

**Noise Analysis Technical Report
Environmental Reevaluation of the
Draft Environmental Impact Statement
Bi-County Parkway Location Study**

**VDOT UPC 52405; Project R000-96A-102, PE-101
Prince William and Loudoun Counties, Virginia**

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EXECUTIVE SUMMARY

The Federal Highway Administration (FHWA) regulations for 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 when interchange ramps are added or relocated and a highway is constructed on new location. This report details the noise impact analysis for the Bi-County Parkway (BCP) Reevaluation, formerly named the Tri-County Parkway project, in Prince William and Loudoun Counties, Virginia. The Bi-County Parkway project involves the construction of a new four-lane divided facility within a new right-of-way and on a new alignment between Route 50 and I-66. This noise analysis was conducted in accordance with FHWA and Virginia Department of Transportation (VDOT) noise assessment regulations and guidelines.

This study details the noise impact assessment for the Existing (2013) conditions and for the design-year (2040) No-Build and Build Alternatives. The table below summarizes the projected number of dwelling units and recreational receptors potentially exposed to noise impact by the project alternatives. No noise impact at interior institutional or commercial outdoor areas are predicted in any of the study alternatives. There is a considerable amount of residential as well as recreational land use on both sides of the BCP and all of the noise impacts in the study area would be associated with traffic traveling on the new roadway. At noise-sensitive locations up to nearly 1000 feet from the BCP mainline, substantial increases in noise levels are predicted from the Existing conditions to the 2040 Build scenario. Only one residential dwelling is currently exposed to noise impact in the Existing 2013 case. The 2040 No Build conditions are predicted to impact four residential units. Under the 2040 Build Alternative, 111 residential units and 32 recreational receptors are predicted to be impacted. Because future noise impacts are predicted under the Build Alternative for this Type I project, noise abatement measures must be considered.

Noise Impact Summary

Land Use	Projected Number of Impacted Receptors by Alternative		
	2013 Existing	2040 No Build	2040 Build
Residential	1	4	111
Recreational	0	0	32
Total	1	4	143

Source: HMMH, 2013

Noise abatement by alternative measures to noise barriers was considered, as suggested in the Noise Policy Code of Virginia HB 2577, but they may not be feasible. Further consideration to the feasibility of alternative abatement measures will be given during the final design phase, with particular attention to areas of Manassas National Battlefield Park as a part of the Section 106 Programmatic Agreement. Noise barriers were evaluated for all of the impacted residential and recreational noise sensitive land use along the BCP. This study made a preliminary determination of barrier feasibility and reasonableness for the 2040 Build Alternative to provide appropriate noise reduction for the impacted areas. Up to approximately 1,004, feet of warranted barriers would be potentially feasible and reasonable with a uniform height of 20 ft. at an approximate cost of \$963,792. The barrier would provide sufficient noise reduction to benefit 16 impacted residential

units, and 21 units in total. An additional 9.2 miles of potentially feasible barriers could benefit 87 impacted receptors at an estimated cost of \$54 million, however, they were found to be not reasonable.

A preliminary noise evaluation was performed and 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 also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

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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1 INTRODUCTION

1.1 Overview

The FHWA regulations for 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 when interchange ramps are added or relocated and lanes are added. This report details the noise impact analysis for the Bi-County Parkway project in Prince William and Loudoun Counties, Virginia.

This study details the noise impact assessment for the Existing (2013) conditions and for the design-year (2040) No-Build and Build Alternatives. A noise assessment of the No-Build scenario was required per FHWA and VDOT guidance since the BCP new location is proposed to connect to an existing interstate highway (I-66). The noise assessment for Build Alternative incorporates the Build Alternative 2 from the Dulles Air Cargo, Passenger, and Metro Access Highway (DACPMAH) project, including an assumed interchange at Route 50 and Bi-County Parkway. The DACPMAH project is included in the BCP study because both projects are being considered within the Loudoun County’s Constrained Long Range Plan for the same future design year. Although several alternatives are proposed for the DACPMAH project, Alternative 2 was chosen for the BCP Build model in order to assess a worst-case scenario for noise impact. The traffic volumes and speeds would be highest along the BCP and the ramps connecting to Route 50 in that alternative.

This report presents a description of noise terminology, the applicable standards and criteria, an evaluation of the existing noise conditions, a description of the predictions of existing and future noise levels, a prediction of future noise impact, and an evaluation of potential noise abatement measures. Appendices provide details of the traffic data used in the noise modeling, predicted noise levels at receptors, noise monitoring data, and noise barrier worksheets.

1.2 Project Description

The VDOT, in cooperation with the FHWA, is conducting an Environmental Reevaluation for the Bi-County Parkway (formerly Tri-County Parkway Location Study) to update findings of the Draft Environmental Impact Statement (DEIS) that was completed and approved by FHWA in 2005. The DEIS addressed the No-build Alternative and three Candidate Build Alternatives (CBA), West Two, West Four, and the Comprehensive Plan. On November 17, 2005, the CTB approved the 10.46 mile CBA West Two alignment as the preferred alternative, which is now referred to as the Bi-County Parkway (BCP). The BCP is located along the western edge of the Manassas National Battlefield and would provide a new urban principal arterial roadway from the northern terminus near the intersection of US 50 (John Mosby Highway) and Route 877 (Racefield Lane) and the southern terminus at the I-66 and 234 Bypass Interchange. The alignment generally follows or parallels existing Route 705 (Pageland Lane and Sanders Lane) and lies west of Route 659 (Gum Spring Road). The BCP would consist of Segment 1 (Option 1) and Segment 2 designs as referenced in the DEIS. Figure 1 below shows typical sections for general design Segment 1 (Option 1) and Segment 2.

In order to take into account what the actual environmental impacts of the proposed project may be, design concepts for an interchange at BCP/234 Bypass and I-66 was included in the Build

Alternative. This method provides a conservative estimate for maximum impacts that may occur in order to allow for flexibility in final design, eliminating the need for further environmental analysis. However, these assumptions do not reflect the completion of any design detail. At-grade intersections are assumed at Braddock Road, Sudley Road, and Lee Highway.

Figure 2, shown later in the report, depicts the locations of the proposed roadway improvements.

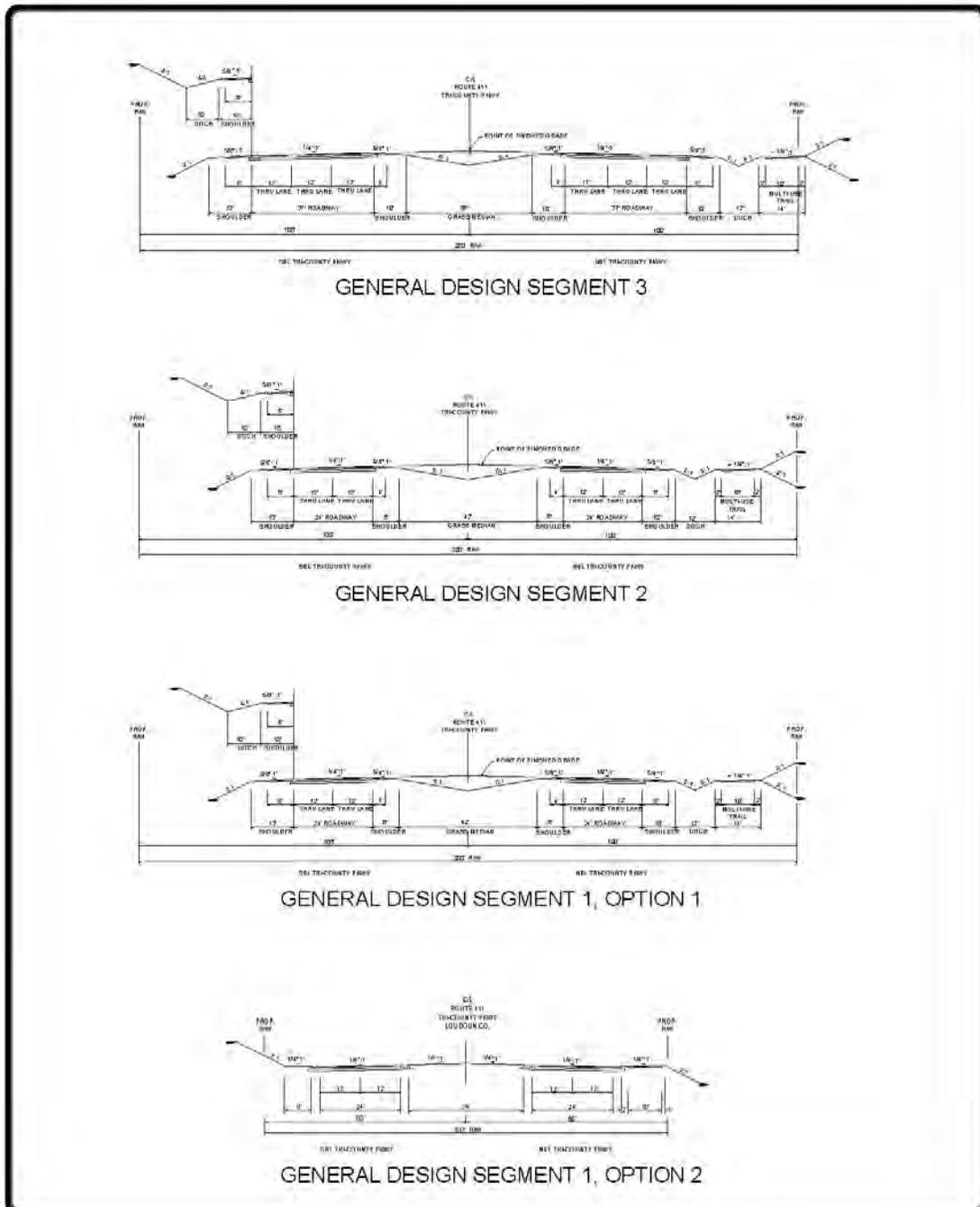


Figure 1 Roadway Design Typical Sections

2 NOISE TERMINOLOGY AND CRITERIA

2.1 Regulations and Guidelines

The noise impact of Bi-County Parkway Project was assessed in accordance with FHWA and VDOT noise assessment regulations and guidelines. The FHWA regulations are set forth in 23 CFR Part 772.¹ 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.² 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 February 11, 2013.³

2.2 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 (see Table 1). The NAC are given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The A-weighted sound level is a single number measure of sound intensity with weighted frequency characteristics that corresponds to human subjective response to 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 (L_{eq}). The L_{eq} 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, L_{eq} is typically evaluated over a one-hour period, and may be denoted as $L_{eq}(h)$.

In this study, residential (Category B), recreational (Category C) 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 $L_{eq}(h)$ 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 $L_{eq}(h)$ 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, $L_{eq}(h)$, or 66 dBA. The threshold for noise impact for Category E is where exterior noise levels are within 1 decibel of 72 dBA, $L_{eq}(h)$, or 71 dBA. Noise impact also would occur wherever Project noise causes a substantial increase over

¹ 23 CFR Part 772, as amended 75 FR 39820, July 13, 2010; Effective date July 13, 2011 – "Procedures for Abatement of Highway Traffic Noise and Construction Noise," Federal Highway Administration, U.S. Department of Transportation. http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/

² "Highway Traffic Noise: Analysis and Abatement Guidance," Federal Highway Administration, U.S. DOT, June 2010, revised January 2011. http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/rev_guidance.pdf

³ "Highway Traffic Noise Impact Analysis Guidance Manual (Version 3)," Virginia Department of Transportation, updated February 11, 2013. <http://www.virginiadot.org/projects/pr-noise-walls-about.asp>

Table 1 FHWA Noise Abatement Criteria

Activity Category	L_{eq}(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, amphitheaters, 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	–	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.

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 scenario noise levels approach or exceed the NAC during the loudest hour of the day or cause a substantial increase in existing noise, consideration of traffic noise reduction measures is necessary. 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 (2013) conditions and for the design-year (2040) 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 3.

2.3 Undeveloped Lands and Permitted Developments

Highway traffic noise analyses 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.

Michael Seigfried at Loudoun County and Christopher Price at Prince William County Planning Departments were contacted on March 22, 2013 and April 18, 2013, respectively, to determine the locations of known noise-sensitive undeveloped lands with active building permits in the corridor. The following neighborhoods were confirmed for assessment in the BCP Reevaluation:

- Westridge Townhomes in CNE 13
- Stone Ridge in CNE 13
- Stratshire Crossing in CNEs 11 and 12
- Kirkpatrick Farms in CNEs 11 and 12

3 EXISTING NOISE CONDITIONS

Existing noise conditions within the study area were evaluated to assist in determining the noise impacts of the proposed project. A noise measurement program was conducted, 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 TNM noise prediction model.

3.1 Monitoring of Existing Noise Levels

Noise monitoring was conducted at ten short-term (30 minutes in duration) sites on April 3rd and 4th, 2013. 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 2, presented later in the report, show the locations of the three noise measurement sites within the project study area.

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. Short-term monitoring does not need to occur within every Common Noise Environment to validate the computer noise model.

The short-term noise measurements were conducted using a Larson Davis 870 (ANSI Type I, "Precision") integrating sound level meter. The short-term data collection procedure involved measurements of individual one-minute L_{eq} s, so that periods including events that were not representative of the ambient noise environment or not traffic-related could be separated or excluded. Specifically, minutes that included such events were logged, and those with events not representative of the ambient environment were eliminated. Minutes with representative events not related to traffic were separated, and the total measurement period L_{eq} was determined both with and without the minutes that included these 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.

The dominant source of noise at site M1 was traffic on Lee Highway due to the proximity of the measurement location to the roadway and the low level of activity directly near the site. Ambient outdoor noise dominated at site M2, and Pageland Lane traffic was the dominant noise source at sites M3 and M4. Sudley Road was the dominant noise source at site M5, and Sanders Lane and ambient outdoor noise dominated at site M6. The noise environment was dominated by ambient outdoor noise at M7 and M8. Traffic on Braddock Road dominated the noise level at M9, and local traffic excluding construction activity dominated at site M10. Ambient outdoor noise sources that were not related to traffic included primarily wood or forest activity, local community activity, and overflights. Local human activity is typical of the study zone and is included in the measurement results presented under "Total" in Table 2. Noise from some local community activity, such as construction or yard work, was thought to be non-typical and was excluded from the totals. Overflights were found to contribute significantly to the noise level north of Braddock Road.

During the measurement program, the weather was overcast, with temperatures between 50 and 55 degrees F and light, variable winds with up to 10 mile per hour (mph) wind gusts. Noise levels

recorded on April 3rd were adjusted to not include noise associated with wind gusts above approximately 12 mph.

The measured short-term noise levels appear in Table 2 as equivalent sound levels (L_{eq}). As described above, the L_{eq} is a sound-energy average of the fluctuating sound level (in A-weighted decibels, dBA) measured over a specified period of time. The measurement time periods are shown in the table. Appendix D provides details of the data acquired during the noise measurement program, including noise monitor output, site sketches, photographs, noise level data with site summary results, and traffic counts with hourly totals.

Table 2 shows that the measured Total L_{eq} s range from a low of 55 dBA at measurement site ST2 to a high of 60 dBA at the mobile home community on Old Courthouse Tpke (Site ST3). Also shown in Table 2 are the measured “Traffic Only” L_{eq} s, which are the same as the measured Total L_{eq} s at all sites, which is an indication that traffic was the dominant source of noise in spite of the presence of occasional human activity.

Table 2 Short-term Noise Measurements on April 3 and 4, 2013

Site No.	Location	Date	Time	Measured L_{eq} (dBA)		Dominant Sources of Noise
				Total	Traffic Only	
M1	12521 Lee Highway, Manassas National Battlefield Park	4/4/13	13:10	55	55	Lee Highway
M2	6389 Pageland Lane	4/4/13	15:09	42	42	Ambient Noise
M3	5905 Pageland Lane	4/4/13	12:10	49	49	Pageland Lane
M4	5501 Pageland Lane	4/4/13	11:12	43	43	Pageland Lane
M5	5805 Sudley Road, Catharpin Park	4/3/13	16:58	57	57	Sudley Road
M6	3480 Sanders Lane	4/4/13	10:08	44	44	Ambient Noise and Sanders Lane
M7	25992 Lightridge Farm Road	4/3/13	15:40	50	50	Ambient Noise
M8	25503 Kinsale Place	4/3/13	13:03	52	52	Ambient Noise
M9	41512 Hitchin Court	4/3/13	12:01	56	50	Braddock Road and Overflights
M10	41535 Sacred Mountain Street, John Champe High School	4/3/13	10:46	53	53	Ambient Noise and Local Traffic

Note: Site locations shown on map in Figure 2. Detailed data presented in Appendix D.

Source: HMMH, 2013

3.2 Characterization of Existing Background Sound Levels

The two days of noise measurements HMMH conducted in the study area were used to form the basis of a reasonable and conservative background noise level associated with the aircraft activity in the area. The characterization of existing background sound levels presented in the Dulles Air Cargo,

Passenger and Metro Access Highway project⁴ was also considered for receptors in the vicinity of Route 50, since the project study areas overlap there. That project determined 57 dBA to be the resulting average background Leq after energy-averaging all of the background Leq sound levels associated with aircraft. Through field observation and measurements, it was determined that aircraft does not contribute as significantly to areas of the Bi-County Parkway corridor south of Braddock Road, but there is still a contribution to consider north of Braddock Road as evidenced by observations and noise levels measured at sites M8 through M10. In the same manner as for the Dulles Air Cargo project, the background Leqs found at these sites were energy-averaged (equivalent to determining Leq for all sites combined) to determine an average background Leq to apply to the area from approximately Tall Cedars Parkway to just south of Braddock Road. The resulting average background L_{eq} for this portion of the study area is 54 dBA. As a result, 57 dBA or 54 dBA are added to the TNM-predicted roadway traffic Leq noise levels to determine the total Leq at each receptor in the study area north of the vicinity of Braddock Road for the Existing and future scenario analyses. At receptors south of the Braddock Road vicinity, background sound levels of 50 dBA or less are characteristic away from major roadways, and were attributed in that portion of the study corridor.

Measured background sound levels associated with the aircraft activity do not include noise from nearby or project roadways. The background aircraft noise levels are used in two ways in the study:

1. The first way is to establish existing noise levels throughout the study area against which the project noise levels are compared to determine “substantial increase” noise impact. The background sound level is used directly in areas away from roadways (i.e. in the Alternative 2 corridor. In areas near roadways that are included in the noise prediction model, the background noise level is added to the existing traffic noise level computed with the Traffic Noise Model (TNM – see Section 4.1 for description) to determine a total existing noise level at each receptor.
2. The second way that the background sound level is used is that it is added to all TNM-predicted future roadway noise levels. This provides the proper context for the determination of noise impact and the noise reduction and feasibility of noise barriers.

The approach described above to account for the contribution of aircraft activity to the background noise level is consistent with that used where other types of noise sources exist in a study area, such as a rail line or another roadway. In such cases, the noise from those sources is added to the noise from project roadways at receptors affected.

3.3 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 prediction methods and predicted noise levels are presented in the next section of this report.

⁴ “Noise Analysis Technical Report, Dulles Air Cargo, Passenger and Metro Access Highway, Loudoun County, Virginia” HMMH Report No. 304800.004, May 2013.

4 PREDICTED NOISE LEVELS

4.1 Noise Prediction Model

All traffic noise predictions for this study were conducted using the latest version of the FHWA Traffic Noise Model (FHWA TNM 2.5).⁵ The FHWA 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, topographic contours and building information were used to create a three-dimensional model in the TNM of the geometry of the existing and future design roadway configurations and the surrounding terrain and buildings. The noise modeling also accounted 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, nearly five hundred noise prediction receivers (also called “receptors” and “sites”) were added to the ten measurement sites in the TNM model.

The majority of the proposed BCP project modeling in this reevaluation used the same design files from the 2004 preliminary noise analysis including roadway plans, right-of-way, typical sections, profiles, and cross-sections. The updated Avoidance Alignment plan for a portion of the BCP was provided by Parsons. Elevations for the modeling used a single updated LIDAR data set for completeness, consistency and accuracy from the Geospatial Data Gateway hosted by the United States Department of Agriculture, Natural Resource Conservation Service.

A concept of the BCP and I-66 interchange was provided by Parsons and included in the future Build model of this project. The improvements to the interchange that affect the noise environment in the study area include a proposed connection from BCP southbound to an existing flyover ramp connection to I-66 westbound and a ramp from I-66 westbound to BCP northbound. The BCP was assumed to be elevated above I-66 and the existing ramps. Any interchange roadway modeled on-structure was elevated approximately 25 feet above the roadway below, a standard engineering assumption consistent with other proposed interchanges in Loudoun County, Virginia.

A concept known as Alternative 2 from the DACPMAH preliminary noise assessment was also included in the model of this project. The proposed improvements include a BCP/DACPMAH/Route 50 partial-cloverleaf interchange with six ramps and an alignment of the DACPMAH freeway on new location to the north of the interchange. The BCP/DACPMAH roadway was assumed to be on elevated structure 25 feet over Route 50 with an adjacent roadway profile that did not exceed the maximum grade assumed in the DACPMAH study.

⁵Anderson, G.S., C.S.Y. Lee, G.G. Fleming, and C.W. Menge, “FHWA Traffic Noise Model, Version 1.0 User’s Guide”. Federal Highway Administration Report No. FHWA-PD-96-009, January 1998.

4.2 Noise Model Validation

A validation of the noise modeling assumptions was conducted using the traffic counted on nearby roadways simultaneous with the noise measurement at sites where roadway noise dominated as input to the noise prediction model. The traffic counts are provided in Appendix D. Predicted noise levels based on the counted traffic were compared to the measured noise levels to confirm the assumptions about aspects of the TNM model, such as the acoustical shielding provided by intervening terrain. The modeling assumptions were refined, as necessary, to obtain appropriate agreement between the predicted and measured values. The validated modeling assumptions at the measurement sites and for the existing geometry were then extended to the design-year alternative and applied at prediction locations where no measurements were made.

Noise levels were predicted at five of the measurement sites where local traffic dominated the noise environment, using the counted traffic as input to the model. These levels were on average slightly higher by 2.5 decibels when compared to the measured noise levels, with a standard deviation of the differences of 0.8 decibels. This generally good agreement confirms that traffic is the dominant source of noise at these sites. There is variation between measured and predicted levels of about four decibels at one of the sites, which may be due to a combination of the relative complex geometry, varying terrain and trees/brush in the area, and wind gusts during the measurement. The comparison of measured versus predicted sound levels at each of the validated measurement sites is shown in Table 3.

Table 3 Predicted vs. Measured Sound Levels at Measurement Sites

Site No.	Location	Land Use	Measured L_{eq} (dBA) (Traffic Only)	Predicted L_{eq} (dBA)	Difference
M1	12521 Lee Highway, Manassas National Battlefield Park	Park	54.6	57.3	2.7
M2	6389 Pageland Lane	Residential	41.7	N/A	N/A
M3	5905 Pageland Lane	Residential	49.1	52.9	3.8
M4	5501 Pageland Lane	Residential	43.4	45.2	1.8
M5	5805 Sudley Road, Catharpin Park	Park	57.0	59.1	2.1
M6	3480 Sanders Lane	Residential	43.6	N/A	N/A
M7	25992 Lightridge Farm Road	Residential	49.7	N/A	N/A
M8	25503 Kinsale Place	Residential	52.4	N/A	N/A
M9	41512 Hitchin Court	Residential	50.2	52.3	2.1
M10	41535 Sacred Mountain Street, John Champe High School	School	52.7	N/A	N/A

Note: Site locations shown on map in Figure 2. Detailed data presented in Appendix D.

N/A indicates no validation was performed due to ambient noise dominating the measured noise level.

Source: HMMH, 2013

4.3 Traffic Data for Noise Prediction

The traffic data used in the noise analysis must produce sound levels representative of the loudest hour of the day, per FHWA and VDOT policy. Hour-by-hour vehicle volumes, truck percentages and speeds were developed by VDOT and Parsons Transportation Group for the Bi-County Parkway, Route 50, Braddock Road, Sudley Road, Lee Highway, I-66, Pageland Lane, Sanders Lane, and 234 Bypass and Interchange. 2040 Build traffic data for the Route 50 Interchange ramps was calculated using data from the Dulles Air Cargo, Passenger, and Metro Access Highway project Alternative 2 condition. The volumes and speeds producing the loudest-hour conditions for the 2013 Existing and 2040 No-Build and Build Alternatives were used in the modeling of those roadways. The loudest-hour conditions for the Existing and No-Build scenarios were determined by calculating the loudest-hours on Pageland Lane, Sanders Lane, Route 50, and I-66. The Build loudest-hour was determined by calculating the loudest-hour for all segments of the Bi-County Parkway. The worst-hour traffic for the 2013 Existing case was in the hour starting at 7:00. For the future 2040 alternatives, the worst-hour traffic occurred in the hour starting at 7:00 for the No Build Alternative and the 11:00 hour for the Build Alternative.

Appendix B provides tables of the existing and future traffic data used in the noise model for all roadways in the network.

4.4 Presentation of Results

The study area includes mostly residential land use and development, as well as some recreational and institutional land use. There are several residential developments with building permits near the northern end of the corridor between Route 50 and Braddock Road that are included in the study. Arcola Elementary School and John Champe High School are also located in this area. The remainder of the study area contains scattered residential land use, with Catharpin Park at Sudley Road and Manassas National Battlefield Park near Route 29.

To fully characterize existing and future noise levels at all noise-sensitive land uses in the study area, roughly 500 additional noise prediction receptors (also called “receivers” and “sites”) were added in the TNM model to the ten measurement sites. Each of these receptors represented exterior noise-sensitive land use except for one receptor representing the interior of each school and the building associated with the Manassas Battlefield Park.

All noise levels predicted were the A-weighted equivalent sound level, or L_{eq} , in dBA. Loudest-hour noise levels were predicted for the Existing 2013 and the design-year 2040 No-Build and Build Alternatives. Table 4 presents a list of the CNEs in the study area with FHWA Activity categories, descriptions of the associated land use, and the general location for each CNE. Table 5 presents ranges of the predicted sound levels at the receptors in each Common Noise Environment (CNE) for each alternative. Appendix C provides a table that lists the predicted sound levels at all of the receptors for each alternative. Each receptor, or prediction site, is given an identifier that is also displayed in Figure 2 using a “P####” format.

Figure 2 shows the location and predicted barrier status for all receptors in the Build Alternative in graphical form. For the receptors in Figure 2 depicting impact, predicted 2040 Build noise levels would approach or exceed the NAC for the associated land use category, or would cause substantial increases in existing noise levels. The NAC is 67 dBA L_{eq} at all residential and recreational receptors, and 72 dBA L_{eq} at the 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

Table 4 Common Noise Environment (CNE) Descriptions

CNE	FHWA Activity Categories*	Description of Land Use and Location
1	C,D	Manassas National Battlefield Park and undeveloped land south of Lee Highway and east of the BCP
2	C	Manassas National Battlefield Park north of Lee Highway and east of the BCP
3	B	Single-family residences north of Lee Highway and west of the BCP
4	B	Single-family residences along Pageland Lane and east of the BCP
5	B	Single-family residences along Pageland Lane and west of the BCP
6	B	Single-family residences in the vicinity of Sudley Road and east of the BCP
7	B,C	Single-family residences and Catharpin Park in the vicinity of Sudley Road and west of the BCP
8	B	Single-family residences north of the Sudley Road area and east of the BCP
9	B,C	Single-family residences along Sanders Lane/Lightridge Farm Road and east of the BCP; Boxwood Farms Equestrian Area
10	B	Single-family residences along Sanders Lane and west of the BCP
11	B	Single-family and multi-family residences in Stratshire Crossing and Kirkpatrick Farms subdivisions under construction and in the vicinity of Braddock Road and east of the BCP
12	B,C	Single-family and multi-family residences in Stratshire Crossing and Kirkpatrick Farms subdivisions under construction and in the vicinity of Braddock Road and west of the BCP; Park at the corner of Braddock and Goshen Roads
13	B	Future permitted residences Stone Ridge and Westridge Townhomes east of Northstar Boulevard
14	B	Single-family residence in wooded area west of Northstar Boulevard
15	C	Arcola Elementary School recreation areas east of Northstar Boulevard
16	B,C,D	John Champe High School recreation areas and future single-family residences west of Northstar Boulevard
17	B	Single-family residences in the vicinity of Route 50 and east of the BCP
18	B	Single-family residences in the vicinity of Route 50 and west of the BCP

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

Source: HMMH, 2013

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. Dark gray symbols represent properties that may be potential acquisitions related to the project. Section 6.2 discusses the details of the barrier designs.

Overall, predicted noise levels range from 43 to 66 dBA L_{eq} (exterior) for the Existing case, 44 to 67 dBA L_{eq} (exterior) for the No-Build case and 48 to 72 dBA L_{eq} (exterior) for the Build Alternative. On average for all receptors, sound levels are predicted to increase from Existing to No-Build conditions by approximately two decibels. This increase is due to predicted increases in traffic volumes in the area in general. For all receptors, an average increase of seven dB over the Existing

Table 5 Ranges of Predicted Worst-hour Leq Noise Levels by CNE

CNE ID	Area Land Use and Description	Receptor Nos.	Ranges of predicted Worst-hour Leq Noise Levels, dBA		
			Existing	No Build	Build
1	Manassas National Battlefield Park and undeveloped land south of Lee Highway and east of the BCP	1 - 3	51	53	57
2	Manassas National Battlefield Park north of Lee Highway and east of the BCP	4 - 29	43 - 52	46 - 58	53 - 70
3	Single-family residences north of Lee Highway and west of the BCP	30 - 35	45 - 60	48 - 63	52 - 72
4	Single-family residences along Pageland Lane and east of the BCP	36 - 45	43 - 52	45 - 58	51 - 66
5	Single-family residences along Pageland Lane and west of the BCP	46 - 60	43 - 50	44 - 56	51 - 68
6	Single-family residences in the vicinity of Sudley Road and east of the BCP	61 - 67	46 - 56	49 - 60	59 - 67
7	Single-family residences and Catharpin Park in the vicinity of Sudley Road and west of the BCP	68 - 108	47 - 64	50 - 66	54 - 72
8	Single-family residences north of the Sudley Road area and east of the BCP	109 - 118	44 - 45	44 - 47	48 - 64
9	Single-family residences along Sanders Lane/Lightridge Farm Road, east of the BCP; Boxwood Farms Equestrian Area	119 - 148	44 - 57	45 - 63	51 - 70
10	Single-family residences along Sanders Lane and west of the BCP	149 - 168	44 - 61	45 - 66	54 - 69
11	Single- and multi-family residences in Stratshire Crossing and Kirkpatrick Farms subdivisions and near Braddock Road and east of the BCP	169 - 269	54 - 56	54 - 58	55 - 70
12	Single- and multi-family residences in Stratshire Crossing and Kirkpatrick Farms subdivisions and near Braddock Road and west of the BCP; Park at the corner of Braddock and Goshen Roads	270 - 298	54 - 57	54 - 60	56 - 69
13	Future permitted residences Stone Ridge and Westridge Townhomes east of Northstar Boulevard	299 - 392	54 - 58	54 - 61	54 - 71
14	Single-family residence in wooded area west of Northstar Boulevard	393	55	57	59
15	Arcola Elementary School recreation areas east of Northstar Boulevard	394 - 414	57	57	59 - 70
16	John Champe High School recreation areas and future single-family residences west of Northstar Boulevard	415 - 490	54 - 58	54 - 61	56 - 68
17	Single-family residences in the vicinity of Route 50 and east of the BCP	491 - 492	57 - 66	58 - 65	62
18	Single-family residences in the vicinity of Route 50 and west of the BCP	493 - 497	57 - 65	57 - 67	64 - 65

case is predicted for the Build scenario. The proposed BCP roadway is the major contributor to the increase in sound levels within the study area. A small number of receptors are predicted to experience slight decreases in sound level from the No build to the Build scenario due to significant traffic volumes being redirected onto roadways farther from the receptors.

Predicted sound levels at land uses other than residential properties are discussed in the paragraphs below. Table 14 in Appendix C presents the predicted sound levels for all receptors under all project alternatives.

The Manassas Battlefield Park Headquarters area in CNE 1 would experience approximately 6 dB increases in noise levels from the existing condition to future Build Alternative due to the proposed construction of the BCP roadway. Existing loudest-hour noise levels are predicted up to 51 dBA (exterior) and Build noise levels are predicted up to 57 dBA, Leq (exterior). Interior noise levels at the headquarters building are projected to be 37 dBA under the Build conditions, assuming an outside-to-inside noise reduction of 20 decibels for wood frame construction and air conditioning.

The Manassas Battlefield Park trail area in CNE 2 would experience approximately 13 dB increases in noise levels from the existing condition to the future Build alternative due to the proposed construction of the new BCP roadway. Existing loudest-hour noise levels are predicted up to 52 dBA in some areas, Build noise levels are predicted up to 70 dBA, Leq.

The receptors at the baseball fields within Catharpin Park in CNE 7 would be impacted under the Build alternative with worst-hour noise levels predicted up to 65 dBA and an average increase of approximately 6 dB. The maximum increase at Catharpin Park receptors is approximately 10 dB over existing noise levels, which are predicted to range from 47 to 61 dBA at the receptors within all fields.

CNE 9 includes the Boxwood Farms equestrian area FHWA Activity Category C with an exterior NAC of 67 dBA. The exterior riding area is predicted to have worst-hour noise levels of 52 dBA under the Build scenario; therefore it is not predicted to be impacted.

CNE 12 includes an unnamed park at the corner of Braddock and Goshen Roads. The exterior court and field areas are predicted to have worst-hour noise levels of 56 dBA under the Build scenario; therefore it is not predicted to be impacted.

CNE 15 includes the Arcola Elementary School. The exterior use consists of two playing fields and several playground areas to the north of the building. Existing loudest-hour noise levels are predicted up to 57 dBA, Build noise levels are predicted up to 70 dBA, Leq. The interior of this air-conditioned masonry building would not be impacted under the Build condition with predicted interior worst-hour Leqs of up to 45 dBA

CNE 16 includes the John Champe High School. The exterior use consists of two playing fields to the south of the main building. Existing loudest-hour noise levels are predicted up to 57 dBA, Build noise levels are predicted up to 67 dBA, Leq. The interior of this air-conditioned masonry building would not be impacted under the Build condition with predicted interior worst-hour Leqs of up to 39 dBA. This area is also the future location of the Boyd School in Stone Ridge represented by Site P464. The interior of this assumed air-conditioned masonry building would not be impacted under the Build condition with predicted interior worst-hour Leqs of up to 37 dBA.

The next section presents the noise impact assessment in detail.

Figure 2 Bi-County Parkway Ree-evaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
HMMH Report No. 305000.009
June 2013

Receiver Site and Number

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

ST# Short-Term Measurement Site

Potential Barrier

Non-Feasible Barrier

66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

Note:

Grouped Receiver Labels are Ordered Left to Right, Top to Bottom

Sheet 1 of 17

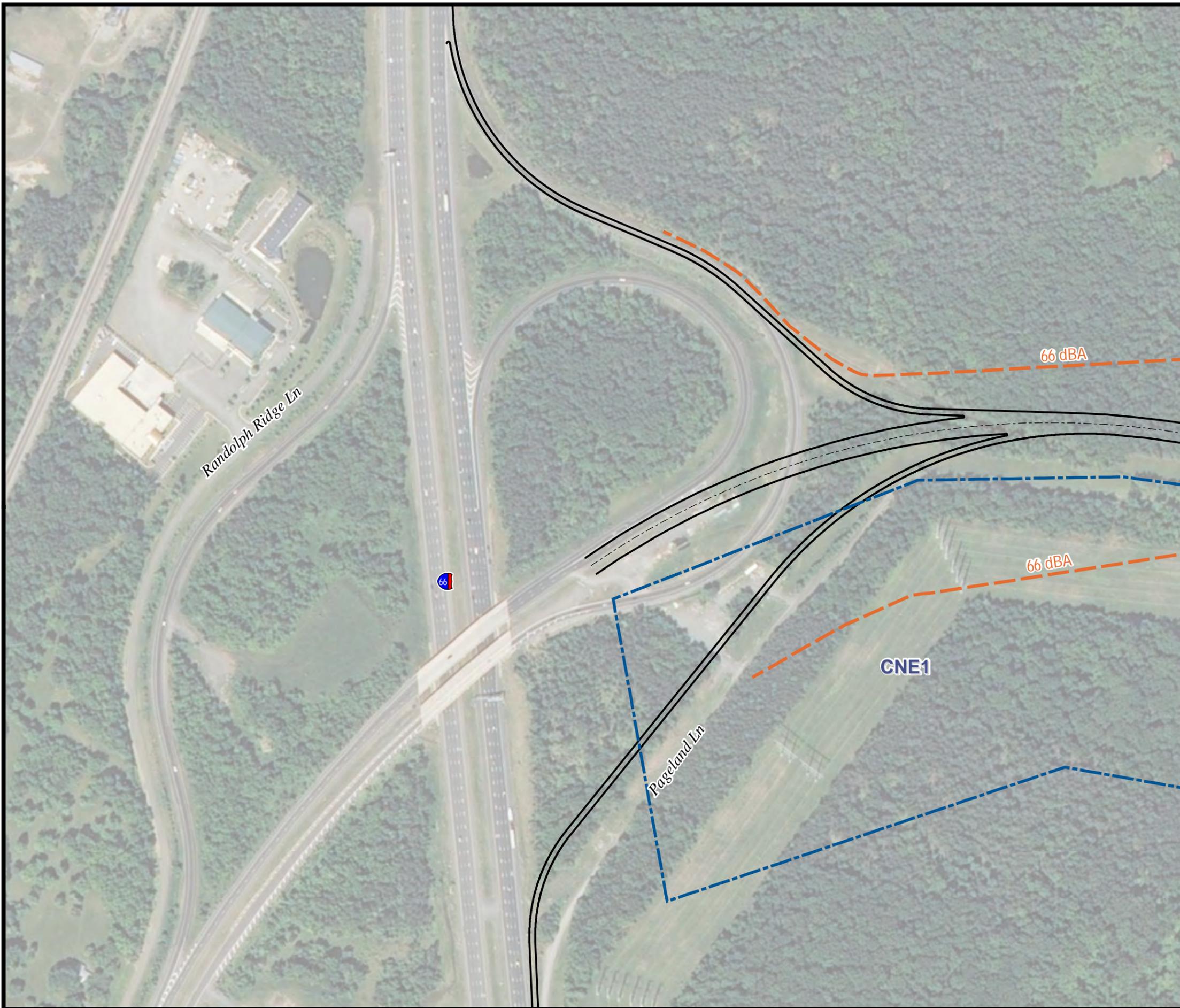
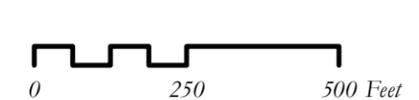
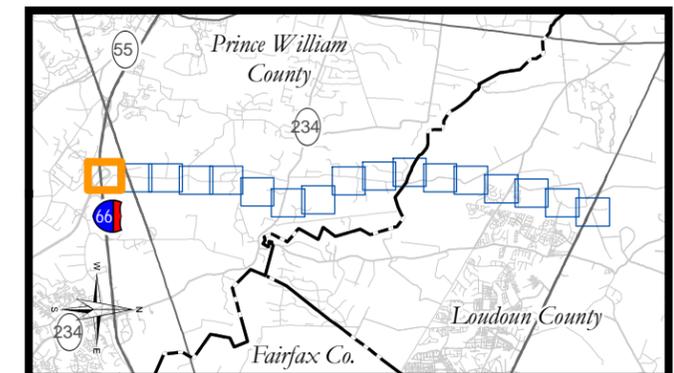


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

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Project No. R000-96A-102, PE-101; UPC No. 52405
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ST# Short-Term Measurement Site

Potential Barrier

Non-Feasible Barrier

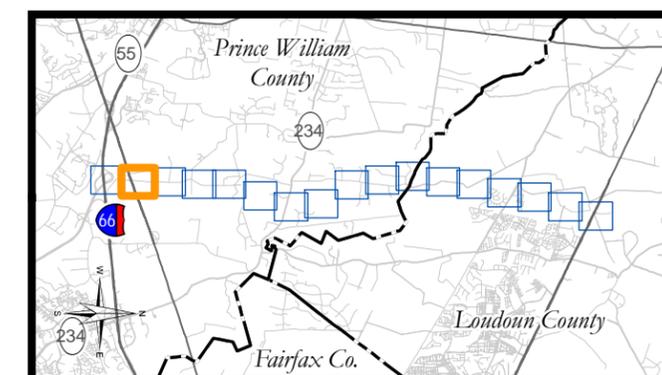
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

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Sheet 2 of 17



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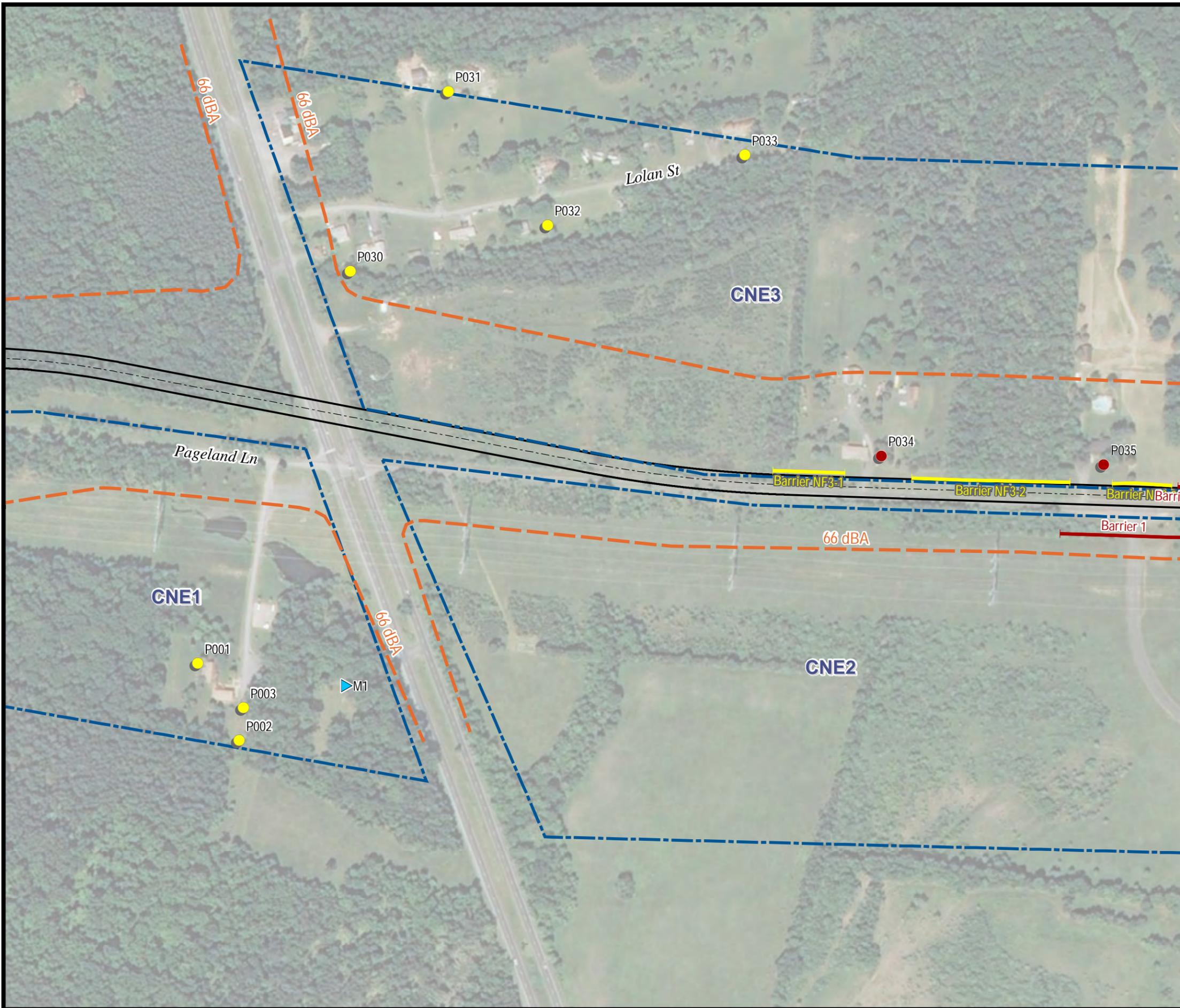


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
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ST# Short-Term Measurement Site

Potential Barrier

Non-Feasible Barrier

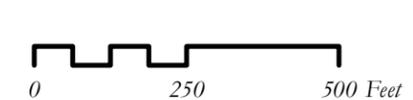
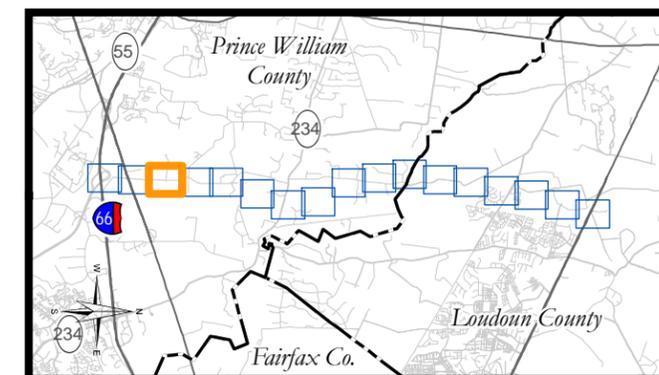
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

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Sheet 3 of 17



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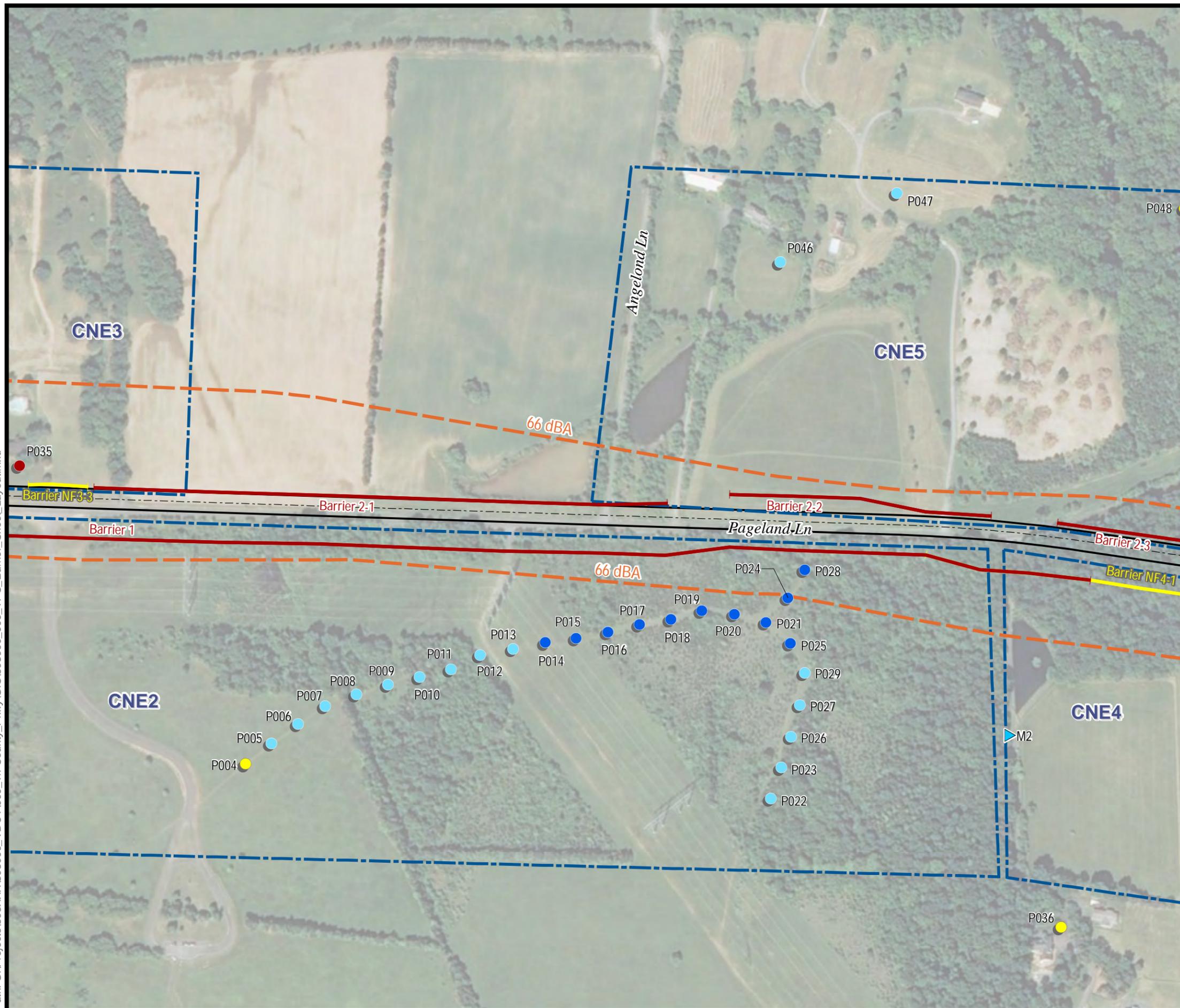


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

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June 2013

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- Potential Acquisitions

▲ ST# Short-Term Measurement Site

~ Potential Barrier

~ Non-Feasible Barrier

- - - 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

- - - Common Noise Environment (CNE) Areas

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Sheet 4 of 17

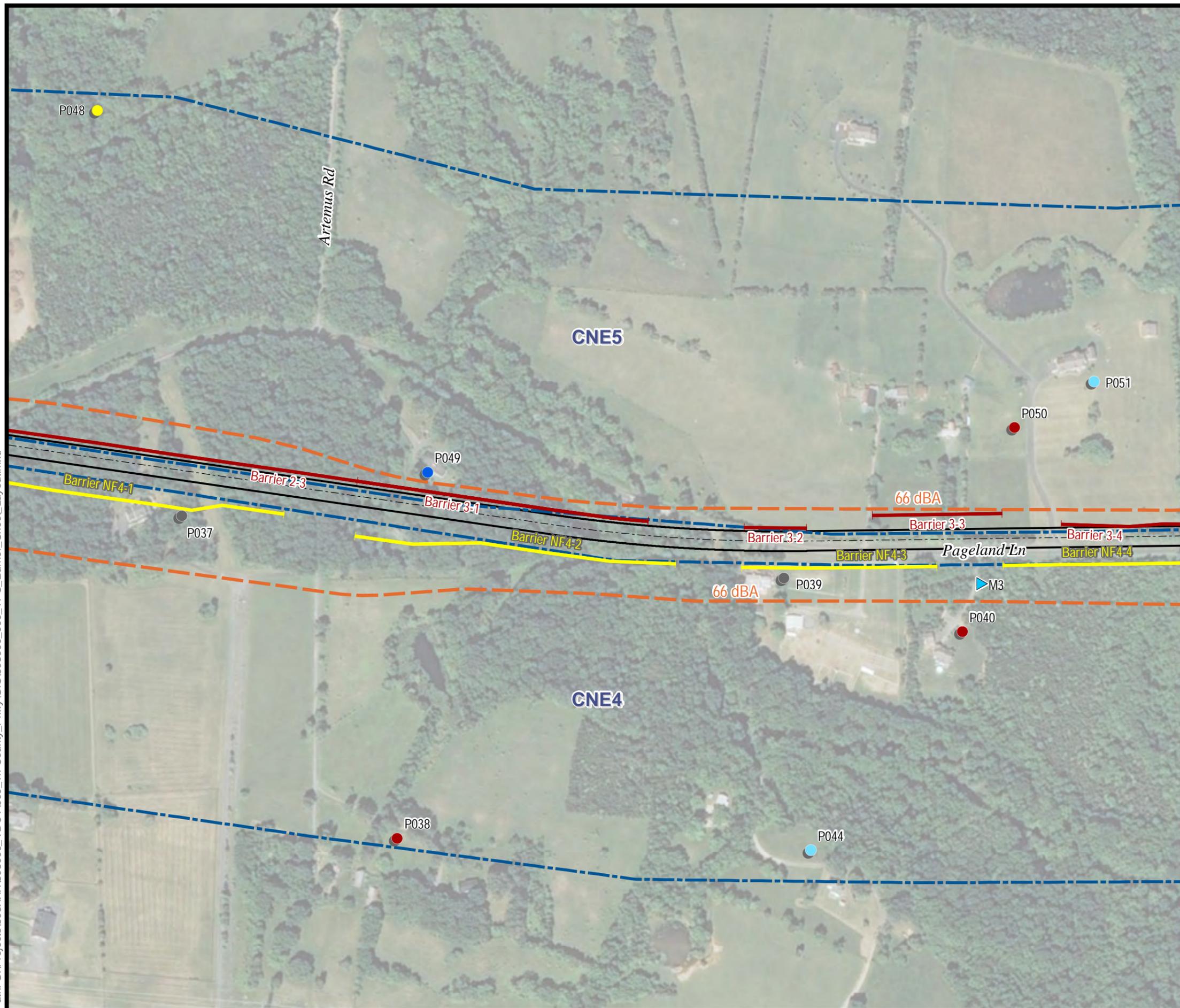
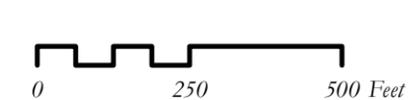
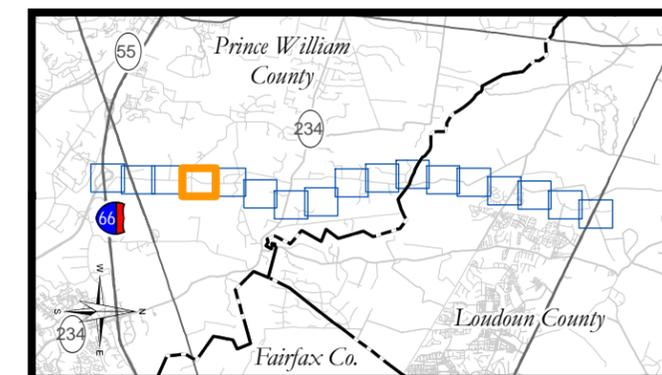


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
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June 2013

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ST# Short-Term Measurement Site

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Non-Feasible Barrier

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Common Noise Environment (CNE) Areas

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Sheet 5 of 17

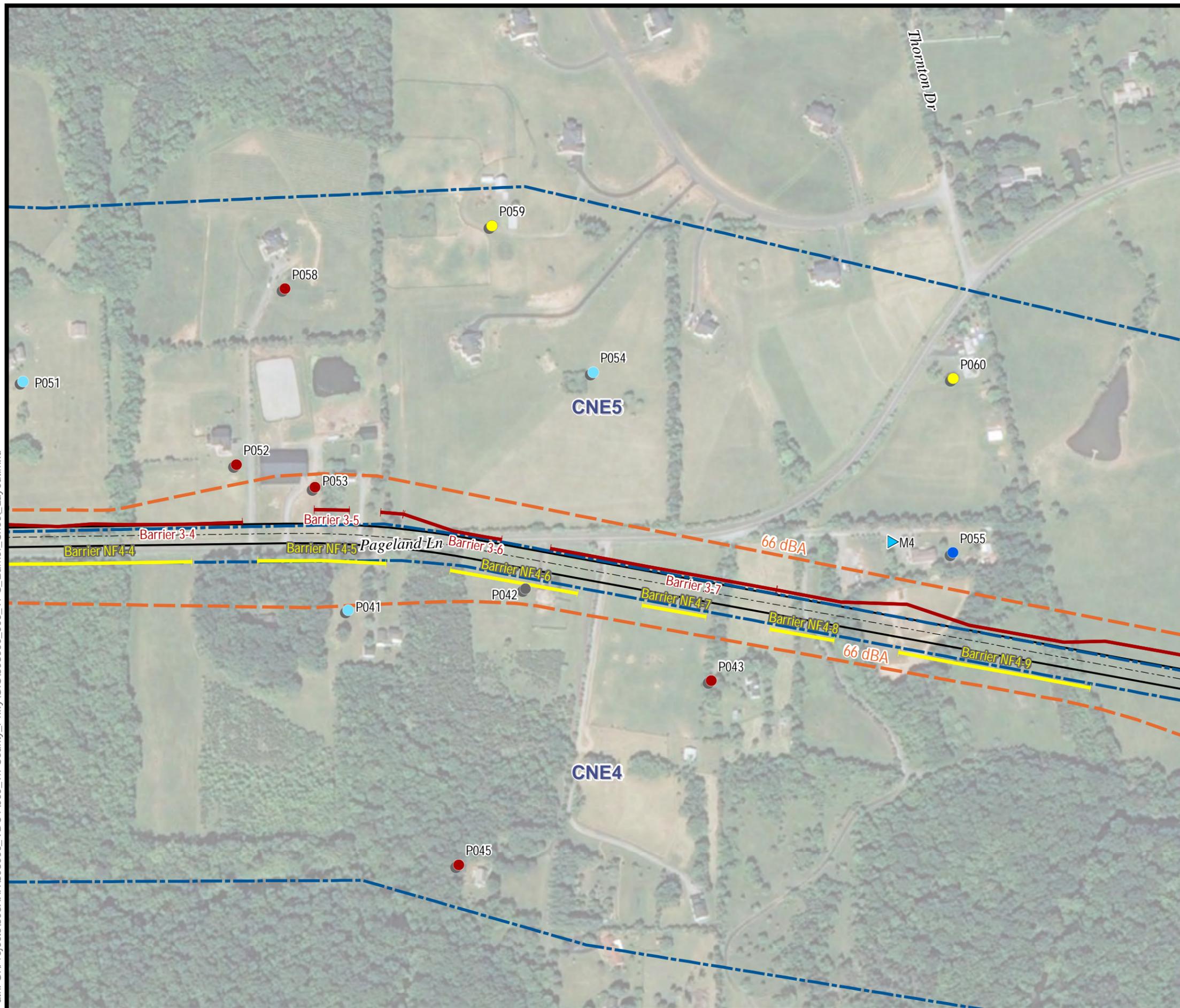
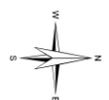
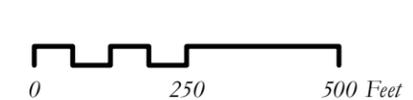
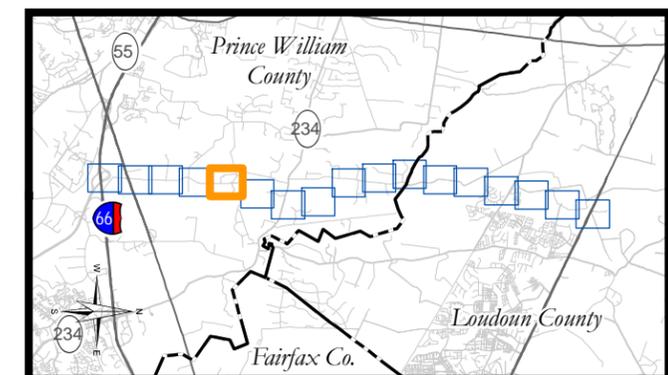


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
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June 2013

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ST# Short-Term Measurement Site

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Non-Feasible Barrier

66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

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Sheet 6 of 17

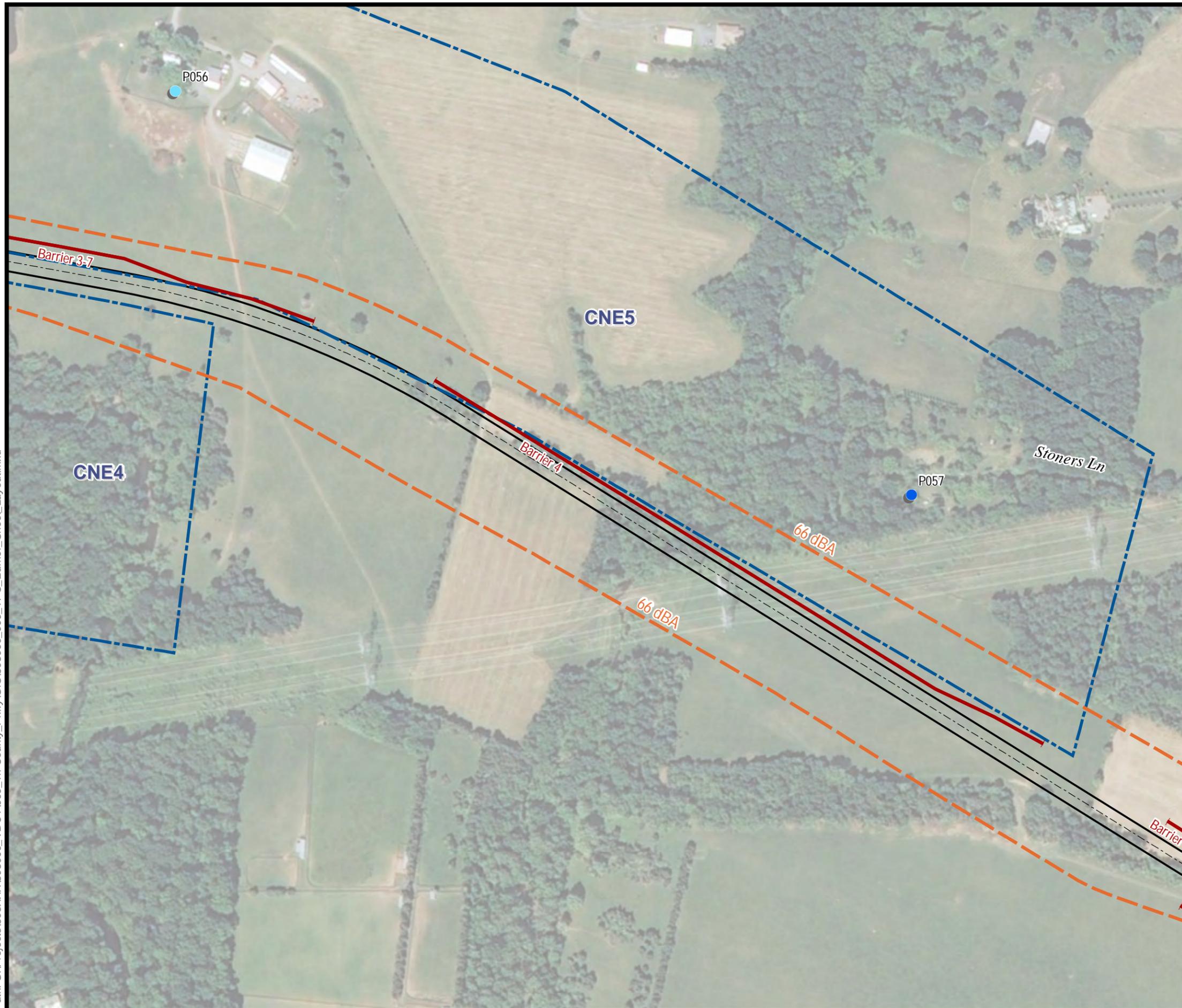
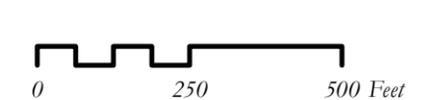
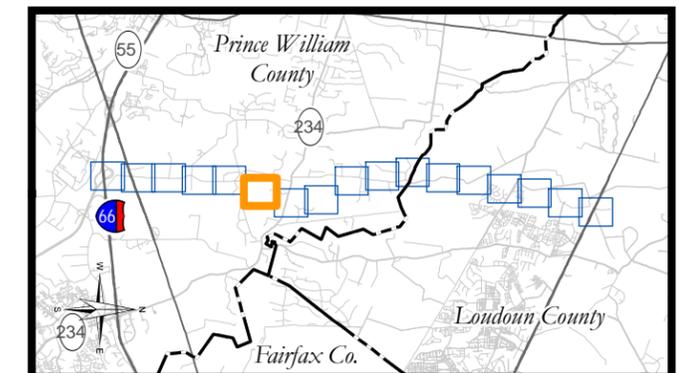


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

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Potential Barrier

Non-Feasible Barrier

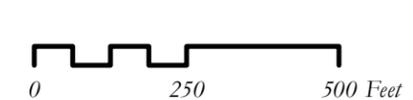
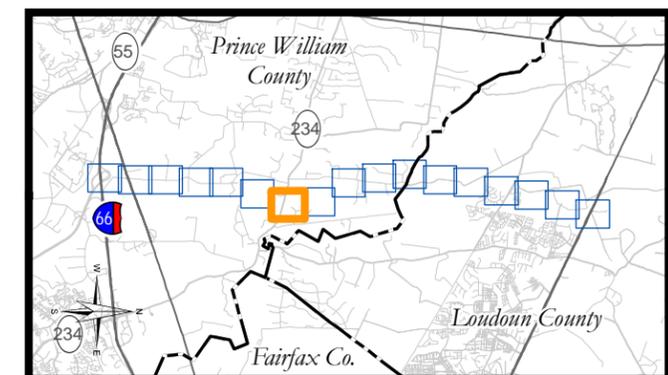
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

Note:

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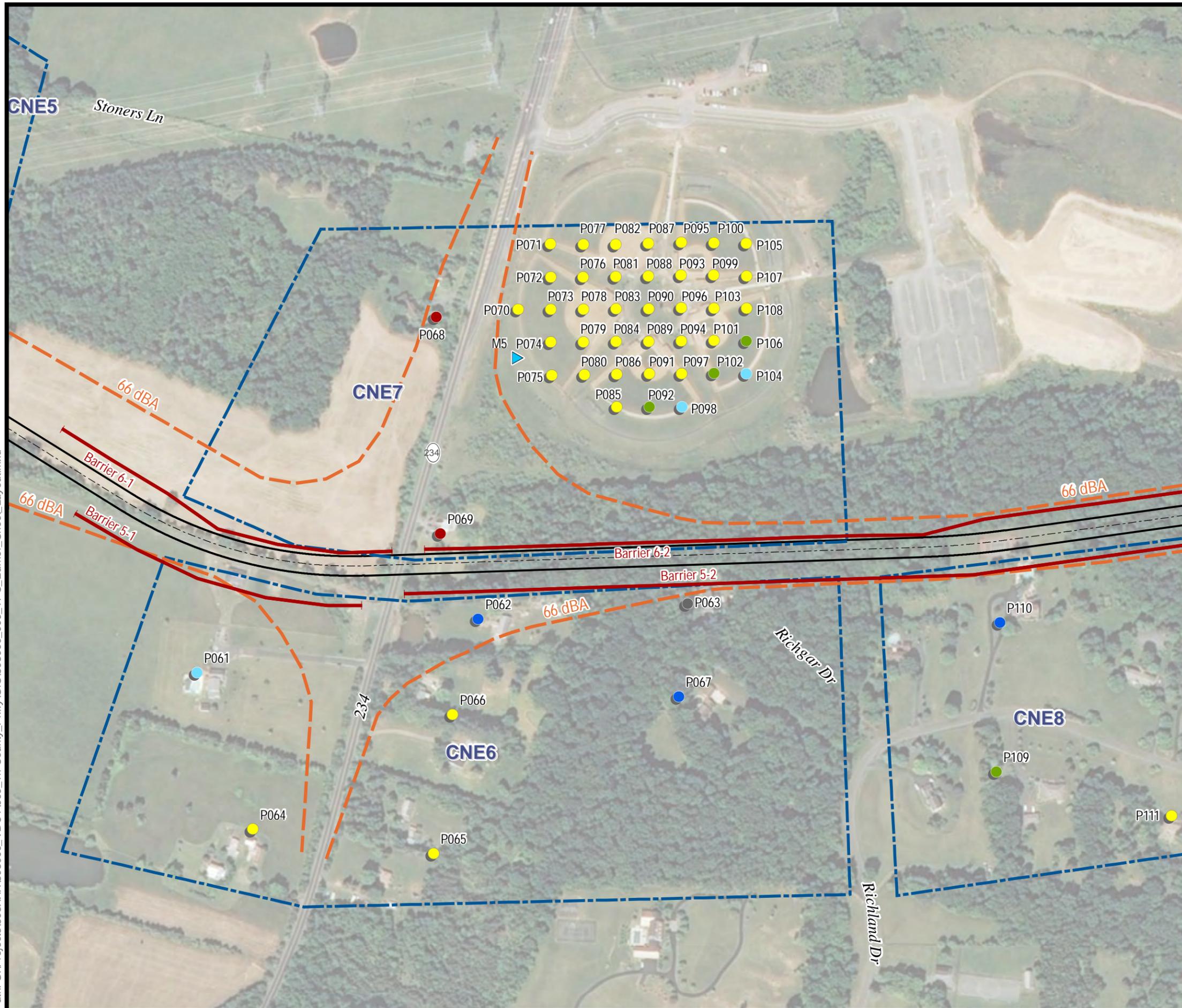


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
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▲ ST# Short-Term Measurement Site

↗ Potential Barrier

↗ Non-Feasible Barrier

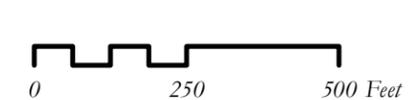
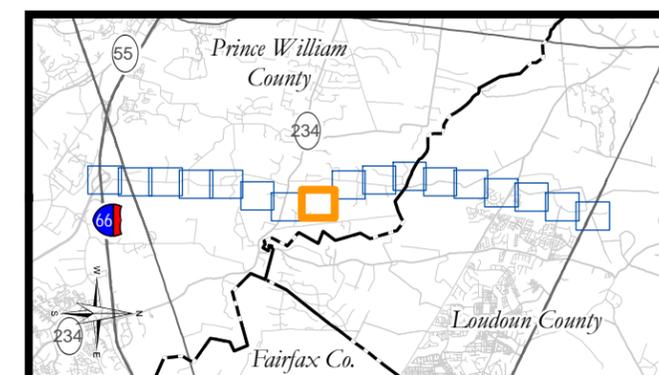
--- 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

--- Common Noise Environment (CNE) Areas

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Sheet 8 of 17



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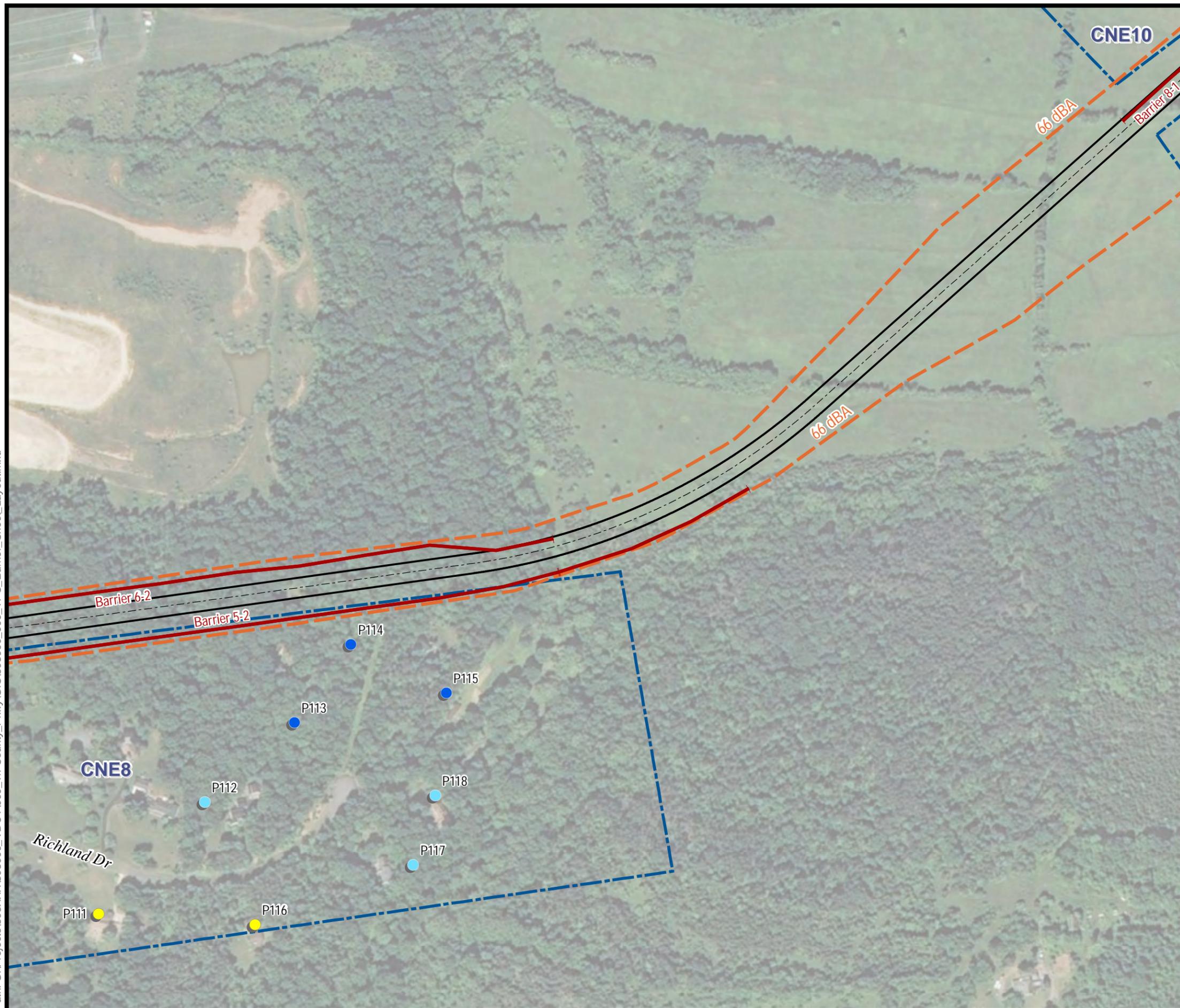


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
HMMH Report No. 305000.009
June 2013

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ST# Short-Term Measurement Site

Potential Barrier

Non-Feasible Barrier

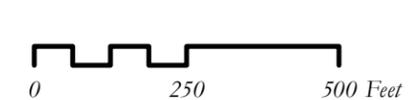
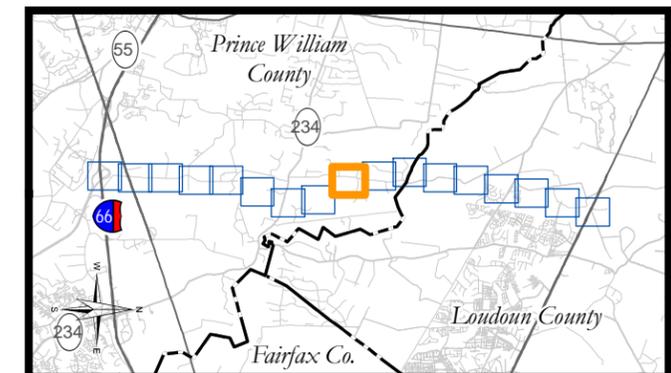
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

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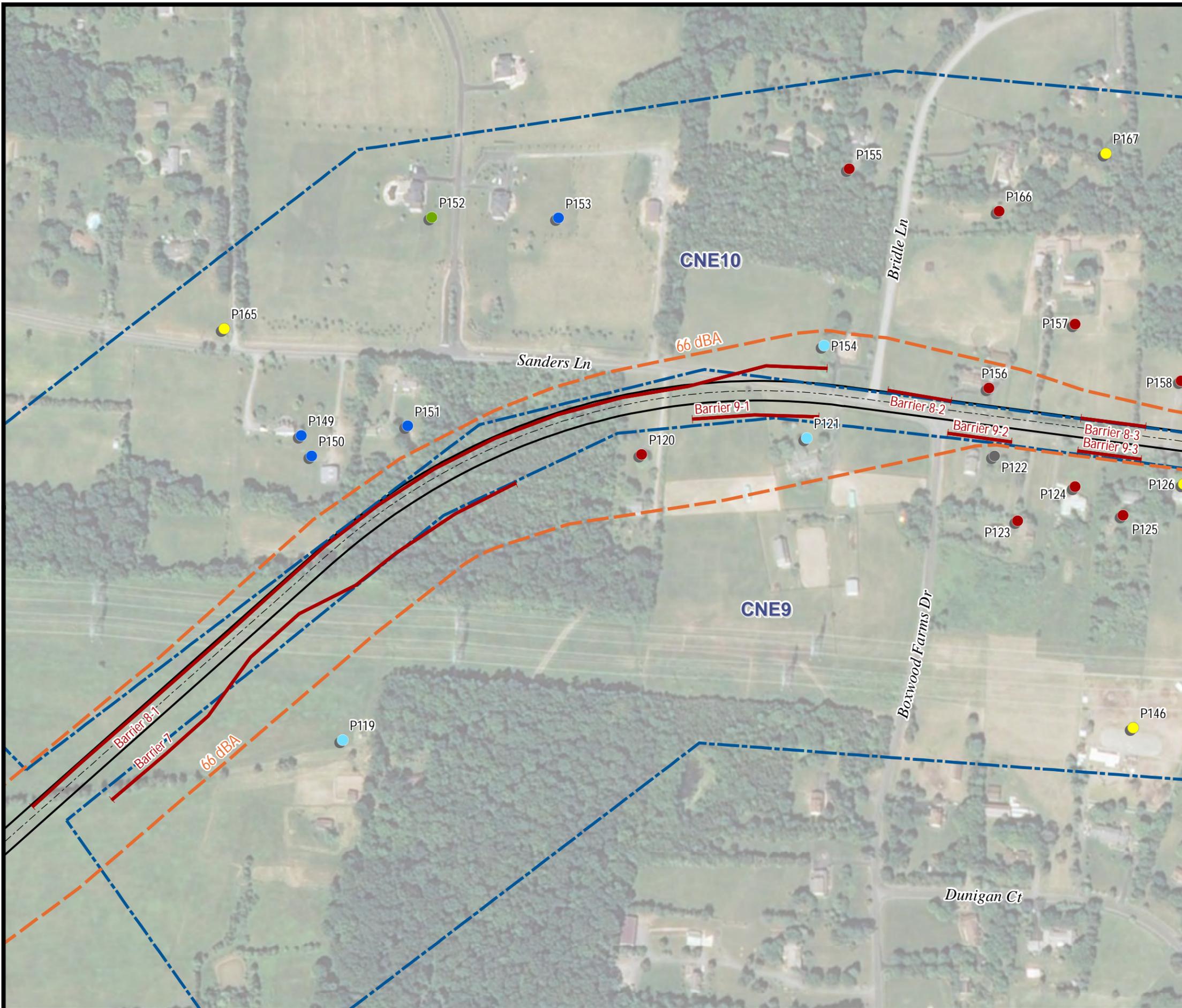


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
HMMH Report No. 305000.009
June 2013

Receiver Site and Number

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▲ ST# Short-Term Measurement Site

~ Potential Barrier

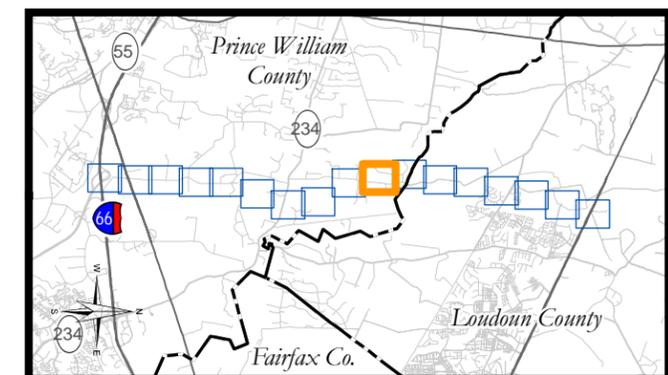
~ Non-Feasible Barrier

--- 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

--- Common Noise Environment (CNE) Areas

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Grouped Receiver Labels are Ordered Left to Right, Top to Bottom

Sheet 10 of 17



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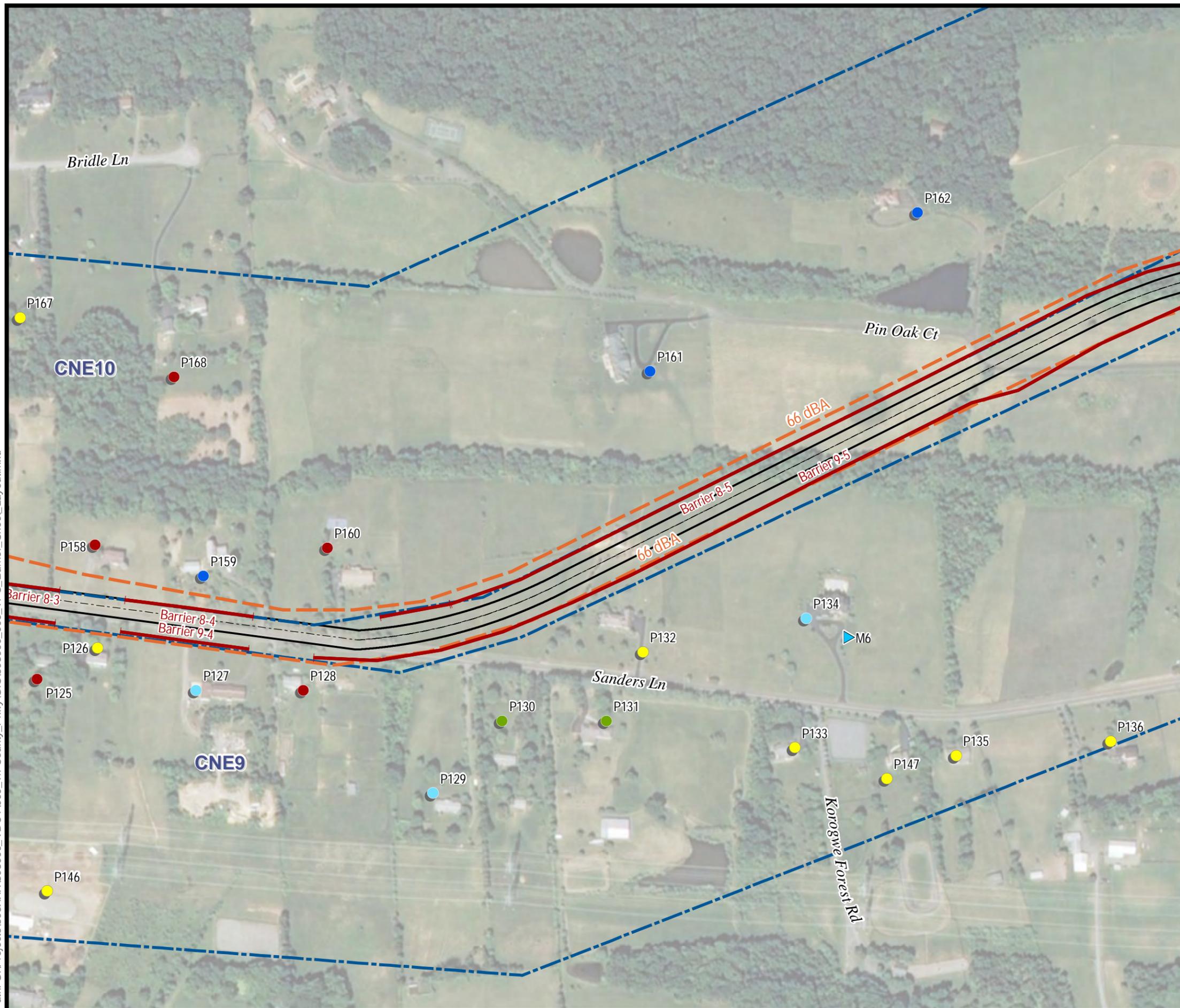


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
HMMH Report No. 305000.009
June 2013

Receiver Site and Number

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

ST# Short-Term Measurement Site

Potential Barrier

Non-Feasible Barrier

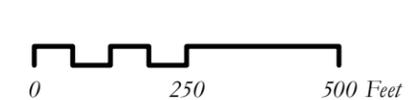
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

Note:

Grouped Receiver Labels are Ordered Left to Right, Top to Bottom

Sheet 11 of 17



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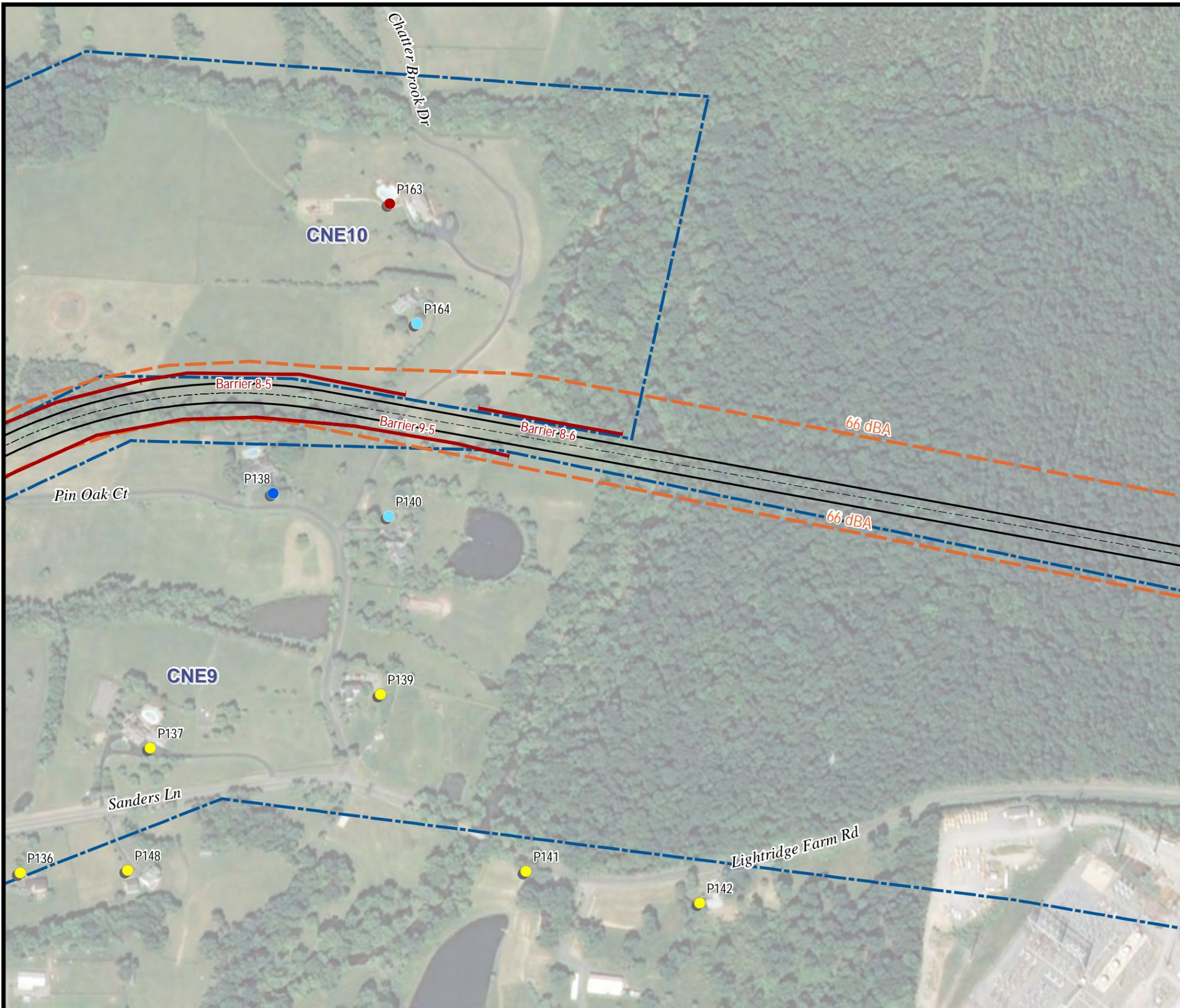


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

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Non-Feasible Barrier

66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

Note:

Grouped Receiver Labels are Ordered Left to Right, Top to Bottom

Sheet 12 of 17

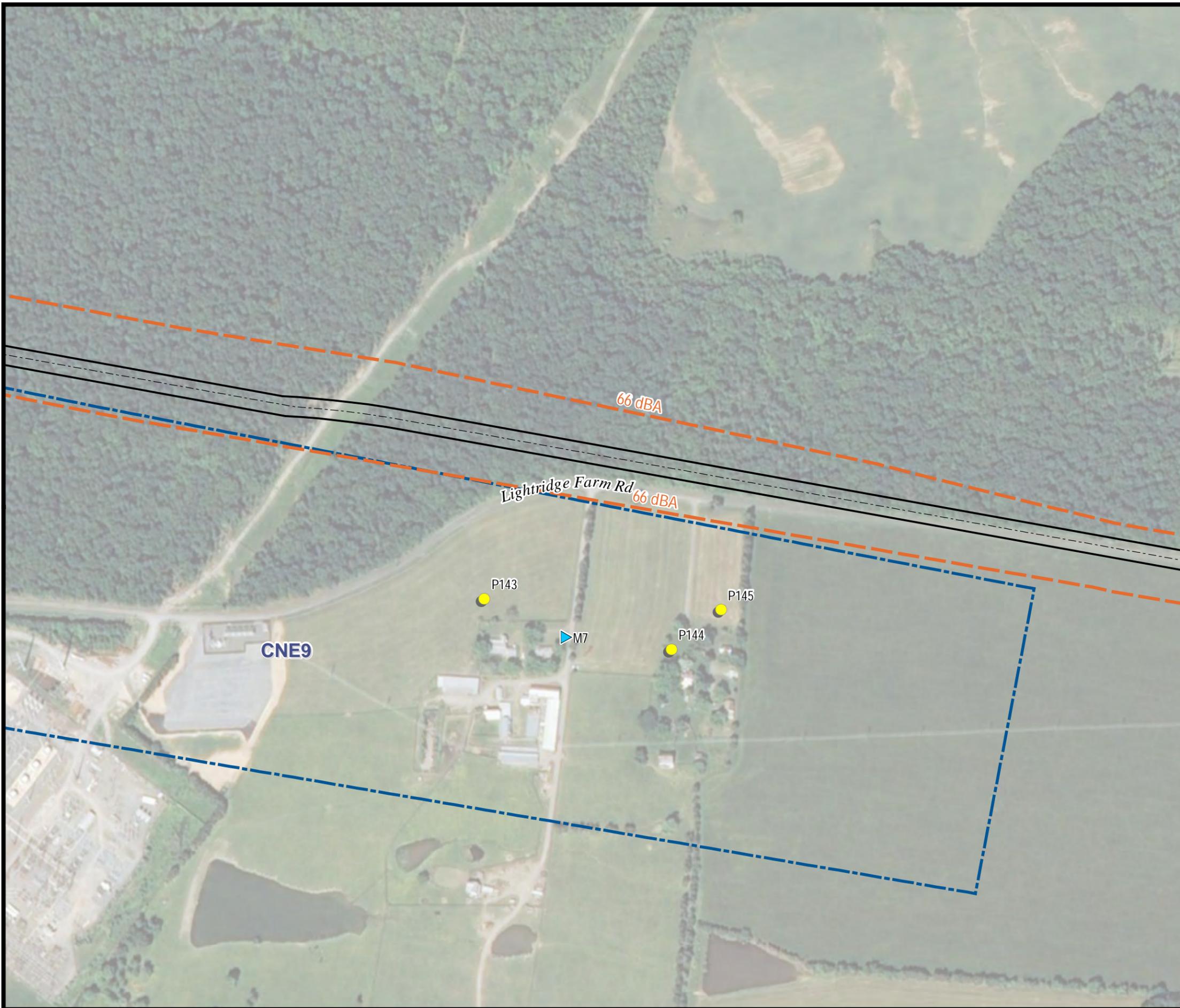
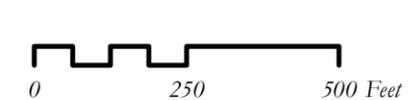
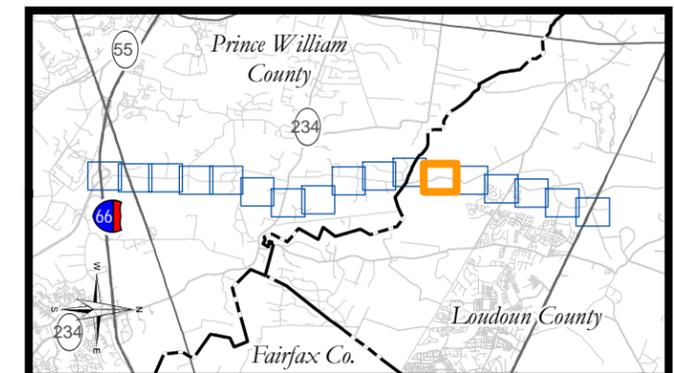


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

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▲ ST# Short-Term Measurement Site

~ Potential Barrier

~ Non-Feasible Barrier

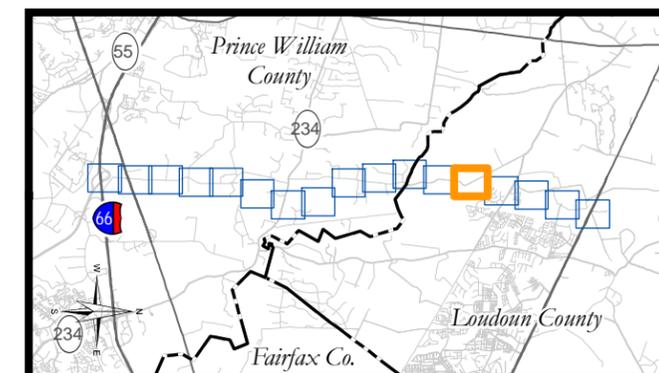
- - - 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

- - - Common Noise Environment (CNE) Areas

Note:

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Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
HMMH Report No. 305000.009
June 2013

Receiver Site and Number

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▲ ST# Short-Term Measurement Site

~ Potential Barrier

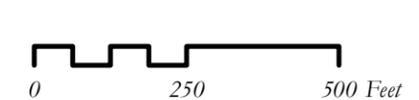
~ Non-Feasible Barrier

--- 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

--- Common Noise Environment (CNE) Areas

Note:
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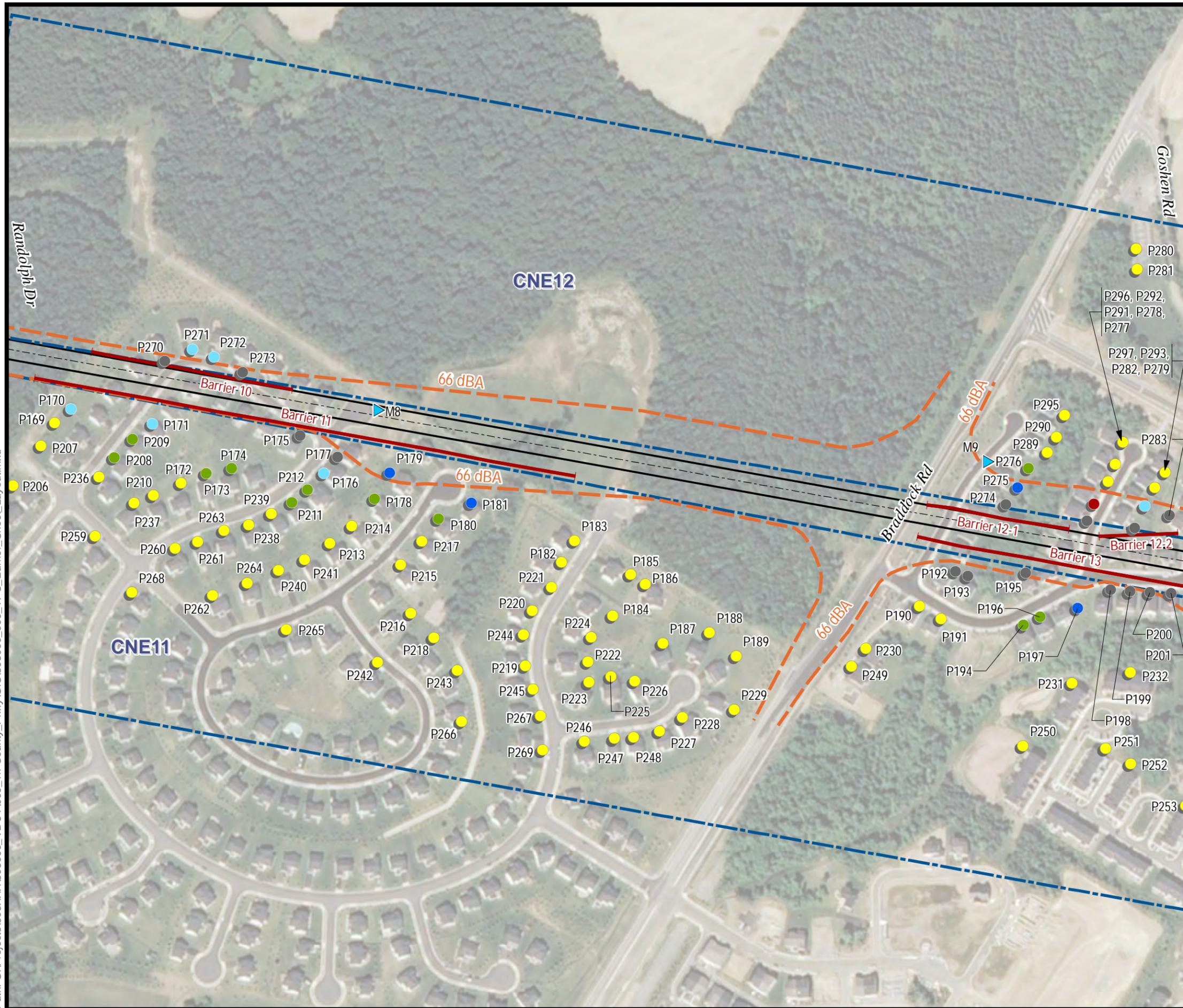


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

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▲ ST# Short-Term Measurement Site

~ Potential Barrier

~ Non-Feasible Barrier

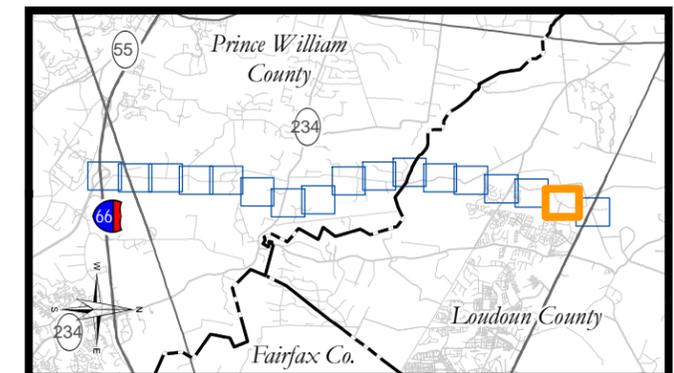
- - - 66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

- - - Common Noise Environment (CNE) Areas

Note:

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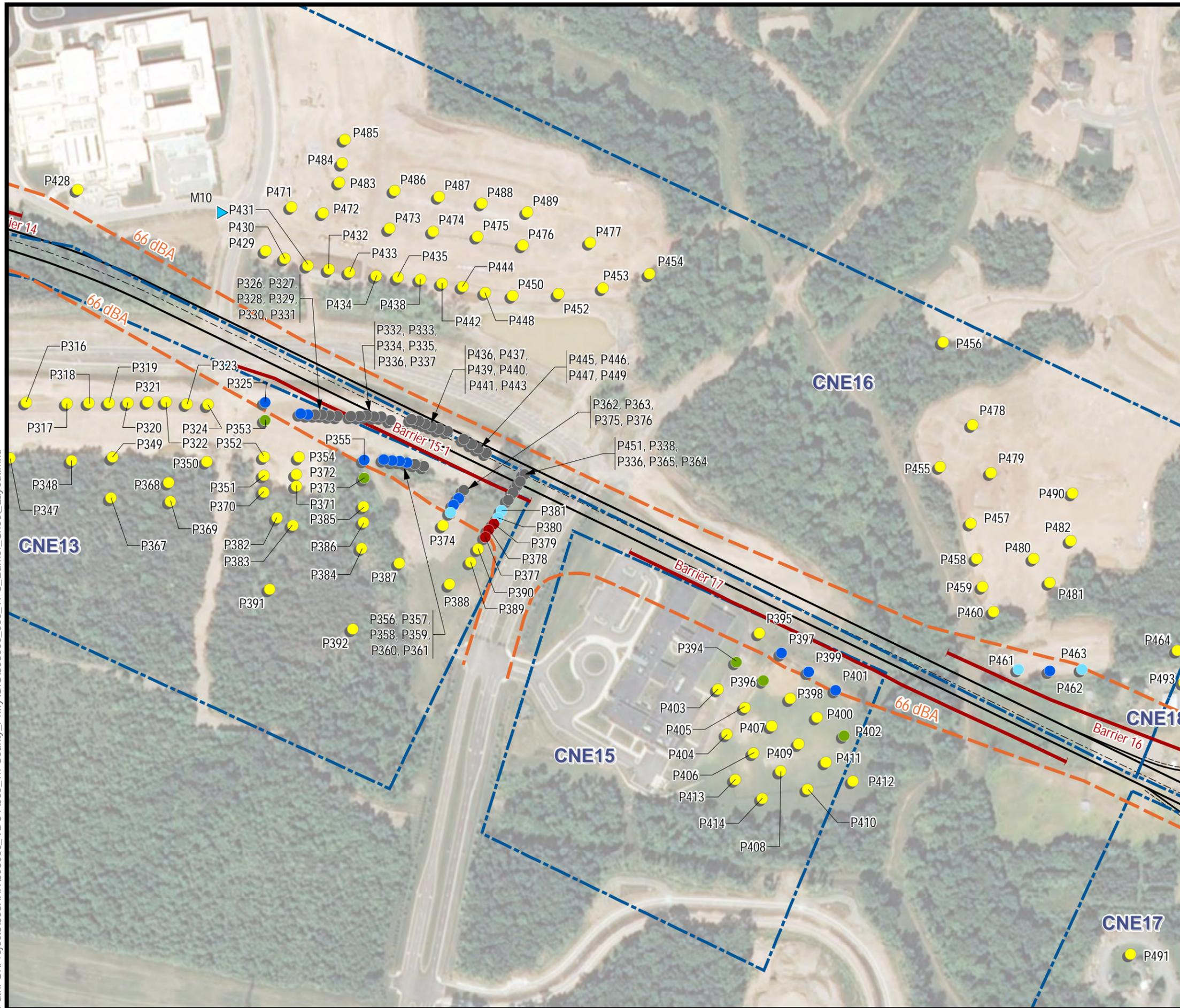


Figure 2 Bi-County Parkway Reevaluation

Prince William and Loudoun Counties, Virginia

Location Map for Common Noise Environments, Receptors, Contours, and Barriers

Project No. R000-96A-102, PE-101; UPC No. 52405
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June 2013

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ST# Short-Term Measurement Site

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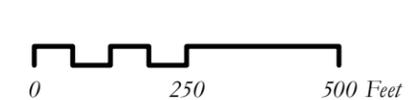
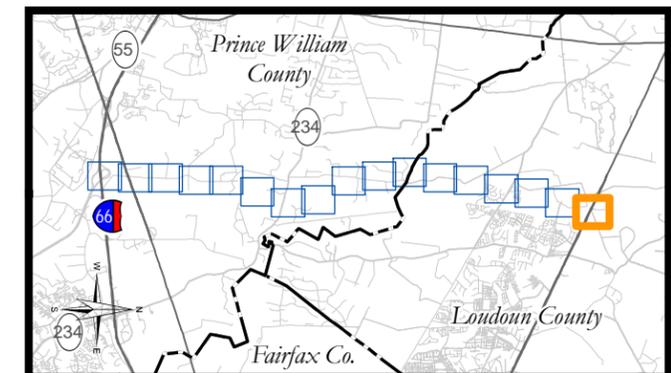
66 dBA Leq Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas

Common Noise Environment (CNE) Areas

Note:

Grouped Receiver Labels are Ordered Left to Right, Top to Bottom

Sheet 17 of 17



5 NOISE IMPACT ASSESSMENT

The potential noise impact of the Bi-County Parkway project was assessed according to FHWA and VDOT noise assessment guidelines, described in detail in Section 2. In summary, noise impact would occur wherever Project 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 Categories E during the loudest hour of the day. Noise impact also would occur wherever Project noise levels cause a substantial increase over existing noise levels—an increase of 10 dB or more is considered substantial by VDOT.

Figure 2, 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 2 also includes a noise impact contour for the Build Alternative without abatement in the residential and recreational areas (at the applicable Categories B and C NAC of 67 dBA, which is represented by 66 dBA L_{eq} for ground floor receptors).

Table 6 presents a summary of the projected noise impact for the 2013 Existing and 2040 No Build and Build alternatives. The impacts are summarized for the entire study area and separated by NAC activity categories and type of impact. For each NAC, noise impact is first given as residential or recreational units that approach or exceed the NAC. This is the only type of impact that occurs for the Existing and No Build alternatives. For the Build alternatives, NAC impact is listed first, followed by substantial increase impact, followed by impact by both NAC and substantial increase, followed by the total noise impact count.

Table 6 Noise Impact Summary

Alternative	Impact Type	Land Use and NAC Activity Category				Total
		Residential B	Recreational C	Interior D	Commercial E	
Existing	NAC/Total	1	0	0	0	1
No Build	NAC/Total	4	0	0	0	4
	NAC Only	5	1	0	0	6
Build	Subs. Increase Only	66	26	0	0	92
	Both*	40	5	0	0	45
	Total	111	32	0	0	143

*Both indicates all receptors where both NAC and Substantial Increase impact is predicted.

Residential land use is the only category where there are impacts under all alternatives, including the Existing and No Build alternatives. No Category D or E impacts are predicted under any alternative. Total noise impact under the Existing Alternative is one residence, and under the 2040 No Build Alternative, four residential units would be impacted. The reason impacts are as low under the Existing and No Build alternatives is that there are few major noise sources in the study corridor currently, except the major intersecting roadways. The Build alternative would impact a total of 143 receptors, 111 of which are residential, and 32 of which are recreational. The NAC would be exceeded at 45 of the residential receptors, and 40 of those would also experience a substantial increase in existing noise levels. Sixty-six additional residences would experience noise impact only due to substantial increases. Of the 32 impacted recreational areas, sound levels would approach or

exceed the NAC at six receptors, and 31 would be exposed to substantial increases in existing noise levels.

Table 7 lists the noise impacts by Common Noise Environment. Residential impact is scattered along the project corridor, some in sparsely-settled areas, and some in existing and proposed residential subdivisions. The permitted subdivisions include Stratshire Crossing and Kirkpatrick Farms in CNEs 11 and 12, and Stone Ridge and Westridge Townhomes in CNE 13. There are no recreational

Table 7 Noise Impact by Common Noise Environment

CNE	Area Description	Dwelling or Recreational Units Impacted by Noise		
		Existing	NB	Build
1	Manassas National Battlefield Park and undeveloped land south of Lee Highway and east of the BCP	0	0	0
2	Manassas National Battlefield Park north of Lee Highway and east of the BCP	0	0	25
3	Single-family residences north of Lee Highway and west of the BCP	0	0	3
4	Single-family residences along Pageland Lane and east of the BCP	0	0	11
5	Single-family residences along Pageland Lane and west of the BCP	0	0	15
6	Single-family residences in the vicinity of Sudley Road and east of the BCP	0	0	3
7	Single-family residences and Catharpin Park in the vicinity of Sudley Road and west of the BCP	0	2	4
8	Single-family residences north of the Sudley Road area and east of the BCP	0	0	11
9	Single-family residences along Sanders Lane/Lightridge Farm Road and east of the BCP	0	0	12
10	Single-family residences along Sanders Lane and west of the BCP	0	1	17
11	Single-family and multi-family residences in Stratshire Crossing and Kirkpatrick Farms subdivisions under construction and in the vicinity of Braddock Road and east of the BCP	0	0	8
12	Single-family and residences in Stratshire Crossing and Kirkpatrick Farms subdivisions under construction and in the vicinity of Braddock Road and west of the BCP	0	0	7
13	Future permitted residences Stone Ridge and Westridge Townhomes east of Northstar Boulevard	0	0	19
14	Single-family residence in wooded area west of Northstar Boulevard	0	0	0
15	Arcola Elementary School recreation areas east of Northstar Boulevard	0	0	3
16	John Champe High School recreation areas and future Single-family residences west of Northstar Boulevard	0	0	5
17	Single-family residences in the vicinity of Route 50 and east of the BCP	1	0	0
18	Single-family residences in the vicinity of Route 50 and west of the BCP	0	1	0
Totals		1	4	143

impacts and very few residential impacts under the Existing and No Build alternatives. Most of the Build case recreational impact occurs in CNE 2, along a Manassas Battlefield Trail located north of Rt. 29, just east of the Build alignment. Noise impact is projected at a total of 25 receptor units, which are spaced 100 feet apart along trail. Two receptors in CNE 7, the Catharpin Park fields, are projected to be impacted. Impact is predicted at three recreational receptors each in the playing fields of Arcola Elementary School (CNE 15) and John Champe High School (CNE 16).

6 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.

6.1 Alternative Noise Abatement Measures

Traffic management measures normally considered for noise abatement include reduced speeds and truck restrictions. Reduced speeds would not be an effective noise mitigation measure since a substantial decrease in speed is necessary to provide a significant noise reduction. A 10 mph reduction in speed would result in only a two decibel decrease in noise level. Restricting truck usage on the Bi-County Parkway itself along the entire corridor is not practical since providing a more direct route for vehicles to and from I-66 and Route 50 and improve traffic flow in the area are primary reasons for constructing the project. Diversion of truck traffic to other roadways would increase noise levels in nearby residential areas. A significant alteration of the horizontal alignment of BCP for this project would be necessary to make such a measure effective in reducing noise and would create undesirable impacts such as right-of-way acquisitions, easements, and retaining walls. Altering the vertical alignment significantly would not be feasible since the project design attempts to minimize the excavation into the hilly terrain and provide the safest vertical slopes possible to intersect with existing cross-streets.

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) states: *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 will be given to these measures during the final design stage, where feasible. Particular attention will be given to areas of Manassas National Battlefield Park as a part of the Section 106 Programmatic Agreement. The response from project management is included Appendix E.

6.2 Noise Barriers

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

To be constructed, any noise barriers identified in this document must satisfy final feasibility and cost reasonableness criteria. Therefore, the noise barrier design parameters and cost identified in this document are preliminary and should not be considered final. Final design parameters, feasibility, and cost reasonableness cannot be determined, as the noise barrier cost estimate must be based upon an approved road design alignment and include all required materials and installation costs. If a noise

barrier is determined to be feasible and reasonable, the affected public will be given an opportunity to decide whether they are in favor of construction of the noise barrier.

6.2.1 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, that is it must reduce noise levels at noise sensitive locations by at least 5 decibels, thereby “benefiting” the property. VDOT requires that at least fifty percent (50%) of the impacted receptors receive 5 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 that of a 30-ft high barrier, or terrain lifts ground-based receptors above the elevation of a 30-ft barrier, these receptors will not be assessed for barrier benefits and are thereby not included in the prediction of the barrier’s feasibility or reasonableness.

The second reasonableness criterion is VDOT’s noise reduction design goal of 7 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 are surveyed in the final design phase of projects.

6.2.2 Barriers Found Not Feasible

The future Build alternative roadway designs resulted in several impacted areas where mitigation would be warranted and barrier designs were evaluated but were found not feasible based on VDOT criteria. In general, the major factors contributing to barriers being found not feasible are the limitations to barrier length due to driveway or local roadway access.

Narrative descriptions are given below for each of the areas where barriers were investigated but found to be not feasible. Barriers that are not feasible due to driveway and local roadway access limitations are not displayed on the graphics. In addition, Warranted, Feasible and Reasonable Worksheets were prepared for all of the areas where quantitative barrier analysis was conducted. Those worksheets are provided in Appendix F.

Three residential dwelling units in CNE 3, represented by sites P034 and P035, would be impacted approximately 65 feet from the Bi-County Parkway edge of roadway. The major contributor to the noise environment in the future Build alternative is the proposed BCP east of the receptors. Barrier system NF-3 was evaluated for this area but found to be not feasible due to gaps required in the

barrier to allow for driveway access to the BCP. The barrier could not provide the necessary minimum 5-decibel reduction at any impacted receptors.

Eleven residential dwelling units in CNE 4, represented by sites P038, P040, P041 and P043-P045, would be impacted along the east side of the proposed BCP from approximately 150 feet to 950 feet from the edge of roadway. The major contributor to the noise environment in the future Build alternative is the proposed BCP west of the receptors. Barrier system NF-4 was evaluated for this area but found to be not feasible due to gaps required in the barrier to allow for driveway access to the BCP. The barrier could not provide the necessary minimum 5-decibel reduction at 50% of the impacted receptors in the area as required by VDOT.

6.2.3 Details of Potential Feasible Barriers

Details of each of the evaluated barriers are given in Table 8 and described in narratives following the table. Each of the barriers is also shown in Figure 2 as a solid red line along the roadway, and is labeled with a barrier number. One of the seventeen barriers that were determined to be feasible was also found to be cost reasonable, Barrier 15 in CNEs 13 and 15. All barriers are discussed in the paragraphs below and their characteristics are shown in Table 8 and in Figure 2. Appendix F presents the preliminary Warranted, Feasible and Reasonable Worksheets for all barriers.

The potential barriers evaluated and shown in the graphics have not been intentionally placed outside of VDOT 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. In some cases, the potential barriers shown on the graphic indicate designs with significant length that do not meet reasonableness criteria in order to make clear that the situation cannot yield a reasonable barrier but still provide the most insertion loss for impacted receptors.

Note that several of the barriers discussed below represent barrier systems with many separate segments. Ideally, these barrier systems would have been evaluated as a continuous barrier in order to benefit impacted receptors set well back from the proposed BCP. However, some of the barriers needed to be broken into separate segments with gaps to accommodate driveway or other access that would have to be maintained between private property and the BCP. Judgment was used to determine the locations of the gaps in the barriers, since detailed engineering guidance was unavailable at the time of study. The acoustical analysis of such barrier systems found that many of these barrier systems would be feasible even with the gaps, and the entire system would be needed to benefit the more distant receptors. All of these barriers and systems would be reexamined during the final design phase of the project, and would be evaluated as both barrier systems and individual barriers to determine if both the feasibility and reasonableness criteria could be met.

Barrier 1 – Recreational receptors in Manassas National Battlefield Park (CNE 2)

Barrier 1 is designed to benefit the impacted trail in Manassas National Battlefield Park (MNBP) on the east side of the proposed BCP. A barrier height of 20 feet would be necessary to provide benefit and meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

Barrier 1 would benefit 100% of the impacted recreational receptors in CNE 2, therefore the barrier is considered feasible. Eleven of these impacted and benefited sites would meet VDOT's noise reduction goal of 7 decibels or more. A total of 25 impacted and benefited recreational receptors are predicted with this design. The barrier would provide 5 to 15 decibels of noise reduction to the benefited receptors. Barrier 1 would be 3,436 feet long along the BCP northbound north of Lee

Table 8 Potential Noise Barriers

Barrier No.	CNE	Barrier Data					Benefited Dwellings & Recreational Receptors Total (Impacted)	Surface Area of Barrier per Benefited Receptor (SF/BR)
		Noise Reduction Range (dBA)	Length (ft)	Height Range (ft)	Surface Area (sq ft)	Cost at \$48.00/sf		
1	2, 4	5-15	3,436	20	68,665	\$3,295,920	25 (25)	2,747
2	5	5-6	4,678	30	140,300	\$6,734,400	2 (2)	70,150
3	5	5-11	5,498	30	164,941	\$7,917,168	5 (5)	32,988
4	5	7	2,173	20	43,460	\$2,086,080	2 (2)	21,730
5	6, 8	5-15	5,371	20	107,400	\$5,155,200	16 (14)	6,713
6	7	5	4,826	25	120,608	\$5,789,184	5 (2)	24,122
7	9	6	1,593	30	47,778	\$2,293,344	1 (1)	47,778
8	10	5-11	7,796	25	194,845	\$9,352,560	10 (9)	19,485
9	9	5-8	5,388	20	107,753	\$5,172,144	8 (6)	13,469
10	12	5-6	629	15	9,424	\$452,352	2 (2)	4,712
11	11	5-9	1,689	15	25,318	\$1,215,264	13 (5)	1,948
12	12	5-9	1,110	15	16,640	\$798,720	4 (3)	4,160
13	11	5-13	1,497	15	22,468	\$1,078,464	5 (3)	4,494
14	16	6-10	618	20	9,263	\$444,624	2 (2)	4,632
15	13	5-12	1,004	20	20,079,	\$963,792	21 (16)	956
16	16	5-7	834	15	12,515	\$600,720	3 (3)	4,172
17	15	5-11	1,489	20	29,768	\$1,428,864	6 (3)	4,961

Highway, with a uniform height of 20 feet. The total area of the barrier would be 68,665 sq. ft., and it would cost a total of \$3,295,920 based on a unit cost of \$48.00 per square foot. Barrier 1 would not be reasonable as it would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 2,747. Although the barrier is not reasonable (and was not desired by the NPS and preservation groups), a commitment to consider other measures to minimize noise impacts to the MNBP during the design process is included in the Section 106 programmatic agreement being developed for the project.

Barrier 2 – Single-family residences off Angel Rod Road (CNE 5)

The Barrier 2 system, comprised of three barriers, is designed to benefit the two impacted homes, P046 and P047, on the west side of the proposed BCP across from Manassas National Battlefield Park on Angel Rod Road. A barrier height of 30 feet was evaluated but found to be not reasonable as it would not provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 2 system would benefit both impacted residential dwelling units, therefore the system is considered feasible. The barriers would provide 5 to 6 decibels of noise reduction to the benefited receptors. The Barrier 2 system would be a total 4,678 feet long along BCP southbound, with a uniform height of 30 feet. The total area of the barriers would be 140,300 sq. ft., and they would cost a total of \$6,734,400 based on a unit cost of \$48.00 per square foot. The Barrier 2 system would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 70,150.

Barrier 3 – Single-family residence west of Pageland Lane (CNE 5)

The Barrier 3 system, comprised of seven barriers, is designed to benefit all but two of the remaining impacted homes west of the proposed BCP in CNE 5. A uniform height of 30 feet would provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 3 system would benefit 50% of the impacted residential dwelling units behind it in CNE 5, therefore the system is considered feasible. Two impacted and benefited sites would meet VDOT's noise reduction goal of 7 decibels or more. A total of 5 impacted and benefited residences are predicted with this design. The barriers would provide 5 to 11 decibels of noise reduction to the benefited receptors. The Barrier 3 system would be a total of 5,498 feet long along BCP southbound, with a uniform height of 30 feet. The total area of the barriers would be 164,941 sq. ft., and they would cost a total of \$7,917,168 based on a unit cost of \$48.00 per square foot. The Barrier 3 system would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 32,988.

Barrier 4 – Single-family residences west of Pageland Lane (CNE 5)

Barrier 4 is designed to benefit the remaining impacted residences, represented by site P057, west of the proposed BCP in CNE 5. A uniform height of 20 feet would provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

Barrier 4 would benefit both impacted residential dwelling units, therefore the barrier is considered feasible. The barrier is predicted to provide approximately 7 decibels of noise reduction to the benefited receptors. Barrier 4 would be 2,173 feet long along BCP southbound, with a uniform height of 20 feet. The total area of the barrier would be 43,460 sq. ft., and it would cost a total of \$2,086,080 based on a unit cost of \$48.00 per square foot. Barrier 4 would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 21,730.

Barrier 5 – Scattered single-family residences north of Sudley Road (CNE 6,8)

The Barrier 5 system, comprised of two barriers, is designed to benefit scattered single-family residences north of Sudley Road, east of the proposed BCP in CNE 6 and 8. A uniform height of 20 feet would benefit the impacted residential receptors, and it would provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 5 system would benefit 100% of the impacted residential dwelling units in CNE 6 and 8, therefore the system is considered feasible. Nine impacted and benefited sites are predicted to meet VDOT's noise reduction goal of 7 decibels or more. A total of 14 impacted and benefited residences and two additional non-impacted residences are predicted to be benefited. The barriers would provide 5 to 15 decibels of noise reduction to the benefited receptors. The Barrier 4 system would be a total of 5,371 feet long along BCP northbound, with a uniform height of 20 feet. The total area of the barriers would be 107,400 sq. ft., and they would cost a total of \$5,155,200 based on a unit cost of \$48.00 per square foot. The barriers were found not to be reasonable as the Barrier 5 system would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 6,713.

Barrier 6 – Scattered single-family residences and Catharpin Park north of Sudley Road (CNE 7)

The Barrier 6 system, comprised of two barriers, is designed to benefit scattered single-family residences and Catharpin Park north of Sudley Road, west of the proposed BCP in CNE 7. A

uniform height of 25 feet would benefit two impacted recreational receptors and three non-impacted recreational receptors. The system was found to be not reasonable as it does not provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 6 system would benefit 67% of the impacted receptors in CNE 7, therefore the system is considered feasible. The barriers are predicted to provide approximately 5 decibels of noise reduction to the benefited receptors. The Barrier 6 system would be a total of 4,826 feet long along BCP southbound, with a uniform height of 25 feet. The total area of the barriers would be 120,608 sq. ft., and they would cost a total of \$5,789,184 based on a unit cost of \$48.00 per square foot. The Barrier 6 system would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 24,122.

Barrier 7 – Single-family residence east of Sanders Lane (CNE 9)

Barrier 7 is designed to benefit a single-family residence, P119, east of the proposed BCP in CNE 9. A uniform height of 30 feet would benefit the impacted receptor, but the barrier was found to be not reasonable as it does not provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

Barrier 7 would benefit the only impacted residence in CNE 9, therefore the barrier is considered feasible. The barrier is predicted to provide approximately 6 decibels of noise reduction to the benefited receptor. Barrier 7 would be 1,593 feet long along BCP northbound, with a uniform height of 30 feet. The total area of the barrier would be 47,778 sq. ft., and it would cost a total of \$2,293,344 based on a unit cost of \$48.00 per square foot. Barrier 7 would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 47,778.

Barrier 8 – Scattered single-family residences west of Sanders Lane (CNE 10)

The Barrier 8 system, comprised of six barriers, is designed to benefit scattered single-family residences west of the proposed BCP in CNE 10. A uniform height of 25 feet is predicted to benefit nine impacted receptors and one non-impacted receptor, and the barriers do provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at five impacted receptors.

The Barrier 8 system would benefit 53% of the impacted receptors in CNE 10, therefore the system is considered feasible. The barriers are predicted to provide 5 to 11 decibels of noise reduction to the benefited receptors. The Barrier 8 system would be a total of 7,796 feet long along BCP southbound, with a uniform height of 25 feet. The total area of the barriers would be 194,845 sq. ft., and they would cost a total of \$9,352,560 based on a unit cost of \$48.00 per square foot. The barriers were found not to be reasonable as they would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 19,485.

Barrier 9 – Scattered single-family residences off Sanders Lane (CNE 9)

The Barrier 9 system, comprised of five barriers, is designed to benefit the remaining scattered single-family residences east of the proposed BCP in CNE 9. A uniform height of 20 feet is predicted to benefit six impacted receptors and two additional non-impacted receptors, and the barriers would provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 9 system would benefit 55% of the impacted receptors in CNE 9, therefore the system is considered feasible. The barriers are predicted to provide 5 to 8 decibels of noise reduction to the benefited receptors. The Barrier 9 system would be a total of 5,388 feet long along BCP northbound, with a uniform height of 25 feet. The total area of the barriers would be 107,753 sq. ft., and they would cost a total of \$5,172,144 based on a unit cost of \$48.00 per square foot. The barriers were found not to be reasonable as the system would be well above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 13,469.

Barrier 10 – Single-family residences in Kirkpatrick Farms (CNE 12)

Barrier 10 is designed to benefit two single-family residences in the Kirkpatrick Farms development west of the proposed BCP in CNE 12. A uniform height of 15 feet would benefit the impacted receptors, but the barrier was found to be not reasonable as it is predicted to not provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

Barrier 10 would benefit 100% of the two impacted receptors in CNE 12, therefore the barrier is considered feasible. The barrier is predicted to provide 5 to 6 decibels of noise reduction to the benefited receptors. Barrier 10 would be 629 feet long along BCP southbound, with a uniform height of 15 feet. The total area of the barrier would be 9,424 sq. ft., and it would cost a total of \$452,352 based on a unit cost of \$48.00 per square foot. The barrier would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,712.

Barrier 11 – Single-family residences in Kirkpatrick Farms (CNE 11)

Barrier 11 is designed to benefit single-family residences in the Kirkpatrick Farms development east of the proposed BCP in CNE 11. A uniform height of 15 feet would benefit the five impacted receptors and eight additional non-impacted residential receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at two impacted receptors.

Barrier 11 would benefit 100% of the impacted receptors in Kirkpatrick Farms in CNE 11, therefore the barrier is considered feasible. The barrier is predicted to provide 5 to 9 decibels of noise reduction to the benefited receptors. Barrier 11 would be 1,689 feet long along BCP northbound, with a uniform height of 15 feet. The total area of the barrier would be 25,318sq. ft., and it would cost a total of \$1,215,264 based on a unit cost of \$48.00 per square foot. The barrier would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 1,948.

Barrier 12 – Single-family residences in Stratshire Crossing (CNE 12)

The Barrier 12 system, comprised of three barriers, is designed to benefit single-family residences in the Stratshire Crossing development west of the proposed BCP in CNE 12. A uniform height of 15 feet would benefit three impacted receptors and one additional non-impacted residential receptor, and the system is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

The Barrier 12 system would benefit 60% of the impacted receptors in Stratshire Crossing in CNE 12, therefore the system is considered feasible. The barriers are predicted to provide 5 to 9 decibels of noise reduction to the benefited receptors. The Barrier 12 system would be a total of 1,110 feet long along BCP southbound, with a uniform height of 15 feet. The total area of the barriers would be 16,640 sq. ft., and they would cost a total of \$798,720 based on a unit cost of \$48.00 per square foot.

The barriers would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,160.

Barrier 13 – Single-family residences in Stratshire Crossing (CNE 11)

Barrier 13 is designed to benefit single-family residences in the Stratshire Crossing development east of the proposed BCP in CNE 13. A uniform height of 15 feet would benefit the three impacted receptors and two additional non-impacted residential receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at two impacted receptors.

Barrier 13 would benefit 100% of the impacted receptors in Stratshire Crossing in CNE 11, therefore the barrier is considered feasible. The barrier is predicted to provide 5 to 13 decibels of noise reduction to the benefited receptors. Barrier 13 would be 1,497 feet long along BCP northbound, with a uniform height of 15 feet. The total area of the barrier would be 22,468 sq. ft., and it would cost a total of \$1,078,464 based on a unit cost of \$48.00 per square foot. The barrier was found to be not reasonable as it would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,494.

Barrier 14 – John Champe High School field west of Northstar Boulevard (CNE 16)

Barrier 14 is designed to benefit an outdoor recreational field at John Champe High School west of the proposed BCP in CNE 14. A uniform height of 20 feet would benefit the two impacted recreational receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at two impacted receptors.

Barrier 14 would benefit 100% of the impacted recreational receptors in CNE 16, therefore the barrier is considered feasible. The barrier is predicted to provide 6 to 10 decibels of noise reduction to the benefited receptors. Barrier 14 would be 618 feet long along BCP southbound, with a uniform height of 20 feet. The total area of the barrier would be 9,263 sq. ft., and it would cost a total of \$444,624 based on a unit cost of \$48.00 per square foot. The barrier was found to be not reasonable as it would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,632.

Barrier 15 – Single-family residences in Stone Ridge east of Northstar Boulevard (CNE 13)

Barrier 15 is designed to benefit single-family residences in Stone Ridge east of the proposed BCP in CNE 13. A uniform height of 20 feet would benefit 16 impacted receptors and five additional non-impacted receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at twelve impacted receptors.

Barrier 15 would benefit 84% of the impacted receptors in Stone Ridge in CNE 13, therefore the barrier is considered feasible. The barrier is predicted to provide 5 to 12 decibels of noise reduction to the benefited receptors. Barrier 15 would be 1,004 feet long along BCP northbound, with a uniform height of 20 feet. The total area of the barrier would be 20,079 sq. ft., and it would cost a total of \$963,792 based on a unit cost of \$48.00 per square foot. Barrier 15 is reasonable as it would be below VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 956.

Barrier 16 – Single-family residences in Stone Ridge west of Northstar Boulevard (CNE 16)

Barrier 16 is designed to benefit single-family residences in Stone Ridge west of the proposed BCP in CNE 16. A uniform height of 15 feet would benefit the three impacted receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at one impacted receptor.

Barrier 16 would benefit 100% of the impacted receptors in Stone Ridge in CNE 16, therefore the barrier is considered feasible. The barrier is predicted to provide 5 to 7 decibels of noise reduction to the benefited receptors. Barrier 16 would be 834 feet long along BCP southbound, with a uniform height of 15 feet. The total area of the barrier would be 12,515 sq. ft., and it would cost a total of \$600,720 based on a unit cost of \$48.00 per square foot. Barrier 16 is not reasonable as it would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,172.

Barrier 17 – Arcola Elementary School field east of Northstar Boulevard (CNE 15)

Barrier 17 is designed to benefit an outdoor recreational field at Arcola Elementary School east of the proposed BCP in CNE 15. A uniform height of 20 feet would benefit the three impacted receptors and three additional non-impacted receptors, and the barrier is predicted to provide enough benefit to meet the VDOT design goal of achieving a minimum of 7 dB of insertion loss at three impacted receptors.

Barrier 17 would benefit 100% of the impacted recreational receptors in CNE 15, therefore the barrier is considered feasible. Barrier 17 is predicted to be 1,489 feet long along BCP northbound, with a uniform height of 20 feet. The total area of the barrier would be 29,768 sq. ft., and it would cost a total of \$1,428,864 based on a unit cost of \$48.00 per square foot. Barrier 17 is not reasonable as it would be above VDOT's cost-reasonableness guideline, with a predicted surface area per benefited receptor of 4,961.

7 CONSTRUCTION NOISE CONSIDERATION

Construction noise provisions are contained in Section 107.16(b)3 Noise of the 2007 VDOT Road and Bridge Specifications. 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 P.M. and 6 A.M. 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.

8 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.

8.1 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.

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

8.2 VDOT's Noise Abatement Program

Information on VDOT's noise program is provided in "Highway Traffic Noise Impact Analysis Guidance Manual (Version 2)," updated September 16, 2011. This document is available from VDOT's Noise Abatement Section, Virginia Department of Transportation, 1401 E. Broad St., Richmond, VA 23219.

APPENDIX A LIST OF PREPARERS

This appendix lists the preparers of this noise study report.

Preparers with Harris Miller Miller & Hanson Inc. are as follows:

- Christopher Menge, Project Manager
- James Ferguson, III, noise analysis
- Ruth Anne Mazur, noise measurements and analysis
- Ryan Cranfill, noise analysis
- Michael Hamilton, noise analysis
- Kirk Harris, noise measurements analysis

TNM Certification of HMMH's Project Manager, Christopher Menge, is on file in VDOT's offices.

APPENDIX B TRAFFIC DATA USED IN NOISE MODELING

This appendix lists the traffic volumes and speeds used in the noise analysis modeling. Hour-by-hour vehicle volumes, truck percentages and speeds were developed by VDOT and Parsons Transportation Group and provided in a format similar to ENTRADA. The traffic volumes and speeds from the ENTRADA forms representing loudest-hour conditions for the Existing, future No Build and future Build alternative for the Bi-County Parkway and associated roadways were entered into the model.

Table 9 Loudest-hour Traffic for All Roadways: 2013 Existing Alternative

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
I-66 EB Between US 29 [Gainesville] and VA 234 Byp./BCP	4837	257	92	68
I-66 WB Between US 29 [Gainesville] and VA 234 Byp./BCP	1751	137	71	70
I-66 EB Between VA 234 Byp./BCP and VA 234 Bus.	5117	271	97	62
I-66 WB Between VA 234 Byp./BCP and VA 234 Bus.	1860	145	75	70
Ramp - EB I-66 to SB VA 234 Byp.	1106	59	21	41
Ramp - WB I-66 to SB VA 234 Byp.	468	37	19	35
Ramp - NB VA 234 Byp. to WB I-66	521	41	21	35
Ramp - NB VA 234 Byp. to EB I-66	886	47	17	44
BCP/Northstar Blvd SB From Tall Cedars Pkwy to Braddock Rd	81	5	2	55
BCP/Northstar Blvd NB From Braddock Rd to Tall Cedars Pkwy	46	3	1	55
234 Bypass SB From I-66 to Balls Ford Rd	2024	129	60	36
234 Bypass NB From Balls Ford Rd to I-66	1902	122	56	39
VA 234 (Sudley Rd) EB From Pageland Ln to BCP	604	19	19	52
VA 234 (Sudley Rd) WB From BCP to Pageland Ln	80	3	2	55
VA 234 (Sudley Rd) EB From BCP to Marble Hill Ln	604	19	19	52
VA 234 (Sudley Rd) WB From Marble Hill Ln to BCP	80	3	2	55
VA 705 (Sanders Ln) SB From Boxwood Farms D to VA 234 (Sudley Rd)	127	7	0	50
VA 705 (Sanders Ln) NB From VA 234 (Sudley Rd) to Boxwood Farms D	47	3	0	50
VA 705 (Sanders Ln) SB From VA 234	38	2	0	50

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
(Sudley Rd) to Livia Dr				
VA 705 (Sanders Ln) NB From Livia Dr to VA 234 (Sudley Rd)	38	2	0	50
US 50 EB From Racefield Ln to BCP/Dulles Connector	1284	49	24	59
US 50 WB From BCP/Dulles Connector to Racefield Ln	398	15	7	60
US 50 EB From BCP/Dulles Connector to Stone Springs Blvd	1284	49	24	59
US 50 WB From Stone Springs Blvd to BCP/Dulles Connector	398	15	7	60
Tall Cedars Pkwy EB From BCP/Northstar Blvd to Stone Springs Blvd	53	0	0	45
Tall Cedars Pkwy WB From Stone Springs Blvd to BCP/Northstar Blvd	89	0	0	45
VA 620 (Braddock Rd) EB From VA 705 (Lightridge Farm Rd) to BCP/Northstar Blvd	42	2	1	35
VA 620 (Braddock Rd) WB From BCP/Northstar Blvd to VA 705 (Lightridge Farm Rd)	42	2	1	35
VA 620 (Braddock Rd) EB From BCP/Northstar Blvd to Summerall Dr	59	4	1	35
VA 620 (Braddock Rd) WB From Summerall Dr to BCP/Northstar Blvd	30	2	0	35

Source: VDOT 2013

Table 10 Loudest-hour Traffic for All Roadways: 2040 No Build Alternative

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
I-66 EB Between US 29 [Gainesville] and VA 234 Byp./BCP	7070	375	134	57
I-66 WB Between US 29 [Gainesville] and VA 234 Byp./BCP	2557	200	104	70
I-66 EB Between VA 234 Byp./BCP and VA 234 Bus.	7418	394	141	37
I-66 WB Between VA 234 Byp./BCP and VA 234 Bus.	2696	211	109	69
Ramp - EB I-66 to SB VA 234 Byp.	2188	116	42	12
Ramp - WB I-66 to SB VA 234 Byp.	850	66	34	33
Ramp - NB VA 234 Byp. to WB I-66	1034	81	42	32
Ramp - NB VA 234 Byp. to EB I-66	1607	85	30	28
BCP/Northstar Blvd SB From Tall Cedars	222	14	7	55

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
Pkwy to Braddock Rd				
BCP/Northstar Blvd NB From Braddock Rd to Tall Cedars Pkwy	135	9	4	55
BCP/MNBPB SB From VA 234 (Sudley Rd) to US 29	815	52	24	55
BCP/MNBPB NB From US 29 to VA 234 (Sudley Rd)	1305	83	39	53
234 Bypass SB From I-66 to Balls Ford Rd	3841	246	114	4
234 Bypass NB From Balls Ford Rd to I-66	3549	227	105	5
VA 234 (Sudley Rd) EB From Pageland Ln to BCP	1539	49	47	7
VA 234 (Sudley Rd) WB From BCP to Pageland Ln	521	17	16	53
VA 234 (Sudley Rd) EB From BCP to Marble Hill Ln	2302	74	71	34
VA 234 (Sudley Rd) WB From Marble Hill Ln to BCP	426	14	13	55
VA 705 (Sanders Ln) SB From Boxwood Farms D to VA 234 (Sudley Rd)	447	25	1	48
VA 705 (Sanders Ln) NB From VA 234 (Sudley Rd) to Boxwood Farms D	162	9	0	50
VA 705 (Sanders Ln) SB From VA 234 (Sudley Rd) to Livia Dr	172	10	0	50
VA 705 (Sanders Ln) NB From Livia Dr to VA 234 (Sudley Rd)	178	10	0	50
US 50 EB From Racefield Ln to BCP/Dulles Connector	2655	101	50	26
US 50 WB From BCP/Dulles Connector to Racefield Ln	785	30	15	60
US 50 EB From BCP/Dulles Connector to Stone Springs Blvd	2503	95	47	31
US 50 WB From Stone Springs Blvd to BCP/Dulles Connector	782	30	15	60
Tall Cedars Pkwy EB From BCP/Northstar Blvd to Stone Springs Blvd	157	0	0	45
Tall Cedars Pkwy WB From Stone Springs Blvd to BCP/Northstar Blvd	245	0	0	45
VA 620 (Braddock Rd) EB From VA 705 (Lightridge Farm Rd) to BCP/Northstar Blvd	301	18	5	35
VA 620 (Braddock Rd) WB From BCP/Northstar Blvd to VA 705 (Lightridge Farm Rd)	257	15	4	35
VA 620 (Braddock Rd) EB From BCP/Northstar Blvd to Summerall Dr	225	13	4	35

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
VA 620 (Braddock Rd) WB From Summerall Dr to BCP/Northstar Blvd	104	6	2	35
<i>Source: VDOT 2013</i>				

Table 11 Loudest-hour Traffic for All Roadways: 2040 Build Alternative

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
I-66 EB Between US 29 [Gainesville] and VA 234 Byp./BCP	3001	269	164	70
I-66 WB Between US 29 [Gainesville] and VA 234 Byp./BCP	2176	287	216	70
I-66 EB Between VA 234 Byp./BCP and VA 234 Bus.	3440	308	188	68
I-66 WB Between VA 234 Byp./BCP and VA 234 Bus.	2505	331	249	69
Ramp - EB I-66 to SB VA 234 Byp.	473	42	26	45
Ramp - EB I-66 to NB BCP	28	2	1	35
Ramp - WB I-66 to SB VA 234 Byp.	568	75	56	35
Ramp - WB I-66 to NB BCP	267	35	26	45
Ramp - NB VA 234 Byp. to WB I-66	417	55	41	35
Ramp - SB BCP to WB I-66	22	3	2	35
Ramp - NB VA 234 Byp. to EB I-66	807	72	44	44
Ramp - SB BCP to EB I-66	377	34	21	35
BCP SB From US 50 to Tall Cedars Pkwy	790	73	51	55
BCP NB From Tall Cedars Pkwy to US 50	738	69	47	55
BCP/Northstar Blvd SB From Tall Cedars Pkwy to Braddock Rd	880	82	56	55
BCP/Northstar Blvd NB From Braddock Rd to Tall Cedars Pkwy	814	76	52	55
BCP SB From Braddock Rd to VA 234 (Sudley Rd)	956	89	61	54
BCP NB From VA 234 (Sudley Rd) to Braddock Rd	899	84	58	55
BCP/MNBPB SB From VA 234 (Sudley Rd) to US 29	1262	117	81	53
BCP/MNBPB NB From US 29 to VA 234 (Sudley Rd)	1072	100	69	54
BCP SB From US 29 to I-66	1021	95	65	54
BCP NB From I-66 to US 29	1087	101	70	54

Roadway Name and Location	Vehicle Volume in the loudest hour (vph)			Speed (mph)
	Autos	Medium Trucks	Heavy Trucks	
234 Bypass SB From I-66 to Balls Ford Rd	1753	163	112	39
234 Bypass NB From Balls Ford Rd to I-66	1842	171	118	37
VA 234 (Sudley Rd) EB From Pageland Ln to BCP	566	26	39	52
VA 234 (Sudley Rd) WB From BCP to Pageland Ln	481	22	33	53
VA 234 (Sudley Rd) EB From BCP to Marble Hill Ln	403	19	28	55
VA 234 (Sudley Rd) WB From Marble Hill Ln to BCP	429	20	29	55
VA 705 (Sanders Ln) SB From Boxwood Farms D to VA 234 (Sudley Rd)	64	4	0	50
VA 705 (Sanders Ln) NB From VA 234 (Sudley Rd) to Boxwood Farms D	54	4	0	50
VA 705 (Sanders Ln) SB From VA 234 (Sudley Rd) to Livia Dr	113	8	0	50
VA 705 (Sanders Ln) NB From Livia Dr to VA 234 (Sudley Rd)	114	8	0	50
US 50 EB From Racefield Ln to BCP/Dulles Connector	927	49	38	60
US 50 WB From BCP/Dulles Connector to Racefield Ln	918	48	37	60
US 50 EB From BCP/Dulles Connector to Stone Springs Blvd	792	42	32	60
US 50 WB From Stone Springs Blvd to BCP/Dulles Connector	771	41	31	60
Tall Cedars Pkwy EB From BCP/Northstar Blvd to Stone Springs Blvd	54	0	0	45
Tall Cedars Pkwy WB From Stone Springs Blvd to BCP/Northstar Blvd	59	0	0	45
VA 620 (Braddock Rd) EB From VA 705 (Lightridge Farm Rd) to BCP/Northstar Blvd	112	8	3	35

Source: VDOT 2013

APPENDIX C PREDICTED NOISE LEVELS

Appendix C provides the predicted 2013 Existing, future design-year 2040 No Build, and future design-year 2040 Build sound levels at all of the receiver locations shown in the study graphics. 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 Loudest-hour L_{eq} sound levels. For the Build Alternative, three values are given for each site: the predicted L_{eq} without a barrier, the L_{eq} with the potential barrier evaluated and the insertion loss of the barrier.

Table 12 Predicted Existing and Future Noise Levels

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P001	LEE HY Manassas Row 1 Flr. 1	1	Int.	51	31	33	37	37	0
P002	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	51	53	57	57	0
P003	LEE HY Manassas Row 1 Flr. 1	1	Rec.	66	51	53	57	57	0
P004	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	54	49	4
P005	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	54	49	5
P006	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	55	50	5
P007	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	55	50	5
P008	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	56	51	5
P009	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	48	56	51	5
P010	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	48	57	51	5
P011	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	48	57	51	6
P012	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	48	58	52	6
P013	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	49	59	52	6
P014	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	49	59	52	7
P015	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	49	60	53	7
P016	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	50	60	53	7
P017	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	46	51	61	53	8

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P018	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	46	52	62	54	8
P019	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	47	52	63	54	9
P020	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	47	52	62	54	9
P021	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	46	51	62	53	8
P022	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	43	46	53	48	5
P023	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	43	46	54	49	5
P024	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	48	54	65	54	11
P025	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	45	49	60	52	7
P026	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	43	46	55	49	5
P027	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	47	56	50	6
P028	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	52	58	70	55	15
P029	PAGELAND LN Manassas Row 1 Flr. 1	1	Rec.	66	44	48	58	51	6
P030	LOLAN ST Manassas Row 1 Flr. 1	2	Res.	66	60	63	65	65	0
P031	LOLAN ST Manassas Row 1 Flr. 1	2	Res.	66	51	54	55	55	0
P032	LOLAN ST Manassas Row 1 Flr. 1	4	Res.	66	48	50	54	54	0
P033	LOLAN ST Manassas Row 1 Flr. 1	1	Res.	66	45	48	52	52	0
P034	PAGELAND LN Manassas Row 1 Flr. 1	2	Res.	66	51	57	72	71	1
P035	PAGELAND LN Manassas Row 1 Flr. 1	1	Res.	66	52	58	72	70	2
P036	PAGELAND LN Manassas Row 1 Flr. 1	2	Res.	66	43	45	51	51	0
P037	PAGELAND LN Manassas Row 1 Flr. 1	1	Res.	66	43	46	PA	PA	PA
P038	PAGELAND LN Manassas Row 1 Flr. 1	2	Res.	66	43	45	53	48	4
P039	PAGELAND LN Gainesville Row 1 Flr. 1	1	Res.	66	52	58	PA	PA	PA
P040	PAGELAND LN Gainesville Row 1 Flr. 1	1	Res.	66	46	51	62	58	4

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P041	PAGELAND LN Catharpin Row 1 Flr. 1	2	Res.	66	48	54	66	60	6
P042	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	50	56	PA	PA	PA
P043	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	43	47	64	61	3
P044	GENERAL TRIMBLES LN Gainesville Row 2 Flr. 1	2	Res.	66	43	46	55	51	5
P045	PAGELAND LN Catharpin Row 2 Flr. 1	3	Res.	66	43	45	53	49	3
P046	PAGELAND LN Manassas Row 1 Flr. 1	1	Res.	66	44	46	56	49	6
P047	PAGELAND LN Manassas Row 1 Flr. 1	1	Res.	66	43	46	53	48	5
P048	ARTEMUS RD Manassas Row 1 Flr. 1	1	Res.	66	43	45	51	51	0
P049	PAGELAND LN Manassas Row 1 Flr. 1	1	Res.	66	47	52	65	56	9
P050	PAGELAND LN Gainesville Row 1 Flr. 1	2	Res.	66	44	48	60	56	4
P051	PAGELAND LN Gainesville Row 1 Flr. 1	1	Res.	66	44	47	58	54	5
P052	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	47	52	64	61	4
P053	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	49	55	68	65	3
P054	DOMINIQUE ESTATES LN Catharpin Row 1 Flr. 1	2	Res.	66	43	47	56	51	5
P055	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	43	47	63	52	11
P056	PAGELAND LN Catharpin Row 1 Flr. 1	1	Res.	66	43	45	55	50	5
P057	SUDLEY RD Catharpin Row 1 Flr. 1	2	Res.	66	43	46	60	54	7
P058	PAGELAND LN Catharpin Row 2 Flr. 1	1	Res.	66	43	45	55	51	4
P059	DOMINIQUE ESTATES LN Catharpin Row 2 Flr. 1	1	Res.	66	43	44	51	47	3
P060	PAGELAND LN Catharpin Row 2 Flr. 1	1	Res.	66	50	56	57	56	2
P061	SUDLEY RD Catharpin Row 1 Flr. 1	1	Res.	66	49	53	61	56	5
P062	SUDLEY RD Catharpin Row 1 Flr. 1	1	Res.	66	56	58	67	60	8
P063	RICHLAND DR Catharpin Row 1 Flr. 1	1	Res.	66	47	50	PA	PA	PA

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P064	SUDLEY RD Catharpin Row 2 Flr. 1	1	Res.	66	56	60	61	61	0
P065	SUDLEY RD Catharpin Row 2 Flr. 1	2	Res.	66	56	58	59	58	1
P066	SUDLEY RD Catharpin Row 2 Flr. 1	2	Res.	66	56	58	61	59	2
P067	RICHLAND DR Catharpin Row 2 Flr. 1	1	Res.	66	46	49	59	52	7
P068	SUDLEY RD Catharpin Row 1 Flr. 1	1	Res.	66	63	66	67	66	0
P069	SUDLEY RD Catharpin Row 1 Flr. 1	1	Res.	66	64	66	72	68	4
P070	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	61	64	65	65	0
P071	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	61	62	63	63	0
P072	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	59	61	62	62	0
P073	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	58	60	61	60	1
P074	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	57	59	61	60	1
P075	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	56	58	60	59	2
P076	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	55	58	59	58	1
P077	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	57	59	60	59	0
P078	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	54	57	59	57	1
P079	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	54	57	59	57	2
P080	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	53	56	59	56	2
P081	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	53	56	57	56	1
P082	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	53	56	57	56	1
P083	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	52	55	57	55	2
P084	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	51	55	57	55	2
P085	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	51	54	59	54	4
P086	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	51	54	58	54	3

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P087	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	51	55	56	54	1
P088	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	51	54	56	54	2
P089	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	50	54	57	53	3
P090	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	50	54	56	54	2
P091	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	50	53	57	53	4
P092	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	49	53	58	53	5
P093	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	49	53	55	53	2
P094	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	49	52	56	52	4
P095	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	50	53	55	53	2
P096	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	49	53	55	52	3
P097	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	52	57	52	4
P098	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	52	58	52	5
P099	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	52	54	52	3
P100	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	52	54	52	2
P101	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	51	56	51	4
P102	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	51	56	52	5
P103	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	48	52	55	51	3
P104	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	47	50	56	51	5
P105	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	47	51	54	51	2
P106	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	47	50	55	51	5
P107	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	47	51	54	51	3
P108	Catharpin Park, Catharpin Row 1 Flr. 1	1	Rec.	66	47	51	55	51	4
P109	RICHLAND DR Catharpin Row 1 Flr. 1	2	Res.	66	45	46	54	49	5

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P110	RICHLAND DR Catharpin Row 1 Flr. 1	3	Res.	66	45	47	64	54	10
P111	RICHLAND DR Catharpin Row 1 Flr. 1	1	Res.	66	44	45	48	46	1
P112	RICHLAND DR Catharpin Row 1 Flr. 1	2	Res.	66	44	45	58	52	6
P113	RICHLAND DR Catharpin Row 1 Flr. 1	1	Res.	66	44	45	59	51	8
P114	RICHLAND DR Catharpin Row 1 Flr. 1	2	Res.	66	44	45	64	55	9
P115	RICHLAND DR Catharpin Row 1 Flr. 1	1	Res.	66	44	45	58	51	8
P116	RICHLAND DR Catharpin Row 2 Flr. 1	1	Res.	66	44	45	51	47	3
P117	RICHLAND DR Catharpin Row 2 Flr. 1	1	Res.	66	44	44	54	49	5
P118	RICHLAND DR Catharpin Row 2 Flr. 1	1	Res.	66	44	45	56	50	6
P119	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	44	45	57	51	6
P120	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	49	53	69	69	0
P121	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	55	60	70	66	5
P122	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	57	62	PA	PA	PA
P123	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	48	52	61	59	2
P124	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	54	58	66	63	3
P125	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	48	53	62	59	3
P126	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	56	61	64	63	1
P127	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	52	56	63	58	5
P128	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	54	59	64	62	2
P129	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	46	49	56	51	5
P130	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	52	57	61	53	8
P131	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	55	60	60	55	5
P132	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	57	62	62	57	4

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P133	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	54	59	55	53	2
P134	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	48	52	58	52	6
P135	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	53	58	55	53	2
P136	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	51	56	54	52	2
P137	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	51	56	55	53	2
P138	PIN OAK CT Catharpin Row 1 Flr. 1	1	Res.	66	45	46	61	54	7
P139	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	48	52	55	52	2
P140	CHATTER BROOK DR Catharpin Row 1 Flr. 1	1	Res.	66	44	46	60	54	5
P141	LIGHTRIDGE FARM RD Catharpin Row 1 Flr. 1	1	Res.	66	57	63	57	57	0
P142	LIGHTRIDGE FARM RD Catharpin Row 1 Flr. 1	1	Res.	66	55	60	55	54	1
P143	LIGHTRIDGE FARM RD Aldie Row 1 Flr. 1	2	Res.	66	51	54	57	57	0
P144	LIGHTRIDGE FARM RD Aldie Row 1 Flr. 1	1	Res.	66	50	51	56	56	0
P145	LIGHTRIDGE FARM RD Aldie Row 1 Flr. 1	1	Res.	66	51	53	58	58	0
P146	DUNIGAN CT Catharpin Row 2 Flr. 1	1	Rec.	66	44	46	52	50	2
P147	SANDERS LN Catharpin Row 2 Flr. 1	1	Res.	66	48	53	51	49	2
P148	SANDERS LN Catharpin Row 2 Flr. 1	1	Res.	66	49	54	53	51	2
P149	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	49	53	60	52	8
P150	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	47	50	62	52	10
P151	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	49	54	64	53	11
P152	GABLES GREEN WY Catharpin Row 1 Flr. 1	1	Res.	66	46	48	55	49	6
P153	GABLES GREEN WY Catharpin Row 1 Flr. 1	1	Res.	66	45	48	56	50	7
P154	BRIDLE LN Catharpin Row 1 Flr. 1	1	Res.	66	53	58	67	63	5
P155	BRIDLE LN Catharpin Row 1 Flr. 1	1	Res.	66	44	46	55	51	4

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P156	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	55	60	69	69	1
P157	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	46	50	60	58	2
P158	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	50	54	63	60	2
P159	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	52	56	65	58	7
P160	SANDERS LN Catharpin Row 1 Flr. 1	1	Res.	66	46	50	61	59	2
P161	PIN OAK CT Catharpin Row 1 Flr. 1	1	Res.	66	45	47	60	50	10
P162	PIN OAK CT Catharpin Row 1 Flr. 1	1	Res.	66	44	46	60	51	9
P163	CHATTER BROOK DR Catharpin Row 1 Flr. 1	1	Res.	66	44	45	55	52	3
P164	CHATTER BROOK DR Catharpin Row 1 Flr. 1	1	Res.	66	44	46	63	58	5
P165	SANDERS LN Catharpin Row 2 Flr. 1	1	Res.	66	61	66	60	60	1
P166	BRIDLE LN Catharpin Row 2 Flr. 1	1	Res.	66	45	47	56	54	2
P167	BRIDLE LN Catharpin Row 2 Flr. 1	1	Res.	66	44	46	54	52	2
P168	BRIDLE LN Catharpin Row 2 Flr. 1	1	Res.	66	45	46	55	52	3
P169	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	63	60	3
P170	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	64	59	5
P171	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	64	58	6
P172	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	61	56	4
P173	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	61	57	5
P174	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	62	57	5
P175	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	PA	PA	PA
P176	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	64	57	6
P177	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	PA	PA	PA
P178	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	63	57	6

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P179	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	67	58	9
P180	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	62	57	5
P181	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	65	58	7
P182	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	61	59	1
P183	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	63	61	2
P184	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	59	58	1
P185	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	61	60	0
P186	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	61	60	0
P187	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	59	58	0
P188	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	55	59	59	0
P189	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	56	59	59	0
P190	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	62	60	2
P191	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	61	58	3
P192	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P193	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P194	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	54	62	57	5
P195	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P196	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	54	63	57	6
P197	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	66	58	8
P198	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P199	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P200	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P201	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P202	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P203	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P204	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	57	70	62	7
P205	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	57	66	61	5
P206	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	59	58	1
P207	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	62	59	2
P208	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	62	57	5
P209	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	63	57	6
P210	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	60	56	4
P211	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	61	56	5
P212	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	62	57	5
P213	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	59	56	3
P214	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	60	56	4
P215	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	59	56	3
P216	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	56	55	2
P217	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	61	56	4
P218	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	56	55	1
P219	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	57	56	1
P220	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	58	57	1
P221	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	59	58	1
P222	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	57	57	0
P223	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	56	56	0
P224	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	58	57	1

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P225	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	57	57	0
P226	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	54	57	57	0
P227	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	55	56	56	0
P228	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	54	55	57	57	0
P229	KIRKPATRICK FARMS Aldie Row 2 Flr. 1	1	Res.	66	56	58	59	59	0
P230	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	57	60	59	1
P231	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	5	Res.	66	54	54	59	56	3
P232	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	5	Res.	66	54	54	60	56	4
P233	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	54	54	57	56	1
P234	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	56	63	59	4
P235	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	59	58	1
P236	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	61	57	4
P237	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	59	56	3
P238	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	59	56	3
P239	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	60	56	4
P240	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	57	55	2
P241	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	58	55	3
P242	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	2	Res.	66	54	54	56	55	1
P243	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	2	Res.	66	54	54	56	55	1
P244	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	58	57	1
P245	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	56	56	1
P246	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	56	56	0
P247	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	56	56	0

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P248	KIRKPATRICK FARMS Aldie Row 3 Flr. 1	1	Res.	66	54	54	56	56	0
P249	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	55	57	60	59	1
P250	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	5	Res.	66	54	54	57	55	2
P251	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	4	Res.	66	54	54	56	55	1
P252	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	4	Res.	66	54	54	57	55	2
P253	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	4	Res.	66	54	54	56	56	0
P254	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	4	Res.	66	54	54	56	56	0
P255	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	54	54	57	56	1
P256	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	54	54	58	56	1
P257	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	54	54	58	56	1
P258	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	58	57	1
P259	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	2	Res.	66	54	54	58	56	2
P260	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	58	55	2
P261	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	58	55	3
P262	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	57	55	2
P263	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	59	56	3
P264	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	57	55	2
P265	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	2	Res.	66	54	54	56	55	1
P266	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	2	Res.	66	54	54	56	55	1
P267	KIRKPATRICK FARMS Aldie Row 4 Flr. 1	1	Res.	66	54	54	56	56	0
P268	KIRKPATRICK FARMS Aldie Row 5 Flr. 1	2	Res.	66	54	54	56	55	1
P269	KIRKPATRICK FARMS Aldie Row 5 Flr. 1	1	Res.	66	54	54	55	55	0
P270	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	PA	PA	PA

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P271	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	65	60	5
P272	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	66	60	6
P273	KIRKPATRICK FARMS Aldie Row 1 Flr. 1	1	Res.	66	54	54	PA	PA	PA
P274	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P275	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	68	60	8
P276	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	56	64	59	5
P277	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	54	55	PA	PA	PA
P278	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	55	69	65	4
P279	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	55	PA	PA	PA
P280	BRADDOCK RD Aldie Row 1 Flr. 1	1	Rec.	66	55	56	56	56	0
P281	BRADDOCK RD Aldie Row 1 Flr. 1	1	Rec.	66	55	56	56	56	0
P282	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	56	67	62	6
P283	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	56	PA	PA	PA
P284	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	57	PA	PA	PA
P285	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	56	58	66	60	5
P286	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	55	57	PA	PA	PA
P287	STRATSHIRE CROSSING Aldie Row 1 Flr. 1	1	Res.	66	56	58	PA	PA	PA
P288	GOSHEN RD Aldie Row 1 Flr. 1	1	Res.	66	54	55	56	56	0
P289	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	56	61	58	3
P290	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	57	60	57	3
P291	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	56	64	61	4
P292	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	56	58	62	59	3
P293	STRATSHIRE CROSSING Aldie Row 2 Flr. 1	1	Res.	66	55	56	64	60	4
P294	STRATSHIRE CROSSING Aldie	1	Res.	66	55	57	65	63	2

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
	Row 2 Flr. 1								
P295	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	56	59	59	57	2
P296	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	57	60	60	58	2
P297	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	55	57	62	59	3
P298	STRATSHIRE CROSSING Aldie Row 3 Flr. 1	1	Res.	66	56	59	63	61	2
P299	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	54	55	58	58	0
P300	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	58	60	60	0
P301	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	54	55	57	57	0
P302	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	58	60	60	0
P303	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	58	59	59	0
P304	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	58	59	59	0
P305	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	58	59	59	0
P306	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	54	55	55	55	0
P307	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	59	58	58	0
P308	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	55	55	55	55	0
P309	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	54	55	55	55	0
P310	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	58	61	58	58	0
P311	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	58	61	58	58	0
P312	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	56	59	56	56	0
P313	CD SMITH Aldie Row 1 Flr. 1	1	Res.	66	55	56	55	55	0
P314	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	58	58	0
P315	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	57	60	58	58	0
P316	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	57	60	58	58	0
P317	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	57	59	58	58	0
P318	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	58	58	0
P319	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	59	59	58	0
P320	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	59	59	1
P321	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	60	59	1
P322	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	61	60	1
P323	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	62	60	2
P324	STONE RIDGE Ashburn Row 1	1	Res.	66	57	60	63	60	3

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
	Flr. 1								
P325	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	57	61	70	60	9
P326	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	71	60	11
P327	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	71	60	12
P328	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	PA	PA	PA
P329	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	PA	PA	PA
P330	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	PA	PA	PA
P331	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	PA	PA	PA
P332	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	59	PA	PA	PA
P333	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P334	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	59	PA	PA	PA
P335	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P336	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P337	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P338	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P339	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	54	55	55	0
P340	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	54	55	55	0
P341	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	55	55	55	0
P342	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	55	55	55	0
P343	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	55	55	55	0
P344	CD SMITH Aldie Row 2 Flr. 1	1	Res.	66	54	55	55	55	0
P345	CD SMITH Aldie Row 2 Flr. 1	2	Res.	66	54	55	55	55	0
P346	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	55	55	0
P347	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	55	55	0
P348	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	55	55	0
P349	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	55	55	0
P350	STONE RIDGE Ashburn Row 2 Flr. 1	3	Res.	66	54	55	57	56	1

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P351	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	57	56	1
P352	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	58	56	2
P353	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	56	57	64	58	5
P354	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	54	55	60	56	4
P355	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	56	67	58	9
P356	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	70	59	11
P357	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	70	59	11
P358	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	71	59	12
P359	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	71	59	12
P360	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	PA	PA	PA
P361	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	PA	PA	PA
P362	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	56	69	61	8
P363	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	56	PA	PA	PA
P364	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P365	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P366	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P367	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	54	55	55	0
P368	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	54	55	55	0
P369	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	54	55	55	0
P370	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	55	56	55	1
P371	STONE RIDGE Ashburn Row 3 Flr. 1	3	Res.	66	54	54	56	56	1
P372	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	55	57	56	1
P373	STONE RIDGE Ashburn Row 3 Flr. 1	3	Res.	66	54	55	64	57	7

Graphi c ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Exist- ing	No- Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P374	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	56	64	60	4
P375	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	57	67	61	6
P376	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	55	57	68	61	7
P377	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	57	59	66	63	3
P378	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	57	59	67	64	4
P379	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	57	59	68	64	4
P380	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	57	59	69	65	5
P381	STONE RIDGE Ashburn Row 3 Flr. 1	1	Res.	66	57	59	71	65	6
P382	STONE RIDGE Ashburn Row 4 Flr. 1	2	Res.	66	54	54	56	55	1
P383	STONE RIDGE Ashburn Row 4 Flr. 1	3	Res.	66	54	54	56	55	1
P384	STONE RIDGE Ashburn Row 4 Flr. 1	4	Res.	66	54	54	56	55	1
P385	STONE RIDGE Ashburn Row 4 Flr. 1	2	Res.	66	54	54	58	55	3
P386	STONE RIDGE Ashburn Row 4 Flr. 1	2	Res.	66	54	54	57	55	2
P387	STONE RIDGE Ashburn Row 4 Flr. 1	4	Res.	66	54	54	55	55	1
P388	STONE RIDGE Ashburn Row 4 Flr. 1	4	Res.	66	56	58	61	60	1
P389	STONE RIDGE Ashburn Row 4 Flr. 1	3	Res.	66	56	59	63	62	1
P390	STONE RIDGE Ashburn Row 4 Flr. 1	2	Res.	66	56	59	64	62	2
P391	STONE RIDGE Ashburn Row 5 Flr. 1	4	Res.	66	54	54	55	55	0
P392	STONE RIDGE Ashburn Row 5 Flr. 1	5	Res.	66	54	54	54	54	0
P393	GOSHEN RD Aldie Row 1 Flr. 1	1	Res.	66	55	57	59	58	1
P394	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	63	58	5
P395	Arcola Elementary School, Fairfax Row 1 Flr. 1	1	Int.	51	32	32	45	45	0
P396	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	63	58	5
P397	TALL CEDARS PKWY Stone	1	Rec.	66	57	57	68	59	9

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
	Ridge Row 1 Flr. 1								
P398	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	63	59	4
P399	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	67	59	8
P400	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	63	59	4
P401	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	66	59	7
P402	TALL CEDARS PKWY Stone Ridge Row 1 Flr. 1	1	Rec.	66	57	57	64	59	5
P403	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	60	58	2
P404	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	60	58	2
P405	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	61	58	2
P406	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	60	58	2
P407	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	61	58	3
P408	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	60	58	2
P409	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	61	59	3
P410	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	60	58	2
P411	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	62	59	3
P412	TALL CEDARS PKWY Stone Ridge Row 2 Flr. 1	1	Rec.	66	57	57	62	59	3
P413	TALL CEDARS PKWY Stone Ridge Row 3 Flr. 1	1	Rec.	66	57	57	59	58	1
P414	TALL CEDARS PKWY Stone Ridge Row 3 Flr. 1	1	Rec.	66	57	57	60	58	1
P415	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	54	57	57	0
P416	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	58	58	0
P417	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	54	57	57	0
P418	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	58	57	0
P419	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	54	57	56	0
P420	SACRED MOUNTAIN ST Aldie	1	Rec.	66	54	55	63	59	4

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
	Row 1 Flr. 1								
P421	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	67	59	8
P422	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	62	59	3
P423	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	66	59	6
P424	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	61	59	2
P425	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	64	60	4
P426	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	60	58	2
P427	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Rec.	66	54	55	62	59	3
P428	SACRED MOUNTAIN ST Aldie Row 1 Flr. 1	1	Int.	51	30	30	39	39	0
P429	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	58	63	63	0
P430	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	58	62	62	0
P431	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	58	62	62	0
P432	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	61	61	0
P433	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	61	61	0
P434	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	60	60	0
P435	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	60	60	0
P436	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P437	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P438	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	60	60	0
P439	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P440	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	61	PA	PA	PA
P441	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P442	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	60	60	0
P443	STONE RIDGE Ashburn Row 1	1	Res.	66	58	61	PA	PA	PA

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
	Flr. 1								
P444	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	61	61	0
P445	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P446	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P447	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P448	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	56	59	60	60	0
P449	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	57	60	PA	PA	PA
P450	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	56	58	60	60	0
P451	STONE RIDGE Ashburn Row 1 Flr. 1	1	Res.	66	58	61	PA	PA	PA
P452	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	56	57	60	60	0
P453	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	55	57	59	59	0
P454	STONE RIDGE Ashburn Row 1 Flr. 1	2	Res.	66	55	56	58	58	0
P455	MARRWOOD Fairfax Row 1 Flr. 1	2	Res.	66	57	57	59	59	0
P456	MARRWOOD Fairfax Row 1 Flr. 1	2	Res.	66	57	57	59	59	0
P457	MARRWOOD Fairfax Row 1 Flr. 1	2	Res.	66	57	57	61	60	0
P458	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	62	61	1
P459	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	62	61	1
P460	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	62	60	2
P461	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	66	60	6
P462	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	68	61	7
P463	MARRWOOD Fairfax Row 1 Flr. 1	1	Res.	66	57	57	66	62	5
P464	Boyd School, Fairfax Row 1 Flr. 1	1	Int.	51	32	32	37	61	1
P465	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	56	55	0
P466	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	57	56	0
P467	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	56	55	0
P468	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	57	56	0
P469	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	56	55	0
P470	SACRED MOUNTAIN ST Aldie Row 2 Flr. 1	1	Rec.	66	54	54	57	56	0

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P471	STONE RIDGE Ashburn Row 2 Flr. 1	1	Res.	66	55	57	60	60	0
P472	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	57	60	60	0
P473	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	57	60	60	0
P474	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	57	60	60	0
P475	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	57	60	60	0
P476	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	57	60	60	0
P477	STONE RIDGE Ashburn Row 2 Flr. 1	2	Res.	66	55	56	59	59	0
P478	MARRWOOD Fairfax Row 2 Flr. 1	2	Res.	66	57	57	59	59	0
P479	MARRWOOD Fairfax Row 2 Flr. 1	2	Res.	66	57	57	60	60	0
P480	MARRWOOD Fairfax Row 2 Flr. 1	2	Res.	66	57	57	61	59	1
P481	MARRWOOD Fairfax Row 2 Flr. 1	1	Res.	66	57	57	60	59	1
P482	MARRWOOD Fairfax Row 2 Flr. 1	2	Res.	66	57	57	60	59	1
P483	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	55	56	56	0
P484	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	55	58	58	0
P485	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	54	55	57	57	0
P486	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	56	58	58	0
P487	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	56	59	59	0
P488	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	56	59	59	0
P489	STONE RIDGE Ashburn Row 3 Flr. 1	2	Res.	66	55	55	58	58	0
P490	MARRWOOD Fairfax Row 3 Flr. 1	2	Res.	66	57	57	60	59	1
P491	JOHN MOSBY HWY Fairfax Row 1 Flr. 1	1	Res.	66	57	58	62	61	1
P492	JOHN MOSBY HWY Fairfax Row 1 Flr. 1	1	Res.	66	66	65	PA	PA	PA
P493	JOHN MOSBY HWY Fairfax Row 1 Flr. 1	0	Res.	66	57	57	64	63	1
P494	John Mosby Hwy Barn Area, Fairfax Row 1 Flr. 1	1	Res.	66	58	58	65	65	0
P495	JOHN MOSBY HWY Fairfax Row 1 Flr. 1	1	Res.	66	64	63	65	65	0
P496	QUAIL RIDGE LN Fairfax Row 1 Flr. 1	1	Res.	66	65	67	PA	PA	PA

Graphic ID	Receiver Site Name	Dwell or Rec. Units	Land Use	NAC Imp. Crit.	Loudest-Hour Leq (dBA)				
					Existing	No-Bld	Bld No-Bar	Bld w/ Bar	Bar IL
P497	QUAIL RIDGE LN Fairfax Row 1 Flr. 1	1	Res.	66	62	63	65	65	0
<p>Note: Noise levels presented in this table are rounded. Comparison of values may appear incorrect as a result. Receptors with design-year Build levels of "PA" are considered acquisitions for the purposes of this study. IL = Insertion loss PA = Potential Acquisition Bold red values indicate impact based on the predicted noise level approaching or exceeding the FHWA noise abatement criterion for that land use Bold orange values indicate impact based on the substantial increase of predicted no-barrier noise levels in the future Build scenario over the Existing noise level Bold values indicate receptor receives at least 5 dB of insertion loss due to proposed barrier</p> <p>Source: HMMH, 2013</p>									

APPENDIX D NOISE MEASUREMENT DATA

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

Noise Monitor Sound Level Output and Calibration Records

Table 13 Noise Monitor Output - Interval Leqs

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M10	3-Apr-13	10:45:07	00:52.7	53.3
M10	3-Apr-13	10:46:00	01:00.0	53.1
M10	3-Apr-13	10:47:00	01:00.0	52.8
M10	3-Apr-13	10:48:00	01:00.0	53.7
M10	3-Apr-13	10:49:00	01:00.0	50.7
M10	3-Apr-13	10:50:00	01:00.0	49.2
M10	3-Apr-13	10:51:00	01:00.0	51.5
M10	3-Apr-13	10:52:00	01:00.0	56.9
M10	3-Apr-13	10:53:00	01:00.0	61.5
M10	3-Apr-13	10:54:00	01:00.0	49.4
M10	3-Apr-13	10:55:00	01:00.0	49.5
M10	3-Apr-13	10:56:00	01:00.0	48.8
M10	3-Apr-13	10:57:00	01:00.0	51.5
M10	3-Apr-13	10:58:00	01:00.0	50.0
M10	3-Apr-13	10:59:00	01:00.0	51.8
M10	3-Apr-13	11:00:00	01:00.0	53.0
M10	3-Apr-13	11:01:00	01:00.0	51.7
M10	3-Apr-13	11:02:00	01:00.0	59.7
M10	3-Apr-13	11:03:00	01:00.0	55.7
M10	3-Apr-13	11:04:00	01:00.0	54.8
M10	3-Apr-13	11:05:00	01:00.0	54.8
M10	3-Apr-13	11:06:00	01:00.0	53.3
M10	3-Apr-13	11:07:00	01:00.0	56.5
M10	3-Apr-13	11:08:00	01:00.0	53.0
M10	3-Apr-13	11:09:00	01:00.0	53.4
M10	3-Apr-13	11:10:00	01:00.0	57.2
M10	3-Apr-13	11:11:00	01:00.0	55.0
M10	3-Apr-13	11:12:00	01:00.0	58.4
M10	3-Apr-13	11:13:00	01:00.0	51.2

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M10	3-Apr-13	11:14:00	01:00.0	53.3
M10	3-Apr-13	11:15:00	01:00.0	54.5
M10	3-Apr-13	11:16:00	00:03.5	49.5
M9	3-Apr-13	12:00:16	00:43.8	43.9
M9	3-Apr-13	12:01:00	01:00.0	50.2
M9	3-Apr-13	12:02:00	01:00.0	47.5
M9	3-Apr-13	12:03:00	01:00.0	53.3
M9	3-Apr-13	12:04:00	01:00.0	48.7
M9	3-Apr-13	12:05:00	01:00.0	49.8
M9	3-Apr-13	12:06:00	01:00.0	55.8
M9	3-Apr-13	12:07:00	01:00.0	53.4
M9	3-Apr-13	12:08:00	01:00.0	53.4
M9	3-Apr-13	12:09:00	01:00.0	51.6
M9	3-Apr-13	12:10:00	01:00.0	41.6
M9	3-Apr-13	12:11:00	01:00.0	48.1
M9	3-Apr-13	12:12:00	01:00.0	50.5
M9	3-Apr-13	12:13:00	01:00.0	50.1
M9	3-Apr-13	12:14:00	01:00.0	46.4
M9	3-Apr-13	12:15:00	01:00.0	45.8
M9	3-Apr-13	12:16:00	01:00.0	53.4
M9	3-Apr-13	12:17:00	01:00.0	45.4
M9	3-Apr-13	12:18:00	01:00.0	52.0
M9	3-Apr-13	12:19:00	01:00.0	46.2
M9	3-Apr-13	12:20:00	01:00.0	57.0
M9	3-Apr-13	12:21:00	01:00.0	56.3
M9	3-Apr-13	12:22:00	01:00.0	58.0
M9	3-Apr-13	12:23:00	01:00.0	53.2
M9	3-Apr-13	12:24:00	01:00.0	47.1
M9	3-Apr-13	12:25:00	01:00.0	64.8
M9	3-Apr-13	12:26:00	01:00.0	58.6
M9	3-Apr-13	12:27:00	01:00.0	59.4
M9	3-Apr-13	12:28:00	01:00.0	56.0
M9	3-Apr-13	12:29:00	01:00.0	50.0
M9	3-Apr-13	12:30:00	01:00.0	61.2
M9	3-Apr-13	12:31:00	00:04.2	53.9
M8	3-Apr-13	13:02:44	00:15.5	39.8
M8	3-Apr-13	13:03:00	01:00.0	42.1
M8	3-Apr-13	13:04:00	01:00.0	42.3
M8	3-Apr-13	13:05:00	01:00.0	44.0
M8	3-Apr-13	13:06:00	01:00.0	42.6

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M8	3-Apr-13	13:07:00	01:00.0	43.4
M8	3-Apr-13	13:08:00	01:00.0	41.2
M8	3-Apr-13	13:09:00	01:00.0	44.6
M8	3-Apr-13	13:10:00	01:00.0	42.7
M8	3-Apr-13	13:11:00	01:00.0	40.9
M8	3-Apr-13	13:12:00	01:00.0	46.6
M8	3-Apr-13	13:13:00	01:00.0	45.3
M8	3-Apr-13	13:14:00	01:00.0	41.8
M8	3-Apr-13	13:15:00	01:00.0	44.2
M8	3-Apr-13	13:16:00	01:00.0	43.0
M8	3-Apr-13	13:17:00	01:00.0	42.9
M8	3-Apr-13	13:18:00	01:00.0	47.2
M8	3-Apr-13	13:19:00	01:00.0	43.8
M8	3-Apr-13	13:20:00	01:00.0	42.6
M8	3-Apr-13	13:21:00	01:00.0	39.5
M8	3-Apr-13	13:22:00	01:00.0	44.3
M8	3-Apr-13	13:23:00	01:00.0	45.1
M8	3-Apr-13	13:24:00	01:00.0	41.5
M8	3-Apr-13	13:25:00	01:00.0	44.5
M8	3-Apr-13	13:26:00	01:00.0	45.6
M8	3-Apr-13	13:27:00	01:00.0	42.3
M8	3-Apr-13	13:28:00	01:00.0	41.7
M8	3-Apr-13	13:29:00	01:00.0	65.6
M8	3-Apr-13	13:30:00	01:00.0	58.9
M8	3-Apr-13	13:31:00	01:00.0	46.2
M8	3-Apr-13	13:32:00	01:00.0	50.1
M8	3-Apr-13	13:33:00	00:05.7	50.8
M7	3-Apr-13	15:39:22	00:37.1	42.7
M7	3-Apr-13	15:40:00	01:00.0	47.1
M7	3-Apr-13	15:41:00	01:00.0	45.9
M7	3-Apr-13	15:42:00	01:00.0	56.9
M7	3-Apr-13	15:43:00	01:00.0	49.4
M7	3-Apr-13	15:44:00	01:00.0	51.4
M7	3-Apr-13	15:45:00	01:00.0	40.7
M7	3-Apr-13	15:46:00	01:00.0	45.2
M7	3-Apr-13	15:47:00	01:00.0	51.5
M7	3-Apr-13	15:48:00	01:00.0	49.3
M7	3-Apr-13	15:49:00	01:00.0	48.7
M7	3-Apr-13	15:50:00	01:00.0	51.7
M7	3-Apr-13	15:51:00	01:00.0	49.3

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M7	3-Apr-13	15:52:00	01:00.0	49.5
M7	3-Apr-13	15:53:00	01:00.0	47.0
M7	3-Apr-13	15:54:00	01:00.0	52.0
M7	3-Apr-13	15:55:00	01:00.0	45.6
M7	3-Apr-13	15:56:00	01:00.0	49.4
M7	3-Apr-13	15:57:00	01:00.0	47.0
M7	3-Apr-13	15:58:00	01:00.0	50.1
M7	3-Apr-13	15:59:00	01:00.0	55.2
M7	3-Apr-13	16:00:00	01:00.0	68.7
M7	3-Apr-13	16:01:00	01:00.0	58.1
M7	3-Apr-13	16:02:00	01:00.0	63.9
M7	3-Apr-13	16:03:00	01:00.0	48.1
M7	3-Apr-13	16:04:00	01:00.0	47.8
M7	3-Apr-13	16:05:00	01:00.0	60.7
M7	3-Apr-13	16:06:00	01:00.0	56.1
M7	3-Apr-13	16:07:00	01:00.0	57.9
M7	3-Apr-13	16:08:00	01:00.0	55.0
M7	3-Apr-13	16:09:00	01:00.0	49.7
M7	3-Apr-13	16:10:00	00:36.6	46.4
M5	3-Apr-13	16:57:45	00:14.1	53.6
M5	3-Apr-13	16:58:00	01:00.0	55.2
M5	3-Apr-13	16:59:00	01:00.0	54.2
M5	3-Apr-13	17:00:00	01:00.0	58.1
M5	3-Apr-13	17:01:00	01:00.0	55.6
M5	3-Apr-13	17:02:00	01:00.0	58.6
M5	3-Apr-13	17:03:00	01:00.0	56.9
M5	3-Apr-13	17:04:00	01:00.0	54.8
M5	3-Apr-13	17:05:00	01:00.0	55.9
M5	3-Apr-13	17:06:00	01:00.0	55.3
M5	3-Apr-13	17:07:00	01:00.0	54.4
M5	3-Apr-13	17:08:00	01:00.0	56.9
M5	3-Apr-13	17:09:00	01:00.0	59.9
M5	3-Apr-13	17:10:00	01:00.0	55.6
M5	3-Apr-13	17:11:00	01:00.0	54.5
M5	3-Apr-13	17:12:00	01:00.0	56.4
M5	3-Apr-13	17:13:00	01:00.0	58.5
M5	3-Apr-13	17:14:00	01:00.0	58.8
M5	3-Apr-13	17:15:00	01:00.0	55.0
M5	3-Apr-13	17:16:00	01:00.0	55.1
M5	3-Apr-13	17:17:00	01:00.0	59.0

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M5	3-Apr-13	17:18:00	01:00.0	53.5
M5	3-Apr-13	17:19:00	01:00.0	56.0
M5	3-Apr-13	17:20:00	01:00.0	56.3
M5	3-Apr-13	17:21:00	01:00.0	60.7
M5	3-Apr-13	17:22:00	01:00.0	60.4
M5	3-Apr-13	17:23:00	01:00.0	58.7
M5	3-Apr-13	17:24:00	01:00.0	59.5
M5	3-Apr-13	17:25:00	01:00.0	56.9
M5	3-Apr-13	17:26:00	01:00.0	57.3
M5	3-Apr-13	17:27:00	01:00.0	57.1
M5	3-Apr-13	17:28:00	00:30.5	57.1
M6	4-Apr-13	10:07:50	00:09.2	44.9
M6	4-Apr-13	10:08:00	01:00.0	41.3
M6	4-Apr-13	10:09:00	01:00.0	43.0
M6	4-Apr-13	10:10:00	01:00.0	36.9
M6	4-Apr-13	10:11:00	01:00.0	46.0
M6	4-Apr-13	10:12:00	01:00.0	39.8
M6	4-Apr-13	10:13:00	01:00.0	37.3
M6	4-Apr-13	10:14:00	01:00.0	41.7
M6	4-Apr-13	10:15:00	01:00.0	34.6
M6	4-Apr-13	10:16:00	01:00.0	34.4
M6	4-Apr-13	10:17:00	01:00.0	41.7
M6	4-Apr-13	10:18:00	01:00.0	38.2
M6	4-Apr-13	10:19:00	01:00.0	46.2
M6	4-Apr-13	10:20:00	01:00.0	37.9
M6	4-Apr-13	10:21:00	01:00.0	35.2
M6	4-Apr-13	10:22:00	01:00.0	39.8
M6	4-Apr-13	10:23:00	01:00.0	42.5
M6	4-Apr-13	10:24:00	01:00.0	35.1
M6	4-Apr-13	10:25:00	01:00.0	48.5
M6	4-Apr-13	10:26:00	01:00.0	34.4
M6	4-Apr-13	10:27:00	01:00.0	33.6
M6	4-Apr-13	10:28:00	01:00.0	35.4
M6	4-Apr-13	10:29:00	01:00.0	52.6
M6	4-Apr-13	10:30:00	01:00.0	46.1
M6	4-Apr-13	10:31:00	01:00.0	50.5
M6	4-Apr-13	10:32:00	01:00.0	46.6
M6	4-Apr-13	10:33:00	01:00.0	38.2
M6	4-Apr-13	10:34:00	01:00.0	31.2
M6	4-Apr-13	10:35:00	01:00.0	38.0

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M6	4-Apr-13	10:36:00	01:00.0	32.6
M6	4-Apr-13	10:37:00	01:00.0	35.4
M6	4-Apr-13	10:38:00	01:00.0	41.0
M6	4-Apr-13	10:39:00	00:22.1	39.5
M4	4-Apr-13	11:11:23	00:36.1	53.8
M4	4-Apr-13	11:12:00	01:00.0	48.1
M4	4-Apr-13	11:13:00	01:00.0	45.7
M4	4-Apr-13	11:14:00	01:00.0	43.7
M4	4-Apr-13	11:15:00	01:00.0	36.8
M4	4-Apr-13	11:16:00	01:00.0	45.2
M4	4-Apr-13	11:17:00	01:00.0	43.6
M4	4-Apr-13	11:18:00	01:00.0	40.4
M4	4-Apr-13	11:19:00	01:00.0	44.5
M4	4-Apr-13	11:20:00	01:00.0	40.0
M4	4-Apr-13	11:21:00	01:00.0	44.8
M4	4-Apr-13	11:22:00	01:00.0	37.3
M4	4-Apr-13	11:23:00	01:00.0	45.7
M4	4-Apr-13	11:24:00	01:00.0	39.9
M4	4-Apr-13	11:25:00	01:00.0	44.5
M4	4-Apr-13	11:26:00	01:00.0	41.4
M4	4-Apr-13	11:27:00	01:00.0	39.8
M4	4-Apr-13	11:28:00	01:00.0	46.3
M4	4-Apr-13	11:29:00	01:00.0	46.5
M4	4-Apr-13	11:30:00	01:00.0	40.6
M4	4-Apr-13	11:31:00	01:00.0	53.9
M4	4-Apr-13	11:32:00	01:00.0	41.7
M4	4-Apr-13	11:33:00	01:00.0	46.9
M4	4-Apr-13	11:34:00	01:00.0	45.9
M4	4-Apr-13	11:35:00	01:00.0	40.2
M4	4-Apr-13	11:36:00	01:00.0	30.5
M4	4-Apr-13	11:37:00	01:00.0	41.1
M4	4-Apr-13	11:38:00	01:00.0	42.5
M4	4-Apr-13	11:39:00	01:00.0	38.8
M4	4-Apr-13	11:40:00	01:00.0	38.0
M4	4-Apr-13	11:41:00	01:00.0	39.4
M4	4-Apr-13	11:42:00	00:27.9	32.7
M3	4-Apr-13	12:09:02	00:57.7	48.0
M3	4-Apr-13	12:10:00	01:00.0	33.2
M3	4-Apr-13	12:11:00	01:00.0	49.2
M3	4-Apr-13	12:12:00	01:00.0	48.0

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M3	4-Apr-13	12:13:00	01:00.0	48.4
M3	4-Apr-13	12:14:00	01:00.0	47.0
M3	4-Apr-13	12:15:00	01:00.0	36.8
M3	4-Apr-13	12:16:00	01:00.0	48.7
M3	4-Apr-13	12:17:00	01:00.0	44.9
M3	4-Apr-13	12:18:00	01:00.0	47.6
M3	4-Apr-13	12:19:00	01:00.0	49.7
M3	4-Apr-13	12:20:00	01:00.0	43.0
M3	4-Apr-13	12:21:00	01:00.0	49.8
M3	4-Apr-13	12:22:00	01:00.0	36.4
M3	4-Apr-13	12:23:00	01:00.0	48.3
M3	4-Apr-13	12:24:00	01:00.0	47.5
M3	4-Apr-13	12:25:00	01:00.0	48.6
M3	4-Apr-13	12:26:00	01:00.0	45.3
M3	4-Apr-13	12:27:00	01:00.0	44.9
M3	4-Apr-13	12:28:00	01:00.0	51.1
M3	4-Apr-13	12:29:00	01:00.0	46.7
M3	4-Apr-13	12:30:00	01:00.0	49.5
M3	4-Apr-13	12:31:00	01:00.0	51.4
M3	4-Apr-13	12:32:00	01:00.0	49.4
M3	4-Apr-13	12:33:00	01:00.0	53.9
M3	4-Apr-13	12:34:00	01:00.0	51.5
M3	4-Apr-13	12:35:00	01:00.0	47.0
M3	4-Apr-13	12:36:00	01:00.0	56.5
M3	4-Apr-13	12:37:00	01:00.0	48.7
M3	4-Apr-13	12:38:00	01:00.0	52.9
M3	4-Apr-13	12:39:00	01:00.0	48.7
M3	4-Apr-13	12:40:00	00:15.1	43.7
M1	4-Apr-13	13:09:57	00:02.9	60.9
M1	4-Apr-13	13:10:00	01:00.0	55.1
M1	4-Apr-13	13:11:00	01:00.0	54.7
M1	4-Apr-13	13:12:00	01:00.0	57.3
M1	4-Apr-13	13:13:00	01:00.0	53.7
M1	4-Apr-13	13:14:00	01:00.0	55.8
M1	4-Apr-13	13:15:00	01:00.0	55.5
M1	4-Apr-13	13:16:00	01:00.0	55.9
M1	4-Apr-13	13:17:00	01:00.0	59.1
M1	4-Apr-13	13:18:00	01:00.0	53.1
M1	4-Apr-13	13:19:00	01:00.0	49.4
M1	4-Apr-13	13:20:00	01:00.0	55.9

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M1	4-Apr-13	13:21:00	01:00.0	55.6
M1	4-Apr-13	13:22:00	01:00.0	52.6
M1	4-Apr-13	13:23:00	01:00.0	54.2
M1	4-Apr-13	13:24:00	01:00.0	56.6
M1	4-Apr-13	13:25:00	01:00.0	52.1
M1	4-Apr-13	13:26:00	01:00.0	52.9
M1	4-Apr-13	13:27:00	01:00.0	54.6
M1	4-Apr-13	13:28:00	01:00.0	52.7
M1	4-Apr-13	13:29:00	01:00.0	49.9
M1	4-Apr-13	13:30:00	01:00.0	50.4
M1	4-Apr-13	13:31:00	01:00.0	49.1
M1	4-Apr-13	13:32:00	01:00.0	53.7
M1	4-Apr-13	13:33:00	01:00.0	55.7
M1	4-Apr-13	13:34:00	01:00.0	55.5
M1	4-Apr-13	13:35:00	01:00.0	58.3
M1	4-Apr-13	13:36:00	01:00.0	52.6
M1	4-Apr-13	13:37:00	01:00.0	54.3
M1	4-Apr-13	13:38:00	01:00.0	56.3
M1	4-Apr-13	13:39:00	01:00.0	51.6
M1	4-Apr-13	13:40:00	00:24.8	52.5
M2	4-Apr-13	15:08:30	00:29.8	38.4
M2	4-Apr-13	15:09:00	01:00.0	42.5
M2	4-Apr-13	15:10:00	01:00.0	39.3
M2	4-Apr-13	15:11:00	01:00.0	42.1
M2	4-Apr-13	15:12:00	01:00.0	43.4
M2	4-Apr-13	15:13:00	01:00.0	39.6
M2	4-Apr-13	15:14:00	01:00.0	39.8
M2	4-Apr-13	15:15:00	01:00.0	36.9
M2	4-Apr-13	15:16:00	01:00.0	35.7
M2	4-Apr-13	15:17:00	01:00.0	43.2
M2	4-Apr-13	15:18:00	01:00.0	39.8
M2	4-Apr-13	15:19:00	01:00.0	40.5
M2	4-Apr-13	15:20:00	01:00.0	37.7
M2	4-Apr-13	15:21:00	01:00.0	40.8
M2	4-Apr-13	15:22:00	01:00.0	46.8
M2	4-Apr-13	15:23:00	01:00.0	40.1
M2	4-Apr-13	15:24:00	01:00.0	43.1
M2	4-Apr-13	15:25:00	01:00.0	49.2
M2	4-Apr-13	15:26:00	01:00.0	41.3
M2	4-Apr-13	15:27:00	01:00.0	37.7

Meas Site No.	Date	Start Time	Duration (sec)	Leq (dBA)
M2	4-Apr-13	15:28:00	01:00.0	41.0
M2	4-Apr-13	15:29:00	01:00.0	41.1
M2	4-Apr-13	15:30:00	01:00.0	40.1
M2	4-Apr-13	15:31:00	01:00.0	39.9
M2	4-Apr-13	15:32:00	01:00.0	39.6
M2	4-Apr-13	15:33:00	01:00.0	43.2
M2	4-Apr-13	15:34:00	01:00.0	43.9
M2	4-Apr-13	15:35:00	01:00.0	40.3
M2	4-Apr-13	15:36:00	01:00.0	41.6
M2	4-Apr-13	15:37:00	01:00.0	39.7
M2	4-Apr-13	15:38:00	01:00.0	40.8
M2	4-Apr-13	15:39:00	00:10.2	42.3

Table 14 Noise Monitor Output - Calibration Record

Date	Time	Level	Offset	Status
3-Apr-13	10:42:01	94.0	9.6	Stable
3-Apr-13	11:18:17	94.0	9.6	Stable
3-Apr-13	11:59:28	94.1	9.6	Stable
3-Apr-13	12:31:41	93.9	9.6	Stable
3-Apr-13	12:59:43	94.0	9.6	Stable
3-Apr-13	13:34:09	93.9	9.6	Stable
3-Apr-13	15:38:00	93.7	9.6	Stable
3-Apr-13	16:14:06	94.1	9.6	Stable
3-Apr-13	16:55:51	94.0	9.6	Stable
3-Apr-13	17:31:33	94.1	9.6	Stable
4-Apr-13	10:05:16	93.9	9.6	Stable
4-Apr-13	10:43:37	93.8	9.6	Stable
4-Apr-13	11:08:57	94.0	9.6	Stable
4-Apr-13	11:43:00	94.0	9.6	Stable
4-Apr-13	12:08:21	94.0	9.6	Stable
4-Apr-13	12:40:54	94.0	9.6	Stable
4-Apr-13	13:08:43	94.0	9.6	Stable
4-Apr-13	13:41:07	93.8	9.6	Stable
4-Apr-13	15:06:37	93.8	9.6	Stable
4-Apr-13	15:39:34	93.7	9.6	Stable
3-Apr-13	10:42:01	94.0	9.6	Stable



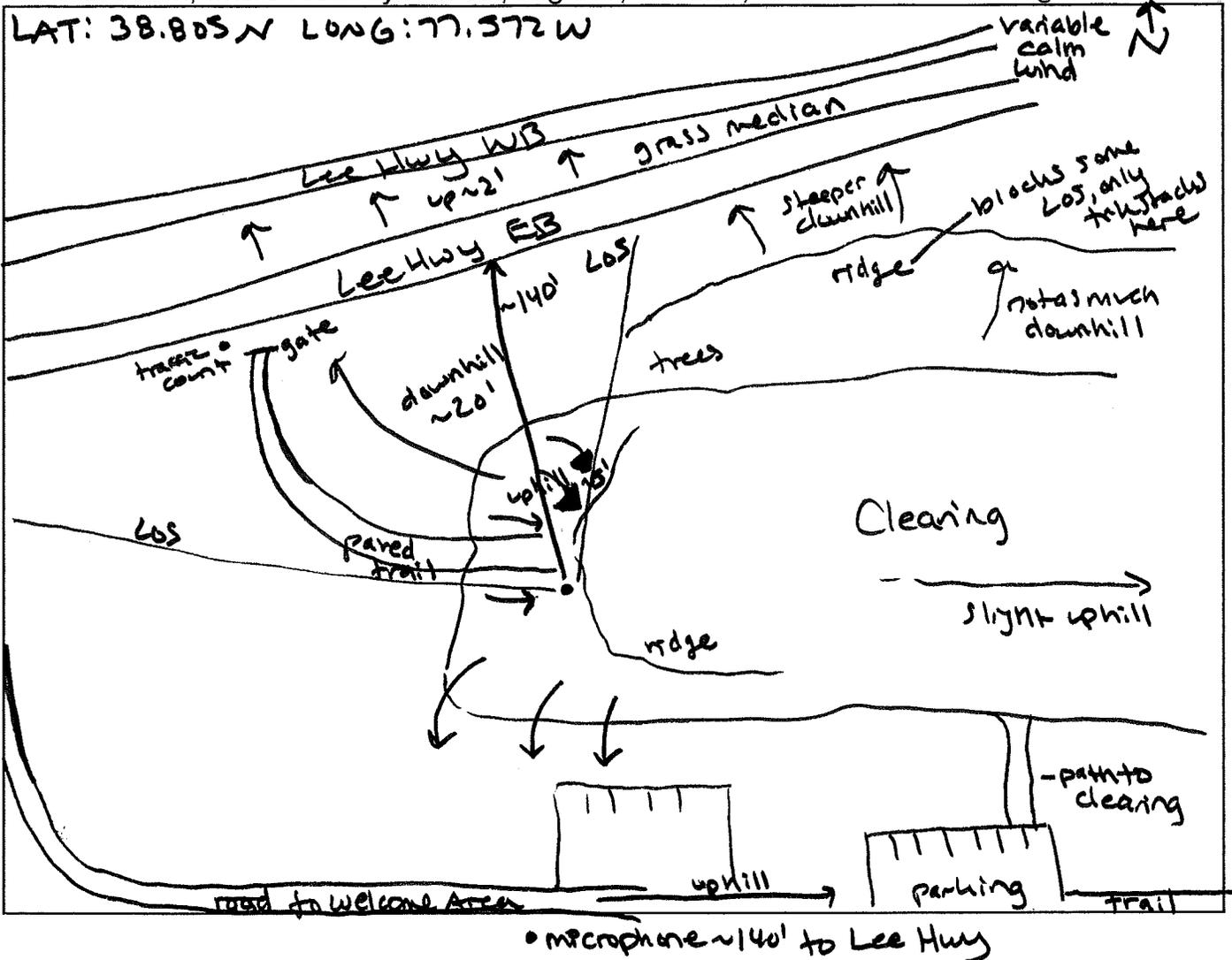
PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William County MEASUREMENT SITE NO.: M1
ADDRESS: 12521 Lee Highway
OWNER: Manassas National Battlefield
DESCRIPTION: Park, historic
NOISE SOURCES: Lee Hwy (29), leaves/wind, birds, people
NOISE MONITOR: LOB70#2 S/N: A0256
MICROPHONE: LOPRM900C S/N: 0862
CALIBRATOR: B&K Type 4231 S/N: 2039365
TEMP. RANGE (°F): 55°F, 20% Hum WEATHER CONDITIONS: sunny, 0-3 mph wind

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M1

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M1

PERSONNEL: RAM

LOCATION/ADDRESS: 12521 Lee Hwy

DATE: April 4 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	13:10	55.1						Cal check: 94.0 dB
2	11	54.7						offset 9.6
3	12	57.3						
4	13	53.7						
5	14	55.8						
6	15	55.5						
7	16	55.9						
8	17	59.1						
9	18	53.1						
10	19	49.4						
11	20	55.9						distant children talking
12	21	55.6						
13	22	52.6						
14	23	54.2						
15	24	56.0						distant train horn
16	25	52.1						
17	26	52.9						
18	27	54.6						
19	28	52.7					hearing possible overflights, may be distant trucks	
20	29	49.9						
21	30	50.4						
22	31	49.1						
23	32	53.7						
24	33	55.7						
25	34	55.5						
26	35	58.3	√					helicopter in area?
27	36	52.6						
28	37	54.3						
29	38	56.9						
30	39	51.6					jet over flight	Cal check: 93.8 dB offset 9.6

TOTAL Leq =

SUBSET Leq =

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<



PROJECT: Tri-County Parkway

JOB NO.:

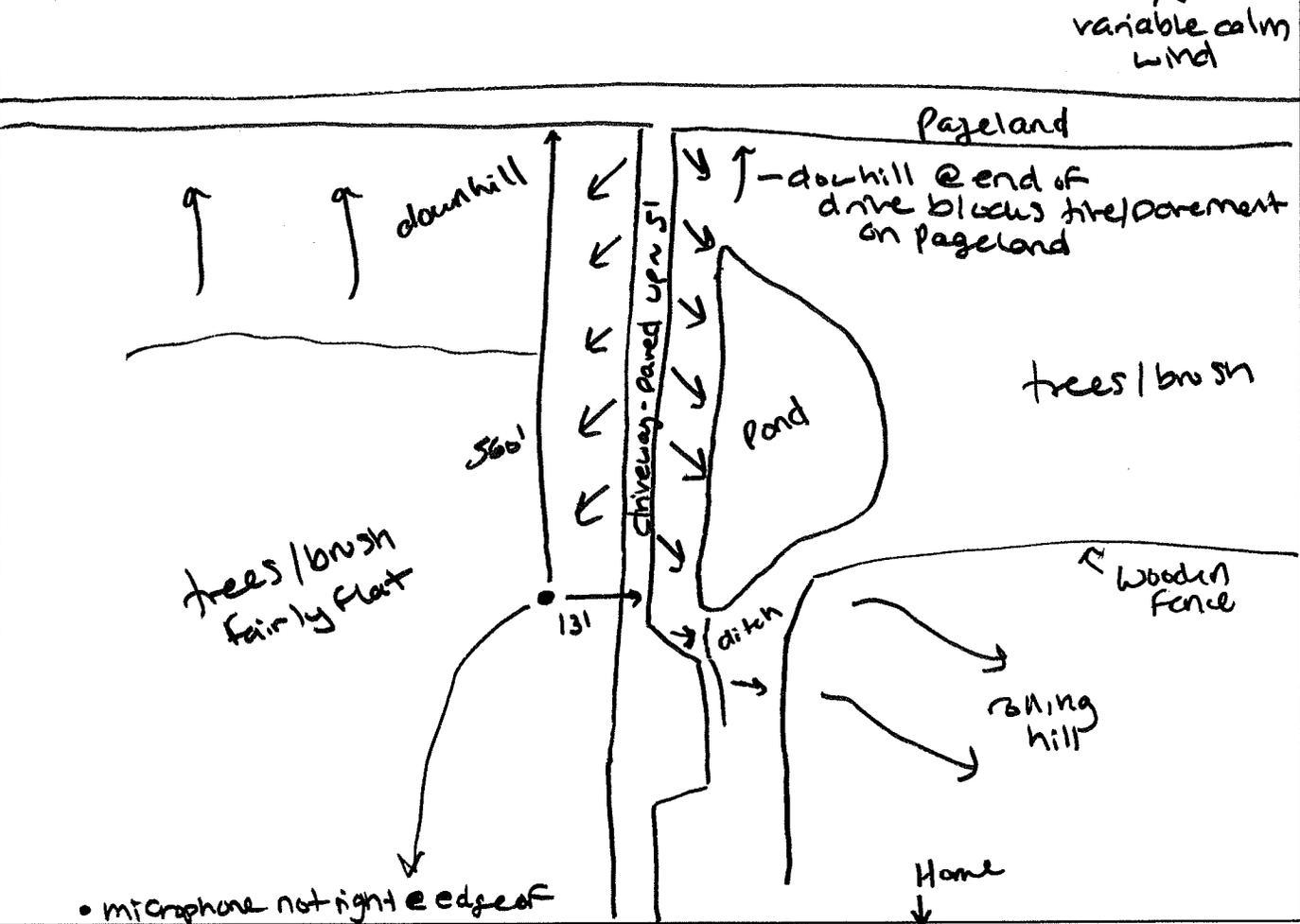
HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William County MEASUREMENT SITE NO.: M2
 ADDRESS: 6389 Pageland Lane
 OWNER: Ghadban
 DESCRIPTION: SF
 NOISE SOURCES: Pageland, overflights, birds/wildlife in woods
 NOISE MONITOR: LD 870 #2 S/N: A0256
 MICROPHONE: LO PRM900C S/N: 0862
 CALIBRATOR: Don Type 4231 S/N: 2039365
 TEMP. RANGE (°F): 55°F, 20% Hum WEATHER CONDITIONS: partly sunny, 0-3 mph wind

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.

LAT: 38.821 N LONG: 77.570 W



• microphone not right @ edge of pond, ~45' back



Site M2

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M2

PERSONNEL: RAM

LOCATION/ADDRESS: 6389 Pageland Ln

DATE: April 4 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	15:09	42.5						Cal Check: 93.8 dB
2	10	39.3						offset 9.6
3	11	42.1						
4	12	43.4						
5	13	39.6						
6	14	39.8						
7	15	36.9						
8	16	35.7						
9	17	43.2						distant jet or flight
10	18	39.8						
11	19	40.5						
12	20	37.7						
13	21	40.8						
14	22	46.8	X					trump horn Pageland
15	23	40.1						noise in woods
16	24	43.1						distant jet
17	25	49.2						jet or flight - DEP?
18	26	41.3					can hear a woodpecker	continues a bit
19	27	37.7						
20	28	41.0						distant jet
21	29	41.1						
22	30	40.1						
23	31	39.9						
24	32	39.6						
25	33	43.2						
26	34	43.9						distant jet
27	35	40.3						duck/goose calls
28	36	41.4						
29	37	39.7						distant jets
30	38	40.8						Cal Check: 93.4 dB offset 9.6

TOTAL Leq =

SUBSET Leq =

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<



PROJECT: Tri-County Parkway
 JOB NO.: HMMH Job No. 305000.009

TRAFFIC VOLUME COUNT DATA SHEET

ASSESSMENT AREA: _____ START TIME: _____
 MEASUREMENT SITE NO.: M2 END TIME: _____
 ADDRESS/DESCRIPTION: 6389 Pageland Ln DATE: April 4 2013
 PERSONNEL: RAM / KCH

M2
 Roadway: Pageland Ln
 First Sample (30 minutes)
 Start Time: 15:09
 speed - 50 to 55 mph
 speed limit - 45 mph

	DIRECTION 1 <u>NB</u>	DIRECTION 2 <u>SB</u>
Automobiles	<u>37</u>	<u>77</u>
Medium Trucks (6 Tires)	<u>4</u>	<u>7</u>
Heavy Trucks (>6 Tires)	<u>1</u>	<u>2</u>

Roadway: _____
 Second Sample (_____ minutes)
 Start Time: _____

Automobiles	_____	_____
Medium Trucks (6 Tires)	_____	_____
Heavy Trucks (>6 Tires)	_____	_____

Roadway: _____
 Third Sample (_____ minutes)
 Start Time: _____

Automobiles	_____	_____
Medium Trucks (6 Tires)	_____	_____
Heavy Trucks (>6 Tires)	_____	_____

Roadway: _____
 Fourth Sample (_____ minutes)
 Start Time: _____

Automobiles	_____	_____
Medium Trucks (6 Tires)	_____	_____
Heavy Trucks (>6 Tires)	_____	_____

Notes:



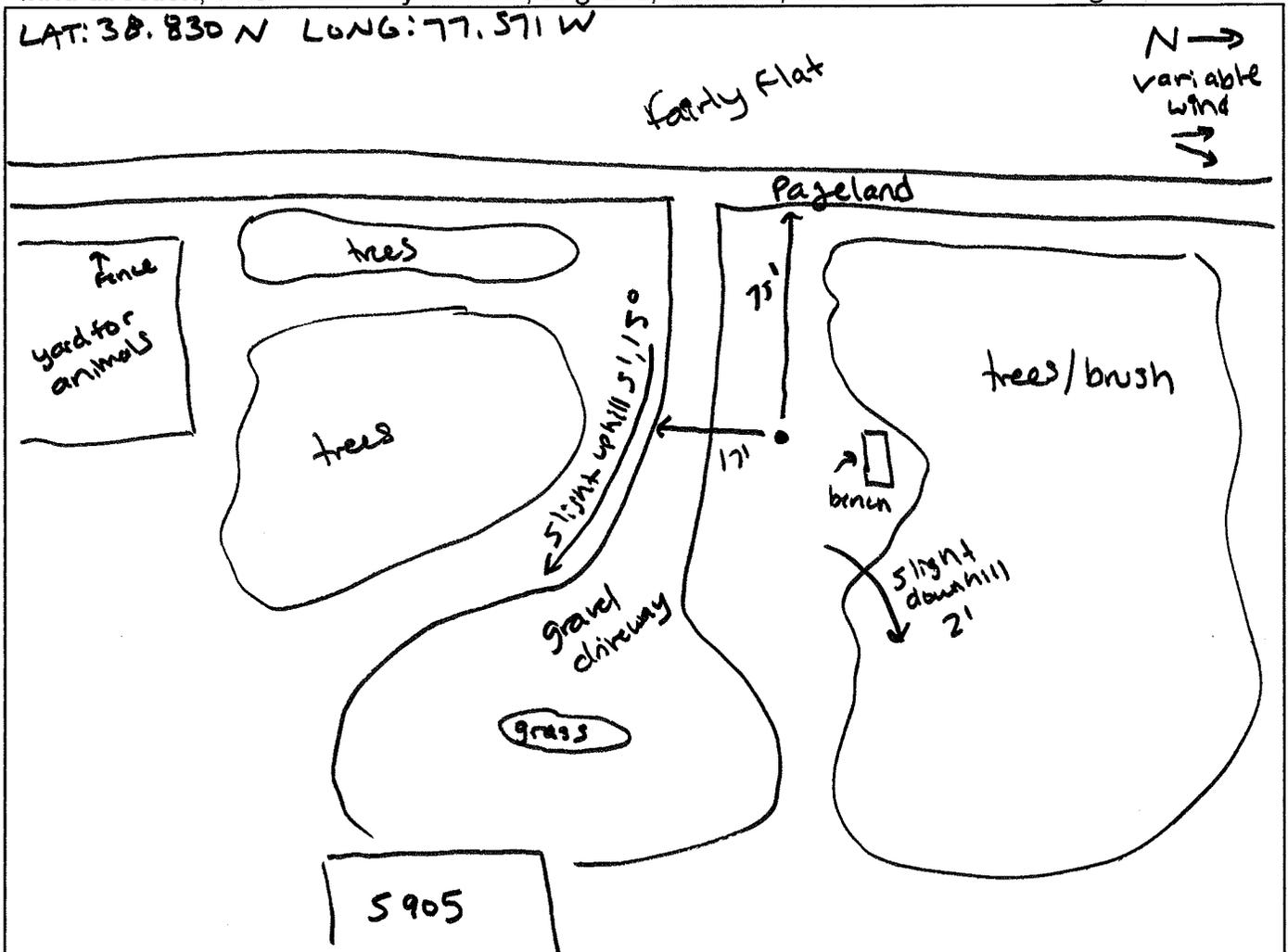
PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William County MEASUREMENT SITE NO.: M3
 ADDRESS: 5905 Pageland Lane
 OWNER: Yamber
 DESCRIPTION: SF
 NOISE SOURCES: Pageland, overflights, farm animals & wildlife
 NOISE MONITOR: LD 87042 S/N: A0256
 MICROPHONE: LD PRM 9006 S/N: 0862
 CALIBRATOR: B&K Type 4231 S/N: 2039365
 TEMP. RANGE (°F): 50°F, 30% Hum WEATHER CONDITIONS: sunny, 0-5 mph wind up to 10 mph gusts

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M3

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M3

PERSONNEL: RAM

LOCATION/ADDRESS: 5905 Pageland Ln

DATE: April 4, 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	12:10	33.2		no pageland traffic				Cal Check: 94.0dB offset 9.6
2	11	49.2						
3	12	48.0						
4	13	48.4						
5	14	47.0						
6	15	36.8						
7	16	48.7						
8	17	44.9						
9	18	47.6						
10	19	49.7						jet over flights
11	20	43.0						
12	21	49.8						
13	22	36.4						
14	23	48.3						jet over flights
15	24	47.5						
16	25	48.6						SLM note: Pageland traffic hits 60 dB, off flight only low-mid class
17	26	45.3						prop over flight
18	27	44.9						Sch bus 64dB max jet over flight
19	28	51.1						
20	29	46.7						
21	30	49.5						
22	31	51.84	√				birds	jet-DEP-max 60dB another jet
23	32	49.4						
24	33	53.9					loud auto Pageland	
25	34	51.5						
26	35	47.0						
27	36	56.5					hvy Pageland traffic	
28	37	48.7						jet DEP, max 63dB
29	38	52.9	√					longer in this minute
30	39	48.7						Cal check: 94.0dB offset 9.6

TOTAL Leq =

SUBSET Leq =

offset 9.6

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

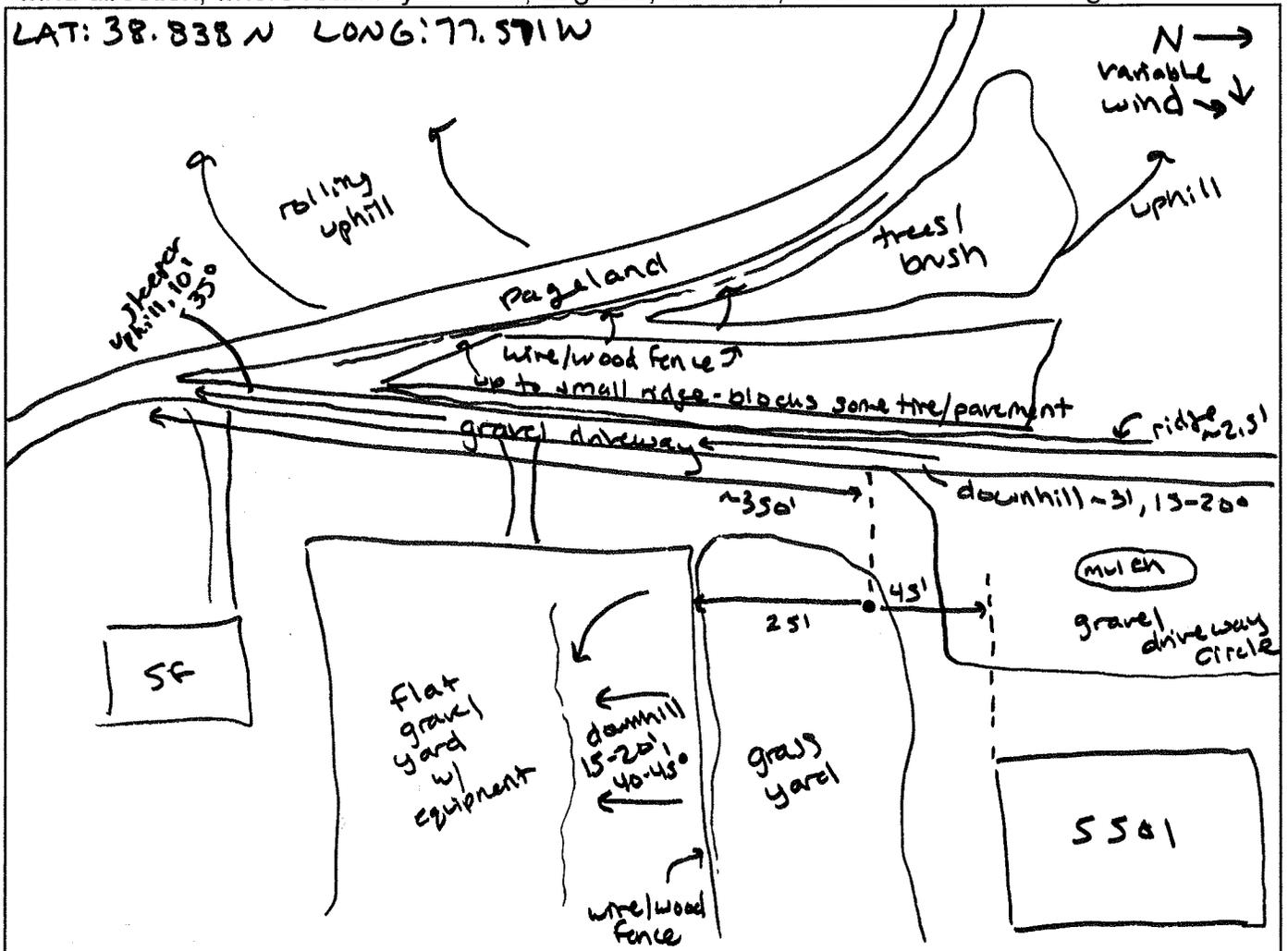


PROJECT: Tri-County Parkway
JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William county MEASUREMENT SITE NO.: MY
ADDRESS: 5501 Pageland Lane
OWNER: Abdullah
DESCRIPTION: SF
NOISE SOURCES: Pageland, roosters, overflights
NOISE MONITOR: LD 870 #2 S/N: A0256
MICROPHONE: LD PRM 9006 S/N: 0862
CALIBRATOR: B&K Type 4231 S/N: 2039365
TEMP. RANGE (°F): 50°F, 30% Hum WEATHER CONDITIONS: sunny, 0-5mph wind up to 10mph gusts

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M4

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M4

PERSONNEL: RAM

LOCATION/ADDRESS: 5501 Pageland Ln

DATE: April 4 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	11:12	48.1					jet overflight	Cal check: 94.0 dBA offset -9.6
2	13	45.7						
3	14	43.7						some rooster calls
4	15	36.8						
5	16	45.2						
6	17	43.6						distant prop overflight
7	18	40.4						
8	19	44.5						
9	20	40.6						
10	21	44.8						
11	22	37.3						
12	23	45.7						
13	24	39.9						
14	25	44.5						
15	26	41.4						
16	27	39.8						
17	28	46.3						
18	29	46.5						some yard activity
19	30	40.6						
20	31	53.9	X				distant jet	resident talking
21	32	41.7						distant prop
22	33	46.9						distant jet
23	34	45.9						↓
24	35	40.2						Some rooster calls
25	36	30.5						
26	37	41.1						
27	38	42.5						
28	39	38.8						
29	40	38.0						
30	41	39.4						Cal check: 94.0 dBA offset -9.6

TOTAL Leq =

SUBSET Leq =

overflights not dominating over Pageland offset 9.6

√ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

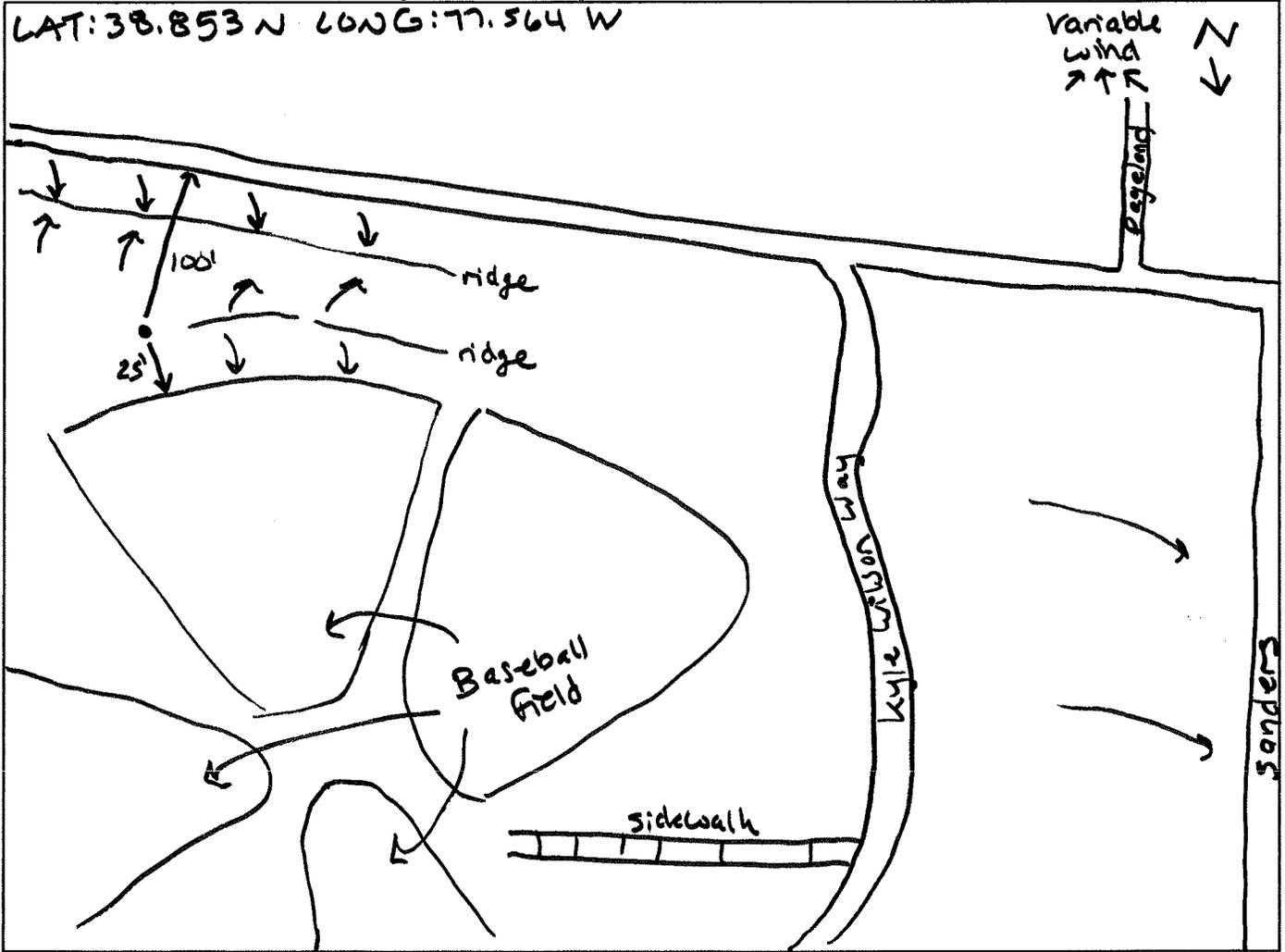


PROJECT: Tri-County Parkway
JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William County MEASUREMENT SITE NO.: M5
ADDRESS: 4805 Sudley Rd / Kyle Wilson Way
OWNER: Catharpin Park
DESCRIPTION: Park - baseball fields
NOISE SOURCES: Sudley Rd (234), overflights, wind
NOISE MONITOR: LD870 #2 S/N: A0256
MICROPHONE: LDERM900C S/N: 0862
CALIBRATOR: B&K Type 4231 S/N: 2039365
TEMP. RANGE (°F): 55-60°F, 25% Hum WEATHER CONDITIONS: sunny, wind 5-10mph gusts up to 17 mph

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M5

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M5

PERSONNEL: RAM

LOCATION/ADDRESS: Cotharpin Park, 4805 Sudley Rd

DATE: April 3 2013

#	Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	16:58	55.2						Cal check: 94.0 dBA offset 9.6
2	59	54.2					jet overflight	
3	17:00	58.1						
4	01	55.6						
5	02	58.6					jet overflight	
6	03	56.9						
7	04	54.8						
8	05	55.9						
9	06	55.3						
10	07	54.4					wind not over 12 mph, jets do not dominate over 234 due to high altitude	
11	08	56.9						jet overflight
12	09	59.9						
13	10	55.6						
14	11	54.5						
15	12	56.94						
16	13	58.5					jet overflight	
17	14	58.8	X				wind gusts 14-17 mph	
18	15	55.0	X					
19	16	55.1						
20	17	59.0	✓				jet overflight overhead	
21	18	53.5						heavy traffic 234 jet overflight (continues) truck exhaust 234
22	19	56.0						
23	20	56.3						
24	21	60.7						
25	22	60.4						
26	23	58.7	X				wind 15-17 mph	
27	24	59.5	X					
28	25	56.9						
29	26	57.3						
30	27	57.1					Cal check: 94.1 dBA	

TOTAL Leq =

SUBSET Leq =

offset 9.6

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

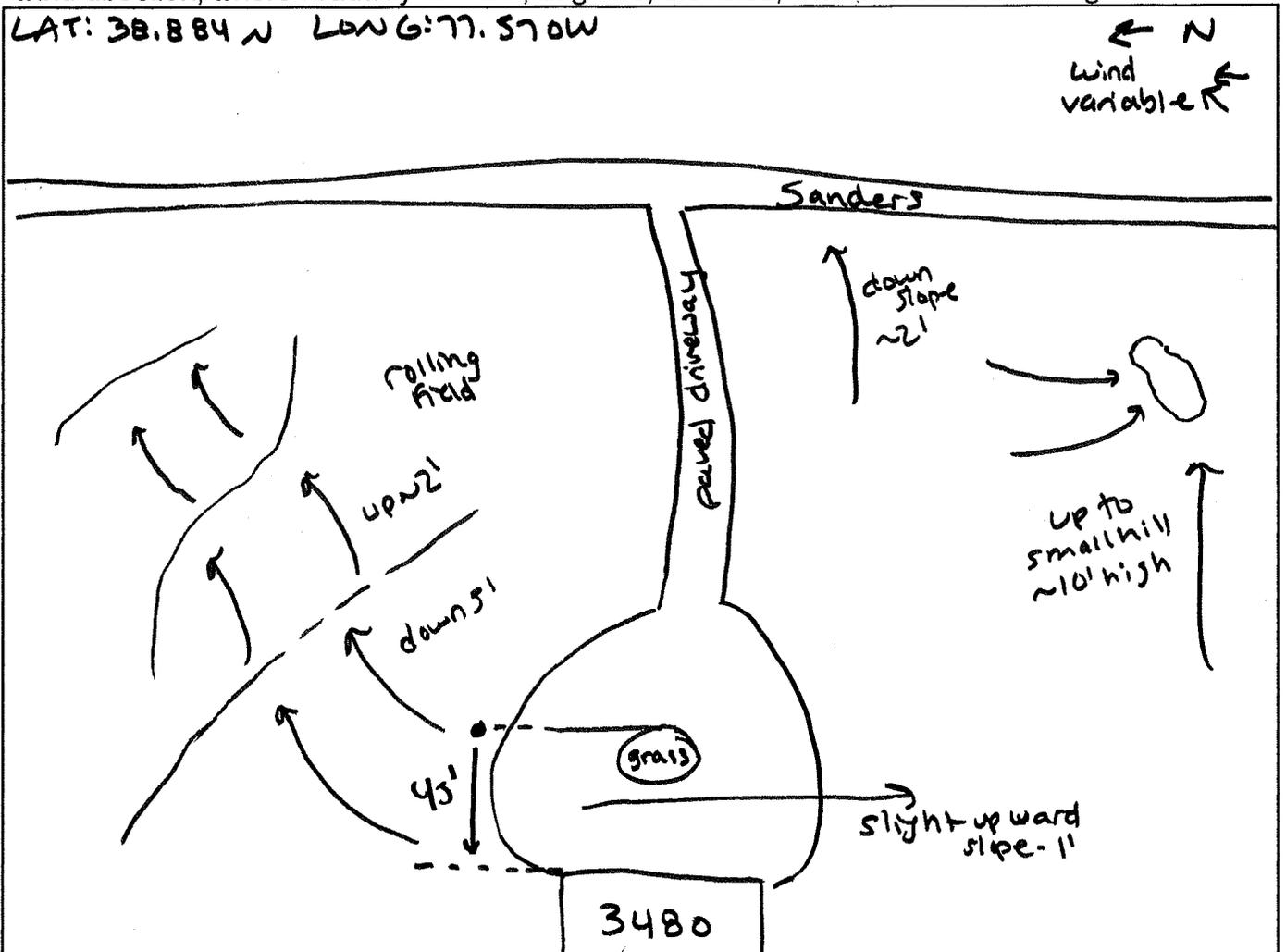


PROJECT: Tri-County Parkway
JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Prince William County MEASUREMENT SITE NO.: M6
ADDRESS: 3480 Sanders Lane
OWNER: Murray
DESCRIPTION: SF
NOISE SOURCES: Sanders (705), over flights, birds
NOISE MONITOR: LO870M2 S/N: A0256
MICROPHONE: LOPRM900C S/N: 0862
CALIBRATOR: B&K Type 4231 S/N: 2039365
TEMP. RANGE (°F): 50°F, 30% Hum WEATHER CONDITIONS: sunny, 0-3 mph wind

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M6

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: ML

PERSONNEL: RAM

LOCATION/ADDRESS: 3480 Sanders Ln

DATE: April 4 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	10:08	41.3					distant jet	Cal check: 93.9 dB offset 9.6
2	09	43.0					jet DEP	
3	10	36.9						
4	11	46.0						2 jets - 1 DEP, 1 ARR
5	12	39.8						
6	13	37.3						
7	14	41.7					auto 705	
8	15	34.6						
9	16	34.4						
10	17	41.7						jet overflight
11	18	38.2						
12	19	46.2						jet DEP?
13	20	37.9						strange bird call
14	21	35.2						
15	22	39.8						
16	23	42.5					auto 705	
17	24	35.1					auto w/ trailer 705	
18	25	48.5					auto 705	
19	26	34.4						
20	27	33.6						
21	28	35.4						
22	29	52.6					hydraulic 705	
23	30	46.1					↑	
24	31	50.5					more trucks	
25	32	46.6					autos	
26	33	38.2					↓	
27	34	31.2						
28	35	38.0						
29	36	32.6						
30	37	35.4						Cal check: 93.8 dB offset 9.6

TOTAL Leq =

SUBSET Leq =

offset 9.6

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

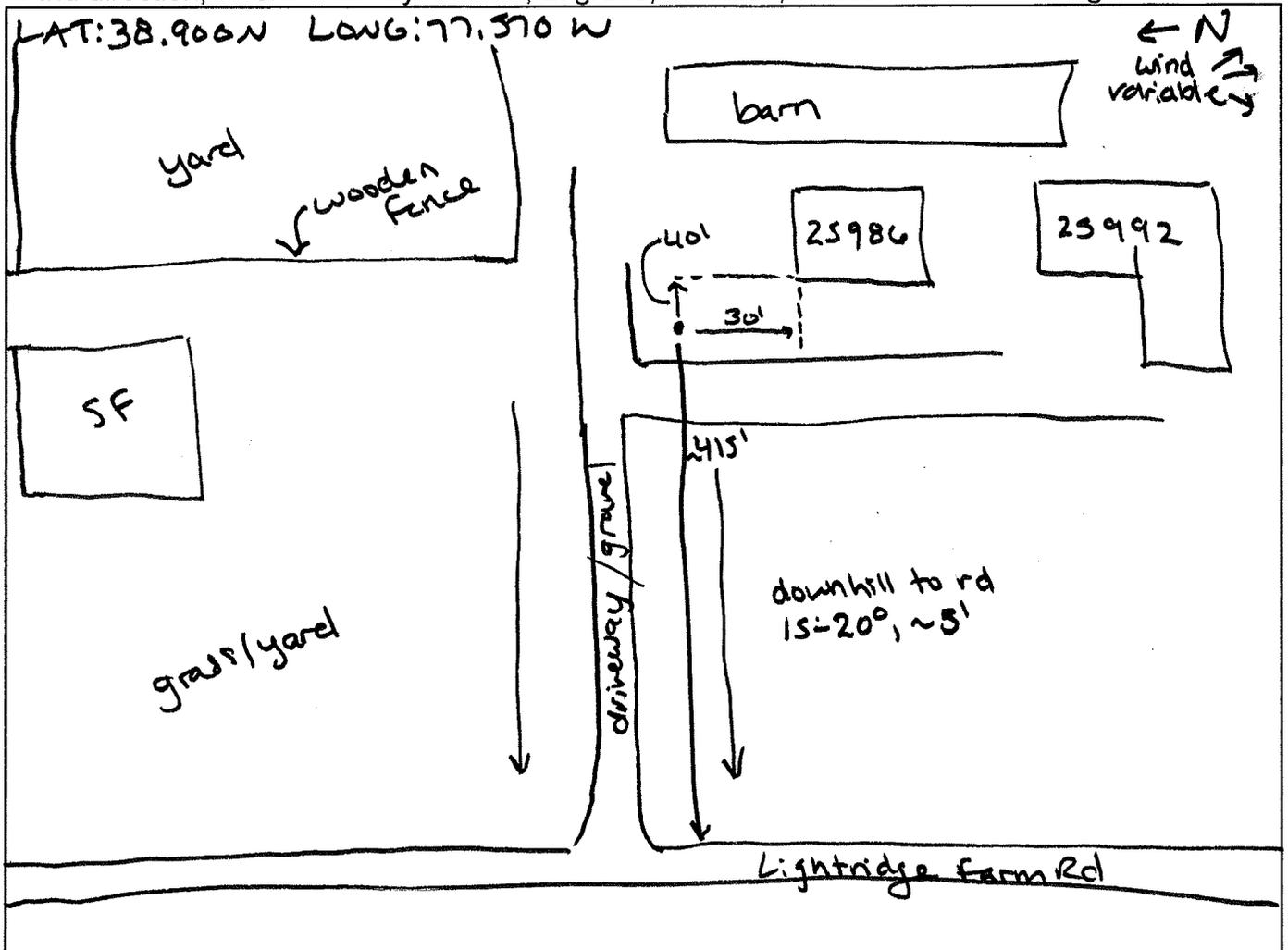


PROJECT: Tri-County Parkway
JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Loudoun County MEASUREMENT SITE NO.: M7
ADDRESS: 25992 Lightridge Farm Rd
OWNER: Light
DESCRIPTION: SF
NOISE SOURCES: Lightridge (705), resident + neighbor yard/house work
NOISE MONITOR: LD870#2 Wind S/N: A0256
MICROPHONE: LOPEM900C S/N: 0862
CALIBRATOR: B&K Type 4231 S/N: 2039365
TEMP. RANGE (°F): 55-60°F, 15% Hum WEATHER CONDITIONS: sunny, wind 5-10 mph, gusts up to 15 mph

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.



o microphone ~415' to Lightridge



Site M7

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M7

PERSONNEL: RAM

LOCATION/ADDRESS: 25992 Lighthridge Farm

DATE: April 3 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Driveway Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	15:40	47.1					distant jet	Cal check: 93.7 dB
2	41	45.9						offset 9.6
3	42	56.9					can hear distant work at neighbor's or elsewhere	jet overflight DEP?
4	43	49.4						jet overflight DEP?
5	44	51.4					banging machinery	jet overflight DEP?
6	45	40.7						
7	46	45.2						
8	47	51.5	X				wind gusts up to 15 mph	
9	48	49.3						
10	49	48.7						
11	50	51.7	X				wind gusts ~12 mph jets	
12	51	49.3						
13	52	49.5					wind gust ~11 mph	
14	53	47.0						
15	54	52.0						distant jet
16	55	45.6					auto 705	
17	56	49.4					rooster next door	distant jet
18	57	47.0						
19	58	50.1	X OK				2 autos 1 truck 705	
20	59	55.2	X					
21	16:00	68.7	X				car start, resident & workers leaving	
22	01	58.1	X					
23	02	63.9	X					
24	03	48.1						
25	04	47.8						
26	05	60.7	X				wind gusts 17 max	
27	06	56.1	X				" "	
28	07	57.9	X				" "	
29	08	55.0	X				hy truck 705	wind over 17 mph
30	09	49.7						Cal Check: 94.1 dB offset 9.6

TOTAL Leq =

SUBSET Leq =

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<



Site M8

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M8

PERSONNEL: RAM

LOCATION/ADDRESS: 25503 Kinsale P1

DATE: April 3 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	13:03	42.1						Cal Check: 94.0 dBA offset 9.6
2	04	42.3					distant jets	
3	05	44.0						
4	06	42.6						
5	07	43.4						
6	08	41.2		1 - Kinsale to Jubilant				
7	09	44.6						distant jets
8	10	42.7						
9	11	40.9						distant construction
10	12	46.6						jet overflight DEP
11	13	45.3						
12	14	41.8						distant jet ↓
13	15	44.2						
14	16	43.0						
15	17	42.9						
16	18	47.2						
17	19	43.8						
18	20	42.6						
19	21	39.5						
20	22	44.3						distant jet, lantern hitting post, etc to wind
21	23	45.1						
22	24	41.5						
23	25	44.5						
24	26	45.6						distant jet
25	27	42.3						
26	28	41.7						
27	29	65.6						jet overflight over head DEP
28	30	58.9						
29	31	46.2						
30	32	50.8					distant jet	Cal check: 93.9 dBA

TOTAL Leq =

SUBSET Leq =

offset 9.6

√ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

↑
No dominant roadway

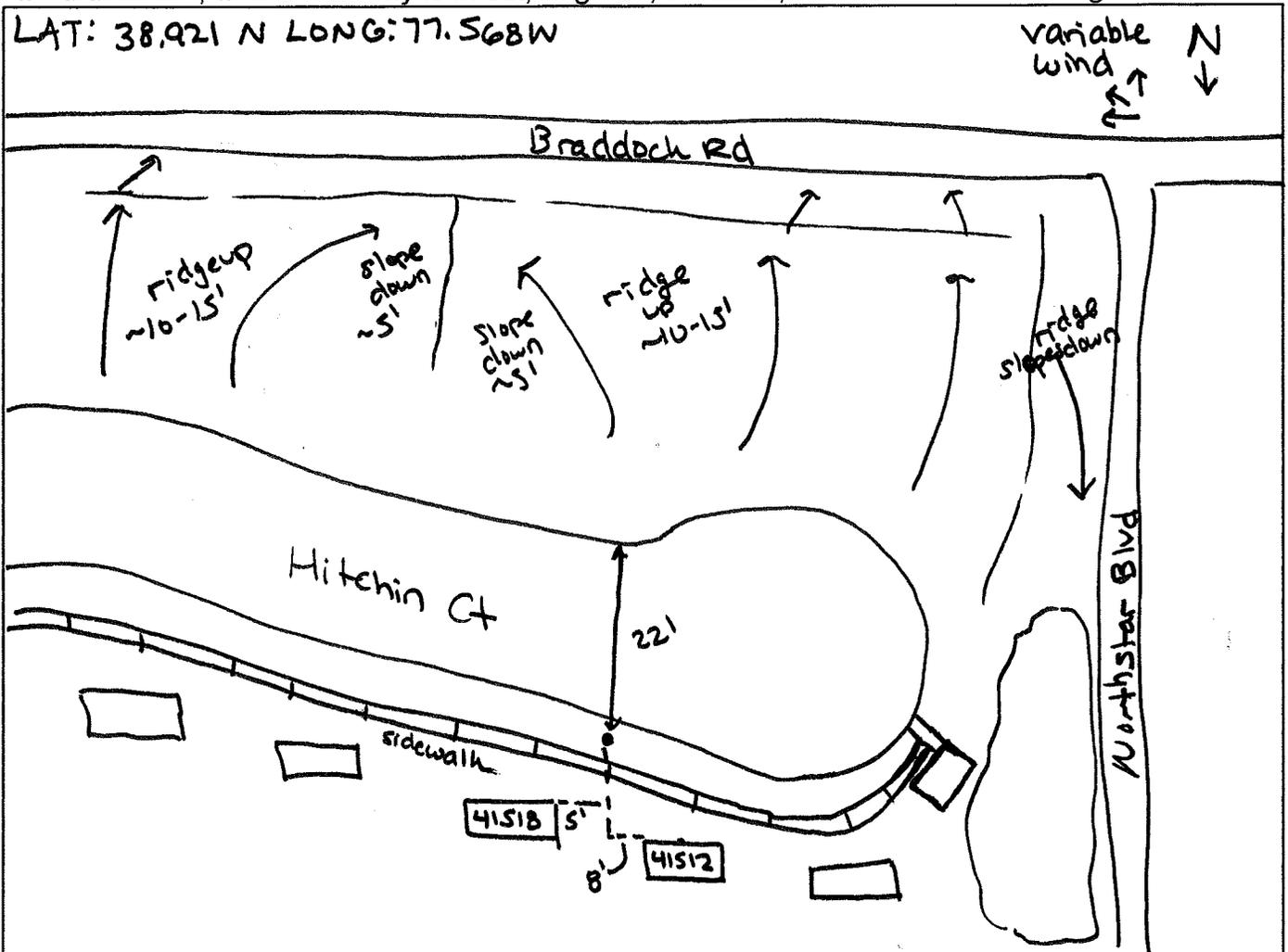


PROJECT: Tri-County Parkway
JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Louden County MEASUREMENT SITE NO.: M9
ADDRESS: 41512/41518 Hitchin Ct
OWNER: _____
DESCRIPTION: SF
NOISE SOURCES: Braddock Rd, Northstar Blvd, Hitchin, overflights,
NOISE MONITOR: LD870 #2 birds, resident activity S/N: A0256
MICROPHONE: LPFRM900C S/N: 6862
CALIBRATOR: B&K Type 4231 S/N: 2639365
TEMP. RANGE (°F): 50-55°F, 25% Hum WEATHER CONDITIONS: Sunny, 5-10mph wind up to 10mph gusts

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.





Site M9

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: M9

PERSONNEL: RAM

LOCATION/ADDRESS: 41521 41518 Hitchin Ct

DATE: April 3 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Hitchin/ Autos	Northstar Medium Trucks	Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	12:01	50.2					Some car doors	Cal check: 94.8 dB offset 9.6
2	02	47.5		1-NS				
3	03	53.3						
4	04	48.7						
5	05	49.8						
6	06	55.8	✓	1-NS	bus off NS to Braddock			jet overflight DEP
7	07	53.4					resident in garage - no leg effect	
8	08	53.4						
9	09	51.6						distant jet
10	10	41.4						
11	11	48.1						
12	12	50.5						
13	13	50.1						
14	14	46.4						
15	15	45.8						
16	16	53.4						
17	17	45.4		1-NS				
18	18	52.0						distant jets
19	19	46.2						
20	20	57.0	✓					jet DEP
21	21	56.3	✓				my truck Braddock	jet- DEP?
22	22	58.0	✓					jets here as well
23	23	53.2	✓			1-NS		2 jet DEP, higher altitude
24	24	47.1						
25	25	64.8	✓					jet DEP overflight
26	26	58.6	✓					spillover
27	27	59.4	✓					jet DEP
28	28	56.0	✓					spillover
29	29	50.0						distant jet-DEP
30	30	61.2	✓				jet-DEP overflight	Cal check: 93.9 dB offset 9.6

TOTAL Leq =

SUBSET Leq =

offset 9.6

✓ = Other sources contributed to Leq X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SHORT-TERM NOISE MEASUREMENT SITE LOG

ASSESSMENT AREA: Loudoun County MEASUREMENT SITE NO.: M10

ADDRESS: 41535 Sacred Mountain Street

OWNER: John Champe High School

DESCRIPTION: School

NOISE SOURCES: Northstar Blvd trucks, autos on Northstar & construction

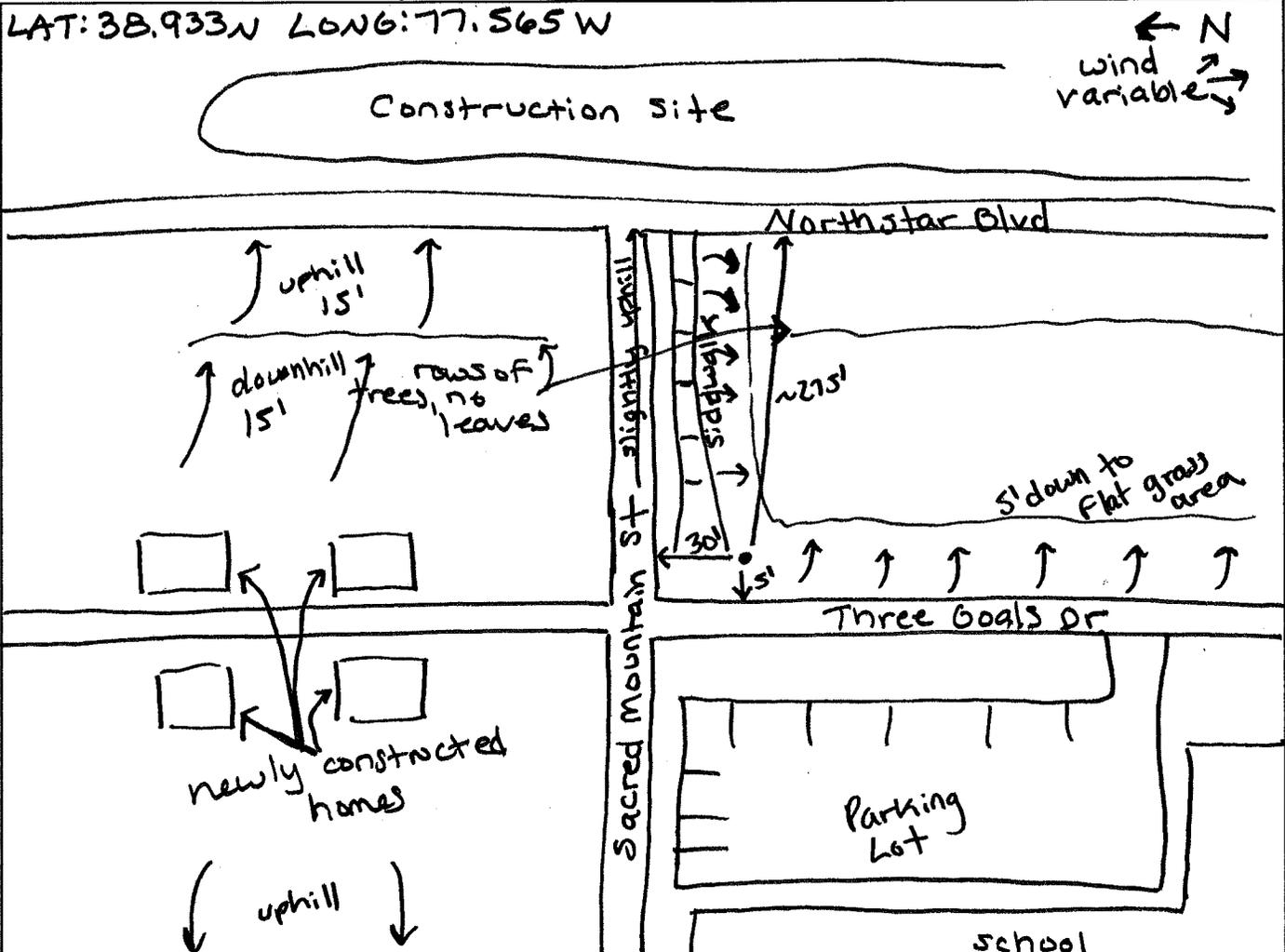
NOISE MONITOR: LD870 #2 work east of Northstar audible, Sacred Mountain S/N: A0256

MICROPHONE: LD PRM900C & Three Goals Dr dominant, overflights S/N: 0862

CALIBRATOR: B&K Type 4231 S/N: 2039365

TEMP. RANGE (°F): 50°F, 33% Hum WEATHER CONDITIONS: Sunny, 5-10mph wind, up to gusts

SITE SKETCH: Show roadway, homes, local roads, reference distances, arrows for North & wind direction, where roadway is in cut, at grade, elevated, where direct lines of sight exist.



LAT: 38.933N LONG: 77.565W

• microphone ~275' to Northstar



Site M10

SHORT-TERM NOISE MEASUREMENT DATA SHEET



PROJECT: Tri-County Parkway

JOB NO.: HMMH Job No. 305000.009

SITE NO.: MW

PERSONNEL: RAM

LOCATION/ADDRESS: John Champe HS

DATE: April 3 2013

#	1 Minute Period Starting	Meas'd Leq (dBA)	√ or X	Sacred Mountain Autos	Medium Trucks	Three Goals Heavy Trucks	Other Noise Sources	COMMENTS (Include Calibration Data)
1	10:46	53.1			1-sm			Cal Change: 94.0 dB offset 9.6
2	47	52.8		1-sm				
3	48	53.7	X	1-sm to TG				
4	49	50.7						
5	50	49.2						
6	51	51.5		1-TG			wind gust	
7	52	56.9			1-sm			
8	53	61.5	X		1-sm	1-TG		
9	54	49.4						distant jet overflight
10	55	49.5						
11	56	48.8		1-sm				
12	57	51.5		1-sm				
13	58	50.0						
14	59	51.8		1-sm				
15	11:00	53.0	X	1-TG to sm				distant jet
16	01	51.7	X	1-TG to sm				
17	02	59.7	X	3-TG to sm 1-w/ radio			construction vehicle-sm	distant jet
18	03	55.7	X	1-sm to TG				
19	04	54.8						truck j brake - north star
20	05	54.8	X	1-TG to sm - next to microphone				
21	06	53.3	X				construction vehicles by new homes	
22	07	56.5	X	1-TG to sm - next to mic				jet overflight DEP
23	08	53.0						distant jet
24	09	53.4						jet overflight DEP
25	10	57.2	X		1-sm			
26	11	55.0	X	2-TG to sm - one by mic				
27	12	58.4	X	1-TG to sm		1-sm		
28	13	51.2						
29	14	53.3		1-sm				
30	15	54.5		1-sm				Cal check: 94.0 dB

TOTAL Leq =

SUBSET Leq =

offset 9.6

√ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

Northstar not dominating
 construction worker vehicles on Sacred Mountain
 & Three Goals considered not typical to ambient environment



PROJECT: Tri-County Parkway
 JOB NO.: HMMH Job No. 305000.009

TRAFFIC VOLUME COUNT DATA SHEET

ASSESSMENT AREA: _____ START TIME: _____
 MEASUREMENT SITE NO.: M6, M4, M3, M1 END TIME: _____
 ADDRESS/DESCRIPTION: _____ DATE: April 4 2013
 _____ PERSONNEL: RAM / KCH

M6
 Roadway: Sanders Ln (705)
 First Sample (30 minutes)
 Start Time: 10:06
 Speed - 50-55 mph *← maybe up to*
 Speed limit - 45 mph

	DIRECTION 1 SB	DIRECTION 2 NB
Automobiles	<u>4</u>	<u>2</u>
Medium Trucks (6 Tires)	<u>1</u>	<u>0</u>
Heavy Trucks (>6 Tires)	<u>0</u>	<u>0</u>

M4
 Roadway: Pageland Ln
 Second Sample (30 minutes)
 Start Time: 11:10
 Speed - 50 to 55 mph
 speed limit - 45 mph

	EB	WB
Automobiles	<u>22</u>	<u>21</u>
Medium Trucks (6 Tires)	<u>1</u>	<u>0</u>
Heavy Trucks (>6 Tires)	<u>0</u>	<u>1</u>

M3
 Roadway: Pageland Ln
 Third Sample (30 minutes)
 Start Time: 12:08
 → same speeds

	EB	WB
Automobiles	<u>29</u>	<u>28</u>
Medium Trucks (6 Tires)	<u>0</u>	<u>2</u>
Heavy Trucks (>6 Tires)	<u>0</u>	<u>0</u>

M1
 Roadway: Lee Hwy (29)
 Fourth Sample (30 minutes)
 Start Time: 13:10
 Speed - 50 to 55 mph

	EB	WB
Automobiles	<u>115</u>	<u>129</u>
Medium Trucks (6 Tires)	<u>6</u>	<u>10</u>
Heavy Trucks (>6 Tires)	<u>7</u>	<u>5</u>

Notes:



PROJECT: Tri-County Parkway
 JOB NO.: HMMH Job No. 305000.009

TRAFFIC VOLUME COUNT DATA SHEET

ASSESSMENT AREA: _____ START TIME: _____
 MEASUREMENT SITE NO.: M5, M7, M9, M10 END TIME: _____
 ADDRESS/DESCRIPTION: _____ DATE: April 3 2013
 _____ PERSONNEL: RAM / KCH

	DIRECTION 1	DIRECTION 2
M10 Roadway: <u>Northstar Blvd</u> First Sample (<u>30</u> minutes) Start Time: <u>10:45</u> Speed - up to 50 mph, 45 mph limit	<u>SB</u>	<u>NB</u>
Automobiles	<u>12</u>	<u>28</u>
Medium Trucks (6 Tires)	<u>7</u>	<u>6</u>
Heavy Trucks (>6 Tires)	<u>5</u>	<u>3</u>
M9 Roadway: <u>Braddock Rd</u> Second Sample (<u>30</u> minutes) Start Time: <u>12:00</u> Speed - up to 40, 35 mph limit	<u>WB</u>	<u>EB</u>
Automobiles	<u>25</u>	<u>33</u>
Medium Trucks (6 Tires)	<u>3</u>	<u>5</u>
Heavy Trucks (>6 Tires)	<u>6</u>	<u>4</u>
M7 Roadway: <u>Lightridge Farm Rd (705)</u> Third Sample (<u>30</u> minutes) Start Time: <u>15:40</u> Speed - about 30 mph, maybe up to 55, 45 mph limit	<u>NB</u>	<u>SB</u>
Automobiles	<u>4</u>	<u>10</u>
Medium Trucks (6 Tires)	<u>0</u>	<u>1</u>
Heavy Trucks (>6 Tires)	<u>0</u>	<u>1</u>
M5 Roadway: <u>Sudley Rd (234)</u> Fourth Sample (<u>30</u> minutes) Start Time: <u>16:57</u> Speed - up to 60 mph, 50 mph limit	<u>WB</u>	<u>EB</u>
Automobiles	<u>375</u>	<u>117</u>
Medium Trucks (6 Tires)	<u>17</u>	<u>5</u>
Heavy Trucks (>6 Tires)	<u>3</u>	<u>0</u>

Notes: Tall Cedars Pkwy speed - up to 40 mph, 35 mph limit

Job#:	305000.009
Name:	Bi-County Parkway
Site#:	M1 - M10
Location:	Chantilly, VA
Date:	4/03/2013 - 4/04/2013

NOISE MEASUREMENT AND VALIDATION SUMMARY

Site	Address	Measurement data				Traffic Only
		Date	Time Start	Duration	Total Leq, dBA	Leq, dBA
M1	12521 Lee Highway, Manassas National Battlefield Park	4/4/2013	13:10	30	54.8	54.6
M2	6389 Pageland Lane	4/4/2013	15:09	30	41.7	41.7
M3	5905 Pageland Lane	4/4/2013	12:10	30	49.4	49.1
M4	5501 Pageland Lane	4/4/2013	11:12	30	43.4	43.4
M5	5805 Sudley Road and Kyle Wilson Way (Catharpin Park)	4/3/2013	16:58	30	57.1	57.0
M6	3480 Sanders Lane	4/4/2013	10:08	30	43.6	43.6
M7	25992 Lightridge Farm Road	4/3/2013	15:40	30	49.7	49.7
M8	25503 Kinsale Place (cul-de-sac)	4/3/2013	13:03	30	52.4	52.4
M9	41512 & 41518 Hitchin Court	4/3/2013	12:01	30	55.5	50.2
M10	41535 Sacred Mountain Street (John Champe High School)	4/3/2013	10:46	30	52.7	52.7

TRAFFIC INPUT

Data Entry Table

Roadway	Direction	VehicleType	Total_Lookup	VehType_Loo	Start_Time	Duration	Count	Speed	10 min Count	
Pageland Ln	WB	A	Pageland Ln_W	Pageland Ln_	12:10		30	28	55	19
Pageland Ln	WB	MT	Pageland Ln_W	Pageland Ln_	12:10		30	2	55	1
Pageland Ln	WB	HT	Pageland Ln_W	Pageland Ln_	12:10		30	0	55	0
Pageland Ln	EB	A	Pageland Ln_E	Pageland Ln_	12:10		30	29	55	19
Pageland Ln	EB	MT	Pageland Ln_E	Pageland Ln_	12:10		30	0	55	0
Pageland Ln	EB	HT	Pageland Ln_E	Pageland Ln_	12:10		30	0	55	0
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						
			—	—						

TNM Input Table

Roadway	Direction	VehicleType	Lookup	Lookup	Total_Duration	Total_Type_Count	Avg_Speed	Hour_Count	Speed	Total_Count	Percentage
Pageland Ln	WB	A	Pageland Ln_W	Pageland Ln_	30	28	55	56	55	60	93%
Pageland Ln	WB	MT	Pageland Ln_W	Pageland Ln_	30	2	55	4	55	60	7%
Pageland Ln	WB	HT	Pageland Ln_W	Pageland Ln_	30	0	55	0	0	60	0%
Pageland Ln	EB	A	Pageland Ln_E	Pageland Ln_	30	29	55	58	55	58	100%
Pageland Ln	EB	MT	Pageland Ln_E	Pageland Ln_	30	0	55	0	0	58	0%
Pageland Ln	EB	HT	Pageland Ln_E	Pageland Ln_	30	0	55	0	0	58	0%
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

TRAFFIC INPUT

Data Entry Table

Roadway	Direction	VehicleType	Total_Lookup	VehType_Lookup	Start_Time	Duration	Count	Speed
Sanders Ln	NB	A	Sanders Ln_NB	Sanders Ln_NB_A	10:08		30	2 55
Sanders Ln	NB	MT	Sanders Ln_NB	Sanders Ln_NB_M	10:08		30	0 55
Sanders Ln	NB	HT	Sanders Ln_NB	Sanders Ln_NB_H	10:08		30	0 55
Sanders Ln	SB	A	Sanders Ln_SB	Sanders Ln_SB_A	10:08		30	4 55
Sanders Ln	SB	MT	Sanders Ln_SB	Sanders Ln_SB_M	10:08		30	1 55
Sanders Ln	SB	HT	Sanders Ln_SB	Sanders Ln_SB_H	10:08		30	0 55
			—	—				
			—	—				
			—	—				
			—	—				
			—	—				
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			—	—				
			—	—				

TNM Input Table

Roadway	Direction	VehicleType	Lookup	Lookup	Total_Duration	Total_Type_Count	Avg_Speed	Hour_Count	Speed	Total_Count	Percentage
LCP	NB	A	LCP_NB	LCP_NB_A	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
LCP	NB	MT	LCP_NB	LCP_NB_MT	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
LCP	NB	HT	LCP_NB	LCP_NB_HT	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
LCP	SB	A	LCP_SB	LCP_SB_A	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
LCP	SB	MT	LCP_SB	LCP_SB_MT	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
LCP	SB	HT	LCP_SB	LCP_SB_HT	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

TRAFFIC INPUT

Data Entry Table

Roadway	Direction	VehicleType	Total_Lookup	VehType_Lookup	Start_Time	Duration	Count	Speed
Lightridge Farm Rd	NB	A	Lightridge Farm Rd	Lightridge Farm R	15:40		30	4 55
Lightridge Farm Rd	NB	MT	Lightridge Farm Rd	Lightridge Farm R	15:40		30	0 55
Lightridge Farm Rd	NB	HT	Lightridge Farm Rd	Lightridge Farm R	15:40		30	0 55
Lightridge Farm Rd	SB	A	Lightridge Farm Rd	Lightridge Farm R	15:40		30	10 55
Lightridge Farm Rd	SB	MT	Lightridge Farm Rd	Lightridge Farm R	15:40		30	1 55
Lightridge Farm Rd	SB	HT	Lightridge Farm Rd	Lightridge Farm R	15:40		30	1 55
			—	—				
			—	—				
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			—	—				

TNM Input Table

Roadway	Direction	VehicleType	Lookup	Lookup	Total_Duration	Total_Type_Count	Avg_Speed	Hour_Count	Speed	Total_Count	Percentage
Lightridge Farm Rd	NB	A	Lightridge Farm Rd	Lightridge Farm R	30	4	55	8	55	8	100%
Lightridge Farm Rd	NB	MT	Lightridge Farm Rd	Lightridge Farm R	30	0	55	0	0	8	0%
Lightridge Farm Rd	NB	HT	Lightridge Farm Rd	Lightridge Farm R	30	0	55	0	0	8	0%
Lightridge Farm Rd	SB	A	Lightridge Farm Rd	Lightridge Farm R	30	10	55	20	55	24	83%
Lightridge Farm Rd	SB	MT	Lightridge Farm Rd	Lightridge Farm R	30	1	55	2	55	24	8%
Lightridge Farm Rd	SB	HT	Lightridge Farm Rd	Lightridge Farm R	30	1	55	2	55	24	8%
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			—	—	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

APPENDIX E 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.



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

Gregory A. Whirley
Acting Commissioner

Month 11, 2013

MEMORANDUM

TO: Nick Nies, Project Manager

FROM: Lovejoy Muchenje, Noise Abatement Engineer

SUBJECT: UPC 52405; Tri-County Parkway Location Study

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 (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: Possibly, as this project is developed through the detailed design phase, there will be opportunities to evaluate the feasibility of adjusting roadway geometrics for the purpose of reducing noise impacts. Particularly as it relates to minimizing roadway impacts as part of the National Historic Preservation Act (NHPA), Section 106 process.

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: Typically, 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.

However, where it is determined that noise may be a contributing factor to an adverse effect determination under Section 106 of the NHPA, quiet pavements can be used to address that adverse effect if the parties involved in the consultation accept it as a mitigation measure and include it in the Programmatic Agreement/Memorandum of Agreement (PA/MOA). By including the measure in a PA/MOA, it becomes a legally binding commitment eligible for federal participation even though quiet pavements in general aren’t eligible for federal participation as a measure to mitigate noise impacts identified under 23 CFR 772.

The Department has committed to considering quiet pavement as part of the PA being developed for this project.

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

Response: Possibly, if deemed necessary.

Note: Please provide the name of each responder. Nicholas Nies (Based on discussions with Ms. Maria Sinner (VDOT NOVA))

APPENDIX F WARRANTED, FEASIBLE AND REASONABLE WORKSHEETS

This appendix presents the preliminary Warranted, Feasible and Reasonable Worksheets for the three such noise barriers evaluated in this study.

**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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	NF 3
Community Name and/or CNE#	CNE 3
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?	Yes

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):	0
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	0%
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

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

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	0 ft
b. Height range of the proposed noise barrier. (ft)	0 ft
c. Average height of the proposed noise barrier. (ft)	0 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$0
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	NF 4
Community Name and/or CNE#	CNE 4
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	16
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	0
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	0%
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?	NA
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?	NA

Reasonableness**1 Surface Area (Square foot)-Benefit Factors**

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

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	0 ft
b. Height range of the proposed noise barrier. (ft)	0 ft
c. Average height of the proposed noise barrier. (ft)	0 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$0
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 1
Community Name and/or CNE#	CNE 2 and CNE 4
Noise Abatement Category(s)	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."	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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	25
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	25
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	68,665 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	25
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	25
e. Surface Area per benefited receptor unit. (ft ² /BR)	2,747 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	3,436 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$3,295,920
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 2
Community Name and/or CNE#	CNE 5
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?	No
b.	Project causes a substantial noise increase of 10 dB(A) or more?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	140,300 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)	70,150 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	4,678 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)	\$48/SF
e. Total Barrier Cost (\$)	\$6,734,400
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 3
Community Name and/or CNE#	CNE 5
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	10
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	5
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	164,941 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	5
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d. Total number of benefited receptors.	5
e. Surface Area per benefited receptor unit. (ft ² /BR)	32,988 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	5,498 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)	\$48/SF
e. Total Barrier Cost (\$)	\$7,917,168
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 4
Community Name and/or CNE#	CNE 5
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?	No
b.	Project causes a substantial noise increase of 10 dB(A) or more?	Yes

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?	NA
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?	NA

Reasonableness**1 Surface Area (Square foot)-Benefit Factors**

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	43,460 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)	21,730 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	2,173 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$2,086,080
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 5
Community Name and/or CNE#	CNE 6 and CNE 8
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	14
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	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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	107,400 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.	2
d. Total number of benefited receptors.	16
e. Surface Area per benefited receptor unit. (ft ² /BR)	6,713 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	5,371 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$5,155,200
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 6
Community Name and/or CNE#	CNE 7
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."	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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	120,608 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.	3
d. Total number of benefited receptors.	5
e. Surface Area per benefited receptor unit. (ft ² /BR)	24,122 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	4,826 ft
b. Height range of the proposed noise barrier. (ft)	25 ft
c. Average height of the proposed noise barrier. (ft)	25 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$5,789,184
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 7
Community Name and/or CNE#	CNE 9
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?	No
b.	Project causes a substantial noise increase of 10 dB(A) or more?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	47,778 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)	47,778 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,593 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)	\$48/SF
e. Total Barrier Cost (\$)	\$2,293,344
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 8
Community Name and/or CNE#	CNE 10
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	17
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	9
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	53%
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	194,845 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	9
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
d. Total number of benefited receptors.	10
e. Surface Area per benefited receptor unit. (ft ² /BR)	19,485 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	7,796 ft
b. Height range of the proposed noise barrier. (ft)	25 ft
c. Average height of the proposed noise barrier. (ft)	25 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$9,352,560
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Prince William
District:	Northern Virginia
Barrier System ID:	Barrier 9
Community Name and/or CNE#	CNE 9
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	11
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	55%
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	107,753 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.	2
d. Total number of benefited receptors.	8
e. Surface Area per benefited receptor unit. (ft ² /BR)	13,469 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	5,388 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$5,172,144
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 10
Community Name and/or CNE#	CNE 12
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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	9,424 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)	4,712 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	629 ft
b. Height range of the proposed noise barrier. (ft)	15 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$452,352
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 11
Community Name and/or CNE#	CNE 11
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	5
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	5
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	25,318 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	5
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	8
d. Total number of benefited receptors.	13
e. Surface Area per benefited receptor unit. (ft ² /BR)	1,948 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,689 ft
b. Height range of the proposed noise barrier. (ft)	15 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$1,215,264
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 12
Community Name and/or CNE#	CNE 12
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	5
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	60%
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?	NA
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?	NA

Reasonableness**1 Surface Area (Square foot)-Benefit Factors**

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	16,640 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.	1
d. Total number of benefited receptors.	4
e. Surface Area per benefited receptor unit. (ft ² /BR)	4,160 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,110 ft
b. Height range of the proposed noise barrier. (ft)	15 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$798,720
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 13
Community Name and/or CNE#	CNE 11
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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	22,468 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.	2
d. Total number of benefited receptors.	5
e. Surface Area per benefited receptor unit. (ft ² /BR)	4,494 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,497 ft
b. Height range of the proposed noise barrier. (ft)	15 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$1,078,464
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 14
Community Name and/or CNE#	CNE 16
Noise Abatement Category(s)	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."	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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	9,263 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)	4,632 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	618 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$444,624
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 15
Community Name and/or CNE#	CNE 13
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?	Yes

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	19
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	16
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	84%
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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	20,079 SF
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	16
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	5
d. Total number of benefited receptors.	21
e. Surface Area per benefited receptor unit. (ft ² /BR)	956 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,004 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$963,792
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 16
Community Name and/or CNE#	CNE 16
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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	12,515 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)	4,172 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	834 ft
b. Height range of the proposed noise barrier. (ft)	15 ft
c. Average height of the proposed noise barrier. (ft)	15 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$600,720
f. Barrier Material	Absorptive

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:	20-Jun-13
Project No. and UPC:	Project # R000-96A-102, PE-101 UPC 52405
County:	Loudoun
District:	Northern Virginia
Barrier System ID:	Barrier 17
Community Name and/or CNE#	CNE 15
Noise Abatement Category(s)	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."	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?	Yes

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?	NA
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?	NA

Reasonableness

1 Surface Area (Square foot)-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft ²)	29,768 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.	3
d. Total number of benefited receptors.	6
e. Surface Area per benefited receptor unit. (ft ² /BR)	4,961 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?	No

2 Additional Noise Barrier Details

a. Length of the proposed noise barrier. (ft)	1,489 ft
b. Height range of the proposed noise barrier. (ft)	20 ft
c. Average height of the proposed noise barrier. (ft)	20 ft
d. Cost per square foot. (\$/ft ²)	\$48/SF
e. Total Barrier Cost (\$)	\$1,428,864
f. Barrier Material	Absorptive

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:
