Tri-County Parkway Location Study
Loudoun, Fairfax and Prince William Counties

Noise Analysis

Technical Report

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EXECUTIVE SUMMARY

Three build alternatives are under evaluation for the Tri-County Parkway Location Study. The Comprehensive Plan alternative traverses a significantly more densely populated area in and near Manassas than do the West Four and West Two alternatives, which are in more sparsely populated areas. The projected noise impact along the three candidate build alternatives was assessed in accordance with procedures and criteria approved by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT).

The following table shows the number of dwelling units exposed to noise impact with each of the candidate build alternatives. For comparison purposes, the table also shows the number of dwelling units at impact sound levels in the corresponding study corridors for the 2005 Existing and 2030 No-build conditions.

Candidate Build Alternative	Dwelling Units with Noise Impact		
	Existing (2005)	No-Build (2030)	Build (2030)
Comprehensive Plan	45	45	852
West Two	1	1	66
West Four	1	1	115

Noise impact where a Project alternative causes a substantial increase in the existing noise level commonly occurs along new-alignment roadways. The majority of the residential noise impact assessed for the build alternatives in the Tri-County Parkway study area is of this type, where the Project alternative passes through areas that are remote from major noise sources and that have relatively low existing noise levels.

Parks and recreation areas that would be impacted by noise with the Comprehensive Plan alternative include Smith Baseball Park, the Ashton Glen playground and basketball/tennis courts, Fairmont Neighborhood Park, Ben Lomond Regional Park, and the amphitheater at the Bull Run Special Events Center. Only the Ashton Glen playground is at impact sound levels under Existing and 2030 No-build conditions.

With the West Two and West Four alternatives, the only recreation area to be exposed to noise impact would be Sudley Park. This park would not be exposed to impact sound levels in either the Existing or No-build cases.

Noise abatement by means of noise barriers was evaluated wherever noise impact was expected to occur. For each candidate build alternative, the following table summarizes the protected land use, the total surface area of the barriers, and the estimated total barrier cost, for all barriers combined.

Candidate Build Alternative	Number of Dwelling Units Protected / Benefited	Total Surface Area (sq. ft.) of Noise Barriers	Total Estimated Cost
Comprehensive Plan	879 / 432 Dus 4 / 1 Pk-Rec	659,642	$13,192,840
West Two	44 / 15 Dus 1 / 0 Pk-Rec	451,500	$9,481,500
West Four	122 / 30 Dus 1 / 0 Pk-Rec	349,746	$7,694,412

This information is preliminary and should be considered to be very approximate since the project is not developed to a stage where a reliable cost estimate can be provided in regard to determining cost-effectiveness. Once the selected alternative has received design approval, a later study will determine the final barrier cost estimates, cost-effectiveness and feasibility.

Construction noise impact is expected to be minimal. Wherever possible, noise barriers planned to abate traffic noise will be constructed as soon as possible, to allow them to protect noise-sensitive areas from construction noise, as well.

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1 INTRODUCTION

1.1 Project Description and History

The Tri-County Parkway Location Study evaluates a new north/south transportation link in northern Virginia that will connect the City of Manassas with Interstate 66 (I-66) and the Dulles corridor. The corridor begins in the north at the intersection of US 50 and Route 606 (Old Ox Road) and extends to the south at the interchange of VA 28/VA 234 Bypass. It is approximately 15 miles long and traverses portions of the counties of Prince William, Fairfax, and Loudoun along with the cities of Manassas and Manassas Park.

The Tri-County Parkway (TCP) was first identified during the development of the transportation element of the comprehensive plans for Prince William, Fairfax, and Loudoun counties. The TCP has been the subject of many local studies and plans and has been known by many names throughout the years. In Prince William County, it has been referred to as the "Route 28 Bypass" and, in Loudoun County, the TCP has been known as the "Loudoun County Parkway". Several conceptual alignments were considered through Fairfax County even before it was first proposed in their comprehensive plan. The TCP has been incorporated in the three counties' comprehensive plans for over ten years. The TCP was adopted by the Metropolitan Washington Council of Governments (MWCOG) and included in their Constrained Long-Range Plan (CLRP) and Transportation Improvement Program (TIP) in the early to mid 1990s. Figure 1 illustrates the TCP project from a regional perspective, while Figure 2 depicts the study area within which TCP alternatives will be evaluated.

The three counties that the TCP will traverse are among the top ten fastest growing counties in the Commonwealth of Virginia. According to the 2000 Census, Loudoun County's population grew by 97 percent from 1990 to 2000. Prince William County's and Fairfax County's population grew by 30 percent and 19 percent, respectively, during those same years. The City of Manassas and the City of Manassas Park are also located within the TCP study area. Both of these cities have experienced substantial population growth over the last ten years. The City of Manassas had a population growth of 26 percent and the City of Manassas Park grew by 53 percent.

Much of the growth in Northern Virginia can be attributed to the emergence of high-tech industries near the Washington Dulles International Airport. By the year 2025, employment in the Dulles/Tysons corridor is expected to reach 280,000 jobs - 71 percent more than current conditions. The Dulles/Tysons corridor will become the second largest employer in the Washington Metropolitan region, second only to downtown Washington D.C. Prince William County and the City of Manassas have also experienced significant high-tech industry growth. The Dulles area consists of the Dulles Greenway, VA 7, VA 28, and US Route 50.

A second rapid growth corridor within the region is the I-66 corridor. Transportation improvements for the I-66 corridor from Interstate 495 (I-495) to the Gainesville area were evaluated in January 1999 as part of a comprehensive study entitled "The I-66 Corridor Major Investment Study (I-66 MIS)." Information from that study revealed that population in the I-66 corridor located within Fairfax, Prince William, and Loudoun counties is projected to increase from 269,000 persons in 1999 to 466,000 persons in 2020. This represents a 73 percent increase in population over the 22-year

Figure 1 Regional Location Map

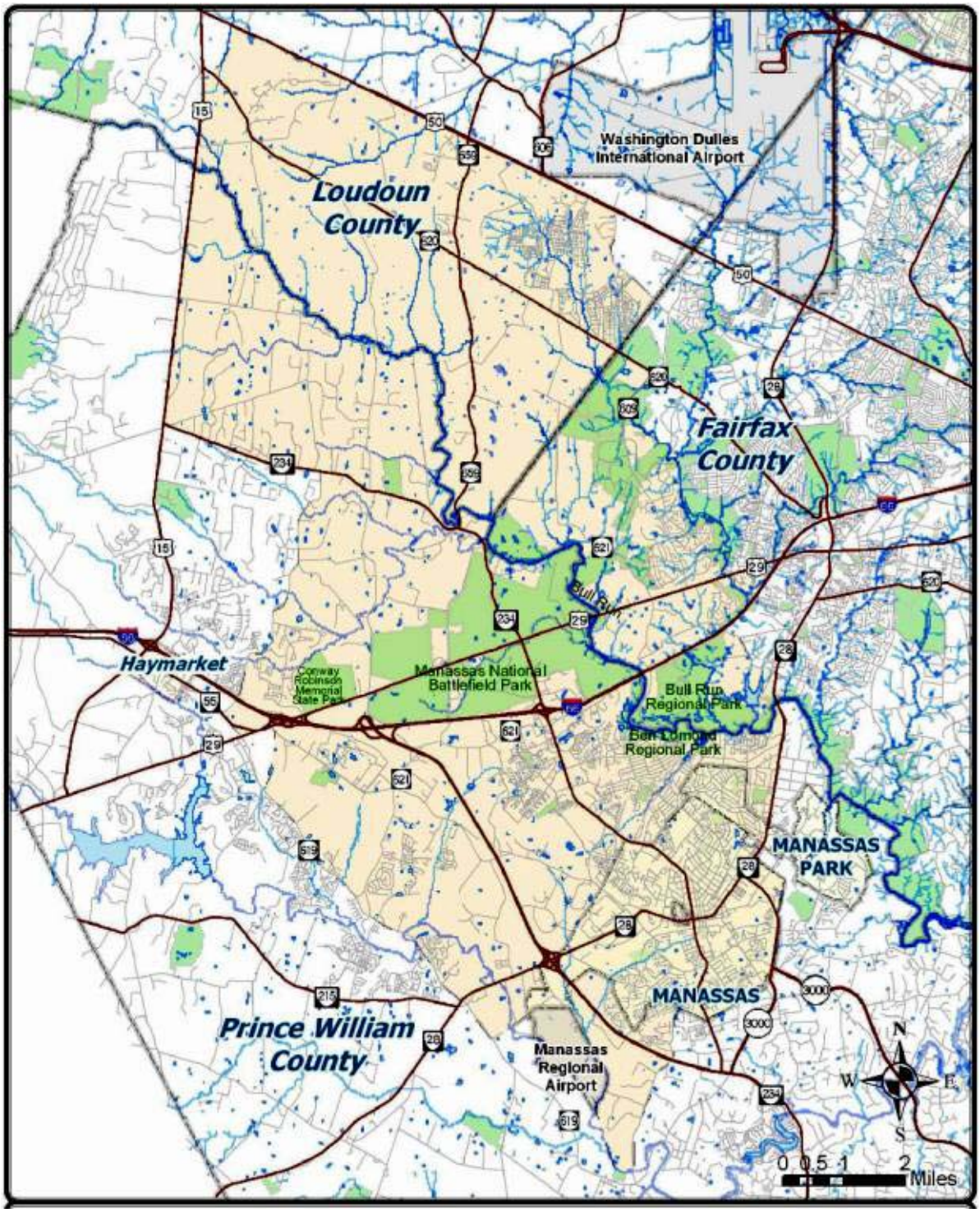


Figure 2 Study Area Map

time frame. Employment is estimated to increase 83 percent in this same time period (from 162,000 jobs in 1999 to 296,000 jobs in 2020).

The primary problem the TCP is intended to address is the lack of adequate north-south transportation facilities linking the I-66 corridor with the Dulles area and VA 267. East of US 15 and west of the I-495 (Capital Beltway), only three principal urban arterials link the spokes together - VA 28 (Sully Road), Route 7100 (Fairfax County Parkway), and VA 123. These north-south facilities are heavily congested and will deteriorate further by the year 2025.

Level of service on VA 28 is currently deficient in the a.m. and p.m. peak periods. By 2025, most segments of VA Route 28 northbound in the a.m. and southbound in the p.m. are expected to operate at LOS F or G (a severely congested state). Traveling south in the p.m. between the Fairfax County line and I-66, speeds are estimated to drop along VA 28 from an already slow 18 miles per hour (mph) to 13 mph between 2000 and 2025. The posted speed limit in this area is 45 mph. By 2025 the peak periods for a.m. and p.m. traffic on VA 28 could extend for over three hours each; however, improvements to VA 28 have been proposed under the Virginia Public-Private Transportation Act (VPPTA) of 1995 to convert the 14-mile stretch of VA 28 between I-66 and Route 7 to a limited access freeway. That project would involve widening VA 28 to an eight-lane section, as well as replacing up to ten signalized intersections with grade-separated interchanges. If the VA 28 improvements project is completed as planned, the added capacity should increase speeds and reduce congestion along VA 28 - in effect improving operating speeds in the a.m. and p.m. peak periods.

1.2 Purpose and Need

The purpose and need for the TCP is comprised of five key elements. Each of the elements is a critical and salient factor to be addressed by the transportation alternatives. There is no attempt to weight one element over the others. Each of the elements has equal value and importance in the overall transportation, environmental, economic, and quality of life objectives for the communities being served under the proposed action. The five elements are listed below:

1. Improve transportation mobility and capacity and, by doing so, improve access and reduce congestion.
2. Enhance the linkage of communities and the transportation system that serves those communities. This linkage includes the modal interrelationships between the various transportation systems and agencies in the region such as the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (VDRPT), the Washington Metropolitan Area Transit Authority (WMATA), the Potomac and Rappahannock Transportation Commission (PRTC), the Northern Virginia Transportation Commission (NVTC), the Virginia Railway Express (VRE), and the Metropolitan Washington Airports Authority (MWAA).
3. Accommodate social demands, environmental goals, and economic development needs.
4. Improve safety and, by doing so, reduce the average crash, injury, and accident rates on the roadway network.
5. Acknowledge and advance the best components of prior transportation planning efforts - including the local government comprehensive plans; the Northern Virginia 2020 Transportation Plan produced by the Northern Virginia Transportation Coordinating Council (TCC); and the regional CLRP and the TIP produced by the National Capital Region Transportation Planning Board (TPB) with the assistance of the MWCOG.

1.3 Alternatives Considered

In accordance with NEPA requirements, alternatives considered for the Tri-County Location Study include the No-Build, Mass Transit, Transportation System Management (TSM), and Candidate Build Alternatives (CBAs). Each alternative has been evaluated with respect to its potential impacts and its ability to address the project's purpose and need.

1.3.1 No-Build

Consistent with the requirements of the NEPA and related FHWA guidelines, full consideration is given to the environmental consequences of taking no action to meet future travel demand (hereinafter referred to as the "No-Build Alternative"). The No-Build Alternative includes currently programmed committed and funded roadway and transit projects in the Virginia Department of Transportation (VDOT) Six Year Plan and the CLRP developed by the MWCOG. The No-Build Alternative, while having no direct construction costs, would result in other economic, environmental, and quality of life impacts that can be expected from the continuation of roadway system deficiencies. While the No-Build alternative does not meet the project needs for traffic, safety, and roadway infrastructure improvements, it provides a baseline condition with which to compare the improvements and consequences associated with the Candidate Build Alternatives. The following is a list of major projects identified in the CLRP which influence the TCP study area.

- Dulles/VA 7 Corridor
- VA 28 Corridor
- Prince William Parkway (VA 3000) Corridor
- Fairfax County Parkway (VA 7100) Corridor
- I-66/US 29/US 50 Corridor
- I-495 (Beltway) Corridor
- Manassas National Battlefield Park Bypass
- Western Transportation Corridor

1.3.2 Mass Transit Alternative

This alternative includes all reasonable and feasible transit options. Consideration of this alternative is specifically addressed in the Northern Virginia 2020 Transportation Plan. Several mass transit alternatives in or adjacent to the study area include:

- Priority Bus – Package of improvements to reduce travel times, increase reliability, and enhance user comfort along several arterial corridors (VA 7, VA 236, US 50, and Columbia Pike).
- Express Bus – New or expanded service along freeway or HOV corridors to move people to employment destinations.
- Rail extensions and new rail systems have been identified along the Dulles Corridor, I-66 Corridor, I-495 Beltway, I-95 Corridor, Route 7/Columbia Pike, US 1, and VA 28.

- Bicycle/Pedestrian improvement – Expansion of existing trails and improved trail connections between activity centers. Improvements include VA 7 bikeway, US 50 bicycle route throughout Northern Virginia, W&OD trail connection, and the VA 234 Trail.

1.3.3 Transportation System Management Alternative

Transportation System Management (TSM) improvements are low cost system enhancements that improve the efficiency of vehicles traveling along the roadways in the study area. TSM alternatives are often evaluated as potential design options. Such alternatives may include high-occupancy vehicle lanes, ridesharing, signal synchronization, and other actions. Also, where appropriate, mass transit options should be considered even when they are outside FHWA's funding authority. TSM includes a number of strategies to add capacity and improve operational deficiencies of the existing transportation system. These measures include:

- Intelligent Transportation Systems – Technology based systems to improve traffic flow by the use of traffic sensors, signal synchronization, closed-circuit television cameras, variable message signs, highway advisory radio, ramp metering, and media communication.
- Travel Demand Management – Implementation of measures designed to reduce congestion such as car pooling and High Occupancy Vehicle (HOV) lanes.
- Access Management – Reduce traffic impedance cause by turning vehicle by eliminating the number of direct access points along a roadway.
- Minor Geometric Improvements – Modification of existing intersections and travel lanes to improve safety and traffic flow.

1.3.4 Candidate Build Alternatives

Three Candidate Build Alternatives (CBAs) have been identified for further evaluation in a Draft Environmental Impact Statement (EIS). These CBAs are referred to hereinafter as: (1) the "Comprehensive Plan" CBA, (2) the "West Two" CBA, and (3) the "West Four" CBA. The process leading to the identification of these three CBAs is discussed in greater detail in the associated document titled Alternatives Identification, Development, and Screening Technical Report (VDOT, 2004). The northern and southern termini for these CBAs have been selected in accordance with FHWA Technical Guidelines for termini development and are discussed in greater detail in the associated document titled Logical Termini Technical Report (VDOT, 2003).

Each of the CBAs is expected to be comprised of two or more facility types according to localized needs and goals. To assess environmental effects associated with a particular facility type along each CBA, three general design concepts have been developed:

- General Design Segment 1 (hereinafter referred to as "Segment 1").
- General Design Segment 2 (hereinafter referred to as "Segment 2").
- General Design Segment 3 (hereinafter referred to as "Segment 3").

The process leading to the development of these general design segments is presented in the associated document tilted Study Location Report (VDOT, 2004). The three general design segments developed for purposes of this assessment are depicted in Figure 3 and are described as follows:

- Segment 1. Segment 1 will provide a controlled access facility with four 12-foot lanes divided with a 42-foot graded grass median and 10-foot multi-use trail. The 42-foot wide median will allow for expanding to six lanes in the future. Segment 1 could either include (1) paved shoulders in areas where right-of-way is needed or (2) curb and gutter in areas where portions of the facility have been partially constructed and right-of-way exists. These design options are represented as Option 1 and Option 2, respectively. The median width will be transitioned to include additional width at all intersection approaches to allow for construction of dual left turn lanes, as necessary.
- Segment 2. Segment 2 will provide a limited access facility with four 12-foot lanes divided with a 42-foot graded grass median, paved shoulders, and 10-foot multi-use trail. The median width will be transitioned to include additional width at all intersection approaches to allow for construction of dual left turn lanes, as necessary.
- Segment 3. Segment 3 will provide a limited access facility with six lanes (four 12-foot outside lanes and two 13-foot inside lanes) divided with a 42-foot graded median, paved shoulders, and a 10-foot multi-use trail. The 13-foot inside lanes are adjacent to curbed median only.

1.3.4.1 The Comprehensive Plan CBA

The Comprehensive Plan CBA is so named because it incorporates certain alignments recognized in local Comprehensive Plans. The Comprehensive Plan CBA would be located east of the Manassas National Battlefield. The Comprehensive Plan CBA would provide a new urban principal arterial roadway from the northern terminus at the intersection of US 50 and Route 606 (Old Ox Road) and the southern terminus at the Route 28 and Route 234 Bypass Interchange, and would consist of Segments F', F, and E (Figure 4).

Segment F' between Route 50 and Route 620 would be comprised of improvements along an existing four-lane divided facility within an existing right-of-way on an existing alignment. Segment F' south of Route 620 would be a new four-lane divided facility within a new right-of-way on a new alignment. Three separate sections characterize segment E. The portion of Segment E between I-66 and the Fairfax/Prince William County Line would be a new six-lane divided facility within a new right-of-way on a new alignment. The portion of segment E from the Fairfax/Prince William County Line south to VA 234 would be a new six-lane divided facility within an existing right-of-way on an existing alignment. The portion of Segment E from VA 234 to the VA 234 Bypass would be comprised of improvements along an existing four-lane divided facility called Godwin Drive and would be widened to a six-lane divided facility within the existing right-of-way and on an existing alignment.

The Comprehensive Plan CBA would consist of three of the aforementioned general design segments in the following areas:

- Segment 1 (Options 1 and 2) will extend from the intersection of US 50 and Route 606 (Old Ox Road) in Loudoun County to the Fairfax County Line.
- Segment 2 will extend from the Fairfax County Line to I-66 (east of the Manassas National Battlefield).
- Segment 3 will extend from I-66 in Fairfax County to Route 234 in Prince William County.

1.3.4.2 The West Two CBA

The West Two CBA is located west of the Manassas National Battlefield. The West Two CBA would provide a new urban principal arterial roadway from the northern terminus near the intersection of US 50 and Route 877 (Racefield Lane) and the southern terminus at the I-66 and Route 234 Interchange. The West Two CBA would be a new four-lane divided facility within a new right-of-way and on a new alignment, and would consist of Segments D and C (see Figure 4).

The West Two CBA would consist of two of the aforementioned general design segments in the following areas:

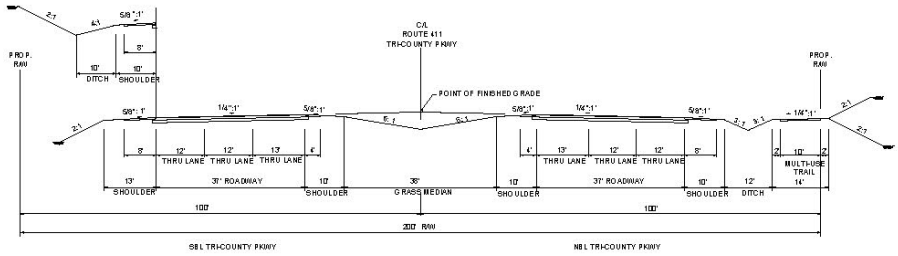
- Segment 1 (Option 1) will extend from the intersection of US 50 and 877(Racefield Road) in Loudoun County to the Prince William County Line.
- Segment 2 will extend from the Prince William County Line to the interchange of I-66 and Route 234 (west of the Manassas National Battlefield).

1.3.4.3 The West Four CBA

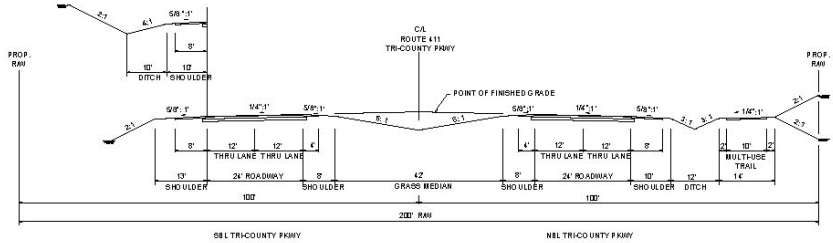
The West Four CBA is also located west of the Manassas National Battlefield. The West Four CBA would provide a new urban principal arterial roadway from the northern terminus at the intersection of US 50 and Route 606 (Old Ox Road) and the southern terminus at the I-66 and Route 234 Interchange. The West Four CBA would consist of Segments F', G, and C (Figure 4). Segment F' between Route 50 and Route 620 (Braddock Road) would be comprised of improvements along an existing four-lane divided facility within an existing right-of-way on an existing alignment. Segment F' south of Route 620 would be comprised of a new four-lane divided facility within a new right-of-way on a new alignment.

The West Four CBA would consist of two of the aforementioned general design segments in the following areas:

- Segment 1 (Option 1) will extend from the intersection of US 50 and Route 606 (Old Ox Road) in Loudoun County to the Prince William County Line.
- Segment 2 will extend from the Prince William County Line to the interchange of I-66 and Route 234 (west of the Manassas National Battlefield).



GENERAL DESIGN SEGMENT 3



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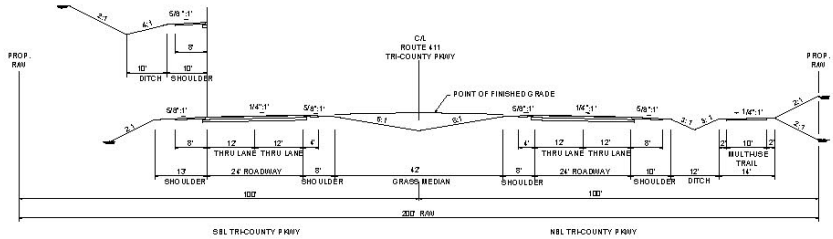
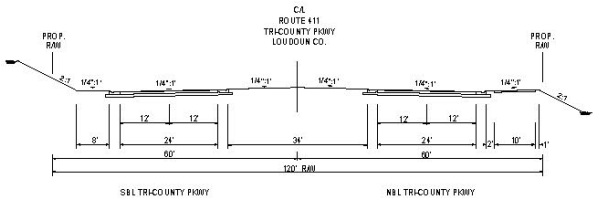


GENERAL DESIGN SEGMENT 1, OPTION 1



GENERAL DESIGN SEGMENT 1, OPTION 2

Figure 3 General Design Segments Typical Sections

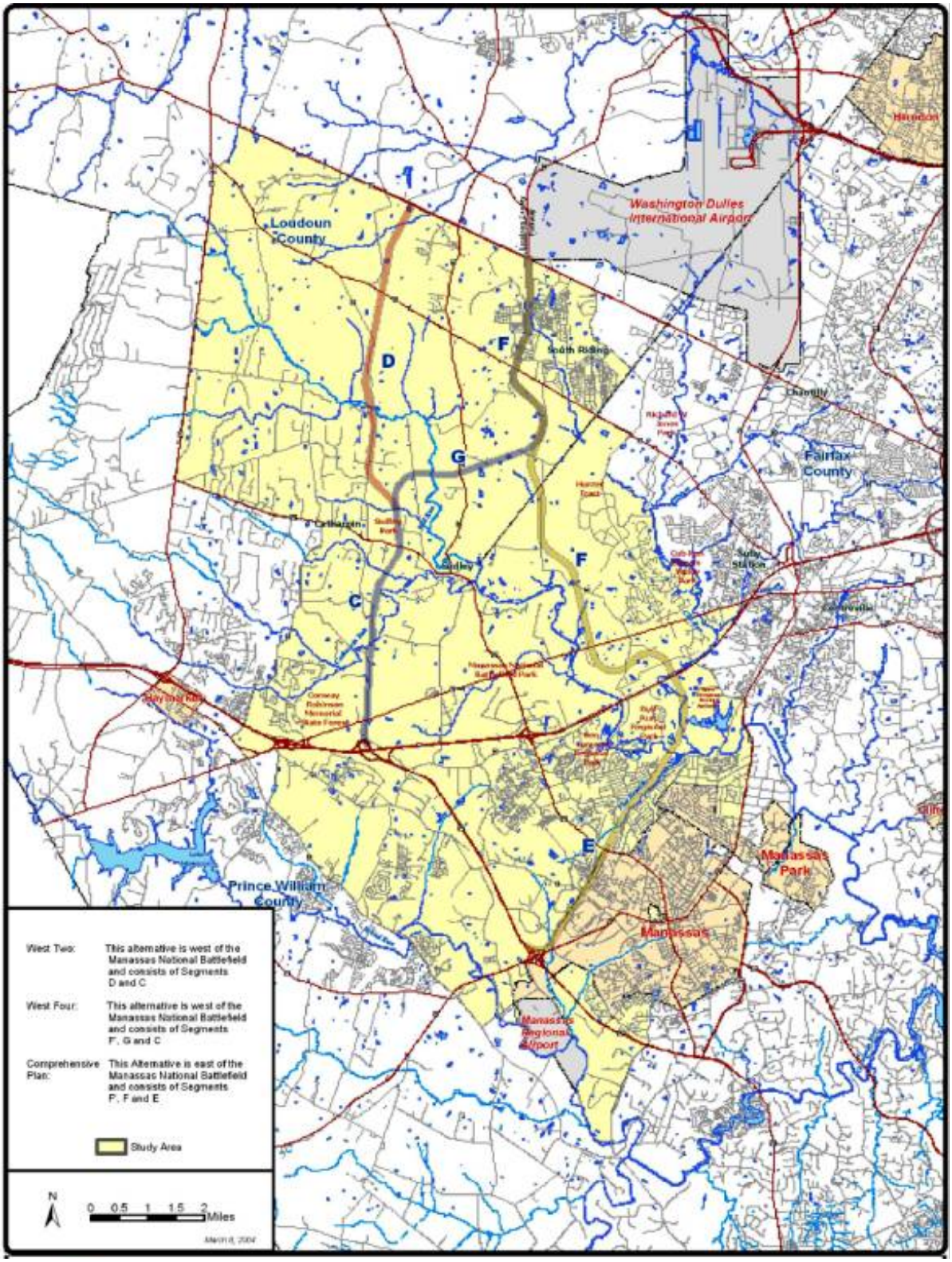


Figure 4 Candidate Build Alternatives Map

2 NOISE TERMINOLOGY AND CRITERIA

The potential noise impact of the proposed alternatives for the Tri-County Parkway Project was assessed in accordance with Federal Highway Administration (FHWA) and Virginia Department of Transportation (VDOT) noise assessment guidelines. The FHWA guidelines are set forth in 23 CFR Part 772[1]. VDOT's regulations are contained within the State Noise Abatement Policy[2], and are consistent with the FHWA guidelines.

To determine the degree of impact of highway traffic noise on human activity, the Noise Abatement Criteria (NAC) established by the FHWA regulation were used in this study (see Table 1).

Table 1 FHWA Noise Abatement Criteria

Activity Category	L_{eq}(h) (dBA)*	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	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

* Hourly Equivalent A-weighted Sound Level

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).

Noise-sensitive land uses potentially affected by this project are in Category B and consist of residences, schools, places of worship, and parks and recreational areas where outdoor activity occurs. Per FHWA, noise impact occurs when the predicted design-year Build Alternative noise levels in the project area "approach or exceed" the NAC during the loudest hour of the day. As shown in Table 1 above, the applicable NAC for exterior activities in Category B is 67 dBA L_{eq}(h). VDOT defines the word "approach" to mean when the loudest-hour L_{eq} equals 1 dB less than the

NAC. Therefore, noise impact is assessed when future Build noise levels equal or exceed 66 dBA L_{eq}, for Activity Category B.

In situations where there are no exterior activities that would be affected by traffic noise (such as may occur at places of worship or schools), noise impact is assessed with respect to the FHWA NAC for Activity Category E. The applicable NAC for interior activities is 52 dBA L_{eq}(h). Based on VDOT's definition of "approach," noise impact also occurs if interior noise levels with the future Build alternative equal or exceed 51 dBA L_{eq}(h).

Noise impact also occurs when predicted project noise levels substantially exceed existing noise levels. An increase of 10 decibels or more is considered "substantial" by VDOT.

In short, for Category B land uses, wherever the predicted design-year Build alternative noise levels during the loudest hour of the day either (1) equal or exceed 66 dBA L_{eq}, or (2) exceed existing noise levels by 10 decibels or more, noise impact occurs. Likewise for Category E land uses, wherever the predicted design-year Build alternative noise levels during the loudest hour of the day either (1) equal or exceed 51 dBA L_{eq}, or (2) exceed existing noise levels by 10 decibels or more, noise impact occurs.

If traffic noise impact is identified as a result of the project, then consideration of noise abatement measures is necessary. Noise abatement will be considered reasonable and feasible unless it is found that such mitigation measures will cause adverse social, economic or environmental effects that outweigh the benefits received.

Noise levels in the project study area were determined for the existing (2005) conditions, and the design-year (2030) No-build and Build conditions.

3 EXISTING NOISE CONDITIONS

To assess existing noise conditions within the Tri-County Parkway project study area, noise measurements were conducted at 28 sites from December 1 to 4, 2003, and on May 25, 2004. Measurements were conducted in the vicinity of noise-sensitive land uses in each of the alternative corridors near the proposed project alignment. The measurements characterized existing noise levels in the study area but were not necessarily conducted during the loudest hour of the day, and included noise from sources other than traffic, such as aircraft over-flights and human activity. During the noise measurement program, a windshield survey of noise-sensitive land and building uses was conducted to supplement the mapping provided.

Existing noise data was collected in two ways. Attended short-term measurements were conducted at 25 representative sites throughout the entire study area. Secondly, unattended long-term measurements of noise levels were collected for a 24-hour period at three sites. Two of the three long-term sites were located in noise-sensitive areas near local roadways that parallel or are coincident with the study corridor alternatives, to obtain information about the hour-to-hour variation of noise levels near those roadways.

Figure 5 shows the location of each noise measurement site in relation to the project alternatives. In the next two sections, results are presented first for the short-term measurements, and second for the long-term measurements.

3.1 Short-Term Noise Measurements

Short-term noise measurements of 20 to 30 minutes duration were obtained at a total of 25 sites from December 2 to 4, 2003 in Project Segments C, E, F, F', and G, and on May 25, 2004 in Segment D. These short-term measurements were conducted with a Brüel and Kjær Type 2230 integrating sound level meter and the Larson-Davis 870 integrating sound level meter/noise monitor; both are Type I (precision) instruments. The data collection procedure involved the measurement of L_{eq} over consecutive one-minute periods. This method allows individual minutes that include noise events unrelated to traffic noise (such as aircraft overflights) to be excluded from consideration later. A summary of the short-term noise measurement results is presented in Table 2. For each site, the table lists the assigned site number, the location and a description of the associated land use, the letter designation of the Project Alternative corridor in which the site falls, the measured sound level, and the dominant sources of noise heard at each site. Table 2 reports both the total measured L_{eq} sound levels, which includes all one-minute periods, and the L_{eq}s associated with traffic only. In some cases, the traffic-only levels were used for comparison with noise predictions. Simultaneous traffic counts on nearby roadways were performed during several short-term noise measurements. The field data sheets are presented in Appendix A.

The measured L_{eq} total noise levels in the study corridor ranged from a low of 39 dBA at the cul-de-sac near 12410 Boxwood Farms Rd. (Site 5) to a high of 66 dBA at 9701 Lomond Dr. (Site 13). The dominant noise sources in the study area were traffic on local roads, aircraft flying overhead ("overflights") and wind in the trees. These noise sources are typical in the project area and are included in the total noise levels shown in Table 2. At most of the measurement sites, the total and traffic-only noise levels were very close, indicating that traffic is the dominant noise source at those locations. At some measurement sites in locations farther from roadways, the contributions from

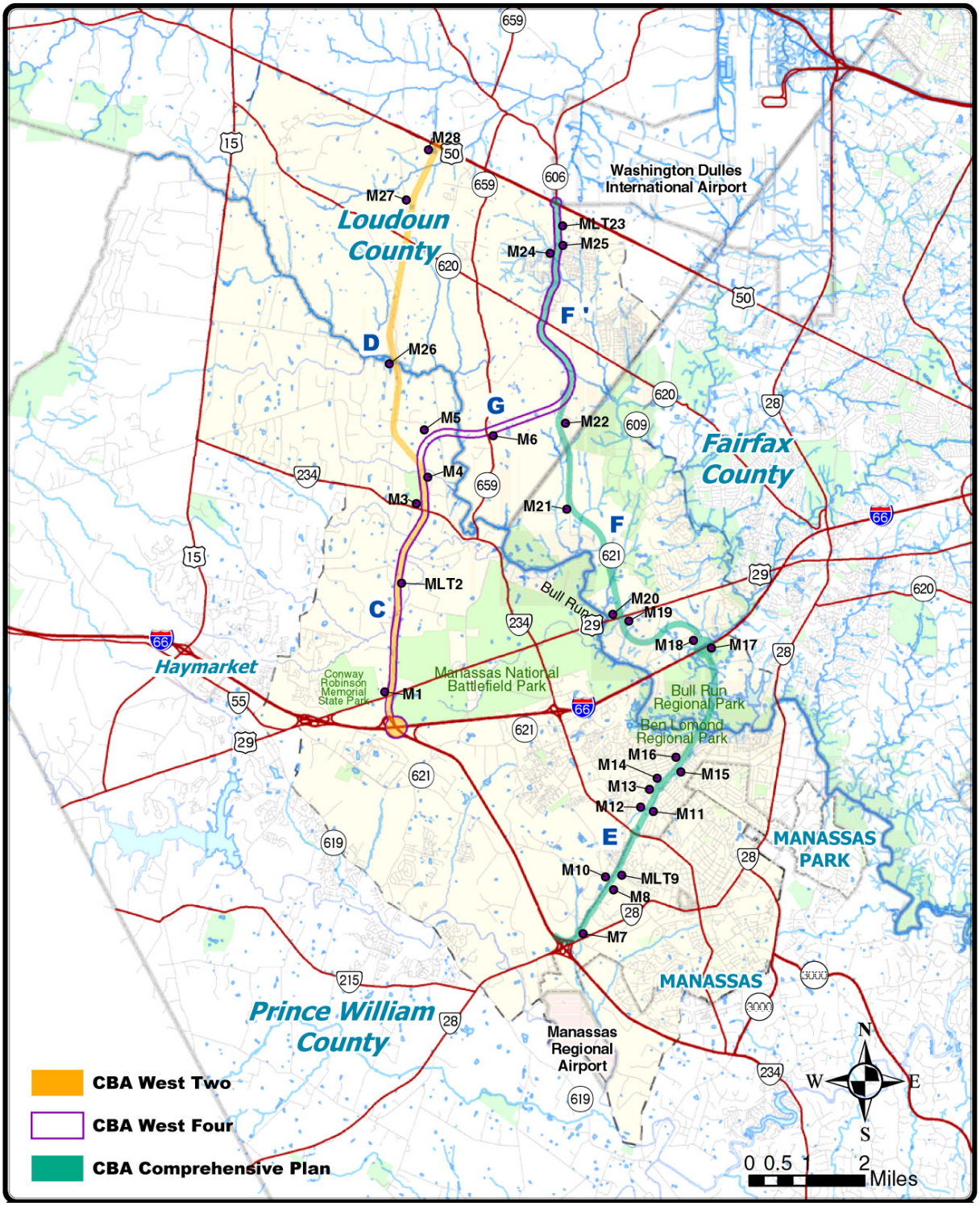


Figure 5 Noise Measurement Location Map

aircraft and other noise sources were more significant, resulting in a greater difference between the total and the traffic-only noise levels.

Table 2 Short-term Noise Measurement Summary

Site No.	Location and Land-use Description	Alter-native Corrid.	Measured L_{eq} in dBA		Dominant Sources of Noise
			Total	Traffic Only	
1	Residence 6621 Lolan St.	C	61	61	Route 29 (Lee Hwy) traffic, incl. trucks
3	Sudley Park, future baseball fields	C	53	53	Rt. 234 (Sudley Rd.) traffic, aircraft overflights
4	Residences - Cul-de-sac 12191 Richland Dr.	C	52	52	Distant traffic, wind in trees, aircraft
5	Residences - Cul-de-sac 12410 Boxwood Farms Rd.	G	39	39	Distant aircraft, distant traffic
6	Residence 27022 Gum Spring Rd. (Rt. 659)	G	61	61	Traffic on Gum Spring, incl. trucks, aircraft
7	E.G. Smith City of Manassas Baseball Complex	E	59	59	Godwin Dr. traffic, incl. trucks
8	Residences - Cul-de-sac Confederate Trail	E	63	62	Godwin Dr. traffic, aircraft, train horn
10	Residences – Cul-de-sac Asheville St.	E	61	61	Godwin Dr. traffic, incl. trucks
11	Residences 8237 Sunset Dr.	E	45	45	Traffic on Highland St. and Sunset Dr.
12	Residences 9855 Nimitz Ct.	E	44	43	Distant traffic, aircraft, train horn
13	Residences 9701 Lomond Dr.	E	66	66	Lomond Dr. traffic
14	Residences 7912 Norfolk Ct.	E	43	42	Distant traffic, aircraft, distant dogs
15	Residences 7814 Amherst Dr.	E	50	48	Distant traffic, aircraft overflights
16	Residences – Cul-de-sac 9325 King George Dr.	E	45	42	Distant traffic, aircraft overflights
17	Bull Run Park Special Event Center	E	59	59	Interstate 66 traffic
18	Residence 15211 Compton Rd.	F	52	52	Distant traffic, aircraft, wind
19	Residence 15901 Lee Highway	F	65	65	Lee Highway traffic, incl. trucks
20	Stone Bridge Manassas Battlefield Park	F	64	64	Lee Highway traffic, incl. trucks, aircraft
21	Residences – Cul-de-sac Sudley Forest Ct.	F	55	55	Wind in trees, aircraft, distant construction
22	Residence 26821 Bull Run Post Office Rd.	F	53	52	Wind in trees, aircraft, Bull Run PO Rd. traffic, distant construction
24	Residences 25465 Beresford Dr.	F’	50	50	Aircraft, wind in trees, distant traffic

Site No.	Location and Land-use Description	Alter-native Corrid.	Measured L_{eq} in dBA		Dominant Sources of Noise
			Total	Traffic Only	
25	Residences Ashbury Dr./Astell St.	F'	54	53	Aircraft overflights, wind in trees, distant traffic
26	Residences 12750 Chatter Brook Dr.	D	44	N/A	Aircraft overflights, traffic on Sanders La. and local
27	Residence 25005 Goshen Rd.	D	51	50	Aircraft overflights, traffic on Goshen Rd. (gravel)
28	Residence/ Equestrian center 41753 John Mosby Hwy (Rt. 50)	D	54	48	Aircraft overflights, traffic on Rt. 50

3.2 Long-Term Noise Measurements

Long-term measurements of approximately 24 hours duration were conducted at three sites in the project area to sample the hour-to-hour cycle of fluctuations in sound levels throughout the day. The measurements were conducted in December 2003 using a Larson Davis Model 870 noise monitor (a Type I instrument), which was programmed to collect noise data continuously and produce hourly reports of various noise descriptors. Table 3 provides a summary of the long-term measurements. For each site, the table provides the location and description of the associated land use, the letter designation of the Project Alternative corridor in which the site falls, the beginning and ending dates and times, the measured hourly L_{eq} sound level during the loudest hour of the day and the hour in which it occurred, and the dominant sources of noise heard while the site was attended.

Site LT-2 was located near a residence south of Sudley about 165 ft from Pageland Rd, in the Alt. C corridor. Sources of noise at this site included wind in the trees, some aircraft, and traffic on Pageland Rd. Auto traffic on Pageland Rd. was much heavier during peak periods than at mid-day. The loudest-hour L_{eq} measured at this site was 63 dBA, during the morning peak period, between 7:00am and 8:00am.

Table 3 Long-term Noise Measurement Summary

Site No.	Location	Alt. Corr.	Measurement Period		Loudest Hours		Dominant Sources of Noise
			Begin Date & Time	End Date & Time	L_{eq} in dBA	Period	
LT-2	Residence 5675 Pageland Road	C	12/2/03 3:30 pm	12/3/03 4:00 pm	63	7:00 to 8:00 am	Wind in trees, aircraft, traffic on Pageland - autos during peak periods and trucks
LT-9	Residence 8906 Sweetbriar St.	E	12/3/03 3:25 pm	12/4/03 4:00 pm	60	5:00 to 6:00 pm	Godwin Drive traffic, including trucks
LT-23	Residence 25045 Impala Ct.	F'	12/1/03 2:12 pm	12/2/03 4:00 pm	60	3:00 to 4:00 pm	Aircraft from Dulles airport
					57	8:00 to 10:00 am	Wind in trees, distant traffic

Site LT-9 was located at a residence in Manassas on Sweetbriar St., adjacent to Godwin Drive in the Alt. E corridor. Traffic on Godwin Drive dominated the noise environment at this site, where the loudest-hour L_{eq} was 60 dBA, occurring in the evening peak period, between 5:00pm and 6:00 pm.

Site LT-23 was located at the northern end of the study area in the Alt. F' corridor near South Riding at a residence on Impala Court, approximately 1500 ft from Route 50. Predominant noise sources at this site included aircraft overflights from Dulles airport, wind in the trees, and distant traffic on Rt. 50. During some hours, aircraft activity dominated the L_{eq}, which measured up to 60 dBA in those hours. During periods of less aircraft activity, wind in the trees and distant traffic combined to produce L_{eq}s of 57 dBA in the two hours between 8:00am and 10:00am, the loudest non-aircraft periods.

Appendix B presents the 24-hour noise measurement results in a more comprehensive graphical form. The graphs illustrate the measured hourly noise levels at each long-term site using the L_{eq} and other statistical descriptors, which provide information on the range of sound levels that occurred during each hour.

3.3 Characterization of Existing Conditions

The measured existing noise levels provide a baseline for evaluating future noise increases from the project roads. In areas remote from major roadways, Existing (and No-build) noise levels were estimated based upon measurements nearby or in similar types of areas. In areas near roadways for which traffic data were developed as part of the project, Existing and No-build levels were computed from the appropriate loudest-hour traffic data. Such computations were performed at appropriate measurement sites as well as at additional "prediction-only" sites. The computation methods and computed levels are reported in Section 4.

To determine the existing noise levels in areas away from roadways for which traffic data were developed (which was much of the study area), the measured existing noise levels and sites were examined for trends. While no patterns were apparent in different parts of the study area, existing measured sound levels trended into two groups based on the distance between the site and a local connector road. Measured L_{eq} values were in the middle 40s dBA in areas away from local connector roads, and in the lower 50s dBA in areas within about 300 ft of connector roads. Connector roads were defined as those with through traffic, and did not include roads within a residential subdivision. Sites that were identified as away from local connector roads included Sites 5, 12, 14, 16, and 26. Sites identified as being near local connecting roads were Sites 15, 22, 24, 25, and 27. The total measured noise levels at each site were averaged to determine an overall existing-conditions L_{eq} for each of the two groups. The overall L_{eq} for the areas away from roads is 44 dBA, and the overall L_{eq} for areas within 300 ft of a local connector road (or one row of homes, whichever is less) is 52 dBA. These values were then used as representative of the *existing* noise level for each of the measurement and prediction-only sites far from roads for which traffic data were provided. In some cases, existing sound levels were computed with the traffic noise computation model (see sec. 4.1) at sites that were moderately far from roads with traffic data. In those cases, the higher of the computed sound level and the appropriate representative existing sound level (44 dBA or 52 dBA) were used, since lower computed levels may be too low as they do not include other sources of ambient noise, and higher computed levels are likely to better represent local traffic conditions.

The existing sound levels in each noise-sensitive area, whether computed or representative, become the basis for *substantial increase impacts* in comparison to build year noise levels.

4 NOISE MODEL AND PROJECTIONS

4.1 Highway Noise Computation Model

The FHWA Traffic Noise Model (FHWA TNM 1.0)[3] was first released by FHWA in April 1998 for use on Federal-aid highway noise projects. The model has had several releases since then, which incorporated various improvements. In the spring of 2004, an updated version of the program (FHWA TNM version 2.5) was made available, which incorporated some changes to the acoustical calculations. All traffic-noise computations for this study were conducted using the latest version.

The TNM noise modeling accounted for such factors as propagation over different types of ground (soft and hard ground), elevated roadway sections, shielding from local terrain and structures, traffic speeds, and hourly traffic volumes including percentages of medium and heavy trucks. The geometric model was taken from Microstation files showing roadway alignment, property boundaries, buildings, parks, and existing ground elevation contours. Noise-sensitive land uses were identified from existing mapping and the windshield survey conducted during the noise measurement program.

4.2 Traffic Data for Traffic Noise Computations

Traffic data for traffic noise computations were supplied as hourly volumes and operating speeds by roadway segment for the 2005 Existing condition, and design-year 2030 No-build and three candidate build alternatives. Separate medium and heavy truck percentages were provided by roadway segment and by alternative for AM peak, PM peak and off-peak periods. As required by FHWA and VDOT, the noise analysis was performed for the loudest hour of the day. For the Tri-County Parkway and major intersecting roads, the traffic conditions for the loudest hour of the day are dependent upon the combination of both relatively high (total) volumes and speeds, as well as the percentage of heavy trucks in the vehicle mix.

The loudest hour for each alternative was determined with a spreadsheet that computes the overall traffic noise level from each roadway segment at a reference distance for each hour of the day. The hour that is the loudest for the greatest number of significant road segments is chosen as the loudest hour to be used for all roadways for that alternative. The loudest hour for the Existing and No-build alternatives is 10AM to 11AM. For the Comprehensive Plan alternative, the loudest hour is 9AM to 10AM, and for both the West Four and West Two alternatives, 8AM to 9AM represented the loudest hour of the day.

Traffic data used as input to the noise prediction model are summarized in Appendix C.

4.3 Computed Existing and Future Noise Levels

Many additional locations were added to the 28 measurement sites for purposes of noise prediction. These sites were added to provide a comprehensive basis for the analysis of noise impact for the design-year Build alternatives; all noise-sensitive areas were represented by prediction locations. Figure 6 shows a selection of these additional “Prediction-only” sites along with the measurement

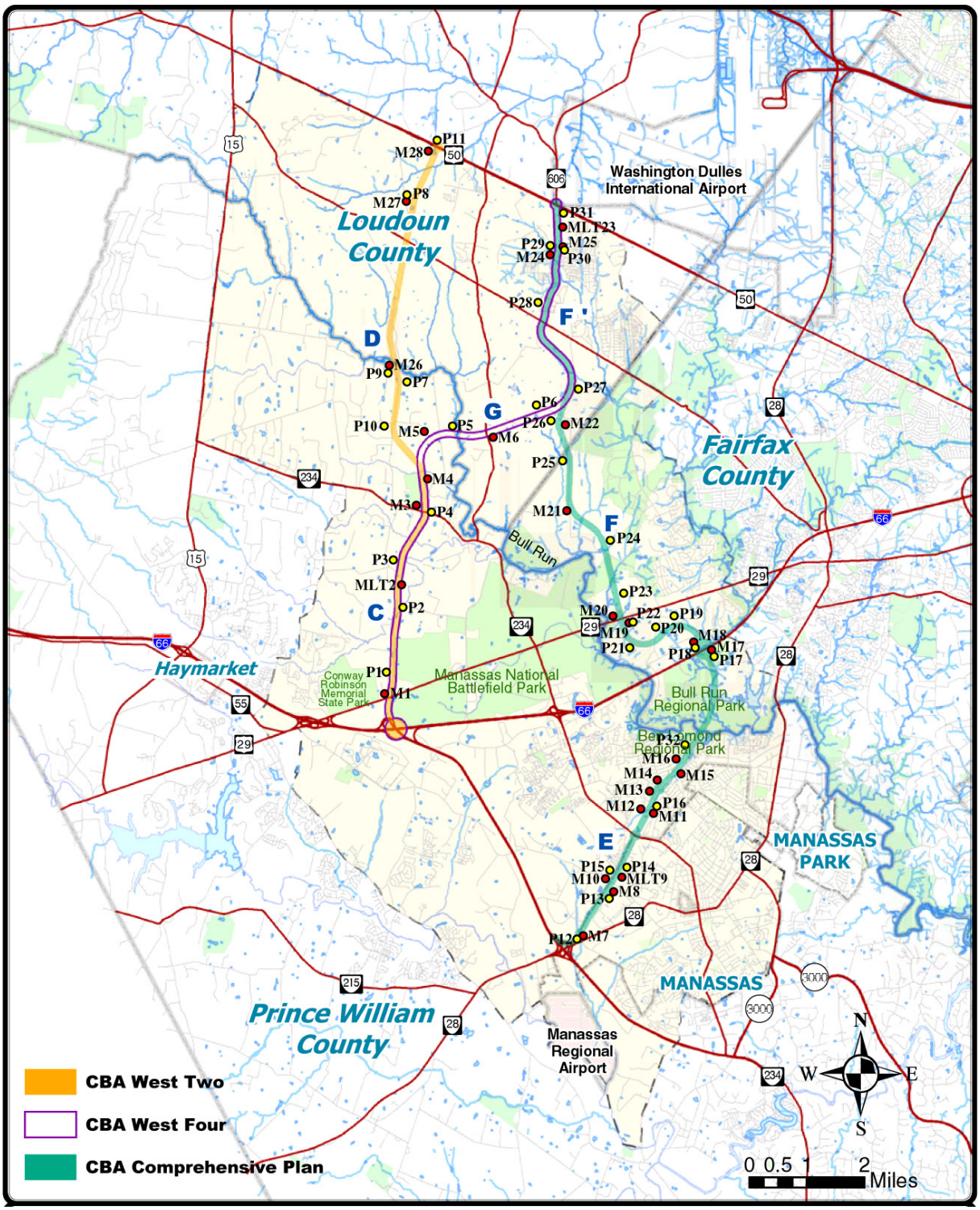


Figure 6 Noise Measurement and Prediction Sites

sites; the measurement sites are shown with an "M" prefix, and the prediction-only sites are shown with a "P" prefix.

Table 4 shows the computed loudest-hour noise levels at the measurement and selected prediction-only sites. All noise levels computed were the A-weighted equivalent sound level, or L_{eq}, in dBA (Section 2 provides a discussion of this descriptor). As described in the previous section, loudest-hour noise levels were computed with TNM for the design-year Build alternatives, and for the Existing condition and No-build alternative near roadways for which traffic data were developed. For areas away from these roadways, the average measured L_{eq} was 44 dBA for areas away from roads, and 52 dBA for areas within 300 ft (or one row of homes) of a local connector road. These values were then used as representative of the *existing* noise level for each of the measurement and prediction-only sites far from roads for which traffic data were provided. Where the representative existing noise levels are given in Table 4, they are shown for both the Existing condition and No-build alternative. In some cases, Existing and No-build sound levels were computed with TNM at

Table 4 Computed Existing and Future Noise Levels

Site Number	Description	Land Use[1]	Corr-idor Sect.	Loudest-Hour Leq (dBA)[2]				
				Existing	No-Build	Comp. Plan	West Two	West Four
M1	6621 Lolan Street	Res	C	59	59		59	59
MLT2	5675 Pageland Lane	Res	C	52	52		68 B	68 B
M3	Sudley Park future ballfields	Pk/Rec	C	52	52		50	50
M4	12191 Richland	Res	C	44	44		58 S	58 S
M5	12410 Boxwood Farms Rd	Res	G	44	44			47
M6	27022 Gum Spring Road	Res	G	52	52			53
M7	Smith Baseball Park	Pk/Rec	E	62	62	66 N		
M8	Confederate Trail	Res	E	64	64	68 N		
MLT9	8902 Sweetbriar Street	Res	E	64	64	65		
M10	Ashville Street	Res	E	66	66	69 N		
M11	8237 Sunset Drive	Res	E	45	45	62 S		
M12	9855 Nimitz Court	Res	E	44	44	66 B		
M13	9701 Lomond Drive	Res	E	66	66	66 N		
M14	7912 Norfolk Court	Res	E	44	44	65 S		
M15	7814 Amherst Drive	Res	E	48	48	62 S		
M16	9325 King George Drive	Res	E	44	44	70 B		
M17	Bull Run Park Events Center	Pk/Rec	E	59	59	64		
M18	15211 Compton Road	Res	F	56	56	58		
M19	15901 Lee Highway	Res	F	65	65	65		
M20	Manassas Battlefield Park Stone Bridge	Pk/Rec	F	64	64	64		
M21	Sudley Forest Court	Res	F	55	55	55		
M22	26821 Bull Run P.O. Road	Res	F	53	53	53		
MLT23	25045 Impala Court	Res	F'	47	47	55		
M24	25465 Beresford Drive	Res	F'	52	52	62 S		62 S

Site Number	Description	Land Use[1]	Corr-idor Sect.	Loudest-Hour Leq (dBA)[2]				
				Existing	No-Build	Comp. Plan	West Two	West Four
M25	Ashbury Dr/Astell Street	Res	F'	53	53	58		58
M26	12750 Chatter Brook Drive	Res	D	48	48		51	
M27	25005 Goshen Drive	Res	D	52	52		59	
M28	41753 John Mosby Highway	Res	D	54	54		59	
P1	Pageland Road	Res	C	52	52		73 B	73 B
P2	Pageland Road	Res	C	52	52		74 B	74 B
P3	Pageland Road	Res	C	44	44		55 S	55 S
P4	Sudley Road	Res	C	52	52		66 B	66 B
P5	Aldie Road	Res	G	44	44			72 B
P6	Gum Spring Road	Res	G	44	44			63 S
P7	Sanders Lane	Res	D	52	52		74 B	
P8	Goshen Road	Res	D	44	44		57 S	
P9	Sanders Lane	Res	D	52	52		64 S	
P10	Sanders Lane	Res	D	52	52		70 B	
P11	John Mosby Highway	Res	D	69	71		71 N	
P12	Smith Park ballfields	Pk/Rec	E	60	60	64		
P13	Milroy Court	Res	E	63	63	67 N		
P14	Sweetbriar Street	Res	E	62	62	67 N		
P15	Sunnygate Drive	Res	E	65	65	68 N		
P16	Highland Street	Res	E	44	44	59 S		
P17	Bull Run Park - Amphitheater	Pk/Rec	E	59	59	68 N		
P18	Compton Road	Res	F	56	56	69 B		
P19	Bull Run P.O. Road	Res	F	44	44	54 S		
P20	Bull Run P.O. Road	Res	F	52	52	63 S		
P21	Bull Road P.O. Road	Res	F	44	44	55 S		
P22	Lee Highway	Res	F	57	57	69 B		
P23	Bull Run P.O. Road	Res	F	44	44	60 S		
P24	Bull Run P.O. Road	Res	F	44	44	56 S		
P25	Bull Run P.O. Road	Res	F	44	44	60 S		
P26	Holly Spring Lane	Res	F	44	44	54 S		
P27	Bull Run P.O. Road	Res	F'	52	52	63 S		
P28	Howerton Drive	Res	F'	47	47	58 S		58 S
P29	Crossfield Drive	Res	F'	47	47	58 S		58 S
P30	Ashbury Drive	Res	F'	47	47	57 S		57 S
P31	John Mosby Highway	Res	F'	66	66	68 N		68 N
P32	Ben Lomond Regional Park	Pk/Rec	E	44	44	72 B		

[1] Land Use codes: Res - residential; Pk/Rec – Park and Recreation
[2] Letter codes adjacent to Build sound levels indicate noise impact: N = NAC only, S = Substantial Increase only, B = Both NAC and Substantial Increase

sites that were moderately far from roads with traffic data. In those cases, the higher of the computed sound level and the appropriate representative existing sound level (44 dBA or 52 dBA) are shown in the table. The existing sound levels in each noise-sensitive area, whether computed or representative, become the basis for evaluating noise impact with respect to *substantial increases* in existing noise levels. Table 4 also lists the noise-sensitive land use represented at each site; commercial and industrial land uses were not selected for noise analysis.

Projected sound levels are given only for the Build alternatives with roadway segments near the measurement or prediction site. Blanks indicate that no roadways for that Build alternative are nearby. Computed future Build sound levels in the study corridor depend significantly on the distance to the roadway and on any noise shielding that may exist from terrain or buildings. Noise predictions were performed only in noise-sensitive areas within 1000 feet of a Project alternative. The FHWA TNM is not considered to be especially reliable beyond 1000 feet, since sound levels are subject to large variations due to atmospheric and terrain effects; therefore, no analysis was conducted at those distances.

Computed Project sound levels vary considerably throughout the study area, primarily due to variations in distance between the noise-sensitive receivers and the roadway itself. Some homes along Pageland Road (Segment C), which would be in close proximity to the Parkway, would experience Build alternative sound levels in the low 70s dBA. Other homes set back from the Project would experience significantly lower levels, in the low to mid 50s dBA.

Where the future Build alternative noise levels constitute noise impact, the Build sound levels for sites in Table 4 are shown with a letter code to indicate the type of noise impact. “N” indicates sites where the Build noise levels approach or exceed the NAC, but the increase above existing is less than 10 dB. “S” is shown for sites where the Project alternative causes a Substantial Increase in the existing noise level – 10 dB or more – but the future level is less than 66 dBA L_{eq}. “B” is given for sites where both conditions exist; i.e. a 10 dB or more increase above the existing noise level and the predicted future noise levels approach or exceed 67 dBA L_{eq}.

5 NOISE IMPACT ASSESSMENT

The potential noise impact of the proposed alternatives for the Tri-County Parkway Location Study was assessed in accordance with FHWA and VDOT noise assessment guidelines, which are described in detail in Section 2.

Residential noise impact in the Tri-County Parkway study area is expected to be greater with any of the future Build alternatives than for Existing or No-build conditions. In the following table and discussion, noise impact is summarized for three separate categories. "Approach or Exceed NAC Only" impact, or *"N"* impact occurs where Project noise levels approach or exceed the FHWA Noise Abatement Criteria (see Section 2), but the increase above existing is less than 10 dB. "Substantial Increase Only" impact, or *"S"* impact, occurs where the Project alternative causes a substantial increase in the existing noise level – 10 dB or more – but the future level is less than 66 dBA L_{eq}. *"B,"* or "Both NAC and Subs. Increase" impact is assessed where both conditions exist; i.e. a 10 dB or more increase above the existing noise level and the predicted future noise levels approach or exceed 67 dBA L_{eq}.

Table 5 provides a summary of the noise impact throughout the study corridor for each candidate build alternative by section of the project, and by impact category. Areas where sound levels approach or exceed the NAC have also been tabulated for the 2005 Existing condition and 2030 No-build alternative in the same study corridor as traversed by the associated Build alternative.

Since the southernmost section of the Comprehensive Plan (Segment E) extends through much high-density residential development, future noise impact is considerably higher with the Comprehensive Plan alternative than with the other two candidate build alternatives.

With the Comprehensive Plan alternative, a total of 852 dwelling units and 5 recreation areas will be impacted by noise in the loudest hour in 2030. All but one of the 129 dwelling units exposed to *N* impact (approach or exceed NAC only) are in the densely developed section of the corridor between Wellington Road and Rt. 234-Business along existing Godwin Drive. Recreation areas exposed to *N* impact include Smith Baseball Park, the Ashton Glen playground and basketball/tennis courts, and the amphitheater at the Bull Run Special Events Center. The 621 residences exposed to *S* impact (substantial increase only) are scattered throughout the study corridor, but 536 of them are concentrated between Rt. 234 Business and Bull Run, south of I-66. Most of this residential impact occurs in the Iron Gate, Highland Park, Fairmont, Wolf Run, West Gate of Lomond, Cedar Park, and Loch Lomond communities. Sixty-seven of the *S* impacted homes are located in the South Riding community just south of Route 50. The Fairmont Neighborhood Park, located just south of Lomond Drive, is the only recreation area exposed to *S* impact. One hundred and two residences and the Ben Lomond Regional Park will be exposed to *B* noise impact (both NAC and substantial increase) under the Comprehensive Plan alternative, with 76 of the impacts occurring between Lomond Drive and Bull Run, predominantly in the West Gate of Lomond and Cedar Park communities, west of the project roadway. Currently in the Comprehensive Plan study corridor, a total of 45 dwelling units and the playground between the Ashton Glen apartments and town homes are exposed to sound levels that approach or exceed the NAC. Future No-build conditions will be the same as existing.

Table 5 Noise Impact Summary

Candidate Build Alternative	Section of Corridor		Number of Dwelling Units or Other Land Use with Noise Impact				
			Exist (2005)	No-build (2030)	Build (2030)		
					Approach or Exceed NAC Only	Substan. Increase Only	Both NAC and Subs. Increase
Compre-hensive Plan	Rt. 234/Rt. 28 to Wellington	E	0	0	1 ball field	0	0
	Wellington to Rt. 234 Business	E	44 DU 1 play area	44 DU 1 play area	128 DU 1 play area	4 DU	0
	Rt. 234 Business to Lomond Drive	E	0	0	0	179 DU 1 park	24 DU
	Lomond Drive to I-66	E	0	0	Amphi-theater	357 DU	76 DU 1 park
	I-66 to Rt. 29	F	0	0	0	5 DU	2 DU
	Rt. 29 to Braddock Road	F,F'	0	0	0	9 DU	0
	Braddock Road to Rt. 50	F'	1 DU	1 DU	1 DU	67 DU	0
	TOTAL – Comprehensive Plan		**45 DU 1 Rec**	**45 DU 1 Rec**	**129 DU 3 Rec**	**621 DU 1 Rec**	**102 DU 1 Rec**
					852 DU, 5 Rec		
West Two	I-66 to Rt. 29	C	0	0	0	0	0
	Rt. 29 to Artemus Rd.	C	0	0	0	0	5 DU
	Artemus Rd. to Rt. 234	C	0	0	0	14 DU	4 DU
	Rt. 234 to Braddock Road	C,D	0	0	0	26 DU	13 DU 1 park
	Braddock Road to Rt. 50	D	1 DU	1 DU	1 DU	3 DU	0
	TOTAL – West Two		**1 DU**	**1 DU**	**1 DU**	**43 DU**	**22 DU 1 Rec**
					66 DU, 1 Rec		
West Four	I-66 to Rt. 29	C	0	0	0	0	0
	Rt. 29 to Artemus Rd.	C	0	0	0	0	5 DU
	Artemus Rd. to Rt. 234	C	0	0	0	14 DU	4 DU
	Rt. 234 to Gum Spring Rd	C,G	0	0	0	10 DU	2 DU 1 park
	Gum Spring Rd. to Braddock Road	G,F'	0	0	0	9 DU	1 DU
	Braddock Road to Rt. 50	F'	1 DU	1 DU	1 DU	69 DU	0
	TOTAL – West Four		**1 DU**	**1 DU**	**1 DU**	**102 DU**	**12 DU 1 Rec**
					115 DU, 1 Rec		
Note: Rec (Recreation) includes parks, ball fields, play areas, and an amphitheater.							

With the West Two alternative in the 2030 design year, 66 dwelling units and Sudley Park will be impacted by noise in the loudest hour. Of the residential properties, one will be exposed to *N* impact, 43 will be exposed to *S* impact, and 22 plus Sudley Park will be exposed to *B* impact. Most of the impact will occur between Artemus Road and Braddock Road. Currently in the West Two corridor, one residence is exposed to sound levels that approach or exceed the NAC. Future No-build conditions will be the same as existing.

With the West Four alternative in the 2030 design year, 115 dwelling units and Sudley Park will be impacted by noise during the loudest hour. Of the residential properties, one will be exposed to *N* impact, 102 will be exposed to *S* impact, and 12 plus Sudley Park will be exposed to *B* impact. Most of the impact will occur in the South Riding community between Braddock Road and Rt. 50, with scattered residential impact occurring between Artemus Road and Braddock Road. Currently in the West Four corridor, one residence is exposed to sound levels that approach or exceed the NAC. Future No-build conditions will be the same as existing.

6 NOISE ABATEMENT

FHWA has identified certain noise abatement measures that may be incorporated in projects to reduce traffic noise impact. Mitigation measures that have been considered for this project include alternative measures (traffic management and the alteration of horizontal and vertical alignment), and the construction of noise barriers.

6.1 Alternative Noise Abatement Measures

Traffic management measures that have been considered for noise abatement include reduced speeds and truck restrictions for the candidate build alternatives. Reduced speeds are not an effective noise mitigation measure since a substantial decrease in speed is necessary to provide a significant noise reduction. A 10 mph (16 kph) reduction in speed will result in only a 2 dB decrease in noise level. Truck restrictions would not significantly reduce noise levels since automobiles are a major contributor to peak hour traffic noise levels. Since automobiles comprise over 90% of vehicle volume during the loudest hour, only modest reductions in noise levels could be achieved by totally eliminating truck traffic. Further, such traffic management measures are in conflict with the intended use of the Project alternatives.

Preliminary corridor locations were chosen to avoid existing, proposed and planned noise sensitive development adjacent to the roadway. The alteration of horizontal alignment is limited by the available right-of-way along the project corridors. Significant noise reduction at noise sensitive locations would require large alignment shifts which would necessitate additional property takings and could expose additional sites to project noise. Also, the alteration of vertical alignment of the proposed roadway is not considered to be a feasible noise abatement measure. Depressing the roadway would require taking of additional property for the sloped embankments, or excessive costs for the construction of sound-absorptive retaining walls; elevating the roadway could allow noise to propagate farther into the community at higher levels.

6.2 Noise Barriers

The only remaining abatement investigated was the construction of noise barriers. The feasibility of noise barriers was evaluated at all locations where noise impact is expected to occur for each of the Build alternatives. 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.

6.2.1 Noise Computation Model

All noise barrier feasibility analysis was performed using TNM 2.5 using the alignment and typical sections of the Project roadways provided. Barrier heights and lengths were adjusted within TNM to provide the minimum noise reduction of 5 dB at all noise sensitive locations where noise impact is expected to occur. The resulting barrier heights are typically between 10 and 20 feet.

6.2.2 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 "protecting" or "benefiting" the property. A residential property is "protected" if it will be exposed to future noise impact and will receive at least 5 decibels of noise reduction from a barrier. By comparison, a residential property is "benefited" if it is *not* exposed to future noise impact, but will still receive at least 5 decibels of noise reduction from a barrier designed to protect impacted properties.

Barrier reasonableness, which is based on cost-effectiveness, is not evaluated in this study, since the barrier unit cost ($ per square foot of surface area) cannot accurately be determined during the Location Study stage of a project. Once the final project alignment has been approved and before the design public hearing, the appropriate barrier unit cost specific to that location will be determined and then barrier reasonableness will be evaluated. Costs can include but are not limited to costs for barrier materials and installation, for additional right-of-way to accommodate the barriers, for the resolution of utility and drainage conflicts with the barriers, and for dealing with safety issues created by the barriers. To be "reasonable," a barrier cannot cost more than $30,000 per protected or benefited residential property. A barrier not found to be reasonable due to cost can still be constructed if a third party (other than FHWA or VDOT) funds the amount above $30,000 per residential property. The reasonableness determinations for non-residential properties such as parks and other recreational areas are made on a case-by-case basis. The determinations are based not only on the barrier cost, but also on the type and duration of the activity taking place, the size of the affected area, the severity of the impact, and the amount of noise reduction provided.

6.2.3 Details of Evaluated Barriers

Details of each of the evaluated barriers are given in Table 6. Details include the applicable build alternative and segment, reference site numbers where applicable, length, height range, range of computed noise reduction, total surface area in square feet, and the land use protected and benefited. Figure 7 provides a graphical depiction of each barrier location as colored lines along the roadways.

Substantial portions of the study area are rural with a relatively low density of noise-sensitive land use. Many of the barriers summarized in Table 6 protect only one home, and such barriers are unlikely to benefit additional homes. Nevertheless, after a roadway alignment is approved, impacted and potentially benefited receivers will be re-evaluated, when cost reasonableness is computed.

For purposes of comparing the potential total cost of noise barriers for each of the three candidate build alternatives under consideration, estimates of the approximate cost of the barriers evaluated are provided in this report. This information is preliminary and should be considered to be very approximate since the project is not developed to a stage where a reliable cost estimate can be provided in regard to determining cost-effectiveness. Once the selected alternative has received design approval, a later study will determine the final barrier cost estimates, cost-effectiveness and feasibility. Table 7 provides protection, total surface area, and the preliminary cost information totaled by project alternative.

Table 6 Details of Evaluated Noise Barriers by Alternative

Barrier Description		Site No.	Barrier Length (ft)	Range Barrier Height (ft)	Range Noise Reduction (dB)	Surface Area (sq. ft.)	Noise-sensitive land use Protected/ Benefited
No.	Build Alt., Segment						
1	Comp Plan, E	M7, P12	400	15	8	5,995	Smith Baseball Park
2	Comp Plan, E	M8, P13	808	15	5 to 8	12,118	18/28 DU
3	Comp Plan, E	M9, P14	2,397	10	5 to 9	23,966	14/25 DU
4	Comp Plan, E	M10, P15	3,001	15	5 to 13	45,011	100/183 DU Ashton Glen Rec
5	Comp Plan, E	M11, P16	4,791	10 to 15	5 to 9	59,890	120/18 DU
6	Comp Plan, E	M12	2,401	15	5 to 10	36,021	80 DU Fairmont Park
7	Comp Plan, E	M15	6,199	10 to 15	5 to 9	85,915	71/140 DU
8	Comp Plan, E	M14, P32	7,414	10 to 15	5 to 12	99,242	362/6 DU Ben Lomond Park
9	Comp Plan, E	M17, P17	1,817	10 to 20	5 to 9	34,326	Amphitheater
10	Comp Plan, F	M18, P18	388	10	6	3,875	1 DU
11	Comp Plan, F	P19	1,858	20	5	37,162	2 DU
12	Comp Plan, F		1,201	10 to 15	5	12,993	1 DU
13	Comp Plan, F	P20	596	15	5	8,933	1 DU
14	Comp Plan, F	P21	1,251	10	5	12,514	1 DU
15	Comp Plan, F	P22	200	15	5	3,002	1 DU
16	Comp Plan, F		1,401	15 to 20	5	24,024	1 DU
17	Comp Plan, F	P23	999	10 to 15	5	11,987	1 DU
18	Comp Plan, F	P24	1,198	15	5	17,975	1 DU
19	Comp Plan, F	P25	578	10	5	5,776	1 DU
20	Comp Plan, F	P26	1,443	10 to 15	5	16,518	1 / 2 DU
21	Comp Plan, F		1,224	15	5	18,353	1 DU
22	Comp Plan, F	M22	960	15	5	14,394	1 DU
23	Comp Plan, F	P27	1,000	10 to 15	5 to 6	11,006	2 DU
24	Comp Plan West Four, F’	P28	1,416	10	5 to 7	14,155	19 DU
25	Comp Plan West Four, F’	M24, P29	1,219	10 to 15	5 to 10	14,266	28/2 DU 30 DU
26	Comp Plan West Four, F’	M25, P30	1,792	10	5 to 6	17,924	20/24 DU
27	Comp Plan West Four, F’	P31	1,230	10	5 to 8	12,301	1 / 2 DU
28	West Two, West Four, C		900	15	5	13,500	1 DU
29	West Two, West Four, C	P3	2,000	25	5	50,000	1 DU

Barrier Description		Site No.	Barrier Length (ft)	Range Barrier Height (ft)	Range Noise Reduction (dB)	Surface Area (sq. ft.)	Noise-sensitive land use Protected/ Benefited
No.	Build Alt., Segment						
30	West Two, West Four, C		1,000	20	5	20,000	2 DU
31	West Two, West Four, C	M3	2,900	10 to 20	5 to 9	57,300	1 DU, Sudley Park ball fields
32	West Two, West Four, C	M4, P4	3,800	15	5 to 12	57,000	8 DU
33	West Four, G		1,200	15	5	18,000	1 DU
34	West Four, G		300	20	8	6,000	1 DU
35	West Four, G		1,200	10	5	12,000	1 DU
36	West Four, G	M6	700	15	5	10,500	1 DU
37	West Four, G		1,400	10	5	14,000	3 DU
38	West Four, G		1,200	20	5 to 6	24,000	2 DU
39	West Four, G		200	10	6	2,000	1 DU
40	West Four, F’		600	10-15	5	6,800	1 DU
41	West Two, D		1,200	14	5	16,600	1 DU
42	West Two, D		1,000	12	9 to 12	11700	2 DU
43	West Two, D	P7	4,200	12-14	6 to11	51,000	12/1 DU
44	West Two, D		1,400	12-14	5	18,400	2 DU
45	West Two, D		1,992	16	5	31,900	3 DU
46	West Two, D		1,600	12-14	5 to 7	20,800	2/3 DU
47	West Two, D	P10	1,000	12	7	12,000	1/1DU
48	West Two, D		2,200	12	5 to 9	26,500	4/6 DU
49	West Two, D	P9, M26	600	12	5	7,400	1 / 2 DU
50	West Two, D	P8, M27	1,600	14	6	22,600	1 DU
51	West Two, D		2,400	14-16	6	34,800	2/2 DU

Table 7 Total Protection, Surface Area and Estimated Cost of Evaluated Noise Barriers by Alternative

Candidate Build Alternative	Number of Dwelling Units Protected / Benefited	Total Surface Area (sq. ft.) of Noise Barriers	Total Estimated Cost
Comprehensive Plan	879 / 432 Dus 4 / 1 Pk-Rec	659,642	$13,192,840
West Two	44 / 15 Dus 1 / 0 Pk-Rec	451,500	$9,481,500
West Four	122 / 30 Dus 1 / 0 Pk-Rec	349,746	$7,694,412

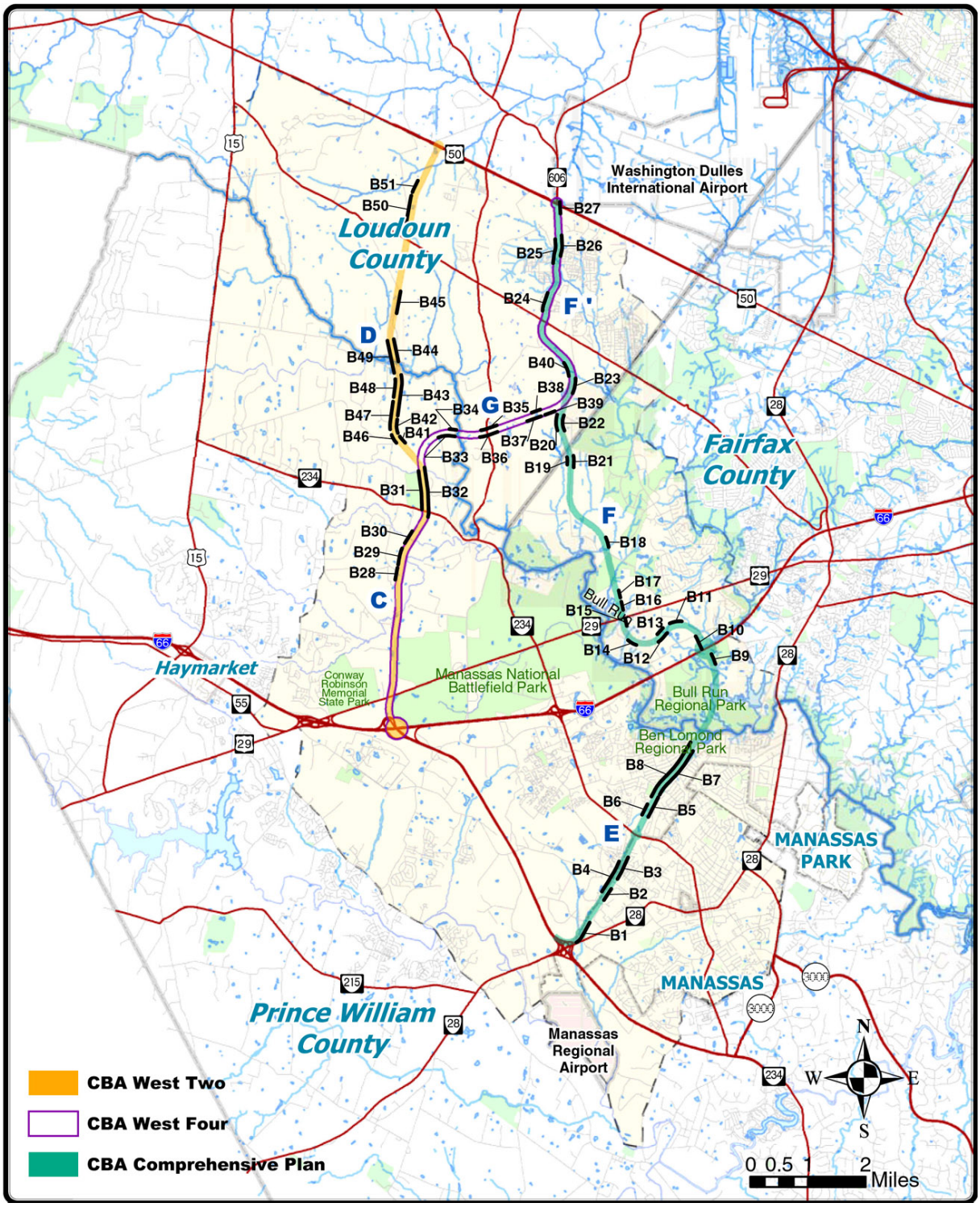


Figure 7 Evaluated Noise Barrier Locations

6.2.4 General Comments about Noise Barriers

In most areas, primarily along mainline sections, barriers were located at the edge of shoulder. This location (as near as possible to the roadway) usually results in the most efficient barriers—to protect the greatest number of homes at the least cost.

Wherever two barriers would be opposite each other, flanking the roadway, they must be constructed to minimize the effects of multiple reflections between them. Such multiple reflections can reduce the effectiveness of both barriers involved, often by several decibels for narrow corridors. These negative effects can be reduced with sound-absorbing materials on the barrier faces.

7 CONSTRUCTION NOISE

An increase in project area noise levels will occur during the construction of the proposed project improvements. Construction noise differs from that generated by normal traffic due to differences in the spectral and temporal characteristics of the noise. The degree of noise impact during construction will be a function of the number and types of equipment being used, and the distances between the construction equipment and the noise sensitive areas.

Generally, construction activity will occur during normal working hours on weekdays. Therefore, noise impact experienced by local residents as a result of construction activities should not occur during sleeping hours. Some impact will occur in the project vicinity where outdoor recreation takes place during normal working hours.

A number of measures can be utilized in order to minimize noise resulting from construction activities. Such measures include, but are not limited to, the following:

- Equip any internal combustion engine used for any purpose on or related to the job with a properly operating muffler;
- Conduct truck loading, unloading and hauling so that noise is kept to a minimum;
- Route construction equipment and vehicles in areas that will cause the least disturbance to nearby receptors where possible; and
- Place continuously operated diesel powered equipment, such as compressors and generators, in areas as far as possible from or shielded from noise sensitive locations.
- Wherever possible, noise barriers to be constructed as part of the project will be constructed as soon as possible to allow the barriers to protect noise-sensitive areas from construction noise.

The Virginia Department of Transportation (VDOT) has developed a specification concerning construction noise that is applicable to this project. In summary, the specification requires the Contractor to limit construction noise levels to 80 decibels in noise sensitive areas adjacent to the project area. Further, VDOT may monitor construction noise and require noise abatement where exterior noise levels from construction operations exceed 80 decibels. Also, VDOT may prohibit or restrict work that produces objectionable noise between 10 P.M. and 6 A.M. Construction equipment cannot be altered such that noise levels will be greater than that of the original equipment. These provisions are contained in Section 107.14(b) 3 Noise[5] and are reproduced below:

- "The Contractor's operations shall be performed so that exterior noise levels measured during a noise sensitive activity shall be not more than 80 decibels. Noise sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose. 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, 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 are not 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 REFERENCES

1. Federal Highway Administration, "23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise B Final Rule." Federal Register, Vol. 47, No. 131, 8 July 1982.

2. Virginia Department of Transportation, "State Noise Abatement Policy," adopted pursuant to the authority of Section 33.1-12 of the Code of Virginia, January 1997.

3. Menge, Christopher W., Christopher F. Rossano, Grant S. Anderson, Christopher J. Bajdek, FHWA Traffic Noise Model, Version 1.0: Technical Manual, Report No. FHWA-PD-96-010 and DOT-VNTSC-FHWA-98-2. Cambridge, MA: U.S. Department of Transportation, Research and Special Programs Administration, John A. Volpe National Transportation Systems Center, Acoustics Facility, February 1998.

4. Federal Highway Administration, "Highway Traffic Noise Analysis and Abatement: Policy and Guidance," U.S. Department of Transportation, Office of Environment and Planning, Noise and Air Quality Branch, Washington D.C., June 1995.

5. Virginia Department of Transportation, Road and Bridge Specifications, Section 107.14(b) 3 Noise, 2002.

APPENDIX A NOISE MEASUREMENT FIELD DATA SHEETS

This appendix provides all of the noise measurement data sheets developed during the field measurement program.

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Site #1	6621 Lolan	Overall Leq	:	61 dBA
		Subset (no X) Leq	:	61 dBA
		Subset (no V or X) Leq	:	61 dBA
Site #3	Sudley Park	Overall Leq	:	53 dBA
		Subset (no X) Leq	:	53 dBA
		Subset (no V or X) Leq	:	53 dBA
Site #4	Richland Dr.	Overall Leq	:	52 dBA
		Subset (no X) Leq	:	52 dBA
		Subset (no V or X) Leq	:	52 dBA
Site #5	Boxwood Farm	Overall Leq	:	39 dBA
		Subset (no X) Leq	:	39 dBA
		Subset (no V or X) Leq	:	39 dBA
Site #6	Gum Spring	Overall Leq	:	61 dBA
		Subset (no X) Leq	:	61 dBA
		Subset (no V or X) Leq	:	61 dBA
Site #7	Baseball	Overall Leq	:	59 dBA
		Subset (no X) Leq	:	59 dBA
		Subset (no V or X) Leq	:	59 dBA
Site #8	Confederate	Overall Leq	:	63 dBA
		Subset (no X) Leq	:	63 dBA
		Subset (no V or X) Leq	:	62 dBA
Site #10	Asheville St	Overall Leq	:	61 dBA
		Subset (no X) Leq	:	61 dBA
		Subset (no V or X) Leq	:	61 dBA
Site #11	Sunset Dr	Overall Leq	:	55 dBA
		Subset (no X) Leq	:	45 dBA
		Subset (no V or X) Leq	:	45 dBA
Site #12	Nimitz Ct	Overall Leq	:	44 dBA
		Subset (no X) Leq	:	44 dBA
		Subset (no V or X) Leq	:	43 dBA
Site #13	9701 Lomond	Overall Leq	:	66 dBA
		Subset (no X) Leq	:	66 dBA
		Subset (no V or X) Leq	:	66 dBA
Site #14	7912 Norfolk Ct	Overall Leq	:	43 dBA
		Subset (no X) Leq	:	43 dBA
		Subset (no V or X) Leq	:	42 dBA

overall = All sources, including contaminated minutes
subset (no X) = All sources, excluding contaminated minutes
subset (no V or X) = Traffic only, excluding contaminated minutes

Site #15	7814 Amherst	Overall Leq	:	50 dBA	
		Subset (no X) Leq	:	50 dBA	
		Subset (no V or X) Leq	:	48 dBA	
Site #16	King George Dr	Overall Leq	:	45 dBA	
		Subset (no X) Leq	:	45 dBA	
		Subset (no V or X) Leq	:	42 dBA	
Site #17	Bull Run Park	Overall Leq	:	59 dBA	
		Subset (no X) Leq	:	59 dBA	
		Subset (no V or X) Leq	:	59 dBA	
Site #18	15211 Compton	Overall Leq	:	52 dBA	
		Subset (no X) Leq	:	52 dBA	
		Subset (no V or X) Leq	:	52 dBA	
Site #19	15901 Lee Hwy	Overall Leq	:	65 dBA	
		Subset (no X) Leq	:	65 dBA	
		Subset (no V or X) Leq	:	65 dBA	
Site #20	Stone Bridge	Overall Leq	:	64 dBA	
		Subset (no X) Leq	:	64 dBA	
		Subset (no V or X) Leq	:	64 dBA	
Site #21	Sudley Forest Ct	Overall Leq	:	55 dBA	
		Subset (no X) Leq	:	55 dBA	
		Subset (no V or X) Leq	:	55 dBA	
Site #22	26821 Bull Run	Overall Leq	:	54 dBA	**Subtract 1.0 dB from all Site 22**
		Subset (no X) Leq	:	54 dBA	**levels due to calibration. DEB 1**
		Subset (no V or X) Leq	:	53 dBA	
Site #24	Beresford	Overall Leq	:	51 dBA	
		Subset (no X) Leq	:	50 dBA	
		Subset (no V or X) Leq	:	50 dBA	
Site #25	Ashbury/Astell	Overall Leq	:	54 dBA	
		Subset (no X) Leq	:	54 dBA	
		Subset (no V or X) Leq	:	53 dBA	

overall = All sources, including contaminated minutes
subset (no X) = All sources, excluding contaminated minutes
subset (no V or X) = Traffic only, excluding contaminated minutes

Tri County Parkway Measurements #298900.010, PART 3 6/4/2004 16:52

May 25, 2004; VDOT on-call acoustical consulting

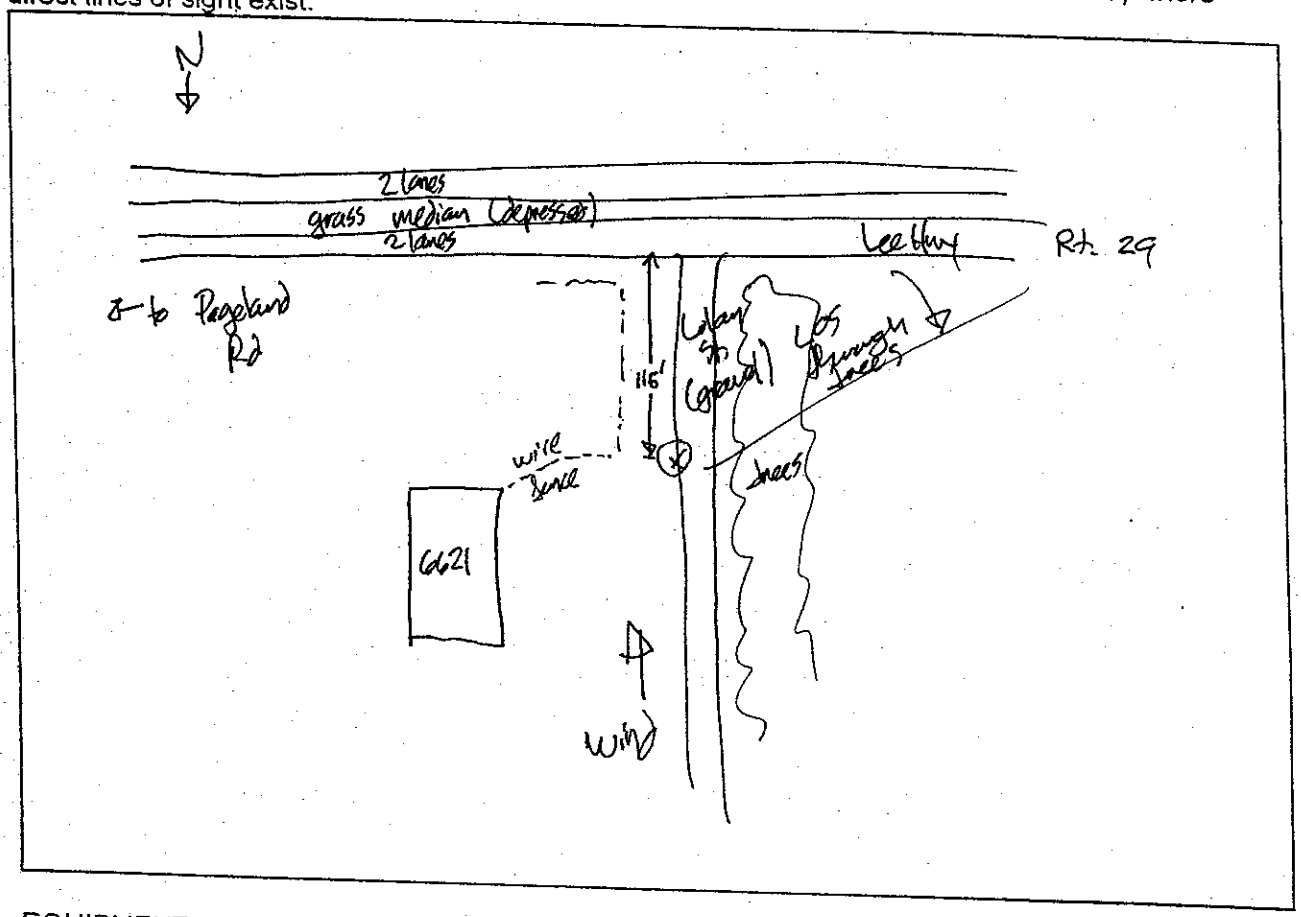
Site #26	12750 Chatter Brook Dr.	Overall Leq	:	~~47.9 dBA~~
		Subset (no X) Leq	:	44.1 dBA
		Subset (no V or X) Leq	:	42.5 dBA
Site #27	25005 Goshen Dr.	Overall Leq	:	51.1 dBA
		Subset (no X) Leq	:	51.1 dBA
		Subset (no V or X) Leq	:	50.4 dBA
Site #28	41753 John Mosby Hwy (F	Overall Leq	:	54.0 dBA
		Subset (no X) Leq	:	54.0 dBA
		Subset (no V or X) Leq	:	47.5 dBA

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Pkwy #1 (Alt. C)
ADDRESS: 6621 Lakeview St.
PHOTO ROLL & FRAME No's:

ENGINEER: DEB / JDV
DATE: 12/2/03

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Microphone / Pre-amp:
Calibrator:

WEATHER DATA:
Estimated Wind Speed: 3-5mph Gs to 9mph from N
Estimated Temperature: 42°F
Sky Conditions: Clear, 25° Humid

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
EB Leethway	77	6	23	50-55	1425	20 min
WB	180	3	15	50-55		

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co. Pkwy #1 (Alt. C)

LOCATION / ADDRESS: 6621 Lowry St.

ENGINEER: ~~DSB~~/JOV

DATE: 12/2/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	14:25	60.0						
2	:26	60.5						Cal = 93.8
3	:27	63.7						
4	:28	54.9				HT Lmax = 72.8		
5	:29	64.2						
6	:30	57.2				HT Lmax = 78.6		
7	:31	55.3						
8	:32	59.9						
9	:33	58.2						
10	:34	63.7						
11	:35	63.2						
12	:36	58.0				Jake Brake approaching Ragsdale = 71.6		
13	:37	57.9						
14	:38	62.8						
15	:39	63.9						
16	:40	62.0				HT Lmax = 77.9		
17	:41	66.8				HT Lmax = 73.9		
18	:42	56.5						
19	:43	55.4				hz-jet ac overflight (X)		
20	:44	60.3						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 61.0

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 <<

HARRIS MILLER MILLER & HANSON INC.

PROJECT: Tri-County Pky

JOB NO.: 2988900.010

LONG TERM NOISE MONITORING SITE LOG

SITE NO.: LT-2 (AH.C)

ADDRESS: 5675 Pageland Road

OWNER:

DESCRIPTION: SFH + Apt, large lot

NOISE SOURCES: Dry leaves/wind, aircraft Quarry Trucks
*Traffic on Pageland - busy during peak hours.

NOISE MONITOR: LD 870 #5 S/N:

MICROPHONE: S/N:

CALIBRATOR: S/N:

START DATE: 12/2 3:30 PM END DATE: 12/3

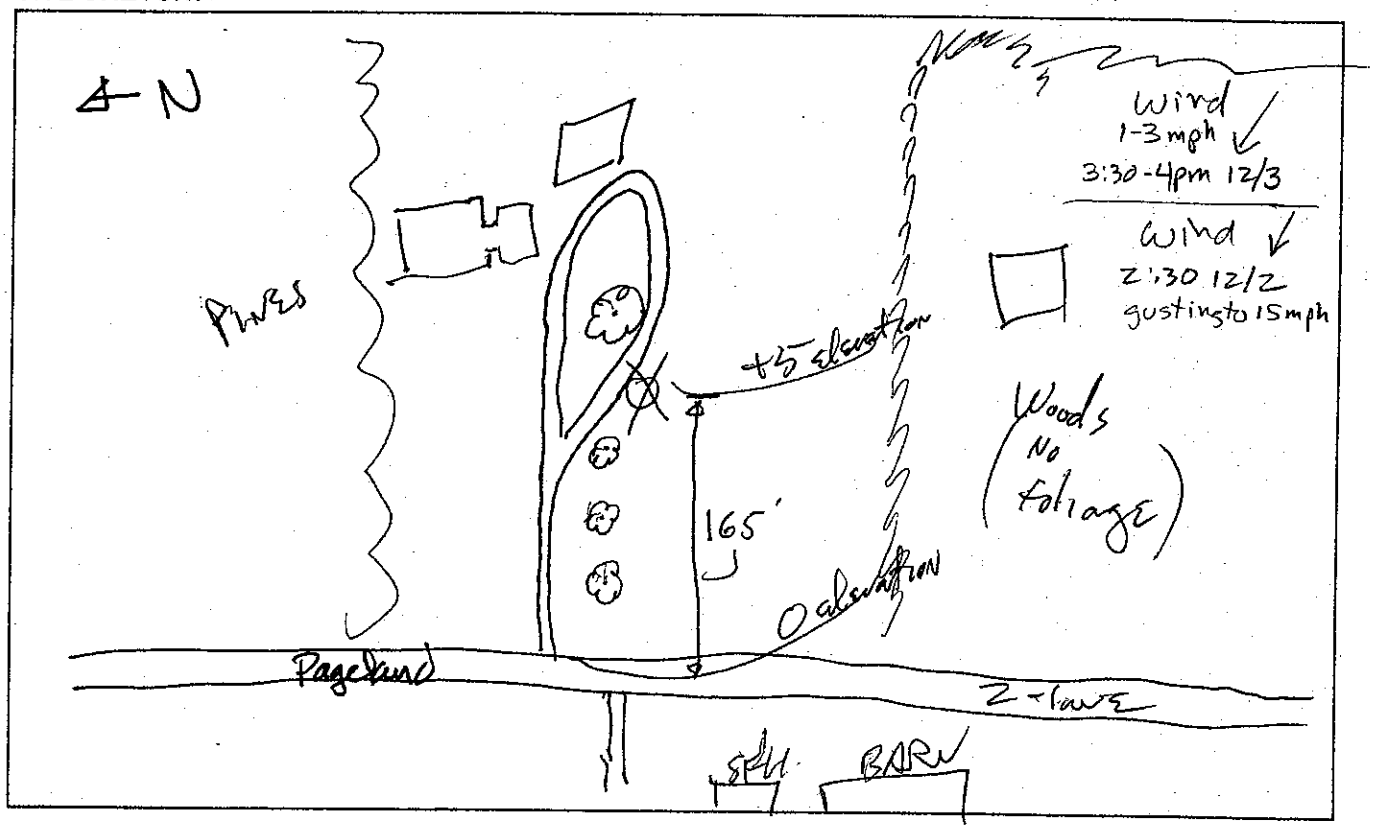
START TIME: END TIME: 4:00 PM

SYNCH W/HOURS? Yes

METRICS STORED:

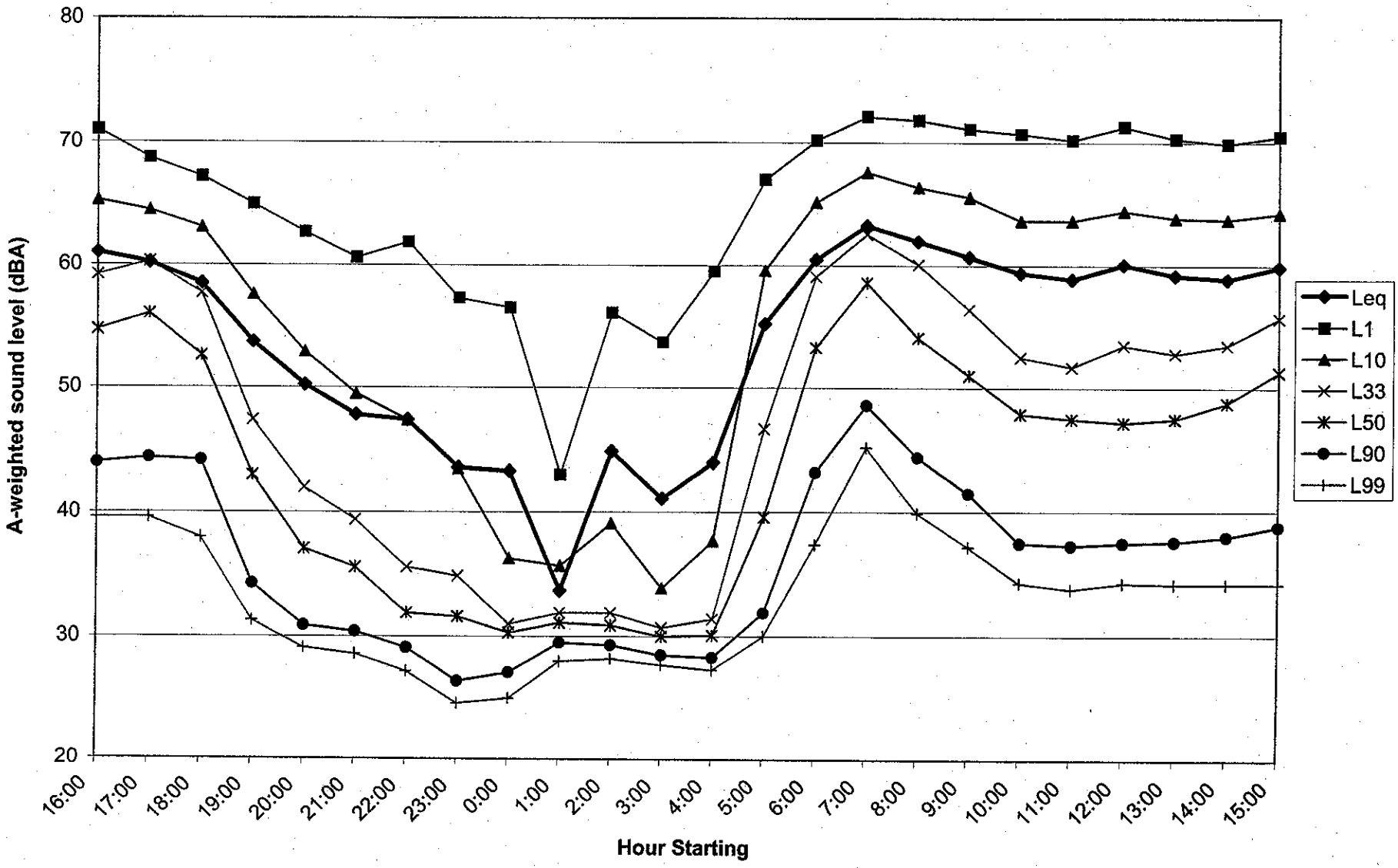
EXCEEDANCE Threshold: Duration:

SITE SKETCH:



Avg Temperature: 40 °F Weather Conditions: Clear

Tri-County Parkway Hourly Descriptors Site LT2 - 5675 Pageland Rd.
Dec 2 to Dec 3, 2003



LT2data.xls Graph interval data

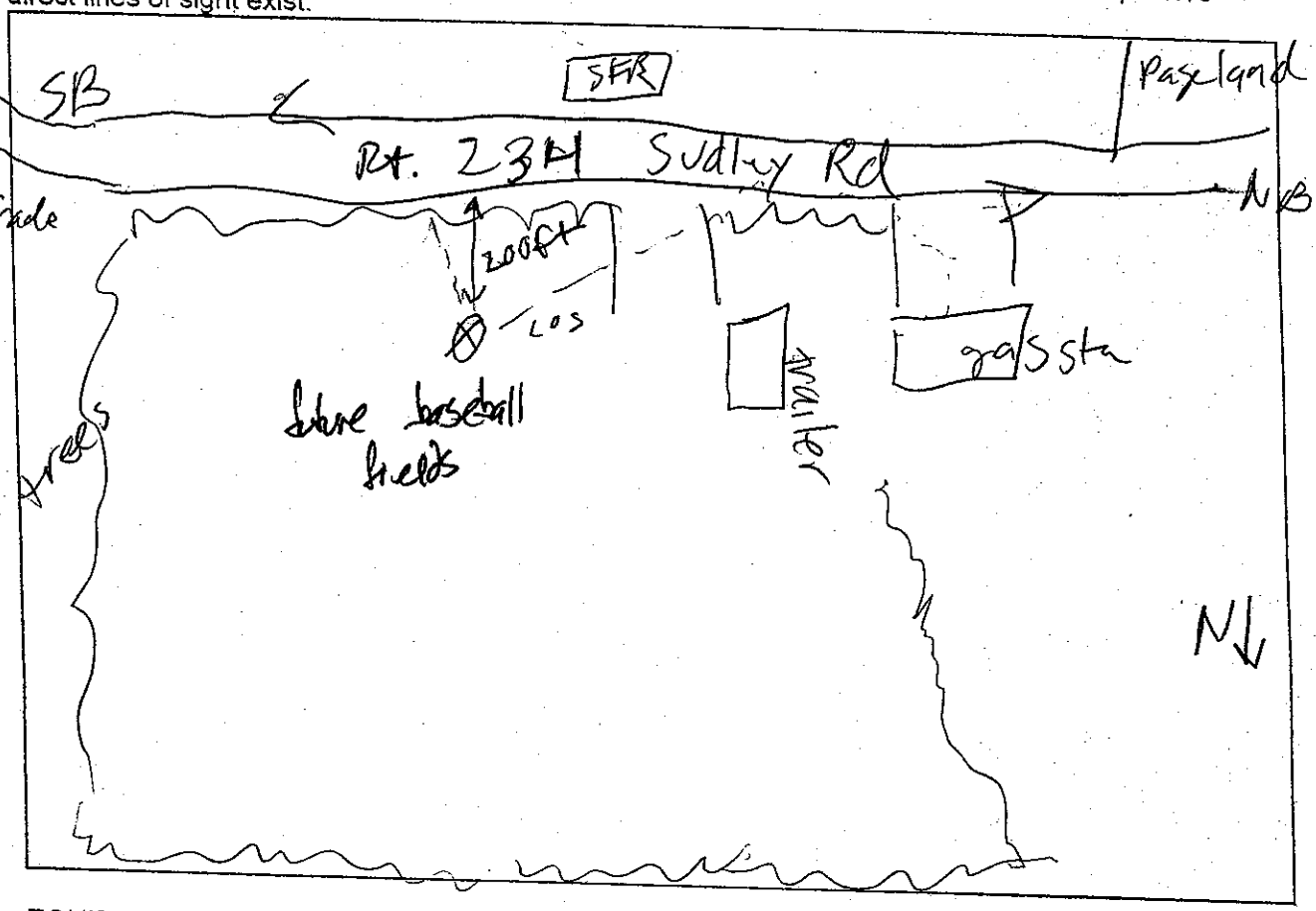
12/10/2003 3:44 PM

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: TriCounty #3 (Alt.c)
ADDRESS: Sudley Park (site)
PHOTO ROLL & FRAME No's: roll 2

ENGINEER: DEB, MRF
DATE: 03 DEC 2003

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B+K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 1-3mph
Estimated Temperature: 35°
Sky Conditions: cloudy

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed est	Start Time	Duration
NB 234	249	11	3	35-40mph		20 min
SB 234	62	6	1	35-40mph		20 min

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri County #3 (Alt.c)

LOCATION / ADDRESS: Sodley Park (Site)

ENGINEER: DEB, MRF

DATE: 03 DEC 2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	17:17	52.1						cal 93.8
2	17:18	53.5						
3	17:19	53.2						
4	17:20	55.6						
5	17:21	54.2						
6	17:22	50.6						
7	17:23	54.2						
8	17:24	50.6						
9	17:25	53.2						
10	17:26	51.8						
11	17:27	53.1					aircraft	
12	17:28	52.5						
13	17:29	52.5						
14	17:30	52.6						
15	17:31	51.3						
16	17:32	53.6					aircraft	
17	17:33	51.2						
18	17:34	51.0					bird	
19	17:35	52.4						
20	17:36	55.4						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 53.0

SUBSET Leq =

traffic on 234 dominant noise source

✓ = *Other sources contributed to Leq*

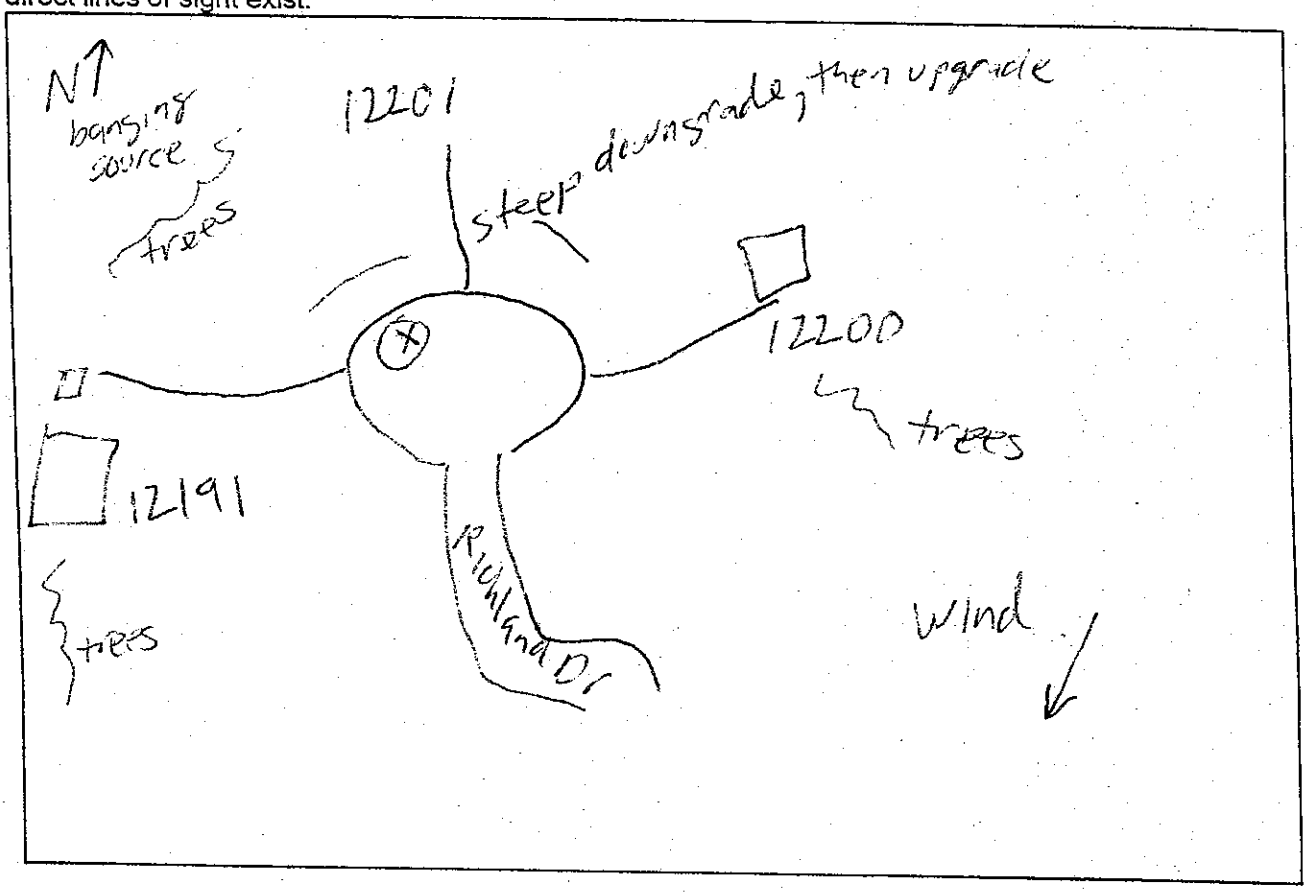
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: #4 Tri County (Alt.C)
ENGINEER: MRF
ADDRESS: Richland Dr Cul de Sac
DATE: 02DEC2003
PHOTO ROLL & FRAME No's: 2 pic disposable

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: LD 870-5
Calibrator: Quest
Microphone / Pre-amp: 3674

WEATHER DATA:
Estimated Wind Speed:
Estimated Temperature: 40°F
Sky Conditions: Clear, windy

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: #4 Tri County (Alt. C)
LOCATION / ADDRESS: Richland Dr cul de sac

ENGINEER: MRF
DATE: 02DEC2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	14:14	54.5					wind!	cal 114.0 dBA
2	14:15	58.5						
3	14:16	57.4						
4	14:17	55.5						
5	14:18	52.8						
6	14:19	52.9						
7	14:20	52.5						
8	14:21	53.2						
9	14:22	54.7					aircraft	
10	14:23	50.0						
11	14:24	51.2						
12	14:25	50.0						
13	14:26	51.2						
14	14:27	50.6						
15	14:28	49.7						
16	14:29	49.4						
17	14:30	48.5						
18	14:31	46.2						
19	14:32	49.8						
20	14:33	49.0	✓					
21	14:34	43.9					bang - especially loud	
22	14:35	46.5						
23	14:36	48.9					aircraft	
24	14:37	53.4						
25	14:38	51.4						
26	14:39	48.2						
27	14:40	49.0						
28	14:41	50.7						
29	14:42	51.3	✓				bang	
30	14:43	51.0					aircraft	

2nd cal 114.0 dB

TOTAL Leq = 52.2
SUBSET Leq = 52.4

wind
occasional bang - distant construction?
distant aircraft

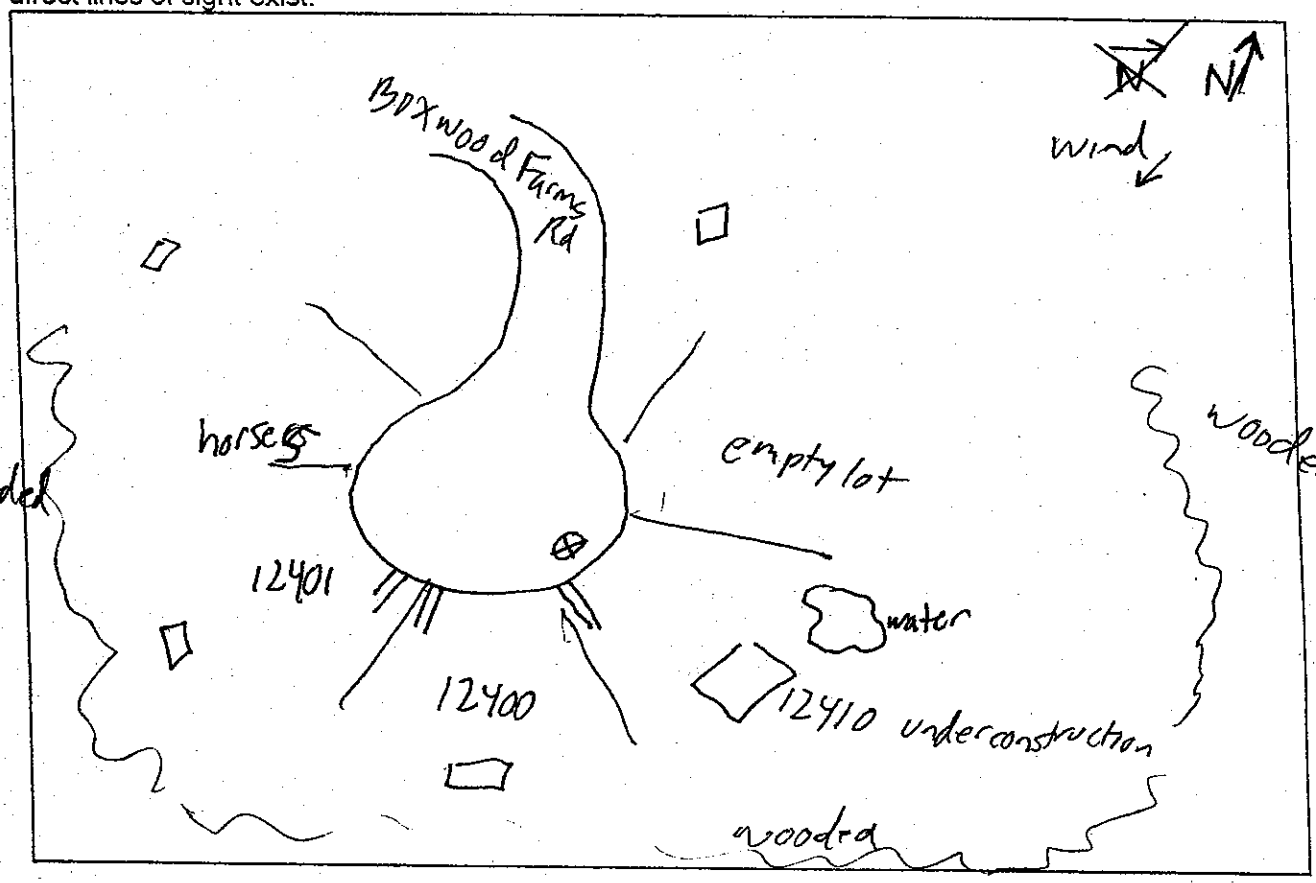
✓ = Other sources contributed to Leq
X = Exclude period - contaminated by non-characteristic sources

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri County PKWY/#5 (Alt. G) ENGINEER: DEB, MRF
ADDRESS: 12410 Boxwood Farms Rd - cul de sac DATE: 03 DEC 2003
PHOTO ROLL & FRAME No's: Roll 2 #4, 5

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B+K 2230 Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 1-3 mph Estimated Temperature: 35°F
Sky Conditions: cloudy/overcast 38% hum

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co Parkway #5 (Alt. G)
LOCATION / ADDRESS: 12410 Boxwood Farms Rd.

ENGINEER: DES/MAF
DATE: 12/3/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	15:34	37.4			high alt	overflight		Pre-cal = 93.9 dBA
2	:35	37.1						
3	:36	35.4						
4	:37	36.1						
5	:38	34.2						
6	:39	31.8						
7	:40	37.4			high alt	overflight		
8	:41	39.1						
9	:42	37.5						
10	:43	38.0			distant alt			
11	:44	33.1						- No traffic noise
12	:45	36.5						audible most of time
13	:46	34.4						
14	:47	38.3						- Leq mostly
15	:48	36.9			distant alt			dominated by
16	:49	38.9						high or distant
17	:50	38.1			distant alt			alt overflights
18	:51	40.6						- children playing
19	:52	41.0			alt Lmax =	46.2		(distant)
20	:53	46.0			alt overflights			- occ. traffic on
21					alt Lmax =	51.9		Sanders (to W)
22								audible
23								
24								Post cal = 93.7
25								
26								
27								
28								
29								
30								

TOTAL Leq = 38.6
SUBSET Leq =

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

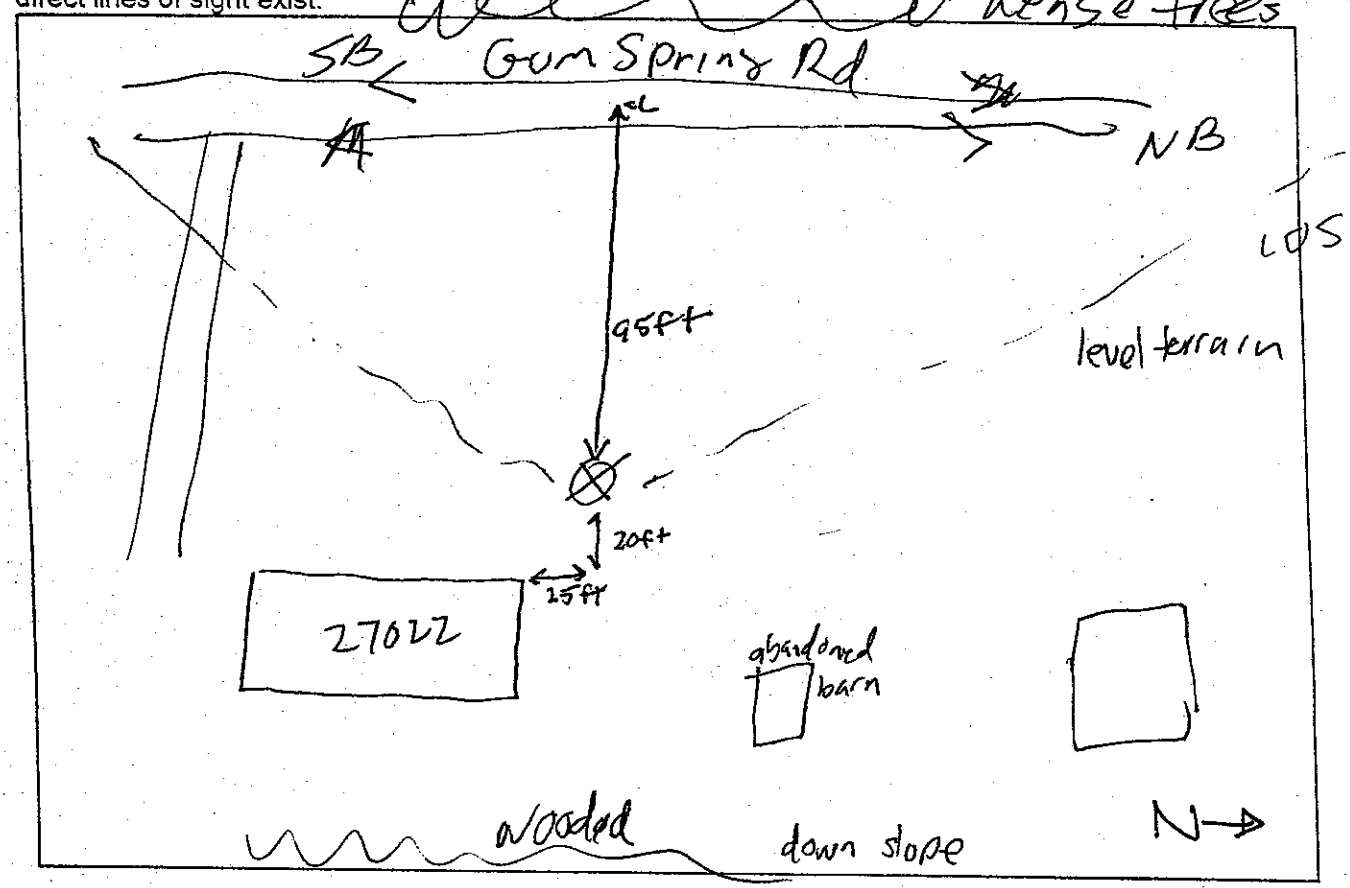
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri County #6 (Alt. G)
ADDRESS: 27022 Gum Spring Rd (Rt 659
PHOTO ROLL & FRAME No's: 25 roll 1, 1-3 roll 2

ENGINEER: DEB, MRF
DATE: 03 DEC 2003

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B+K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 3-5 mph, 8 mph gusts
Estimated Temperature: 35°F
Sky Conditions: cloudy / high overcast
40% Hum

TRAFFIC COUNTS:

	Roadway	Autos	Med Trucks	Heavy Trks	Speed est	Start Time	Duration
NB	Gum Spring	48	7	26	35 mph	14:29	30 min
SB	Gum Spring	101	10	22	35 mph		30 min

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri County #6 (Alt G)
LOCATION / ADDRESS: 27022 Gum Spring Rd (659)
ENGINEER: DEB, MRT
DATE: 03DEC2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	14:29	60.3					aircraft	cal 93.8
2	14:30	56.4						
3	14:31	50.8						
4	14:32	61.2						
5	14:33	53.0						
6	14:34	62.8					aircraft	HT horn
7	14:35	51.4						
8	14:36	62.0						
9	14:37	64.9						
10	14:38	54.4						
11	14:39	61.1					aircraft	
12	14:40	61.0						
13	14:41	61.5						
14	14:42	63.9						
15	14:43	60.9		𝍸		11		
16	14:44	59.0		𝍸		11		
17	14:45	57.1		𝍸		1	bang	
18	14:46	58.1		1		1		
19	14:47	55.5						
20	14:48	58.4						
21	14:49	64.1		𝍸 1	1	1111		
22	14:50	64.9		1111		111		
23	14:51	59.7					aircraft	
24	14:52	58.7						
25	14:53	59.5					car horn	
26	14:54	62.2					aircraft	
27	14:55	54.7						
28	14:56	44.5					lear, no trucks	
29	14:57	63.1					aircraft	endcal
30	14:58	66.5					aircraft	

TOTAL Leq = 61.0
SUBSET Leq =

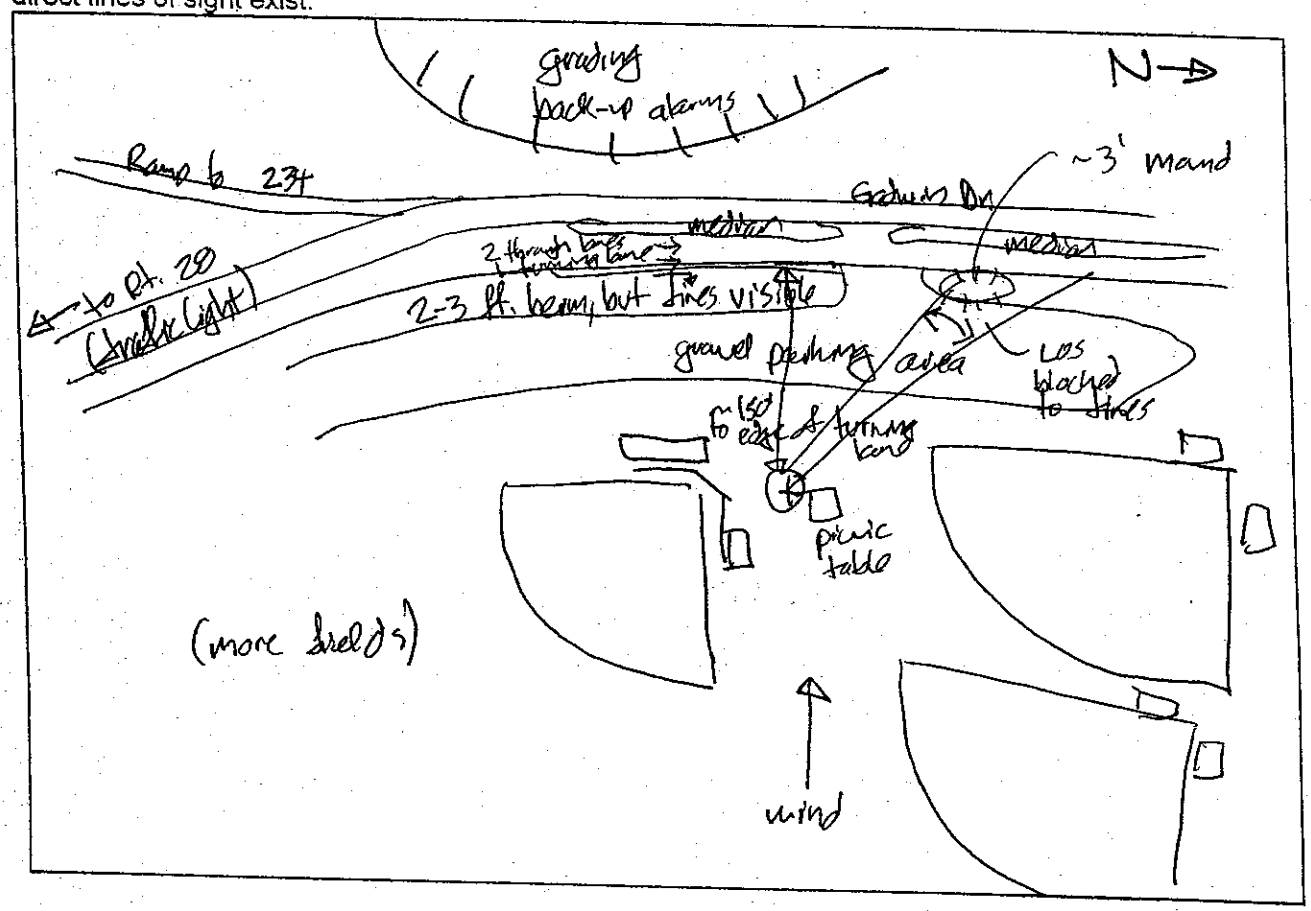
lot of HT - quarry traffic?

✓ = *Other sources contributed to Leq*
X = *Exclude period - contaminated by non-characteristic sources*
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Pkwy #7 (Alt. E)
ENGINEER: DEB/MRF
ADDRESS: E.G. Smith City of Manassas Baseball Complex
DATE: 12/4/03
PHOTO ROLL & FRAME No's: Roll #2 8-12

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 1-3 mph from SE gusting to 5 mph
Estimated Temperature: 36°F
Sky Conditions: High overcast
Humid 45%

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
Godwin Dr NB	306	6	6	35 mph	10:10	30 min
Godwin Dr SB	206	8	9	35 mph		

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co. Pkwy #7 (Alt. E)

LOCATION / ADDRESS: E.G. Smith City of Manassas Baseball Complex

ENGINEER: DEB/MRF

DATE: 12/4/03

#	⊥ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	10:10	58.1						
2	:11	58.2						
3	:12	58.0						Cal = 93.8
4	:13	58.7						
5	:14	58.3						Traffic on
6	:15	57.4						Godwin
7	:16	57.8		train horn (traffic dominates)				dominates
8	:17	59.6						
9	:18	55.7						
10	:19	57.4		a/c high overlight, train horn (traffic dominates)				
11	:20	58.1		train horn (traffic dominates)				
12	:21	58.1						
13	:22	58.8						
14	:23	64.3		Lead HT on Godwin, Lmax = 76.4				
15	:24	58.8		a/c high overlight				
16	:25	61.0		HT on Godwin, Lmax = 70.1				
17	:26	56.4						
18	:27	56.1						
19	:28	57.4		helo (traffic dominates)				
20	:29	57.7						
21	:30	55.9						
22	:31	63.4		motorcycle, Lmax = 74.3				
23	:32	58.7						
24	:33	56.1						
25	:34	58.1		helo				
26	:35	57.4						
27	:36	54.3						
28	:37	58.8						End cal = 93.7
29	:38	55.4						
30	:39	57.2						

TOTAL Leq = 58.6

SUBSET Leq =

✓ = *Other sources contributed to Leq*

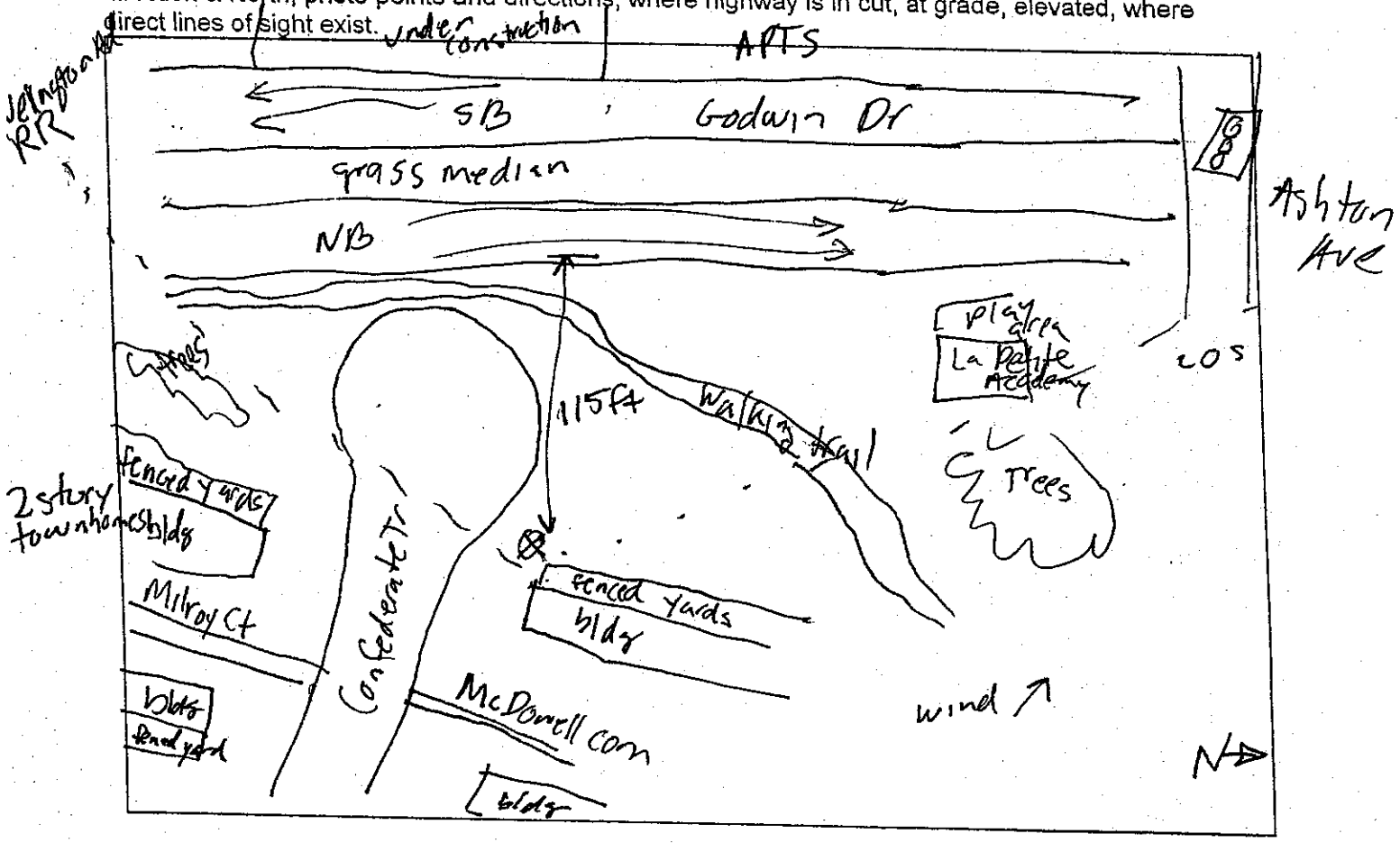
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri County #90 (AH.E)
ENGINEER: DEB, MRF
ADDRESS: Confederate Trail cul de sac
DATE: 04 DEC 2003
PHOTO ROLL & FRAME No's: roll 2 #14-18

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B+K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 2-3mph
Estimated Temperature: 37°F 44% hum
Sky Conditions: overcast

TRAFFIC COUNTS:

	Roadway	Autos	Med Trucks	Heavy Trks	Speed est	Start Time	Duration
NB	Godwin Dr	354	7	19	35mph	11:35	30min
SB	Godwin Dr	220	9	19	35mph		30min

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri County #8 (Alt. E)

LOCATION / ADDRESS: Confederate Tr cul de sac

ENGINEER: DEB/MRF

DATE: 04 DEC 2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	11:35	60.9					aircraft	cal 93.9 dBA
2	11:36	60.3					air craft	
3	11:37	58.9						
4	11:38	58.6					backing beep	
5	11:39	65.3						
6	11:40	59.5					aircraft	
7	11:41	62.7						
8	11:42	56.1						
9	11:43	61.3					car in cul de sac	
10	11:44	61.2					dogs barking	
11	11:45	57.3						
12	11:46	63.6					dogs	
13	11:47	57.7						
14	11:48	61.2						
15	11:49	59.8					dogs	
16	11:50	61.2					dogs	
17	11:51	59.7					dogs	
18	11:52	64.2						
19	11:53	61.1					heat pump shut off	
20	11:54	61.0						
21	11:55	58.7						
22	11:56	64.6						
23	11:57	61.9					aircraft, beeping, dogs, HT	
24	11:58	63.4					aircraft, " " " "	
25	11:59	62.8					train horn	
26	12:00	61.1						
27	12:01	60.7						
28	12:02	67.8					HT acc (max 78.7)	
29	12:03	64.3					train horn	
30	12:04	68.9	✓				train horn (max 80.9)	end cal 93.5 dBA

TOTAL Leq = 62.6

SUBSET Leq = 62.1

Godwin Dr traffic dominant noise

✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

HARRIS MILLER MILLER & HANSON INC.

PROJECT: Tri-County Pkwy

JOB NO.: 298900.016

Engr.: JDV/DEB

LONG TERM NOISE MONITORING SITE LOG

SITE NO.: LT #9 (Alt. E)

ADDRESS: 8906 Sweetbriar Street

OWNER: GUCK

DESCRIPTION: 2-story SFH with backyard, pool, etc.

NOISE SOURCES: Godwin Drive Traffic - Busy including Trucks Divided 4-lane.

NOISE MONITOR: LD 870 #6 S/N:

MICROPHONE: S/N:

CALIBRATOR: S/N:

START DATE: 12/3/03 END DATE: 12/4

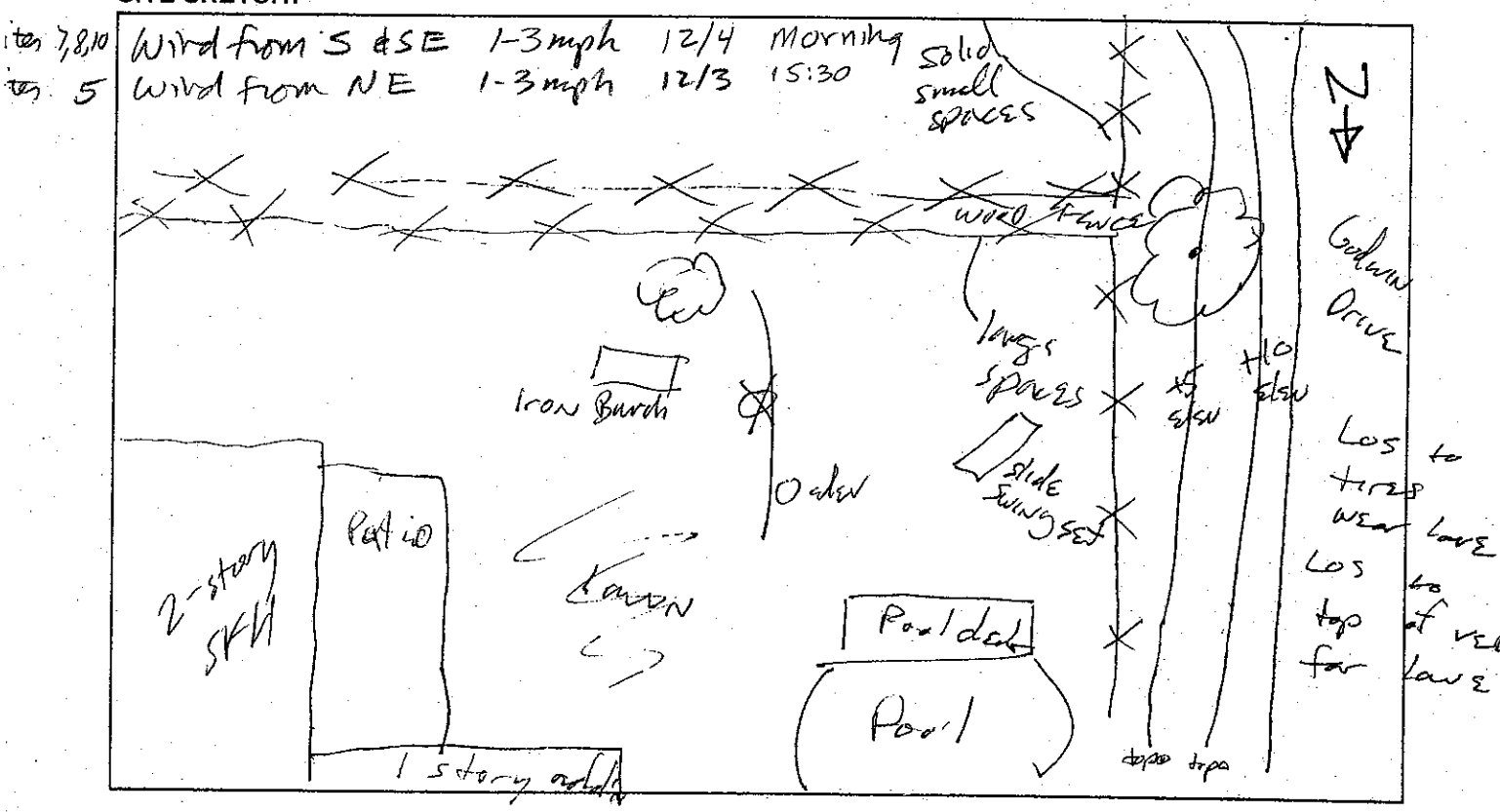
START TIME: ~15:25 END TIME: 1600

SYNCH W/HOURS? Yes

METRICS STORED: Ln's

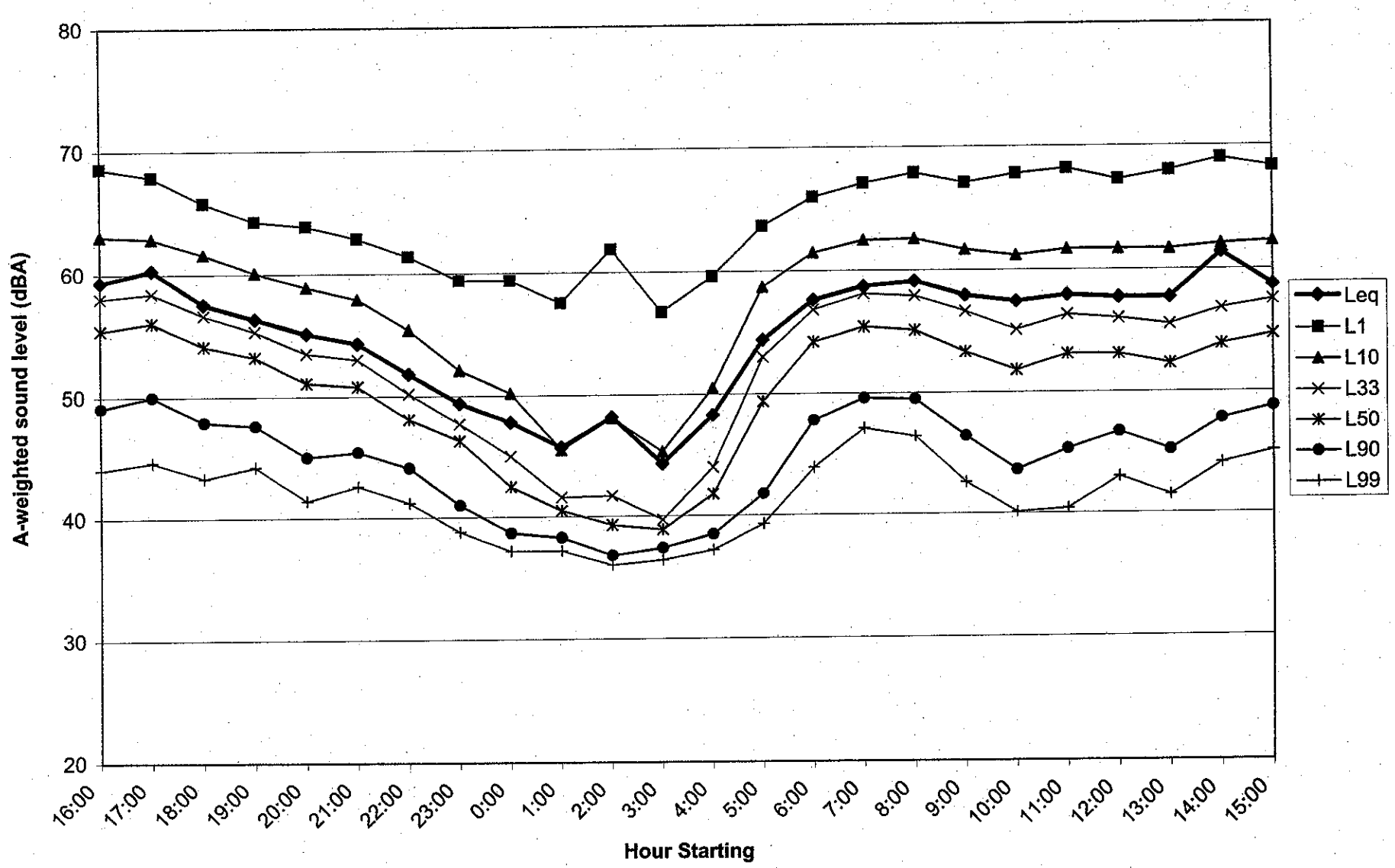
EXCEEDANCE Threshold: Duration:

SITE SKETCH:



Avg Temperature: 37 °F Weather Conditions: OVERCAST, Low WIND.

Tri-County Parkway Hourly Sound Level Descriptors
Site LT9 - 8906 Sweetbriar St. - Dec 3 to Dec 4, 2003

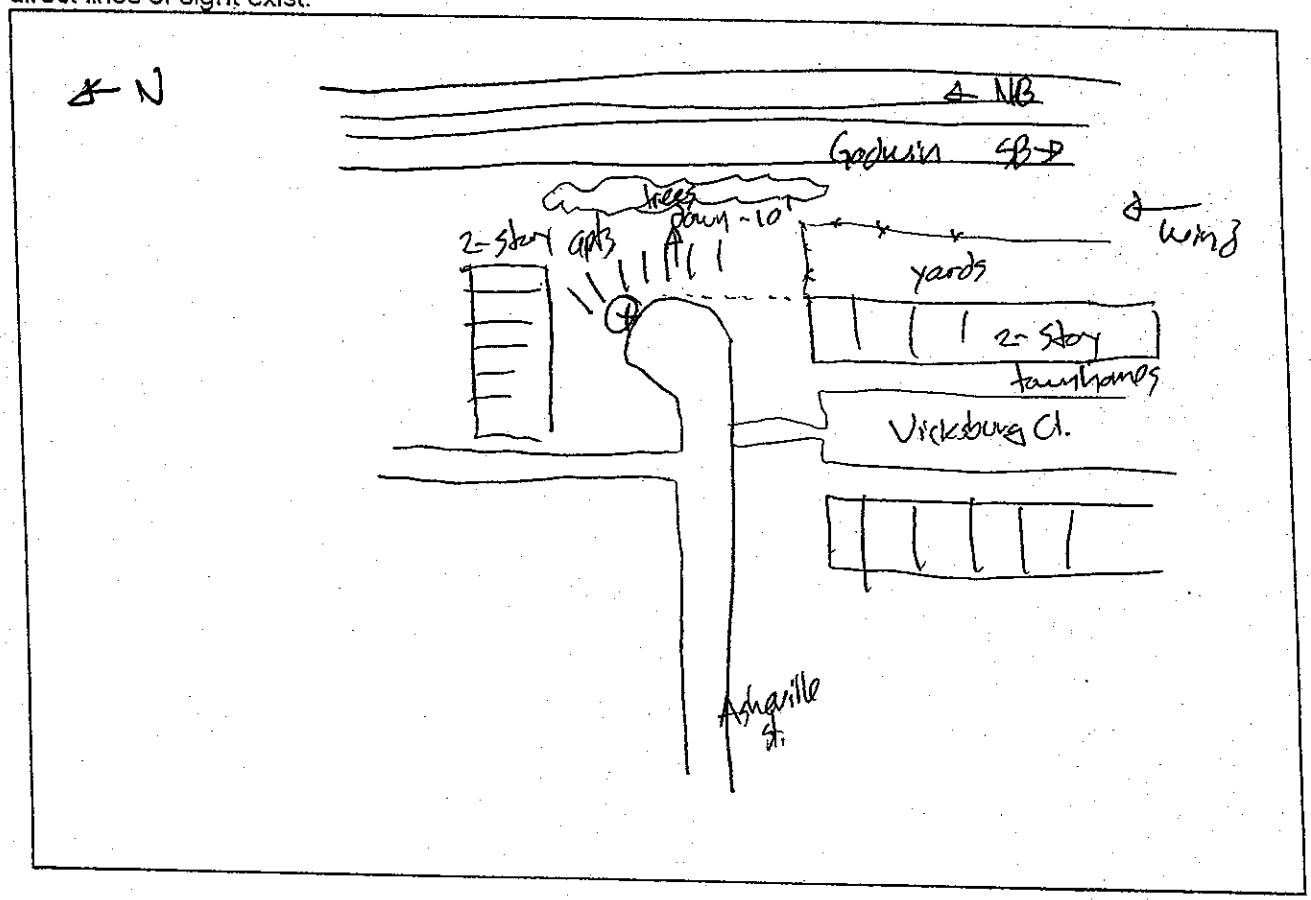


HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Pkwy #10 (Alt. E)
ADDRESS: Cul-de-sac end of Asheville St.
PHOTO ROLL & FRAME No's: Roll #2 20-24

ENGINEER: ~~DEB~~/MRF
DATE: 12/4/03

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Microphone / Pre-amp:
Calibrator:

WEATHER DATA:
Estimated Wind Speed: 1-3 mph
Sky Conditions: overcast
Estimated Temperature: 37°F
36% Humid

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
Godwin NB	240	4	12	35 mph	12:42	30 min
Godwin SB	280	7	26	35 mph		

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co. Pkwy #10 (Alt. E)
LOCATION / ADDRESS: Cul-de-sac end of Asheville St.

ENGINEER: ~~KS~~ MRF
DATE: 12/4/03

#	__ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	12:42	61.3						Cal = 93.8
2	:43	62.4						
3	:44	61.2						
4	:45	60.6						Traffic on
5	:46	60.8						Galwin dominates,
6	:47	56.7						but variable
7	:48	63.0						due to traffic
8	:49	60.5						lights
9	:50	59.2						
10	:51	59.9						
11	:52	64.6			HT	Lmax = 71.9	(3 SB HTs during minute)	
12	:53	59.4						
13	:54	63.4						
14	:55	57.3						
15	:56	61.4						
16	:57	57.7						
17	:58	59.5						
18	:59	60.4						
19	13:00	60.4						
20	:01	57.9						
21	:02	63.5		HT	Lmax = 72.5			
22	:03	61.9		SB	Jake Brake Lmax	= 75.1		
23	:04	58.4						
24	:05	59.5						
25	:06	61.9						
26	:07	60.3						
27	:08	59.5						
28	:09	58.8						
29	:10	64.9		Several HTs, Lmax = 71.8				end cal = 93.7
30	:11	62.7		drain horn (traffic dominates)				

TOTAL Leq = 61.1
SUBSET Leq =

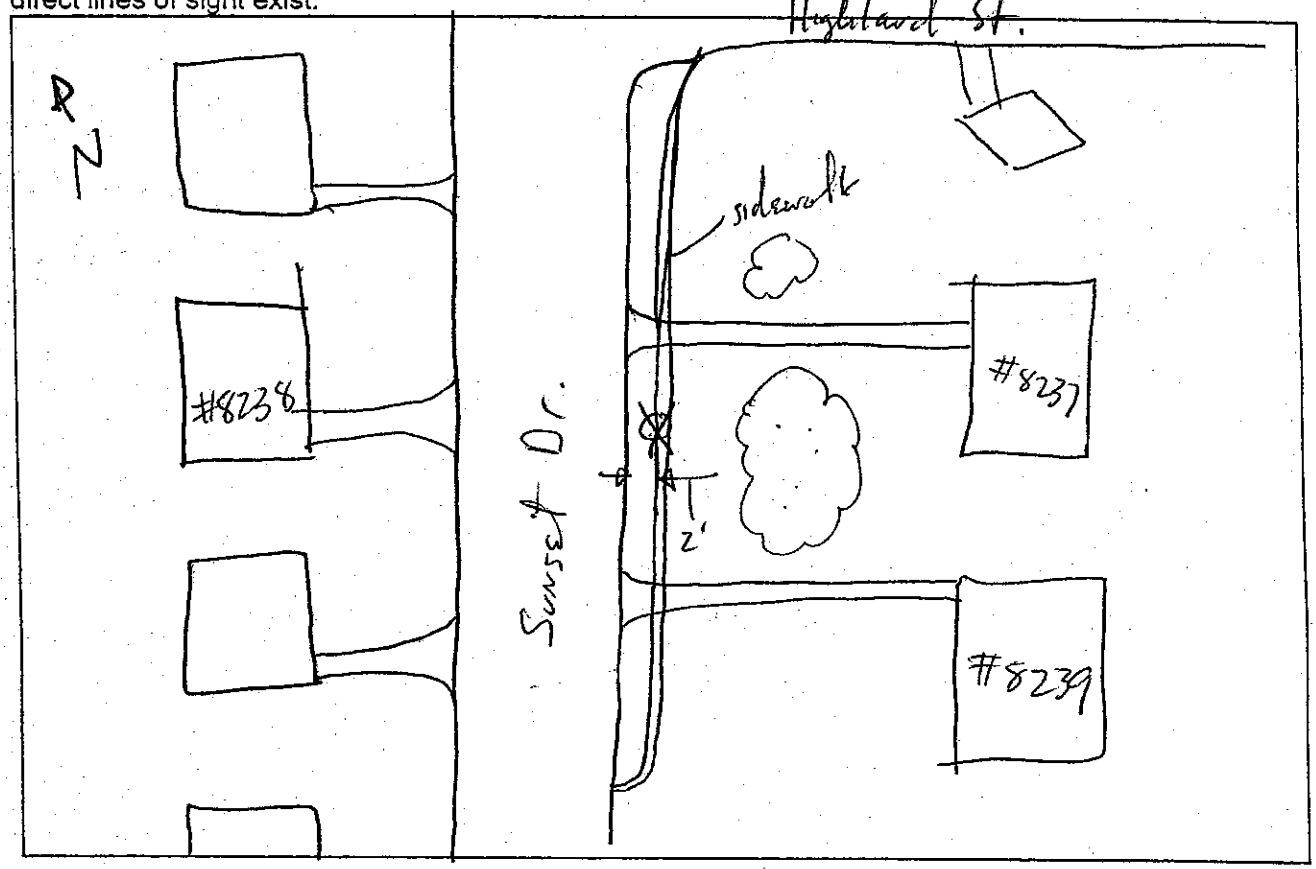
✓ = *Other sources contributed to Leq*
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-county Parkway ~~[illegible]~~ #11 (Alt. E) ENGINEER: JDV
ADDRESS: 8237 Sunset Dr DATE: 12/4/03
PHOTO ROLL & FRAME No's: DIG.

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: LD 870 #5 Kit Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 3-5 mi/h Estimated Temperature: 35 F
Sky Conditions: overcast

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: 8237 Sunset Dr #11 (A/E) ENGINEER: JDV
LOCATION/ADDRESS: Tri-County Pkwy 298400.010 DATE: 12/4/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Sunset Drive Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	11:40	55.5	X	I				cal @ 114.0
2	11:41	59.1	X	III				MIN 40.5 MAX 72.3 passby
3	11:42	57.7	X	I				
4	11:43	61.6	X	III			A/C	
5	11:44	44.0				MIN 38.6 MAX 51.5	A/C, wind, dogs, dog, distant traffic	
6	11:45	54.7	X	I			A/C	
7	11:46	54.4	X	I			A/C	
8	11:47	44.8				MIN 39.2 MAX 52.5	"	
9	11:48	44.8				MIN 41.2 MAX 51.5	"	
10	11:49	41.2				MIN 38.2 MAX 46.4	"	
11	11:50	41.0				MIN 38.6 MAX 44.9	"	
12	11:51	52.6	X	I				
13	11:52	56.4	X	I				
[illegible]	11:53	42.7	[illegible]			MIN 40.5 MAX 48.2		
15	11:54	45.7				MIN 39.2 MAX 53.9	car start, nearby	
16	11:55	50.5	[illegible]				A/C off	
17	11:56	58.2	X	I			A/C off	
18	11:57	58.7	X	I			" "	
19	11:58	60.2	X	III			dog	
20	11:59	53.3	X	I				
21	12:00	59.2	X	II				
22	12:01	42.4					wind, squirrels	
23	12:02	41.0				MIN 37.2 MAX 48.7	RR horn	
24	12:03	45.3				MIN 39.8 MAX 54.2	" "	
25	12:04	58.4	X	II				
26	12:05	43.1						
27	12:06	55.1	X	II				
28	12:07	57.2	X	II			next door, [illegible]	
29	12:08	41.5						
30	12:09	42.7					A/C	cal @ 114.3

offset 9.2

TOTAL Leq = 55.1
SUBSET Leq = 44.5

Mic. too close to Sunset Dr. to be representative of noise exposure in yards, so minutes where vehicles passed the microphone on Sunset Dr. are excluded.

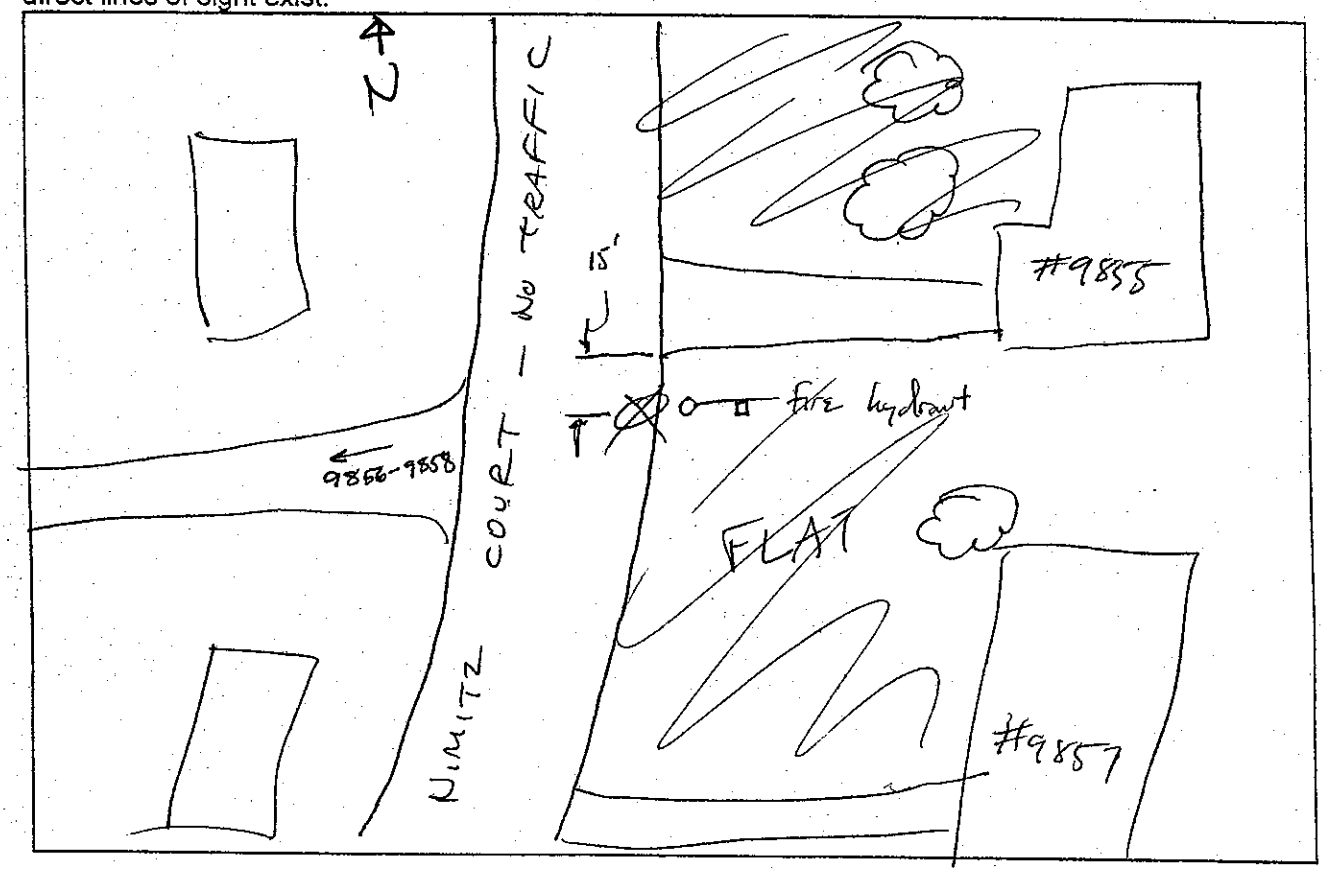
✓ = Other sources contributed to Leq
X = Exclude period - contaminated by non-characteristic sources

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-County Pkwy #12 (AH.E) ENGINEER: JDV
ADDRESS: 9855-7 Nimitz Court DATE: 12/4/03
PHOTO ROLL & FRAME No's: Dig.

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: LD 870 #5 Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 2-4 mi/h Estimated Temperature: 35 F
Sky Conditions: Overcast

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: Tri-County Pkwy 298900.010 #12 (Alt.E) ENGINEER: JDV
LOCATION/ADDRESS: 9855-7 Nimitz Court DATE: 12/4/03

#	∠ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	12:54	48.3	✓				A/C	@ 114.0
2	12:55	44.9					container	
3	12:56	42.5						
4	12:57	40.2						
5	12:58	41.9					dog	
6	12:59	41.9						
7	13:00	41.4					distant traffic, A/C	
8	13:01	41.9					[BIRDS]	
9	13:02	39.7						MIN 37.4 MAX 45.9
10	13:03	44.0						MIN 39.6 MAX 51.6
11	13:04	42.6						MIN 38.8 MAX 48.3
12	13:05	41.9						
13	13:06	45.3					A/C, hammerway, car	
14	13:07	42.7						
15	13:08	45.0					A/C	
16	13:09	43.5					A/C, RR horn	MIN 38.1 MAX 49.9
17	13:10	47.1					A/C, RR horn ~~close~~	
18	13:11	49.8	✓				RR horn closer max 65.8	
19	13:12	42.9						
20	13:13	43.2					RR horn	
21	13:14	40.0					buses stopped - RR cross	
22	13:15	42.2						
23	13:16	43.5						
24	13:17	40.7						
25	13:18	40.9						
26	13:19	40.9						
27	13:20	41.0						
28	13:21	48.6	✓				A/C	
29	13:22	50.4	✓				", ladder	
30	13:23	42.2						

TOTAL Leq = 44.5
SUBSET Leq = 42.8

✓ = *Other sources contributed to Leq*

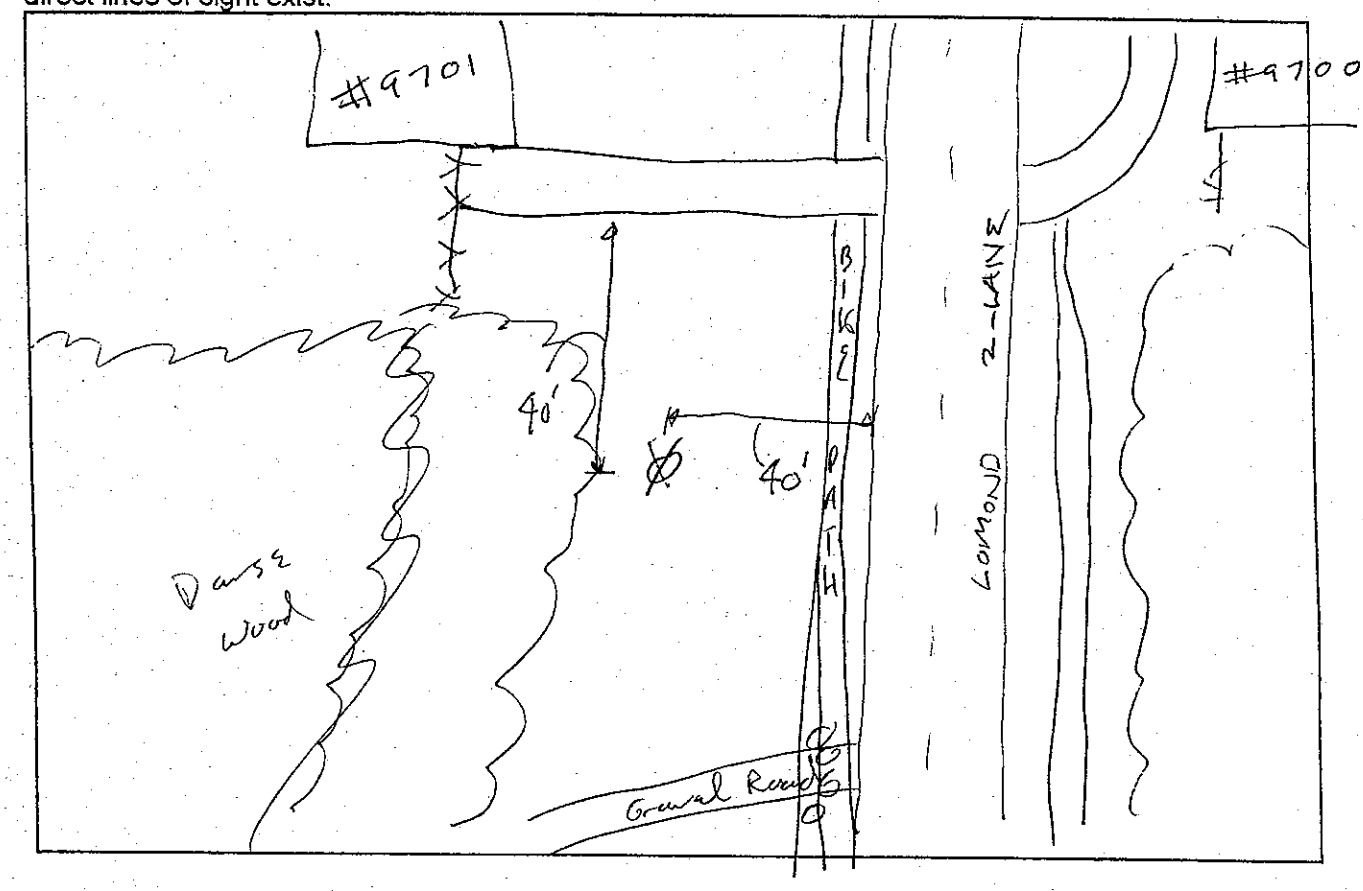
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-County Parkway #2958000.010 Site 13 (Alt. E) ENGINEER: JDV
ADDRESS: 9701 Lomond Drive DATE: 12/3/03
PHOTO ROLL & FRAME No's: D16

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: LD 870 #6 Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: Ø Estimated Temperature: 37 F
Sky Conditions: Overcast

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
Lomond	406	21	3	40	14:11	20 min
(both dir.)						

HIGHWAY NOISE MEASUREMENT DATA SHEET

14:09:00
14:19:15

PROJECT & SITE NO.: Tri-County Pkwy 298900.010 #13 ENGINEER: (AHE)
LOCATION/ADDRESS: 9701 Lomond Drive DATE: 12/3/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	14:11	67.9					Traffic	cal@114.0
2	14:12	65.8					Dominant	
3	14:13	65.9						
4	14:14	64.5						
5	14:15	64.4						
6	14:16	64.6						
7	14:17	65.9						
8	14:18	67.1						
9	14:19	65.0						
10	14:20	68.3						
11	14:21	67.1						
12	14:22	64.3						
13	14:23	64.9						
14	14:24	67.1						MIN 52.9 MAX 74.2
15	14:25	68.0						
16	14:26	66.0						
17	14:27	66.4						
18	14:28	65.2						
19	14:29	66.9						
20	14:30	67.9						
21	14:31	68.5						
22	14:32	65.2						
23	14:33	64.4						
24	14:34	65.8						
25	14:35	64.2						
26	14:36	67.3						
27	14:37	65.8						
28	14:38	65.4						
29								
30								

TOTAL Leq = 66.3
SUBSET Leq =

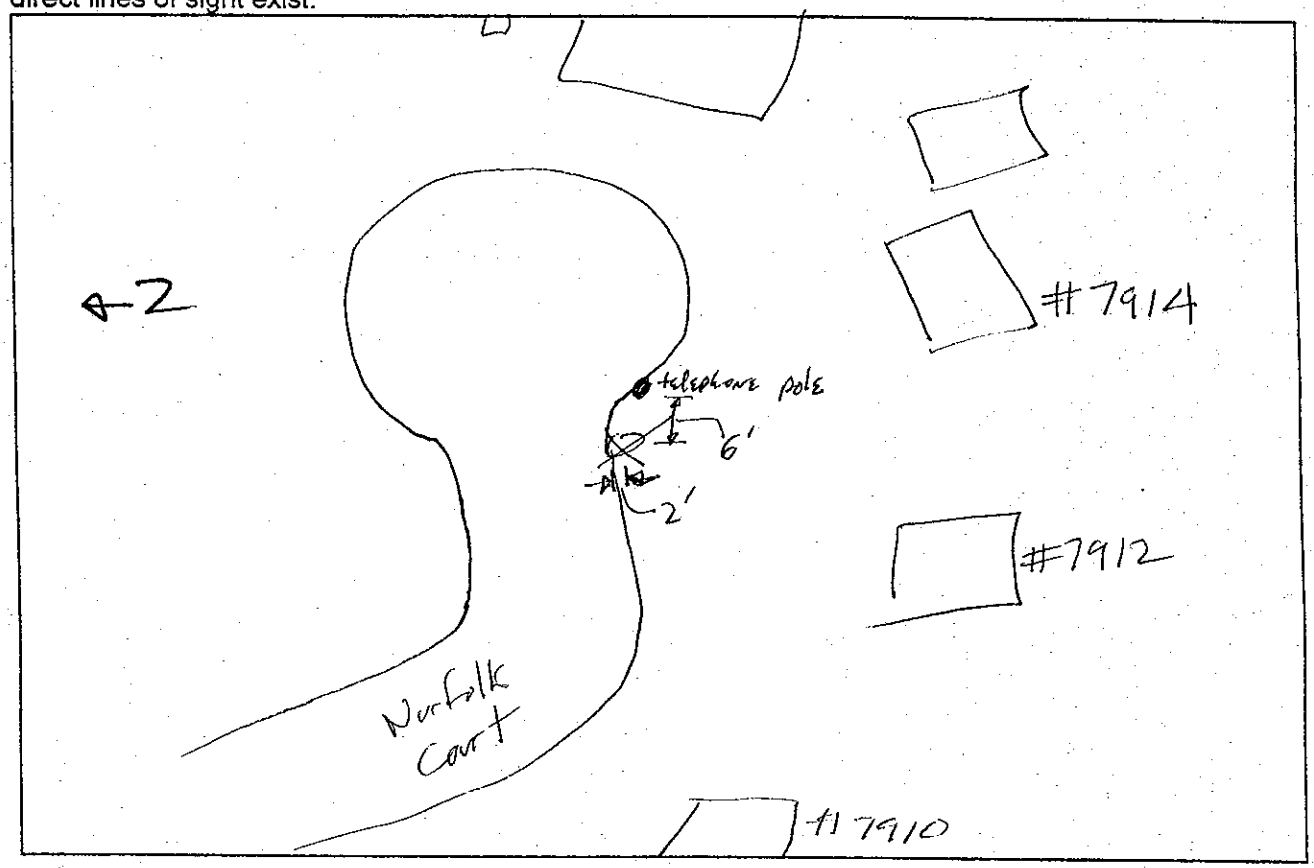
✓ = Other sources contributed to Leq
X = Exclude period - contaminated by non-characteristic sources

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: TRI COUNTY PKWY #14 (AHE) ENGINEER: JDV
ADDRESS: 7912 NORFOLK CT. DATE: 12/3/03
PHOTO ROLL & FRAME No's: D16.

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: LD 870 #6 Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: Ø Estimated Temperature: 37 F
Sky Conditions: OVERCAST.

TRAFFIC COUNTS: NONE.

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: TRI-COUNTY PKWY #14 (NLE) ENGINEER: JDV/DEB

LOCATION/ADDRESS: 7912 NORFOLK CT. DATE: 12/3/03

#	__ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	13:26	41.8					constant:	cal @114.0
2	13:27	39.5					close barking	
3	13:28	39.1					distant traffic	
4	13:29	40.6					distant A/C	
5	13:30	41.7						
6	13:31	41.0						
7	13:32	43.3						
8	13:33	48.8	✓				A/C	MIN 38.6 MAX 59.1
9	13:34	42.9						
10	13:35	44.0						
11	13:36	41.2						
12	13:37	41.2						MIN 36.1 MAX 51.9
13	13:38	41.2						
14	13:39	47.7	✓				A/C	
15	13:40	40.6						
16	13:41	42.9						
17	13:42	45.6	X				car door	
18	13:43	44.1						
19	13:44	40.5						
20	13:45	40.1						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 43.1

SUBSET Leq = 41.8

✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

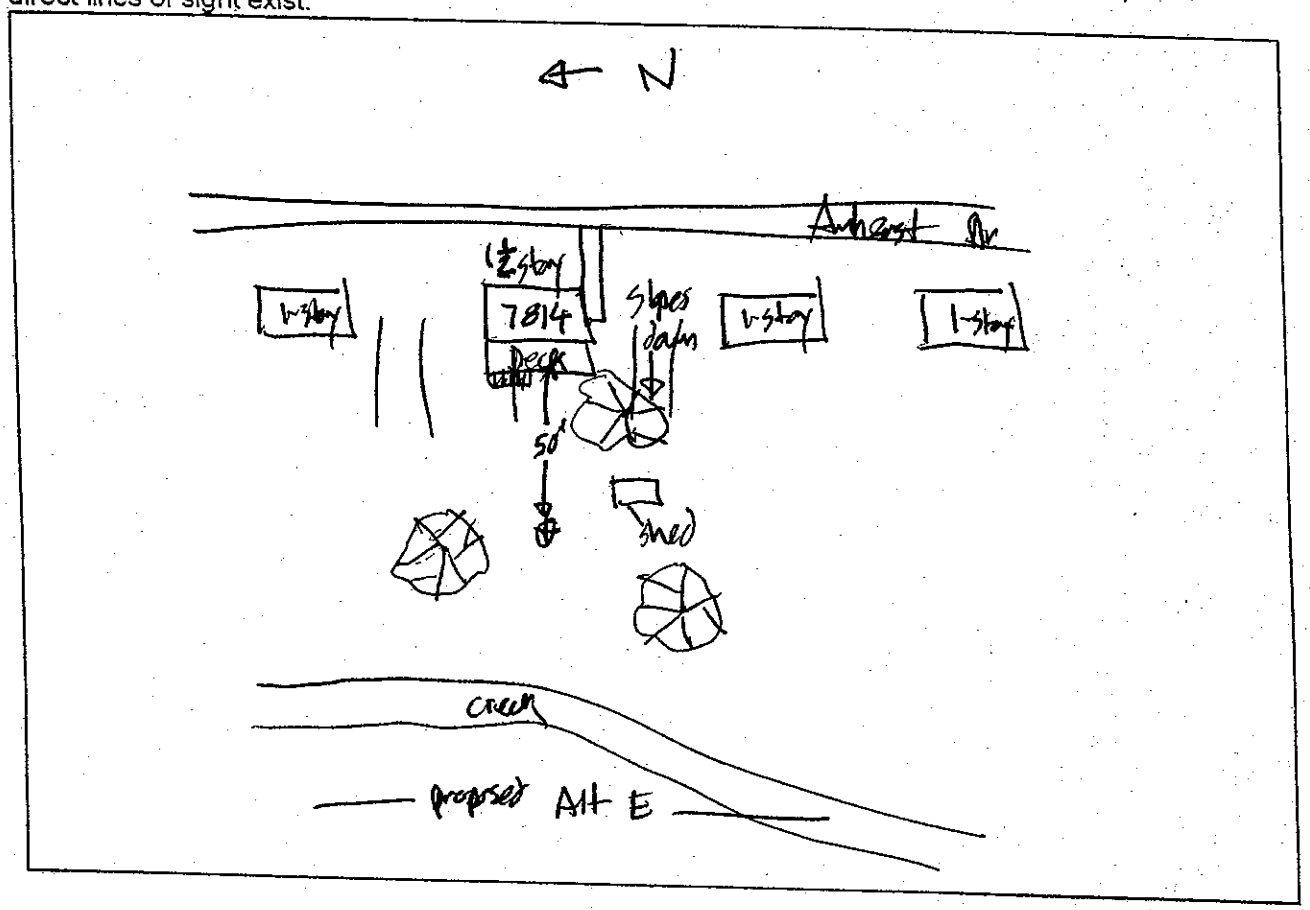
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-G. Pkwy Site#15 (Alt. E)
ADDRESS: 7814 Amherst Dr.
PHOTO ROLL & FRAME No's:

ENGINEER: DEB/JTN
DATE: 12/3/03

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Microphone / Pre-amp:
Calibrator:

WEATHER DATA:
Estimated Wind Speed: 2 mph
Sky Conditions: Hazy
Estimated Temperature: 37 F

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-County Pkwy 298900.010 #15 (Alt.E) ENGINEER: JDV/DEB
LOCATION / ADDRESS: 7814 AMHERST DR. DATE: 12/3/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Amherst Dr 25-30 mph. Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	11:12	46.6					Traffic / A/C	cal 93.8
2	11:13	45.4						
3	11:14	46.3						
4	11:15	52.1	✓	IIII	}		A/C O/F	MIN 42.9 MAX 63.6
5	11:16	46.1		HH			A/C (A300) O/F	
6	11:17	50.4						MIN 46.6 MAX 59.4
7	11:18	45.6					A/C	
8	11:19	43.7						
9	11:20	47.8		HH			A/C Sub?	
10	11:21	45.2		III			"	
11	11:22	47.3		HHI				
12	11:23	48.8		HH				
13	11:24	49.1		HH				
14	11:25	47.4		IIII			A/C	
15	11:26	57.0	✓	HH		1	" O/F, HT	
16	11:27	49.2		II			"	
17	11:28	54.7	✓	III			" O/F	
18	11:29	47.8		HH II			CRJ A/C	
19	11:30	47.0					CRJ A/C	
20	11:31	45.9						
21	11:32	55.1					Buckhoe, 2 MTs	
22	11:33	44.3						
23	11:34	52.0					CRJ A/C O/F	
24	11:35	46.8						
25	11:36	45.9					A/C, leafblower	
26	11:37	46.7						
27	11:38	45.8						
28	11:39	47.9					A/C	
29	11:40	48.7						
30	11:41	51.4						

cont'd

TOTAL Leq = 49.8
SUBSET Leq = 48.4

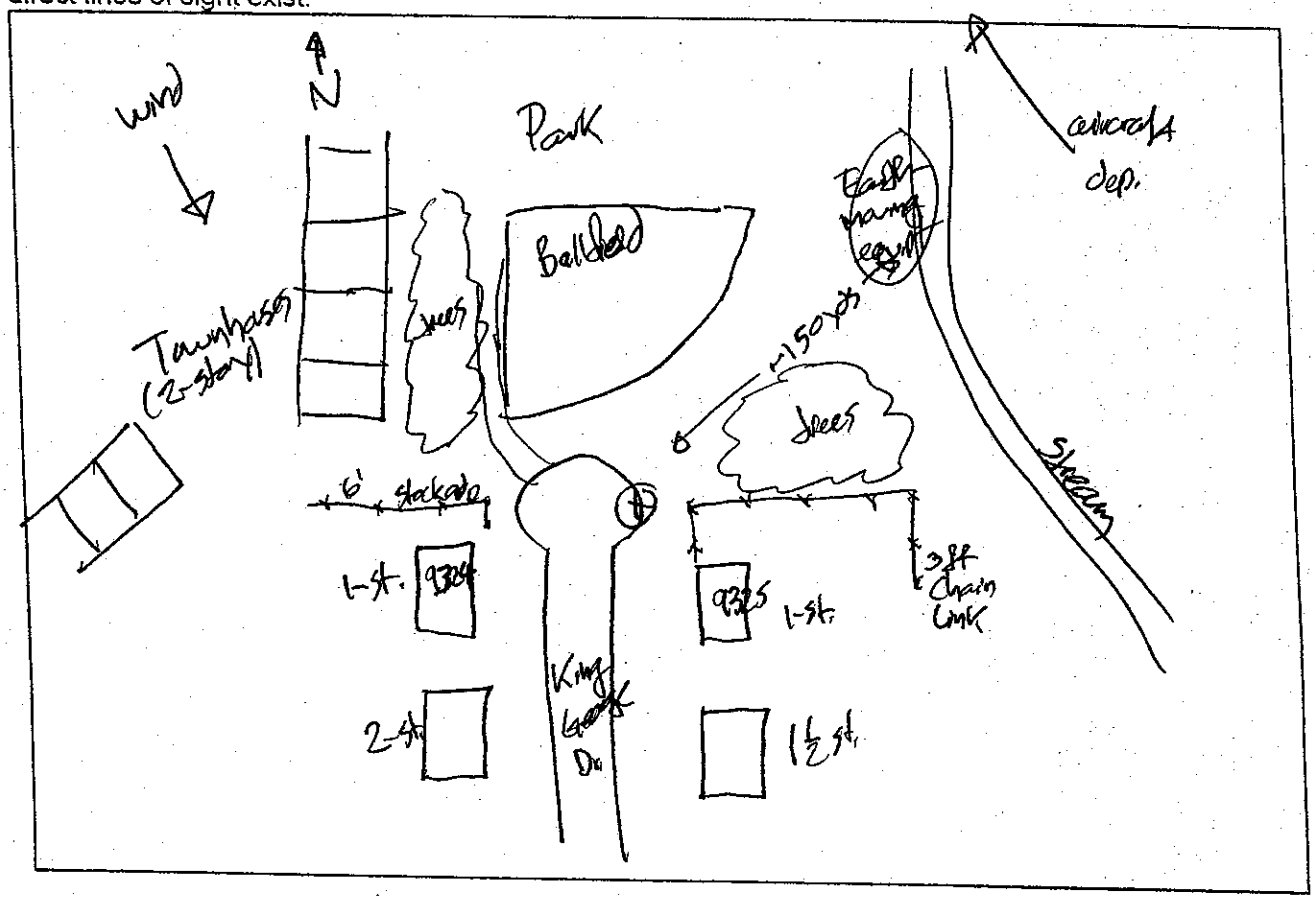
✓ = *Other sources contributed to Leq*
X = *Exclude period - contaminated by non-characteristic sources*
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Pkwy #16 (Alt. E)
ADDRESS: End of King George Dr.
PHOTO ROLL & FRAME No's: Roll #1 21-24

ENGINEER: DEB
DATE: 12/3/03

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter:
Microphone / Pre-amp: B/K 2230
Calibrator:

WEATHER DATA:
Estimated Wind Speed: 0-4 mph from NW Gust to 11 mph
Sky Conditions: High overcast
Estimated Temperature: 40° F
Humid 30%

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co. Pkwy #16 (Alt. E)
LOCATION / ADDRESS: End of King George Dr.

ENGINEER: DEB
DATE: 12/3/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	13:11	41.4						Cal = 93.8
2	:12	40.9						
3	:13	53.2	✓			A/C depart from Dulles		Lmax = 65.6
4	:14	41.5						
5	:15	53.8	✓			A/C depart from Dulles		Lmax = 68.9
6	:16	43.5						
7	:17	42.5						
8	:18	40.6						
9	:19	43.9				high A/C overflight		
10	:20	42.4						
11	:21	39.8						
12	:22	45.6	✓			A/C depart		
13	:23	45.0	X			" (same)		Earthmoving equipt near stream
14	:24	42.8						
15	:25	41.3						
16	:26	41.9						Distant traffic, vacuum truck or blower beyond park?
17	:27	42.7						
18	:28	42.0						
19	:29	40.5						
20	:30	41.0						
21	:31	40.9						A/C departs & overflights
22	:32	40.4						
23	:33	49.7	✓			A/C overflight		Lmax = 61.1
24	:34	39.8						
25	:35	46.2	✓			A/C overflight		Lmax = 55.1
26	:36	40.7						
27	:37	44.8	✓			A/C overflight		
28	:38	41.1						
29	:39	44.2	✓			A/C overflight		Lmax = 55.8
30	:40	39.6						

TOTAL Leq = 45.3
SUBSET Leq = 41.6

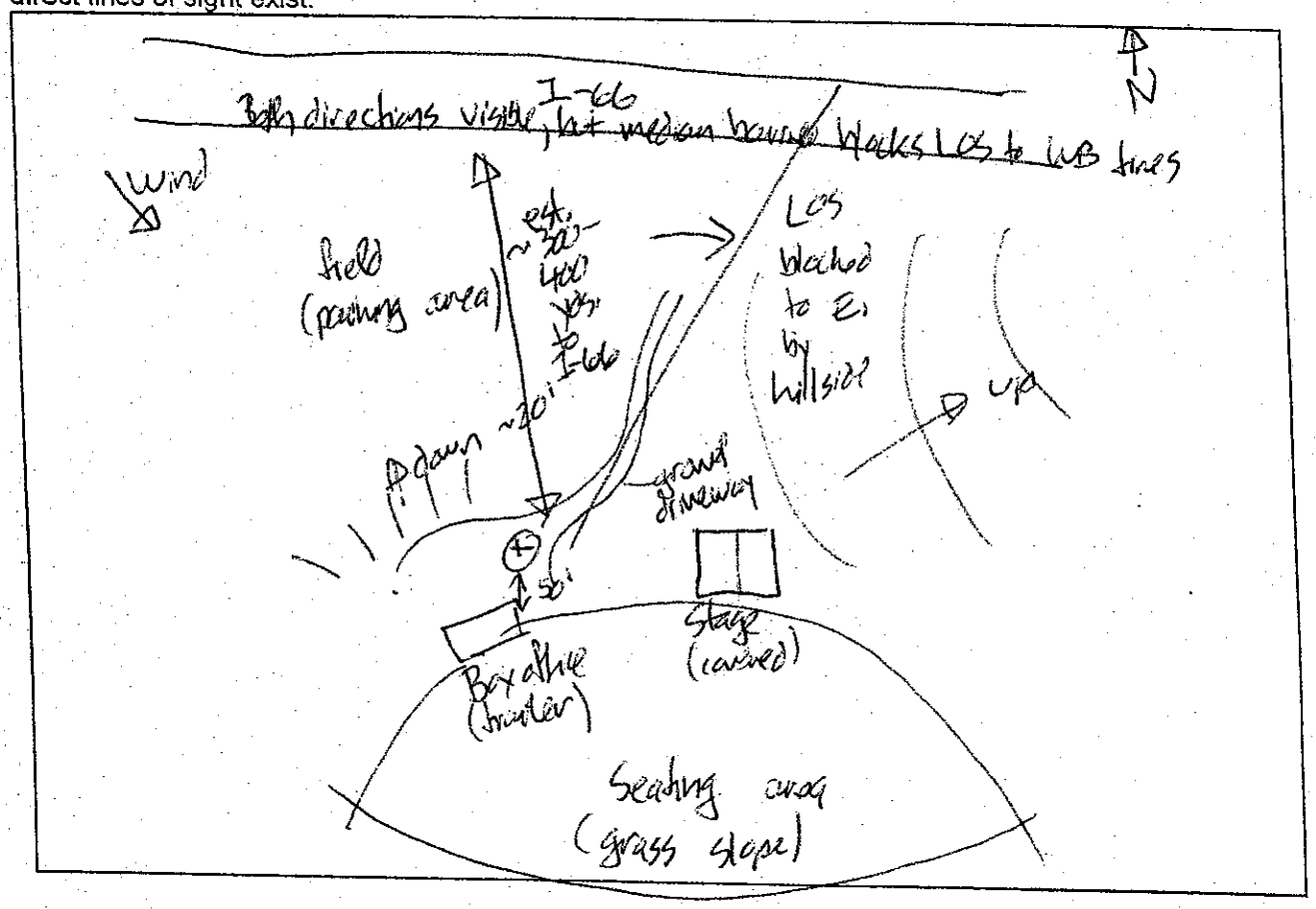
✓ = *Other sources contributed to Leq*
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Pkwy #17 (Alt. E) ENGINEER: ~~AB~~ JJV
ADDRESS: Bull Run Park Special Event Center DATE: 12/3/03
PHOTO ROLL & FRAME No's:

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: Calibrator:
Microphone / Pre-amp: B&K 2230

WEATHER DATA:
Estimated Wind Speed: 2-8 mph from NW, some gusts to 11 mph Estimated Temperature: 36°F
Sky Conditions: Clear / High overcast Humid 44%

TRAFFIC COUNTS: 20 min

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
I-66 EB	2137	38	101	~60 mph	9:59	20 min 30 s
I-66 WB	552	26	94			" "

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co Pkwy #17 (Alt. E)

ENGINEER: DEB/JDV

LOCATION / ADDRESS: Bull Run Park Special Event Center

DATE: 12/3/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	9:59	60.3						93.8 dB
2	10:00	61.2						
3	:01	60.1						I-66 dominates
4	:02	59.1						
5	:03	60.8						
6	:04	59.5						
7	:05	60.5						
8	:06	57.2						
9	:07	58.7						
10	:08	58.0						
11	:09	57.2						
12	:10	59.2					helicopter	(ok)
13	:11	58.2						
14	:12	58.6						
15	:13	56.1						
16	:14	57.3						
17	:15	59.7						
18	:16	59.6						
19	:17	59.1						
20	:18	58.0						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 59.1

SUBSET Leq =

✓ = *Other sources contributed to Leq*

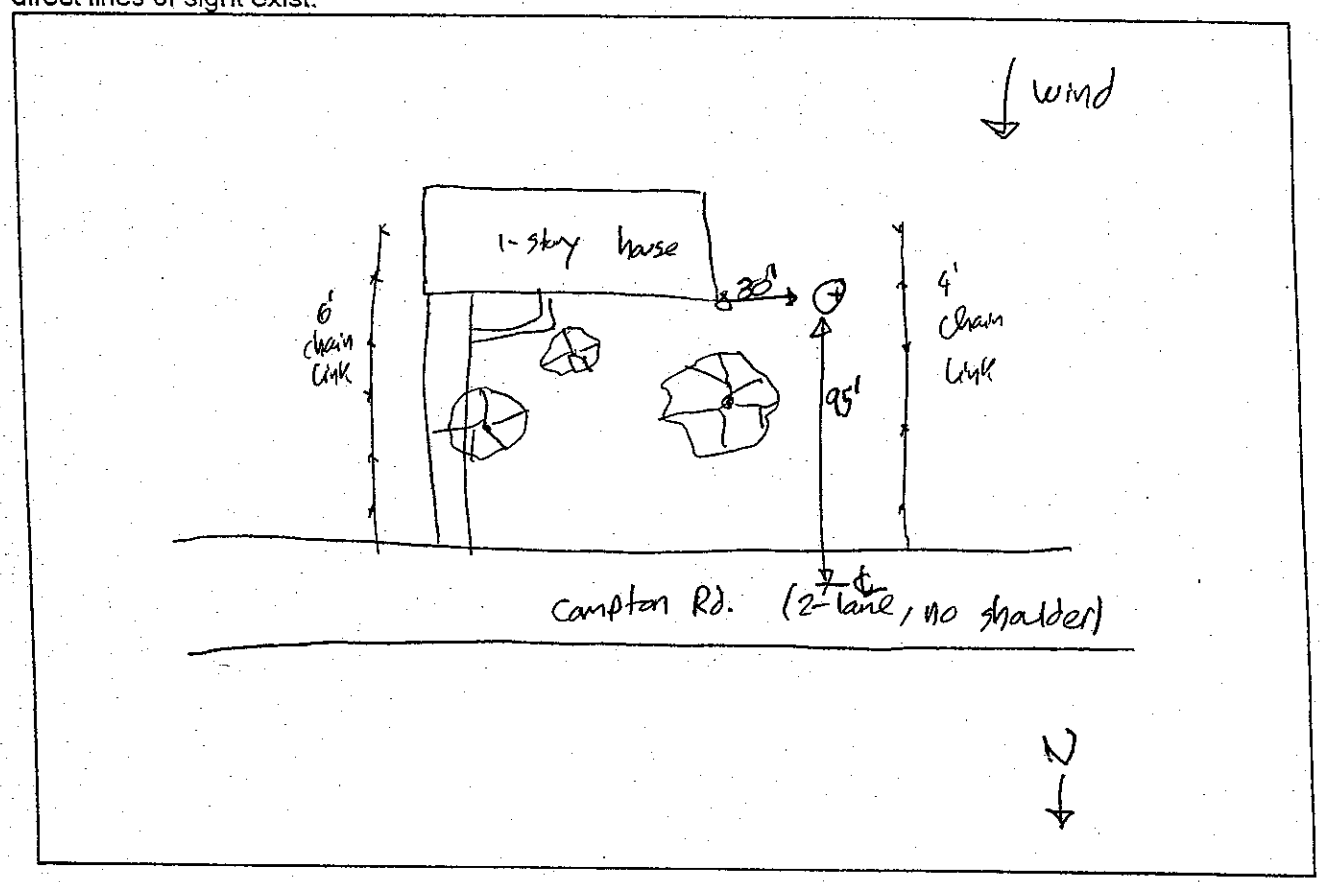
X = *Exclude period - contaminated by non-characteristic sources*

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

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co. Parkway Site #18 (Alt. F)
ENGINEER: DEB/JDV
ADDRESS: 15211 Compton Rd.
DATE: 12/2/03
PHOTO ROLL & FRAME No's: Roll #1 14-18

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 0-2 mph 6 to 5 mph Sham S/N
Estimated Temperature: 45° F
Sky Conditions: Clear, Humid 22%
direction variable

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: Tri County Parkway #18 (Alt. F) ENGINEER: JDV

LOCATION/ADDRESS: 15211 Compton Road DATE: 12/2/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Compton Rd. 35-40 mph. Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	9:57	53.7						clothing 94.0
2	9:58	53.3		1				
3	9:59	52.0					wind	
4	10:00	51.4						MIN 49.4 MAX 54.6 CONSTANT NOISE
5	10:01	50.6						Distant
6	10:02	49.5						Traffic.
7	10:03	51.9		1				from NW
8	10:04	49.9						birds a/c
9	10:05	49.8						Hrz whine
10	10:06	54.3	✓	11				max 63.4
11	10:07	57.2						
12	10:08	49.3						
13	10:09	50.1						
14	10:10	49.5						
15	10:11	50.0						
16	10:12	50.3					a/c, wind	
17	10:13	46.9						
18	10:14	49.8						
19	10:15	54.3		11			a/c	MIN 49.4 MAX 63.0
20	10:16	53.3		1			wind gust, a/c	
21	10:17	54.9		11				max 63.0
22	10:18	52.2		1				MIN 47.4 MAX 61.5
23	10:19	54.8		1			a/c small jet	max 64.7
24	10:20	52.1		1				MIN 48.4 MAX 62.6
25	10:21	51.2						MIN 48.1 MAX 55.0
26	10:22	49.9						
27	10:23	51.9		1				
28	10:24	52.7		1				max 62.7
29	10:25	51.4		11				
30	10:26	56.1		11			a/c	max 65.3

End cal 93.9

TOTAL Leq = 52.1

SUBSET Leq = 52.0

✓ = *Other sources contributed to Leq*

X = Exclude period - contaminated by non-characteristic sources

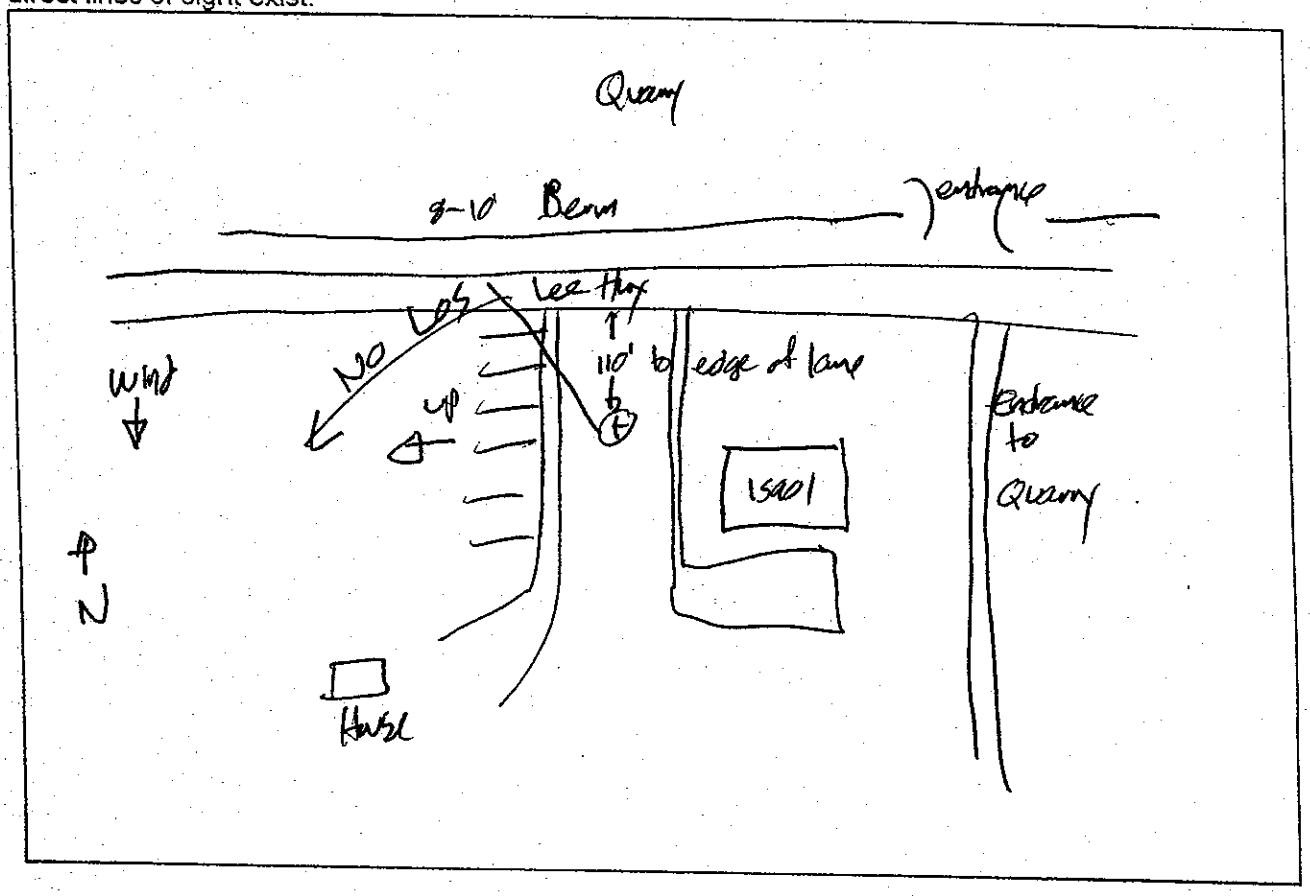
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-Co #19 (Alt. F)
ADDRESS: 15901 Lee Hwy
PHOTO ROLL & FRAME No's:

ENGINEER: DB/JDV
DATE: 12/2/03

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter: B&K 2230
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 5-8 mph Gusts to 14 from N. Estimated Temperature: 43°
Sky Conditions: Clear, Humid 26%

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
WB	164	5	18	~35 mph	12:06	20 min
EB	83	4	22			

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri-Co Pkwy # 19 (Alt. F)

LOCATION / ADDRESS: 15901 Lee Hwy.

ENGINEER: DEB/JDV

DATE: 12/2/03

#	L Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	12:06	66.1						Cal = 93.8
2	:07	60.4						
3	:08	62.8						
4	:09	60.5						
5	:10	66.3						
6	:11	62.9						
7	:12	67.3						
8	:13	67.7					Jake Brakes	
9	:14	62.4					Accelerating	HTS
10	:15	67.5						
11	:16	69.2					Truck Lmax	= 79.8
12	:17	64.0						
13	:18	66.7						
14	:19	63.7						
15	:20	63.7					Truck Lmax	= 74.3
16	:21	62.1						
17	:22	63.9						
18	:23	63.5						
19	:24	62.0						
20	:25	60.9						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 64.7

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 <<

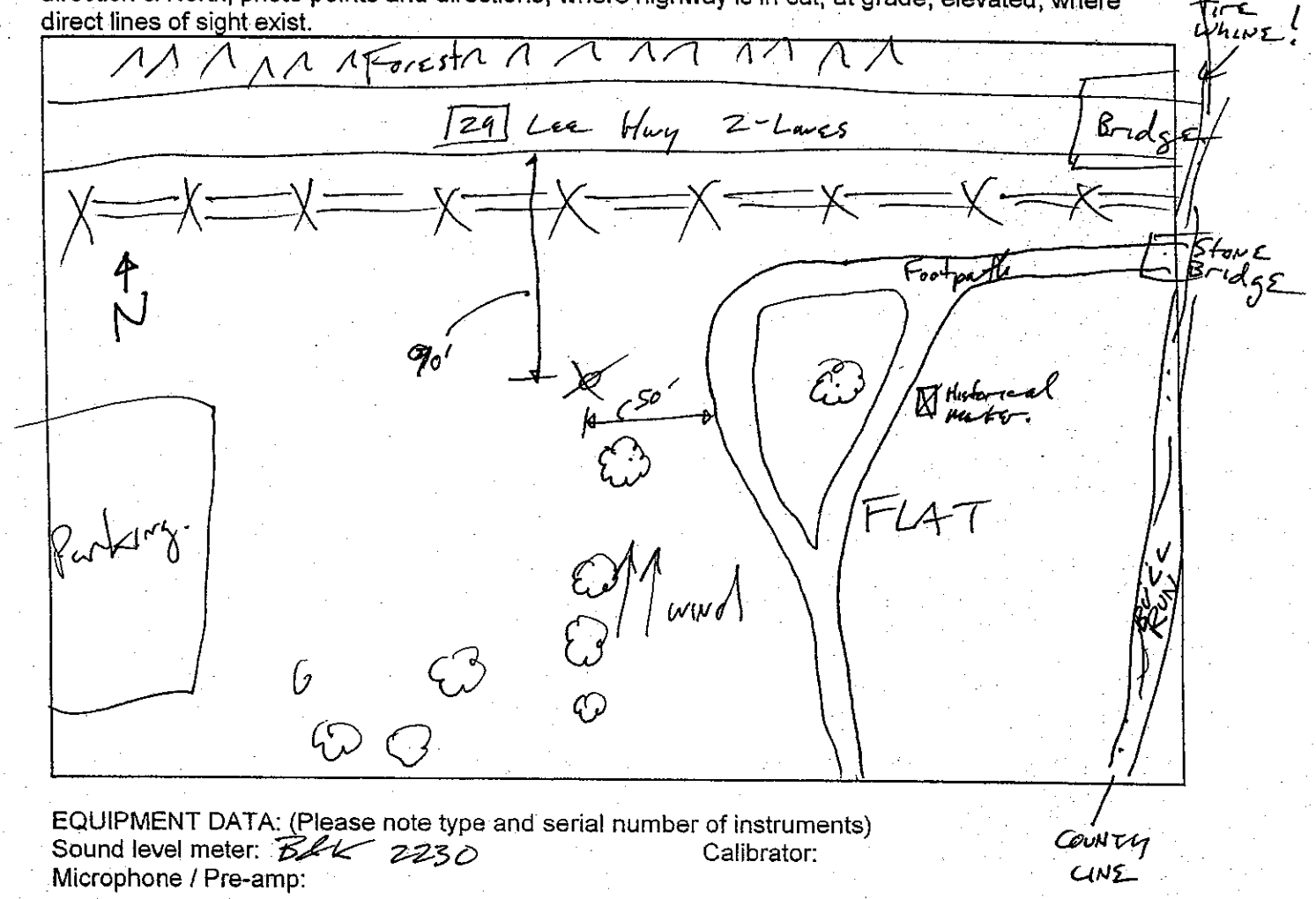
HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-County Pkwy #20 (Alt.F) ENGINEER: JDV

ADDRESS: Stone Bridge - Manassas Battlefield Park 258900.010 DATE: 12/2/03

PHOTO ROLL & FRAME No's: Dig

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

Sound level meter: B&K 2230 Calibrator:

Microphone / Pre-amp:

WEATHER DATA:

Estimated Wind Speed: 3-7 mph. Estimated Temperature: 42 F

Sky Conditions: clear.

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
Lee Hwy EB	141	2	16	35-45	11:05	30 min
Lee Hwy WB	140	9	32	35-45		

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: Tri County Parkway #20 (038990.00) ENGINEER: JDV/DEB
LOCATION/ADDRESS: Stone Bridge - Manassas Battlefield Pkwy (Alt. F) DATE: 12/2/03

#	__ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data) (end cal from #18 93.9)
1	11:05	59.1						
2	11:06	64.8						~~LEE Hwy~~
3	11:07	65.5						~~DOMINANT~~
4	11:08	66.7						
5	11:09	64.0						
6	11:10	53.6						
7	11:11	61.9						
8	11:12	64.1						
9	11:13	58.9						
10	11:14	64.6						
11	11:15	60.0						
12	11:16	63.8						
13	11:17	61.4						
14	11:18	64.5					gust w/ 10mph.	
15	11:19	59.0					A/C	
16	11:20	66.4						
17	11:21	62.5						
18	11:22	64.1					gust opposite dir 13 mph.	
19	11:23	67.9						
20	11:24	64.3					lots of HTs	
21	11:25	61.6					max 71.3	
22	11:26	62.8					max 73.8	
23	11:27	62.4					max 81.0	gust opp dir. 10mph
24	11:28	58.1					A/C	
25	11:29	61.9					MIN 48.1	gust 9 mph
26	11:30	61.9						
27	11:31	67.7						
28	11:32	67.5					gust 14 mph.	
29	11:33	62.5					jakes	
30	11:34	65.8					air brake? max 79.1	end cal 93.8

TOTAL Leq = 64.2
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 <<

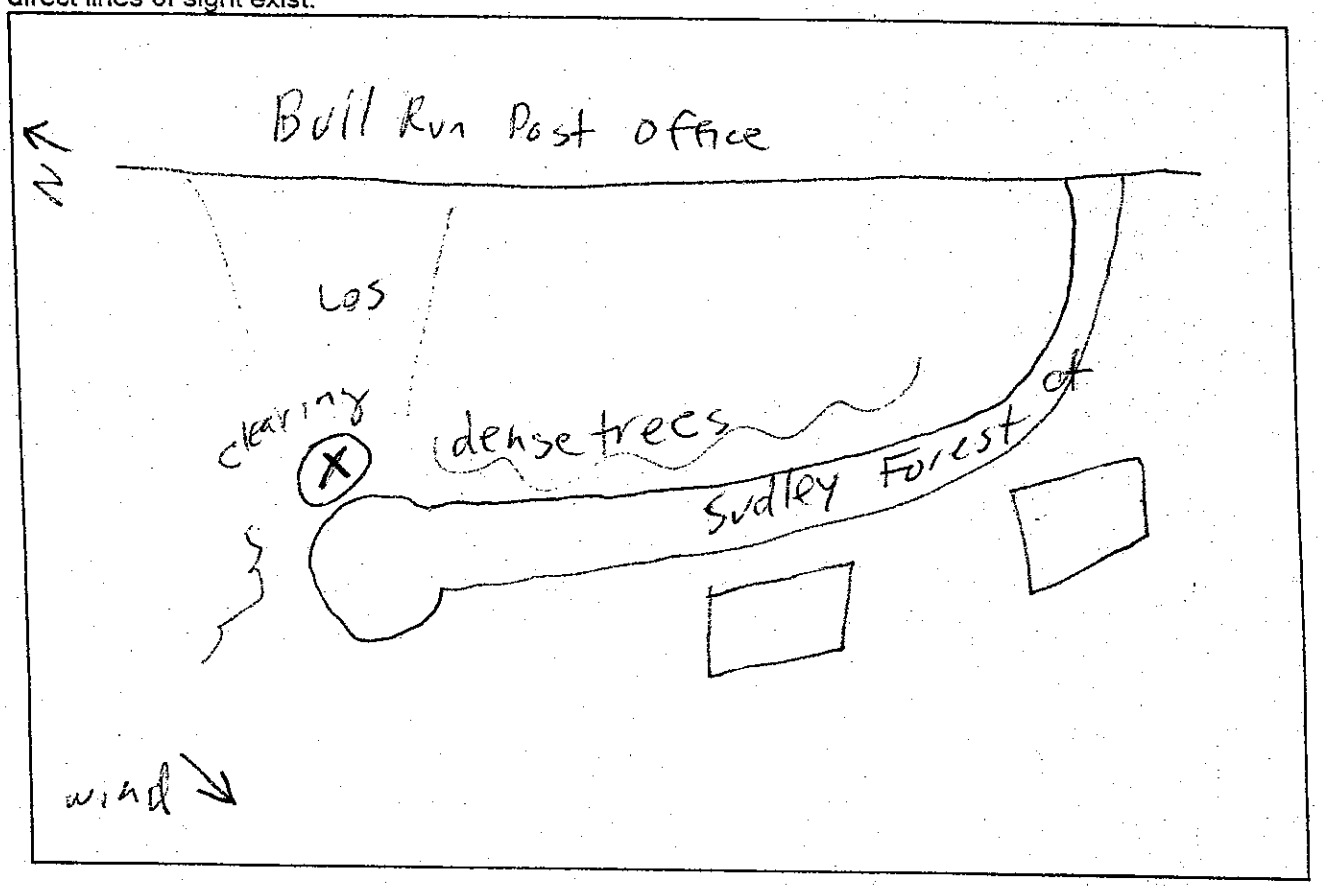
HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri County #21 (AH.F) ENGINEER: MRF

ADDRESS: cul de sac Sudley Forest ct DATE: 02DEC2003

PHOTO ROLL & FRAME No's: 2 pics - disposable

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

Sound level meter: LD 870-5 Calibrator: Quest

Microphone / Pre-amp: 3674

WEATHER DATA:

Estimated Wind Speed: Estimated Temperature: 40°F

Sky Conditions: Clear

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri County #21 (Alt.P)

ENGINEER: MRF

LOCATION / ADDRESS: cul de sac Sudley Forest Ct

DATE: 02DEC2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Bull Run P.O.Rd. Autos	Med Tr	Hvy Tr	Other Noise Sources wind!	COMMENTS (incl. Calib. Data)
1	11:40	54.7						cal 115.1 dB
2	11:41	54.7						
3	11:42	50.6						
4	11:43	54.6		1				
5	11:44	54.3						
6	11:45	53.0						
7	11:46	53.8						
8	11:47	56.0						
9	11:48	55.9						
10	11:49	56.9						
11	11:50	55.5						
12	11:51	52.4						
13	11:52	53.1						
14	11:53	56.0		1				
15	11:54	56.4						
16	11:55	59.9	✓				aircraft	
17	11:56	58.9						
18	11:57	54.8						
19	11:58	49.7						
20	11:59	47.1						
21	12:00	49.4					aircraft	
22	12:01	56.6						
23	12:02	56.2				1		
24	12:03	49.7						
25	12:04	51.1					aircraft	
26	12:05	51.8						
27	12:06	52.5						
28	12:07	51.4						
29	12:08	56.3						
30	12:09	50.2						end cal 115.1 dB

TOTAL Leq = 54.9

SUBSET Leq =

distant construction/hearing
heavy wind
aircrafts

✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

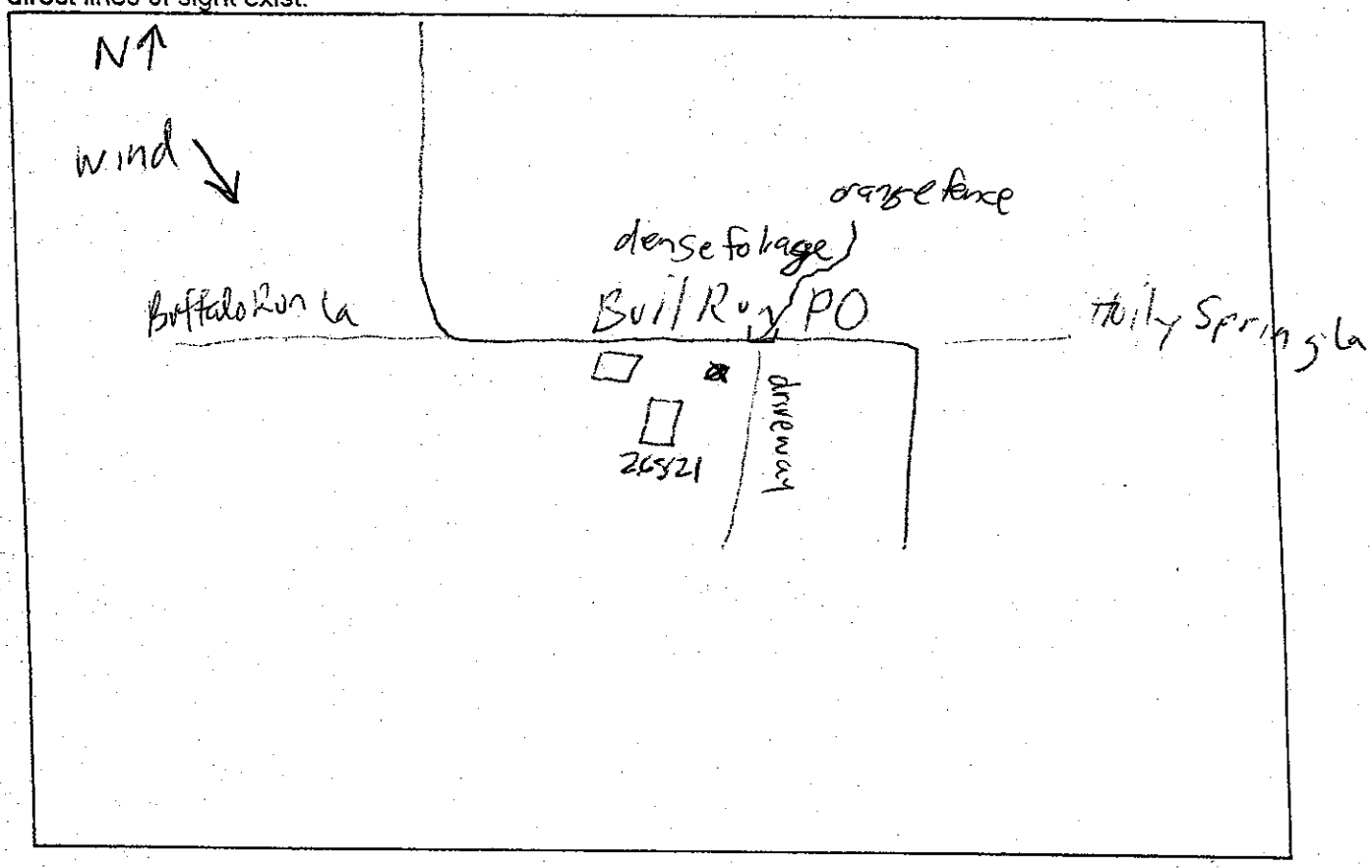
HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: #22 Tri County (AthF) ENGINEER: MRF

ADDRESS: 26821 Bull Run Post Office Rd. DATE: 02DEC2003

PHOTO ROLL & FRAME No's: 2 pic - disposable

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

Sound level meter: LD 870-5 Calibrator: Quest

Microphone / Pre-amp: 3674

WEATHER DATA:

Estimated Wind Speed: Estimated Temperature: 40°F

Sky Conditions: clear, windy

TRAFFIC COUNTS:

Roadway	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No. #22 26821 Bull Run Post Office (Alt. F) ENGINEER: MRF

LOCATION / ADDRESS:

DATE: 02 DEC 2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	10:20	55.0					wind!	cal 115.4
2	10:21	52.5		III	I			
3	10:22	52.2						
4	10:23	57.0						
5	10:24	58.8						
6	10:25	55.6						
7	10:26	53.7		I				
8	10:27	51.6		I				
9	10:28	51.7					aircraft	
10	10:29	49.8					I	
11	10:30	51.6		II				
12	10:31	51.2		I				
13	10:32	51.5						
14	10:33	48.8						
15	10:34	50.7						
16	10:35	51.3						
17	10:36	52.8			I			
18	10:37	52.6						
19	10:38	51.0		I				
20	10:39	49.0						
21	10:40	47.1						
22	10:41	51.5		I				
23	10:42	51.4						
24	10:43	51.0	✓				construction/trucks to West	
25	10:44	52.4					aircraft	
26	10:45	59.4	✓		I		I	
27	10:46	53.1	✓				construction/trucks	
28	10:47	52.7					I	
29	10:48	56.7		I			beeping	
30	10:49	59.8	X	II		I excavator	idling	end cal 115.1

N 67

TOTAL Leq = 52.6 (Corrected for 1dB cal offset)

SUBSET Leq = 52.2

distant beeping (construction backup?)
wind chimes
distant aircraft

✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

HARRIS MILLER MILLER & HANSON INC.

PROJECT 298900.010
JOB NO.

DEB/MRF

LONG TERM NOISE MONITORING SITE LOG

SITE NO.: 23 LT (Mt-P) 4 pictures

ADDRESS: 25045 Impala Ct

OWNER:

DESCRIPTION: SFR culde Sac

NOISE SOURCES: Wind in trees, distant traffic noise (Rt 50?)
Aircraft from Dulles

NOISE MONITOR: LD 870-6 S/N: #A0346
MIC: LD PRM900C #08898
CALIBRATOR: Gen Rad S/N: #2880 cal 114.0 dBA

START DATE: 01 DEC 2003 END DATE: 12/2/03

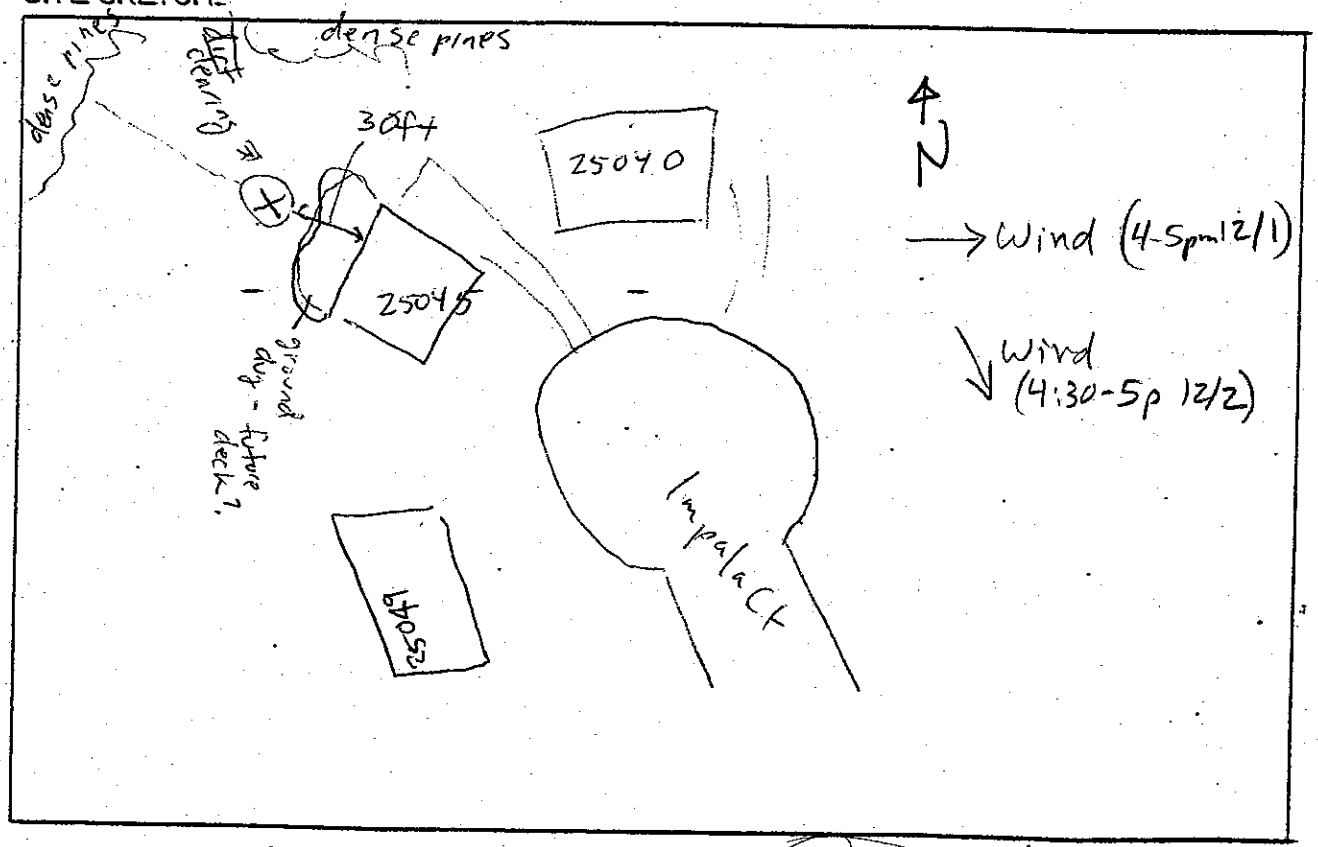
START TIME: 14:15 END TIME: 15:00

SYNCH W/ HOURS? yes

METRICS STORED:

EXCEEDANCE Threshold: 55 dBA Duration:

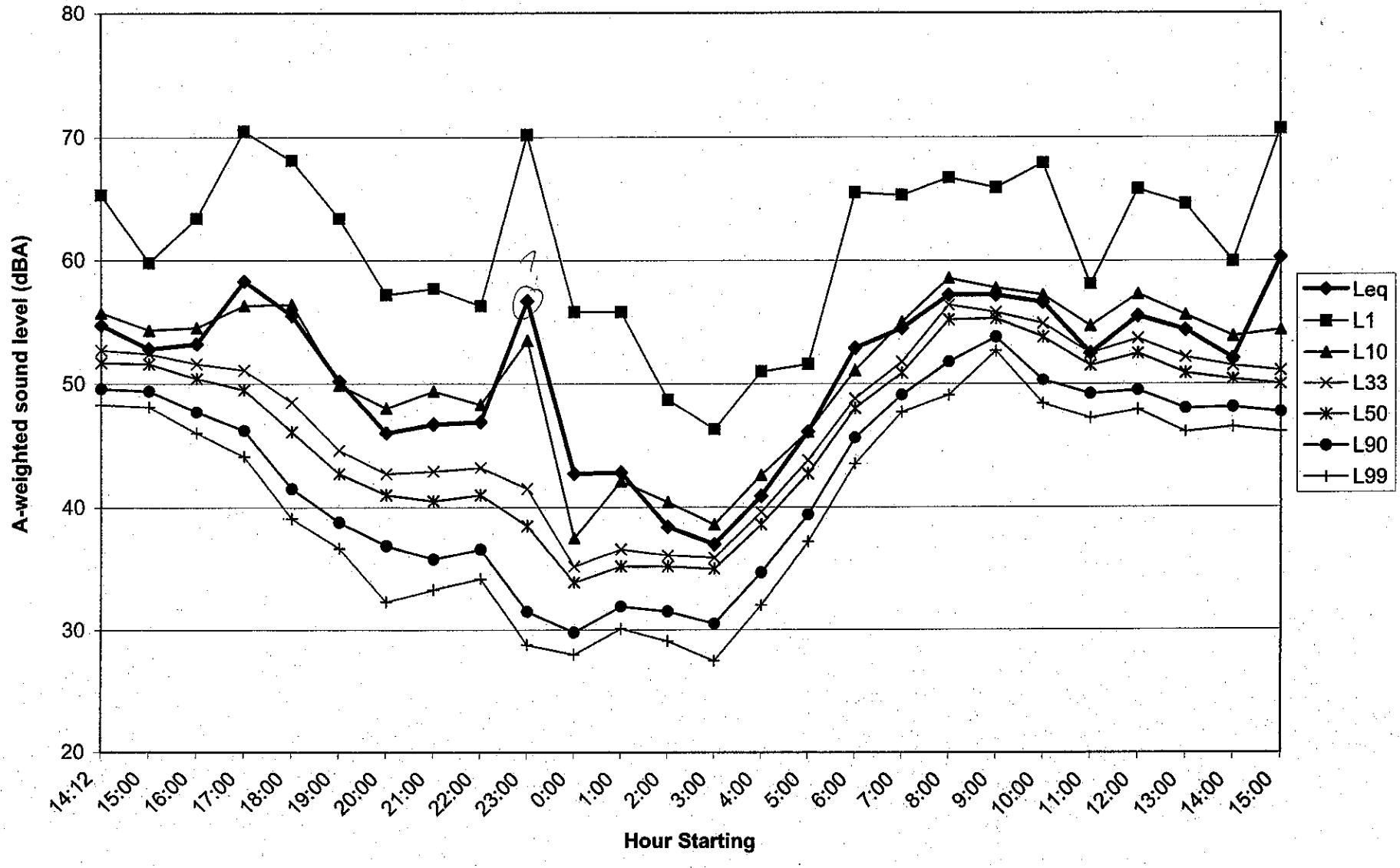
SITE SKETCH:



Avg Temperature: 35° °F

Weather Conditions: breezy, cold

Tri-County Parkway Hourly Sound Level Descriptors
Site LT23 - 25045 Impala Ct. - Dec 1 to Dec 2, 2003



HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: 295700.010 Tri County #

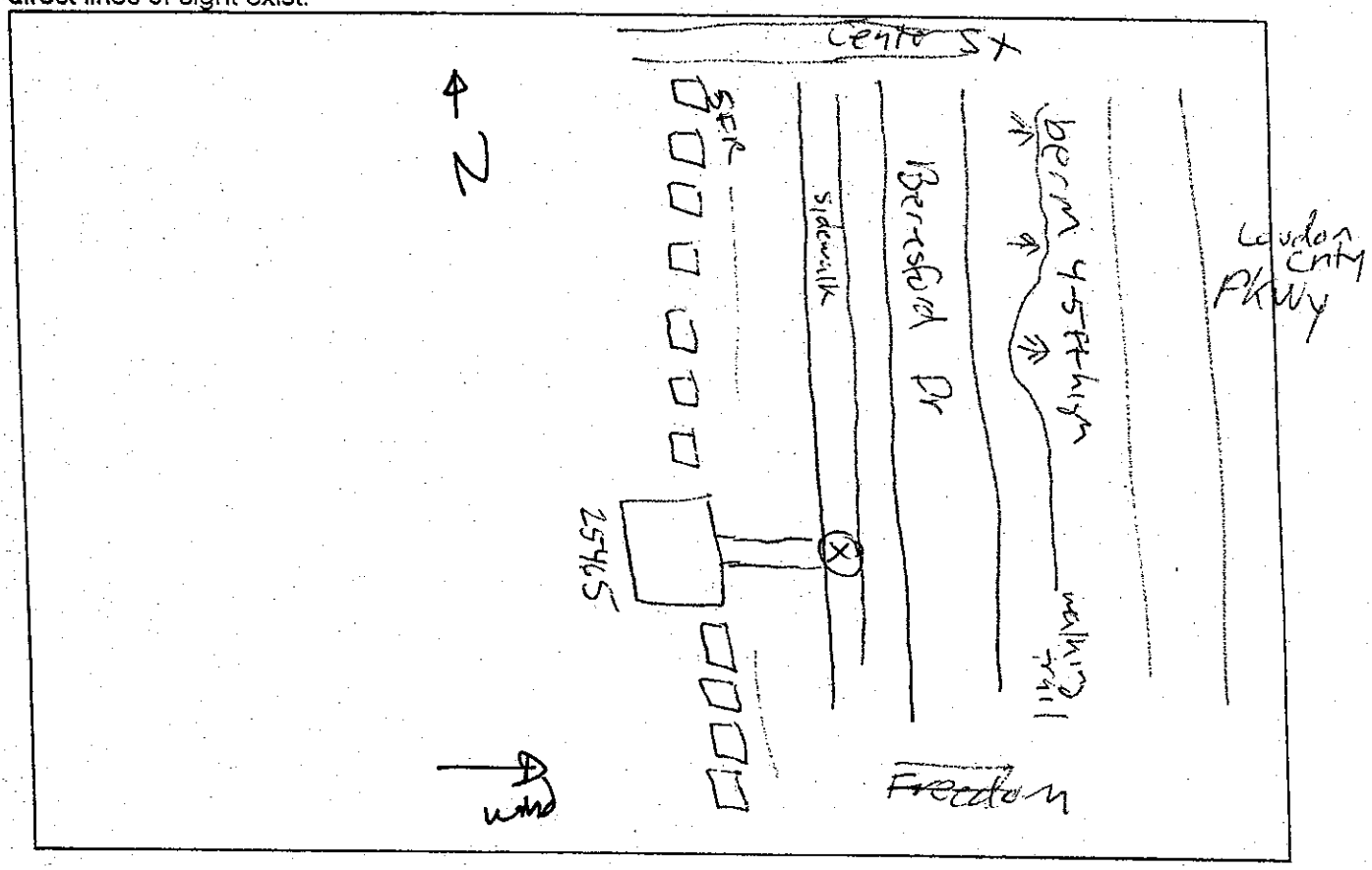
ENGINEER: DEB, MRF

ADDRESS: 25465 Beresford Dr sidewalk #24 (Alt. F)

DATE: 01 DEC 2003

PHOTO ROLL & FRAME No's: 10 – 13

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

Sound level meter: Richmond Btk 2230

Calibrator:

Microphone / Pre-amp:

WEATHER DATA:

Estimated Wind Speed: 3-5mph from West

Estimated Temperature: 46°F 36% humidity

Sky Conditions: partly cloudy

TRAFFIC COUNTS: Loudoun Co. Pkwy

Roadway	Autos	Med Trucks	Heavy Trks	Speed EST	Start Time	Duration
SB	90	3	5	35	16:20	40 min
NB	55	2	1	35		40 min

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Jn County #24 (Alt. F)
LOCATION / ADDRESS: 25465 Beresford Dr

ENGINEER: DEB, MRF
DATE: 01 DEC 2003

cal 93.8

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	16:20	52.2					flagpole, wind	
2	16:21	55.2					aircraft, dist	
3	16:22	49.6		1				
4	16:23	50.3						
5	16:24	48.4						
6	16:25	48.1						
7	16:26	46.5						
8	16:27	49.3						
9	16:28	51.6					banging	
10	16:29	58.5	✓				truck on pkwy	
11	16:30	48.7		1				
12	16:31	51.2					sirens	
13	16:32	47.9						
14	16:33	49.1						
15	16:34	53.1	✓				aircraft	
16	16:35	53.1	✓				truck turning on pkwy, aircraft	
17	16:36	48.2					aircraft	
18	16:37	53.8						
19	16:38	53.4						
20	16:39	48.2						
21	16:40	43.0						
22	16:41	45.7						
23	16:42	46.3						
24	16:43	51.2					aircraft	
25	16:44	56.0			1		aircraft	
26	16:45	57.8	X	1			UPS truck delivery	
27	16:46	48.7						
28	16:47	47.3						
29	16:48	47.6						
30	16:49	50.6						

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 <<

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE No.: Tri County #24 (Alt.F) cont'd
LOCATION / ADDRESS: 29465 Beresford Dr

ENGINEER: DETS, MKF
DATE: 01 DEC 2003

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	16:50	53.7	✓				HT on pkwy	
2	16:51	50.4					banging (hammering?)	
3	16:52	49.2					banging "	
4	16:53	54.8	✓				HT on pkwy, aircraft, HT on Freeda St	
5	16:54	49.0						
6	16:55	46.7					banging "	
7	16:56	47.6						
8	16:57	50.9		1			school bus on Center St	
9	16:58	49.1					"	
10	16:59	49.1					banging	
11								end cal 93.8
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

TOTAL Leq = 50.5
SUBSET Leq = 49.7

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

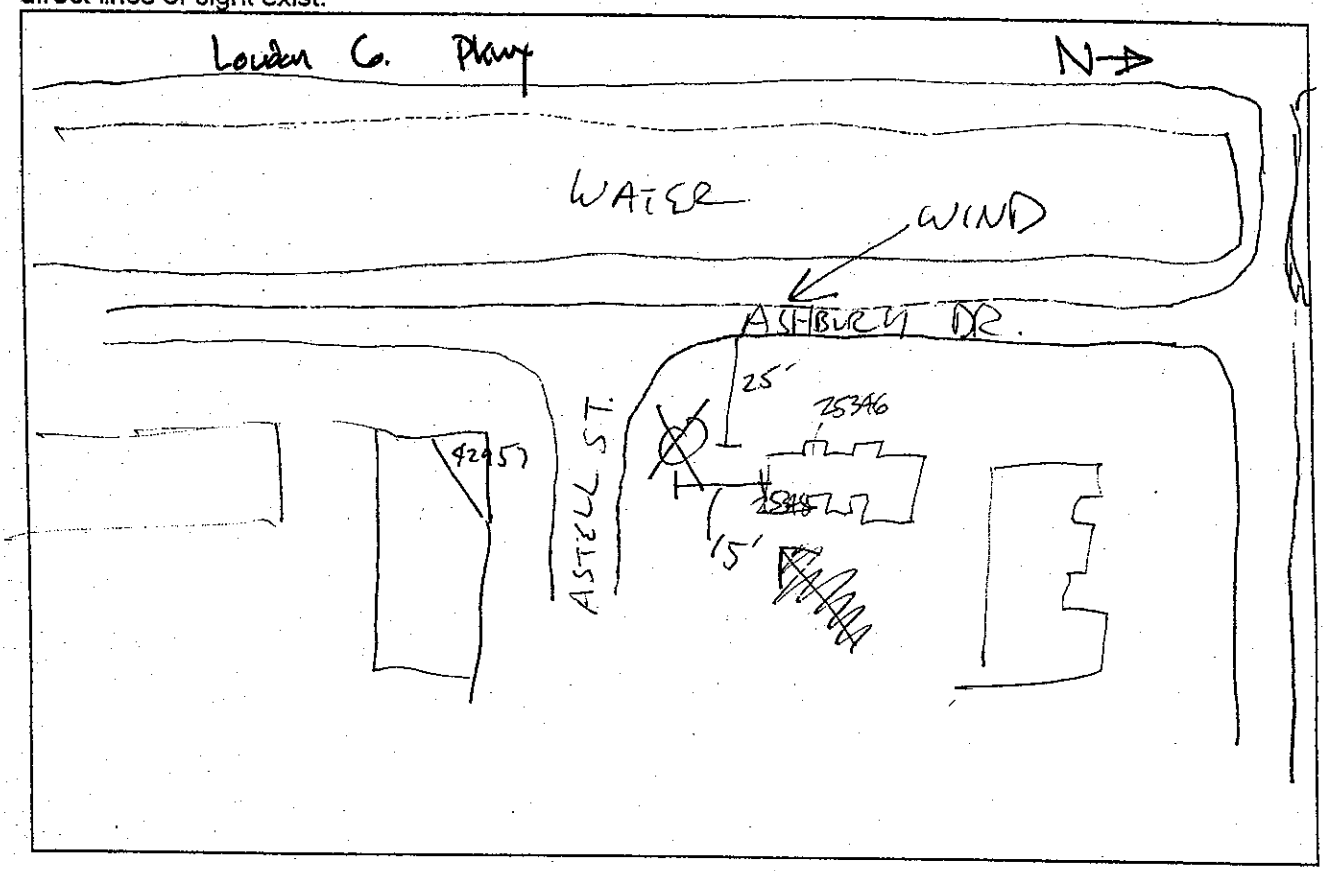
>> ADD SKETCH AND WEATHER CONDITIONS TO REVERSE OR OTHER SHEET <<

HIGHWAY NOISE STUDY SITE DATA SHEET

PROJECT / SITE No.: Tri-County #25 (Alt Pl)
ADDRESS: Ashburn Dr. / Astell St.
PHOTO ROLL & FRAME No's:

ENGINEER: 12/2/03
DATE:

SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)
Sound level meter:
Calibrator:
Microphone / Pre-amp:

WEATHER DATA:
Estimated Wind Speed: 6-8 mph
Estimated Temperature: 37 F
Sky Conditions: Clear

TRAFFIC COUNTS:

Roadway (Loudon Co. Pkwy)	Autos	Med Trucks	Heavy Trks	Speed	Start Time	Duration
NB	47	5	5	30	16:34	30 min
SB	72	5	4	30		

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: Tri-County #25 (Alt. F)
LOCATION/ADDRESS: Ashbury Dr. / Astell St.

ENGINEER: JDV/DCB
DATE: 12/2/03

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	4:24	54.9						cal 73.8
2	4:35	56.4						
3	4:36	57.4	✓				A/C, hammering	[distant traffic]
4	4:37	54.7						
5	4:38	53.7						
6	4:39	50.8					A/C	
7	4:40	49.8						
8	4:41	54.4					A/C	
9	4:42	50.5						
10	4:43	52.0						
11	4:44	46.9					A/C	
12	4:45	45.5						
13	4:46	58.5						
14	4:47	56.7	✓				A/C	
15	4:48	57.7					gust	12 mph
16	4:49	51.5						
17	4:50	52.5					A/C	
18	4:51	47.8						
19	4:52	52.1					A/C	
20	4:53	50.9					A/C	
21	4:54	55.5	✓				A/C off	min 48.2 max 67.9
22	4:55	47.0	✓					wind 8-10 42.0 min 57.8 max
23	4:56	53.1	✓				Dog, A/C	
24	4:57	56.5					A/C	45.7 min 56.7 max
25	4:58	53.0						
26	4:59	55.4	✓				LoF A/C	
27	5:00	52.7					A/C	
28	5:01	51.4						
29	5:02	53.0	X				Dog, A/C	beep
30	5:03	58.4	X				A/C off,	Dog

TOTAL Leq = 53.5
SUBSET Leq = 52.8

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

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

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: D-1 (#26) ENGINEER: CWM

LOCATION/ADDRESS: 12750 Chatter Brook Dr. Corner Pin Oak DATE: 5/25/04

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	10:59a	42.2					DISTA/C	93.9dBA Cal.
2	11:00	41.8						
3	01	41.2						
4				Hi Alt Jet				
5	03	43.1		1 local vehicle			on Chatter Brook	
6	04	45.2					Hi Jet	
7	05	41.4						
8	06	40.6						Traffic on
9	07							Sanders La
10	08	44.7		Aircraft				Occasionally
11	09	51.4	✓		747 Departing		Dulles	Audible - Mostly
12	10							trucks.
13	11				737 departing		Dulles	A/C Dominate
14	12	43.6						
15	13	39.8		Hi Jet				
16	14	40.1						
17	15	38.1						
18	16	41.5		Truck on Sanders La.				
19	17	43.7		LP nearby				
20	18	40.4		Dulles Departure DC9? E145?				
21	19	47.1	✓	Hawking Geese fly over				
22	20	60.5	✓	x? aircraft, Local MT on Chatter Brook (gate lo				
23	21	39.7						
24	22	40.6						
25	23	44.1		Jet dep Dulles				
26	24	44.5						
27	25	44.0		Local Car on Pin Oak, Jet				
28	26	38.8		Jet dep Dulles, E145?				
29	27	41.3		Turbo Prop Dep Dulles Directly OH				
30	28	49.5	✓	Turbo Prop				

TOTAL Leq =

SUBSET Leq =

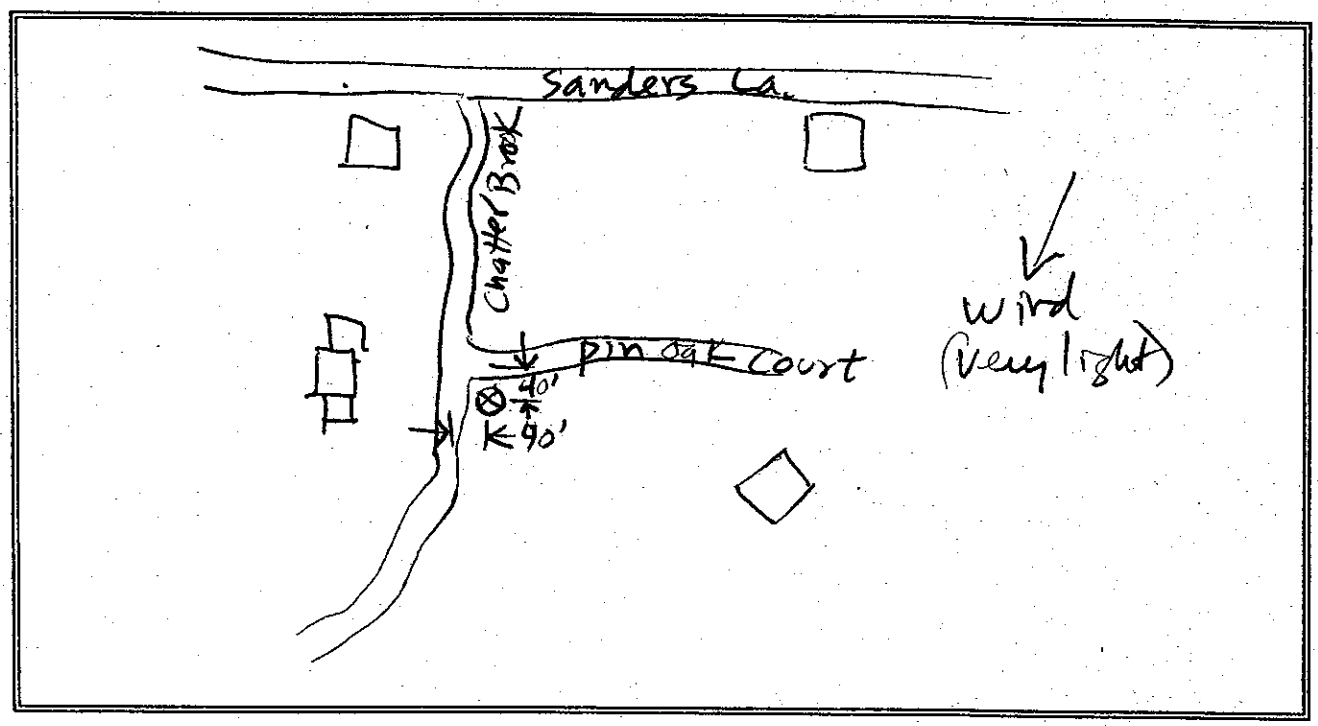
✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

HMMH NOISE MEASUREMENT SITE DATA SHEET

SITE NO.: D-1 Tri County Parkway (# 26)
LOCATION/ADDRESS: 12750 Chatter Brook Dr. off Sanders La.
ENGINEER: CWM
DATE: 5/25/04
SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

WEATHER DATA: Estimated Wind Speed: 0-1 mph
Estimated Temperature: 78°F Sky Conditions: clear

TRAFFIC COUNTS:

ROADWAY	AUTOS	MED TR	HVY TR	SPEED	START TIME	DURATION

Start time 10:55AM

Tri-County Parkway

5/25/04 Site D-1 (26)

rush hour = 4 ocla.

Sgr = Rickky

Sanders Lane Count

Time Interval	CLASSIFICATION		
	Car	Med. Truck	Heavy Truck
0-5 min	I		
5-10	III	I	I
10-15	III		
15-20			
20-25	II	II	
25-30	II	I	I

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: Tri County Parkway D-2 (#27) ENGINEER: CWM

LOCATION/ADDRESS: Goshen Rd. # 25005 20 yds from ℄ DATE: 5/25/04

#	⊥ Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Goshen Rd Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	11:58	37.0						Goshen's Gravel
2	59						Aircraft	
3	12:00	57.6		1		11		Truck Dominated
4	01			1				
5	02	51.0			1	Speeds ~	20-30 mph	on Smooth gravel
6	03	37.7					Dulles A/C Dep	
7	04	51.9		1				
8	05	37.2						Birds are dominant
9	06	38.6						when no Traffic or A/C.
10	07						A/C	
11	08	40.7					2nd A/C	
12	09	49.8	✓				A/C - Just fairly low	
13	10	46.2	✓				A/C	
14	11							
15	12	41.4						
16	13	55.7	✓				Dulles Dep (MD-80)	loud
17	14	43.4						
18	15							
19	16	40.1					~~Hi A/C~~	
20	17	45.0					Hi A/C	
21	18	58.8		1		1		
22	19	42.9		1			Hi A/C	
23	20	52.2		1 (fast)				
24	21	41.2					Birds	
25	22	38.4						
26	23	52.0		1 (fast)			Hi A/C	
27	24							
28	25	40.4					Birds Dominate	A-level
29	26	35.7						
30	27	57.1	✓				Turbo Prop OH	

TOTAL Leq =

SUBSET Leq =

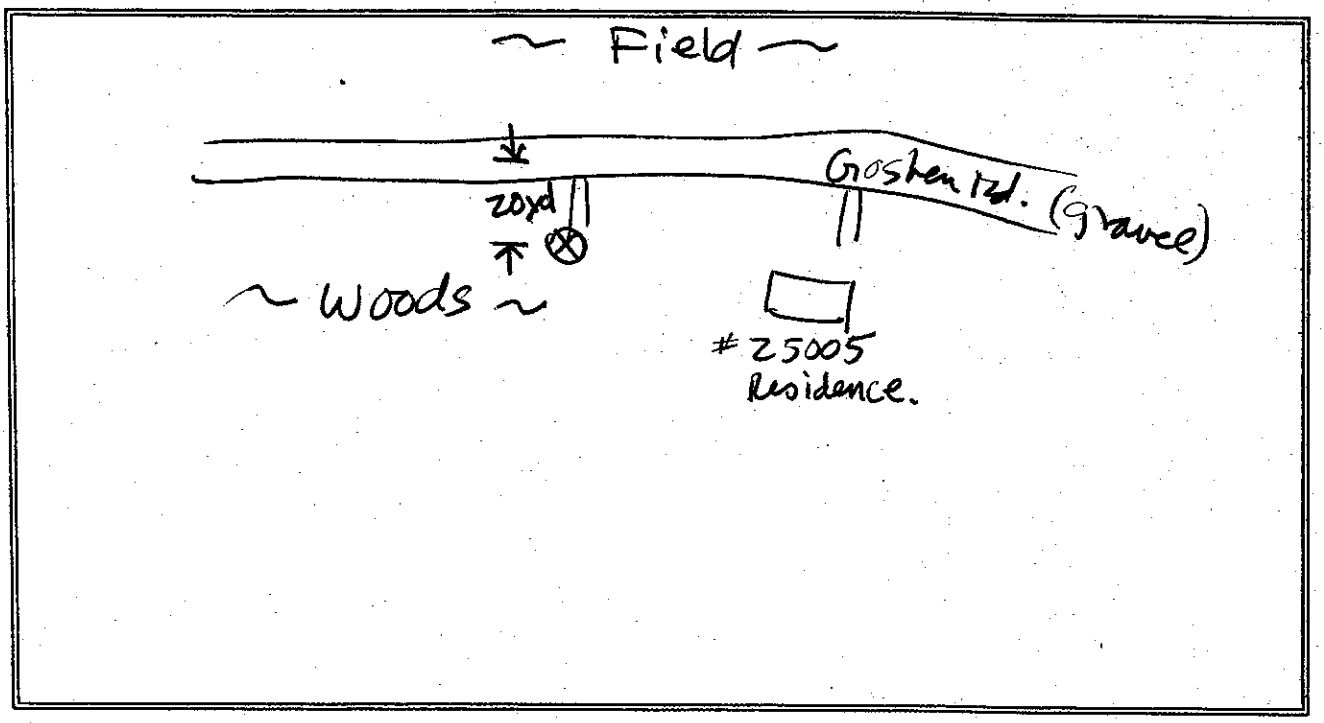
✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

HMMH NOISE MEASUREMENT SITE DATA SHEET

SITE NO.: TH - County Parkway D-2 (#27)
LOCATION/ADDRESS: 25005 Goshen Rd. - 20 yds from ℄
ENGINEER: CWM
DATE: 5/25/04
SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

B&K 2230 - Richmond Kit

WEATHER DATA: Estimated Wind Speed: 0-2 mph
Estimated Temperature: 80°F Sky Conditions: Clear

TRAFFIC COUNTS:

ROADWAY	AUTOS	MED TR	HVY TR	SPEED	START TIME	DURATION

HIGHWAY NOISE MEASUREMENT DATA SHEET

PROJECT & SITE NO.: D-3 Tri-County Parkway (#28) ENGINEER: CWM

LOCATION/ADDRESS: 41753 John Mosby Hwy (Rt 50) DATE: 5/25/04

#	1 Minute Period Starting	Meas'd Leq (dBA)	✓ or X	Autos	Med Tr	Hvy Tr	Other Noise Sources	COMMENTS (incl. Calib. Data)
1	1:49p	46.9					Primary Sources - Traffic	
2	1:50	44.5					on Rt 50, birds, wind in	
3	57						trees, A/C	
4	52	45.9						
5	53	43.2						
6	54	49.4					Loud Trucks Rt 50 + A/C	
7	55	47.2					A/C Jet	
8	56							
9	57	44.5						
10	58							
11	59	42.0						
12	2:00p	45.1						
13	01	45.9						
14	02	47.5					Bird May have dominated	
15	03						Bird + Traffic on 50	
16	04	47.1						
17	05	45.7						
18	06	49.2				Loud HT		
19	07	47.9					Traffic + A/C	
20	08	46.6						
21	09	48.4						
22	10							
23	11	50.1					747 departure from Dulles,	
24	12	67.7	✓				747	
25	13	51.1						
26	14	49.9					Hi Alt Biz Jet.	
27	15	47.1						
28	16	44.4						
29	17	51.4					Loud HT, Jet OH	
30	18	47.2						

TOTAL Leq =

SUBSET Leq =

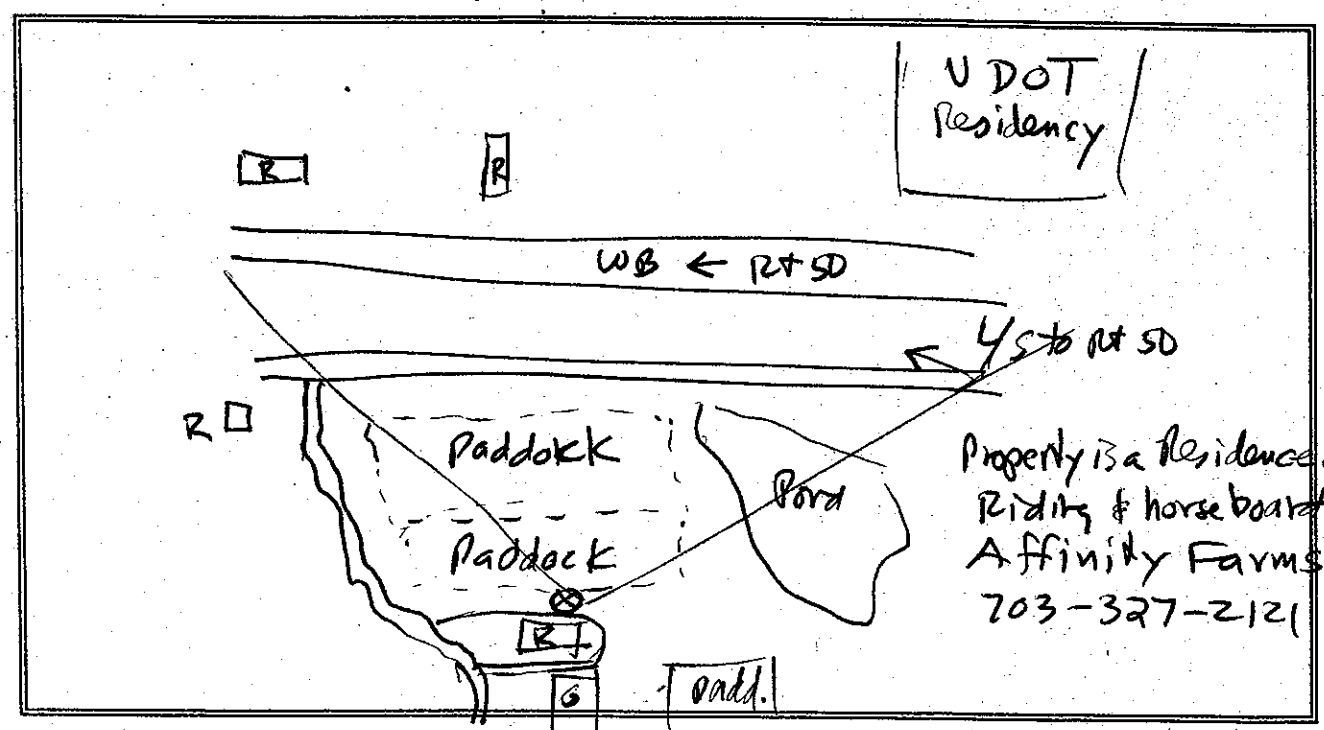
✓ = Other sources contributed to Leq

X = Exclude period - contaminated by non-characteristic sources

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

HMMH NOISE MEASUREMENT SITE DATA SHEET

SITE NO.: D-3 Tri-County Pkwy (#28)
LOCATION/ADDRESS: 41753 John Mosby Hwy (Rt 50)
ENGINEER: CWM
DATE: 5/25/04
SITE SKETCH: Please show highway, homes, local roads, reference distances, arrows for wind direction & North, photo points and directions, where highway is in cut, at grade, elevated, where direct lines of sight exist.



EQUIPMENT DATA: (Please note type and serial number of instruments)

WEATHER DATA: Estimated Wind Speed: 0-3 mph
Estimated Temperature: 83°F Sky Conditions: Partly Cloudy

TRAFFIC COUNTS:

ROADWAY	AUTOS	MED TR	HVY TR	SPEED	START TIME	DURATION

Start: 2:00

Site D-3 (-as)

Rt 50: TRAFFIC (41753 John Mosby Hwy)

TIME (min)	EAST-BOUND (Rt. 50) CARS	EAST-BOUND MED. Truck	EAST-BOUND Heavy Truck	WEST-BOUND (Rt. 50) CARS	WEST-BOUND MED. Truck	WEST-BOUND Heavy Truck
0-5	27	III	III	28	III	I
5-10	29	IIII	I	30	IIII	II
10-15	24	III	I	49	~~IIII~~	I
15-20	32	III	Ø	52	III	III
20-25	18	I	Ø	54	~~IIII~~ III	II
25-30	31	~~IIII~~ I	Ø	31	Ø	I

APPENDIX B 24-HOUR NOISE MEASUREMENT RESULTS

This appendix presents the 24-hour noise measurement results in a comprehensive graphical form. The graphs illustrate the measured hourly noise levels at each long-term site using the following noise descriptors: Leq, L1, L10, L33, and L90. The noise descriptors with numerical subscripts are statistical descriptors, which represent a noise level that is exceeded a certain percentage of the time.

These statistical descriptors provided useful additional information about how the sound level fluctuated during the measurement hour. For example, L1 is the noise level exceeded for 1 percent of the measurement hour—that is, the fluctuating sound level is louder than this L1 for only 36 seconds out of the hour. Therefore, the L1 is nearly the highest sound level that occurred during the hour. On the other hand, L90 is the sound level exceeded 90 percent of the time; the sound level is lower than this for only 6 minutes out of the hour. The L90 is often used to represent the "background" sound level. The L33, the noise level exceeded 33 percent of the hour, is often approximately equal to the Leq at locations and/or times dominated by traffic noise from a major roadway. In other areas or at other times, when one or more events during the hour significantly exceeds the background traffic noise level, Leq is higher than the L33 for that hour (as long as the total duration of the events was less than 20 minutes, or 33 percent of the hour). At Site LT2, light traffic on Pageland Road during off-peak hours, wind, and aircraft from Dulles airport contributed events that increased the Leq above the L33. At Site LT9, Godwin Drive traffic dominated the noise level, so Leq and L33 values are similar. At Site LT23, Dulles airport traffic and wind in the trees contributed events that increased the Leq above the L33, but mostly during the first day.

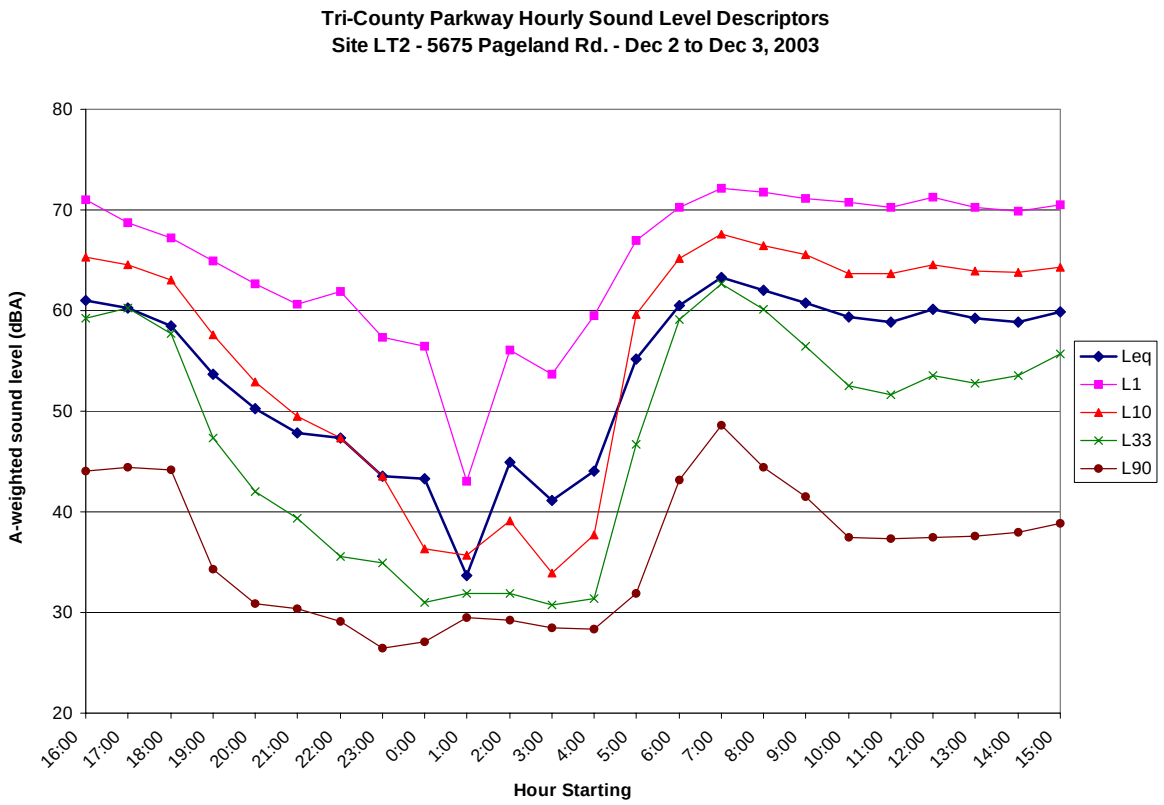


Figure 8 Site LT2 Hourly Sound Level Descriptors

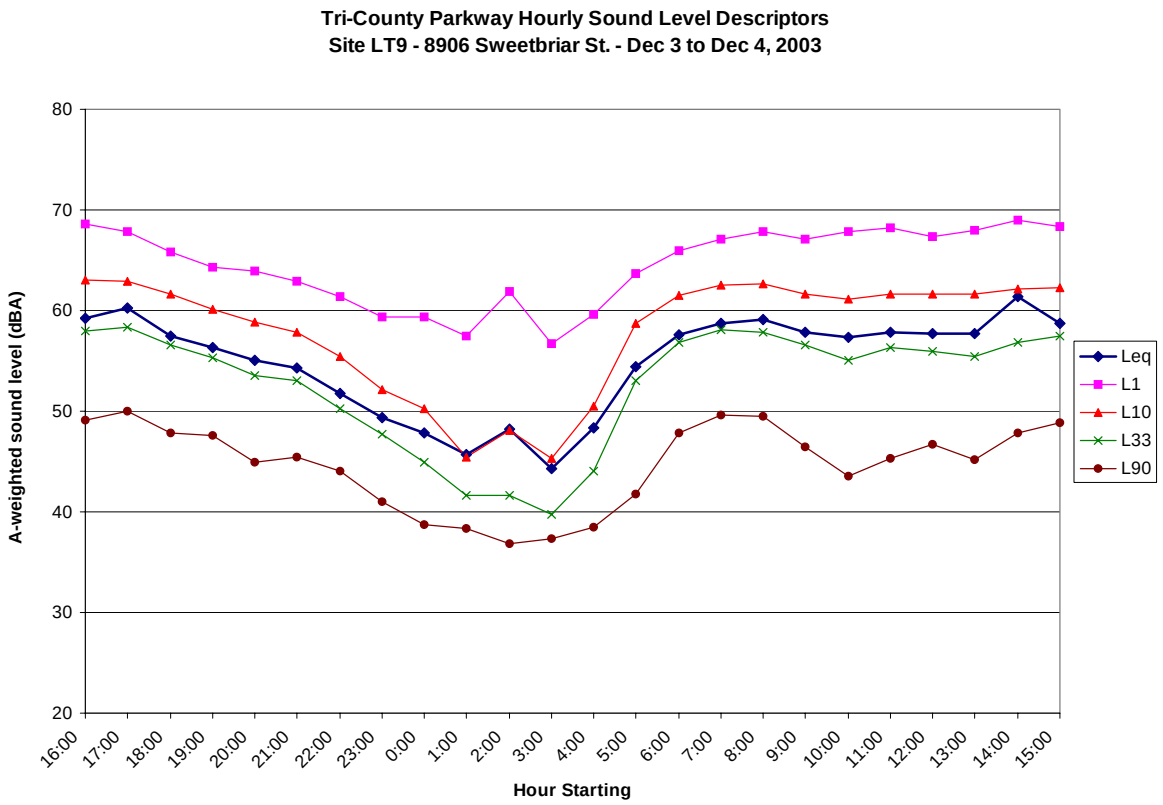


Figure 9 Site LT9 Hourly Sound Level Descriptors

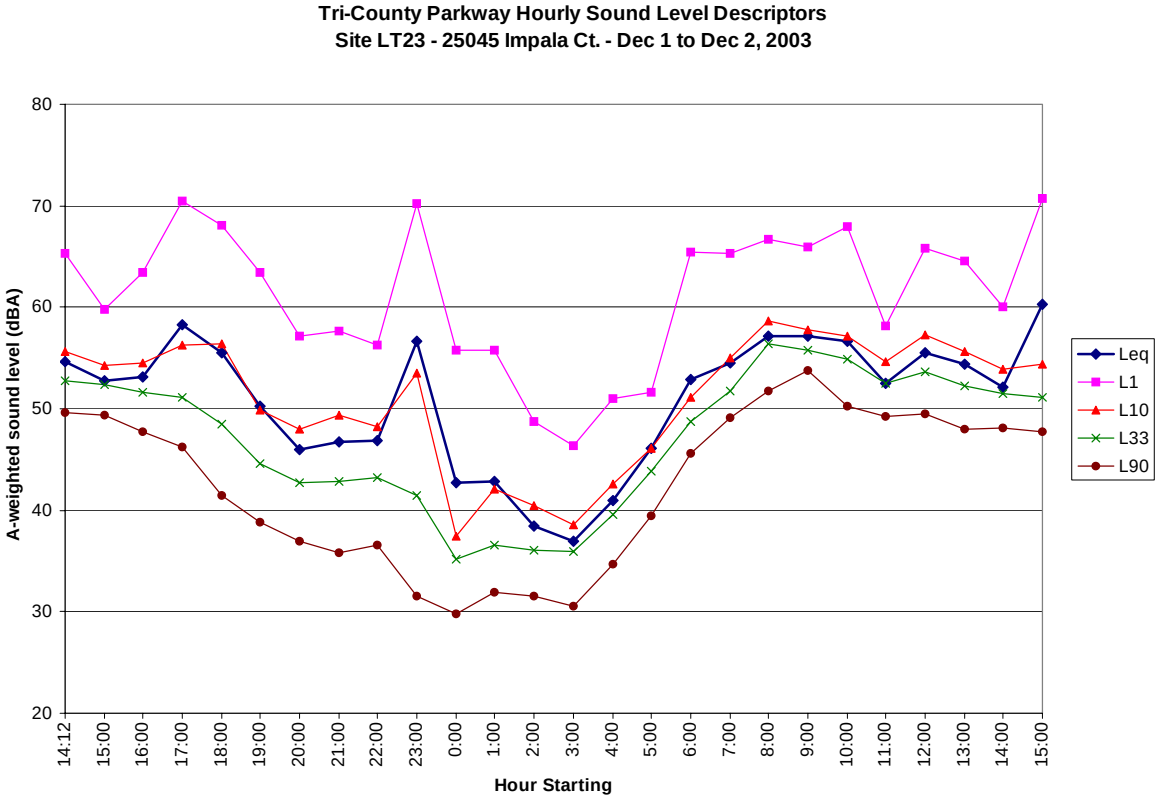


Figure 10 Site LT23 Hourly Sound Level Descriptors

APPENDIX C TRAFFIC DATA USED IN NOISE ANALYSIS

The following tables list all of the traffic volumes and speeds used in the noise modeling with the Traffic Noise Model, by alternative.

Table 8 Loudest-hour Traffic Data for 2005 Existing Conditions

		Speed	Volume, veh per hour			
Facility	**Limits**	**mph**	**Autos**	**MT**	**HT**	**Total**
Godwin Drive	VA 28 to Wellington Drive	51	931	50	40	1020
Godwin Drive	Wellington Drive to VA 234 Business	51	950	54	43	1047
Loudoun County Parkway (existing)	Braddock Road to US 50	46	328	9	4	341
Wellington Road	East of existing Godwin Drive	45	203	8	5	215
Wellington Road	West of TCP (existing Godwin Drive)	45	597	21	11	629
VA 234 Business	North of Godwin Drive	44	1716	89	54	1859
VA 234 Business	South of Godwin Drive	44	1202	30	6	1238
VA 234	East of TCP west location	50	369	5	1	375
VA 234	West of TCP west location	50	256	3	1	260
Lomond Drive	East of TCP location	38	439	9	2	450
Lomond Drive	West of TCP location	30	991	36	10	1038
Interstate 66 Eastbound	at TCP east location	65	2927	175	262	3365
Interstate 66 Westbound	at TCP east location	68	2644	141	216	3001
Interstate 66 Eastbound	East of TCP west location	40	2243	108	230	2581
Interstate 66 Eastbound	West of TCP west location	31	2591	111	225	2928
Interstate 66 Westbound	East of TCP west location	53	1818	85	177	2080
Interstate 66 Westbound	West of TCP west location	46	2107	88	178	2372
US 29	at TCP East location	50	580	10	4	594
US 29	at TCP west location	50	646	20	18	685
Braddock Road	East of Loudoun County Parkway	33	284	6	2	292
Braddock Road	West of Loudoun County Parkway	33	147	3	1	152
Braddock Road	at TCP West Location	33	46	1	1	48
US 50	East of Loudoun County Parkway	55	1166	47	32	1246
US 50	West of Loudoun County Parkway	56	785	32	22	838
US 50	at TCP west location	56	980	36	22	1038

Table 9 Loudest-hour Traffic Data for 2030 No-Build Conditions

		Speed	Volume, veh per hour			
Facility	**Limits**	**mph**	**Autos**	**MT**	**HT**	**Total**
Godwin Drive	VA 28 to Wellington Drive	51	496	23	33	552
Godwin Drive	Wellington Drive to VA 234 Business	51	502	24	35	561
Loudoun County Parkway (exist.)	Braddock Road to US 50	45	1285	25	13	1324
Wellington Road	East of existing Godwin Drive	45	138	1	4	143
Wellington Road	West of TCP (existing Godwin Drive)	45	361	2	3	365
VA 234 Business	North of Godwin Drive	44	1268	35	39	1342
VA 234 Business	South of Godwin Drive	44	1093	13	9	1116
VA 234	East of TCP west location	50	334	1	0	334
VA 234	West of TCP west location	50	317	1	0	318
Lomond Drive	East of TCP location	38	617	6	2	625
Lomond Drive	West of TCP location	30	1024	9	3	1036
Interstate 66 Eastbound	at TCP east location	53	3744	161	453	4359
Interstate 66 Westbound	at TCP east location	59	3389	132	370	3891
Interstate 66 Eastbound	East of TCP west location	47	4141	164	516	4821
Interstate 66 Eastbound	West of TCP west location	56	3639	129	386	4155
Interstate 66 Westbound	East of TCP west location	63	3070	113	334	3516
Interstate 66 Westbound	West of TCP west location	58	3482	114	347	3943
US 29	at TCP East location	48	921	11	10	943
US 29	at TCP west location	49	868	7	4	879
Braddock Road	East of Loudoun County Parkway	30	1182	11	7	1200
Braddock Road	West of Loudoun County Parkway	32	766	7	5	777
Braddock Road	at TCP West Location	33	466	9	4	479
US 50	East of Loudoun County Parkway	54	1808	28	32	1868
US 50	West of Loudoun County Parkway	55	1452	22	25	1500
US 50	at TCP west location	55	1352	39	52	1443
US 50	at TCP east location	54	1823	53	70	1945

Table 10 Loudest-hour Traffic Data for Comprehensive Plan Alternative 2030: Segments E F F'

		Speed	Volume, veh per hour			
Facility	**Limits**	**mph**	**Autos**	**MT**	**HT**	**Total**
TCP Seg. E (exist. Godwin Dr)	VA 28 to Wellington Drive	46	1787	67	213	2067
TCP Seg. E (exist. Godwin Dr)	Wellington Drive to VA 234 Business	43	2065	93	236	2394
TCP Segment E	VA 234 Business to Lomond Drive	56	4165	162	280	4607
TCP Segment E	Lomond Drive to I-66	52	4827	195	296	5319
TCP Segment F	I-66 to US 29	63	1195	21	16	1232
TCP Segment F	US 29 to Braddock Road	45	1655	28	17	1700
TCP Segment F	Braddock Road to US 50	45	1591	27	17	1634
Wellington Road	East of TCP (existing Godwin Drive)	45	506	18	15	539
Wellington Road	West of TCP (existing Godwin Drive)	45	405	13	11	429
VA 234 Business	North of TCP	44	1181	21	14	1216
VA 234 Business	South of TCP	41	2320	61	37	2418
Lomond Drive	East of TCP	31	937	30	17	983
Lomond Drive	West of TCP	17	1488	7	3	1498
Interstate 66 Eastbound	West of TCP	58	3422	153	385	3960
Interstate 66 Eastbound	East of TCP	28	5326	226	720	6272
Interstate 66 Westbound	West of TCP	68	2602	102	259	2963
Interstate 66 Westbound	East of TCP	48	4074	154	493	4721
US 29	East of TCP	44	1299	18	15	1333
US 29	West of TCP	48	956	7	8	971
Braddock Road	East of TCP	31	730	7	3	739
Braddock Road	West of TCP	31	896	9	5	911
US 50	East of TCP	54	1923	35	34	1991
US 50	West of TCP	55	1477	23	24	1524

Table 11 Loudest-hour Traffic Data for West Four Alternative 2030: Segments C G F'

		Speed	Volume, veh per hour			
Facility	**Limits**	**mph**	**Autos**	**MT**	**HT**	**Total**
TCP Segment C	I-66 to US 29	53	2887	75	109	3071
TCP Segment C	US 29 to Artemus Rd	56	2563	62	98	2723
TCP Segment C	Artemus Road to VA 234	59	2218	58	90	2366
TCP Segment C	VA 234 to TCP Segment G	57	2589	47	65	2702
TCP Segment G	TCP Seg. C to VA 659 (Gum Spgs Rd)	56	2630	47	60	2738
TCP Segment G	VA 659 to TCP Segment F	44	1799	19	19	1838
TCP Segment F	TCP Segment G to Braddock Road	44	1904	20	20	1944
TCP Segment F	Braddock Road to US 50	43	2208	32	16	2256
Interstate 66 Eastbound	West of TCP Interchange	21	5063	97	264	5424
Interstate 66 Eastbound	East of TCP Interchange	24	4672	86	222	4980
Interstate 66 Westbound	West of TCP Interchange	66	2571	174	509	3254
Interstate 66 Westbound	East of TCP Interchange	63	2935	151	428	3514
US 29	East of TCP	50	580	13	18	611
US 29	West of TCP	36	1689	22	30	1741
Artemus Road	East of TCP	38	27	0	0	27
Artemus Road	West of TCP	38	206	0	1	207
VA 234 (Sudley Road)	East of TCP	50	203	2	10	215
VA 234 (Sudley Road)	West of TCP	41	1318	20	55	1393
VA 659 (Gum Springs Road)	North of TCP	28	1667	40	47	1754
VA 659 (Gum Springs Road)	South of TCP	42	943	13	12	967
Braddock Road	East of TCP	27	2093	25	19	2137
Braddock Road	West of TCP	49	772	10	5	786
US 50	East of TCP	46	2958	50	40	3048
US 50	West of TCP	53	2142	35	39	2215

Table 12 Loudest-hour Traffic Data for West Two Alternative 2030: Segments C D

		Speed	Volume, veh per hour			
Facility	**Limits**	**mph**	**Autos**	**MT**	**HT**	**Total**
TCP Segment C	I-66 to US 29	53	2869	77	132	3079
TCP Segment C	US 29 to Artemus Rd	56	2639	62	98	2798
TCP Segment C	Artemus Road to VA 234	59	2248	58	91	2396
TCP Segment D	VA 234 to US 50	59	2236	49	71	2356
Interstate 66 Eastbound	West of TCP Interchange	18	6083	118	340	6541
Interstate 66 Eastbound	East of TCP Interchange	19	5693	97	260	6050
Interstate 66 Westbound	West of TCP Interchange	66	2587	176	491	3254
Interstate 66 Westbound	East of TCP Interchange	63	2992	161	422	3574
US 29	East of TCP	49	707	15	19	741
US 29	West of TCP	35	1740	29	51	1820
Artemus Road	East of TCP	38	60	0	0	60
Artemus Road	West of TCP	38	218	0	0	218
VA 234 (Sudley Road)	East of TCP	50	322	4	19	346
VA 234 (Sudley Road)	West of TCP	46	1061	16	46	1122
Braddock Road	East of TCP	50	527	9	11	547
Braddock Road	West of TCP	50	579	5	10	594
US 50	East of TCP	51	2299	43	58	2400
US 50	West of TCP	50	2505	64	85	2653