	64.3	66.9	72.2		66.9	4897788	72.2
3/21/2017 13:25	67.6	64.1	66.3	70.3		66.3	4265795	70.3
3/21/2017 13:26	67.7	63.6	65.8	68.8		65.8	3801894	68.8
3/21/2017 13:27	68.6	63.0	66.4	71.2		66.4	4365158	71.2
3/21/2017 13:28	68.6	64.4	66.9	70.1		66.9	4897788	70.1
3/21/2017 13:29	70.1	65.7	68.1	73.4		68.1	6456542	73.4
3/21/2017 13:30	69.2	61.0	66.5	70.3		66.5	4466836	70.3
3/21/2017 13:31	68.6	63.8	66.4	70.1		66.4	4365158	70.1
3/21/2017 13:32	69.1	63.9	66.6	71.7		66.6	4570882	71.7
3/21/2017 13:33	69.6	63.7	66.8	71.0		66.8	4786301	71.0
3/21/2017 13:34	70.1	63.6	66.8	71.7		66.8	4786301	71.7

Notes:
-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 3
I-95 NB / Ex.133-136



Noise Monitoring Photograph



N.End of Sidewalk W. Border of Pkg. Lot facing I-95 NB

I-95 Fredericksburg Ext. Setup 3.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 3	Noise Monitoring Traffic Data
I-95 NB / Ex.133-136	N.End of Sidewalk W. Border of Pkg. Lot facing I-95 NB



I-95 Fredericksburg Ext. Setup 3.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
3	SB	13:05	13:35	1542	71	226	0
3	NB	13:05	13:35	1447	41	193	2

Conversion	Autos	MT	HT	M	VPH
2.00	3084	142	452	0	3678
2.00	2894	82	386	4	3366
TOTAL	5978	224	838	4	7044

%DT	%TTST	TOTAL
3.86%	12.29%	16.15%
2.44%	11.47%	13.90%
3.18%	11.90%	15.08%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1028	47	151	0	0	64
NB	3	965	27	129	0	1	65

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 3	Noise Monitoring Data Sheet
I-95 NB / Ex.133-136	NW Entrance to Field "Wheel" @ Decorative Bollards Btwn. N. & W. Fields

I-95 Fredericksburg Ext. Setup 3.2								
Date/Time	Raw Data				Calc:	64.0		68.1
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 13:05	65.3	63.6	64.4	65.9		64.4	2754229	65.9
3/21/2017 13:06	65.2	63.3	64.1	65.3		64.1	2570396	65.3
3/21/2017 13:07	64.9	62.8	64.0	65.5		64.0	2511886	65.5
3/21/2017 13:08	66.0	64.3	65.0	66.8		65.0	3162278	66.8
3/21/2017 13:09	64.9	62.3	63.7	66.3		63.7	2344229	66.3
3/21/2017 13:10	63.9	61.4	62.8	64.8		62.8	1905461	64.8
3/21/2017 13:11	64.0	61.3	62.4	64.4		62.4	1737801	64.4
3/21/2017 13:12	66.4	62.9	64.8	67.7		64.8	3019952	67.7
3/21/2017 13:13	65.2	62.1	64.0	65.7		64.0	2511886	65.7
3/21/2017 13:14	65.0	63.0	64.1	65.4		64.1	2570396	65.4
3/21/2017 13:15	65.9	61.0	64.3	66.1		64.3	2691535	66.1
3/21/2017 13:16	64.8	63.2	64.0	65.1		64.0	2511886	65.1
3/21/2017 13:17	64.0	62.6	63.3	64.9		63.3	2137962	64.9
3/21/2017 13:18	65.7	62.3	64.2	66.1		64.2	2630268	66.1
3/21/2017 13:19	64.8	62.3	63.7	65.1		63.7	2344229	65.1
3/21/2017 13:20	64.8	61.8	63.4	65.2		63.4	2187762	65.2
3/21/2017 13:21	66.9	62.0	65.4	67.7		65.4	3467369	67.7
3/21/2017 13:22	64.9	62.3	64.0	65.9		64.0	2511886	65.9
3/21/2017 13:23	64.6	62.7	63.6	66.0		63.6	2290868	66.0
3/21/2017 13:24	64.0	62.3	63.1	64.9		63.1	2041738	64.9
3/21/2017 13:25	63.7	62.4	63.0	64.2		63.0	1995262	64.2
3/21/2017 13:26	65.1	61.7	63.3	65.7		63.3	2137962	65.7
3/21/2017 13:27	64.8	62.8	64.0	65.1		64.0	2511886	65.1
3/21/2017 13:28	66.3	64.0	65.0	68.1		65.0	3162278	68.1
3/21/2017 13:29	65.7	61.5	64.0	65.9		64.0	2511886	65.9
3/21/2017 13:30	65.4	63.2	64.1	65.7		64.1	2570396	65.7
3/21/2017 13:31	64.6	63.2	63.7	65.5		63.7	2344229	65.5
3/21/2017 13:32	65.9	63.4	64.4	66.4		64.4	2754229	66.4
3/21/2017 13:33	65.8	62.5	64.0	67.3		64.0	2511886	67.3
3/21/2017 13:34	65.1	61.4	63.8	65.6		63.8	2398833	65.6

Notes:
-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 3
I-95 NB / Ex.133-136



Noise Monitoring Photograph



NW Entrance to Field "Wheel" @ Decorative Bollards Btwn. N. & W. Fields

I-95 Fredericksburg Ext. Setup 3.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 3	Noise Monitoring Data Sheet
I-95 NB / Ex.133-136	Light Pole NW of Concession Stand, Btwn. N. & W. Fields

I-95 Fredericksburg Ext. Setup 3.3								
Date/Time	Raw Data				Calc:	61.7		66.0
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 13:05	65.2	63.7	64.4	66.0		64.4	2754229	66.0
3/21/2017 13:06	64.3	61.8	62.9	64.5		62.9	1949845	64.5
3/21/2017 13:07	62.0	60.3	61.2	62.5		61.2	1318257	62.5
3/21/2017 13:08	63.2	61.7	62.4	65.9		62.4	1737801	65.9
3/21/2017 13:09	63.0	60.1	61.7	65.4		61.7	1479108	65.4
3/21/2017 13:10	62.1	58.9	60.4	62.7		60.4	1096478	62.7
3/21/2017 13:11	61.0	58.5	59.5	61.7		59.5	891250.9	61.7
3/21/2017 13:12	64.0	60.3	62.2	65.2		62.2	1659587	65.2
3/21/2017 13:13	62.7	60.5	61.7	62.9		61.7	1479108	62.9
3/21/2017 13:14	62.3	61.1	61.6	62.8		61.6	1445440	62.8
3/21/2017 13:15	63.2	59.2	61.6	63.6		61.6	1445440	63.6
3/21/2017 13:16	61.8	60.8	61.3	62.4		61.3	1348963	62.4
3/21/2017 13:17	61.4	59.8	60.6	61.6		60.6	1148154	61.6
3/21/2017 13:18	62.9	59.9	61.6	63.2		61.6	1445440	63.2
3/21/2017 13:19	62.1	60.2	61.1	62.4		61.1	1288250	62.4
3/21/2017 13:20	62.8	59.3	61.3	64.8		61.3	1348963	64.8
3/21/2017 13:21	64.1	60.6	62.9	64.8		62.9	1949845	64.8
3/21/2017 13:22	63.0	60.5	62.0	64.0		62.0	1584893	64.0
3/21/2017 13:23	62.5	60.8	61.6	63.9		61.6	1445440	63.9
3/21/2017 13:24	61.3	59.6	60.5	62.1		60.5	1122018	62.1
3/21/2017 13:25	62.0	59.8	60.7	62.6		60.7	1174898	62.6
3/21/2017 13:26	61.8	59.6	60.6	62.5		60.6	1148154	62.5
3/21/2017 13:27	62.3	60.8	61.4	62.5		61.4	1380384	62.5
3/21/2017 13:28	63.6	61.4	62.5	64.9		62.5	1778279	64.9
3/21/2017 13:29	63.2	60.0	61.7	63.6		61.7	1479108	63.6
3/21/2017 13:30	62.9	60.9	61.7	63.2		61.7	1479108	63.2
3/21/2017 13:31	62.1	60.9	61.3	62.4		61.3	1348963	62.4
3/21/2017 13:32	64.2	60.7	62.1	64.4		62.1	1621810	64.4
3/21/2017 13:33	63.7	60.3	62.1	65.3		62.1	1621810	65.3
3/21/2017 13:34	62.3	59.8	61.1	62.9		61.1	1288250	62.9

Notes:
-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 3
I-95 NB / Ex.133-136



Noise Monitoring Photograph



Light Pole NW of Concession Stand, Btwn. N. & W. Fields

I-95 Fredericksburg Ext. Setup 3.3



Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 4	Noise Monitoring Data Sheet
I-95 SB / Ex.133-136	R/W Vehicle Access @ R/W Fence S. of Ravenwood Dr. Cul-de-sac

I-95 Fredericksburg Ext. Setup 4.1								
Date/Time	Raw Data				Calc:	65.4		72.0
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 15:05	66.3	60.1	63.4	67.4		63.4	2187762	67.4
3/21/2017 15:06	66.6	61.7	64.0	67.1		64.0	2511886	67.1
3/21/2017 15:07	67.3	60.0	65.2	68.3		65.2	3311311	68.3
3/21/2017 15:08	66.3	63.6	64.8	68.0		64.8	3019952	68.0
3/21/2017 15:09	65.9	63.0	64.5	66.4		64.5	2818383	66.4
3/21/2017 15:10	65.7	63.1	64.5	66.0		64.5	2818383	66.0
3/21/2017 15:11	65.6	60.3	63.6	69.7		63.6	2290868	69.7
3/21/2017 15:12	66.5	64.0	65.0	67.9		65.0	3162278	67.9
3/21/2017 15:13	65.7	62.0	64.0	66.2		64.0	2511886	66.2
3/21/2017 15:14	69.1	63.4	65.7	70.2		65.7	3715352	70.2
3/21/2017 15:15	65.3	63.5	64.5	67.8		64.5	2818383	67.8
3/21/2017 15:16	66.8	64.4	65.7	67.2		65.7	3715352	67.2
3/21/2017 15:17	67.7	62.4	65.8	68.2		65.8	3801894	68.2
3/21/2017 15:18	67.7	63.3	65.6	68.3		65.6	3630781	68.3
3/21/2017 15:19	67.8	64.2	66.3	69.3		66.3	4265795	69.3
3/21/2017 15:20	70.5	65.2	67.2	72.0		67.2	5248075	72.0
3/21/2017 15:21	68.1	65.3	66.7	68.5		66.7	4677351	68.5
3/21/2017 15:22	69.0	65.7	67.5	71.8		67.5	5623413	71.8
3/21/2017 15:23	66.6	64.2	65.3	67.1		65.3	3388442	67.1
3/21/2017 15:24	67.0	64.2	65.3	68.5		65.3	3388442	68.5
3/21/2017 15:25	67.4	63.1	64.8	68.7		64.8	3019952	68.7
3/21/2017 15:26	67.1	64.1	65.5	67.9		65.5	3548134	67.9
3/21/2017 15:27	67.6	65.1	66.1	68.8		66.1	4073803	68.8
3/21/2017 15:28	67.2	63.6	65.7	69.9		65.7	3715352	69.9
3/21/2017 15:29	67.1	64.0	65.8	68.0		65.8	3801894	68.0
3/21/2017 15:30	65.4	62.6	64.0	66.6		64.0	2511886	66.6
3/21/2017 15:31	67.9	65.7	66.8	69.4		66.8	4786301	69.4
3/21/2017 15:32	65.8	64.5	65.1	66.5		65.1	3235937	66.5
3/21/2017 15:33	66.7	64.3	65.3	67.3		65.3	3388442	67.3
3/21/2017 15:34	66.1	63.5	64.8	66.4		64.8	3019952	66.4

Notes: -Soundpro DL-1 S/N BLH040011
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I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 4
I-95 SB / Ex.133-136



Noise Monitoring Photograph



R/W Vehicle Access @ R/W Fence S. of Ravenwood Dr. Cul-de-sac

I-95 Fredericksburg Ext. Setup 4.1





Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 4	Noise Monitoring Traffic Data
I-95 SB / Ex.133-136	R/W Vehicle Access @ R/W Fence S. of Ravenwood Dr. Cul-de-sac

I-95 Fredericksburg Ext. Setup 4.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
4	SB	15:05	15:35	2317	43	220	2
4	NB	15:05	15:35	1653	53	185	0
Conversion	Autos	MT	HT	M	VPH		
2.00	4634	86	440	4	5164		
2.00	3306	106	370	0	3782		
TOTAL	7940	192	810	4	8946		
%DT	%TTST	TOTAL					
1.67%	8.52%	10.19%					
2.80%	9.78%	12.59%					
2.15%	9.05%	11.20%					
Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1545	29	147	0	1	58
NB	3	1102	35	123	0	0	62

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 4	Noise Monitoring Data Sheet
I-95 SB / Ex.133-136	Utility Pole @ R/W Fence Midway Between Ravenwood Dr. & Pine View Ct.

I-95 Fredericksburg Ext. Setup 4.2								
Date/Time	Raw Data				Calc:	64.9		74.0
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 15:05	70.2	60.7	66.5	73.6		66.5	4466836	73.6
3/21/2017 15:06	65.2	61.8	63.8	67.1		63.8	2398833	67.1
3/21/2017 15:07	67.0	59.3	65.3	67.9		65.3	3388442	67.9
3/21/2017 15:08	66.0	63.3	64.7	67.7		64.7	2951209	67.7
3/21/2017 15:09	67.1	61.9	65.1	71.4		65.1	3235937	71.4
3/21/2017 15:10	64.8	60.5	63.3	65.2		63.3	2137962	65.2
3/21/2017 15:11	65.5	61.1	63.2	66.0		63.2	2089296	66.0
3/21/2017 15:12	65.9	63.2	64.7	66.9		64.7	2951209	66.9
3/21/2017 15:13	64.8	61.0	63.1	65.7		63.1	2041738	65.7
3/21/2017 15:14	67.8	62.6	65.2	70.7		65.2	3311311	70.7
3/21/2017 15:15	67.3	62.6	65.8	74.0		65.8	3801894	74.0
3/21/2017 15:16	67.1	64.0	65.6	67.6		65.6	3630781	67.6
3/21/2017 15:17	66.3	60.8	64.4	66.9		64.4	2754229	66.9
3/21/2017 15:18	66.7	60.8	64.7	67.7		64.7	2951209	67.7
3/21/2017 15:19	66.1	63.2	65.2	66.4		65.2	3311311	66.4
3/21/2017 15:20	69.1	64.3	66.8	73.0		66.8	4786301	73.0
3/21/2017 15:21	66.6	63.7	65.4	68.1		65.4	3467369	68.1
3/21/2017 15:22	67.9	63.8	65.5	68.5		65.5	3548134	68.5
3/21/2017 15:23	66.5	62.4	64.8	70.1		64.8	3019952	70.1
3/21/2017 15:24	67.5	63.8	65.8	73.1		65.8	3801894	73.1
3/21/2017 15:25	63.4	61.2	62.2	64.8		62.2	1659587	64.8
3/21/2017 15:26	66.4	60.4	64.5	68.7		64.5	2818383	68.7
3/21/2017 15:27	67.1	63.2	65.5	69.7		65.5	3548134	69.7
3/21/2017 15:28	66.6	62.1	65.1	72.0		65.1	3235937	72.0
3/21/2017 15:29	66.4	63.9	65.2	67.9		65.2	3311311	67.9
3/21/2017 15:30	66.3	62.4	64.5	67.4		64.5	2818383	67.4
3/21/2017 15:31	68.0	64.9	66.7	72.2		66.7	4677351	72.2
3/21/2017 15:32	65.0	62.6	63.7	67.1		63.7	2344229	67.1
3/21/2017 15:33	65.0	62.7	63.9	65.6		63.9	2454709	65.6
3/21/2017 15:34	66.0	61.5	64.1	66.8		64.1	2570396	66.8

Notes:
-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 4
I-95 SB / Ex.133-136



Noise Monitoring Photograph



Utility Pole @ R/W Fence Midway Between Ravenwood Dr. & Pine View Ct.

I-95 Fredericksburg Ext. Setup 4.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 4	Noise Monitoring Data Sheet
I-95 SB / Ex.133-136	Next Utility Pole S. of M-4.2, 3rd Utility Pole N. of Pine View Ct. @ R/W Fence

I-95 Fredericksburg Ext. Setup 4.3								
Date/Time	Raw Data				Calc:	68.7		79.1
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 15:05	68.7	60.9	65.6	71.4		65.6	3630781	71.4
3/21/2017 15:06	65.1	62.1	63.8	65.9		63.8	2398833	65.9
3/21/2017 15:07	70.1	60.0	68.0	70.8		68.0	6309573	70.8
3/21/2017 15:08	70.6	67.5	69.2	71.2		69.2	8317638	71.2
3/21/2017 15:09	71.0	66.3	68.9	73.0		68.9	7762471	73.0
3/21/2017 15:10	69.8	64.8	67.4	71.0		67.4	5495409	71.0
3/21/2017 15:11	69.5	63.9	67.2	71.5		67.2	5248075	71.5
3/21/2017 15:12	69.5	66.1	67.9	72.9		67.9	6165950	72.9
3/21/2017 15:13	69.3	65.1	67.8	70.4		67.8	6025596	70.4
3/21/2017 15:14	72.1	66.9	69.3	73.5		69.3	8511380	73.5
3/21/2017 15:15	71.0	65.7	69.4	78.3		69.4	8709636	78.3
3/21/2017 15:16	70.8	67.3	69.4	71.6		69.4	8709636	71.6
3/21/2017 15:17	70.3	65.4	68.0	71.6		68.0	6309573	71.6
3/21/2017 15:18	69.7	63.8	68.2	71.5		68.2	6606934	71.5
3/21/2017 15:19	69.8	66.0	68.5	70.6		68.5	7079458	70.6
3/21/2017 15:20	72.5	67.7	70.7	79.1		70.7	11748976	79.1
3/21/2017 15:21	71.0	67.2	69.2	71.3		69.2	8317638	71.3
3/21/2017 15:22	71.8	68.3	70.1	73.3		70.1	10232930	73.3
3/21/2017 15:23	71.8	68.0	70.0	76.7		70.0	10000000	76.7
3/21/2017 15:24	73.0	69.1	71.0	76.8		71.0	12589254	76.8
3/21/2017 15:25	68.7	65.8	67.2	72.2		67.2	5248075	72.2
3/21/2017 15:26	70.0	64.2	68.0	73.2		68.0	6309573	73.2
3/21/2017 15:27	71.7	67.4	69.6	74.6		69.6	9120108	74.6
3/21/2017 15:28	70.4	65.9	69.2	76.5		69.2	8317638	76.5
3/21/2017 15:29	70.2	66.6	68.7	71.2		68.7	7413102	71.2
3/21/2017 15:30	70.0	66.1	68.3	71.6		68.3	6760830	71.6
3/21/2017 15:31	72.0	68.8	70.5	75.5		70.5	11220185	75.5
3/21/2017 15:32	68.5	65.8	67.1	68.8		67.1	5128614	68.8
3/21/2017 15:33	70.1	67.6	68.8	71.0		68.8	7585776	71.0
3/21/2017 15:34	70.3	66.6	68.6	71.1		68.6	7244360	71.1

Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 4
I-95 SB / Ex.133-136



Noise Monitoring Photograph



Next Utility Pole S. of M-4.2, 3rd Utility Pole N. of Pine View Ct. @ R/W Fence

I-95 Fredericksburg Ext. Setup 4.3



Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.		
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 5	NE Corner Cleared Portion of #53 Ellison Court Lot	
I-95 NB / Ex.136-140		

I-95 Fredericksburg Ext. Setup 5.1								
Date/Time	Raw Data				Calc:	68.5		80.0
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 16:05	69.1	64.5	66.8	69.7		66.8	4786301	69.7
3/21/2017 16:06	70.0	66.9	68.5	71.1		68.5	7079458	71.1
3/21/2017 16:07	68.4	65.8	67.2	70.1		67.2	5248075	70.1
3/21/2017 16:08	70.6	66.5	68.8	71.5		68.8	7585776	71.5
3/21/2017 16:09	68.2	65.4	67.0	69.1		67.0	5011872	69.1
3/21/2017 16:10	69.1	65.0	67.2	72.1		67.2	5248075	72.1
3/21/2017 16:11	72.1	65.2	70.0	79.4		70.0	10000000	79.4
3/21/2017 16:12	69.0	64.8	67.2	70.3		67.2	5248075	70.3
3/21/2017 16:13	71.3	65.6	69.5	75.1		69.5	8912509	75.1
3/21/2017 16:14	69.7	65.3	67.8	70.6		67.8	6025596	70.6
3/21/2017 16:15	70.5	66.1	68.9	71.4		68.9	7762471	71.4
3/21/2017 16:16	71.1	65.9	68.7	73.6		68.7	7413102	73.6
3/21/2017 16:17	69.9	65.6	69.2	77.9		69.2	8317638	77.9
3/21/2017 16:18	69.6	67.0	68.3	71.0		68.3	6760830	71.0
3/21/2017 16:19	69.5	64.5	67.6	71.1		67.6	5754399	71.1
3/21/2017 16:20	69.3	64.8	67.0	70.4		67.0	5011872	70.4
3/21/2017 16:21	69.6	63.9	67.4	71.5		67.4	5495409	71.5
3/21/2017 16:22	67.9	62.4	65.6	68.9		65.6	3630781	68.9
3/21/2017 16:23	69.3	65.3	68.1	74.4		68.1	6456542	74.4
3/21/2017 16:24	71.9	66.5	69.6	74.5		69.6	9120108	74.5
3/21/2017 16:25	70.6	66.1	68.7	72.1		68.7	7413102	72.1
3/21/2017 16:26	70.3	66.8	68.6	70.6		68.6	7244360	70.6
3/21/2017 16:27	69.9	66.6	68.7	71.4		68.7	7413102	71.4
3/21/2017 16:28	70.3	67.8	68.9	70.9		68.9	7762471	70.9
3/21/2017 16:29	73.7	66.7	71.2	80.0		71.2	13182567	80.0
3/21/2017 16:30	69.4	66.2	67.8	70.5		67.8	6025596	70.5
3/21/2017 16:31	69.8	65.9	67.9	70.3		67.9	6165950	70.3
3/21/2017 16:32	70.5	67.3	69.2	71.1		69.2	8317638	71.1
3/21/2017 16:33	72.1	67.5	69.9	72.4		69.9	9772372	72.4
3/21/2017 16:34	70.3	67.6	69.1	71.0		69.1	8128305	71.0

Notes:
-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 5
I-95 NB / Ex.136-140



Noise Monitoring Photograph

NE Corner Cleared Portion of #53 Ellison Court Lot

I-95 Fredericksburg Ext. Setup 5.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
 VDOT
 UPC 110527
 Setup 5
 I-95 NB / Ex.136-140



Noise Monitoring Traffic Data

NE Corner Cleared Portion of #53 Ellison Court Lot

I-95 Fredericksburg Ext. Setup 5.1

Setup	Direction	Start	Finish	Autos	MT	HT	M
5	SB	16:05	16:35	2571	49	124	0
5	NB	16:05	16:35	1725	60	205	1



Conversion	Autos	MT	HT	M	VPH
2.00	5142	98	248	0	5488
2.00	3450	120	410	2	3982
TOTAL	8592	218	658	2	9470

%DT	%TTST	TOTAL
1.79%	4.52%	6.30%
3.01%	10.30%	13.31%
2.30%	6.95%	9.25%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1714	33	83	0	0	48
NB	3	1150	40	137	0	1	62

Notes:

-Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.		
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 5	Driveway Apron S. of #53 Ellison Court	
I-95 NB / Ex.136-140		

I-95 Fredericksburg Ext. Setup 5.2								
Date/Time	Raw Data				Calc:	63.2		74.6
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 16:05	68.5	63.1	66.3	70.4		66.3	4265795	70.4
3/21/2017 16:06	65.4	59.3	62.8	67.9		62.8	1905461	67.9
3/21/2017 16:07	62.3	59.3	60.8	63.3		60.8	1202264	63.3
3/21/2017 16:08	64.7	60.1	62.5	65.2		62.5	1778279	65.2
3/21/2017 16:09	62.0	59.6	60.9	62.5		60.9	1230269	62.5
3/21/2017 16:10	62.7	57.2	60.9	63.8		60.9	1230269	63.8
3/21/2017 16:11	65.5	59.0	63.2	71.6		63.2	2089296	71.6
3/21/2017 16:12	63.1	59.4	61.1	63.6		61.1	1288250	63.6
3/21/2017 16:13	65.9	61.9	63.8	69.3		63.8	2398833	69.3
3/21/2017 16:14	65.6	60.2	63.0	66.8		63.0	1995262	66.8
3/21/2017 16:15	66.5	61.2	64.5	67.8		64.5	2818383	67.8
3/21/2017 16:16	65.6	61.7	63.3	68.0		63.3	2137962	68.0
3/21/2017 16:17	64.5	60.2	63.5	72.9		63.5	2238721	72.9
3/21/2017 16:18	64.6	60.9	62.9	65.6		62.9	1949845	65.6
3/21/2017 16:19	63.3	59.2	61.4	64.6		61.4	1380384	64.6
3/21/2017 16:20	63.8	59.7	61.9	65.3		61.9	1548817	65.3
3/21/2017 16:21	64.9	57.8	62.1	67.4		62.1	1621810	67.4
3/21/2017 16:22	62.1	57.1	60.0	63.4		60.0	1000000	63.4
3/21/2017 16:23	66.0	60.5	64.0	72.0		64.0	2511886	72.0
3/21/2017 16:24	66.8	62.1	64.7	71.8		64.7	2951209	71.8
3/21/2017 16:25	64.6	61.8	63.5	65.2		63.5	2238721	65.2
3/21/2017 16:26	64.5	61.5	63.1	64.8		63.1	2041738	64.8
3/21/2017 16:27	64.7	62.2	63.5	67.6		63.5	2238721	67.6
3/21/2017 16:28	65.3	62.0	63.6	67.3		63.6	2290868	67.3
3/21/2017 16:29	66.5	61.5	65.2	74.6		65.2	3311311	74.6
3/21/2017 16:30	63.7	60.7	62.2	64.6		62.2	1659587	64.6
3/21/2017 16:31	64.0	60.8	62.4	64.9		62.4	1737801	64.9
3/21/2017 16:32	64.7	61.7	63.4	65.8		63.4	2187762	65.8
3/21/2017 16:33	66.1	61.3	64.3	69.5		64.3	2691535	69.5
3/21/2017 16:34	65.1	61.6	63.6	65.7		63.6	2290868	65.7

Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 5
I-95 NB / Ex.136-140





Noise Monitoring Photograph
Driveway Apron S. of #53 Ellison Court

I-95 Fredericksburg Ext. Setup 5.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 5	Noise Monitoring Data Sheet
I-95 NB / Ex.136-140	Electrical Box S. of #38 Ellison Court

I-95 Fredericksburg Ext. Setup 5.3								
Date/Time	Raw Data				Calc:	62.3		73.1
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 16:05	63.9	59.5	61.2	65.2		61.2	1318257	65.2
3/21/2017 16:06	62.8	59.4	61.3	63.4		61.3	1348963	63.4
3/21/2017 16:07	60.1	58.0	58.9	60.4		58.9	776247.1	60.4
3/21/2017 16:08	62.8	59.6	61.0	63.1		61.0	1258925	63.1
3/21/2017 16:09	62.6	59.0	61.0	63.5		61.0	1258925	63.5
3/21/2017 16:10	60.8	59.1	60.0	61.4		60.0	1000000	61.4
3/21/2017 16:11	65.1	57.0	63.1	73.1		63.1	2041738	73.1
3/21/2017 16:12	60.4	57.9	59.3	61.5		59.3	851138	61.5
3/21/2017 16:13	63.4	59.0	61.7	68.2		61.7	1479108	68.2
3/21/2017 16:14	64.5	60.9	62.5	67.1		62.5	1778279	67.1
3/21/2017 16:15	66.9	63.1	65.3	68.0		65.3	3388442	68.0
3/21/2017 16:16	65.7	61.7	63.7	69.3		63.7	2344229	69.3
3/21/2017 16:17	62.6	59.8	61.5	62.9		61.5	1412538	62.9
3/21/2017 16:18	63.9	60.5	62.7	70.4		62.7	1862087	70.4
3/21/2017 16:19	63.9	60.5	62.4	64.6		62.4	1737801	64.6
3/21/2017 16:20	62.1	59.9	60.7	62.8		60.7	1174898	62.8
3/21/2017 16:21	64.2	59.9	62.3	65.4		62.3	1698244	65.4
3/21/2017 16:22	61.7	57.8	59.7	63.3		59.7	933254.3	63.3
3/21/2017 16:23	62.6	59.4	61.3	63.6		61.3	1348963	63.6
3/21/2017 16:24	66.6	61.4	64.5	69.3		64.5	2818383	69.3
3/21/2017 16:25	63.4	60.7	62.0	64.3		62.0	1584893	64.3
3/21/2017 16:26	63.9	62.2	63.0	64.3		63.0	1995262	64.3
3/21/2017 16:27	63.5	61.4	62.2	64.2		62.2	1659587	64.2
3/21/2017 16:28	63.6	62.2	63.0	63.9		63.0	1995262	63.9
3/21/2017 16:29	67.8	61.9	64.4	70.7		64.4	2754229	70.7
3/21/2017 16:30	64.4	61.9	63.1	64.7		63.1	2041738	64.7
3/21/2017 16:31	62.0	59.8	60.8	64.2		60.8	1202264	64.2
3/21/2017 16:32	63.6	61.7	62.8	64.3		62.8	1905461	64.3
3/21/2017 16:33	65.1	61.6	63.8	67.1		63.8	2398833	67.1
3/21/2017 16:34	64.0	61.5	62.5	64.6		62.5	1778279	64.6

Notes: -Soundpro DL-1 S/N BIH030023
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I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 5
I-95 NB / Ex.136-140





Noise Monitoring Photograph
Electrical Box S. of #38 Ellison Court

I-95 Fredericksburg Ext. Setup 5.3



Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 6	Noise Monitoring Data Sheet
I-95 NB / Ex.140-143	Top of Berm Perpendicular to Car Wash, N. of #61 Bass Drive

I-95 Fredericksburg Ext. Setup 6.1								
Date/Time	Raw Data				Calc:	74.6		80.6
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 17:05	76.9	68.4	73.3	78.7		73.3	21379621	78.7
3/21/2017 17:06	75.4	68.8	72.6	78.1		72.6	18197009	78.1
3/21/2017 17:07	76.7	71.8	74.5	78.7		74.5	28183829	78.7
3/21/2017 17:08	77.3	69.3	74.7	78.6		74.7	29512092	78.6
3/21/2017 17:09	76.1	70.9	74.1	76.9		74.1	25703958	76.9
3/21/2017 17:10	77.4	71.0	74.9	78.4		74.9	30902954	78.4
3/21/2017 17:11	76.3	71.4	74.1	78.5		74.1	25703958	78.5
3/21/2017 17:12	77.4	71.3	75.0	78.7		75.0	31622777	78.7
3/21/2017 17:13	77.5	66.3	74.4	78.6		74.4	27542287	78.6
3/21/2017 17:14	75.8	69.8	73.6	76.9		73.6	22908677	76.9
3/21/2017 17:15	77.4	69.8	74.5	78.3		74.5	28183829	78.3
3/21/2017 17:16	78.4	70.2	75.5	79.2		75.5	35481339	79.2
3/21/2017 17:17	76.1	67.3	72.8	78.1		72.8	19054607	78.1
3/21/2017 17:18	77.3	73.3	75.4	78.1		75.4	34673685	78.1
3/21/2017 17:19	77.6	71.0	75.0	79.2		75.0	31622777	79.2
3/21/2017 17:20	76.7	70.7	74.2	78.4		74.2	26302680	78.4
3/21/2017 17:21	76.9	71.2	74.9	78.3		74.9	30902954	78.3
3/21/2017 17:22	76.8	70.3	74.7	79.4		74.7	29512092	79.4
3/21/2017 17:23	77.4	73.0	75.1	78.0		75.1	32359366	78.0
3/21/2017 17:24	76.8	71.3	74.8	79.2		74.8	30199517	79.2
3/21/2017 17:25	77.4	71.7	75.3	78.1		75.3	33884416	78.1
3/21/2017 17:26	75.9	68.1	73.8	76.8		73.8	23988329	76.8
3/21/2017 17:27	77.5	68.9	74.9	78.6		74.9	30902954	78.6
3/21/2017 17:28	77.0	70.5	74.9	78.2		74.9	30902954	78.2
3/21/2017 17:29	76.8	72.1	74.8	77.8		74.8	30199517	77.8
3/21/2017 17:30	76.4	69.0	73.9	77.8		73.9	24547089	77.8
3/21/2017 17:31	77.2	67.7	73.6	79.5		73.6	22908677	79.5
3/21/2017 17:32	77.7	73.5	75.8	80.3		75.8	38018940	80.3
3/21/2017 17:33	79.3	70.4	76.5	80.6		76.5	44668359	80.6
3/21/2017 17:34	77.8	69.4	74.8	78.5		74.8	30199517	78.5

Notes: -Soundpro DL-1 S/N BLH040011
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I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 6
I-95 NB / Ex.140-143



Noise Monitoring Photograph



Top of Berm Perpendicular to Car Wash, N. of #61 Bass Drive

I-95 Fredericksburg Ext. Setup 6.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 6	Noise Monitoring Traffic Data
I-95 NB / Ex.140-143	Top of Berm Perpendicular to Car Wash, N. of #61 Bass Drive



I-95 Fredericksburg Ext. Setup 6.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
6	SB	17:05	17:35	2055	38	84	0
6	NB	17:05	17:35	1417	47	107	2

Conversion	Autos	MT	HT	M	VPH
2.00	4110	76	168	0	4354
2.00	2834	94	214	4	3146
TOTAL	6944	170	382	4	7500

%DT	%TTST	TOTAL
1.75%	3.86%	5.60%
2.99%	6.80%	9.79%
2.27%	5.09%	7.36%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1370	25	56	0	0	52
NB	3	945	31	71	0	1	66

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 6	Noise Monitoring Data Sheet
I-95 NB / Ex.140-143	S. End @ Bottom of Berm W. of Pkg. Lot, SW. of #61 Bass Drive

I-95 Fredericksburg Ext. Setup 6.2								
Date/Time	Raw Data				Calc:	73.1		79.9
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 17:05	68.5	63.1	66.3	70.4	x			
3/21/2017 17:06	74.7	68.0	72.3	76.4		72.3	16982437	76.4
3/21/2017 17:07	76.1	67.1	73.6	77.2		73.6	22908677	77.2
3/21/2017 17:08	73.9	67.0	71.9	74.9		71.9	15488166	74.9
3/21/2017 17:09	75.0	69.8	73.0	77.3		73.0	19952623	77.3
3/21/2017 17:10	75.7	67.5	72.5	77.7		72.5	17782794	77.7
3/21/2017 17:11	74.8	68.5	72.8	79.5		72.8	19054607	79.5
3/21/2017 17:12	75.5	65.6	72.7	76.8		72.7	18620871	76.8
3/21/2017 17:13	75.6	64.7	72.2	77.3		72.2	16595869	77.3
3/21/2017 17:14	76.1	66.4	72.8	76.9		72.8	19054607	76.9
3/21/2017 17:15	76.3	67.2	73.2	77.7		73.2	20892961	77.7
3/21/2017 17:16	75.7	66.8	72.2	78.4		72.2	16595869	78.4
3/21/2017 17:17	76.2	67.0	73.0	77.5		73.0	19952623	77.5
3/21/2017 17:18	75.0	68.0	72.9	77.5		72.9	19498446	77.5
3/21/2017 17:19	76.4	68.2	72.9	78.3		72.9	19498446	78.3
3/21/2017 17:20	75.3	69.8	73.1	76.8		73.1	20417379	76.8
3/21/2017 17:21	76.0	69.2	73.9	77.3		73.9	24547089	77.3
3/21/2017 17:22	76.3	69.2	73.4	78.1		73.4	21877616	78.1
3/21/2017 17:23	75.6	69.6	73.6	77.8		73.6	22908677	77.8
3/21/2017 17:24	75.3	70.0	73.2	77.3		73.2	20892961	77.3
3/21/2017 17:25	74.8	64.3	72.2	75.3		72.2	16595869	75.3
3/21/2017 17:26	75.6	66.0	73.1	76.6		73.1	20417379	76.6
3/21/2017 17:27	75.0	67.2	72.6	76.8		72.6	18197009	76.8
3/21/2017 17:28	76.1	69.7	73.4	77.7		73.4	21877616	77.7
3/21/2017 17:29	75.1	70.0	72.8	75.9		72.8	19054607	75.9
3/21/2017 17:30	75.4	64.2	71.5	76.7		71.5	14125375	76.7
3/21/2017 17:31	77.7	67.3	74.2	79.2		74.2	26302680	79.2
3/21/2017 17:32	78.0	68.5	75.1	79.9		75.1	32359366	79.9
3/21/2017 17:33	77.1	68.1	73.6	78.6		73.6	22908677	78.6
3/21/2017 17:34	76.9	70.3	74.6	78.4		74.6	28840315	78.4

Notes:
-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 6
I-95 NB / Ex.140-143



Noise Monitoring Photograph

S. End @ Bottom of Berm W. of Pkg. Lot, SW. of #61 Bass Drive

I-95 Fredericksburg Ext. Setup 6.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.	 Virginia Department of Transportation	
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 6	Fire Hydrant NW of #61 Bass Drive	
I-95 NB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 6.3								
Date/Time	Raw Data				Calc:	61.1		66.6
	L10-1	L90-1	Leq-1	Lmax-1	Despike?	Leq	SPL	Lmax
3/21/2017 17:05	60.0	58.2	59.0	60.7		59.0	794328.2	60.7
3/21/2017 17:06	61.6	57.3	59.8	61.8		59.8	954992.6	61.8
3/21/2017 17:07	63.8	59.8	61.9	65.0		61.9	1548817	65.0
3/21/2017 17:08	62.2	58.6	60.9	65.2		60.9	1230269	65.2
3/21/2017 17:09	62.5	60.6	61.5	64.8		61.5	1412538	64.8
3/21/2017 17:10	62.5	59.3	61.1	63.1		61.1	1288250	63.1
3/21/2017 17:11	62.0	59.7	60.7	62.4		60.7	1174898	62.4
3/21/2017 17:12	63.4	61.5	62.6	63.8		62.6	1819701	63.8
3/21/2017 17:13	63.6	59.3	61.6	64.4		61.6	1445440	64.4
3/21/2017 17:14	62.7	60.1	61.2	63.3		61.2	1318257	63.3
3/21/2017 17:15	62.5	60.0	61.2	63.5		61.2	1318257	63.5
3/21/2017 17:16	63.6	60.3	62.0	66.6		62.0	1584893	66.6
3/21/2017 17:17	61.7	57.7	59.7	62.4		59.7	933254.3	62.4
3/21/2017 17:18	62.3	59.9	61.2	62.9		61.2	1318257	62.9
3/21/2017 17:19	63.3	58.2	61.6	64.1		61.6	1445440	64.1
3/21/2017 17:20	61.7	59.8	60.8	62.5		60.8	1202264	62.5
3/21/2017 17:21	62.0	59.4	61.0	62.9		61.0	1258925	62.9
3/21/2017 17:22	61.6	58.9	60.6	62.0		60.6	1148154	62.0
3/21/2017 17:23	62.3	59.6	60.9	62.8		60.9	1230269	62.8
3/21/2017 17:24	62.4	59.6	61.1	62.9		61.1	1288250	62.9
3/21/2017 17:25	62.1	59.7	60.9	62.2		60.9	1230269	62.2
3/21/2017 17:26	61.9	58.7	60.7	63.0		60.7	1174898	63.0
3/21/2017 17:27	62.9	58.7	60.8	63.5		60.8	1202264	63.5
3/21/2017 17:28	62.5	60.3	61.5	63.0		61.5	1412538	63.0
3/21/2017 17:29	61.7	59.6	60.6	62.2		60.6	1148154	62.2
3/21/2017 17:30	61.6	57.4	60.1	62.1		60.1	1023293	62.1
3/21/2017 17:31	63.2	57.8	60.7	63.8		60.7	1174898	63.8
3/21/2017 17:32	63.0	59.7	61.4	63.7		61.4	1380384	63.7
3/21/2017 17:33	63.6	58.9	61.7	65.0		61.7	1479108	65.0
3/21/2017 17:34	63.6	59.7	61.8	64.0		61.8	1513561	64.0

Notes:
-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 6
I-95 NB / Ex.140-143



Noise Monitoring Photograph



Fire Hydrant NW of #61 Bass Drive

I-95 Fredericksburg Ext. Setup 6.3



Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.		
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 7	Lot Line NW of NW End Doria Hill Drive	
I-95 NB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 7.1								
Date/Time	Raw Data				Calc:	69.3		82.2
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 18:10	71.4	66.2	68.9	72.3		68.9	7762471	72.3
3/21/2017 18:11	70.8	66.9	69.4	72.3		69.4	8709636	72.3
3/21/2017 18:12	72.9	67.7	70.4	73.7		70.4	10964782	73.7
3/21/2017 18:13	70.0	66.4	68.4	71.4		68.4	6918310	71.4
3/21/2017 18:14	71.6	67.7	69.5	72.9		69.5	8912509	72.9
3/21/2017 18:15	70.0	66.6	68.8	71.1		68.8	7585776	71.1
3/21/2017 18:16	70.6	66.6	69.3	71.3		69.3	8511380	71.3
3/21/2017 18:17	72.7	64.1	68.7	73.7		68.7	7413102	73.7
3/21/2017 18:18	73.2	64.7	70.7	76.3		70.7	11748976	76.3
3/21/2017 18:19	71.4	66.7	69.7	72.1		69.7	9332543	72.1
3/21/2017 18:20	72.1	64.8	69.6	75.3		69.6	9120108	75.3
3/21/2017 18:21	71.4	63.5	68.5	73.8		68.5	7079458	73.8
3/21/2017 18:22	68.7	63.6	66.8	69.9		66.8	4786301	69.9
3/21/2017 18:23	71.1	64.9	68.5	71.5		68.5	7079458	71.5
3/21/2017 18:24	73.8	68.4	71.5	76.2		71.5	14125375	76.2
3/21/2017 18:25	71.4	67.1	69.4	72.0		69.4	8709636	72.0
3/21/2017 18:26	69.6	64.8	67.7	72.2		67.7	5888437	72.2
3/21/2017 18:27	72.7	65.5	70.1	73.6		70.1	10232930	73.6
3/21/2017 18:28	70.5	62.5	67.5	70.8		67.5	5623413	70.8
3/21/2017 18:29	70.9	67.6	69.6	71.4		69.6	9120108	71.4
3/21/2017 18:30	70.1	67.2	68.8	70.4		68.8	7585776	70.4
3/21/2017 18:31	70.9	65.8	69.0	73.0		69.0	7943282	73.0
3/21/2017 18:32	70.3	64.7	69.5	80.6		69.5	8912509	80.6
3/21/2017 18:33	75.1	68.0	72.8	82.2		72.8	19054607	82.2
3/21/2017 18:34	70.7	63.6	67.4	72.7		67.4	5495409	72.7
3/21/2017 18:35	70.7	64.3	68.2	71.0		68.2	6606934	71.0
3/21/2017 18:36	71.6	64.9	68.5	72.7		68.5	7079458	72.7
3/21/2017 18:37	72.1	65.6	69.2	72.6		69.2	8317638	72.6
3/21/2017 18:38	71.1	65.2	68.6	72.4		68.6	7244360	72.4
3/21/2017 18:39	71.2	67.6	69.2	72.2		69.2	8317638	72.2

Notes:
-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 7
I-95 NB / Ex.140-143





Noise Monitoring Photograph
Lot Line NW of NW End Doria Hill Drive

I-95 Fredericksburg Ext. Setup 7.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 7	Noise Monitoring Traffic Data
I-95 NB / Ex.140-143	Lot Line NW of NW End Doria Hill Drive


I-95 Fredericksburg Ext. Setup 7.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
7	SB	18:10	18:40	1740	27	110	0
7	NB	18:10	18:40	1200	33	140	1

Conversion	Autos	MT	HT	M	VPH
2.00	3480	54	220	0	3754
2.00	2400	66	280	2	2748
TOTAL	5880	120	500	2	6502

%DT	%TTST	TOTAL
1.44%	5.86%	7.30%
2.40%	10.19%	12.59%
1.85%	7.69%	9.54%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1160	18	73	0	0	55
NB	3	800	22	93	0	1	69

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 Virginia Department of Transportation	
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 7	Fire Hydrant @ NW End of Doria Hill Drive	
I-95 NB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 7.2								
Date/Time	Raw Data				Calc:	67.2		71.7
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 18:10	72.0	69.4	70.7	73.8	x			
3/21/2017 18:11	72.1	69.2	70.7	73.4	x			
3/21/2017 18:12	71.7	69.4	70.4	72.5	x			
3/21/2017 18:13	70.5	69.0	69.6	72.2	x			
3/21/2017 18:14	70.7	69.3	69.8	71.1	x			
3/21/2017 18:15	72.1	69.1	70.2	73.7	x			
3/21/2017 18:16	70.4	68.6	69.4	70.8	x			
3/21/2017 18:17	70.6	68.2	69.3	71.6	x			
3/21/2017 18:18	72.6	69.4	70.9	73.9	x			
3/21/2017 18:19	72.6	70.1	71.2	73.8	x			
3/21/2017 18:20	72.1	65.6	69.8	73.5	x			
3/21/2017 18:21	68.0	65.7	66.7	68.7		66.7	4677351	68.7
3/21/2017 18:22	67.7	65.6	66.6	68.7		66.6	4570882	68.7
3/21/2017 18:23	68.2	65.5	66.9	69.0		66.9	4897788	69.0
3/21/2017 18:24	70.1	67.5	68.7	71.7		68.7	7413102	71.7
3/21/2017 18:25	68.2	66.0	66.9	68.4		66.9	4897788	68.4
3/21/2017 18:26	68.2	65.7	66.7	68.5		66.7	4677351	68.5
3/21/2017 18:27	69.2	65.6	67.5	69.7		67.5	5623413	69.7
3/21/2017 18:28	68.4	65.4	67.2	68.6		67.2	5248075	68.6
3/21/2017 18:29	68.5	66.7	67.5	68.9		67.5	5623413	68.9
3/21/2017 18:30	67.6	66.8	67.1	67.8		67.1	5128614	67.8
3/21/2017 18:31	68.2	65.4	66.8	69.7		66.8	4786301	69.7
3/21/2017 18:32	74.9	66.4	70.1	78.5	x			
3/21/2017 18:33	68.7	65.5	67.1	69.1		67.1	5128614	69.1
3/21/2017 18:34	67.9	65.2	66.3	68.2		66.3	4265795	68.2
3/21/2017 18:35	68.4	65.4	66.9	68.8		66.9	4897788	68.8
3/21/2017 18:36	69.3	65.7	67.3	69.9		67.3	5370318	69.9
3/21/2017 18:37	69.2	65.9	67.5	69.5		67.5	5623413	69.5
3/21/2017 18:38	68.6	66.1	67.1	69.1		67.1	5128614	69.1
3/21/2017 18:39	68.8	66.6	67.5	69.5		67.5	5623413	69.5

Notes:

- Soundpro DL-2 S/N BIJ030015
- Concrete mix truck cleanout 18:10 - 18:20.
- Concrete mix truck depart 18:32

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 7
I-95 NB / Ex.140-143



Noise Monitoring Photograph



Fire Hydrant @ NW End of Doria Hill Drive

I-95 Fredericksburg Ext. Setup 7.2



Notes:

- Soundpro DL-2 S/N BIJ030015
- Concrete mix truck cleanout 18:10 - 18:20.
- Concrete mix truck depart 18:32

I-95 Fredericksburg Ext.	 Virginia Department of Transportation	
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 7	E. Corner Doria Hill Drive & Capri Court	
I-95 NB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 7.3								
Date/Time	Raw Data				Calc:	58.6		67.9
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/21/2017 18:10	61.0	58.2	59.5	62.1		59.5	891250.9	62.1
3/21/2017 18:11	61.0	58.9	59.9	62.4		59.9	977237.2	62.4
3/21/2017 18:12	62.2	58.4	60.2	62.8		60.2	1047129	62.8
3/21/2017 18:13	60.3	57.8	59.0	61.7		59.0	794328.2	61.7
3/21/2017 18:14	59.7	57.6	58.7	60.9		58.7	741310.2	60.9
3/21/2017 18:15	59.9	57.7	58.7	60.3		58.7	741310.2	60.3
3/21/2017 18:16	59.6	57.5	58.6	60.0		58.6	724436	60.0
3/21/2017 18:17	60.6	56.3	58.3	60.8		58.3	676083	60.8
3/21/2017 18:18	60.2	56.6	59.0	61.6		59.0	794328.2	61.6
3/21/2017 18:19	62.6	59.2	60.7	63.8		60.7	1174898	63.8
3/21/2017 18:20	59.9	55.8	58.3	63.4		58.3	676083	63.4
3/21/2017 18:21	59.9	54.9	57.4	63.3		57.4	549540.9	63.3
3/21/2017 18:22	57.3	55.6	56.3	58.0		56.3	426579.5	58.0
3/21/2017 18:23	58.9	55.9	57.6	59.4		57.6	575439.9	59.4
3/21/2017 18:24	61.7	58.1	60.0	62.9		60.0	1000000	62.9
3/21/2017 18:25	59.8	57.6	58.6	60.2		58.6	724436	60.2
3/21/2017 18:26	58.8	56.8	57.8	59.5		57.8	602559.6	59.5
3/21/2017 18:27	60.6	57.3	59.0	61.3		59.0	794328.2	61.3
3/21/2017 18:28	58.7	56.3	57.3	59.1		57.3	537031.8	59.1
3/21/2017 18:29	60.1	58.2	59.1	60.4		59.1	812830.5	60.4
3/21/2017 18:30	58.6	56.4	57.5	58.9		57.5	562341.3	58.9
3/21/2017 18:31	59.1	55.4	57.4	59.6		57.4	549540.9	59.6
3/21/2017 18:32	59.6	56.0	58.6	67.9		58.6	724436	67.9
3/21/2017 18:33	66.0	57.7	61.9	69.7	x			
3/21/2017 18:34	58.2	56.1	57.0	59.4		57.0	501187.2	59.4
3/21/2017 18:35	59.3	55.6	57.4	59.8		57.4	549540.9	59.8
3/21/2017 18:36	59.5	56.5	57.9	60.2		57.9	616595	60.2
3/21/2017 18:37	60.7	56.9	58.8	60.9		58.8	758577.6	60.9
3/21/2017 18:38	59.9	56.8	58.4	60.3		58.4	691831	60.3
3/21/2017 18:39	59.9	57.3	58.5	60.3		58.5	707945.8	60.3

Notes:
 -Soundpro DL-1 S/N BIH030023
 -Concrete mix truck depart 18:33

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 7
I-95 NB / Ex.140-143



Noise Monitoring Photograph



E. Corner Doria Hill Drive & Capri Court

I-95 Fredericksburg Ext. Setup 7.3





Notes:

- Soundpro DL-1 S/N BIH030023
- Concrete mix truck depart 18:33

I-95 Fredericksburg Ext.		
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 8	E. of Whitsons Run, Opposite #243	
I-95 SB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 8.1								
Date/Time	Raw Data				Calc:	68.2		86.5
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 8:10	71.9	67.4	70.0	72.4		70.0	10000000	72.4
3/23/2017 8:11	69.5	63.6	67.4	71.5		67.4	5495409	71.5
3/23/2017 8:12	71.3	66.6	68.9	72.9		68.9	7762471	72.9
3/23/2017 8:13	70.0	66.4	68.4	71.4		68.4	6918310	71.4
3/23/2017 8:14	71.6	67.7	69.5	72.9		69.5	8912509	72.9
3/23/2017 8:15	70.0	66.6	68.8	71.1		68.8	7585776	71.1
3/23/2017 8:16	70.6	66.6	69.3	71.3		69.3	8511380	71.3
3/23/2017 8:17	72.7	64.1	68.7	73.7		68.7	7413102	73.7
3/23/2017 8:18	71.5	65.8	69.7	80.1		69.7	9332543	80.1
3/23/2017 8:19	68.5	63.2	66.4	69.3		66.4	4365158	69.3
3/23/2017 8:20	67.2	62.5	65.3	68.0		65.3	3388442	68.0
3/23/2017 8:21	72.7	66.4	70.2	74.5		70.2	10471285	74.5
3/23/2017 8:22	69.7	56.2	65.5	71.1		65.5	3548134	71.1
3/23/2017 8:23	73.6	66.8	70.5	79.3		70.5	11220185	79.3
3/23/2017 8:24	75.5	58.6	74.1	86.5		74.1	25703958	86.5
3/23/2017 8:25	66.8	59.4	63.9	67.7		63.9	2454709	67.7
3/23/2017 8:26	68.3	63.4	66.2	68.8		66.2	4168694	68.8
3/23/2017 8:27	66.0	58.6	63.3	69.0		63.3	2137962	69.0
3/23/2017 8:28	68.1	63.4	66.3	70.1		66.3	4265795	70.1
3/23/2017 8:29	68.0	60.6	65.6	70.0		65.6	3630781	70.0
3/23/2017 8:30	67.8	61.8	65.7	69.6		65.7	3715352	69.6
3/23/2017 8:31	68.1	65.2	67.2	68.8		67.2	5248075	68.8
3/23/2017 8:32	69.9	64.9	67.4	71.9		67.4	5495409	71.9
3/23/2017 8:33	69.6	63.9	66.8	70.9		66.8	4786301	70.9
3/23/2017 8:34	68.9	60.5	66.2	70.5		66.2	4168694	70.5
3/23/2017 8:35	68.6	63.2	66.3	70.4		66.3	4265795	70.4
3/23/2017 8:36	71.3	62.8	69.2	72.1		69.2	8317638	72.1
3/23/2017 8:37	68.5	62.3	66.4	69.4		66.4	4365158	69.4
3/23/2017 8:38	65.7	62.6	64.2	66.2		64.2	2630268	66.2
3/23/2017 8:39	71.4	63.8	68.0	73.2		68.0	6309573	73.2

Notes:
-Soundpro DL-1 S/N BLH040011



I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 8	Noise Monitoring Photograph
I-95 SB / Ex.140-143	E. of Whitsons Run, Opposite #243

I-95 Fredericksburg Ext. Setup 8.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 8	Noise Monitoring Traffic Data
I-95 SB / Ex.140-143	E. of Whitsons Run, Opposite #243



I-95 Fredericksburg Ext. Setup 8.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
8	SB	8:10	8:40	765	122	295	0
8	NB	8:10	8:40	2238	104	236	0

Conversion	Autos	MT	HT	M	VPH
2.00	1530	244	590	0	2364
2.00	4476	208	472	0	5156
TOTAL	6006	452	1062	0	7520

%DT	%TTST	TOTAL
10.32%	24.96%	35.28%
4.03%	9.15%	13.19%
6.01%	14.12%	20.13%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	510	81	197	0	0	62
NB	3	1492	69	157	0	0	45

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 8	Noise Monitoring Data Sheet
I-95 SB / Ex.140-143	E. of Whitsons Run, Opposite #245

I-95 Fredericksburg Ext. Setup 8.2								
Date/Time	Raw Data				Calc:	67.5		79.4
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 8:10	72.0	69.4	70.7	73.8	x			
3/23/2017 8:11	72.1	69.2	70.7	73.4	x			
3/23/2017 8:12	71.7	69.4	70.4	72.5	x			
3/23/2017 8:13	70.5	64.2	67.8	72.4		67.8	6025596	72.4
3/23/2017 8:14	71.5	66.6	69.1	73.8		69.1	8128305	73.8
3/23/2017 8:15	70.2	65.1	67.8	73.2		67.8	6025596	73.2
3/23/2017 8:16	69.7	65.4	67.9	70.9		67.9	6165950	70.9
3/23/2017 8:17	71.7	65.9	69.1	73.6		69.1	8128305	73.6
3/23/2017 8:18	70.7	65.4	68.1	73.1		68.1	6456542	73.1
3/23/2017 8:19	71.2	62.8	68.8	73.4		68.8	7585776	73.4
3/23/2017 8:20	69.1	63.0	66.5	70.6		66.5	4466836	70.6
3/23/2017 8:21	70.4	64.3	68.1	74.0		68.1	6456542	74.0
3/23/2017 8:22	72.5	56.7	69.8	75.1		69.8	9549926	75.1
3/23/2017 8:23	73.3	58.0	69.1	77.3		69.1	8128305	77.3
3/23/2017 8:24	74.3	61.6	70.2	79.4		70.2	10471285	79.4
3/23/2017 8:25	70.4	58.5	67.4	79.4		67.4	5495409	79.4
3/23/2017 8:26	68.0	61.9	65.2	69.5		65.2	3311311	69.5
3/23/2017 8:27	68.9	60.4	65.4	69.7		65.4	3467369	69.7
3/23/2017 8:28	66.5	58.7	64.5	68.0		64.5	2818383	68.0
3/23/2017 8:29	68.9	64.6	66.7	71.0		66.7	4677351	71.0
3/23/2017 8:30	66.3	60.4	63.9	69.5		63.9	2454709	69.5
3/23/2017 8:31	68.7	64.1	66.9	69.7		66.9	4897788	69.7
3/23/2017 8:32	70.4	65.8	67.8	72.4		67.8	6025596	72.4
3/23/2017 8:33	68.8	63.8	66.6	71.3		66.6	4570882	71.3
3/23/2017 8:34	69.5	60.0	67.0	71.5		67.0	5011872	71.5
3/23/2017 8:35	68.1	61.5	65.4	69.2		65.4	3467369	69.2
3/23/2017 8:36	69.8	61.8	67.4	71.5		67.4	5495409	71.5
3/23/2017 8:37	71.1	61.5	68.6	73.2		68.6	7244360	73.2
3/23/2017 8:38	66.8	62.7	64.9	70.3		64.9	3090295	70.3
3/23/2017 8:39	67.0	61.9	64.6	67.8		64.6	2884032	67.8

Notes:
-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 8
I-95 SB / Ex.140-143



Noise Monitoring Photograph



E. of Whitsons Run, Opposite #245

I-95 Fredericksburg Ext. Setup 8.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 8	Noise Monitoring Data Sheet
I-95 SB / Ex.140-143	S. of Whitsons Run, opposite Ryan Way

I-95 Fredericksburg Ext. Setup 8.3								
Date/Time	Raw Data				Calc:	57.6		64.1
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 8:10	60.7	56.0	58.7	62.9		58.7	741310.2	62.9
3/23/2017 8:11	61.1	58.2	59.7	64.1		59.7	933254.3	64.1
3/23/2017 8:12	61.4	57.5	59.2	62.7		59.2	831763.8	62.7
3/23/2017 8:13	60.3	57.8	59.0	61.7		59.0	794328.2	61.7
3/23/2017 8:14	59.7	57.6	58.7	60.9		58.7	741310.2	60.9
3/23/2017 8:15	59.9	57.7	58.7	60.3		58.7	741310.2	60.3
3/23/2017 8:16	59.6	57.5	58.6	60.0		58.6	724436	60.0
3/23/2017 8:17	60.6	56.3	58.3	60.8		58.3	676083	60.8
3/23/2017 8:18	60.2	56.6	59.0	61.6		59.0	794328.2	61.6
3/23/2017 8:19	62.6	59.2	60.7	63.8		60.7	1174898	63.8
3/23/2017 8:20	59.9	55.8	58.3	63.4		58.3	676083	63.4
3/23/2017 8:21	59.9	54.9	57.4	63.3		57.4	549540.9	63.3
3/23/2017 8:22	57.3	55.6	56.3	58.0		56.3	426579.5	58.0
3/23/2017 8:23	69.8	59.1	67.0	80.0	x			
3/23/2017 8:24	66.2	54.8	63.7	75.9	x			
3/23/2017 8:25	56.1	51.4	54.3	56.7		54.3	269153.5	56.7
3/23/2017 8:26	58.7	54.6	57.0	59.7		57.0	501187.2	59.7
3/23/2017 8:27	57.5	52.1	55.3	58.7		55.3	338844.2	58.7
3/23/2017 8:28	59.3	55.5	57.8	61.6		57.8	602559.6	61.6
3/23/2017 8:29	58.2	54.0	56.7	59.0		56.7	467735.1	59.0
3/23/2017 8:30	57.6	52.7	55.4	58.2		55.4	346736.9	58.2
3/23/2017 8:31	57.9	55.9	57.2	58.2		57.2	524807.5	58.2
3/23/2017 8:32	59.0	55.2	57.0	59.9		57.0	501187.2	59.9
3/23/2017 8:33	58.8	53.9	56.5	59.7		56.5	446683.6	59.7
3/23/2017 8:34	57.9	52.1	55.7	58.6		55.7	371535.2	58.6
3/23/2017 8:35	57.1	54.1	55.4	58.6		55.4	346736.9	58.6
3/23/2017 8:36	59.2	53.7	57.4	60.4		57.4	549540.9	60.4
3/23/2017 8:37	57.6	52.9	55.7	58.2		55.7	371535.2	58.2
3/23/2017 8:38	54.6	52.1	53.3	55.6		53.3	213796.2	55.6
3/23/2017 8:39	60.1	54.3	57.3	60.9		57.3	537031.8	60.9

Notes:
 -Soundpro DL-1 S/N BIH030023
 -Car idle, car stereo near M-8.1 @ 08:23 - 08:24

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 8
I-95 SB / Ex.140-143



Noise Monitoring Photograph



S. of Whitsons Run, opposite Ryan Way

I-95 Fredericksburg Ext. Setup 8.3



Notes:

- Soundpro DL-1 S/N BIH030023
- Car idle, car stereo near M-8.1 @ 08:23 - 08:24

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 9	Noise Monitoring Data Sheet
I-95 SB / Ex.140-143	Hiking Trail, Perpendicular to I-95 SB Concrete Ditch

I-95 Fredericksburg Ext. Setup 9.1								
Date/Time	Raw Data				Calc:	68.6		80.6
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 9:10	71.9	67.4	70.0	72.4		70.0	10000000	72.4
3/23/2017 9:11	70.9	65.8	68.5	72.2		68.5	7079458	72.2
3/23/2017 9:12	71.0	64.1	68.3	72.6		68.3	6760830	72.6
3/23/2017 9:13	70.0	62.3	67.3	73.3		67.3	5370318	73.3
3/23/2017 9:14	69.0	62.1	65.8	70.7		65.8	3801894	70.7
3/23/2017 9:15	70.0	64.2	67.8	70.6		67.8	6025596	70.6
3/23/2017 9:16	70.2	64.1	68.3	72.9		68.3	6760830	72.9
3/23/2017 9:17	71.8	65.6	69.3	73.4		69.3	8511380	73.4
3/23/2017 9:18	71.0	67.7	69.5	73.7		69.5	8912509	73.7
3/23/2017 9:19	74.0	67.3	71.6	80.6		71.6	14454398	80.6
3/23/2017 9:20	70.5	64.9	68.5	72.5		68.5	7079458	72.5
3/23/2017 9:21	70.2	64.1	67.5	72.9		67.5	5623413	72.9
3/23/2017 9:22	73.3	66.5	70.1	73.7		70.1	10232930	73.7
3/23/2017 9:23	70.2	63.6	67.8	71.7		67.8	6025596	71.7
3/23/2017 9:24	71.7	65.7	69.5	72.8		69.5	8912509	72.8
3/23/2017 9:25	69.2	65.2	67.5	71.2		67.5	5623413	71.2
3/23/2017 9:26	70.0	63.4	67.3	72.3		67.3	5370318	72.3
3/23/2017 9:27	72.0	65.7	69.5	75.5		69.5	8912509	75.5
3/23/2017 9:28	71.9	64.7	69.1	73.1		69.1	8128305	73.1
3/23/2017 9:29	71.1	67.1	69.2	73.1		69.2	8317638	73.1
3/23/2017 9:30	72.0	65.8	69.7	73.5		69.7	9332543	73.5
3/23/2017 9:31	70.4	64.6	68.2	71.4		68.2	6606934	71.4
3/23/2017 9:32	70.8	61.5	68.0	72.8		68.0	6309573	72.8
3/23/2017 9:33	71.5	65.0	69.0	72.2		69.0	7943282	72.2
3/23/2017 9:34	69.8	60.9	66.8	71.0		66.8	4786301	71.0
3/23/2017 9:35	71.2	65.3	68.8	72.2		68.8	7585776	72.2
3/23/2017 9:36	71.5	65.5	69.2	72.0		69.2	8317638	72.0
3/23/2017 9:37	70.2	66.1	68.4	72.0		68.4	6918310	72.0
3/23/2017 9:38	68.4	59.7	65.8	70.0		65.8	3801894	70.0
3/23/2017 9:39	69.6	63.5	67.3	70.8		67.3	5370318	70.8

Notes:
-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 9
I-95 SB / Ex.140-143



Noise Monitoring Photograph



Hiking Trail, Perpendicular to I-95 SB Concrete Ditch

I-95 Fredericksburg Ext. Setup 9.1



Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 9	Noise Monitoring Traffic Data
I-95 SB / Ex.140-143	Hiking Trail, Perpendicular to I-95 SB Concrete Ditch



I-95 Fredericksburg Ext. Setup 9.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
9	SB	9:10	9:40	1497	77	136	0
9	NB	9:10	9:40	1454	94	119	0

Conversion	Autos	MT	HT	M	VPH
2.00	2994	154	272	0	3420
2.00	2908	188	238	0	3334
TOTAL	5902	342	510	0	6754

%DT	%TTST	TOTAL
4.50%	7.95%	12.46%
5.64%	7.14%	12.78%
5.06%	7.55%	12.61%

Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	998	51	91	0	0	65
NB	3	969	63	79	0	0	50

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 9	Noise Monitoring Data Sheet
I-95 SB / Ex.140-143	SE End of Sidewalk Hiking Trail Behind #24 & #28 Banner Spring Circle

I-95 Fredericksburg Ext. Setup 9.2								
Date/Time	Raw Data				Calc:	67.2		77.4
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 9:10	68.6	65.0	67.1	69.9		67.1	5128614	69.9
3/23/2017 9:11	69.3	64.3	67.0	70.4		67.0	5011872	70.4
3/23/2017 9:12	69.5	63.3	67.4	70.8		67.4	5495409	70.8
3/23/2017 9:13	68.8	62.7	66.1	69.5		66.1	4073803	69.5
3/23/2017 9:14	66.6	61.6	64.0	68.4		64.0	2511886	68.4
3/23/2017 9:15	68.4	64.7	66.9	69.0		66.9	4897788	69.0
3/23/2017 9:16	69.6	63.1	67.4	71.8		67.4	5495409	71.8
3/23/2017 9:17	69.4	65.1	67.9	71.7		67.9	6165950	71.7
3/23/2017 9:18	69.2	66.8	68.3	71.1		68.3	6760830	71.1
3/23/2017 9:19	72.6	66.0	69.7	77.4		69.7	9332543	77.4
3/23/2017 9:20	69.0	63.1	66.8	70.5		66.8	4786301	70.5
3/23/2017 9:21	68.9	64.3	66.7	70.2		66.7	4677351	70.2
3/23/2017 9:22	71.4	64.8	68.1	71.7		68.1	6456542	71.7
3/23/2017 9:23	68.9	61.6	66.3	69.8		66.3	4265795	69.8
3/23/2017 9:24	69.6	66.3	67.9	70.4		67.9	6165950	70.4
3/23/2017 9:25	67.5	64.1	65.8	68.4		65.8	3801894	68.4
3/23/2017 9:26	68.3	62.2	65.9	70.3		65.9	3890451	70.3
3/23/2017 9:27	70.7	64.1	67.8	72.0		67.8	6025596	72.0
3/23/2017 9:28	70.2	65.0	68.3	71.2		68.3	6760830	71.2
3/23/2017 9:29	68.2	64.3	67.0	68.9		67.0	5011872	68.9
3/23/2017 9:30	71.3	65.1	68.7	72.0		68.7	7413102	72.0
3/23/2017 9:31	68.6	62.9	66.3	69.5		66.3	4265795	69.5
3/23/2017 9:32	69.9	60.2	67.2	70.4		67.2	5248075	70.4
3/23/2017 9:33	70.0	64.1	67.4	70.5		67.4	5495409	70.5
3/23/2017 9:34	67.1	59.7	64.8	67.9		64.8	3019952	67.9
3/23/2017 9:35	69.6	65.2	67.9	70.0		67.9	6165950	70.0
3/23/2017 9:36	69.5	64.6	67.5	70.7		67.5	5623413	70.7
3/23/2017 9:37	69.1	64.2	66.9	69.7		66.9	4897788	69.7
3/23/2017 9:38	66.3	58.4	63.3	67.2		63.3	2137962	67.2
3/23/2017 9:39	68.6	64.4	67.0	69.2		67.0	5011872	69.2

Notes:
-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 9
I-95 SB / Ex.140-143



Noise Monitoring Photograph



SE End of Sidewalk Hiking Trail Behind #24 & #28 Banner Spring Circle

I-95 Fredericksburg Ext. Setup 9.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 9	Noise Monitoring Data Sheet
I-95 SB / Ex.140-143	NW End of Sidewalk Entrance to Hiking Trail Between #24 & #28 Banner Spring Circle

I-95 Fredericksburg Ext. Setup 9.3								
Date/Time	Raw Data				Calc:	55.4		66.2
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 9:10	61.2	54.7	57.6	63.2		57.6	575439.9	63.2
3/23/2017 9:11	58.5	54.4	56.6	59.7		56.6	457088.2	59.7
3/23/2017 9:12	58.4	53.5	56.6	62.1		56.6	457088.2	62.1
3/23/2017 9:13	57.6	52.9	55.5	59.1		55.5	354813.4	59.1
3/23/2017 9:14	58.5	51.4	55.7	60.8		55.7	371535.2	60.8
3/23/2017 9:15	56.5	52.1	54.6	57.5		54.6	288403.2	57.5
3/23/2017 9:16	56.9	52.6	55.0	58.0		55.0	316227.8	58.0
3/23/2017 9:17	57.7	54.5	56.1	59.0		56.1	407380.3	59.0
3/23/2017 9:18	57.4	54.9	56.1	59.5		56.1	407380.3	59.5
3/23/2017 9:19	61.5	54.9	58.3	66.2		58.3	676083	66.2
3/23/2017 9:20	56.5	53.5	55.0	57.3		55.0	316227.8	57.3
3/23/2017 9:21	54.9	52.1	53.7	56.9		53.7	234422.9	56.9
3/23/2017 9:22	58.4	54.7	56.4	59.0		56.4	436515.8	59.0
3/23/2017 9:23	58.2	53.7	56.1	62.0		56.1	407380.3	62.0
3/23/2017 9:24	56.2	54.0	55.1	57.3		55.1	323593.7	57.3
3/23/2017 9:25	54.7	52.9	53.7	57.5		53.7	234422.9	57.5
3/23/2017 9:26	58.1	51.0	55.1	61.5		55.1	323593.7	61.5
3/23/2017 9:27	57.7	53.0	55.4	58.6		55.4	346736.9	58.6
3/23/2017 9:28	56.2	51.8	54.4	56.5		54.4	275422.9	56.5
3/23/2017 9:29	56.9	54.3	55.5	57.5		55.5	354813.4	57.5
3/23/2017 9:30	57.5	54.4	56.1	58.4		56.1	407380.3	58.4
3/23/2017 9:31	56.4	52.1	54.9	58.1		54.9	309029.5	58.1
3/23/2017 9:32	55.9	49.6	53.5	56.5		53.5	223872.1	56.5
3/23/2017 9:33	56.6	52.4	54.9	56.9		54.9	309029.5	56.9
3/23/2017 9:34	55.6	50.8	53.8	56.5		53.8	239883.3	56.5
3/23/2017 9:35	56.4	52.8	54.7	57.4		54.7	295120.9	57.4
3/23/2017 9:36	55.7	52.7	54.4	56.2		54.4	275422.9	56.2
3/23/2017 9:37	55.3	52.8	53.8	56.0		53.8	239883.3	56.0
3/23/2017 9:38	54.2	48.5	51.8	54.8		51.8	151356.1	54.8
3/23/2017 9:39	55.7	52.1	54.4	56.6		54.4	275422.9	56.6

Notes:
-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.
VDOT
UPC 110527



Setup 9

Noise Monitoring Photograph

I-95 SB / Ex.140-143



NW End of Sidewalk Entrance to Hiking Trail Between #24 & #28 Banner Spring Circle

I-95 Fredericksburg Ext. Setup 9.3



Notes:

-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 10	Noise Monitoring Data Sheet
I-95 NB / Ex.140-143	N. End of Belladonna Ln Cul-de-Sac

I-95 Fredericksburg Ext. Setup 10.1								
Date/Time	Raw Data				Calc:	63.0		72.5
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 10:30	68.9	58.4	64.5	70.4		64.5	2818383	70.4
3/23/2017 10:31	66.2	59.6	63.4	66.8		63.4	2187762	66.8
3/23/2017 10:32	66.3	59.3	63.4	67.3		63.4	2187762	67.3
3/23/2017 10:33	66.9	59.8	63.4	67.8		63.4	2187762	67.8
3/23/2017 10:34	65.8	58.0	62.8	67.0		62.8	1905461	67.0
3/23/2017 10:35	65.9	58.4	62.6	67.3		62.6	1819701	67.3
3/23/2017 10:36	68.2	60.2	65.0	69.3		65.0	3162278	69.3
3/23/2017 10:37	68.8	56.0	65.4	72.5		65.4	3467369	72.5
3/23/2017 10:38	64.5	60.3	62.8	64.8		62.8	1905461	64.8
3/23/2017 10:39	66.0	59.6	63.0	66.7		63.0	1995262	66.7
3/23/2017 10:40	68.4	61.5	65.2	69.0		65.2	3311311	69.0
3/23/2017 10:41	63.6	57.7	60.9	65.4		60.9	1230269	65.4
3/23/2017 10:42	63.5	54.1	60.9	64.2		60.9	1230269	64.2
3/23/2017 10:43	64.1	56.7	61.1	64.6		61.1	1288250	64.6
3/23/2017 10:44	64.1	56.4	62.0	65.0		62.0	1584893	65.0
3/23/2017 10:45	65.5	58.0	63.2	66.5		63.2	2089296	66.5
3/23/2017 10:46	65.6	60.3	62.9	67.2		62.9	1949845	67.2
3/23/2017 10:47	67.0	61.5	64.5	68.1		64.5	2818383	68.1
3/23/2017 10:48	63.7	58.4	61.6	65.2		61.6	1445440	65.2
3/23/2017 10:49	65.2	60.4	63.7	65.6		63.7	2344229	65.6
3/23/2017 10:50	65.7	58.7	62.6	69.1		62.6	1819701	69.1
3/23/2017 10:51	66.3	57.8	62.7	67.1		62.7	1862087	67.1
3/23/2017 10:52	64.8	58.2	61.8	65.6		61.8	1513561	65.6
3/23/2017 10:53	62.7	56.4	60.1	64.2		60.1	1023293	64.2
3/23/2017 10:54	65.6	61.0	63.9	66.5		63.9	2454709	66.5
3/23/2017 10:55	64.2	59.1	61.9	65.0		61.9	1548817	65.0
3/23/2017 10:56	62.6	59.5	61.2	63.0		61.2	1318257	63.0
3/23/2017 10:57	64.6	59.4	63.0	65.0		63.0	1995262	65.0
3/23/2017 10:58	63.4	58.6	61.1	65.0		61.1	1288250	65.0
3/23/2017 10:59	65.3	59.2	62.5	66.6		62.5	1778279	66.6

Notes:
-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 10
I-95 NB / Ex.140-143



Noise Monitoring Photograph



N. End of Belladonna Ln Cul-de-Sac

I-95 Fredericksburg Ext. Setup 10.1





Notes:

-Soundpro DL-1 S/N BLH040011

I-95 Fredericksburg Ext.	 
VDOT	
UPC 110527	
Setup 10	Noise Monitoring Traffic Data
I-95 NB / Ex.140-143	N. End of Belladonna Ln Cul-de-Sac

I-95 Fredericksburg Ext. Setup 10.1							
Setup	Direction	Start	Finish	Autos	MT	HT	M
10	SB	10:30	11:00	1545	49	262	0
10	NB	10:30	11:00	1500	61	230	0
Conversion		Autos	MT	HT	M	VPH	
2.00		3090	98	524	0	3712	
2.00		3000	122	460	0	3582	
TOTAL		6090	220	984	0	7294	
%DT		%TTST	TOTAL				
2.64%		14.12%	16.76%				
3.41%		12.84%	16.25%				
3.02%		13.49%	16.51%				
Direction	LANES	A	MT	HT	B	M	SPEED
SB	3	1030	33	175	0	0	67
NB	3	1000	41	153	0	0	60

Notes:
 -Speeds by average of 1-min directional speeds from hand-held radar velocity detector

I-95 Fredericksburg Ext. VDOT UPC 110527	 
Setup 10	Noise Monitoring Data Sheet
I-95 NB / Ex.140-143	N. End of Playground Fence Opposite #22 Belladonna Ln

I-95 Fredericksburg Ext. Setup 10.2								
Date/Time	Raw Data				Calc:	68.0		75.9
	L10-1	L90-1	Leq-1	Lmax-1	Despik?	Leq	SPL	Lmax
3/23/2017 10:30	72.7	65.3	69.8	75.9		69.8	9549926	75.9
3/23/2017 10:31	71.6	66.9	69.4	72.1		69.4	8709636	72.1
3/23/2017 10:32	70.0	65.6	67.8	71.4		67.8	6025596	71.4
3/23/2017 10:33	72.4	65.4	69.1	74.2		69.1	8128305	74.2
3/23/2017 10:34	71.1	66.7	69.1	71.8		69.1	8128305	71.8
3/23/2017 10:35	69.4	65.1	67.2	71.1		67.2	5248075	71.1
3/23/2017 10:36	72.7	64.4	69.9	73.5		69.9	9772372	73.5
3/23/2017 10:37	70.6	62.6	67.9	71.4		67.9	6165950	71.4
3/23/2017 10:38	69.0	64.4	67.2	70.0		67.2	5248075	70.0
3/23/2017 10:39	71.1	64.5	68.6	73.0		68.6	7244360	73.0
3/23/2017 10:40	72.3	66.3	69.2	73.1		69.2	8317638	73.1
3/23/2017 10:41	69.4	63.1	66.9	71.9		66.9	4897788	71.9
3/23/2017 10:42	68.1	62.0	65.9	69.8		65.9	3890451	69.8
3/23/2017 10:43	69.2	63.3	66.8	69.9		66.8	4786301	69.9
3/23/2017 10:44	70.1	59.9	67.4	70.6		67.4	5495409	70.6
3/23/2017 10:45	70.3	64.5	68.1	71.0		68.1	6456542	71.0
3/23/2017 10:46	69.4	65.6	67.8	72.0		67.8	6025596	72.0
3/23/2017 10:47	70.7	64.5	68.9	73.0		68.9	7762471	73.0
3/23/2017 10:48	69.6	65.0	67.6	70.7		67.6	5754399	70.7
3/23/2017 10:49	70.3	64.7	68.2	71.6		68.2	6606934	71.6
3/23/2017 10:50	70.6	64.9	67.8	72.2		67.8	6025596	72.2
3/23/2017 10:51	69.4	62.5	67.4	71.9		67.4	5495409	71.9
3/23/2017 10:52	70.6	63.9	67.9	71.5		67.9	6165950	71.5
3/23/2017 10:53	67.3	61.1	65.2	69.5		65.2	3311311	69.5
3/23/2017 10:54	71.0	67.4	69.4	72.9		69.4	8709636	72.9
3/23/2017 10:55	69.0	66.0	67.6	69.8		67.6	5754399	69.8
3/23/2017 10:56	68.5	64.9	66.9	69.5		66.9	4897788	69.5
3/23/2017 10:57	69.2	65.6	68.0	70.3		68.0	6309573	70.3
3/23/2017 10:58	67.5	64.1	65.8	68.3		65.8	3801894	68.3
3/23/2017 10:59	69.4	64.1	67.3	70.9		67.3	5370318	70.9

Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 10
I-95 NB / Ex.140-143



Noise Monitoring Photograph



N. End of Playground Fence Opposite #22 Belladonna Ln

I-95 Fredericksburg Ext. Setup 10.2



Notes:

-Soundpro DL-2 S/N BIJ030015

I-95 Fredericksburg Ext.	 Virginia Department of Transportation	
VDOT		
UPC 110527	Noise Monitoring Data Sheet	
Setup 10	W. End of Green Bell Lane	
I-95 NB / Ex.140-143		

I-95 Fredericksburg Ext. Setup 10.3								
Date/Time	Raw Data				Calc:	66.3		74.2
	L10-1	L90-1	Leq-1	Lmax-1	Despikes?	Leq	SPL	Lmax
3/23/2017 10:30	69.4	65.1	67.5	70.9		67.5	5623413	70.9
3/23/2017 10:31	68.9	64.2	66.8	71.3		66.8	4786301	71.3
3/23/2017 10:32	67.9	63.7	66.3	70.2		66.3	4265795	70.2
3/23/2017 10:33	70.4	66.1	68.6	70.9		68.6	7244360	70.9
3/23/2017 10:34	67.0	63.5	65.3	68.3		65.3	3388442	68.3
3/23/2017 10:35	70.1	63.2	67.6	70.7		67.6	5754399	70.7
3/23/2017 10:36	69.0	62.8	66.8	70.5		66.8	4786301	70.5
3/23/2017 10:37	67.7	61.8	65.2	68.5		65.2	3311311	68.5
3/23/2017 10:38	69.1	64.5	67.2	71.0		67.2	5248075	71.0
3/23/2017 10:39	67.6	63.0	65.7	69.0		65.7	3715352	69.0
3/23/2017 10:40	70.4	62.4	67.0	71.1		67.0	5011872	71.1
3/23/2017 10:41	66.9	60.2	64.4	69.0		64.4	2754229	69.0
3/23/2017 10:42	67.9	62.2	65.8	68.9		65.8	3801894	68.9
3/23/2017 10:43	68.9	59.2	65.8	69.4		65.8	3801894	69.4
3/23/2017 10:44	68.6	64.2	66.6	69.7		66.6	4570882	69.7
3/23/2017 10:45	67.7	63.7	66.0	70.0		66.0	3981072	70.0
3/23/2017 10:46	68.8	62.8	66.5	69.8		66.5	4466836	69.8
3/23/2017 10:47	68.1	62.3	66.0	69.2		66.0	3981072	69.2
3/23/2017 10:48	69.3	63.7	67.3	74.2		67.3	5370318	74.2
3/23/2017 10:49	68.4	63.3	66.2	70.2		66.2	4168694	70.2
3/23/2017 10:50	67.0	60.6	64.9	67.6		64.9	3090295	67.6
3/23/2017 10:51	68.7	63.3	66.5	69.8		66.5	4466836	69.8
3/23/2017 10:52	65.4	59.9	63.5	67.1		63.5	2238721	67.1
3/23/2017 10:53	68.5	61.9	66.3	69.3		66.3	4265795	69.3
3/23/2017 10:54	67.2	63.8	65.8	67.8		65.8	3801894	67.8
3/23/2017 10:55	67.2	62.8	65.5	68.2		65.5	3548134	68.2
3/23/2017 10:56	68.8	63.0	66.7	69.3		66.7	4677351	69.3
3/23/2017 10:57	65.7	61.6	63.9	67.6		63.9	2454709	67.6
3/23/2017 10:58	68.1	62.1	65.8	69.7		65.8	3801894	69.7
3/23/2017 10:59	69.0	63.7	66.4	69.5		66.4	4365158	69.5

Notes:
-Soundpro DL-1 S/N BIH030023

I-95 Fredericksburg Ext.
VDOT
UPC 110527
Setup 10
I-95 NB / Ex.140-143



Noise Monitoring Photograph

W. End of Green Bell Lane

I-95 Fredericksburg Ext. Setup 10.3



Notes:

-Soundpro DL-1 S/N BIH030023

**Certificate of Calibration**

Certificate No: 5129740QIL020010

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number: QIL020010
Customer ID: N/A
Model: QC-10 CALIBRATOR

Date Received: 7/28/2016
Date Issued: 8/8/2016
Valid Until: 8/8/2017

Test Conditions:**Model Conditions:**

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description:

Serial Number:

Calibrated per Procedure: 56V981

Reference Standard(s):

I.D. Number	Device
ET0000556	B&K ENSEMBLE
T00230	FLUKE 45 MULTIMETER

Last Calibration	Date Calibration Due
2/10/2016	2/10/2017
2/4/2016	2/4/2018

Measurement Uncertainty:

+/- 1.1% ACOUSTIC (0.1DB) +/- 1.4% VAC +/- 0.012% HZ
Estimated at 95% Confidence Level (k=2)

Calibrated By:


BRIAN BAYER Service Technician

8/8/2016

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.

**Certificate of Calibration**

Certificate No: 5129740BLH040011

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number: BLH040011 Date Received: 7/28/2016
Customer ID: N/A Date Issued: 8/8/2016
Model: SOUNDPRO DL-1-1/3 SLM Valid Until: 8/8/2017

Test Conditions:**Model Conditions:**

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:**Description:****Serial Number:**

TYPE 1 PREAMP
MICROPHONE B&K 4936 1/2 IN. ELECTRET

0308 1833
2614662

Calibrated per Procedure: 53V899

Reference Standard(s):

I.D. Number	Device
EF000176	QUEST-CAL
ET0000556	B&K ENSEMBLE

Last Calibration	Date Calibration Due
12/15/2015	12/15/2016
2/10/2016	2/10/2017

Measurement Uncertainty:

+/- 2.2% ACOUSTIC (0.19DB)
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian A. Bayer 8/8/2016
BRIAN BAYER Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.

**Certificate of Calibration**

Certificate No: 5129740QIJ070197

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number: QIJ070197
Customer ID: N/A
Model: QC-10 CALIBRATOR
Test Conditions:

Date Received: 7/28/2016
Date Issued: 8/8/2016
Valid Until: 8/8/2017

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

SubAssemblies:

Description:

Serial Number:

Calibrated per Procedure: 56V981

Reference Standard(s):

I.D. Number	Device
ET0000556	B&K ENSEMBLE
T00230	FLUKE 45 MULTIMETER

Last Calibration Date	Calibration Due
2/10/2016	2/10/2017
2/4/2016	2/4/2018

Measurement Uncertainty:

+/- 1.1% ACOUSTIC (0.1DB) +/- 1.4% VAC +/- 0.012% HZ
Estimated at 95% Confidence Level (k=2)

Calibrated By:


BRIAN BAYER Service Technician

8/8/2016

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.

**Certificate of Calibration**

Certificate No: 5129740BIH030023

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number: BIH030023
Customer ID: N/A
Model: SOUNDPRO DL-2-1/3 SLM
Test Conditions:

Date Received: 7/28/2016
Date Issued: 8/8/2016
Valid Until: 8/8/2017

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

SubAssemblies:

Description:
TYPE 2 PREAMP

Serial Number:

0508 2028
31715

Calibrated per Procedure: 53V899

Reference Standard(s):

I.D. Number	Device
EF000176	QUEST-CAL
ET0000556	B&K ENSEMBLE

Last Calibration Date	Calibration Due
12/15/2015	12/15/2016
2/10/2016	2/10/2017

Measurement Uncertainty:

+/- 2.2% ACOUSTIC (0.19DB)
Estimated at 95% Confidence Level (k=2)

Calibrated By:


BRIAN BAYER Service Technician

8/8/2016

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.

**Certificate of Calibration**

Certificate No: 5129740QOJ080004

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number: QOJ080004
Customer ID: N/A
Model: QC-20 CALIBRATOR

Date Received: 7/28/2016
Date Issued: 8/8/2016
Valid Until: 8/8/2017

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description:

Serial Number:

Calibrated per Procedure: 56V982

Reference Standard(s):

I.D. Number	Device
ET0000556	B&K ENSEMBLE
T00230	FLUKE 45 MULTIMETER

Last Calibration	Date Calibration Due
2/10/2016	2/10/2017
2/4/2016	2/4/2018

Measurement Uncertainty:

+/- 1.1% ACOUSTIC (0.1DB) +/- 1.4% VAC +/- 0.012% HZ
Estimated at 95% Confidence Level (k=2)

Calibrated By:


BRIAN BAYER Service Technician

8/8/2016

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.



Certificate of Calibration

Certificate No: 5129740BIJ030015

Submitted By: ARGUS-HAZCO SUWANEE, GA
140 SATELLITE BLVD NE
NORCROSS, GA 30093

Serial Number:	BIJ030015	Date Received:	7/28/2016
Customer ID:	N/A	Date Issued:	8/8/2016
Model:	SOUNDPRO DL-2-1/3 SLM	Valid Until:	8/8/2017

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:**Description:**

TYPE 2 PREAMP
MICROPHONE QE 7052 1/2 IN. ELECTRET

Serial Number:

0311 5576
38229

Calibrated per Procedure: 53V899

Reference Standard(s):

I.D. Number	Device	Last Calibration Date	Calibration Due
EF000176	QUEST-CAL	12/15/2015	12/15/2016
ET0000556	B&K ENSEMBLE	2/10/2016	2/10/2017

Measurement Uncertainty:

+/- 2.2% ACOUSTIC (0.19DB)
Estimated at 95% Confidence Level (k=2)

Calibrated By:


 BRIAN BAYER Service Technician

8/8/2016

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of 3M Detection Solutions.

APPENDIX E:

**Response from VDOT Project Management on Alternative Noise
Abatement Measures**

RESPONSE FROM VDOT PROJECT MANAGEMENT ON ALTERNATIVE NOISE ABATEMENT MEASURES

This appendix includes a memo and survey sent to the VDOT project managers about the potential for use of alternative noise abatement measures, pursuant to Virginia House Bill 2577.

HMMH
77 South Bedford Street
Burlington, Massachusetts 01803
781.229.0707
www.hmmh.com

MEMORANDUM

To: Scott Smizik, Project Manager, Environmental Contact, VDOT
From: Christopher Menge, Noise Abatement Engineer
Subject: UPC 110527, I-95 Express Lanes Fredericksburg Extension Study EA
Virginia HB 2577 form
Reference: HMMH No. 305780.002
Date: April 19, 2017



The 2009 General Assembly passed Chapter 120 (HB 2577), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2577 States: Requires that whenever the CTB or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, consideration *should* be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Landscaping in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2577 we are asking for your input (per [Chapter VI of Materials Division's Manual of Instruction](#) and [Section 2B-3 Determination of Roadway Design](#) of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are seeking your professional opinion by providing comments for the project noted above. Please distribute this memorandum to the appropriate District staff and combine all responses into one response.

Should you have any questions, please contact me at (781) 229-0707 x3153, Jim Ponticello at (804) 371-6769 or L.J. Muchenje at (804) 371-6768. Thank you for your time and consideration regarding this request.

Comment: Is noise reducing design feasible in lieu of construction of noise walls or sound barriers? For example, the roadway alignment can be shifted away from noise sensitive receptors or the roadway can be placed in deep cut (Location & Design to address)

Response: The Environmental Assessment (EA) is based on improvements that would occur within existing Interstate I-95 corridor and is considering a build or no build scenario. As such, roadway alignments are not being developed in order to make the determination if shifting the alignments is feasible.

Comment: Can the project support the use of low noise pavement in lieu of construction of noise walls or sound barriers? (Materials Division to address)

Response: The EA does not prescribe specific construction materials or methods as a means of reducing impacts. In addition, the Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration.

Comment: Can landscaping be utilized to act as a visual screen if visual screening is required? (Location & Design to address)

Response: The EA does not prescribe specific construction materials or methods as a means of reducing impacts. This can be examined during final design once a preferred alternative is chosen and more information is available.

Note: Please provide the name of each responder.

Scott Smizik

APPENDIX F:

Warranted, Feasible, and Reasonable Worksheets

WARRANTED, FEASIBLE AND REASONABLE WORKSHEETS

This appendix presents the Warranted, Feasible and Reasonable Worksheets for the noise barriers evaluated in this study. The worksheets are presented in order by CNE.

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	C-F
Community Name and/or CNE#	RR
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	42
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	21
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	50%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	38,131 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	21
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	15
d. Total number of benefited receptors.	36
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,059 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	2,304 ft
b. Height range of the proposed noise barrier. (ft)	9 - 29 ft
c. Average height of the proposed noise barrier. (ft)	17 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,601,502
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

Barrier C is a future "F" barrier to be constructed prior to the 2042 Design Year in conjunction with another project.

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	NN-E
Community Name and/or CNE#	NN-E
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	38
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	31
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	82%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	62,930 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	31
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	61
d. Total number of benefited receptors.	92
e. Surface Area per benefited receptor unit. (ft ² /BR)	684 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	4,033 ft
b. Height range of the proposed noise barrier. (ft)	12 - 19 ft
c. Average height of the proposed noise barrier. (ft)	16 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$2,643,060
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

Barrier is Existing in CNE NN, adjacent to I-95 southbound, south of Route 610 (Garrisonville Road).

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	OO-P
Community Name and/or CNE#	OO-P
Noise Abatement Category(s)	B, C
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	20
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	14
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	70%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	38,883 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	14
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	12
d. Total number of benefited receptors.	26
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,496 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,410 ft
b. Height range of the proposed noise barrier. (ft)	14 - 30 ft
c. Average height of the proposed noise barrier. (ft)	28 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,633,086
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	PP-P
Community Name and/or CNE#	PP
Noise Abatement Category(s)	B, C
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	63
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	56
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	89%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	162,003 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	56
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	47
d. Total number of benefited receptors.	103
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,573 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	6,100 ft
b. Height range of the proposed noise barrier. (ft)	12 - 30
c. Average height of the proposed noise barrier. (ft)	27 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$6,804,126
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	QQ-P
Community Name and/or CNE#	QQ
Noise Abatement Category(s)	B, C
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	30
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	12
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	40%
d.	Is the percentage 50 or greater?	No
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	163,833 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	12
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	9
d. Total number of benefited receptors.	21
e. Surface Area per benefited receptor unit. (ft ² /BR)	7,802 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	5,461 ft
b. Height range of the proposed noise barrier. (ft)	-30 ft
c. Average height of the proposed noise barrier. (ft)	30 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$6,880,986
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	No
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	SS1-P
Community Name and/or CNE#	SS
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	1
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	6,001 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
d. Total number of benefited receptors.	2
e. Surface Area per benefited receptor unit. (ft ² /BR)	3,001 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	600 ft
b. Height range of the proposed noise barrier. (ft)	10 ft
c. Average height of the proposed noise barrier. (ft)	10 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$252,042
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	SS2-P
Community Name and/or CNE#	SS
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	4
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	75%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	27,404 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	7
d. Total number of benefited receptors.	10
e. Surface Area per benefited receptor unit. (ft ² /BR)	2,740 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,300 ft
b. Height range of the proposed noise barrier. (ft)	20 - 22 ft
c. Average height of the proposed noise barrier. (ft)	21 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,150,968
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	SS3-P
Community Name and/or CNE#	SS
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	3
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	5,998 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	3
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,999 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	500 ft
b. Height range of the proposed noise barrier. (ft)	12 ft
c. Average height of the proposed noise barrier. (ft)	12 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$251,916
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	TT1-P
Community Name and/or CNE#	TT
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	1
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	42,006 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	1
e. Surface Area per benefited receptor unit. (ft ² /BR)	42,006 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,400 ft
b. Height range of the proposed noise barrier. (ft)	30 ft
c. Average height of the proposed noise barrier. (ft)	30 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,764,252
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	TT2-P
Community Name and/or CNE#	TT
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	1
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	7,011 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
d. Total number of benefited receptors.	2
e. Surface Area per benefited receptor unit. (ft ² /BR)	3,506 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	584 ft
b. Height range of the proposed noise barrier. (ft)	12 ft
c. Average height of the proposed noise barrier. (ft)	12 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$294,462
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	TT3-R
Community Name and/or CNE#	TT
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	NA
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	2
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	2
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	17,349 SF
b. Surface Area of the existing barrier that will be removed (ft ²)	10,515 SF
c. Additional (Net) Surface Area of the Replacement Barrier (ft ²)	16,535 SF
d. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	2
e. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
f. Total number of benefited receptors.	2
g. Net Surface Area per benefited receptor unit. (ft ² /BR)	8,268 SF/BR
h. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
i. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Details of Total Proposed Noise Barrier

a. Total length of the proposed noise barrier. (ft)	1,107 ft
b. Height range of the proposed noise barrier. (ft)	10 - 18 ft
c. Average height of the proposed noise barrier. (ft)	14.9 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$728,658
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	UU2-P
Community Name and/or CNE#	UU
Noise Abatement Category(s)	B, C
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	13
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	12
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	92%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	38,396 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	12
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	12
d. Total number of benefited receptors.	24
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,600 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	2,500 ft
b. Height range of the proposed noise barrier. (ft)	10 - 16 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,612,632
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	VV-P
Community Name and/or CNE#	VV
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	4
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	4
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	30,705 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	4
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	4
e. Surface Area per benefited receptor unit. (ft ² /BR)	7,676 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	2,723 ft
b. Height range of the proposed noise barrier. (ft)	10 - 14 ft
c. Average height of the proposed noise barrier. (ft)	11 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$1,289,610
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	WW1-P
Community Name and/or CNE#	WW
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	2
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	50%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	22,029 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
d. Total number of benefited receptors.	2
e. Surface Area per benefited receptor unit. (ft ² /BR)	11,015 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,134 ft
b. Height range of the proposed noise barrier. (ft)	10 - 24 ft
c. Average height of the proposed noise barrier. (ft)	19 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$925,218
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	WW2-P
Community Name and/or CNE#	WW
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	6
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	6
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	57,975 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	6
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	4
d. Total number of benefited receptors.	10
e. Surface Area per benefited receptor unit. (ft ² /BR)	5,798 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	2,924 ft
b. Height range of the proposed noise barrier. (ft)	18 - 22 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$2,434,950
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	XX1-P
Community Name and/or CNE#	XX
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	1
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	8,004 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	1
e. Surface Area per benefited receptor unit. (ft ² /BR)	8,004 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	501 ft
b. Height range of the proposed noise barrier. (ft)	14 - 18 ft
c. Average height of the proposed noise barrier. (ft)	16 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$336,168
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	XX2-P
Community Name and/or CNE#	XX
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	3
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	2
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	67%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	4,252 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	2
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	2
e. Surface Area per benefited receptor unit. (ft ² /BR)	2,126 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	425 ft
b. Height range of the proposed noise barrier. (ft)	10 ft
c. Average height of the proposed noise barrier. (ft)	10 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$178,584
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

**VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet**

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	11-Oct-17
Project No. and UPC:	VDOT Project No. 0095-969-739 and UPC 110527
County:	Stafford
District:	Fredericksburg
Barrier System ID:	YY-P
Community Name and/or CNE#	YY
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	Yes
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	7
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	7
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	22,437 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	7
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	7
e. Surface Area per benefited receptor unit. (ft ² /BR)	3,205 SF/BR
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,314 ft
b. Height range of the proposed noise barrier. (ft)	10 - 22 ft
c. Average height of the proposed noise barrier. (ft)	17 ft
d. Cost per square foot. (\$/ft ²)	\$42/SF
e. Total Barrier Cost (\$)	\$942,354
f. Barrier Material	NA

3 Community Desires Related to the Barrier

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

APPENDIX G:

2013 Final Design Noise Report Results from UPC 70849

2013 FINAL DESIGN NOISE REPORT RESULTS FROM UPC 70849

This appendix includes the noise prediction impact and barrier tables and figures for the final design noise report that overlaps with the current project study area.³ Tables and Figures from the I-95 Express Lanes Project, Segments I-III, UPC 70849, are provided for the section of that project between Garrisonville Road (Exit 143) and Russell Road (Exit 148). The CNEs in the overlap area are designated JJ, KK, LL and MM, and the four potential noise barriers, all of which were found to be reasonable and feasible, are designated P34, P35, P39 and P38. The first table, Table 62 from the report, summarizes the characteristics of each barrier. One table for each barrier follows, providing the receptor noise levels and barrier insertion loss values. The figures for the barriers follow the tables.

Since the 2013 study was conducted, 33 additional homes have been permitted and added in the community that was under development at the time in CNE LL between Short Branch Road and Smith Lake Park. The 2013 study had receptors modeled in all locations in which the 33 additional homes have been constructed, so the noise barrier that was designed for the community would benefit all 33 additional homes as well as the homes that were included in the 2013 study. The barrier that was designed for CNE LL was originally predicted to benefit 152 homes with a surface area per benefited receptor of 735 square feet. With the 33 additional homes that would also be benefited by this barrier, the total benefits would rise to 185 homes, with a new surface area per benefited receptor of 604 square feet. The barrier remains feasible and reasonable per VDOT criteria.

³ Final Design Noise Analysis Report (Segment I-III), Interstate-95 Express Lanes Project, State Project No.: 0095-96A-1077, PE-101; UPC 70849, June 2013.

Table 62
I-95 Express Lanes Project - CNE Noise Barrier Summary

1	2	3	4	5	6	7	8	9
CNE Descriptor	Number of Benefited Residences	Noise Barrier Length (ft.)	Noise Barrier Height Range (ft.)	Max. Square Footage (MaxSF)	MaxSF per Benefited Residence	Barrier Cost (\$36/sq. ft.)	Feasible?	Reasonable?
CNE G	0	991	30	29730	N/A	N/A	NO	NO
CNE H*	46	3220	14-15	60429	902	\$ 2,175,444	YES	YES
CNE I (Existing Barrier)	79	4400	16-18	88000	1114	\$ 3,168,000	YES	YES
CNE N	77	3902	14-17	59538	773	\$ 2,143,368	YES	YES
CNE P (Barrier Extensions)	0	1130	30	33900	N/A	N/A	NO	NO
CNE R (Southern Extension)	10	1094	14	15309	1531	\$ 551,124	YES	YES
CNE R (Northern Extension)	10	1550	30	46487	4649	\$ 1,673,532	NO	NO
CNE R (Existing Barriers)	126	4105	12-16	61575	489	\$ 2,216,700	YES	YES
CNE S (Existing Barrier)	47	3117	12-18	68579	1459	\$ 2,468,844	YES	YES
CNE S (Northern Extension)	14	1436	30	43080	N/A	\$ 1,550,880	NO	NO
CNE S (Southern Partial)	18	1562	10-15	20972	1165	\$ 754,992	YES	YES
CNE S (Southern Extension)	19	3117	10-12	34244	1802	\$ 1,232,784	YES	NO
CNE T	4	1143	10	11430	2858	\$ 411,480	YES	NO
CNE X	25	1547	14-20	25699	1028	\$ 925,164	YES	YES
CNE Y	18	2484	30	74532	4141	\$ 2,683,152	YES	NO
CNE AA	15	2510	13	32626	2175	\$ 1,174,536	YES	NO
CNE DD	66	3195	5-15	43880	665	\$ 1,579,680	YES	YES
CNE EE	46	4297	8-18	70976	1543	\$ 2,555,136	YES	YES
CNE FF	5	1526	18	27474	5495	\$ 989,064	YES	NO
CNE GG	17	3488	18	62786	3693	\$ 2,260,296	YES	NO
CNE GG-Partial	5	1758	17	30049	6010	\$ 1,081,764	YES	NO
CNE HH	5	1402	18	25241	5048	\$ 908,676	YES	NO
CNE HH-2	15	1883	30	56488	3766	\$ 2,033,568	YES	NO
CNE II	16	4431	16	70889	4431	\$ 2,552,004	YES	NO
CNE JJ	69	2231	14-18	36586	530	\$ 1,317,096	YES	YES
CNE KK	88	6939	12-20	112523	1279	\$ 4,050,828	YES	YES
CNE LL	152	6255	12-24	111703	735	\$ 4,021,308	YES	YES
CNE MM	92	2696	14-17	40895	445	\$ 1,472,220	YES	YES

* Includes demolition costs of existing barrier

Table 58
I-95 Express Lanes Project
Optimized Barrier Analysis - CNE JJ

1	2	3	4	5	6
CNE Descriptor	Site Descriptor	Site Representation	Build (2035) Noise Level	Abated (2035) Noise Level	Net Insertion Loss
CNE JJ	JJ1	4 Residences	68	59	8
	JJM1	3 Residences	70	64	6
	JJM2	2 Residences	75	64	11
	JJM3	3 Residences	68	61	7
	JJM4	4 Residences	74	63	11
	JJM5	4 Residences	66	59	7
	JJM6	4 Residences	69	61	8
	JJM7	4 Residences	68	61	8
	JJM8	5 Residences	66	58	7
	JJM9	4 Residences	70	61	8
	JJM10	6 Residences	66	58	8
	JJM11	4 Residences	66	59	8
	JJM12	5 Residences	67	60	7
	JJM13	4 Residences	65	59	7
	JJM14	6 Residences	64	59	5
	JJM15	7 Residences	69	62	7
	JJM16	7 Residences	63	59	4
	JJM17	3 Residences	69	65	4
JJM18	2 Residences	65	62	3	

Noise Levels approach or exceed FHWA/VDOT Noise Abatement Criteria

Insertion Losses are considered "feasible".

Note: The calculated Insertion Losses might appear to be off due to rounding errors

Table 59
I-95 Express Lanes Project
Optimized Barrier Analysis - CNE KK



1	2	3	4	5	6
CNE Descriptor	Site Descriptor	Site Representation	Build (2035) Noise Level	Abated (2035) Noise Level	Net Insertion Loss
CNE KK	KK1	3 Residences	73	67	7
	KK2	8 Residences	73	68	5
	KK3	12 Residences	68	64	5
	KKM1	6 Residences	66	63	3
	KKM2	10 Residences	60	59	1
	KKM3	6 Residences	66	62	5
	KKM4	8 Residences	67	61	5
	KKM5	8 Residences	61	59	2
	KKM6	6 Residences	63	60	4
	KKM7	6 Residences	61	59	2
	KKM8	12 Residences	62	59	3
	KKM9	5 Residences	61	59	2
	KKM10	4 Residences	60	59	1
	KKM11	3 Residences	60	60	0
	KKM12	6 Residences	74	68	6
	KKM13	8 Residences	62	62	0
	KKM14	6 Residences	70	64	6
	KKM15	6 Residences	61	61	0
	KKM16	6 Residences	68	63	4
	KKM17	8 Residences	59	59	0
	KKM18	6 Residences	67	64	3
	KKM19	6 Residences	65	62	3
	KKM20	6 Residences	59	58	1
	KKM21	Community Center Pool	71	64	7
	KKM22	8 Residences	71	60	11
	KKM23	2 Residences	72	68	4
	KKM24	2 Residences	69	61	8
	KKM25	3 Residences	63	57	6
	KKM26	7 Residences	76	65	11
	KKM27	2 Residences	68	60	8
	KKM28	3 Residences	66	59	7
	KKM29	3 Residences	74	64	10
	KKM30	4 Residences	63	59	4
	KKM31	3 Residences	65	59	5
	KKM32	4 Residences	76	65	11
	KKM33	3 Residences	70	64	6
KKM34	3 Residences	58	58	0	
KKM35	2 Residences	70	67	3	
KKM36	2 Residences	66	63	3	

Noise Levels approach or exceed FHWA/VDOT Noise Abatement Criteria
 Insertion Losses are considered "feasible".

Note: The calculated Insertion Losses might appear to be off due to rounding errors

Table 60
I-95 Express Lanes Project
Optimized Barrier Analysis - CNE LL



1	2	3	4	5	6
CNE Descriptor	Site Descriptor	Site Representation	Build (2035) Noise Level	Abated (2035) Noise Level	Net Insertion Loss
CNE LL	LL1	4 Planned Residences	69	63	6
	LL2	4 Residences	70	62	7
	LLM1	6 Residences	67	61	6
	LLM2	2 Residences	71	62	9
	LLM3	6 Residences	59	55	4
	LLM4	3 Residences	64	61	4
	LLM4A	3 Residences	59	58	1
	LLM5	6 Residences	68	63	5
	LLM6	6 Residences	74	61	13
	LLM7	6 Residences	75	62	13
	LLM8	6 Residences	63	60	3
	LLM9	6 Residences	60	57	2
	LLM10	5 Residences	73	67	6
	LLM10A	5 Residences	65	60	4
	LLM11	3 Residences	76	75	1
	LLM12	4 Residences	59	58	2
	LLM13	5 Residences	65	59	7
	LLM14	6 Residences	70	62	8
	LLM15	6 Residences	74	66	8
	LLM16	12 Residences	59	53	6
	LLM17	8 Residences	66	57	9
	LLM18	6 Residences	67	59	8
	LLM19	10 Residences	67	57	10
	LLM19A	3 Residences	76	66	10
	LLM19B	3 Residences	70	58	12
	LLM20	5 Residences	69	60	9
	LLM21	4 Planned Residences	72	65	7
	LLM21A	4 Residences	75	72	4
	LLM22	2 Residences	66	60	6
	LLM23	5 Residences	65	62	3
	LLM24	4 Planned Residences	58	55	2
	LLM25	4 Residences	72	65	8
	LLM26	4 Planned Residences	72	65	6
	LLM27	4 Planned Residences	71	62	10
	LLM28	4 Planned Residences	71	63	8
	LLM29	4 Planned Residences	70	60	10
	LLM30	Baseball Field - 1 Unit	67	59	7
	LLM31	Baseball Field - 1 Unit	69	61	9
	LLM32	Baseball Field - 1 Unit	67	60	7
	LLM33	Baseball Field - 1 Unit	70	61	9
	LLM34	Baseball Field - 1 Unit	67	60	7
	LLM35	Baseball Field - 1 Unit	70	61	9
	LLM36	Baseball Field - 1 Unit	67	60	7
	LLM37	Baseball Field - 1 Unit	70	61	8
	LLM38	Baseball Field - 1 Unit	67	60	7
	LLM39	Baseball Field - 1 Unit	70	62	9
	LLM40	Baseball Field - 1 Unit	67	61	6
	LLM41	Baseball Field - 1 Unit	70	62	8
	LLM42	Baseball Field - 1 Unit	67	61	6
	LLM43	Baseball Field - 1 Unit	70	62	8
	LLM44	Baseball Field - 1 Unit	67	61	6
	LLM45	Baseball Field - 1 Unit	70	62	8
	LLM46	Baseball Field - 1 Unit	67	62	6
	LLM47	Baseball Field - 1 Unit	70	63	7
	LLM48	Baseball Field - 1 Unit	67	62	5
LLM49	Baseball Field - 1 Unit	70	63	7	
LLM50	Baseball Field - 1 Unit	67	63	5	
LLM51	Baseball Field - 1 Unit	70	64	6	
LLM52	Baseball Field - 1 Unit	68	63	4	
LLM53	Baseball Field - 1 Unit	70	65	5	
LLM54	Baseball Field - 1 Unit	68	64	4	
LLM55	Baseball Field - 1 Unit	70	66	4	

 Noise Levels approach or exceed FHWA/VDOT Noise Abatement Criteria
 Insertion Losses are considered "feasible".

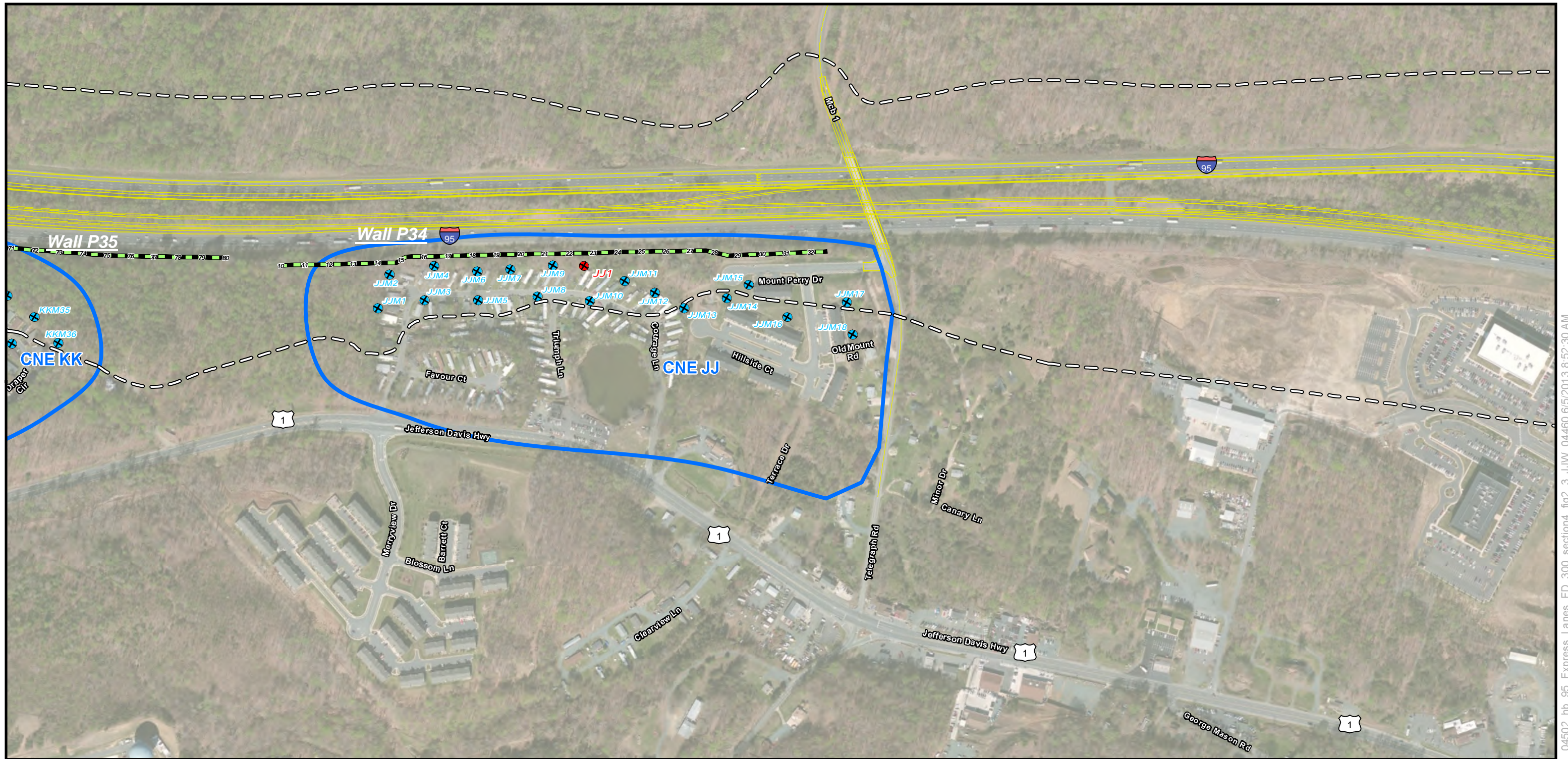
Note: The calculated Insertion Losses might appear to be off due to rounding errors

Table 61
I-95 Express Lanes Project
Optimized Barrier Analysis - CNE MM

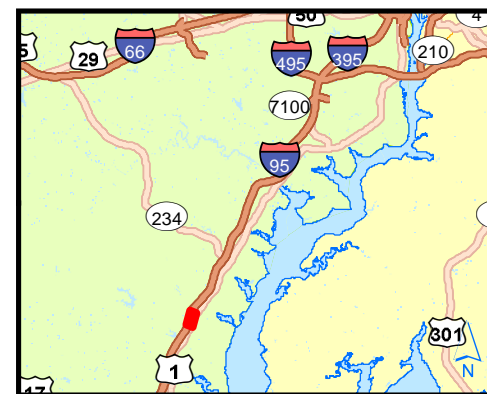
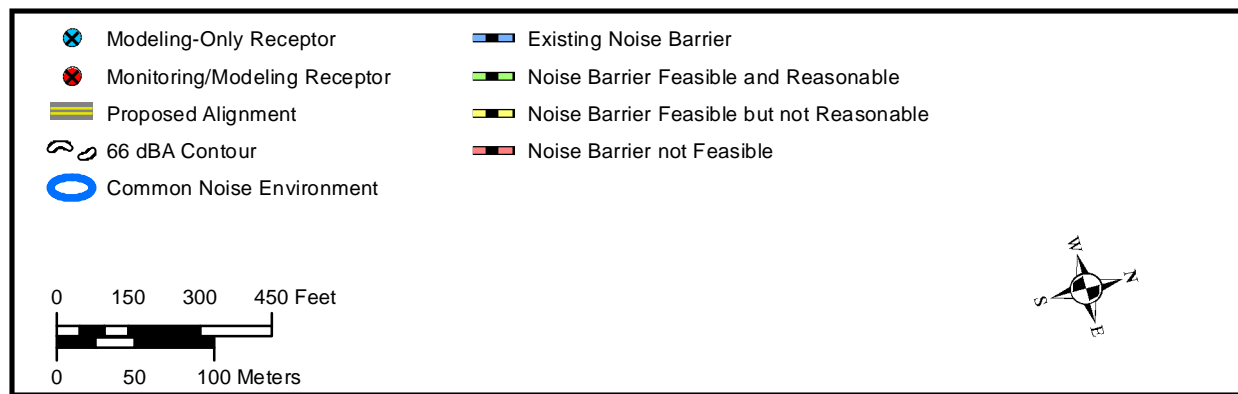
1	2	3	4	5	6
CNE Descriptor	Site Descriptor	Site Representation	Build (2035) Noise Level	Abated (2035) Noise Level	Net Insertion Loss
CNE MM	MM1	12 Residences	68	59	9
	MM2	6 Residences	64	59	5
	MMM1	6 Residences	75	61	14
	MMM2	8 Residences	74	60	14
	MMM3	9 Residences	66	61	5
	MMM4	6 Residences	65	60	5
	MMM5	8 Residences	67	60	7
	MMM6	8 Residences	65	59	5
	MMM7	8 Residences	67	60	7
	MMM8	8 Residences	67	61	6
	MMM9	8 Residences	67	61	6
	MMM10	5 Residences	65	63	2
	MMM11	8 Residences	65	61	4
	MMM12	5 Residences	68	62	5
	MMM13	Deck Level	69	65	4
	MMM14	Deck Level	68	62	6
	MMM15	Deck Level	67	61	6
	MMM16	Deck Level	68	61	7
	MMM17	Deck Level	69	62	7
	MMM18	Deck Level	72	62	10
	MMM19	Deck Level	73	63	10
	MMM20	Deck Level	74	67	7
	MMM21	Deck Level	65	61	4
MMM22	Deck Level	66	63	3	
MMM23	Deck Level	66	64	2	

 Noise Levels approach or exceed FHWA/VDOT Noise Abatement Criteria
 Insertion Losses are considered "feasible".

Note: The calculated Insertion Losses might appear to be off due to rounding errors



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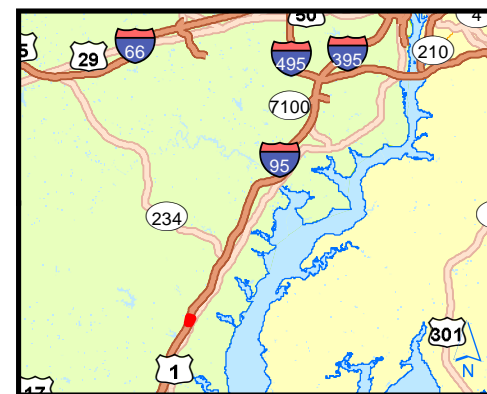
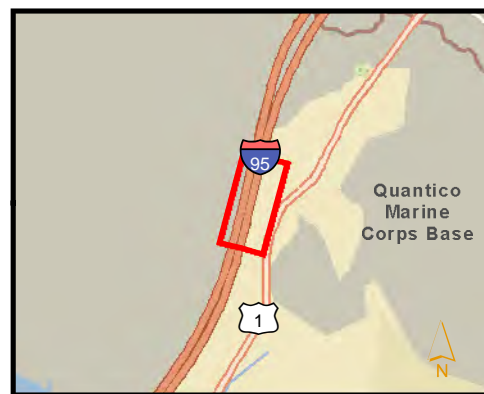
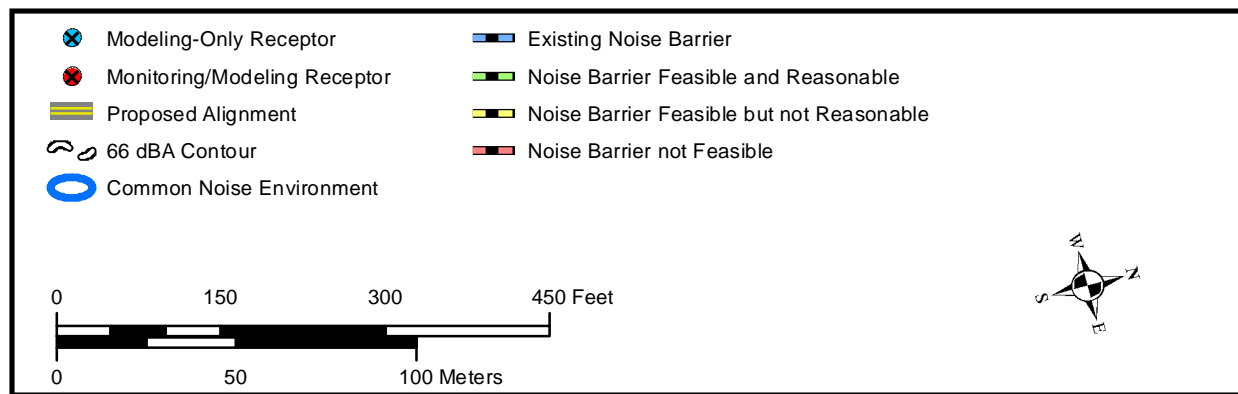
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Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 19

Fairfax, Prince William, and Stafford Counties, VA



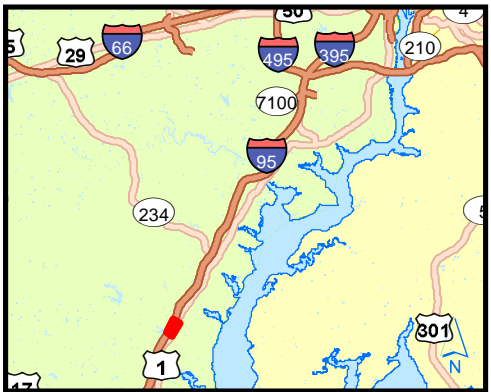
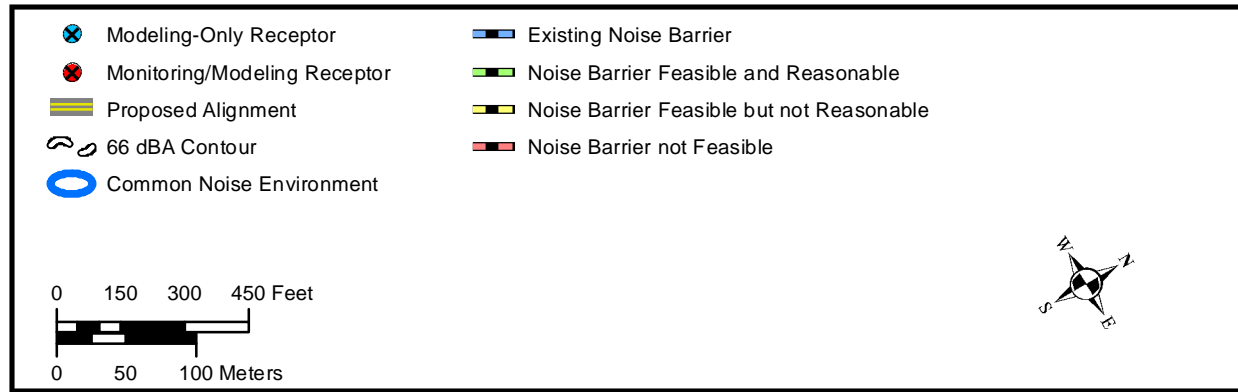
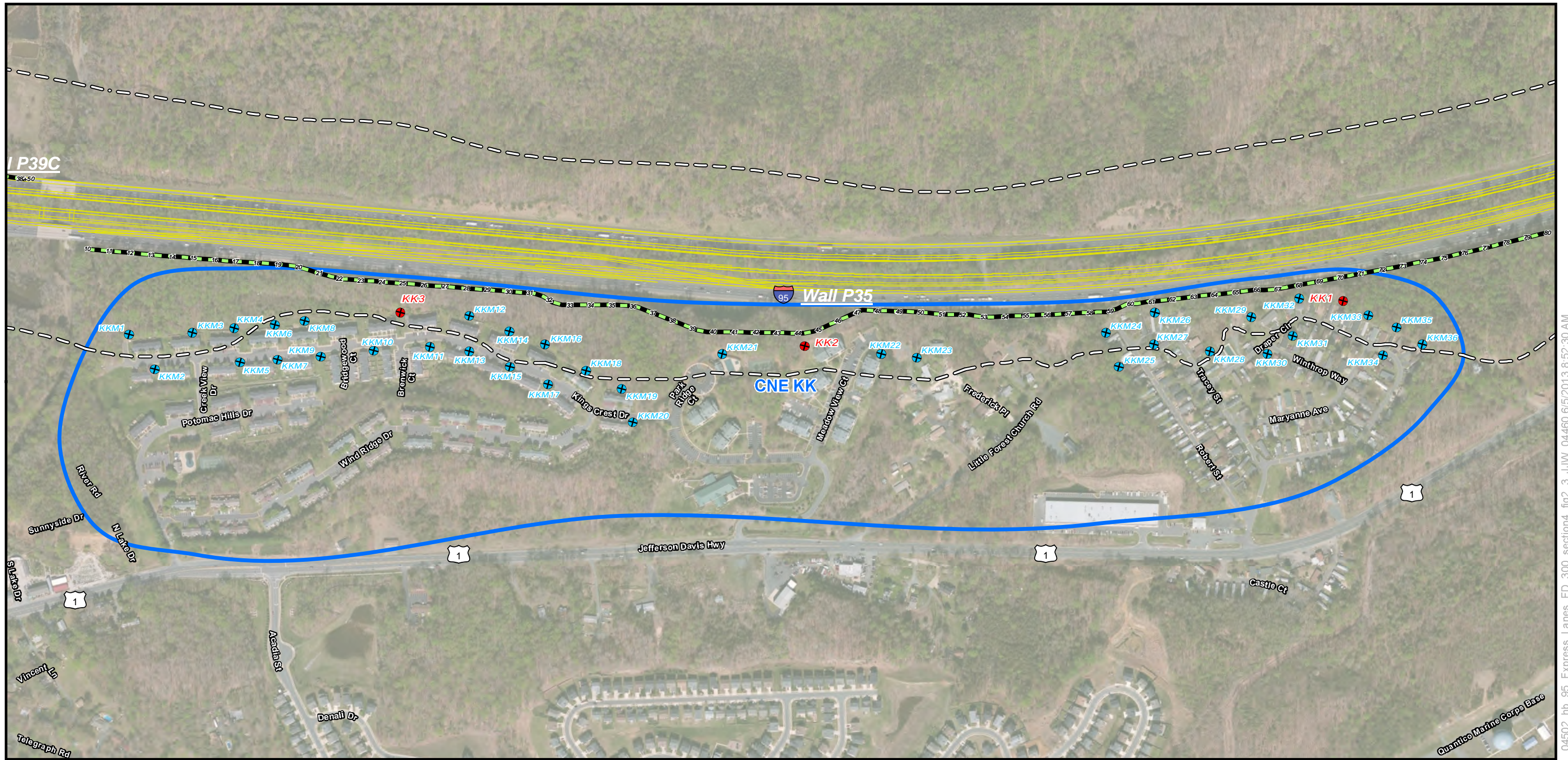
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Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 19A

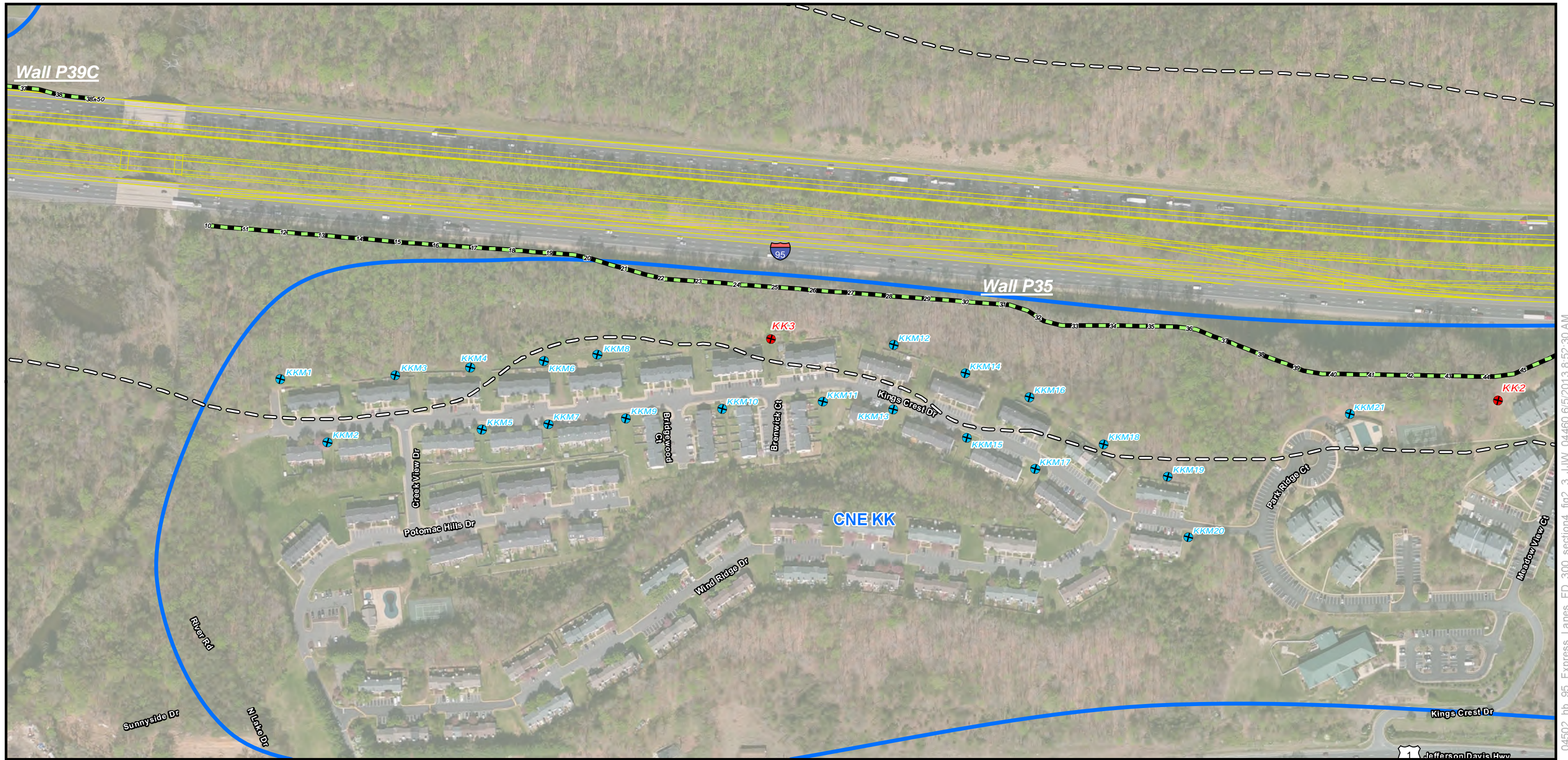
Fairfax, Prince William, and Stafford Counties, VA



Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 20

Fairfax, Prince William, and Stafford Counties, VA

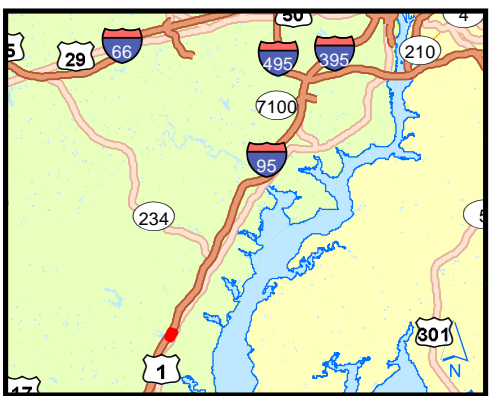


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Modeling-Only Receptor	Existing Noise Barrier
Monitoring/Modeling Receptor	Noise Barrier Feasible and Reasonable
Proposed Alignment	Noise Barrier Feasible but not Reasonable
66 dBA Contour	Noise Barrier not Feasible
Common Noise Environment	

0 150 300 450 Feet

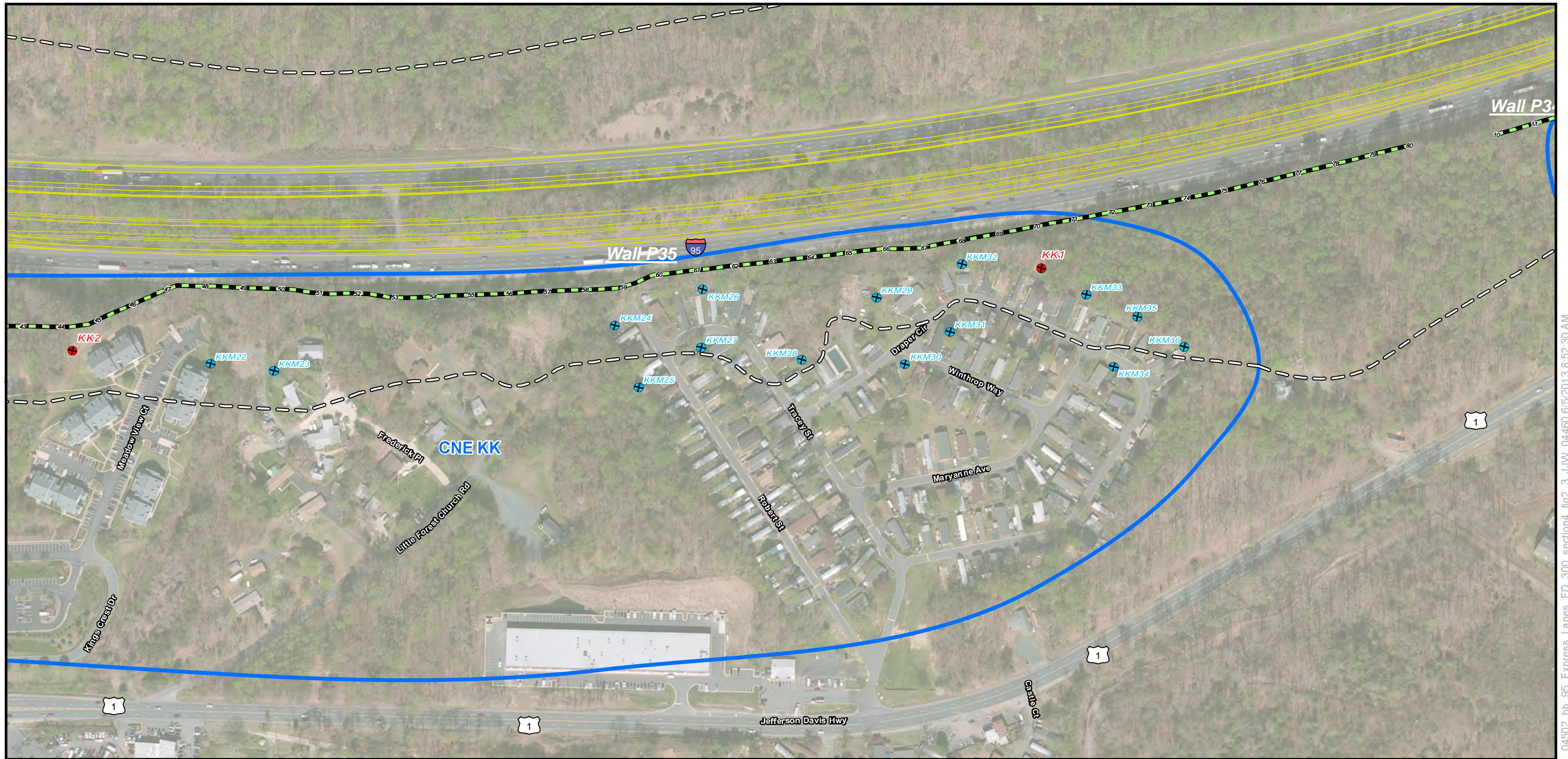
0 50 100 Meters



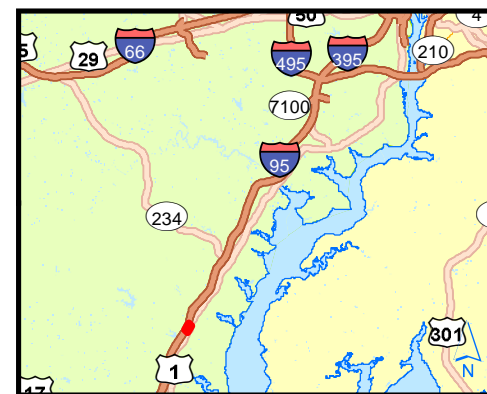
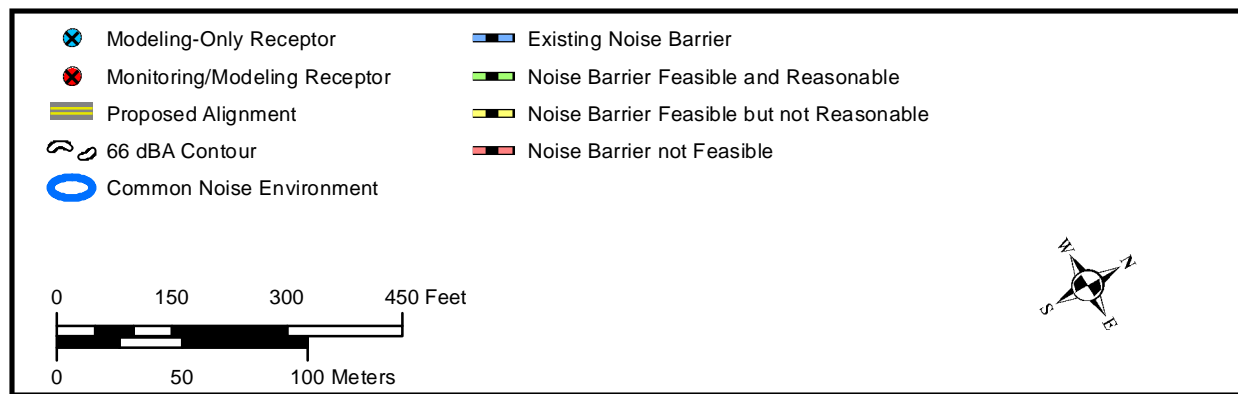
Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 20A

Fairfax, Prince William, and Stafford Counties, VA



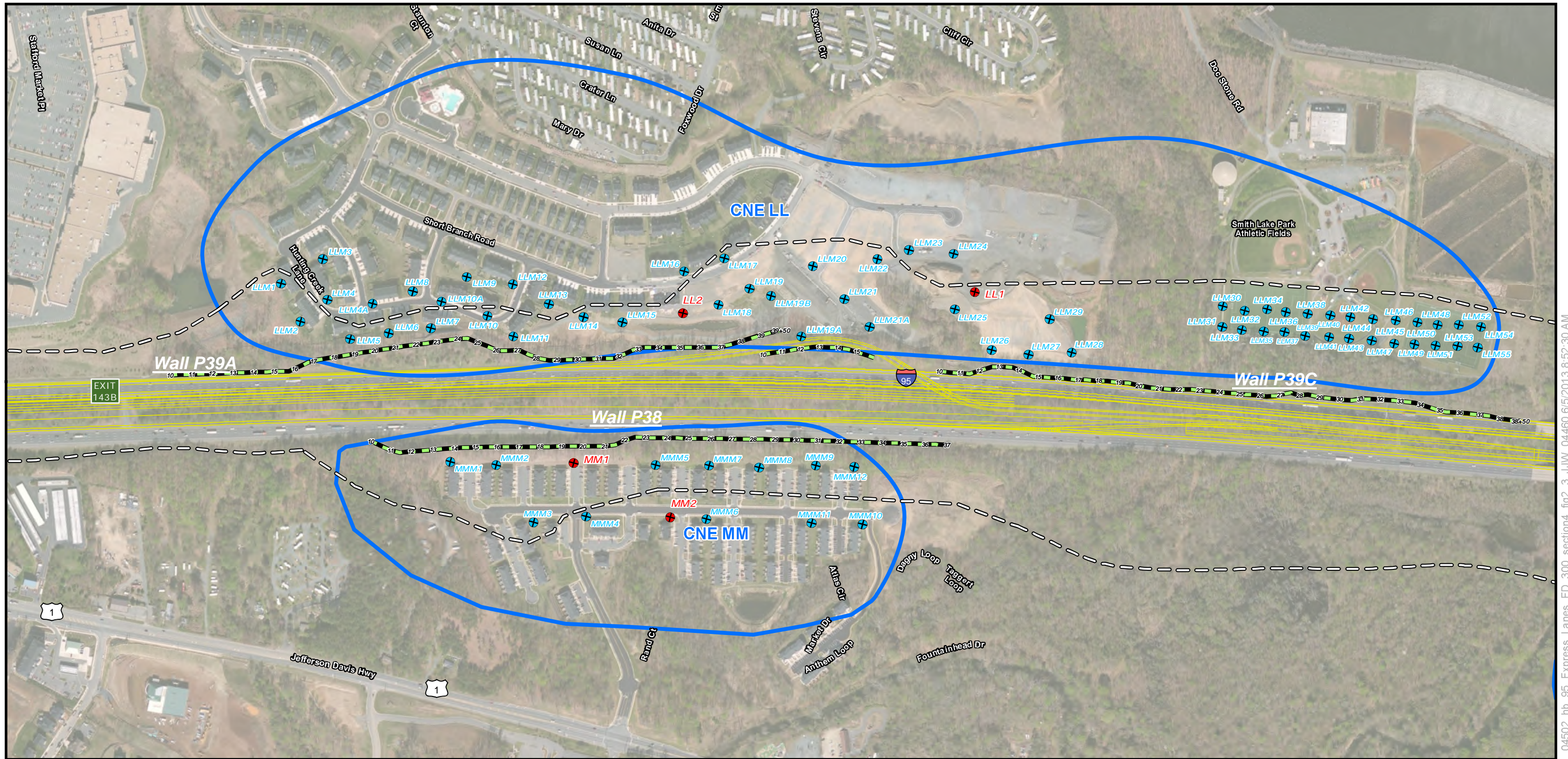
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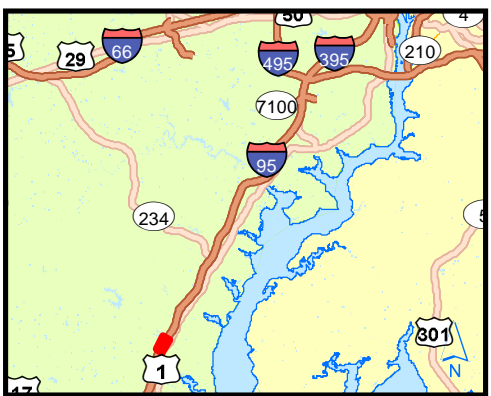
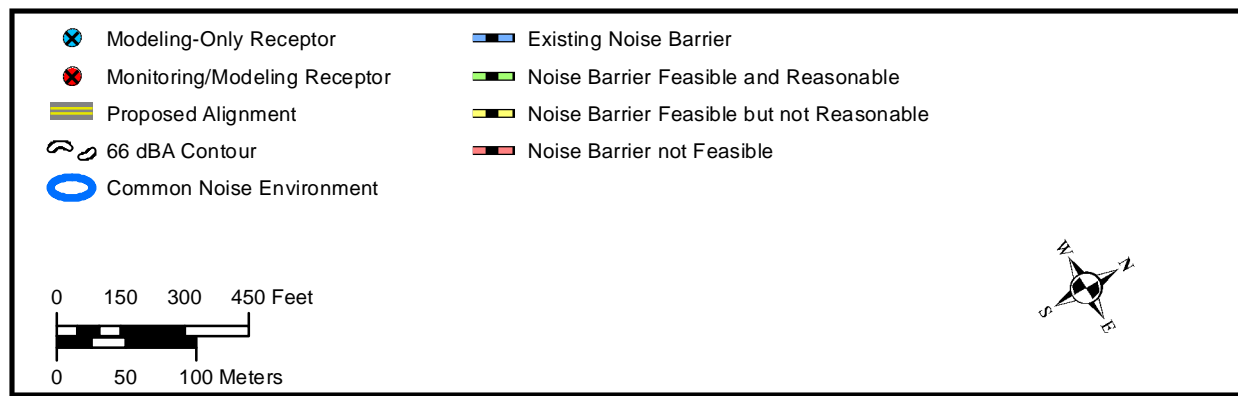
Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 20B

Fairfax, Prince William, and Stafford Counties, VA



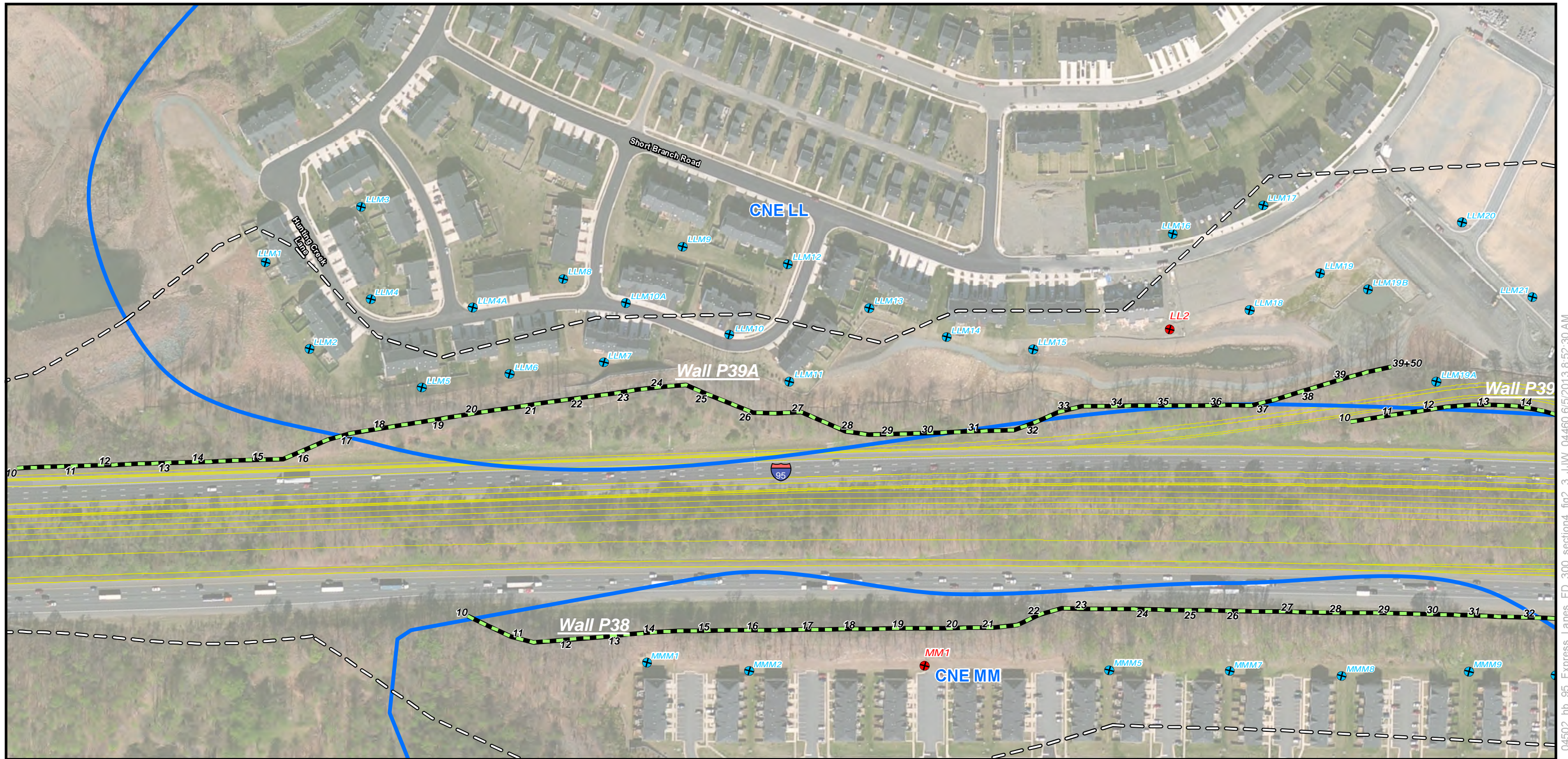
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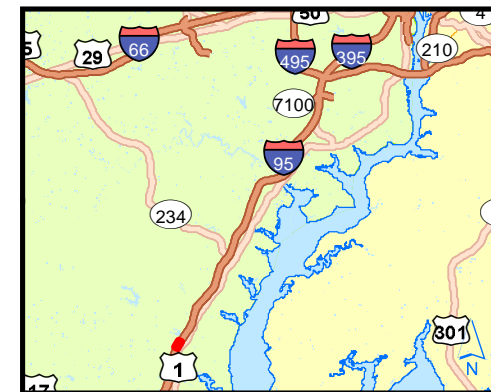
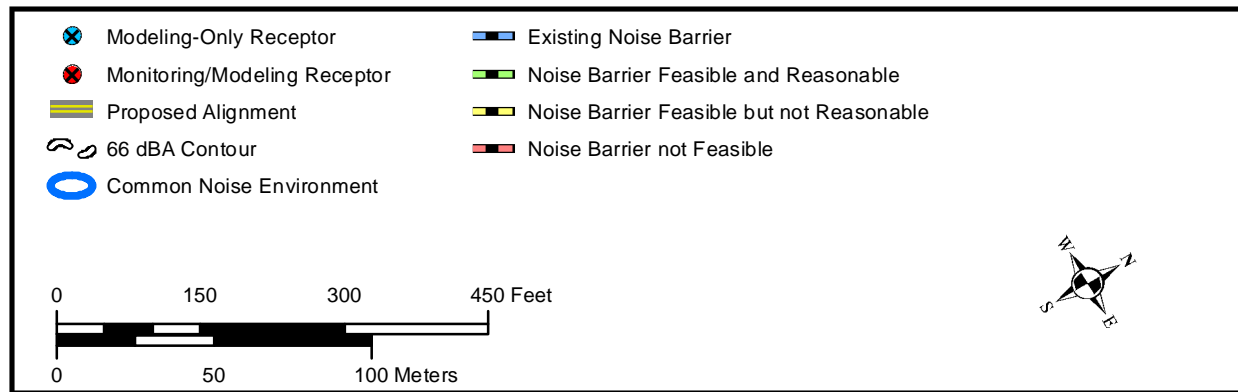
Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 21

Fairfax, Prince William, and Stafford Counties, VA



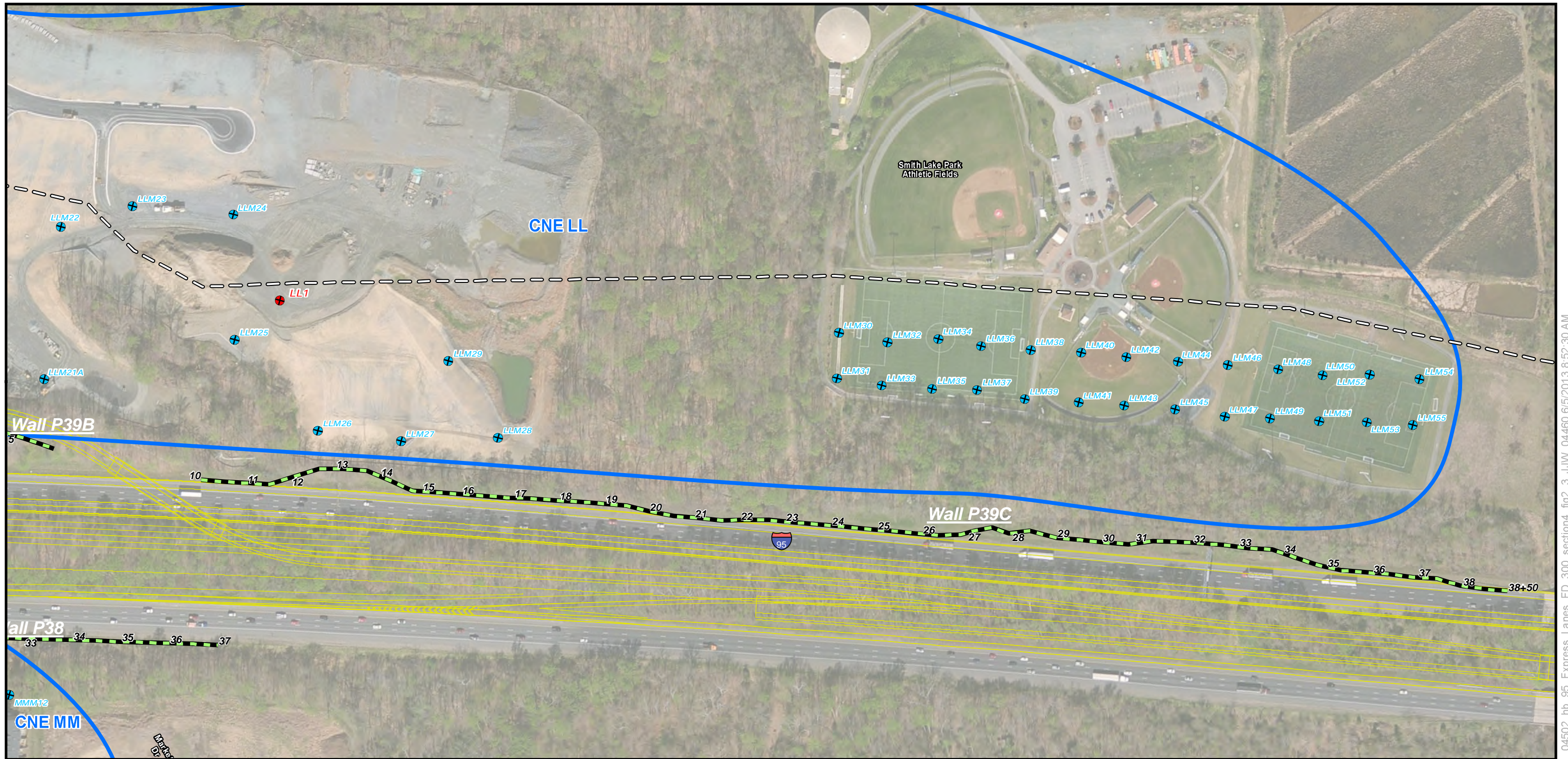
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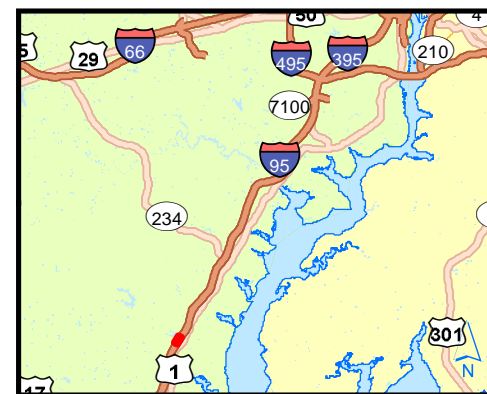
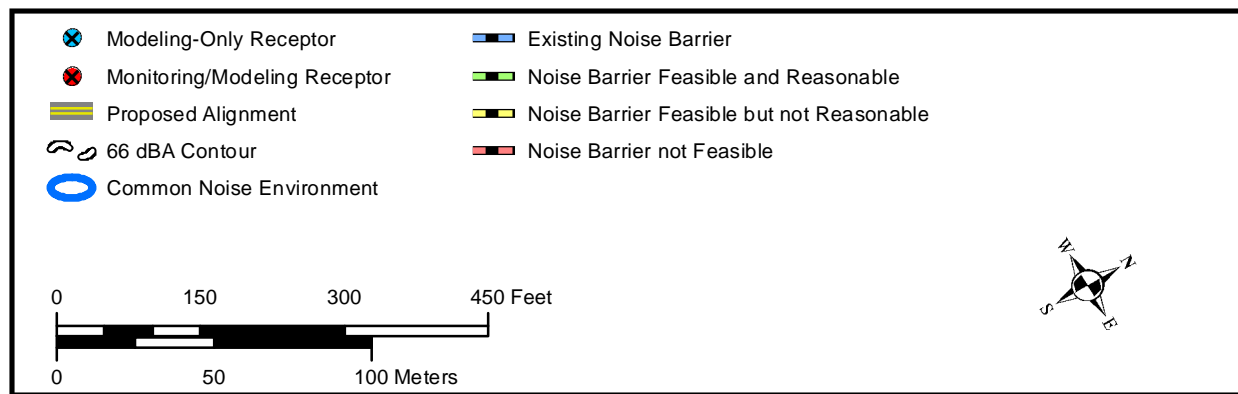
Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
 To: I-95/395/495 Interchange
 Section I, II, and III

Figure 21A

Fairfax, Prince William, and Stafford Counties, VA



04502_hb_95_Express_Lanes_FD_300_section4_fig2_3_JJW_04460 6/5/2013 8:52:30 AM



Virginia Department of Transportation
Interstate 95 – Express Lanes Project
 State Project No.: 0095-96A-107, PE-101; UPC 70849
 From: I-95 Exit 143 (Garrisonville Road Interchange)
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 Section I, II, and III

Figure 21B

Fairfax, Prince William, and Stafford Counties, VA