U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

In Cooperation With:
FEDERAL AVIATION ADMINISTRATION
and
U.S. ARMY CORPS OF ENGINEERS

ENVIRONMENTAL ASSESSMENT

Route 606 (Loudoun County Parkway/Old Ox Road) Reconstruction Project
Loudoun County, Virginia

State Project: 0606-053-983, P101
VDOT UPC: 97529
Federal Project: STP-5A01(165)

Submitted Pursuant to 42 U.S.C. 4332(2) (C)

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for the Division Administrator

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The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA) as the lead federal agency, the Federal Aviation Administration (FAA) as a cooperating federal agency, and the U.S. Army Corps of Engineers (USACE) as a cooperating federal agency is evaluating solutions to provide transportation improvements along a 5.283-mile segment of existing Route 606 (Loudoun County Parkway/Old Ox Road) in Loudoun County. Pursuant to the National Environmental Policy Act (NEPA) of 1969 and in accordance with FHWA regulations, this Environmental Assessment (EA) has been prepared to analyze the potential social, economic, and environmental effects associated with the proposed project.

1. PURPOSE AND NEED

1.1 Project Corridor

The proposed project is located adjacent to Washington Dulles International Airport and the National Oceanographic Atmosphere Administration property in the eastern portion of Loudoun County (Figure 1-1). Route 606 (Loudoun County Parkway/Old Ox Road) connects two major roads, US Route 50 and the Dulles Greenway (Route 267), and provides a desirable route for motorists from points west to Washington Dulles International Airport and the Dulles North Transit Center (a 750-space park-and-ride lot), as well as the business commerce centers in the Ashburn, Sterling, and Herndon areas. The 5.283 miles of Route 606 included as part of this project transects a developing corridor of both commercial and residential properties, including the planned "Route 606 Metro Station" near the Route 267 interchange. Route 606 presently extends over Horsepen Dam, which is owned by the Metropolitan Washington Airport Authority (MWAA). A number of utilities are located within the corridor - including overhead and underground telephone lines, power lines, gas lines, fiber, and an electrical transmission line. Substantial portions of the Route 606 corridor are located within easements presently administered by MWAA.

1.2 Background History

Planning for the widening of the Route 606 corridor has been ongoing since the early 1990's. The first segment of this effort was implemented in 2002-2003 with reconstruction and widening between Route 50 and Route 621. Preliminary engineering for the remaining two-lane segment of the corridor was started in 2005 as part of the Secondary Six Year Plan (SSYP) for Loudoun County. At that time, it was felt that there would not be sufficient SSYP funds to construct the total project and, as a result, further project development was put on hold. The project has since been identified as part of the "Dulles Loop" which is a plan to encircle Washington Dulles International Airport with urban collectors and limited access arterials to allow traffic of all types to freely access the airport complex.

Because of the importance of Washington Dulles International Airport to the region and the importance of access to and from the airport, the Dulles Loop Implementation Group (DLIG) initiated a study managed by the Washington Airports Task Force titled the "Dulles Loop

Implementation Plan". The Implementation Plan defines the Dulles Loop as an 18-mile loop which would encircle Dulles Airport by improving portions of Route 50, Route 606, and Route 28. Studies on which the Plan was based outline details on the existing conditions, interim needs, and long-term needs for improvements to the proposed Dulles Loop. According to the Implementation Plan, "a long-term plan with capacity greater than currently identified in both Fairfax and Loudoun Counties Transportation Plans, is critical if future opportunities for the counties and the region are to be preserved."

1.3 Purpose

The purpose of the Route 606 Reconstruction Project is to improve the capacity and safety of a heavily trafficked roadway and to provide a critical leg of the proposed Dulles Loop by widening the existing two-lane roadway to a four-lane roadway with divided median and signalized intersections. The ultimate condition would convert Route 606 between Route 50 and Route 28 to a limited access facility.

1.4 Needs

Present needs associated with improving Route 606 within the study corridor include:

- Improve capacity and reduce congestion.
- Improve traffic safety through improvements to roadway geometry and operations.
- Provide a critical segment of proposed Dulles Loop.
- Allow improved connectivity with the regional multimodal transportation network.

1.3.1 Existing Conditions

1.3.1.1 *Capacity*

Loudoun County has been ranked as second in the U.S. for job growth over the last decade. County statistics indicate that at-place employment has returned to and slightly surpassed pre-recession employment levels of 2009. Recent Loudoun County data indicates that employment within the county is at an all-time high of more than 134,000. This figure reflects a 3 percent increase over the previous year when the employment rate for Northern Virginia increased by only 1.7 percent. With this recent increase in employment within the county (especially around Washington Dulles International Airport) has come increased commuter traffic.

Loudoun County currently has major roadways running in an east-west direction (including Route 7, Route 50, and the Dulles Greenway), but is deficient in major north-south transportation facilities. The section of Route 606 addressed by this assessment currently provides a somewhat limited and ineffective route for local traffic coming from points west to access Ashburn, Sterling, and Herndon. In addition, many airport patrons living in the western regions of the Washington Metropolitan area also use Route 606 as an alternate route to Washington Dulles International Airport.

VDOT has computed a "daily service volume" (DSV) for most segments of roads in the Commonwealth. This volume, which is based on geometrics of the existing roadway (pavement

widths, shoulders, radius of curves, limits of sight distance, etc.), represents the acceptable traffic volume for that segment of the roadway based on its existing conditions. By comparing the calculated DSV with measured "average daily traffic" (ADT), transportation planners are given advance indication of the need for capacity improvements. The DSV for Route 606 between Route 50 and Route 621 (Evergreen Mills Road) is estimated to be 35,000 vehicles per day. By comparison, the DSV for the sections of Route 606 between Route 621 and Route 28 is estimated to be 6,700 vehicles per day. For the section of Route 606 north of Route 621 and south of Route 267, 2011 traffic counts were 21,500 ADT, with a projected traffic count of 35,250 ADT for the design year of 2036. The heavy vehicle percentage for the entire study segment is eight percent. This data indicates that existing traffic counts on the section of Route 606 between Route 621 and Route 267 substantially exceed the previously described DSV of 6,700, thereby emphasizing the need for additional capacity. Under the existing traffic conditions, most of the side streets are operating at unacceptable service levels of E or F in both AM and PM peak hours (Table 1-1). Improvements to roadways in eastern Loudoun County (especially north-south corridors such as Route 606) are needed to improve capacity and ease existing congestion.

1.3.1.2 *Safety*

From 2007 to the end of 2010, a total of 158 accidents were reported on Route 606 between Route 621 (Evergreen Mills Road) and Route 267 (Dulles Greenway). While the numbers of accidents were approximately the same between 2007 and 2009, they increased by 49 percent in 2010. One-third of the accidents were injury accidents (with seventy-six individuals injured), while two-thirds of the accidents involved property damage. Seventy-seven of the accidents involved rear end collisions and thirty-five of the accidents involved angle collisions. The great majority of the accidents (119) occurred in daylight hours, with 21 occurring in darkness. The great majority of the accidents (126) occurred during dry road surface conditions, while 23 occurred in wet conditions. In almost all of the accidents (133) the weather conditions were reported as "no adverse condition". This data indicates that road conditions presently experienced on Route 606 are not designed for the traffic presently on the roadway, thus, resulting in unsafe conditions.

1.3.1.3 *Multimodal Integration*

From a statewide perspective, Washington Dulles International Airport is identified as a critical part of the Commonwealth's marketing strategy to attract industry to the Northern Virginia area. Current limitations on the ability of trucks to get into and out of the airport complex, in turn, hinder opportunities for the airport to be a major factor in the movement of freight and to attract associated businesses and industries. To help address existing and projected conditions, adequate transportation facilities must be provided to support Loudoun County's Dulles Airport Commercial/Industrial base by implementing improvements, such as those along Route 606.

A 750-space park-and-ride lot known as the "Dulles North Transit Center" is presently located immediately northeast of the existing Route 606/Route 267 interchange (Figure 3-1). The Dulles North Transit Center currently serves as the hub of transit service provided by Loudoun County Transit, with all bus routes traversing Loudoun County utilizing the lot.

Table 1-1

LOS Results – Existing (2011) Conditions

ID	Intersection	Control	Movement		2011 Existing AM		2011 Existing PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Evergreen Mills Rd	Signalized	EB	L	C	26.6	E	60.1
				R	A	0.5	A	0.4
				Overall	A	7.2	A	8.2
			NB	L	C	25.0	D	46.7
				T	A	8.8	A	2.3
				Overall	B	12.4	C	29.6
			SB	TR	C	20.7	C	33.5
				Overall	C	20.7	C	33.5
			Intersection Overall		**B**	**12.8**	**C**	**28.1**
2	Arcola Rd	Unsignalized	EB	LR	F	58.1	F	51.6
				Overall	F	58.1	F	51.6
			NB	LT	A	0.0	A	0.3
				Overall	A	0.0	A	0.3
			SB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.3**	**A**	**0.3**
3	Pebble Run Pl	Unsignalized	EB	L	F	77.2	F	71.3
				R	B	11.7	E	36.6
				Overall	C	24.8	E	41.3
			NB	L	A	8.8	B	13.0
				T	A	0.0	A	0.0
				Overall	A	0.8	A	1.1
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**1.2**	**A**	**1.9**
4	Bears School Rd	Unsignalized	WB	LR	E	38.8	B	11.3
				Overall	E	38.8	B	11.3
			NB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	L	A	0.0	A	0.0
				T	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.2**	**A**	**0.0**

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 1-1 (continued)

LOS Results – Existing (2011) Conditions - Continued

ID	Intersection	Control	Movement		2011 Existing AM		2011 Existing PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
5	Overland Dr	Signalized	EB	L	F	98.4	F	106.0
				R	E	67.8	F	82.8
				Overall	F	87.2	F	91.2
			NB	L	F	89.0	F	97.1
				T	C	20.3	A	3.4
				Overall	C	23.8	B	10.9
			SB	T	B	10.1	C	24.5
				R	A	7.6	A	5.6
				Overall	A	9.6	C	22.5
			Intersection Overall		**C**	**28.0**	**C**	**28.7**
6	Beaver Meadow Rd	Unsignalized	WB	LR	F	*	F	95.2
				Overall	F	*	F	95.2
			NB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	LT	A	2.7	A	0.1
				Overall	A	2.7	A	0.1
			Intersection Overall		**F**	**134.4**	**A**	**2.8**
7	Freeport Pl & Trade Center Pkwy	Signalized	EB	LTR	F	107.2	F	86.0
				Overall	F	107.2	F	86.0
			WB	LT	F	124.8	F	97.1
				R	F	103.8	F	85.3
				Overall	F	110.8	F	90.1
			NB	L	A	4.3	C	20.5
				T	C	26.2	A	6.5
				R	A	5.0	A	4.5
				Overall	C	25.2	A	7.2
			SB	L	C	27.5	A	3.8
				T	A	3.9	C	21.5
				R	A	2.7	A	4.5
				Overall	A	9.1	C	20.6
			Intersection Overall		**C**	**29.1**	**C**	**24.9**
8	Stukely Dr & Weather Service Rd	Unsignalized	EB	LTR	F	*	F	69.2
				Overall	F	*	F	69.2
			WB	LTR	F	3917.8	F	61.7
				Overall	F	3917.8	F	61.7
			NB	L	A	8.5	B	11.9
				TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	LT	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**F**	**290.1**	**A**	**0.9**

*Inadequate gaps for left turns, so delay considered infinite by HCM/Synchro

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 1-1 (continued)

LOS Results – Existing (2011) Conditions - Continued

ID	Intersection	Control	Movement		2011 Existing AM		2011 Existing PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
9	Ladbrook Dr	Signalized	EB	L	F	80.6	C	21.7
				R	E	74.6	C	20.9
				Overall	E	78.6	C	21.3
			NB	L	A	1.0	A	0.0
				T	B	12.1	A	6.1
				Overall	B	12.1	A	6.1
			SB	T	A	2.6	A	6.2
				R	A	1.7	A	1.8
				Overall	A	2.5	A	6.2
			Intersection Overall		**A**	**9.8**	**A**	**6.8**
10	Mercure Cir & Thunder Rd	Unsignalized	EB	L	F	104.4	F	143.2
				R	B	12.0	D	28.8
				Overall	E	42.8	F	63.1
			WB	LTR	E	42.4	E	49.4
				Overall	E	42.4	E	49.4
			NB	L	A	8.9	B	11.4
				TR	A	0.0	A	0.0
				Overall	A	0.4	A	0.1
			SB	L	B	11.9	A	8.9
				T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.2	A	0.0
			Intersection Overall		**A**	**0.7**	**A**	**3.3**
11	Mercure Cir	Signalized	EB	L	F	99.6	F	109.1
				R	F	95.3	E	79.1
				Overall	F	98.7	F	107.7
			NB	L	A	1.5	C	31.9
				T	B	10.9	A	8.1
				Overall	B	10.9	A	8.2
			SB	T	A	3.5	C	32.0
				R	A	2.3	A	6.4
				Overall	A	3.2	C	31.6
			Intersection Overall		**A**	**9.1**	**C**	**31.4**
12	Commerce Center Ct	Unsignalized	EB	LR	F	72.8	F	60.3
				Overall	F	72.8	F	60.3
			NB	L	A	9.6	B	13.3
				T	A	0.0	A	0.0
				Overall	A	0.1	A	0.0
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.6**	**A**	**1.0**

Note: Cells highlighted in red reflect unacceptable levels of service.

The Dulles North Transit Center also serves carpools. Presently, 23 bus routes serving 28 destinations in Northern Virginia and the District of Columbia depart the Dulles North Transit Center in the morning, while 30 bus routes depart Northern Virginia and the District of Columbia in the afternoon with a destination of the Dulles North Transit Center. Because of construction currently underway as part of the extension of the Metro Silver Line and the HOT lane construction along I-495, the Virginia Megaprojects organization subsidized bus service from Loudoun County to Tyson's Corner (the "Tyson's Express") in 2010 and 2011. This service has been very successful - doubling passenger trips from 3,000 in July of 2010 to 6,000 in March of 2011. While the operators of the Tyson's Express would like to serve the Dulles North Transit Center, it is presently not able to because the 750-space park-and-ride lot is over capacity. Because of very high demand, the existing lot is chronically oversubscribed and improved circulation along roadways presently serving the facility (such as Route 606) is critically needed.

1.3.2 Future Conditions

1.3.2.1 *Capacity*

In May of 2013, the Commonwealth Transportation Board (CTB) passed a Resolution titled "Northern Virginia North-South Corridor of Statewide Significance" in which the CTB noted that the population of Northern Virginia is projected to grow by 55 percent by 2035, with much of the growth occurring in Loudoun County and Prince William County. In its Resolution, the CTB also noted that employment is projected to increase by 74 percent, and that daily vehicle miles traveled are expected to increase by 123 percent. For the section of Route 606 north of Route 621 and south of Route 267, 2011 traffic counts were 23,500 ADT, with a projected traffic count of 35,250 ADT for the design year of 2036. This data demonstrates that the existing traffic counts on the section of Route 606 between Route 621 and Route 267 exceed the DSV of 6,700 calculated for the segment of Route 606 between Route 621 and Route 28 - indicating the need for additional capacity for Route 606. Data generated by the Metropolitan Washington Council of Governments illustrate that, while employment within the entirety of Loudoun County will continue to grow, employment within the sector of the county where Route 606 is located will increase dramatically in the near future. Without roadway improvements, the increase in population will cause worsening congestion and an increase in traffic volumes.

1.3.2.2 *Safety*

Road conditions presently experienced on Route 606 are not designed for the traffic presently on the roadway, thus, resulting in unsafe conditions. Based on projections set forth in section 1.3.2.1, failure to provide roadway improvements would not serve to address present or projected safety issues.

1.3.2.3 *Multimodal Integration*

The regional/statewide significance of improving access to Dulles International Airport from the west and south was reinforced as recently as May of 2011, when the CTB passed a Resolution titled "Northern Virginia North-South Corridor of Statewide Significance". Among other

priorities, the Resolution identified the importance of improving access to major activity centers around Washington Dulles International Airport for passengers and freight from the west and south. To help address current and projected conditions, adequate transportation facilities must be provided to support Loudoun County's Dulles Airport Commercial/Industrial base by implementing improvements such as the Route 606 segment of the Dulles Loop. Planned airport facility improvements proposed to further enhance opportunities for the airport to be a major factor in the movement of freight will place added demand on local roads, including Route 606.

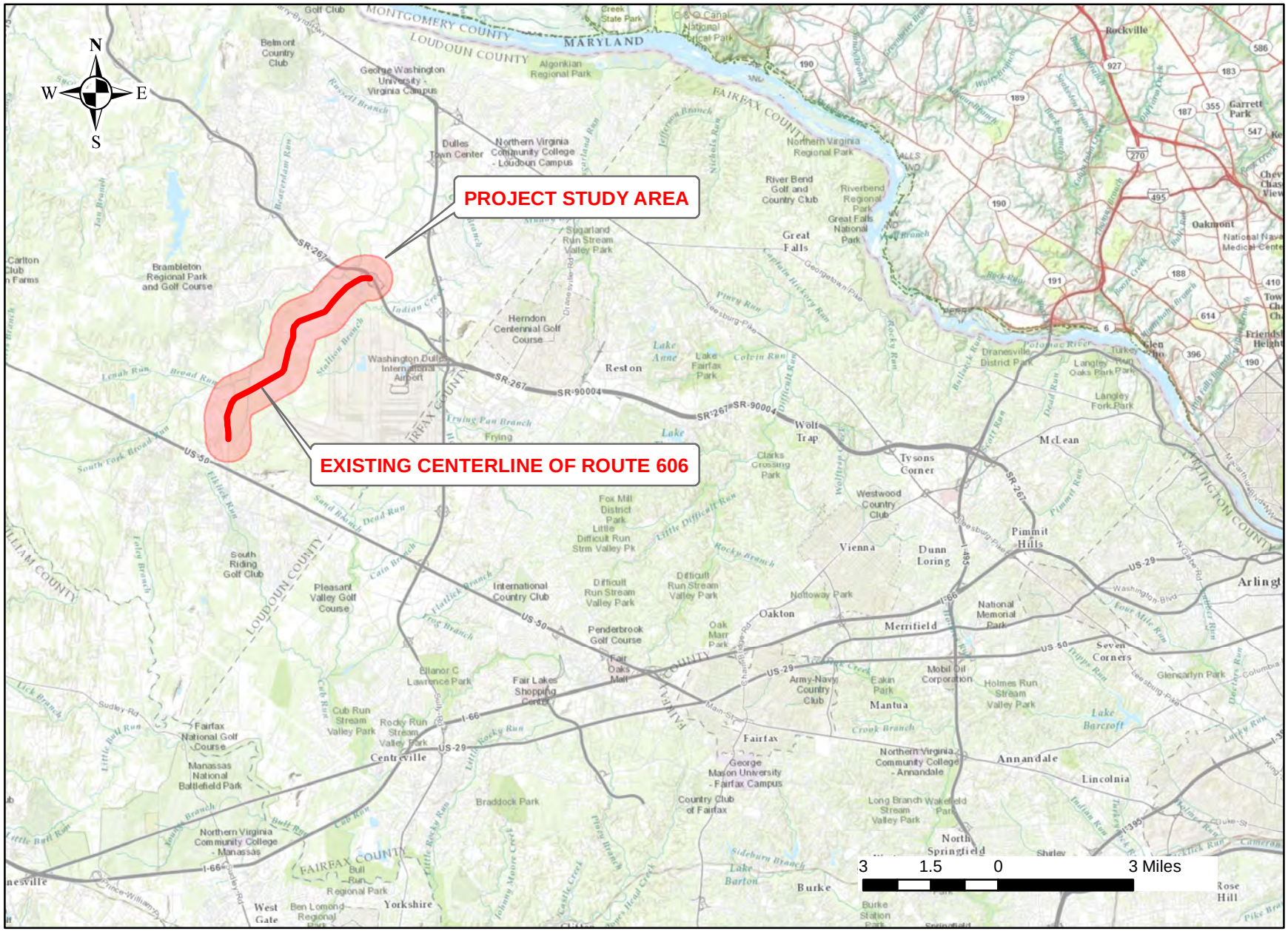
Virginia's previous Long-Range Multimodal Transportation Plan (VTRANS 2025) states that improving Route 606 would enhance a vital connection to Washington Dulles International Airport and is a priority multimodal project in that it will provide access to the airport complex and to the future Route 606 Metro station to be located in the median of the Dulles Greenway just northwest of the intersection of Route 606 (Figure 3-1). Virginia's most recent Long-Range Multimodal Transportation Plan (VTRANS 2035) also ascertains the importance of Route 606 improvements. Because of very high demand, the existing 750-space Dulles North Transit Center park-and-ride lot is chronically oversubscribed. Further justifying the need for Route 606 improvements from a multimodal perspective, Phase 2 plans for the expansion of WMATA's Dulles Line also includes a proposed 2,000-space parking garage near the intersection of Route 606 and Route 267 to service the proposed Route 606 Metro Station.

1.5 Purpose and Needs Summary

The purpose of the Route 606 Reconstruction Project is improve the capacity and safety of a heavily trafficked roadway and to provide a critical leg of the proposed Dulles Loop by widening the existing 2-lane roadway to a four-lane roadway with divided median and signalized intersections. Northern Virginia Transportation Authority's planned "Corridor 2" improvements (of which Route 606 is a part) will provide facility improvements identified in the National Capital Region's Constrained Long Range Plan (CLRP) and the Transportation Improvement Program (TIP), which is the official Transportation Plan for the Metropolitan Washington Region. The project is listed in the 2011 CLRP Air Quality Conformity Inputs approved by the Transportation Planning Board on March 16, 2011.

Critical needs for the improvement of Route 606 from Route 621 to the Dulles Greenway (Route 267) from the local, regional, and state perspective are as follows:

- The need to improve capacity and reduce congestion.
- The need to improve traffic safety through improvements to roadway geometry and operations.
- The need to provide a critical segment of proposed Dulles Loop.
- The need to provide improved connectivity with the regional multimodal transportation network.



Environmental Assessment *Figure 1-1: Project Location* *Route 606 Reconstruction Project*

2. ALTERNATIVES

2.1 Alternative Development and Screening Process

2.1.1 Alternatives Development Process

This section describes the development and screening of alternatives that were considered to enhance the capacity of traffic operations along Route 606. All reasonable alternatives that met the project purpose and need (Section 1) were initially considered. Discussions with project stakeholders identified one build alternative for analysis and evaluation. The project stakeholders included representatives from FHWA, VDOT, FAA, USACE, Loudoun County, the Dulles Airport Authority, and property owners within the corridor.

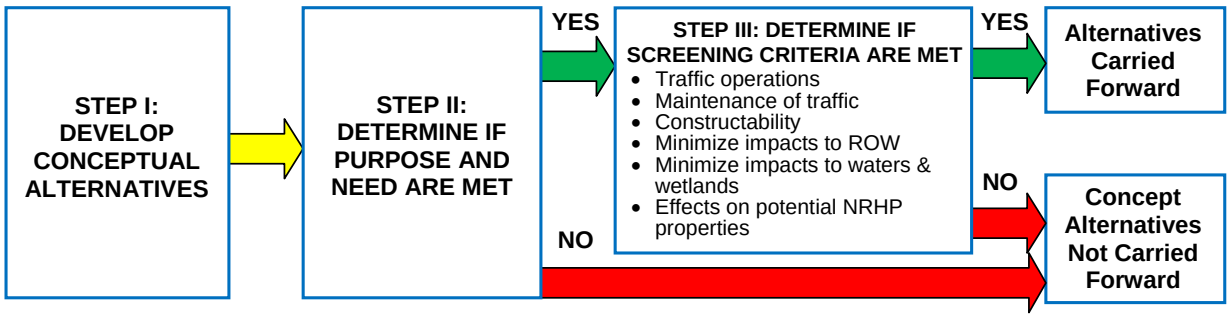
2.1.2 Screening Process and Criteria

Considering purpose and need (as set forth in Section 1), the no-build alternative along with the build alternative were developed and analyzed, with consideration being given to the following key criteria identified during preliminary studies:

- Relative efficacy and project life with respect to traffic operations.
- Relative ability to accommodate maintenance of traffic.
- Constructability and phases of construction.
- Relative ability to stay within existing right-of-way or to minimize right-of-way and relocation impacts.
- Relative ability to minimize impacts to Horsepen Run and the Horsepen Run dam.
- Potential effects to cultural resources considered eligible for listing on the National Register of Historic Places.

2.1.3 Flowchart

The following flowchart depicts the general approach used for screening concept alternatives using purpose and need of the proposed action along with the screening criteria listed in the previous section. As depicted in the flowchart, alternatives were either not carried forward for further analysis or were carried forward for more-detailed analysis based on their ability to meet purpose and need and their relative ability to address key criteria.



2.2 Build Alternative Options Not Carried Forward for Detailed Study

All practicable alternatives that appeared to meet the project purpose and need were initially considered. Because the proposed action entails widening of an existing roadway largely upon present alignment, initial screening determined that environmental factors would not be substantially different among the build alternative options discussed below. Because the purpose of the proposed project is to enhance the capacity of the transportation corridor to accommodate the forecasted traffic demand and because the initial assessment indicated noticeable differences with respect to traffic operation, maintenance of traffic, and constructability associated with each of the build alternative options, these parameters were used as primary factors in the alternatives screening process. Of the build alternative options initially considered, the four build alternative options not carried forward for detailed study are described in following the sections.

2.2.1 The Proposed Alignment With Curb-and-Gutter Section

A concept option of the preferred build alternative which would provide curb-and-gutter was considered. This build alternative option was dismissed in favor of the currently proposed shoulder section at the request of Loudoun County and landowners within the corridor. The reason for dismissal of the curb-and-gutter option was to better facilitate possible future HOV / transit facilities, as called for in Loudoun County's Comprehensive Plan.

2.2.2 The Proposed Alignment with Roundabouts at Major Intersections

A concept option of the preferred build alternative which would provide roundabouts at major intersections was considered. Analysis indicates that this option would not function at the same level of operational efficiency as conventional intersections and that it was geometrically constrained in certain areas and, therefore, was not carried forward.

2.2.3 Realignment of Route 606 to Cross Upstream or Downstream of Horsepen Dam

Concept options of the preferred build alternative that would realign Route 606 to cross Horsepen Run upstream or downstream of Horsepen Dam were considered. These realignment options were not carried forward due to substantive right-of-way impacts, greater costs, and impacts to the proposed Metro Silver Line extension.

2.2.4 The Proposed Alignment with Spanning Horsepen Run Dam on Structure.

A concept option of the preferred build alternative which would span the existing dam over Horsepen Run entirely on-structure was considered. Analysis indicates that this option would not be as cost effective as the preferred build alternative which would make use of a combination of retaining walls and structure (over the emergency spillway only) and, therefore, was not carried forward.

2.3 Alternatives Carried Forward

Based on the screening process described in previous sections, the No-Build Alternative and the Preferred Build Alternative were selected to be evaluated as part of this Environmental

Assessment (EA). Transportation System Management (TSM) strategies to improve the operational efficiency without any major improvements were also considered as an integral component of alternatives under consideration. TSM strategies are underway to improve traffic operations in the region and are included in the No-Build Alternative. Improvements such as signal timing optimization, addition and extension of turn bays, and signage are included as part of TSM. The aforementioned TSM measures would improve traffic operations incrementally, but would not be sufficient by themselves to fulfill the purpose of and need for the project.

2.3.1 No-Build

The 2036 No-Build Alternative is a baseline condition without the proposed roadway improvements and was defined to provide a baseline for comparison with the Preferred Build Alternative. Capacity analyses were conducted for the no-build conditions using the 2036 projected traffic volumes and existing lane configurations. The No-Build Alternative would retain the existing configuration of Route 606 and would not include any modifications to the roadway network other than the following:

- Planned and programmed improvements identified in the regional fiscally Constrained Long Range Transportation Plan (CLRP).
- Transit and travel demand management options.

Based on the above definition, the following roadway improvements are expected to be in place by opening year (2016) and included in the No-Build Alternative for opening year (2016):

- Route 50 Widening from four to six lanes between Route 28 and Route 742 (Poland Road).
- Loudoun County Parkway Extension between Route 842 and Route 772.
- Route 659 Widening from two to four lanes between Route 620 (Braddock Road) and Route 50.
- Dulles Air Cargo, Passenger Metro Access Highway (formerly known as the “Dulles Spur”).

Additional roadway improvements that are expected to be in place between year 2017 and design year 2036 and included in the No-Build Alternative for the design year (2036) are as follows:

- Route 28 widening from six to eight lanes between I-66 and Route 7.
- Route 50 widening from four to six lanes between Route 742 and Route 659 Relocated (Northstar Boulevard).
- Proposed Interchange at Route 50 and Route 606.
- Bi-County Parkway - four lanes on new alignment between I-66 and Route 50.

The level of service (LOS) results and arterial reports for 2036 no-build conditions (prepared as part of the 2013 traffic study) show that most of the side streets, as well as some of the mainline left turns would operate at unacceptable levels during both AM and PM peak hours. The arterial LOS report also indicates that, during the peak periods, several sections on Route 606 would

operate at LOS E or F (Table 2-1). This shows that the existing two-lane section is not sufficient for future demand. Under the No-Build Alternative, existing substandard conditions would remain. As a result, the needed safety improvements and roadway deficiencies would not be addressed, and the existing substandard conditions would remain. This would result in decreased LOS along critical segments and an increase in the degree of traffic safety hazard over time. In addition, the No-Build Alternative would not be consistent with the Loudoun County Comprehensive Plan.

Table 2-1

LOS Results – 2036 No-Build Conditions

ID	Intersection	Control	Movement		2036 No-Build AM		2036 No-Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Evergreen Mills Rd	Signalized	EB	L	D	35.6	F	206.2
				R	A	0.7	A	0.5
				Overall	A	9.5	C	27.4
			NB	L	C	30.9	F	107.9
				T	B	15.9	A	1.7
				Overall	B	18.8	E	62.4
			SB	TR	B	19.3	F	85.1
				Overall	B	19.3	F	85.1
			Intersection Overall		**B**	**17.0**	**E**	**68.6**
2	Arcola Rd	Unsignalized	EB	LR	F	361.7	F	228.0
				Overall	F	361.7	F	228.0
			NB	LT	A	0.0	A	1.0
				Overall	A	0.0	A	1.0
			SB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**1.9**	**A**	**1.0**
3	Pebble Run Pl	Unsignalized	EB	L	F	624.1	F	591.1
				R	C	15.7	F	130.5
				Overall	F	111.8	F	236.8
			NB	L	B	10.2	C	21.2
				T	A	0.0	A	0.0
				Overall	A	0.8	A	1.5
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**4.2**	**A**	**5.7**
4	Bears School Rd	Unsignalized	WB	LR	F	266.5	B	13.7
				Overall	F	266.5	B	13.7
			NB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	L	A	0.0	A	0.0
				T	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**1.2**	**A**	**0.0**

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 2-1 (continued)

LOS Results – 2036 No-Build Conditions - Continued

ID	Intersection	Control	Movement		2036 No-Build AM		2036 No-Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
5	Overland Dr	Signalized	EB	L	F	143.9	F	227.4
				R	D	53.4	E	78.6
				Overall	F	110.8	F	132.5
			NB	L	E	69.4	E	69.6
				T	F	178.9	A	3.4
				Overall	F	174.3	A	7.9
			SB	T	B	12.1	F	196.0
				R	A	7.1	A	5.1
				Overall	B	11.4	F	178.8
			Intersection Overall		**F**	**125.9**	**F**	**132.5**
6	Beaver Meadow Rd	Unsignalized	WB	LR	F	*	F	*
				Overall	F	*	F	*
			NB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	LT	F	830.8	A	0.0
				Overall	F	830.8	A	0.0
			Intersection Overall		**F**	*	**F**	**247.1**
7	Freeport Pl & Trade Center Pkwy	Signalized	EB	LTR	E	78.0	E	70.5
				Overall	E	78.0	E	70.5
			WB	LT	F	156.8	F	252.6
				R	E	72.1	E	67.5
				Overall	F	99.6	F	144.6
			NB	L	A	3.3	D	46.1
				T	F	194.0	A	7.0
				R	A	3.9	A	3.7
				Overall	F	186.4	A	8.9
			SB	L	F	192.6	A	3.6
				T	A	5.4	F	175.5
				R	A	2.9	A	3.8
				Overall	D	39.7	F	167.4
			Intersection Overall		**F**	**137.9**	**F**	**122.0**
8	Stukely Dr & Weather Service Rd	Unsignalized	EB	LTR	F	*	F	1385.6
				Overall	F	*	F	1385.6
			WB	LTR	F	*	F	910.3
				Overall	F	*	F	910.3
			NB	L	A	9.5	C	17.3
				TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.1
			SB	LT	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**F**	**242.6**	**C**	**17.0**

*Inadequate gaps for left turns, so delay considered infinite by HCM/Synchro

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 2-1 (continued)

LOS Results – 2036 No-Build Conditions - Continued

ID	Intersection	Control	Movement		2036 No-Build AM		2036 No-Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
9	Ladbrook Dr	Signalized	EB	L	E	74.3	C	33.3
				R	E	69.3	C	32.3
				Overall	E	72.9	C	32.9
			NB	L	A	1.3	A	0.0
				T	F	168.7	A	6.6
				Overall	F	167.4	A	6.6
			SB	T	A	3.4	A	7.2
				R	A	1.8	A	1.3
				Overall	A	3.3	A	7.1
			Intersection Overall		**F**	**117.6**	**A**	**7.9**
10	Mercure Cir & Thunder Rd	Unsignalized	EB	L	F	846.0	F	*
				R	C	15.4	F	157.3
				Overall	F	252.7	F	3185.5
			WB	LTR	F	236.3	F	*
				Overall	F	236.3	F	*
			NB	L	B	10.2	C	16.0
				TR	A	0.0	A	0.0
				Overall	A	0.4	A	0.1
			SB	L	C	17.4	A	10.0
				T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.3	A	0.0
			Intersection Overall		**A**	**2.7**	**F**	**158.6**
11	Mercure Cir	Signalized	EB	L	F	80.4	F	221.7
				R	E	71.2	E	56.0
				Overall	E	78.6	F	212.3
			NB	L	A	3.4	D	44.5
				T	F	157.9	A	9.7
				Overall	F	157.8	A	9.9
			SB	T	A	6.6	F	217.1
				R	A	2.8	A	5.3
				Overall	A	5.9	F	214.2
			Intersection Overall		**F**	**101.9**	**F**	**148.7**
12	Commerce Center Ct	Unsignalized	EB	LR	F	595.4	F	720.4
				Overall	F	595.4	F	720.4
			NB	L	B	11.3	C	20.4
				T	A	0.0	A	0.0
				Overall	A	0.1	A	0.0
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**3.7**	**B**	**11.0**

Note: Cells highlighted in red reflect unacceptable levels of service.

2.3.2 The Preferred Build Alternative

2.3.2.1 *Description*

The Preferred Build Alternative involves construction along 5.283 miles of Route 606 (Old Ox Road) to provide for the widening the existing two-lane rural roadway to a four-lane divided urban collector with a depressed grass median from Route 621 (Evergreen Mills Road) to Route 267 (Dulles Greenway). The project would transect a developing corridor of both commercial and residential properties, including the planned "Route 606 Metro Station" at the Route 267 interchange. Route 606 presently extends over Horsepen Dam, which is owned by the Metropolitan Washington Airport Authority (MWAA). Utilities presently located within the corridor include overhead and underground telephone lines, power lines, gas lines, fiber, and a major electrical transmission line. Figure 2-1 depicts the layout of the Preferred Build Alternative.

2.3.2.2 *Alternative Concept*

The proposed roadway would differ from the typical section between Route 50 and Route 621 by (1) utilizing a shoulder and ditch design on the outside of the travel lanes and (2) adding shared-use paths on both sides of the road (Figure 2-2). These proposed modifications were requested by Loudoun County and landowners within the corridor to facilitate possible future transit / HOV uses (as currently set forth in the county's Comprehensive Plan). The design speed is 60 mph, and the posted speed limit for the design year would remain at 55 mph. The typical section would utilize a 54-foot-wide median which has been determined to be wide enough to allow for future expansion to a six-lane section.

2.3.2.3 *Cost*

As estimated in January of 2013, costs for the project are $3,692,000 for preliminary engineering, $34,534,954 for right-of-way acquisition, and $106,727,060 for construction (for a total estimated project cost of $144,954,014). These costs are preliminary and will be further refined as the project advances.

2.3.2.4 *Ability to Meet Needs*

With respect to project purpose and project needs (as set forth in Section 1.3 of this EA), reconstruction of Route 606 would:

- improve capacity and reduce congestion by widening the existing two-lane roadway to a four-lane roadway with divided median and signalized intersections; thereby providing acceptable service levels (LOS A-D) for 2036 build-out conditions.
- improve traffic safety by providing signalized intersections, turn lanes, and increased sight distances.
- provide a critical 5.283-mile-long segment of the proposed 18-mile-long Dulles Loop, while allowing for future conversion to a 6-lane limited access facility.
- improve connectivity with the regional multimodal transportation network by improving access to major activity centers around Washington Dulles International Airport, by

providing access to the future Route 606 Metro station, and by providing improved access to the Dulles North Transit Center.

The Preferred Build Alternative would be consistent with local and regional land use plans, including Loudoun County's Comprehensive Plan. The Preferred Build Alternative would also be consistent with the National Capital Region Transportation Plan, Constrained Long Range Transportation Plan (CLRP) for the Washington Metropolitan Area.

Table 2-2

LOS Results – 2036 Build-Out Conditions

ID	Intersection	Control	Movement		2036 Build AM		2036 Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Evergreen Mills Rd	Signalized	EB	L	D	35.6	D	49.7
				R	A	0.7	A	0.5
				Overall	A	9.5	A	7.0
			NB	L	C	30.9	D	49.1
				T	B	15.9	A	3.0
				Overall	B	18.8	C	29.4
			SB	T	B	15.7	D	44.9
				R	B	13.5	B	17.8
				Overall	B	15.5	D	43.7
			Intersection Overall		**B**	**16.3**	**C**	**33.2**
2	Arcola Rd	Unsignalized	EB	LR	C	20.0	E	41.8
				Overall	C	20.0	E	41.8
			NB	L	A	0.0	C	19.4
				T	A	0.0	A	0.0
				Overall	A	0.0	A	0.1
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.1**	**A**	**0.2**
3	Pebble Run Pl	Unsignalized	EB	L	D	27.3	F	57.2
				R	B	11.6	C	24.4
				Overall	B	14.1	D	32.0
			NB	L	B	10.2	C	21.4
				T	A	0.0	A	0.0
				Overall	A	0.8	A	1.5
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**1.0**	**A**	**1.1**

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 2-2 (continued)

LOS Results – 2036 Build-Out Conditions - Continued

ID	Intersection	Control	Movement		2036 Build AM		2036 Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
4	Bears School Rd	Unsignalized	WB	LR	C	19.3	B	10.8
				Overall	C	19.3	B	10.8
			NB	TR	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	T	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.1**	**A**	**0.0**
5	Overland Dr	Signalized	EB	L	D	42.5	D	43.2
				R	C	29.3	C	34.7
				Overall	D	37.7	D	37.8
			NB	L	A	5.1	B	13.8
				T	B	13.3	A	4.2
				Overall	B	12.9	A	4.8
			SB	T	B	12.1	C	24.3
				R	A	9.7	A	7.8
				Overall	B	11.7	C	22.8
			Intersection Overall		**B**	**15.1**	**C**	**20.1**
6	Beaver Meadow Rd	Unsignalized	WB	LR	D	25.7	C	19.5
				Overall	D	25.7	C	19.5
			NB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			SB	L	C	16.7	A	9.3
				T	A	0.0	A	0.0
				Overall	A	0.3	A	0.0
			Intersection Overall		**A**	**0.4**	**A**	**0.5**
7	Freeport Pl & Trade Center Pkwy	Signalized	EB	LTR	D	39.9	D	35.0
				Overall	D	39.9	D	35.0
			WB	LT	D	41.5	D	46.1
				R	D	39.1	C	34.6
				Overall	D	39.9	D	39.4
			NB	L	A	7.4	B	11.9
				T	C	31.3	A	8.5
				R	A	8.2	A	6.5
				Overall	C	30.4	A	8.6
			SB	L	D	41.3	A	5.3
				T	A	6.2	C	20.4
				R	A	4.8	A	6.7
				Overall	B	14.6	B	19.6
			Intersection Overall		**C**	**26.5**	**B**	**18.5**

Note: Cells highlighted in red reflect unacceptable levels of service.

Table 2-2 (continued)

LOS Results – 2036 Build-Out Conditions - Continued

ID	Intersection	Control	Movement		2036 Build AM		2036 Build PM	
					LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
8	Stukely Dr & Weather Service Rd	Unsignalized	EB	R	B	11.8	C	20.5
				Overall	B	11.8	C	20.5
			WB	R	B	12.5	A	9.9
				Overall	B	12.5	A	9.9
			NB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.4
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.3**	**A**	**0.2**
9	Ladbrook Dr	Signalized	EB	L	C	30.0	D	38.1
				R	C	29.5	D	36.0
				Overall	C	29.8	D	37.1
			NB	L	A	3.0	B	10.4
				T	A	9.4	A	3.3
				Overall	A	9.4	A	3.4
			SB	T	A	7.0	B	14.8
				R	A	3.7	A	2.8
				Overall	A	6.8	B	14.7
			Intersection Overall		**A**	**8.8**	**B**	**11.9**
10	Mercure Cir & Thunder Rd	Unsignalized	EB	L	D	29.8	F	96.7
				R	B	11.4	C	24.3
				Overall	C	16.6	E	46.5
			WB	LTR	E	38.4	C	19.7
				Overall	E	38.4	C	19.7
			NB	L	B	10.3	C	16.2
				T	A	0.0	A	0.0
				TR	A	0.0	A	0.0
				Overall	A	0.4	A	0.1
			SB	L	C	17.5	B	10.0
				T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.3	A	0.0
			Intersection Overall		**A**	**0.6**	**A**	**2.1**

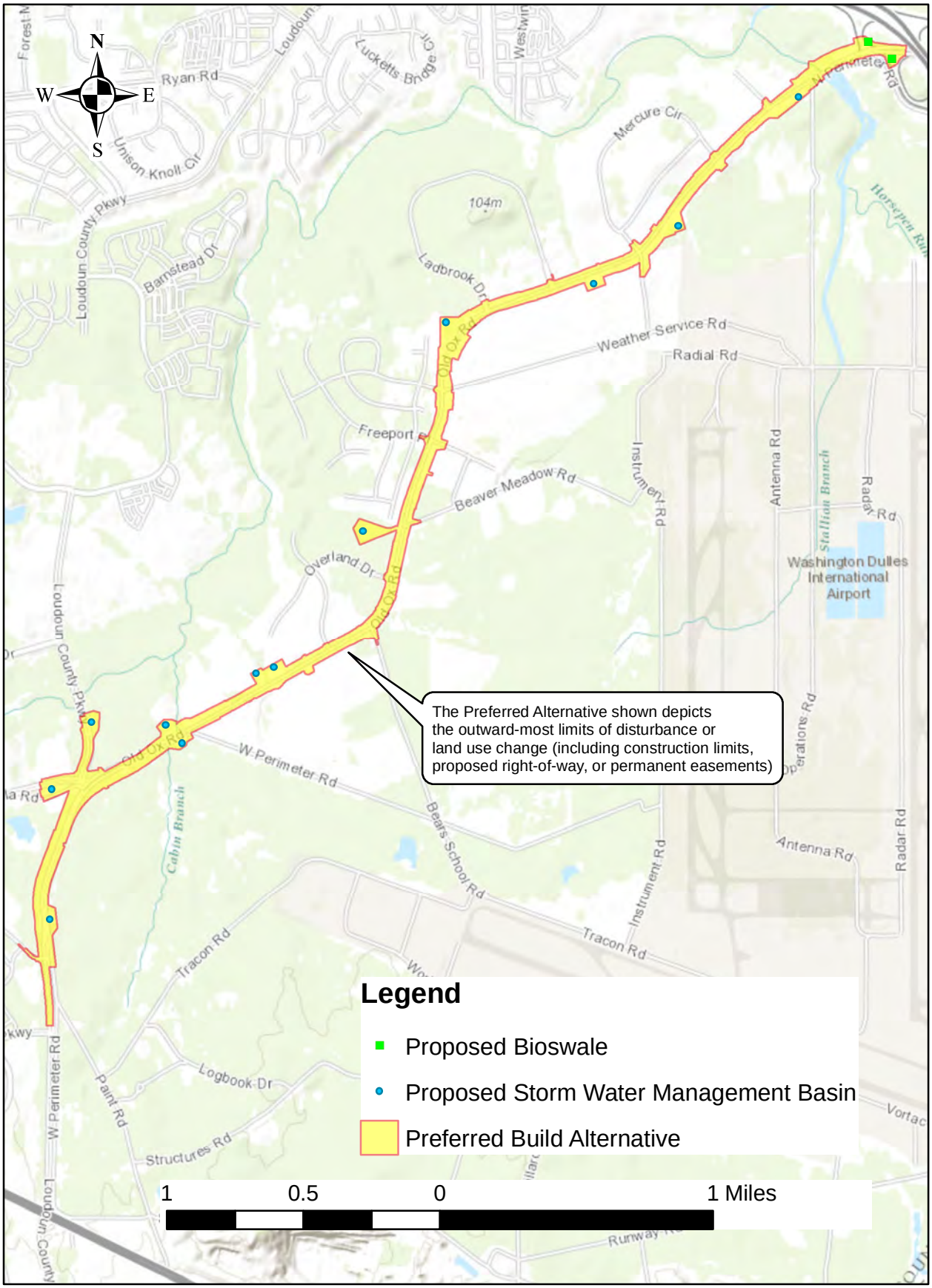
Note: Cells highlighted in red reflect unacceptable levels of service.

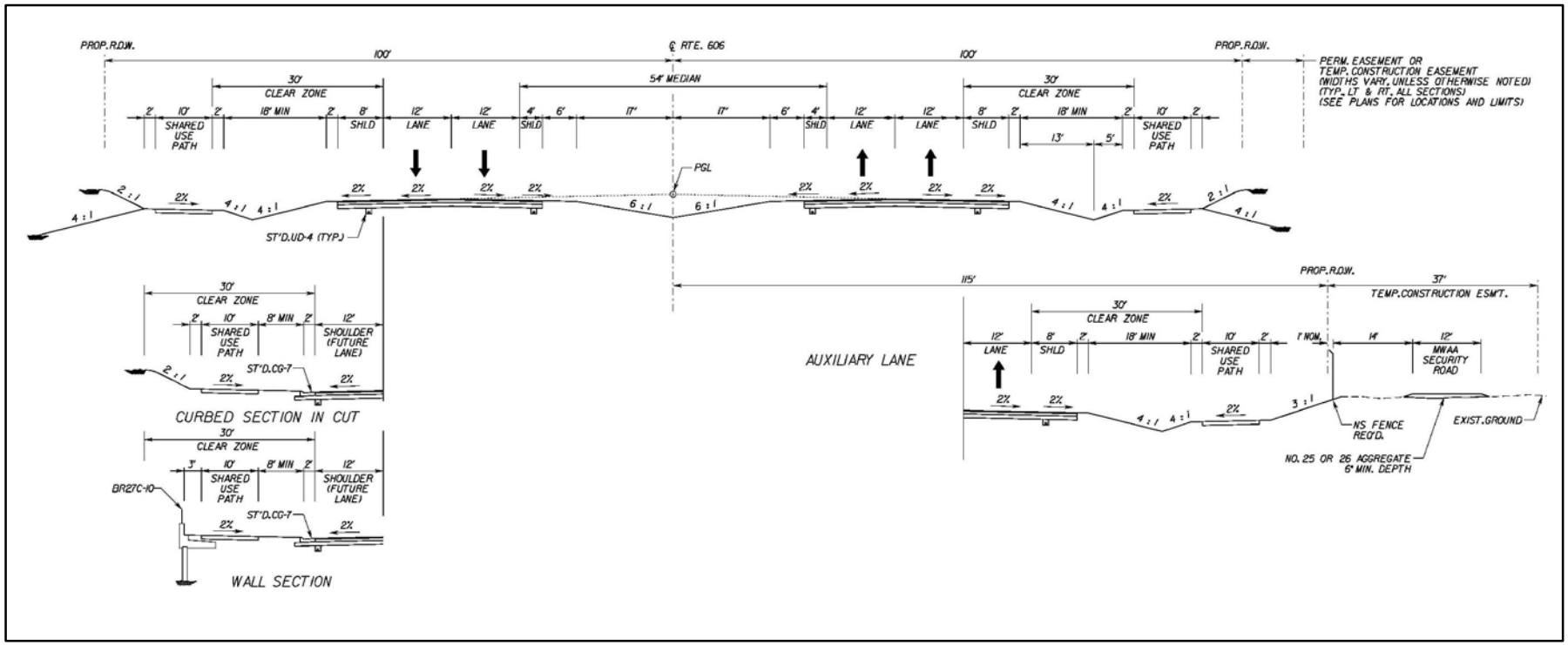
Table 2-2 (continued)

LOS Results – 2036 Build-Out Conditions - Continued

ID	Table 12: 2036 Build-Out Conditions				2036 Build AM		2036 Build PM	
	Intersection	Control	Movement		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
11	Mercure Cir	Signalized	EB	L	C	33.1	C	34.4
				LR	C	33.1	C	34.4
				Overall	C	33.1	C	34.4
			NB	L	A	2.6	B	12.4
				T	A	7.8	A	5.6
				Overall	A	7.8	A	5.6
			SB	T	A	6.9	C	24.5
				R	A	5.3	A	6.8
				Overall	A	6.6	C	24.3
			Intersection Overall		**A**	**7.6**	**B**	**19.2**
12	Commerce Center Ct	Unsignalized	EB	L	C	22.9	E	35.5
				R	C	22.9	E	35.5
				Overall	C	22.9	E	35.5
			NB	L	B	11.5	C	22.5
				T	A	0.0	A	0.0
				Overall	A	0.1	A	0.0
			SB	T	A	0.0	A	0.0
				R	A	0.0	A	0.0
				Overall	A	0.0	A	0.0
			Intersection Overall		**A**	**0.2**	**A**	**0.6**

Note: Cells highlighted in red reflect unacceptable levels of service.


N
W
E
S
Ryan Rd
Unison Knoll Cir
Loudoun County Pkwy
Barnstead Dr
Cuckells Bridge Cir
Westwind Dr
Mercure Cir
104m
Ladbrook Dr
Old Ox Rd
Weather Service Rd
Radial Rd
Freeport Cir
Beaver Meadow Rd
Instrument Rd
Antenna Rd
Radar Rd
Stallion Branch
Washington Dulles International Airport
Overland Dr
Old Ox Rd
Loudoun County Pkwy
W Perimeter Rd
Cabin Branch
Bears School Rd
Tracon Rd
Logbook Dr
Paint Rd
Structures Rd
Runway
Horsepen Run
Vortac
The Preferred Alternative shown depicts the outward-most limits of disturbance or land use change (including construction limits, proposed right-of-way, or permanent easements)
Legend
Proposed Bioswale
Proposed Storm Water Management Basin
Preferred Build Alternative
1
0.5
0
1 Miles



Environmental Assessment *Figure 2-2: Typical Section* *Route 606 Reconstruction Project*

3. ENVIRONMENTAL CONSEQUENCES

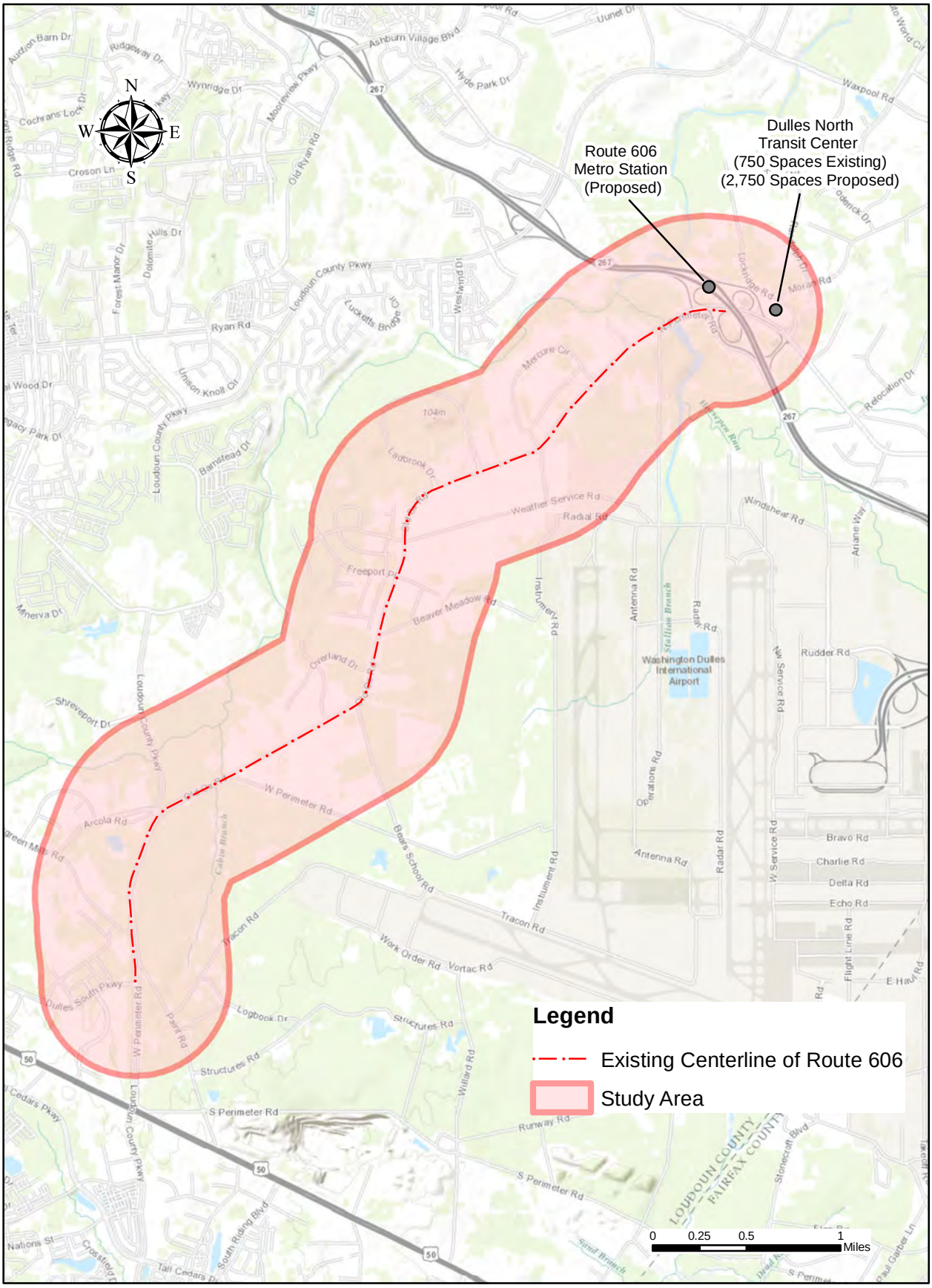
3.1 Overview of Existing Conditions and Environmental Issues

Except for the assessment of cultural resources, impacts to environmental resources were assessed within an area extending one-half-mile each direction from the existing 5.283-mile-long centerline of Route 606 for a total area of 2,324 acres (hereinafter referred to as the "study area") (Figure 3-1). As discussed in section 3.2.18, a direct effects Area of Potential Effects (APE) and an indirect effects APE were developed and applied to address issues specific to cultural resources in the vicinity of the project.

TABLE 3-1: Environmental Issues Associated with Existing Conditions

Resource or Issue	Existing Conditions
Land Use and Socioeconomics	The study area consists of forest lands & fallow fields interspersed amongst commercial & general industrial developed lands (see Section 3.2.1). Two residential areas fall within the study area – an unnamed community near the southern end of the project (next to Rt. 621) & Loudoun Valley Estates III (between Overland Dr. several hundred feet east of Stukely Dr.). Rt. 606 is within a transportation corridor crucial to economy derived from & associated with adjacent Washington Dulles International Airport.
Right-of-Way	VDOT owns right-of-way along the length of the project corridor. The density of development abutting VDOT right-of-way ranges from low to moderately high (see Section 3.2.2). Substantial portions of the Rt. 606 corridor are located within easements administered by MWAA.
Environmental Justice	No minority or low income populations are located within the study area (see Section 3.2.3).
Parks and Recreation	No public recreation areas located within the study area (see Section 3.2.4).
Water Resources / Water Quality	No portion of the study area is located within a watershed for a public water supply or in proximity to a water supply intake. No water supply wells located within or near the study area. No impaired waters are located within or near the study area (see Section 3.2.5).
Floodplains and Floodways	100-year floodplains along Horsepen Run, Stallion Creek, & Broad Run are located within portions of the study area. No regulated floodways are located within the study area (see Section 3.2.6).
Waters of the U.S., including Wetlands	Approx. 225,495 linear feet (47.6 miles) of streams located within the study area (see Section 3.2.7). Approx. 12.06 acres of mixed palustrine wetlands & 5.63 acres of palustrine open water bodies located within the study area.
Water Quality Permits	A State Programmatic General Permit issued by the U.S. Army Corps of Engineers, a Virginia Water Protection Permit issued by the Virginia Department of Environmental Quality, and a subaqueous lands permit from the Virginia Marine Resources Commission will be required prior to work in wetlands or jurisdictional streams (see Section 3.2.8).
Coastal Resources	No portions of Loudoun County are located within the Virginia Coastal Zone. No coastal resources are located with the study area (see Section 3.2.9).
Wild and Scenic	No National wild and scenic rivers or Virginia scenic rivers are located within

Rivers	the study area (see Section 3.2.10).
Agricultural and Forestal Districts	No agricultural/forestal districts are present within or in the vicinity of the study area (see Section 3.2.11).
Forest Lands	Approximately 1,997 acres (52%) of the study area is comprised of mixed evergreen/deciduous & deciduous forests typical to the region (see Section 3.2.12).
Prime Farmland Soils	Approximately 2,324 acres (60%) of the study area is underlain by soils mapped as prime farmland soils by USDA. Soil units adjoining Rt. 606 fall within an urbanized transportation corridor see Section 3.2.13).
Threatened and Endangered Species	No federally listed threatened or endangered species reported within 2-mile radius of study area. USFWS database accessed for Information, Planning, and Conservation System (IPaC) review indicates there is no potential habitat for federally protected species within the study area (see Section 3.2.14).
Invasive Species	Plant species listed on the Virginia Department of Conservation and Recreation list of "Invasive Alien Plant Species of Virginia" occur within the study area (see Section 3.2.15).
Pedestrian and Bicycle Considerations	No contiguous or formally designated pedestrian paths or bicycle facilities presently exist along Rt. 606. Loudoun County Bicycle & Pedestrian Mobility Master Plan identifies a planned shared-use path around proposed Dulles Loop, including portion of Rt. 606 within study area (see Section 3.2.16).
Hazardous Materials	No properties documented to contain or suspected of containing hazardous substances are known to exist within the study area (see Section 3.2.17).
Air Quality	The study area is located within a Moderate Ozone Nonattainment area, a Fine Particulate Matter (PM2.5) Nonattainment area, a volatile organic compounds (VOC) and oxides of nitrogen (NOx) Emissions Control Area (see Section 3.2.18).
Noise	Developed portions of the study area consist mainly of mixed office complexes & warehouse facilities that are not included in the noise analysis due to their lack of outdoor use areas. Sixteen noise sensitive land uses in the project area are residential; one is a playground. Four noise sensitive sites were modeled (representing the 17 receptors). Existing year noise levels range from 55 to 69 dBA (see Section 3.2.19).
Light Emissions and Visual Setting	The visual setting along the Rt. 606 corridor is typical of a developed corridor of Northern Virginia region and is characterized by fragmented forest stands and fallow fields interspersed amongst commercial and general industrial developed properties. Outdoor lighting is present within parking areas and campuses of commercial and general industrial developments lining the corridor (see Section 3.2.20).
Cultural Resources	No historic architectural properties eligible for listing on the National Register (NR) are located within the Area of Potential Effect (APE). The historic core of Dulles Airport is NR-eligible historic district; however, boundary of district is over 1 mile from APE. Several archaeological sites span boundary of APE; however, DHR concurred that no portions of the sites located within the APE are eligible for listing on the NR (see Section 3.2.21).
Section 4(f) Properties	No public recreational properties subject to Section 4(f) of Department of Transportation Act located within study area. Historic properties subject to Section 4(f) of Department of Transportation Act identified in Section 3.2.19.



Environmental Assessment *Figure 3-1: Project Study Area* *Route 606 Reconstruction Project*

TABLE 3-2: Summary of Impacts

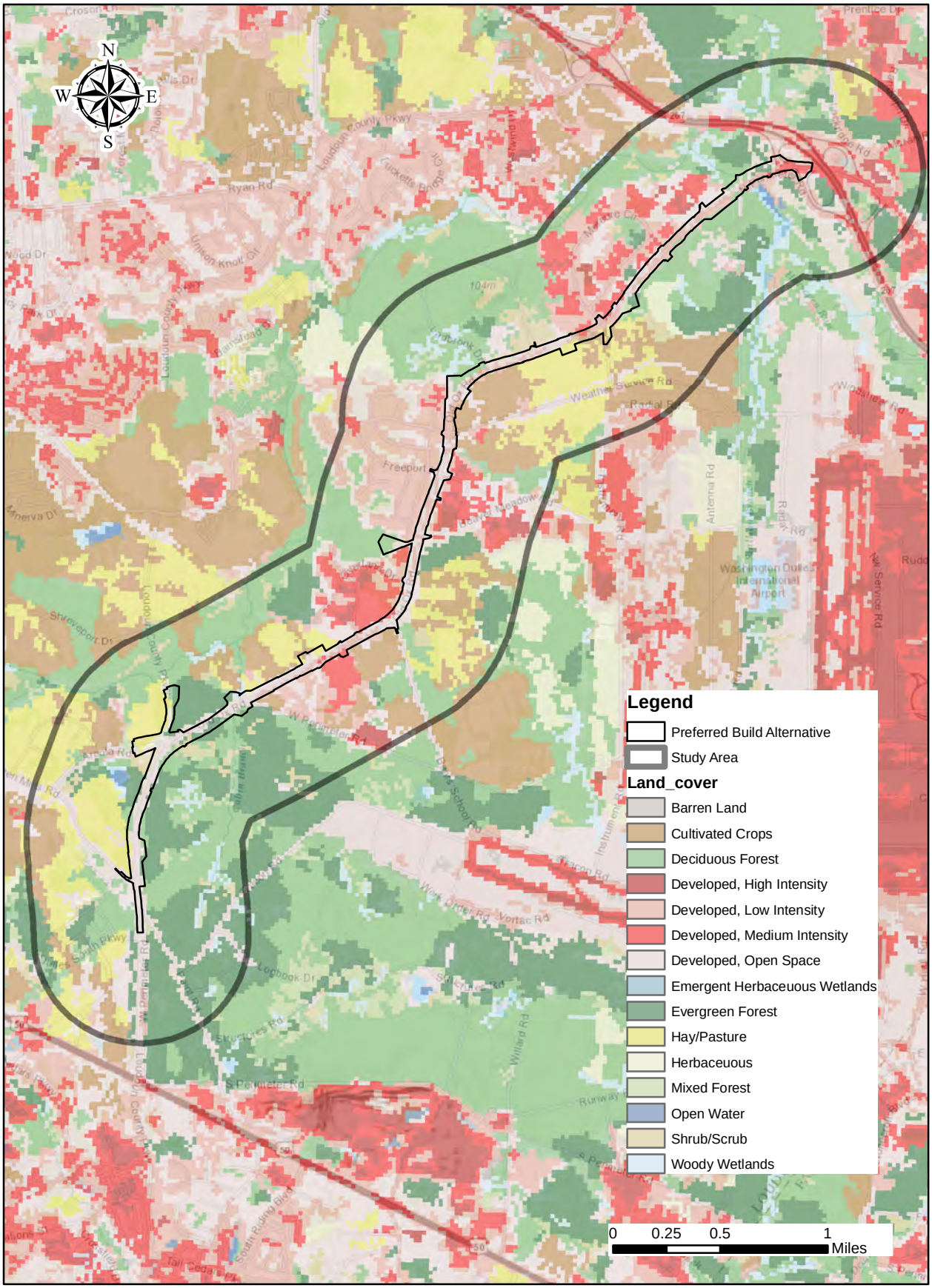
Environmental Resource or Area of Concern	Impact
Right-of-Way Acquisition (acres)	45
Owner Families Displaced*	0
Tenant Families Displaced*	0
Businesses Displaced*	0
Schools Displaced*	0
Non-Profit Organizations Displaced (tenant)*	0
Other Community Facilities Affected	0
Minority or Low Income Populations Disproportionately Affected	0
Section 4(f) Properties Used (acres)	0
Wetlands Affected (acres)	4.86
Streams Affected (linear feet)	7,577
Coastal Zone Resources	0
Wild and Scenic Rivers	0
Threatened and Endangered Species	0
Cultural Resources Adversely Affected	0
Forest Lands Affected (acres)	107.9
Prime Farmland Soils Affected (acres)	72.0
Farmlands Displaced (acres)	0
Impacted Noise Sensitive Receptors	17
Light Emissions and Visual Impacts	No street lighting; minor visual effects
Hazardous Materials Sites Affected	0

*The acquisition of property and the relocation of residents, businesses, farms, and non-profit organizations will be conducted in accordance with all applicable Federal laws, regulations and requirements, including but not limited to, 23 CFR Part 710, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and its implementing regulations found in 49 CFR Part 24. All persons displaced on Federally-assisted projects will be treated fairly, consistently, and equitably so that they do not suffer disproportionate injuries as a result of projects that are designed for the benefit of the public as a whole. Relocation resources will be available to all residential and business relocatees without discrimination.

3.2 Further Discussion of Environmental Consequences

3.2.1 Land Use & Socioeconomics

The area immediately surrounding the Route 606 study area is largely a mosaic of forest lands and fallow fields interspersed among commercial and general industrial developed lands ranging from low to high density (Figure 3-2). Areas along the existing corridor are predominantly developed. Two residential communities are present within the study area – an unnamed community located near southern end of the project corridor (along Evergreen Mill Road (Rt. 621)) and the Loudoun Valley Estates III community located in the central portion of the corridor (between Overland Drive and several hundred feet north of Stukely Drive).



Environmental Assessment *Figure 3-2: Regional Land Use* *Route 606 Reconstruction Project*

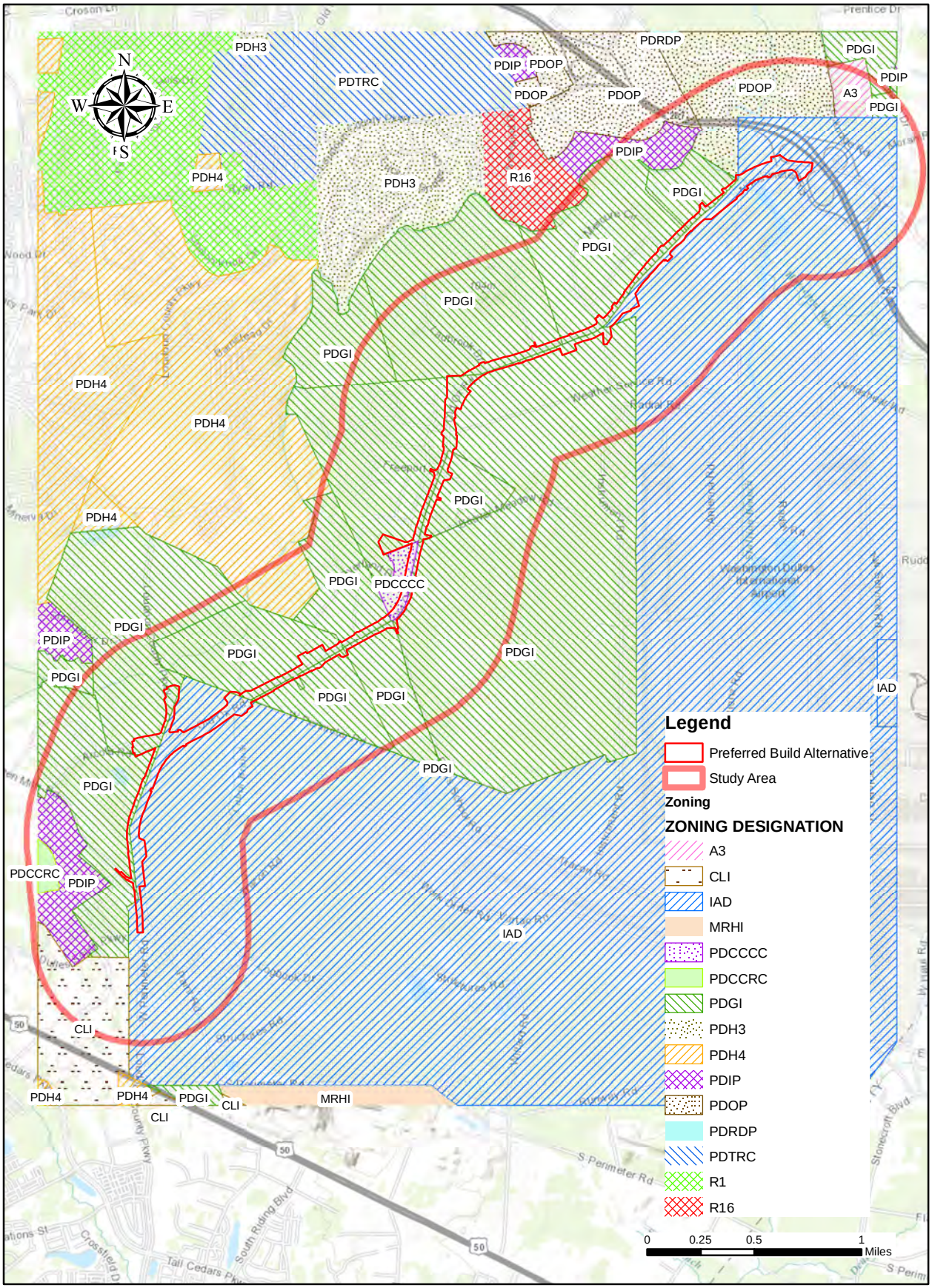
Hay production is associated with several parcels in the central portion of the corridor (along Weather Service Road). No community or public facilities are located within the study area (Loudoun County Department of Planning, 2013). The more intensely developed residential portions of the region occur northwest of and south of the study area. Dulles International Airport property abuts the southeastern side of Route 606 near the southern terminus and the northern terminus of the project. The project is located within a transportation corridor that is crucial to the economy derived from and associated with adjacent Washington Dulles International Airport.

According to the Virginia Outdoors Foundation (VOF), no VOF-designated open space easements are located in or near the project study area. Temporary construction easements may be required within small portions of a county-designated open space surrounding the Loudoun Valley Estates III subdivision.

Southeast of Route 606 the northern and southern portions of the study area are zoned "Washington-Dulles International Airport" (IAD). The remainder of parcels adjoining Route 606 are zoned "Planned Development-General Industrial" (PDGI) (Figure 3-3). The Preferred Build Alternative would be consistent with local and regional land use plans, including Loudoun County's Comprehensive Plan. The Preferred Build Alternative would also be consistent with the National Capital Region Transportation Plan, Constrained Long Range Transportation Plan (CLRP) for the Washington Metropolitan Area.

Loudoun County is currently the fastest growing county in Virginia (U.S. Census Bureau, 2010), with the population projected to grow by an additional 30 percent by year 2020 (Loudoun County Department of Planning, 2011). County statistics indicate that at-place employment has returned to and slightly surpassed pre-recession employment levels of 2009. Recent Loudoun County data indicates that employment within the county is at an all-time high of more than 134,000 (Loudoun County, Department of Management and Financial Services, 2011). This reflects a 3 percent increase over the previous year.

The project corridor adjoins Washington Dulles International Airport which the Commonwealth has identified as being a critical part of the state's marketing strategy to attract industry to the Northern Virginia area. Improving access to major activity centers around Washington Dulles International Airport for passengers and freight from the west and south has been given high priority by the Commonwealth. To help address current and projected conditions, transportation facilities and improvements are being planned to support Loudoun County's Dulles Airport Commercial/Industrial base (such as the Route 606 segment of the Dulles Loop). Because of the opportunity for the airport to be a major factor in the movement of air freight, the ability of trucks to get into and out of the airport will be greatly facilitated by the upgrading of Route 606 and the Dulles Air Cargo Highway project (currently under development). In consideration of these goals and priorities, transportation improvements provided by this project would have a beneficial socioeconomic effect on the local, regional, and statewide economy.



Environmental Assessment *Figure 3-3: Zoning* *Route 606 Reconstruction Project*

3.2.2 Right-of-Way / Relocations

The Preferred Build Alternative would require acquisition of approximately 45 acres of right-of-way. In addition, approximately 67 acres of permanent easement (primarily for storm water management basins) and 24 acres of temporary easement would be required. In addition to acquisition, 55.02 acres of permanent easement and 7.03 acres of temporary easement would be required on Dulles International Airport/MWAA property, while 11.54 acres of permanent easement and 3.82 acres of temporary easement would be required on NOAA property. No displacements or relocations would be required.

3.2.3 Environmental Justice

The study area is located almost entirely within US Census Block Group 511076118001 (Figure 3-4). A reported 4.2 percent of the population within this block group is considered low-income (compared to 4.3 percent for the entire county), while a reported 14 percent of the population within this block group are minority (compared to 31 percent for the entire county) (U.S. Census Bureau, 2010 Census; U.S. Census Bureau, 2007-2011 American Community Survey Five-Year Estimates). No minority or low-income populations have been identified within the study area (Loudoun County Department of Planning, 2013) that would be adversely affected by the Preferred Build Alternative; therefore, in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23, the proposed project is not anticipated to cause disproportionately high and adverse effects on minority population. VDOT will ensure meaningful opportunities to participate by conducting all required public outreach to give minority or low-income populations the opportunity to comment on the project.

3.2.4 Parks and Recreation

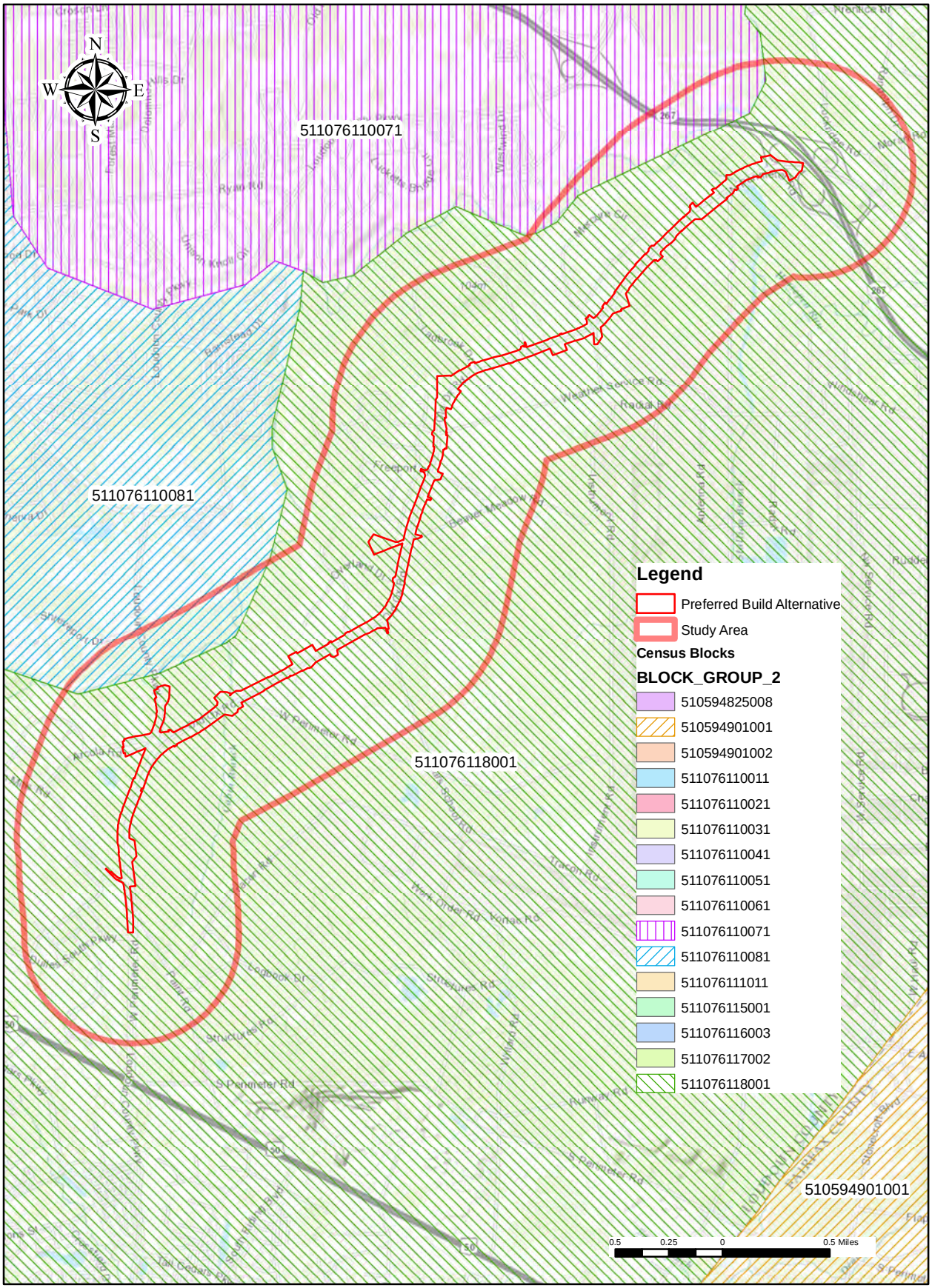
No public parks or recreation areas are located within proposed construction limits or within areas on potential indirect effects. No waterfowl or wildlife refuges would be affected. No Virginia natural heritage resources would be affected. No Virginia Outdoors Foundation (VOF) open space easements would be affected.

3.2.5 Water Resources and Water Quality

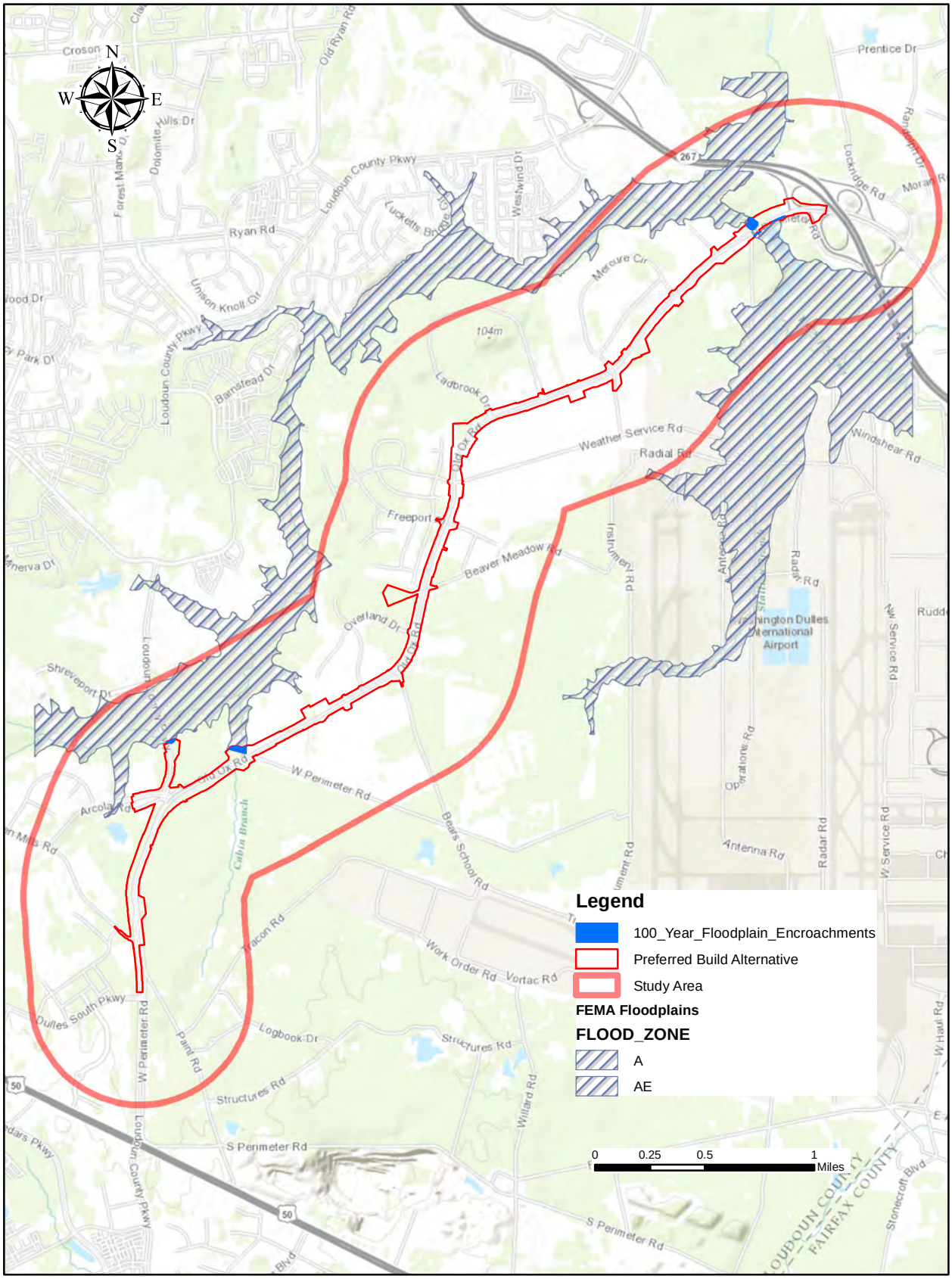
No public water supplies would be affected. No water supply wells would be affected.

3.2.6 Floodplains and Floodways

The 100-year floodplain along Horsepen Run is located within the northern portion of the study area (Figure 3-5). The 100-year floodplain along Stallion Creek parallels the southeastern boundary of the study area. The 100-year floodplain along Broad Run Creek parallels the northwestern boundary of the study area. No regulated floodways are located within the study area. Construction of the Preferred Build Alternative will encroach into approximately 1.3 acres of the 100-year floodplain along Horsepen Run and approximately 0.8 acre of the 100-year floodplain along Broad Run.



Environmental Assessment *Figure 3-4: Census Block Groups* *Route 606 Reconstruction Project*



Environmental Assessment *Figure 3-5: 100-Year Floodplains* *Route 606 Reconstruction Project*

As the project design advances, impacts to these floodplains will be avoided, if practicable, or encroachments minimized and mitigated to the extent that no net increase in base flood levels will occur. No regulated floodways would be affected.

3.2.7 Waters of the U.S., including Wetlands

Approximately 225,495 linear feet (47.6 miles) of streams are located within the project study area (Figure 3-6). The Preferred Build Alternative would impact 7,577 linear feet (1.4 miles) of streams. Streams potentially affected by the Preferred Build Alternative comprise less than 3.0 percent of all streams present with the study area. As the project design advances, streams will be avoided, if practicable, or modifications minimized and mitigated to the extent that no net loss in stream functions and/or values will occur. Approximately 12.06 acres of palustrine wetlands and 5.63 acres of palustrine open water bodies are located within the project study area (Figure 3-6). The Preferred Build Alternative would impact 3.46 acres of palustrine emergent wetlands, 0.22 acre of palustrine scrub-shrub wetlands, and 1.18 acre of palustrine forested wetland. The Preferred Build Alternative would impact 0.82 acres of palustrine open water bodies.

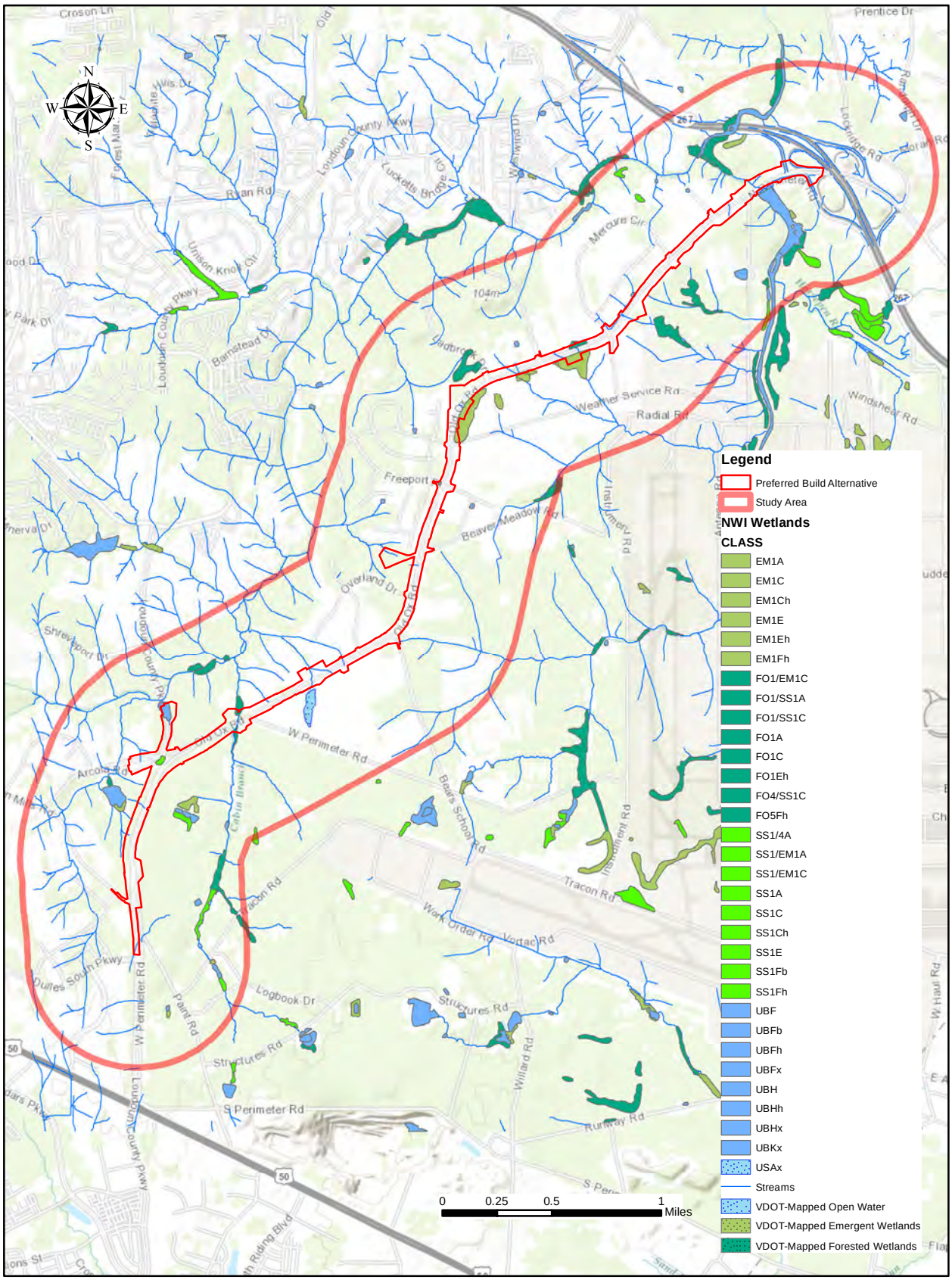
Wetlands potentially affected by the Preferred Build Alternative total approximately 4.86 acres (or approximately 40 percent of all wetlands present with the study area). Open water bodies potentially affected by the Preferred Build Alternative total approximately 0.82 acre (or approximately 15 percent of all open water bodies present with the study area). As the project design advances, the discharge of dredged or fill material into wetlands will be avoided, if practicable, or minimized and mitigated to the extent that no net loss in wetlands will occur.

3.2.8 Water Quality Permits

A State Programmatic General Permit issued by the U.S. Army Corps of Engineers, a Virginia Water Protection Permit issued by the Virginia Department of Environmental Quality, and a subaqueous lands permit from the Virginia Marine Resources Commission will be required for impacts to wetlands and streams that are deemed to be practicably unavoidable during final design phases. Wetland mitigation plans and stream restoration plans will be submitted for agency review and approval as part of the permit application process. Any mitigation required would occur prior to or concurrent with the construction activity under which mitigation is required.

3.2.9 Coastal Resources

In accordance with the Coastal Zone Management Act of 1972, the Commonwealth established the Virginia Coastal Zone Management (CZM) Program, through an Executive Order in 1986, which administers enforceable laws, regulations, and policies regarding coastal resources. The study area is not located within this designated Coastal Zone Management Area; therefore, a Coastal Zone Consistency Determination was not required. The study area is largely upland in nature, and those wetlands and streams present are classified as palustrine and riverine, respectively. No coastal resources would be affected by the proposed project.



Environmental Assessment *Figure 3-6: Waters of the U.S., Including Wetlands* *Route 606 Reconstruction Project*

3.2.10 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Virginia Scenic Rivers Program was developed to identify, designate, and help protect rivers and streams that possess outstanding scenic, recreational, historic, and natural characteristics of statewide significance. No waterways listed on the National Inventory of Wild and Scenic Rivers or the Virginia Inventory of Scenic Rivers are located within the study area.

3.2.11 Agricultural / Forestal Districts

No Agricultural / Forestal Districts are currently designated within the project study area or surrounding areas. No Agricultural / Forestal Districts would be affected.

3.2.12 Forest Lands

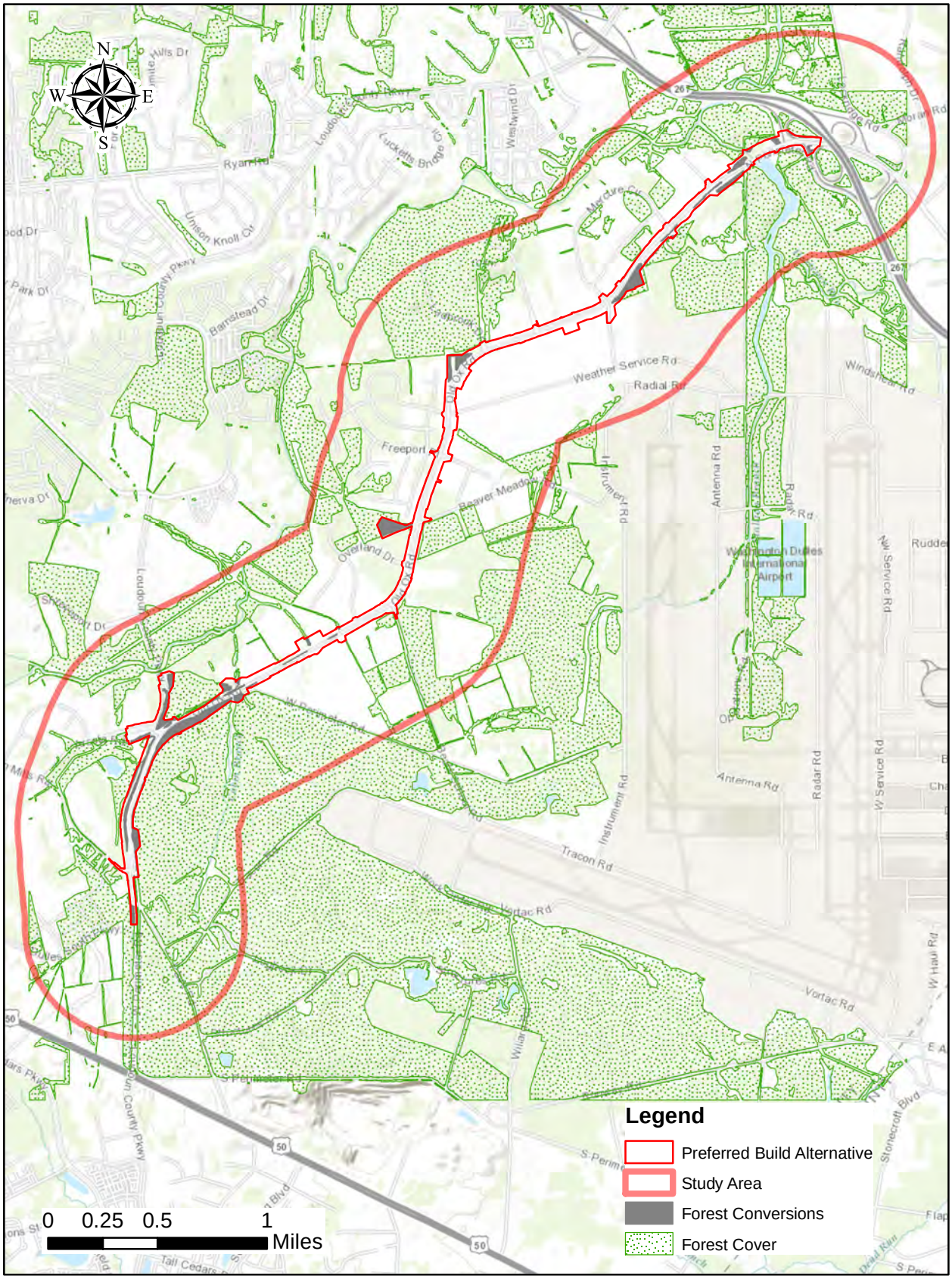
Approximately 1,997 acres (or 52 percent) of the study area (including 5.1 acres presently designated as VDOT right-of-way) is comprised of mixed evergreen/ deciduous and deciduous forest stands typical to the region. Approximately 107.9 acres of forest cover located outside of existing right-of-way would be affected by the Preferred Build Alternative (Figure 3-7). The 107.9 acres of forest cover that would be affected by construction of the Preferred Build Alternative comprises 5.4 percent of the total 1,997 acres mapped within the study area and, as such, impacts would be minor.

3.2.13 Prime Farmland Soils

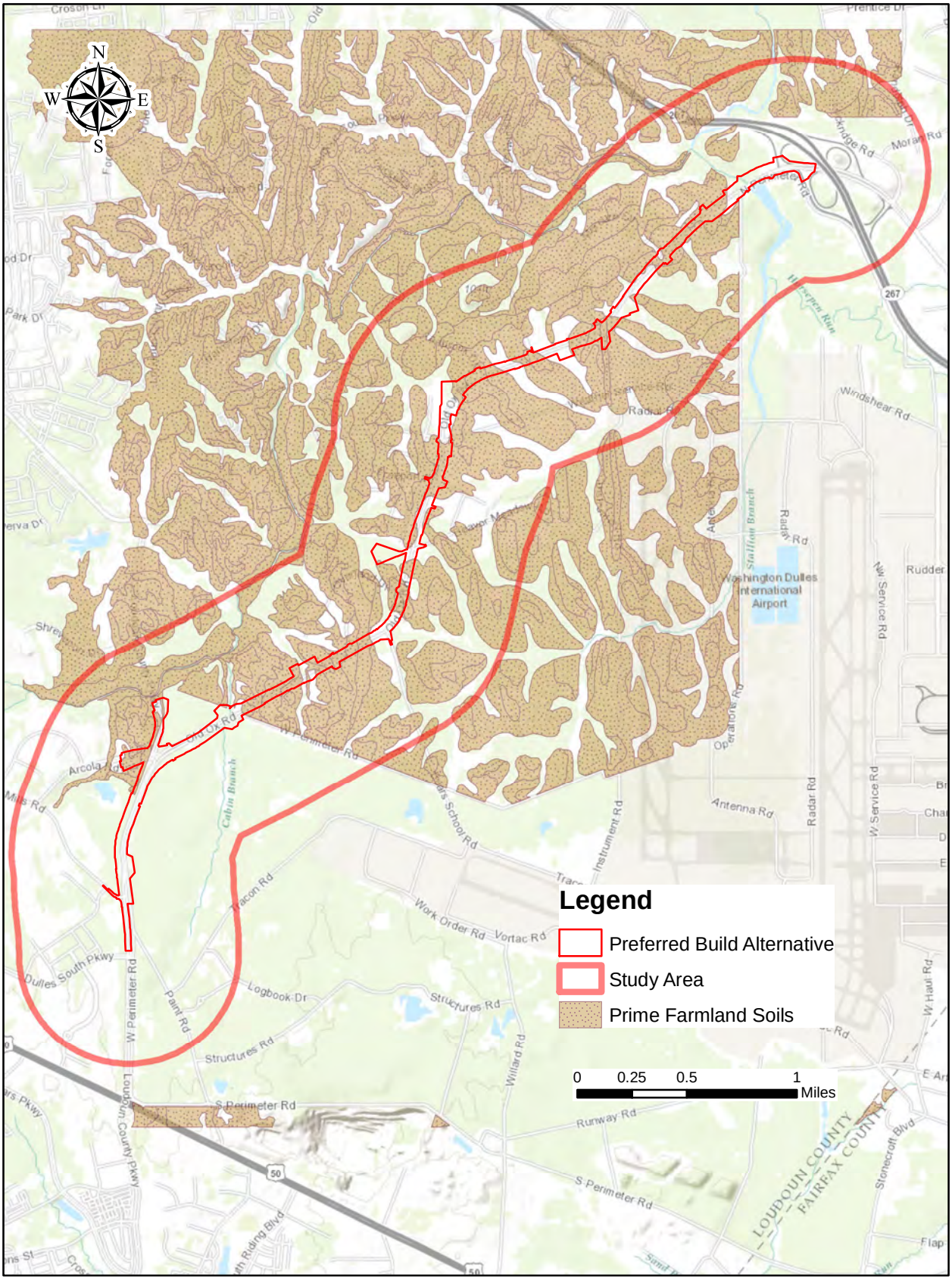
Approximately 2,324 acres (or 60 percent) of the study area (including 45 acres presently designated as VDOT right-of-way) is underlain by soils mapped as prime farmland soils by USDA. Of the total 117 acres of prime farmland soils affected by the project, 72 acres are located outside of existing right-of-way (Figure 3-8). The 72 acres of prime farmland soils that would be newly affected by construction of the Preferred Build Alternative comprises 3.1 percent of the total 2,324 acres mapped within the study area and, as such, impacts would be minor. Also considering that these 72 acres of prime farmland soils are located within a county-planned urbanized transportation corridor and are not zoned agricultural, they are not considered to be contributors to potential prime farmlands (see NRCS form CPA-106 in Appendix I).

3.2.14 Threatened and Endangered Species

Section 7 of the Endangered Species Act outlines consultation procedures for federal interagency cooperation to conserve federally listed species and designated critical habitats. VDOT initiated coordination with the U.S. Fish and Wildlife Service (USFWS) to determine whether Section 7 Consultation is required. The USFWS database accessed for Information, Planning, and Conservation System (IPaC) review indicates that there is no potential habitat for federally protected species to be found within the project area.



Environmental Assessment *Figure 3-7: Forest Cover* *Route 606 Reconstruction Project*



Environmental Assessment *Figure 3-8: Prime Farmland Soils* *Route 606 Reconstruction Project*

VDOT concluded that the project study area does not contain suitable habitat to support protected species and made a "No Effect" determination under Section 7. USFWS concurred with this determination on May 24, 2013. Additionally, no state listed species are reported in the project study area.

3.2.15 Invasive Species

Plant species listed on Virginia Department of Conservation and Recreation's list of "Invasive Alien Plant Species of Virginia" have been observed within proposed construction limits and adjoining areas. The potential exists for the project to contribute to the further establishment of invasive species. To minimize this potential, all seeds used will be tested in accordance with the Virginia Seed Law to ensure there are no noxious weed seeds present within seed mixes.

3.2.16 Pedestrian and Bicycle Considerations

The 2003 Loudoun County Bicycle and Pedestrian Mobility Master Plan identifies a planned shared-use path around the perimeter of the proposed Dulles Loop, including the portion of Route 606 within the study area. As part of the Preferred Build Alternative, 10-foot-wide shared-use paths would be provided along both sides of the improved Route 606.

3.2.17 Hazardous Materials

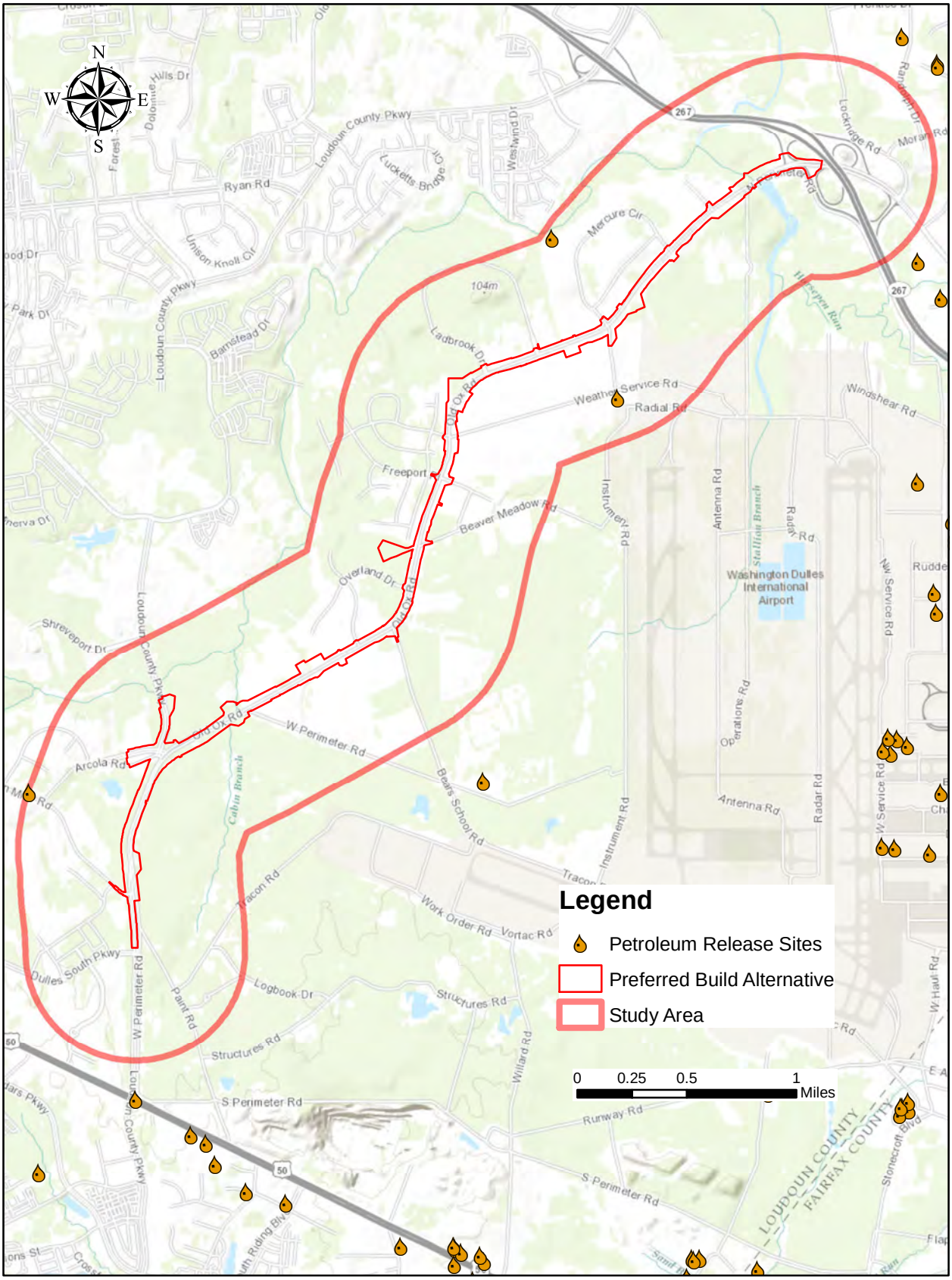
No hazardous materials sites or underground storage tanks are reported or anticipated within potentially affected areas (Figure 3-9).

3.2.18 Air Quality

The Route 606 corridor is located within a Carbon Monoxide Attainment Area, a Moderate Ozone Nonattainment Area, a Fine Particulate Matter (PM2.5) Nonattainment Area, and a volatile organic compounds (VOC) and oxides of nitrogen (NOx) Emissions Control Area. The Route 606 Reconstruction Project is included in the conformity analysis for the FY10-FY16 TIP and 2010 LRP which received federal approval on February 9, 2011.

An Air Report[1] was completed for the project in January 2013 (see Appendix II). The report concludes that the design year 24-hour forecasted traffic does not exceed the thresholds contained in VDOT's Project-Level Carbon Monoxide Air Quality Studies Agreement with FHWA dated February 27, 2009, and therefore does not require a project-level CO air quality analysis. Although the project is located within an 8-hour Ozone Nonattainment Area, the scope and concept of the project is consistent with what was modeled in the conformity analysis of the 11-16 TIP and 2010 LRP. The Clean Air Act and 40 CFR 93.116 requirements were met without a PM2.5 hot-spot analysis, since this project has been found not to be of air quality concern under 40 CFR93.123(b)(1). All reasonable precautions will be taken during construction to limit the emissions of VOC and NOx.

[1] An environmental study was initiated for a Dulles Air Cargo, Passenger and Metro Access Project after the air report was completed. The report will be amended in the Revised EA with updated traffic projections for 2040 future conditions.



Environmental Assessment *Figure 3-9: Petroleum Release Sites* *Route 606 Reconstruction Project*

While it is possible that localized increases in MSAT emissions may occur as a result of this project, emissions will likely be lower than present levels in the design year of this project as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Although local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

In summary, the project would not significantly impact air quality and would not cause or contribute to a new violation, increase the frequency or severity of an existing violation, or delay timely attainment of the National Ambient Air Quality Standards (NAAQS).

3.2.19 Noise

Two Common Noise Environments (CNE's) were studied as part of a preliminary noise analysis[1] conducted for the Route 606 Reconstruction Project (CNE A and CNE B). Design Year Build (2036) noise levels are predicted to exceed the FHWA/VDOT Noise Abatement Criteria (NAC) at four modeled sites and one monitored site within CNE A. Design Year Build (2036) noise levels are predicted to exceed NAC at one modeled noise sensitive receptor within CNE B. Noise impacts within CNE A will affect 14 residences within the Loudoun Valley Estates subdivision, along Summerstown Place, Rogersdale Place, and Camerons Point Court. Noise impacts within CNE B will affect one residence located on Evergreen Mills Road (Route 621), near the intersection with Loudoun County Parkway.

To determine feasibility of evaluated highway traffic noise barriers, the following two conditions were considered:

- at least a 5 dB(A) highway traffic noise reduction at impacted receptors. Per 23 CFR 772, FHWA requires the highway agency to determine the number of impacted receptors required to achieve at least 5 dB(A) of reduction. VDOT requires that fifty percent (50%) or more of the impacted receptors experience 5 dB(A) or more of insertion loss to be feasible; and
- the determination that it is possible to design and construct the noise abatement measure. The factors related to the design and construction include: safety, barrier height, topography, drainage, utilities, and maintenance of the abatement measure, maintenance access to adjacent properties, and general access to adjacent properties (i.e. arterial widening projects).

VDOT's noise barrier cost effectiveness value is based upon a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 1,600. One barrier along Route 606 (Barrier A of CNE A, as shown on Figure 3-10) was determined to be feasible and reasonable, with a MaxSF/BR value of 1,273 (below the limit of 1,600 MaxSF/BR).

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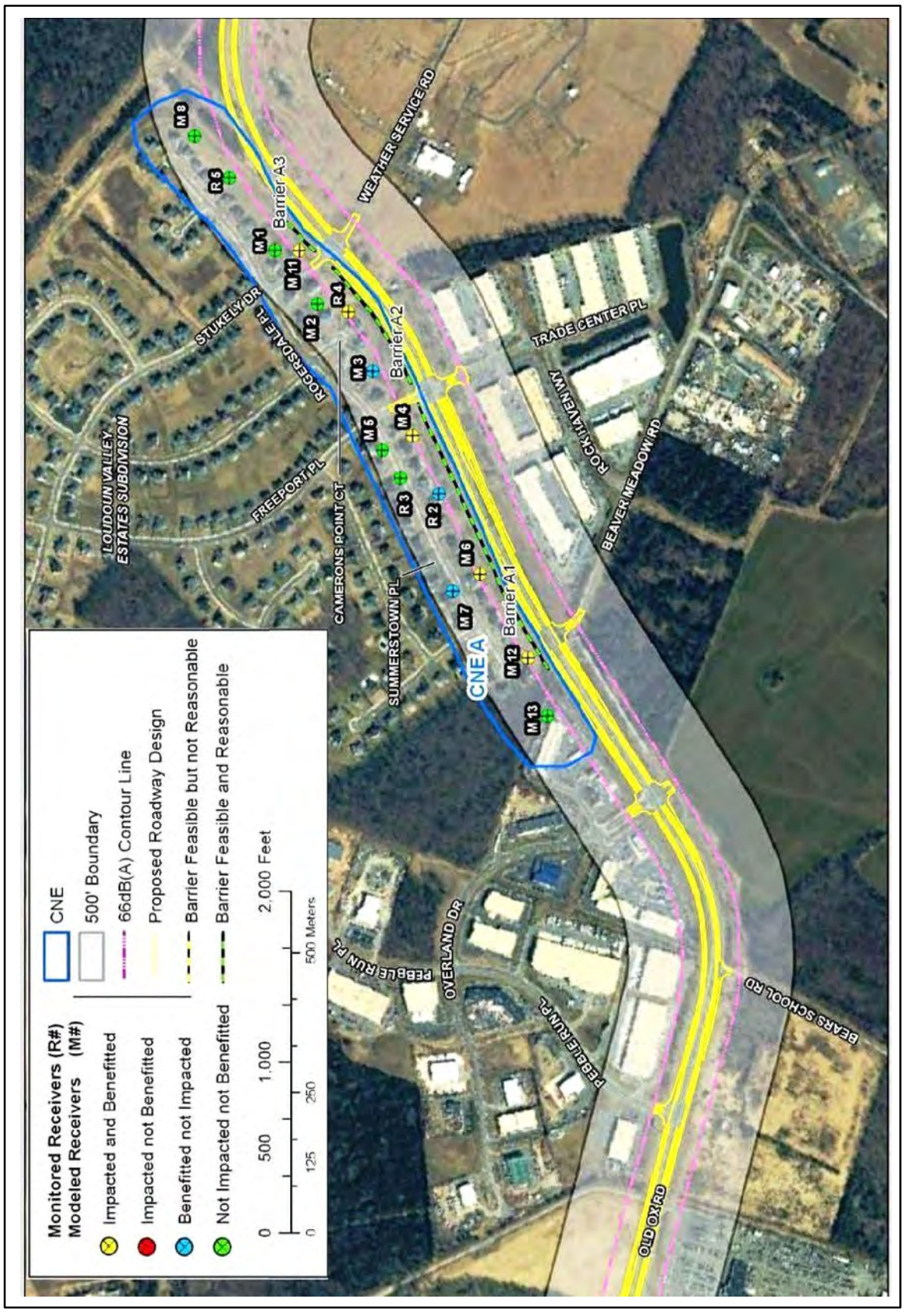
1 An environmental study was initiated for a Dulles Air Cargo, Passenger and Metro Access Project after the preliminary noise analysis was completed. The noise analysis will be amended in the Revised EA with updated traffic projections for 2040 future conditions.



Environmental Assessment Figure 3-10: Evaluated Noise Barriers Route 606 Reconstruction Project

Another barrier along Evergreen Mills Road (Barrier B of CNE B) was considered feasible with 100 percent of the affected receptors receiving an insertion loss of 5 dB(A) or more; however, Barrier B was not considered reasonable with the MaxSF/BR value of 3,228 (thus exceeding the limit of 1,600 MaxSF/BR).

A more-detailed review will be completed as the project design advances. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

3.2.20 Light Emissions and Visual Impacts

No street lighting is present along Route 606; however, outdoor lighting is present within the parking areas and campuses of commercial and general industrial developments lining the corridor. No street lighting would be installed along the project. The visual setting along the Route 606 corridor is typical of a developed urban corridor of the Northern Virginia region. Views to and from the roadway are dominated by fragmented forest stands and fallow fields interspersed amongst commercial and general industrial developed properties. Road construction would occur at-grade, and landscaping of rights-of-way would be provided in accordance with specifications set forth in Division VI (Roadside Development) of VDOT Road and Bridge Specifications. The noise barrier evaluated along Route 606 (as discussed in section 3.2.19) would receive VDOT standard aesthetic treatment, if it is found to be feasible and reasonable during the final design noise analysis.

3.2.21 Cultural Resources

Cultural resource investigations were conducted along a 4.85-mile-long and approximately 300-foot-wide Area of Potential Effect (APE) for archaeological resources (which was subsequently expanded to encompass proposed stormwater management facility sites) [1] and a viewshed-based APE for historic architectural resources. Communities along each Area of Potential Effect (APE) were evaluated for the presence of potential historic districts.

Buildings within the APEs are from a variety of periods, styles, and associations - representing late nineteenth and early twentieth century farmsteads, mid-twentieth century suburbanization, modern suburban residential development, and modern commercial complexes. The historic core of Dulles Airport (which includes the main terminal building, the original three runways, original service buildings, and associated landscaping) is a National Register-eligible historic district; however, the boundary of the district is a minimum of one mile from the APE. No areas within the APEs are recommended as an eligible historic district.

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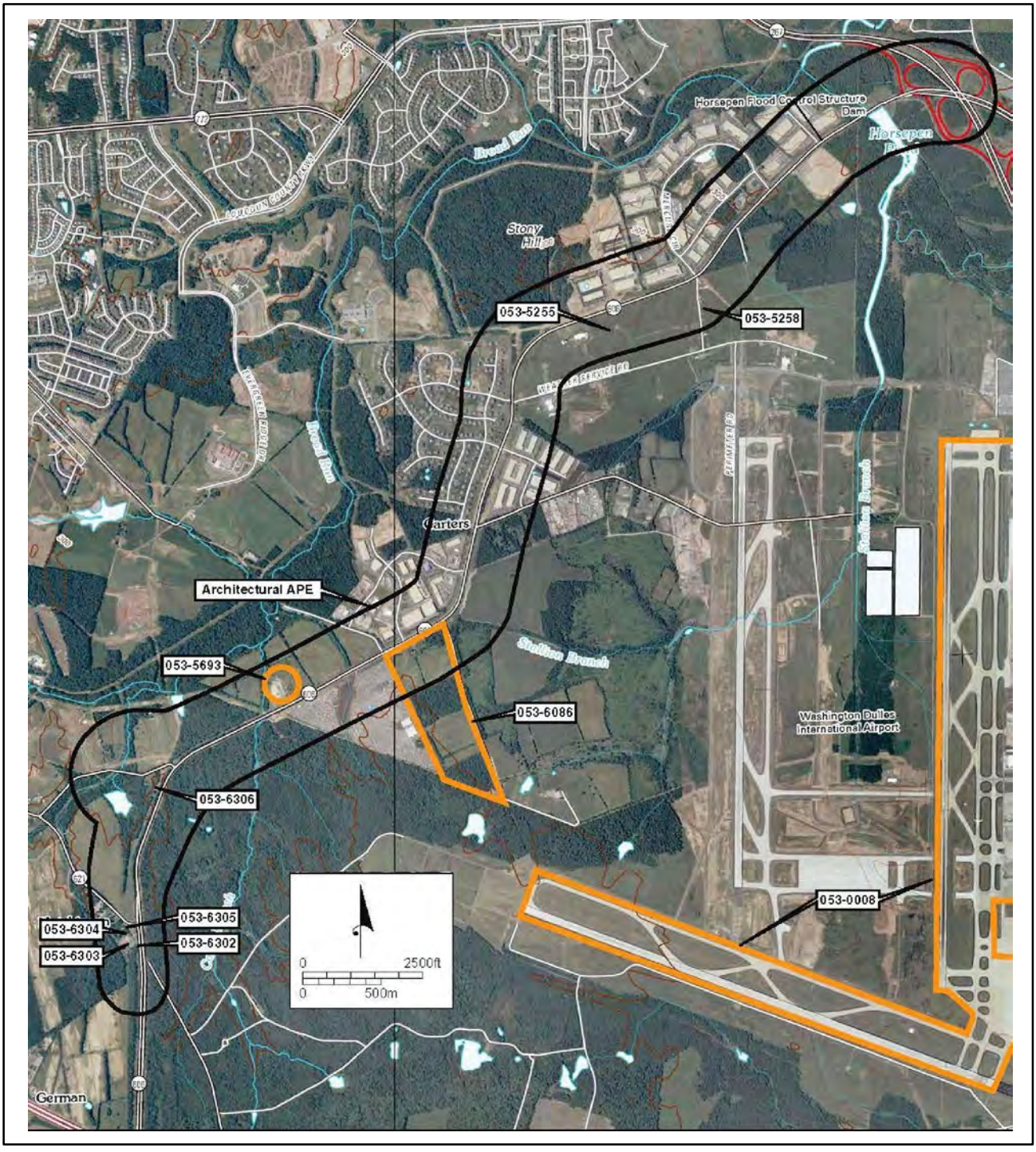
[1] Findings for additional Phase I Archaeological investigations will be coordinated with DHR to confirm an “Effect” or “No Effect” determination, which will be documented in the Revised EA.

Field investigation included the documentation of nine architectural resources. Five previously unrecorded architectural resources were surveyed as part of reconnaissance survey (Figure 3-11). VDOT recommended that none are eligible for listing on the NRHP because these resources lack significance and/or have lost integrity through modern alterations.

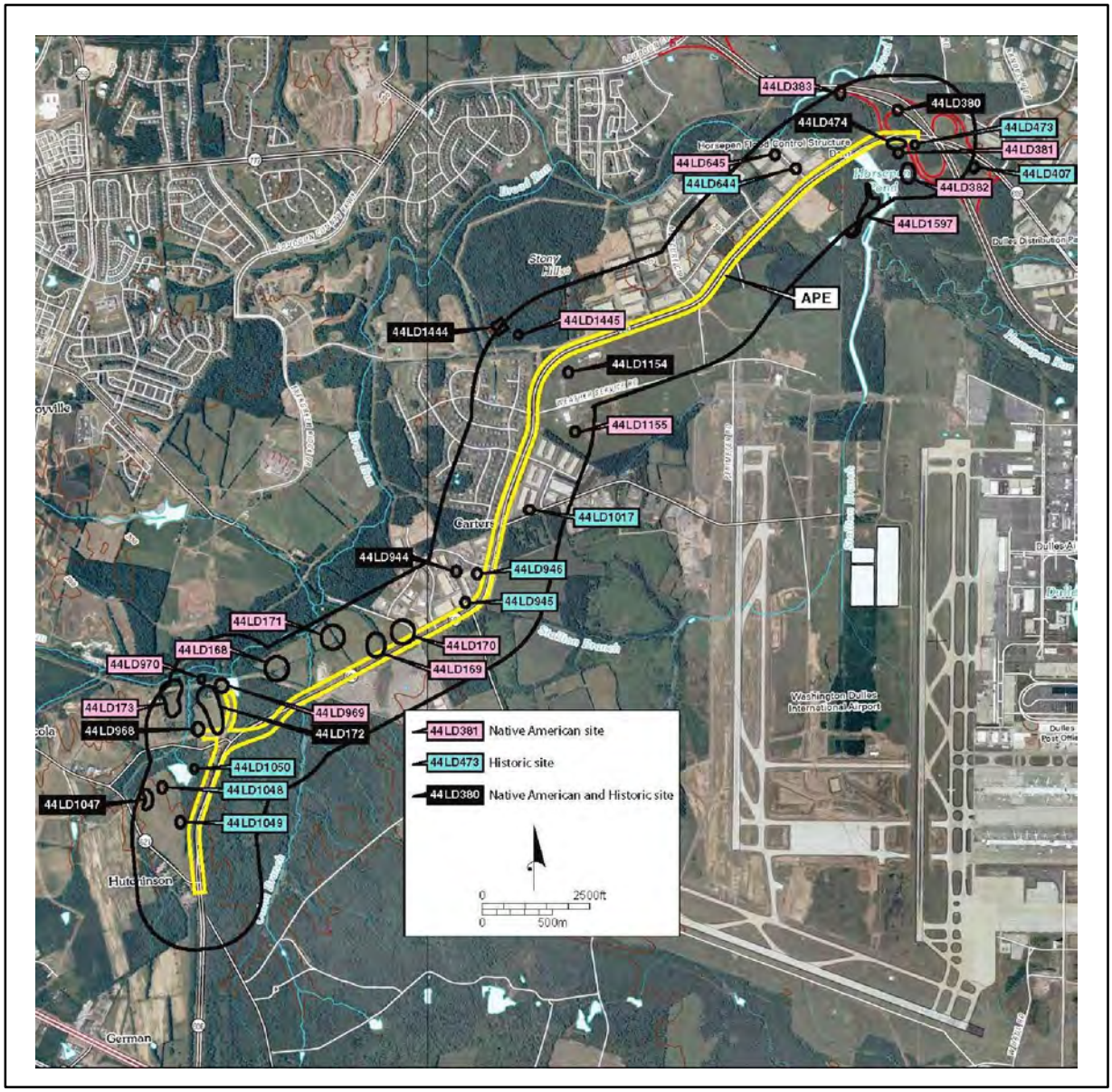
A Phase I archaeological field investigation was conducted, which included a walkover of the APE for archaeology and the excavation of 144 shovel tests (STs). At ST 1.2 (located along the west side of Route 606 southwest of its intersection with Arcola Road), five ironstone shards were recovered from a thin stratum of disturbed and possibly re-deposited soils. The shards may be associated with a nearby unoccupied residence at 42911 Arcola Road located 70 feet west of the APE. This structure was moved from its original location and its outbuildings were demolished sometime between 1957 and 1964 for the construction of the segment of current Route 606 between Route 621 and Arcola Road. ST 1.2 appears to be located directly south of its original location; however, because the area has been severely disturbed by construction of the road and installation of the water line and fiber optic cable, it cannot be positively determined that the shards were associated with the residence. Because they were recovered from disturbed and possibly re-deposited soils they do not constitute an archaeological site. No further work was recommended for the area surrounding ST 1.2.

Although the APE falls within the boundaries of previously identified Sites 44LD169, 44LD170, and 44LD172 (Figure 3-12), no additional artifacts were encountered. Field investigation showed that a water line, fiber optic cable, and road cuts associated with the proposed West Spine Road and the Loudoun County Parkway had destroyed the portions of these sites within the APE. Field investigation also showed that much of the APE has very low potential for archaeological resources because it has been impacted by the installation of utilities and by modern development. No significant archaeological resources were identified and it was determined that no further archaeological work is warranted.

Based on the limits of the study, DHR could not concur that portions of sites 44LD169, 44LD170, 44LD172, 44LD968, and 44LD969 located outside the APE are not eligible; however, DHR determined that no further work is required as long as VDOT does not encroach upon portions of the aforementioned sites falling outside the designated APE. On October 19, 2012, the Virginia Department of Historic Resources (DHR) concurred with VDOT's determination of "no effect" on historic properties within the APE.



Environmental Assessment *Figure 3-11: Historic Architectural Resources* *Route 606 Reconstruction Project*



Environmental Assessment *Figure 3-12: Archaeological Resources* *Route 606 Reconstruction Project*

3.2.22 Section 4(f) Properties

No public recreational properties subject to Section 4(f) of the Department of Transportation Act are located within the study area. Historic properties subject to Section 4(f) of the Department of Transportation Act are identified in Section 3.2.19 (Cultural Resources). With respect to direct and indirect effects on historic architectural properties and archaeological sites, DHR issued a determination of "no adverse effect" for the Preferred Build Alternative. No right-of-way, permanent easements or temporary easements would be needed from these historic properties; therefore, no "use" of a Section 4(f) property would be required.

3.3 Construction Impacts

3.3.1 Water Quality

Through implementation and monitoring of best management practices during and after construction, water quality impacts would be effectively avoided or minimized and mitigated. Specifically, the potential for non-point source pollutants to enter groundwater or surface water from storm water runoff would be managed by implementing an erosion and sediment control plan and a storm water management plan (including a pollution prevention plan) in accordance with VDOT's most current *Road and Bridge Specifications*. These specifications prohibit contractors from discharging any contaminants that could affect water quality. In the event of accidental releases, the contractor would be required to immediately notify all appropriate local, state, and federal agencies and take immediate action to contain and remove contaminants in accordance with the approved pollution prevention plan.

3.3.2 Air Quality

Construction-related air quality impacts such as emissions from diesel-powered equipment, burning of debris, fugitive dust, and the use of cutback asphalt would be temporary. All reasonable precautions will be taken to limit the emissions of VOC, NOx, and particulate matter. In addition, the following DEQ air pollution regulations will be adhered to during construction of the project: 9 VAC 5-40-5600 et seq. (Open Burning restrictions); 9 VAC 5-40-[130] (Cutback Asphalt restrictions); and 9 VAC 5-50-60 et seq. (Fugitive Dust precautions). Measures to control dust would include minimizing exposed earth by stabilization practices (including grass, mulch, pavement, and/or other types of cover) as early as possible following ground disturbance. Stabilization practices would be implemented in accordance with VDOT's most current *Road and Bridge Specifications* manual.

3.3.3 Noise

Construction activity may cause intermittent fluctuations in noise levels. Temporary noise impacts would be attenuated through implementation of the VDOT-developed and FHWA-approved noise limit specification for construction activities (as specified in VDOT's most recent *Road and Bridge Specifications*). The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

3.3.4 Solid Waste and Hazardous Materials

Solid waste and hazardous materials generated during construction activities (such as clearing, grubbing, demolition, and earthworks) would be removed from the work area and disposed of in accordance with applicable local, state, and federal statutes, regulations, and policy. If previously unknown conditions (such as contaminated soils or groundwater) are encountered during construction, the contractor will be required to implement procedures for proper removal, disposal, and/or treatment of contaminated substances. Pollution Prevention Plans and Spill Prevention Control and Countermeasure (SPCC) Plans will be prepared and approved prior to construction.

3.3.5 Late Discoveries

If late discoveries of archaeological, paleontological, or rare mineralogical articles are made during construction activities, work would be immediately suspended in affected areas, and the articles would be addressed in accordance with VDOT's *Road and Bridge Specifications* manual.

3.4 **Indirect Effects**

Indirect effects are those that would be caused by the proposed action but would occur later in time or in another location than would the direct impacts addressed in preceding sections. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems, associated with the proposed action.

The cause-effect relationship between certain proposed actions and indirect effects can be difficult to quantify. Beginning in the 1990s, studies indicate that the association between road construction and urbanization has been historically over-stated and that roads are, at best, an inefficient means for inducing or encouraging development in the absence of a combination of other necessary development factors (Hartgen, et al, 1990; Bly, 1998; Hartgen, 2003a) and that major road improvements appear to "accommodate, rather than spur, growth" (Hartgen, 2003b). At the direction of Congress, FHWA completed the Economic Development Highways Initiative which reached a similar conclusion. The overall results of the initiative support the general linkage between highway improvement and economic development, and validate the contention that highway improvements are a necessary but not sufficient condition for capturing economic growth potential.

The long-range land use plan presented in the most current version of the Loudoun County Comprehensive Plan identifies most areas along the corridor for General Industry Planned Development. Independent of local land use plans, however, the proposed improvements are intended to provide a much-needed north-south corridor within eastern Loudoun County and to provide enhanced vehicular and freight access in to and out of Dulles Airport. As such, the project is consistent with the level and nature of planned growth already anticipated under the Loudoun County's Comprehensive Plan and would not, by itself, directly induce local development.

3.5 Cumulative Impacts

Cumulative effects are the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the sponsor of those actions. The assessment of cumulative effects requires an assessment of the impact that past and present actions have had on the environmental resources in the project study area that would also be impacted by the project; the current affected environment is a reflection of the impacts of those past and present actions over time. A review of cumulative effects requires an assessment of how reasonably foreseeable future actions may affect the same environmental resources that would be directly affected by the project.

Reasonably foreseeable projects in close proximity to the Route 606 study area that are expected to be in place prior to the design year of 2036 include:

- Route 50 Widening from four to six lanes between Route 28 and Route 742 (Poland Road).
- Loudoun County Parkway Extension between Route 842 and Route 772.
- Route 659 Widening from two to four lanes between Route 620 (Braddock Road) and Route 50.
- Route 28 Widening from six to eight lanes between I-66 and Route 7.
- Route 50 Widening from four to six lanes between Route 742 and Route 659 Relocated (Northstar Boulevard).
- Proposed Interchange at Route 50 and Route 606.
- Tri-County Parkway - four lanes on new alignment between I-66 and Route 50.
- The Dulles North Transit Center (a 750-space park and ride lot which, in Phase III, becomes the 2,750-space Route 606 Metrorail station).
- The Dulles Corridor Metrorail Project.
- Dulles Air Cargo, Passenger Metro Access Highway (formerly known as the “Dulles Spur”).
- Route 606 / Loudoun County Parkway – improve road to 8-lane limited access median divided urban arterial between Arcola Road and John Mosby Highway.

Table 3.3 summarizes the environmental resources in the project study area that would be impacted by the Preferred Build Alternative, the impact that these resources have experienced from past and present actions, the incremental impact expected from the proposed project, identification of potential reasonably foreseeable future actions, and the potential impact that may occur from the reasonably foreseeable future actions in or near the study area. As summarized in Table 3-3, the intensity of the incremental impacts of the Preferred Build Alternative are considered minor, when viewed in the context of impacts from other past, present, and reasonably foreseeable future actions, and that they would not rise to a level that would cause significant cumulative impacts.

Table 3-3: Cumulative Impacts Matrix

Environmental Resource or Area-of-Concern	Impacts from Past and Present Actions	Impact from Proposed Action	Potential Impact from Reasonably Foreseeable Actions	Cumulative Impact
Land Use and Socioeconomics	Widespread conversion to commercial and air transport uses	Minor land use conversions. Positive effect on local, regional and state economics	Moderate	Moderate to severe, but not attributable to proposed action
Parks and Recreation	Minor	None	Minor	Minor
Water Resources / Water Quality	Widespread conversion to commercial and air transport uses	None	Minor	Minor
Floodplains and Floodways	Minor	Minor	Minor	Minor
Waters of the U.S., including Wetlands	Widespread conversion to commercial and air transport uses	Moderate (less than 20% of total in vicinity)	Minor to Moderate	Moderate to severe, but not attributable to proposed action
Agricultural and Forestal Districts	None	None	None	None
Forest Lands	Widespread conversion to commercial and air transport uses	Minor (less than 3% of total in vicinity)	Minor to Moderate	Moderate to severe, but not attributable to proposed action
Prime Farmland Soils	Widespread conversion to commercial and air transport uses	Minor (less than 3% of total in vicinity)	Minor	Moderate to severe, but not attributable to proposed action
Threatened and Endangered Species	Minor	None	None	None to minor
Air Quality	Minor	Positive effects attributable to more efficient traffic flow	Positive effects attributable to more efficient traffic flow	None to minor
Noise	Minor	Minor	Minor	Minor
Light Emissions and Visual Impacts	Widespread conversion to commercial and air transport uses	None for light emissions. Minor for visual impacts.	Minor to Moderate	Moderate, but not attributable to proposed action
Cultural Resources	Widespread conversion to commercial and air transport uses	None	Minor	Moderate, but not attributable to proposed action or related transportation projects

4. PUBLIC INVOLVEMENT

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: agency scoping, project development team meetings, and stakeholder meetings. This chapter summarizes the results of VDOT's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

Between February 10, 2012 and February 24, 2012, VDOT distributed scoping letters to local, state, and federal agencies describing the proposed action and requesting information and comments. Agency comments received are presented in Appendix IV.

Throughout the alternatives development and screening process, VDOT held regular meetings with the primary stakeholders of Loudoun County and the Washington Metropolitan Airports Authority. Comments received as part of this process are presented in Appendix IV.

The concept on which the Preferred Build Alternative was based has been further advanced through preliminary design and analysis. VDOT will hold a design public hearing for this project on June 26, 2013. The purpose of the hearing will be to present the preliminary project design and findings of this Draft EA, provide a discussion forum between the public and project team, and obtain input and comments from the community and agencies. In addition, there will be a minimum 30-day public review and comment period following the notice of availability of the EA. Any public comments received during the public hearing and within 15-calendar days after public hearing will become part of the public hearing record.

VDOT will evaluate and address substantive comments received in response to the public hearing in the environmental document.

To further accommodate public outreach and involvement, VDOT maintains a project website at http://www.virginiadot.org/projects/northernvirginia/old_ox_road_widening.asp which readily allows public access to information about the project.

5. APPENDICES

☒ Appendix I: NRCS Form – 106

☒ Appendix II: VDOT Air Study

☒ Appendix III: VDOT Traffic Noise Study

☐ Section 106 MOA

☐ Endangered Species Survey

☐ Section 4(f) Evaluation

☐ Wetlands Finding

☐ Mitigation Summary

☒ Appendix IV: Agency Scoping Comments and Other Relevant Correspondence

Appendix I

NRCS Form – 106

ENVIRONMENTAL ASSESSMENT

Route 606 (Loudoun County Parkway/Old Ox Road) Reconstruction Project
Loudoun County, Virginia

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 1/8/13	4. Sheet 1 of 1
1. Name of Project Interstate 66 / US Route 15 Interchange Reconstruction	5. Federal Agency Involved Federal Highway Administration	
2. Type of Project Linear (Roadway Reconstruction)	6. County and State Loudoun County, Virginia	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form Don Flegel
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☑		4. Acres Irrigated / Average Farm Size
5. Major Crop(s) n/a	6. Farmable Land in Government Jurisdiction Acres: n/a %	7. Amount of Farmland As Defined in FPPA Acres: n/a %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	72	72		
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0	0		
C. Total Acres In Corridor	72	72	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland		0		
B. Total Acres Statewide And Local Important Farmland		0		
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15		7		
2. Perimeter in Nonurban Use — 10		4		
3. Percent Of Corridor Being Farmed — 20		0		
4. Protection Provided By State And Local Government — 20		0		
5. Size of Present Farm Unit Compared To Average — 10		5		
6. Creation Of Nonfarmable Farmland — 25		2		
7. Availability Of Farm Support Services — 5		1		
8. On-Farm Investments — 20		10		
9. Effects Of Conversion On Farm Support Services — 25		0		
10. Compatibility With Existing Agricultural Use — 10		5		
TOTAL CORRIDOR ASSESSMENT POINTS — 160		34		0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100				
Total Corridor Assessment (From Part VI above or a local site assessment) — 160		34		
TOTAL POINTS *(Total of above 2 lines)* — 260				

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
Preferred Build Alternative Identified in June 2013 NEPA EA	72	1/8/13	YES ☐ NO ☑

5. Reason For Selection:

The Preferred Build Alternative would provided needed capacity and safety improvements by widening and reconstructing Route 606 largely along the existing alignment, utilizing existing right-of-way to the maximum extent practicable.

Signature of Person Completing this Part: M. Lane Mitchell, VDOT Environmental Specialist II — DATE 1/8/13

NOTE: Complete a form for each segment with more than one Alternate Corridor

Appendix II

VDOT Air Study

ENVIRONMENTAL ASSESSMENT

Route 606 (Loudoun County Parkway/Old Ox Road) Reconstruction Project
Loudoun County, Virginia

Air Report

Project Information

Project Name:	Rte 606 - Dulles Loop		
Project Number:	0606-053-983, P101	**UPC:**	97529
Route Number:	606		
Project Limit - From:	Rte 621	**To:**	Rte 267
District	**City/County**	**Residency**	
Northern Virginia	Loudoun	Leesburg	
IPM Project Description:	Rte 606 - Dulles Loop		
Air Quality:	Yes		
Additional Project Description:	Rte 606 - Dulles Loop. This project consists of reconstructing and widening the existing 2-lane rural roadway to a 4-lane divided Urban Collector with a depressed grass median from Route 621 to Route 267 Dulles Greenway. The typical section will utilize a sufficiently wide median to allow for future expansion to a 6-lane section. The proposed roadway will use a similar typical section as the recently reconstructed section between Rte 50 and Route 621.		
Funding Source:	Federal		

PPTA/LAP

Locally Administered?	**PPTA?**

Traffic Data

Design Year:	2036	**Design Year Traffic ADT:**	35,250
Existing Year:	2011	**Existing Year Traffic ADT:**	23,500
Project Opening Year:	2014		

TASK INFORMATION

Task/Subtask	PED	AED	Assigned To
Air Determination	08/25/2011		Grinnell, Daniel T

I. Carbon Monoxide

This project is located in: A Carbon Monoxide Attainment Area

CO Microscale Analysis Required for NEPA? No

- The design year 24-hour forecasted traffic does not exceed the thresholds contained in VDOT's Project-Level Carbon Monoxide Air Quality Studies Agreement with FHWA dated February 27, 2009, and therefore does not require a project-level CO air quality analysis.

The project does not include or directly affect any roadway whose design year average daily traffic volume, skew angle or level of service would exceed the threshold criteria specified in the Agreement between the Federal Highway Administration and the Virginia Department of Transportation for streamlining the project-level air quality analysis process for carbon monoxide. Modeling using "worst-case" parameters has been conducted for these thresholds and it has been determined that projects, such as this one, for which the thresholds would not be exceeded would not significantly impact air quality and would not cause or contribute to a new violation, increase the frequency or severity of an existing violation, or delay timely attainment of the National Ambient Air Quality Standards for carbon monoxide.

Comments: The design year 2035 ADT on the affected roadway (route 606) of 35250 vpd is below the threshold.

II. Ozone

This project is located in: An 8-hour Ozone Nonattainment Area

- The scope and concept of the project is consistent with what was modeled in the conformity analysis of the 11-16 TIP and 2010 LRP.

Comments: This project is included in the conformity analysis for the 10-16 TIP and 2010 LRP which received federal approval on February 9, 2011.

This project is located in a VOC/NOx Emission Control Area. All reasonable precautions should be taken to limit VOCs and NOx emissions. Restrictions and prohibitions may apply to open burning, fugitive dust and the use of cutback asphalt, particularly during the months of April through October. Refer to DEQ's Open Burning Regulation (9 VAC 5-130-10 et seq.); Cutback Asphalt Regulation (9 VAC 5-40-5490 et seq.); and Fugitive Dust Regulation (9 VAC 5-50-60 et seq.) for requirements.

III. Particulate Matter

This project is located in: A PM2.5 Nonattainment Area

- The scope and concept of the project is consistent with what was modeled in the conformity analysis of the 11-16 TIP and 2010 LRP.

PM Hotspot Analysis Required for NEPA? No

Yes	No	
[ ]	[X]	Is this project a new or expanded highway project that serves a significant volume of or will result in a significant increase in diesel vehicles, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic?

Explained: The proposed project design year ADT of 35,250 with daily projected total truck volume of 4230 vpd, even assuming these are all diesel trucks, is well below the level of concern. Furthermore, when compared with the projected no build design year level of traffic of 29, 500 vpd the impact from the increase form the build condition is expecetd to be minimal.

[ ]	[X]	Does this project create a new or expanded bus or rail terminal or transfer point that will have, or result in an increase of, a significant number of diesel vehicles congregating at that location?

Explained: The proposed project does not create new or expand rail terminal or transfer points that will result in an increase of a significant number of diesel vehicles.

[ ]	[X]	Does this project affect intersections that are at LOS D, E or F with a significant number of diesel vehicles, or that will change to LOS D, E or F because of increased traffic volumes from a significant number of diesel vehicles related to the project?

Explained: This project will not impact a significant number of diesel vehicles. The project has minmal impact on traffic volumes and improves speeds and traffic flow within the project vicinity without significantly increasing idling.

[ ]	[X]	Can this project otherwise be considered a project of "air quality concern" as outlined in 40 CFR 93.123 (b)(1) (i),(ii),(iii) or (iv) or (v), or following recommendations obtained through the VDOT PM2.5 Hotspot Screening Process?

Explained: The project is not considered to be a project of air quality concern according to 40 CFR93.123(b)(1)(i-v) and the March 29,2006 EPA/FHWA guidance entitled" Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance areas" EPA has determined that such projects meet the Clean Air Acts requirements without any further hot-spot analysis.

The final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in Fine Particulate Matter (PM2.5) nonattainment and maintenance areas was published on March 10, 2006. This project is located in the Northern Virginia PM2.5 nonattainment area.

Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance Areas, circulated on March 29, 2006, outlines how to conduct qualitative PM2.5 hot-spot analyses for “projects of air quality concern”, as defined in the final rule by 40 CFR 93.123(b)(1). Projects of air quality concern are highway and transit projects that involve significant levels of diesel traffic, or any project that is identified as a localized air quality concern by the PM2.5 State Implementation Plan (SIP). The guidance also notes that a PM2.5 hot-spot analysis is not required for projects that are not an air quality concern, but states that the project-level conformity determination should document Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since the project has been found to not be of air quality concern under 40 CFR 93.123(b)(1).

A comparison of this project with examples of projects considered to be “projects of air quality concern” (that would be covered by 40 CFR 93.123(b)(1) and would require a qualitative PM2.5 hot-spot analysis) shows that this project is not a “project of air quality concern”. The construction of this project would not result in a significant increase in the number of diesel vehicles in the area.

Since the project was not found to be a project of air quality concern under 40 CFR 91.123(b)(1), a PM2.5 hot-spot analysis is not required. The following statement should be added to the environmental document for the proposed project:

A PM2.5 hot-spot analysis is not required for this project since it is not an air quality concern. The Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since this project has been found not to be of air quality concern under 40 CFR 93.123(b)(1).

IV. Mobile Source Air Toxics

This project requires: A qualitative MSAT analysis

This project requires a qualitative MSAT analysis. Please see the appendix for the appropriate language to be included in the environmental document.

Comments: None

Comments

This project is located within a Moderate Ozone Nonattainment area, a Fine Particulate Matter (PM2.5) Nonattainment area, and a volatile organic compounds (VOC) and oxides of nitrogen (NOx) Emissions Control Area. As such, all reasonable precautions should be taken to limit the emissions of VOC, NOx, and particulate matter. In addition, the following DEQ air pollution regulations must be adhered to during the construction of this project: 9 VAC 5-40-5600 et seq., Open Burning restrictions; 9 VAC 5-40-5490 et seq., Cutback Asphalt restrictions; and 9 VAC 5-50-60 et seq., Fugitive Dust precautions.

Qualitative Analysis for Mobile Source Air Toxics

BACKGROUND

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), the U.S. Environmental Protection Agency (EPA) also regulates air toxics. Most air toxics originate from man-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes and locomotives), area sources (e.g., dry cleaners and gas stations), and stationary sources (e.g., factories and refineries). Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://cfcpub.epa.gov/ncea/iris/index.cfm). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are *acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.* While the U.S. Federal Highway Administration (FHWA) considers these the priority mobile source air toxics (MSAT), the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles traveled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 1 below.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA). The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

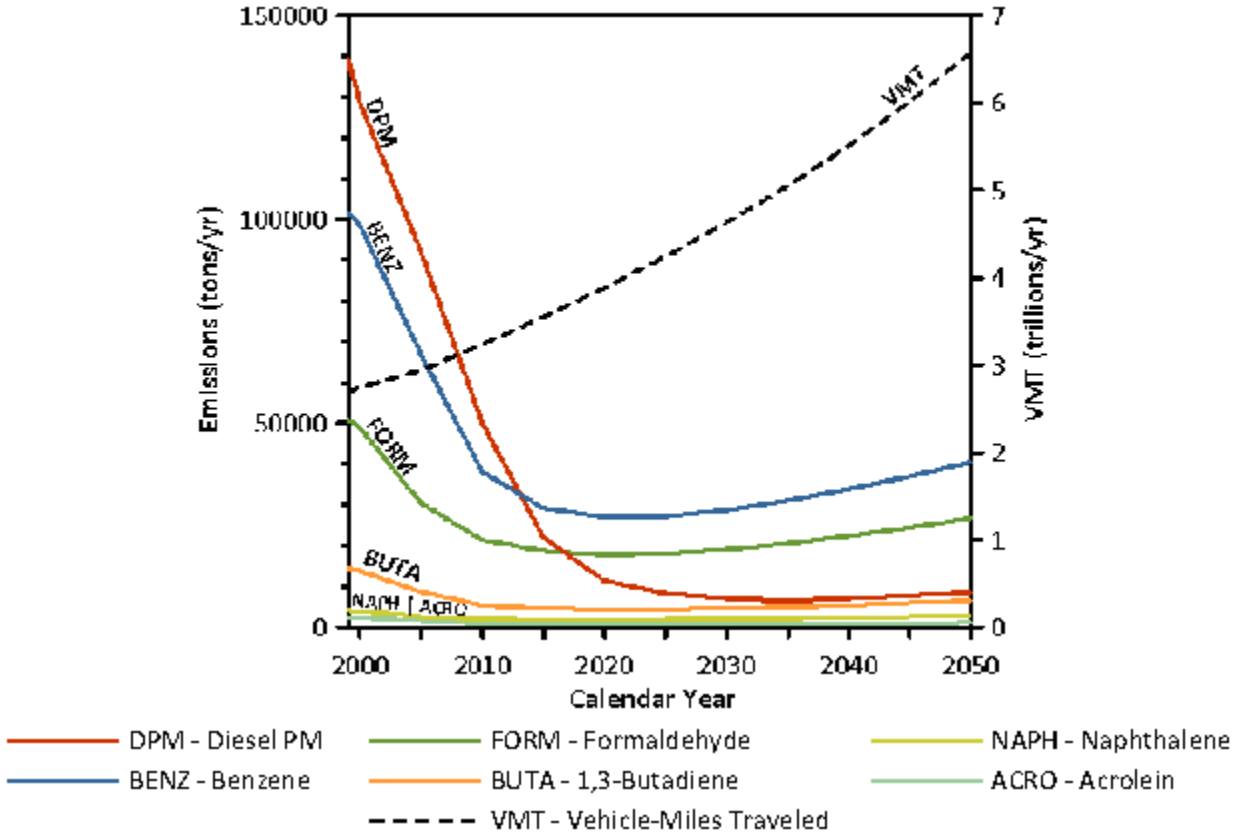
PROJECT-LEVEL MSAT DISCUSSION

Following FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents dated September 30, 2009 (http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm), this project has been determined to have low potential MSAT effects, thereby requiring a qualitative MSAT analysis. A qualitative MSAT analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For each alternative, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT

estimated for each of the Build Alternatives may be slightly higher than that for the No-Build Alternative, because the additional capacity may increase the efficiency of the roadway and attract rerouted trips from elsewhere in the transportation network. This potential increase in VMT could lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase would be offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6.2 model, emissions of all of the priority MSAT except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Figure 1: NATIONAL MSAT EMISSION TRENDS 1999 - 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOBILE6.2 MODEL



Note:
(1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
(2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles traveled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors
Source: U.S. Environmental Protection Agency. MOBILE6.2 Model run 20 August 2009.

There may also be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control

programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives may have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No-Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, https://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or

uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's EMFAC 2007 model, and the EPA's Draft MOVES 2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country – three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with National Ambient Air Quality Standards for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful

to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

CONCLUSION

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project at this time. While it is possible that localized increases in MSAT emissions may occur as a result of this project, emissions will likely be lower than present levels in the design year of this project as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Although local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Appendix III

VDOT Traffic Noise Study

ENVIRONMENTAL ASSESSMENT

Route 606 (Loudoun County Parkway/Old Ox Road) Reconstruction Project
Loudoun County, Virginia

Virginia Department of Transportation
Dulles Loop Project

State Project: 0606-053-983
UPC 97529

Route 606 (Old Ox Road) and Loudoun County Parkway
From: Route 621 (Evergreen Mills Road)
To: Route 267 (Dulles Greenway)
Loudoun County, VA

PRELIMINARY NOISE ANALYSIS

Submitted to:

Virginia Department of Transportation
Environmental Division
1401 East Broad Street
Richmond, VA 23219

Prepared by:

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4951 Lake Brook Drive, Suite 275
Glen Allen, VA 23060

July 2012

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APPENDICES

I. Executive Summary

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing to widen the existing Old Ox Road (Route 606) from its current 2-lane rural roadway to a 4-lane divided Urban Collector with a depressed grass median from Route 621 (Evergreen Mills Road) to Route 267 (Dulles Greenway) in Loudoun County, Virginia. The noise analysis in this document will focus solely on the Common Noise Environments, referred to as CNEs. Noise sensitive receptors within 500 feet of the construction limits were considered for this evaluation.

This report documents the Existing (2011) and Design Year (2036) noise levels associated with the Dulles Loop Project. A project field view was performed to examine the project area, as well as document major sources of acoustic shielding (e.g., terrain lines, building rows, etc.) adjacent to the project corridor. Noise monitoring was performed at four locations, while noise modeling was conducted for 13 additional sites to gain a thorough understanding of the existing noise environment and to determine how the proposed improvements will change the noise levels throughout the project area. Due to the proximity of the project area to Dulles International Airport, off-peak noise monitoring was performed in order to minimize the influence of aircraft flying overhead. Any observed aircraft and their time overhead was recorded so that they could be accounted for when determining the existing monitored levels.

Noise modeling was completed for Existing (2011) and Design Year Build (2036) conditions. Existing worst-case noise levels exceeded the FHWA/VDOT Noise Abatement Criteria (NAC) at one of the modeled receptors in the project area (M10). Design Year Build (2036) noise levels were predicted at each monitored and modeled receptor site under the proposed improvements. Design Year Build (2036) levels are predicted to exceed the FHWA/VDOT NAC at six of the modeled locations (R4, M4, M6, M10, M12, and M13).

The findings in this document are based on conceptual information. A Final Design Noise Analysis will be performed for this project based on detailed engineering information. Thus, any conclusions derived in the report should be considered preliminary in nature and subject to change.

II. Introduction

Impacts associated with noise are often a prime concern when evaluating roadway improvement projects. Roadway construction at a new location or improvements to the existing transportation network may cause impacts to the noise-sensitive environment located adjacent to the project corridor. For this reason, the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT) have established a noise analysis methodology and associated noise level criteria to assess the potential noise impacts associated with the construction and use of transportation related projects.

This report details the steps involved in the noise analysis for the Dulles Loop Project, including noise monitoring, noise modeling methodologies, results, and impact evaluation. The project area can be seen in Figure 1. The appendices attached at the end of this report include all relevant information that was incorporated into the noise modeling process.

III. Noise Analysis Methodology, Terminology and Criteria

The methodologies applied to the noise analysis for the Dulles Loop Project are in accordance with VDOT's *"State Noise Abatement Policy"*, effective July 13, 2011, and updated September 2011. VDOT guidelines are based on Title 23 of the Code of Federal Regulations, Part 772 and the Procedures for Abatement of Highway Traffic Noise and Construction Noise, (23 CFR 772).

To determine the degree of highway noise impact, Noise Abatement Criteria (NAC) has been established for a number of different land use categories. Table 1 documents the NAC for the associated activity land use category shown in the adjacent column. The majority of the project area is comprised of undeveloped lands, since it is situated near the vicinity of the Runway Safety Areas for two of Dulles International Airport's runways. To ensure that none of the undeveloped land uses are slated for future development, coordination with Loudoun County occurred in April 2012 to ensure that there are no active building permits for approved developments, per VDOT procedures.

The developed portion of the project area consists mainly of mixed office complexes and warehouse facilities. These land uses are categorized as E and F, respectively and were not included in the preliminary noise analysis, due to their lack of outdoor use areas. The remaining noise sensitive land uses within this project corridor are considered Category B and Category C. Category B receptors are comprised of and limited to residential areas. Category C is comprised of active sports areas, campgrounds, day care centers, hospitals, libraries, schools, among other land uses. Please see Table 1 for the full list of land uses that comprise Category C receptors. The NAC are given in terms of an hourly, A-weighted, equivalent sound level. The A-weighted sound level frequency is used for human use areas because it is comprised of the sound level frequencies that are most easily distinguished by the human ear, out of the entire sound level spectrum. Highway traffic noise is categorized as a linear noise source, where varying noise levels occur at a fixed point during a single vehicle pass by. It is acceptable to characterize these fluctuating noise levels with a single number known as the equivalent noise level (L_{eq}). The L_{eq} is the value of a steady sound level that would represent the same sound energy as the actual

time-varying sound evaluated over the same time period. For highway noise assessments, L_{eq} is typically evaluated over a one-hour period.

Noise abatement determination is based on VDOT's three-phase approach. The first phase (**Phase 1**) distinguishes if a sensitive receptor, within a project corridor, warrants highway traffic noise abatement. The following describes the **Phase 1** warranted criterion, as discussed in VDOT policy. Receptors that satisfy either condition warrant consideration of highway traffic noise abatement.

- Predicted highway traffic noise levels (for the design year) approach or exceed the highway traffic noise abatement criteria in Table 1. "Approach" has been defined by VDOT as 1 dB(A) below the noise abatement criteria.

~or~

- A substantial noise increase has been defined by VDOT as a 10 dB(A) increase above existing noise levels for all noise-sensitive exterior activity categories. A 10 dB(A) increase in noise reflects the generally accepted range of a perceived doubling of the loudness.

Phase 2 and **Phase 3** of the three-phased approach will be discussed in the noise abatement evaluation, located in Section VI of this report.

The identification of noise-sensitive land uses guided the selection of noise monitoring locations along the project corridor. In order to determine the existing noise conditions within the project area, noise monitoring was conducted at four representative noise sensitive receptor sites. Figures 2A through 2C identify the project area and the locations of the four noise monitoring sites.

Monitoring was performed at each of the selected noise sensitive receptors using Metrosonics dB-3080 dosimeters (noise meters). The noise meters were placed at each receptor site in a manner that would yield a typical absolute ambient environment noise reading, and allowed for minimal influence from atypical, background noise sources. Readings were taken on the A-weighted scale and reported in decibels (dB(A)). Prior to noise monitoring, noise meters were calibrated using a Metrosonics cl-304 acoustical calibrator. The noise monitoring equipment meets all requirements of the American National Standard Specifications for Sound Level Meters, ANSI S1.4-1983 (R1991), Type 2, and meets all requirements as defined by FHWA. Noise monitoring was conducted in accordance with the methodologies contained in FHWA-PD-96-046, *Measurement of Highway-Related Noise*, (FHWA, May 1996).

Short-term noise monitoring was performed on April 3, 2012 between 12 PM and 3 PM. It was determined that 24-hour monitoring was not favorable because of the project's proximity to Dulles International Airport and the resulting airplane noise. The receptor sites were selected based on their proximity to the existing Old Ox Road (Route 606), the dominant traffic noise source in the project area. Due to the proximity of the project area to Dulles International Airport, off-peak noise monitoring was performed in order to minimize the influence of aircraft flying overhead. Any aircraft flyovers were noted, and their noise contribution was subtracted

from the overall noise level to ensure that the resulting L_{eq} would accurately reflect the highway noise. Noise monitoring is used solely for noise model validation and is not performed to predict noise impacts. Noise levels were recorded at one minute intervals for the duration of each test. Data collected by the sound analyzers included time, average noise level (L_{av}), maximum noise level (L_{max}), and instantaneous peak noise level (L_{pk}) for each recorded interval. Additional data collected at each monitoring location included atmospheric conditions, wind speed, background noise sources, and unusual / atypical noise events. Traffic data (vehicle volume and speed) were also recorded on all roadways, which were visible from the monitoring sites and substantially contributed to the overall noise levels. Traffic was grouped into one of three categories: cars, medium trucks, and heavy trucks, as per VDOT procedures. Combined, all of this data is used during the noise model validation process.

Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every Common Noise Environment (CNE) to validate the computer noise model. CNEs are groupings of receptor sites that, by location, form distinct communities within the project area. These areas are used to evaluate traffic noise impacts and potential noise mitigation options to residential developments or communities as a whole, as well as for consideration of feasibility and reasonableness of possible noise abatement measures for specific communities.

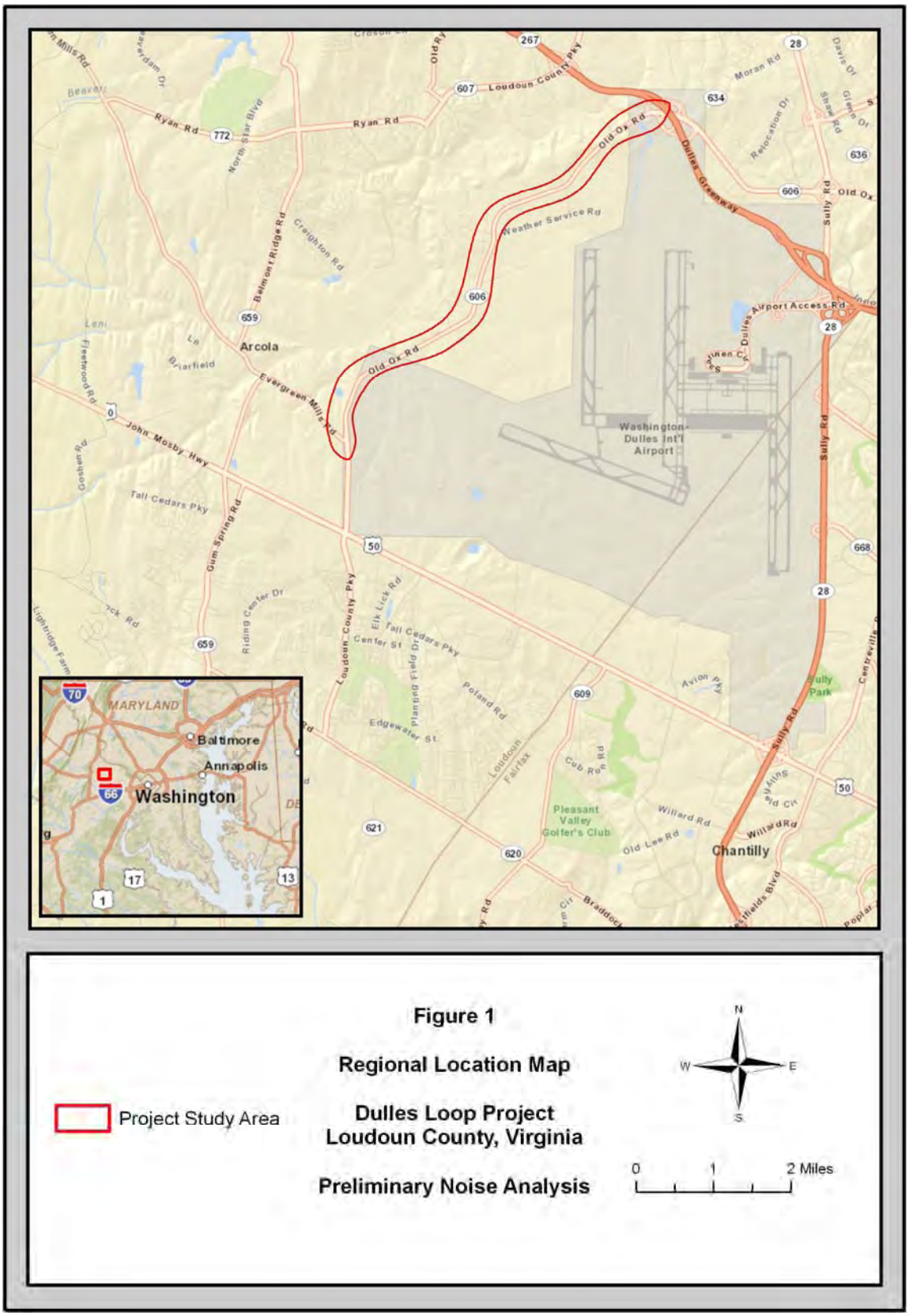


Figure 1
Regional Location Map
Dulles Loop Project
Loudoun County, Virginia
Preliminary Noise Analysis
Project Study Area
N
W
E
S
0
1
2 Miles
Arcola
Washington-Dulles Int'l Airport
Chantilly
Pleasant Valley Golfer's Club
Sully Park
Baltimore
Annapolis
Washington
MARYLAND
Ryan Rd
Old Ox Rd
Loudoun County Pky
Dulles Greenway
Dulles Airport Access Rd
Sully Rd
Evergreen Mills Rd
John Mosby Hwy
Tall Cedars Pky
Gum Spring Rd
Belmont Ridge Rd
Weather Service Rd
Poland Rd
Willard Rd
Old Lee Rd
Edgewater St
Center St
Elk Lick Rd
Riding Center Dr
Planting Field Dr
Loudoun Fairfax
Cub Run Rd
Moran Rd
Relocation Dr
Old Rt
North Star Blvd
Creighton Rd
Fleetwood Rd
Gosheh Rd
Avion Pky
Braddock
Shields Blvd

TABLE 1
Dulles Loop Project
FHWA/VDOT Noise Abatement Criteria
Hourly-A-Weighted Sound Level in Decibels (dB(A))[1]

Activity Category	Activity L_{eq} (h)*	Criteria[2] L10 (h)	Evaluation Location	Description of Activity Category
A	57	60	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[3]	67	70	Exterior	Residential.
C[3]	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties of activities not included in A-D or F.
F	--	--	Exterior	Agriculture, airports, bus yards, emergency services, industrial logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

[1] Either Leq (h) or L10 (h) (but not both) may be used on a project.
[2] The Leq (h) and L10 (h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measure.
[3] Includes undeveloped lands permitted for this Activity Criteria.
***** VDOT utilizes the Leq(h) designation

Source: VDOT Highway Traffic Noise Manual, Updated September 16, 2011

IV. Validation and Existing Conditions

Computer modeling is the accepted technique for predicting Existing and Design Year noise levels associated with traffic-induced noise. Currently, the FHWA Traffic Noise Model (TNM) 2.5 is the approved highway noise prediction model. The TNM has been established as a reliable tool for representing noise generated by highway traffic. The information applied to the modeling effort includes the following: highway design files (existing and proposed conceptual design), traffic data, roadway cross-sections, and surveying of terrain. Base mapping, aerial photography, and field views were used to identify noise-sensitive land uses within the corridor and any terrain features that may shield roadway noise. Sixteen of the noise sensitive land uses in the project area are residential and thus will be categorized as Category B. One of the noise sensitive land uses in the project area is a playground and thus will be categorized as Category C.

The modeling process begins with model validation, as per VDOT requirements. This is accomplished by comparing the monitored noise levels with noise levels generated by the computer model, using the traffic volumes, speeds and composition that were witnessed during the monitoring effort. This comparison ensures that reported changes in noise levels between Existing and Design Year conditions are due to changes in traffic conditions and not to discrepancies between monitoring and modeling techniques. A difference of three decibels (3 dB(A)) or less between the monitored and modeled level is considered acceptable, since this is the limit of change detectable by the typical human ear. Table 2 provides a summary of the model validation for the existing and monitored conditions. Column 5 represents the difference between the monitored level (Column 3) and the modeled level produced by the noise model (Column 4).

All four analyzed receptors have less than a 3 dB(A) difference between the monitored and modeled noise levels; therefore, the model is considered an accurate representation of actual existing conditions throughout the project area. There are many factors that influence the measured noise levels that may cause differences with computed noise levels of several decibels. Such factors included atmospheric conditions (upwind, neutral or downwind), shielding by structures that may be difficult to model, and the representation of louder vehicles passing during the measurement period.

The validated noise model was the base noise model for the remainder of the preliminary noise analysis. Additional modeling sites were added to the validated model to thoroughly predict existing noise levels throughout the project corridor. Additional noise modeling was then performed for existing conditions using 2011 traffic data supplied by traffic engineers (see Appendix D). This modeling step was performed to evaluate existing "worst-case" conditions associated with existing worst-case traffic volumes and composition. Column 7 of Table 2 provides a summary of the worst-case existing noise levels.

The following is a discussion of the monitored and existing noise environment for each CNE evaluated for the Dulles Loop Project. Where residential communities or groupings of noise-

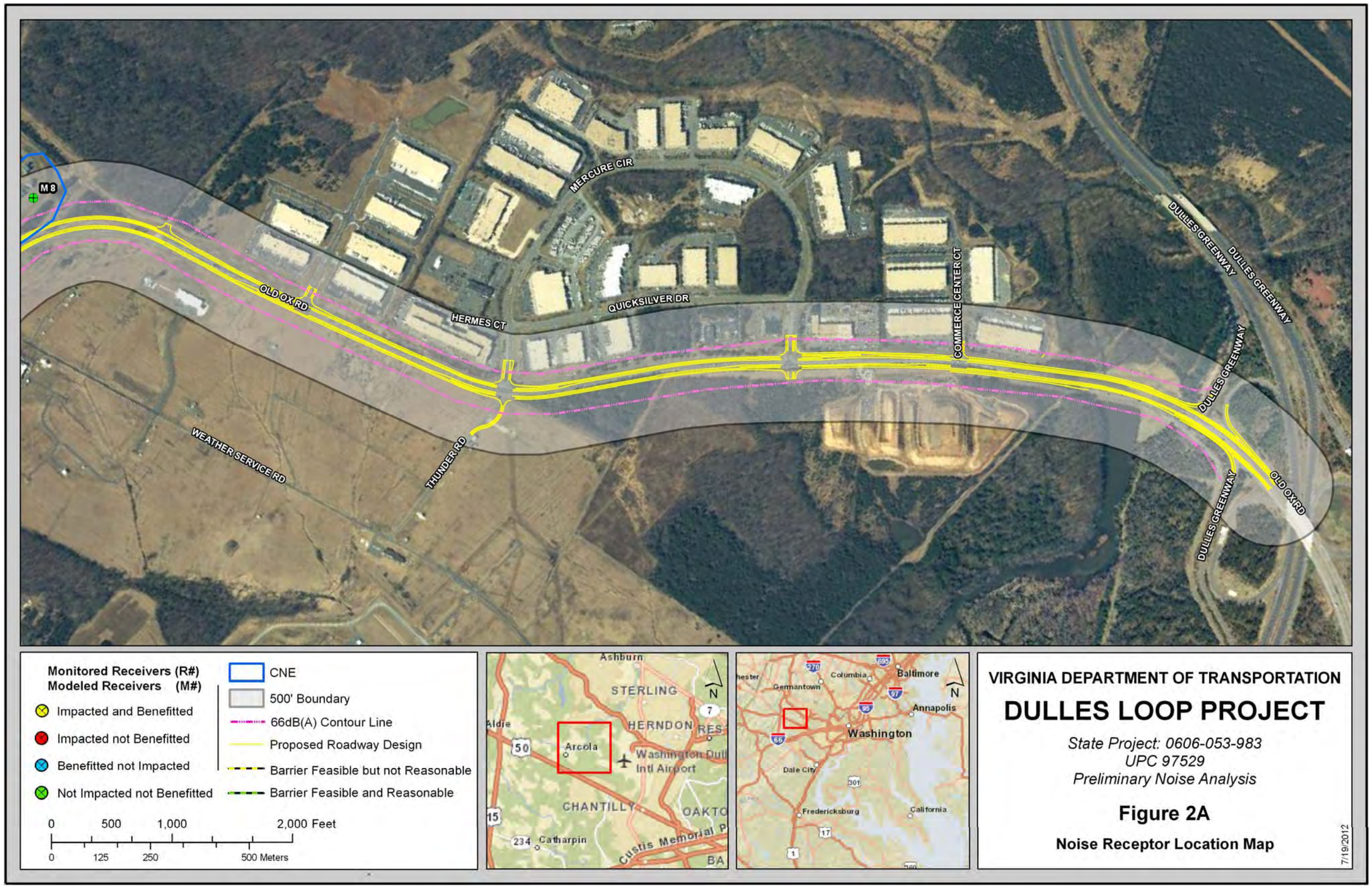
sensitive land uses exist, noise monitoring sites were grouped into CNEs. The following CNE descriptions are a function of both geographic proximity and common noise environment.

CNE A

Common Noise Environment A (CNE A) is located in the western portion of the project area in the Loudoun Valley Estates subdivision, and includes single family residences located along Summerstown Place, Rogersdale Place, and Camerons Point Court (see Figure 2B). Immediately adjacent to this subdivision is a commercial development that contains a daycare center with an outdoor play area (M11). CNE A contains four noise monitoring sites (R2, R3, R4, R5), and 11 modeling–*only* sites (M1-M8, M11-M13) which represent a total of 49 residences and one playground. As shown in Column 3 of Table 2, monitored noise levels within CNE A were found to range from 54.1 to 57.8 dB(A). Existing worst-case noise levels within CNE A were found to range from 55 to 64 dB(A), as shown in Column 7 of Table 2.

CNE B

Common Noise Environment B (CNE B) is located in the western portion of the project area, along Evergreen Mills Road (Route 621) and Loudoun County Parkway. CNE B contains two modeling-*only* sites (M9 and M10), which represent three residences. The locations of these receptor sites are shown in Figure 2C. Modeled noise levels within CNE B were found to range from 62 to 69 dB(A), as shown in Column 7 of Table 2. The dominant noise source within CNE B is Old Ox Road (Route 606). CNE B includes one modeled receptor (M10) with an existing noise level that is predicted to exceed the NAC.


M 8
MERCURE CIR
OLD OX RD
HERMES CT
QUICKSILVER DR
COMMERCE CENTER CT
DULLES GREENWAY
DULLES GREENWAY
DULLES GREENWAY
DULLES GREENWAY
OLD OX RD
WEATHER SERVICE RD
THUNDER RD
Monitored Receivers (R#)
Modeled Receivers (M#)
Impacted and Benefitted
Impacted not Benefitted
Benefitted not Impacted
Not Impacted not Benefitted
CNE
500' Boundary
66dB(A) Contour Line
Proposed Roadway Design
Barrier Feasible but not Reasonable
Barrier Feasible and Reasonable
0 500 1,000 2,000 Feet
0 125 250 500 Meters
Ashburn
STERLING
HERNDON
Arcola
Washington Dull Intl Airport
CHANTILLY
Catharpin
Custis Memorial P
Germantown
Columbia
Baltimore
Annapolis
Washington
Dale City
Fredericksburg
California
N
VIRGINIA DEPARTMENT OF TRANSPORTATION
DULLES LOOP PROJECT
State Project: 0606-053-983
UPC 97529
Preliminary Noise Analysis
Figure 2A
Noise Receptor Location Map
7/19/2012


LOUDOUN VALLEY ESTATES SUBDIVISION
STUKELY DR
FREEPORT PL
ROGERSDALE PL
PEBBLE RUN PL
OVERLAND DR
CAMERONS POINT CT
SUMMERSTOWN PL
WEATHER SERVICE RD
ROCK HAVEN WY
TRADE CENTER PL
BEAVER MEADOW RD
OLD OX RD
BEARS SCHOOL RD
M 1
M 2
M 3
M 4
M 5
M 6
M 7
M 8
M 11
M 12
M 13
R 2
R 3
R 4
R 5
Barrier A1
Barrier A2
Barrier A3
CNE A
Monitored Receivers (R#)
Modeled Receivers (M#)
Impacted and Benefitted
Impacted not Benefitted
Benefitted not Impacted
Not Impacted not Benefitted
CNE
500' Boundary
66dB(A) Contour Line
Proposed Roadway Design
Barrier Feasible but not Reasonable
Barrier Feasible and Reasonable
0 500 1,000 2,000 Feet
0 125 250 500 Meters
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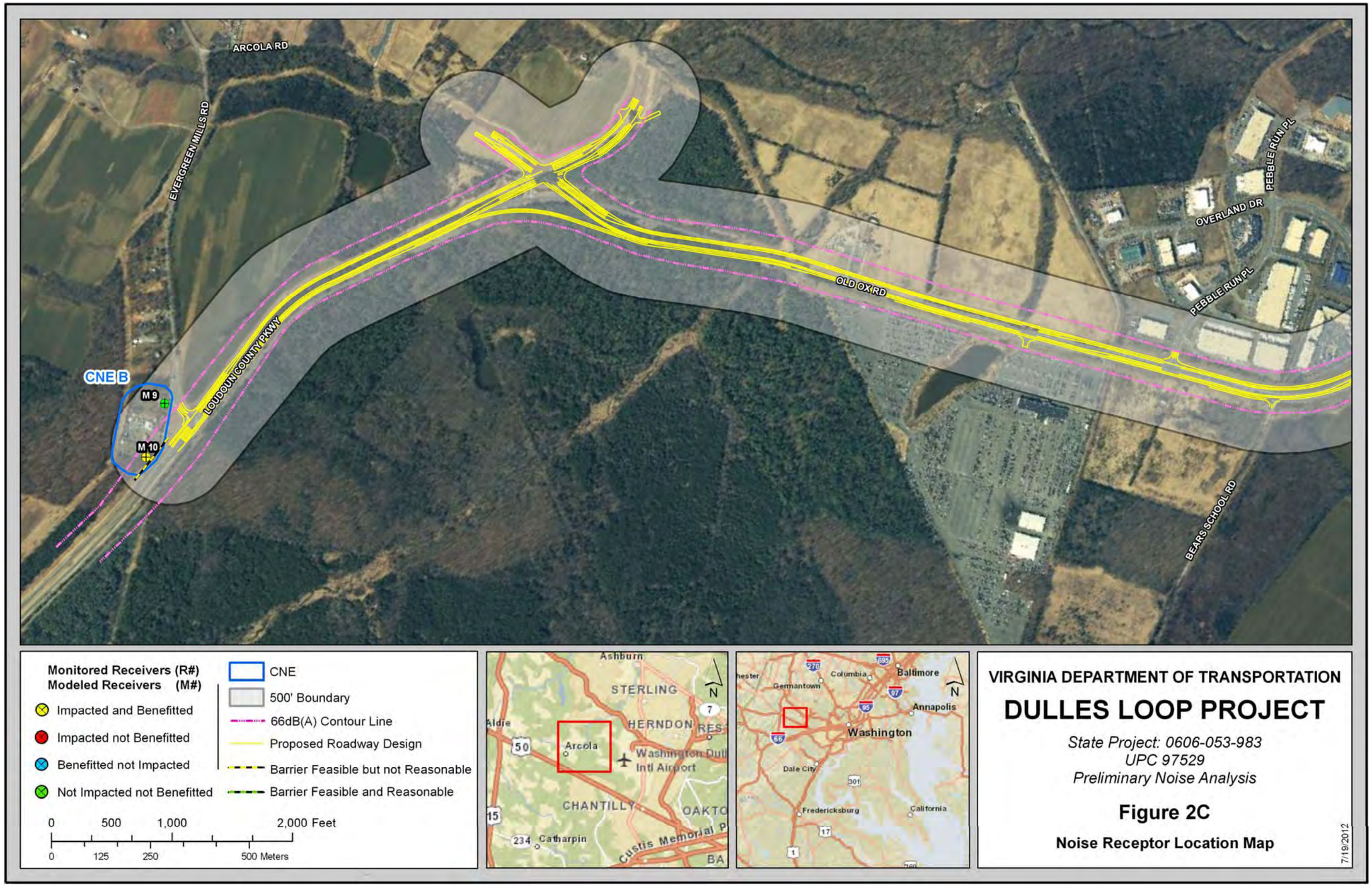
Figure 2B
Noise Receptor Location Map
7/19/2012


ARCOLA RD
EVERGREEN MILLS RD
LOUDOUN COUNTY PKWY
OLD OX RD
OVERLAND DR
PEBBLE RUN PL
PEBBLE RUN PL
BEARS SCHOOL RD
CNE B
M 9
M 10
Monitored Receivers (R#)
Modeled Receivers (M#)
Impacted and Benefitted
Impacted not Benefitted
Benefitted not Impacted
Not Impacted not Benefitted
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State Project: 0606-053-983
UPC 97529
Preliminary Noise Analysis
Figure 2C
Noise Receptor Location Map
7/19/2012

V. Evaluation of Design Year Noise Levels and Noise Impact Assessment

Following the development of the existing conditions model and the prediction of existing (worst-case) noise levels, the assessment continued with the projection of Design Year (2036) noise levels. This task was accomplished by accounting for the proposed improvements and applying Design Year (2036) traffic volumes and composition to the validated computer model. The proposed improvements should be considered conceptual and preliminary in nature. Design Year (2036) Build noise levels were predicted with the conceptual improvements in place and in use.

The next step in the noise analysis is to determine if future noise levels at the sensitive receptors will approach or exceed the FHWA/VDOT NAC. If the criteria are approached or exceeded at any receptor, noise mitigation would be considered and evaluated in an attempt to reduce future noise to acceptable levels. The noise levels associated with the Design Year (2036) modeling analysis are summarized in Column 8 of Table 2.

Design Year (2036) traffic volumes, vehicle composition, and speeds were assigned to all proposed roadways. All traffic data used in the Design Year (2036) noise analyses were derived from traffic engineering studies performed during the preliminary engineering phase of the project (refer to Appendix D*).*

Federal regulations (23 CFR Part 772) state that if a noise level at any given receptor approaches or exceeds the appropriate abatement criterion, or if predicted traffic noise levels substantially exceed the existing noise levels (by 10 dBA), abatement considerations are warranted. Table 1 summarizes the federal and state criteria for a variety of activity categories. Most sites modeled in this noise analysis represent Category B land uses, with one site representing a Category C land use.

As shown in Table 2, Design Year Build (2036) noise levels are predicted to exceed the FHWA/VDOT Noise Abatement Criteria (NAC) at four of the modeled sites (M4, M6, M12, and M13) and one of the monitored sites (R4) within CNE A and one modeled noise sensitive receptor within CNE B (M10). The noise impacts within CNE A will affect 14 residences within the Loudoun Valley Estates subdivision, along Summerstown Place, Rogersdale Place, and Camerons Point Court. The noise impacts within CNE B will affect one residence located on Evergreen Mills Road (Route 621), near the intersection with Loudoun County Parkway.

TABLE 2
Dulles Loop Project
Sound Level Summary in dB(A)

	1	2	3	4	5	6	7	8
CNE	**Site**	**Site Representation**	**Monitored (2012) Noise Level**	**Modeled Noise Level**	**Difference (Mon.-Mod.)**	**Criteria**	**Existing Worst-Case (2011) Noise Level**	**Design Year (2036) Build Noise Level**
A	R2	3 residences	56.7	59.0	-2.3	66	62	65
	R3	4 residences	54.1	53.0	1.1	66	56	58
	R4	3 residences	57.0	58.6	-1.6	66	62	66
	R5	5 residences	57.8	56.5	1.3	66	60	64
	M1	4 residences	--	--	--	66	60	62
	M2	4 residences	--	--	--	66	58	61
	M3	3 residences	--	--	--	66	61	63
	M4	3 residences	--	--	--	66	62	66
	M5	2 residences	--	--	--	66	56	58
	M6	4 residences	--	--	--	66	62	67
	M7	7 residences	--	--	--	65	55	58
	M8	3 residences	--	--	--	66	57	61
	M11	Playground	--	--	--	66	58	62
	M12	3 residences	--	--	--	66	61	68
	M13	1 residence	--	--	--	66	64	67
B	M9	2 residences	--	--	--	66	62	63
	M10	1 residence	--	--	--	66	69	72

*Grey highlighted cells indicate impact

VI. Noise Abatement Evaluation

Design Year Build (2036) noise levels are predicted to exceed the NAC in both CNE A and CNE B within the project corridor. Therefore, as per FHWA/VDOT procedures, noise abatement considerations are warranted, as discussed in **Phase 1**, for the impacted properties within both CNEs.

Phase 2 and **Phase 3** of VDOT's three-phased approach to considering noise abatement and determining the feasibility and reasonableness of noise barriers is discussed below in detail.

Phase 2: Feasibility Criteria for Noise Barriers

To determine feasibility of a highway traffic noise barrier, the following two conditions shall be considered:

- *at least a 5 dB(A) highway traffic noise reduction at impacted receptors. Per 23 CFR 772, FHWA requires the highway agency to determine the number of impacted receptors required to achieve at least 5 dB(A) of reduction. VDOT requires that fifty percent (50%) or more of the impacted receptors experience 5 dB(A) or more of insertion loss to be feasible; and;*

- *the determination that it is possible to design and construct the noise abatement measure. The factors related to the design and construction include: safety, barrier height, topography, drainage, utilities, and maintenance of the abatement measure, maintenance access to adjacent properties, and general access to adjacent properties (i.e. arterial widening projects).*

FHWA and VDOT guidelines recommend a variety of abatement measures which should be considered in response to transportation-related noise impacts. While noise barriers and/or earth berms are generally the most effective form of noise abatement, additional abatement measures exist which have the potential to provide considerable noise reductions, under certain circumstances. Additionally, the Code of Virginia (§33.1-223.2:21) states: "Whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required."

Consideration will be given to these measures during the Final Design phase, where feasible:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise abatement measure.

- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.

- Alteration of horizontal and vertical alignments.

- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.

- Noise insulation of Activity Category D land use facilities listed in Table 1. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) requires that whenever the Commonwealth Transportation Board or VDOT plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. However, low noise pavement materials and techniques will only be considered if VDOT participates in a federally approved Quiet Pavement Pilot Program. Noise reducing design is not an option to mitigate impacts for this project, as the proposed alignment best matches the existing terrain and roadways while minimizing impacts to the properties. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required. However, the landscaping must not decrease driver sight and must not require additional right-of-way. Correspondence related to HB 2577 is contained in Appendix I.

Due to the project need and the nature of the proposed improvements, traffic control measures were not considered an appropriate solution. Property acquisition to provide noise abatement was not necessary or supported by the analysis. Therefore, noise barriers and/or earth berms were considered the only form of abatement having the potential to reduce Design Year Build (2036) noise levels.

Noise walls and earth berms are often implemented into the highway design in response to identified noise impacts. The effectiveness of a free-standing (post and panel) noise barrier and an earth berm of equivalent height are relatively consistent; however, an earth berm is often perceived as a more aesthetically pleasing option. Therefore, where possible, earth berms are typically the preferred form of noise abatement. The use of earth berms is not always an option, however, due to the excessive space they require adjacent to the roadway corridor. At a standard slope of 2:1, every one foot of berm height would require approximately four feet of horizontal width. This requirement becomes more complex on roadway improvement projects, where residential properties often abut the proposed roadway corridor. In these situations, implementation of earth berms can require considerable property acquisition to accommodate noise abatement. Due to limited right-of-way throughout the proposed roadway corridor and the

potential impact (and acquisition) to adjacent residential properties and local roadways that would be required to provide berms, earth berms were not considered a viable abatement option for this project. Therefore, noise barriers were evaluated as a way to reduce Design Year Build (2036) noise levels below criteria.

Phase 3: Reasonableness Criteria for Noise Barriers

A determination of noise barrier reasonableness will include the consideration of the parameters listed below. The parameters used during the National Environmental Policy Act (NEPA) process are also used during the Final Design phase when making a determination of noise barrier reasonableness. When performing a reasonableness analysis for the NEPA document, some parameters (e.g., desires of the impacted community) will not yet be quantifiable. All of the reasonableness factors must collectively be achieved in order for a noise abatement measure to be deemed reasonable.

- **Viewpoints of the benefited receptors**
  VDOT shall solicit the viewpoints of all benefited receptors through certified mailings and obtain enough responses to document a decision as to whether or not there is a desire for the proposed noise abatement measure. Fifty percent (50%) or more of the respondents shall be required to favor the noise abatement measure in determining reasonableness.

- **Cost-effectiveness**
  VDOT's noise barrier cost effectiveness value is based upon a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 1,600. This MaxSF/BR criterion shall be applied as part of the noise barrier reasonableness determination. It replaces the previously used "Cost per Benefited Receptor" criteria.

- **Noise Reduction Design Goals**
  The design goal is a reasonableness factor indicating a specific reduction in noise levels that VDOT uses to identify that a noise abatement measure effectively reduces noise. The design goal establishes a criterion, selected by VDOT, that noise abatement must achieve. VDOT's design goal is 7db(A) of insertion loss for at least one impacted receptor. The design goal is not the same as acoustic feasibility, which is the minimum level of effectiveness of a noise abatement measure. Acoustic feasibility indicates that the noise abatement measure can, at a minimum, achieve a discernible reduction in noise levels.

The effectiveness of a noise barrier is measured by examining the barrier's capability to reduce Design Year Build noise levels. Noise reduction is measured by comparing Design Year Build pre-and post-barrier noise levels. This difference between unabated and abated noise levels is known as "insertion loss" (IL). It is important to optimize the noise barrier design to achieve the most effective noise barrier in terms of both noise reduction (insertion losses) and cost. Although at least a 5 dB(A) reduction is required to meet the feasibility criteria, the following tiered noise barrier abatement goals should be used to govern barrier design and optimization.

- Reduction of future highway traffic noise by 7dB(A) at one (1) or more of the impacted receptor sites (required criterion).

- Reduction of future highway traffic noise levels to the low-60-decibel range when practical (desirable).

- Reduction of future highway traffic noise levels to existing noise levels when practical (desirable).

The following is a preliminary discussion of the evaluated noise barrier system for CNE A and CNE B. Noise abatement was evaluated where noise impacts are predicted to occur. The noise evaluation is preliminary and a more detailed review will be completed during the Final Design phase. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the Final Design Noise Analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction. Appendix G provides completed warranted, feasible, and reasonable worksheets.

CNE A

Design Year Build (2036) noise levels are predicted to create an exceedence at 14 residential properties within CNE A located within the Loudoun Valley Estates subdivision, along Summerstown Place, Rogersdale Place, and Camerons Point Court. To effectively protect the residences, and provide some neighborhood continuity, a three barrier noise barrier system was evaluated along the southbound lanes of Old Ox Road (Route 606) from Beaver Meadow Road to Freeport Place (Barrier A1), between Freeport Place and Stukely Drive (Barrier A2) and a northern extension to protect the impacted residences along Rogersdale Place (Barrier A3).

The three-barrier system for CNE A has a total length of approximately 2,864 feet. At a height of 12 feet, this barrier system provides feasible (>5dBA) noise reductions to approximately 27 residences, as shown in Table 4. Noise abatement for CNE A is considered feasible, per VDOT procedures. The total area for the barrier system for CNE A is approximately 34,370 square feet and benefits approximately 27 total residences, as shown in Table 4. This barrier system achieves the design goal of at least a 7 dB(A) insertion loss at an impacted receptor. This barrier is considered reasonable because it has a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 1,273, thus within the (MaxSF/BR) value of 1,600.

CNE B

Design Year Build (2036) noise levels are predicted exceed the NAC at one property within CNE B located along Old Ox Road (Route 606) / Evergreen Mills Road (Route 621). A continuous post and panel noise barrier was evaluated along the southbound lanes of Old Ox Road (Route 606), just south of Evergreen Mills Road (Route 621). The preliminary barrier has a length of 269 feet (see Table 4). At an evaluated height of 12 feet, the noise barrier achieves feasible reductions at one residence, as shown in Table 3. Therefore, noise abatement within

CNE B is considered feasible at this time. This barrier achieves at least a 7 dB(A) insertion loss at the impacted property. However, this barrier is not considered reasonable because it has a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 3,228, thus exceeding the (MaxSF/BR) value of 1,600.

TABLE 3
Dulles Loop Project
Noise Barrier Feasibility Evaluation (12 foot Barrier Height)

	1	2	3	4	5
Barrier	**Site**	**Number of Residences**	**Design Year (2036) Build Noise Level**	**Mitigated Noise Level**	**Insertion Loss (IL)**
A1	R2	3	65	58	7
	R3	4	58	54	4
	M4	3	66	60	6
	M5	2	58	54	4
	M6	4	67	58	9
	M7	7	58	53	5
	M12	3	68	61	7
A2	R4	3	66	58	8
	M2	4	61	57	4
	M3	3	63	58	5
A3	M1	4	62	59	3
	M13	1	67	61	6
B	M9	2	63	63	0
	M10	1	72	66	8

*Grey highlighted cells indicate impact
**Blue highlighted cells indicate receptors achieving an IL of 5 dB(A) or greater

TABLE 4
Dulles Loop Project
Noise Abatement Reasonableness Evaluation

Barrier Segment	Number of Benefited Residences	Combined Noise Barrier Length (ft.)	Average Noise Barrier Height (ft.)	Maximum Square Footage (MaxSF)	MaxSF per Benefited Residence	Barrier Cost ($48/sq. ft.)	Feasible	Reasonable
A	27	2,864	12	34,370	1,273	$1,649,760	Y	Y
B	1	269	12	3,228	3,228	$154,944	Y	N

VII. Construction Noise

VDOT is also concerned with noise generated during the construction phase of the proposed project. The degree of noise impact will vary, as it is directly related to the types and number of equipment used and the proximity to the noise-sensitive land uses within the project area.

Based on a review of the project area, no considerable, long-term construction-related noise impacts are anticipated. Any noise impacts that do occur, as a result of roadway construction measures, are anticipated to be temporary in nature and will cease upon completion of the project construction phase.

The following will be utilized to help minimize potential construction-related noise impacts. A detailed discussion of VDOT's construction noise policy can be viewed in *Section 107.16(b) 3 Noise, VDOT's Road and Bridge Specifications (VDOT, 2007).*

- The Contractor's operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels. Such noise level measurements shall be taken at a point on the perimeter of the construction limit that is closest to the adjoining property on which a noise-sensitive activity is occurring. A noise-sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose and not present an unreasonable public nuisance. Such activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.

- VDOT may monitor construction-related noise. If construction noise levels exceed 80 decibels during noise sensitive activities, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.

- VDOT may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 PM and 6 AM. If other hours are established by local ordinance, the local ordinance shall govern.

- Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.

- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

- These requirements shall not be applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.

VIII. Public Involvement/Local Officials Coordination

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

VDOT's current noise policy outlines VDOT's approach to communication with local officials and provides information and resources on highway noise and noise-compatible land-use planning. VDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize the potential impacts of highway traffic noise.

Entering the Quiet Zone, is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. The following is a link to this brochure on FHWA's website: http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/qz00.cfm.

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

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

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

Also required under the revised 2011 FHWA and VDOT noise policies is information on the noise impact zones adjacent to project roadways in undeveloped lands. To determine these zones, noise levels are computed at various distances from the edge of the project roadways in each of the undeveloped areas of the project study area. The distances from the edge of the roadway to the NAC sound levels are then determined through interpolation. Distances vary in the project corridor due to changes in traffic volumes, or terrain features. The distances for this

project are summarized in Table 5. Any noise sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels.

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments. Highway traffic noise is considered a linear noise source and sound levels can drop considerably over distance. The degree that sound levels decrease can vary based on a number of different factors including objects that shield the roadway noise, terrain features and ground cover type (e.g., pavement, grass or snow). The use of noise level contours have become increasingly popular over the last several years, as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66-dB(A) noise contour). Figures 2A through 2C show the approximate 66-dB(A) noise level contours when considering the improvements made to Old Ox Road (Route 606) and the Design Year (2036) traffic volumes, speeds and composition. Table 5 shows the approximate distance of the 66 dB(A) contour line from the center line of the proposed conceptual design within each CNE throughout the project.

TABLE 5
Dulles Loop Project
Distance from Centerline of Proposed Design to CNE Specific Noise Contours

Design Year (2036) Noise Level Contours 66 dB(A)	
CNE	**Distance (feet)**
A	160
B	180

IX. Conclusion

In summary, the results of the preliminary noise analysis for the Dulles Loop Project indicate that Design Year Build (2036) noise levels are anticipated to exceed the FHWA/VDOT NAC at five locations representing 14 residences within the Loudoun Valley Estates subdivision, along Summerstown Place, Rogersdale Place, and Camerons Point Court. Noise levels are anticipated to exceed the NAC at one location within CNE B representing one residence along Evergreen Mills Road (Route 621). Barrier A (CNE A) is feasible and reasonable, with a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 1,273, which is below the limit of 1,600 MaxSF/BR. Barrier B (CNE B) is considered feasible with 100% of the affected receptors receiving an insertion loss of 5 dB(A) or more. However, Barrier B is not considered reasonable with the Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value exceeding 1,600. Noise abatement considerations for both CNEs within the Dulles Loop Project should be reassessed during the Final Design phase of the project.

Appendix A
Noise Meter and Acoustical Calibrator Calibration Certificates

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

METROLOGGER

Manufactured by:	METROSONICS
Model No:	db-3080
Serial No:	2555
Calibration Recall No:	20965

Submitted By:

Customer:	CHUCK WEAVER
Company:	MCCORMICK TAYLOR
Address:	509 S EXETER STREET/ 4TH FLOOR
	BALTIMORE MD 21202

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Calibration Date: 27-Jun-11

Certificate No: 20965 - 1

Approved by:

Felix Christopher
Quality Manager

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1533.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

METROLOGGER

Manufactured by:	METROSONICS
Model No:	db-3080
Serial No:	2557
Calibration Recall No:	20965

Submitted By:

Customer:	CHUCK WEAVER
Company:	MCCORMICK TAYLOR
Address:	509 S EXETER STREET/ 4TH FLOOR
	BALTIMORE MD 21202

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: 27-Jun-11

Certificate No: 20965 - 3

Felix Christopher
Quality Manager

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.
Calibration Traceable To N. I. S. T.
ACCREDITATION ISO/IEC 17025 ACCREDITED 1633.01
Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3904**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **db-3080 METR**

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **20-May-11**

Certificate No: **20813 - 2**

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1633.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3908**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **db-3080 METR**

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **20-May-11**

Certificate No: **20813 - 5**

Felix Christopher
Quality Manager

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1839.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

Appendix B
Noise Monitoring Data Forms

Dulles Loop

Site # 2
Done By: RVH / AJN
Meter: 3908

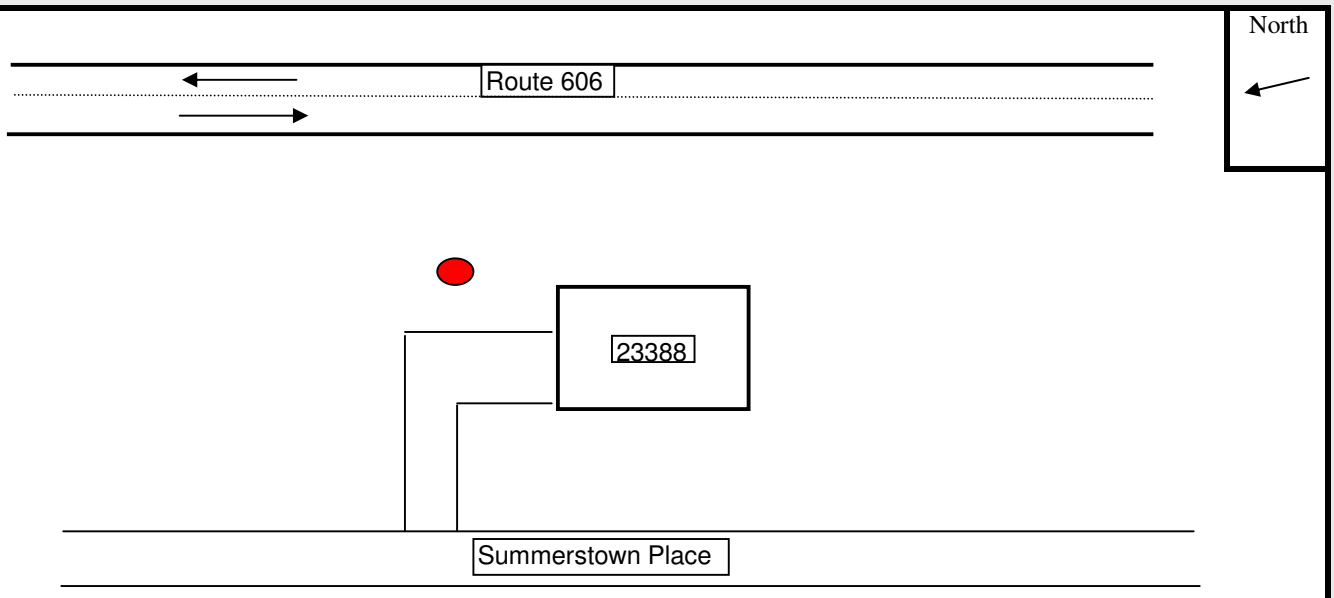
Description : 23388 Summerstown Place

	Start	End
Date	4/3/2012	4/3/2012
Time	1:40 PM	2:40 PM

Traffic	**NB/EB**	**SB/WB**
Cars	524	544
MT	20	52
HT	48	36
Buses	0	0
Motorcycles	0	4
Total	**592**	**636**

Notes: Traffic was counted for 15 minutes

Wind Speed (mph) >1 **Temp. (°F)** 64 **Humidity (%)**



Dulles Loop

Site # 3
Done By: RVH / AJN
Meter: 2555

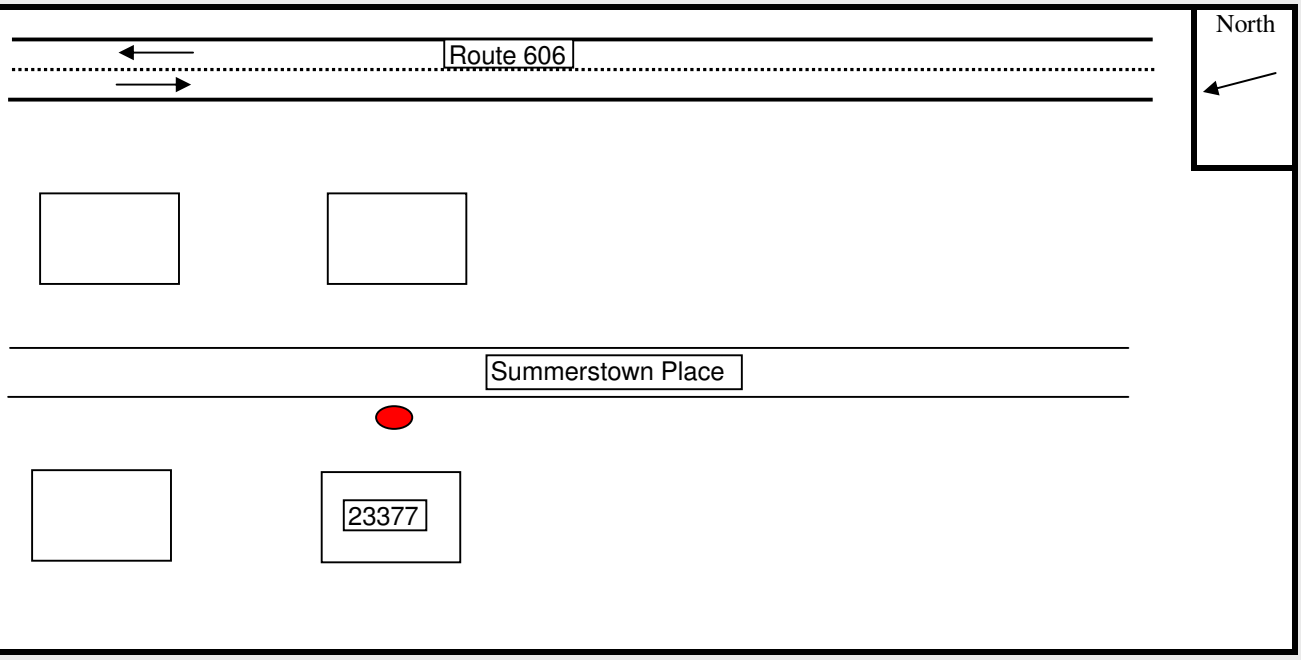
Description : 23377 Summerstown Place

	Start	End
Date	4/3/2012	4/3/2012
Time	13:40	14:40

Traffic	**NB/EB**	**SB/WB**
Cars	524	544
MT	20	52
HT	48	36
Buses	0	0
Motorcycles	0	4
Total	**592**	**636**

Notes: Traffic was counted for 15 minutes

Wind Speed (mph) > 1 **Temp. (°F)** 64 **Humidity (%)**



McCormick Taylor, Inc

Dulles Loop

Site # 4
Done By: RVH / AJN
Meter: 2557

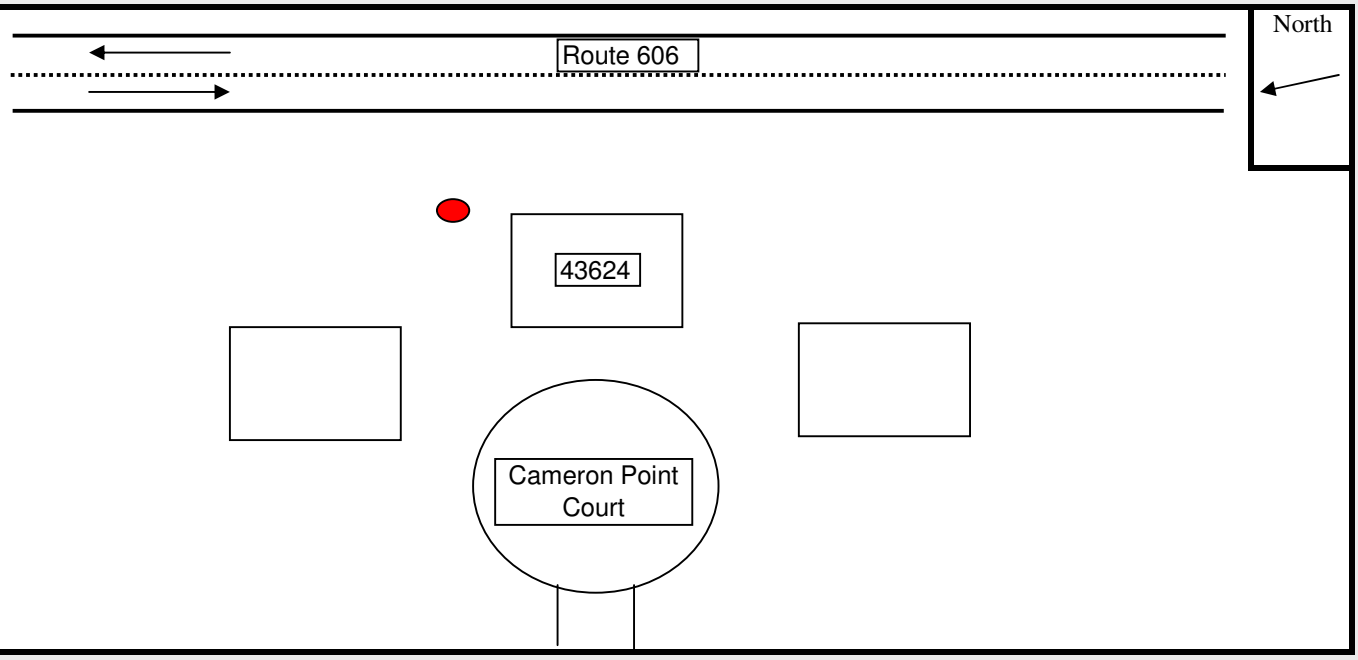
Description : 43624 Cameron Point Court

	Start	End
Date	4/3/2012	4/3/2012
Time	13:40	14:40

Traffic	**NB/EB**	**SB/WB**
Cars	524	544
MT	20	52
HT	48	36
Buses	0	0
Motorcycles	0	4
Total	**592**	**636**

Notes: Traffic was counted for 15 minutes

Wind Speed (mph) >1 **Temp. (°F)** 64 **Humidity (%)**



Dulles Loop

Site # 5
Done By: RVH / AJN
Meter: 3904

Description : 23292 Rogerdale Place

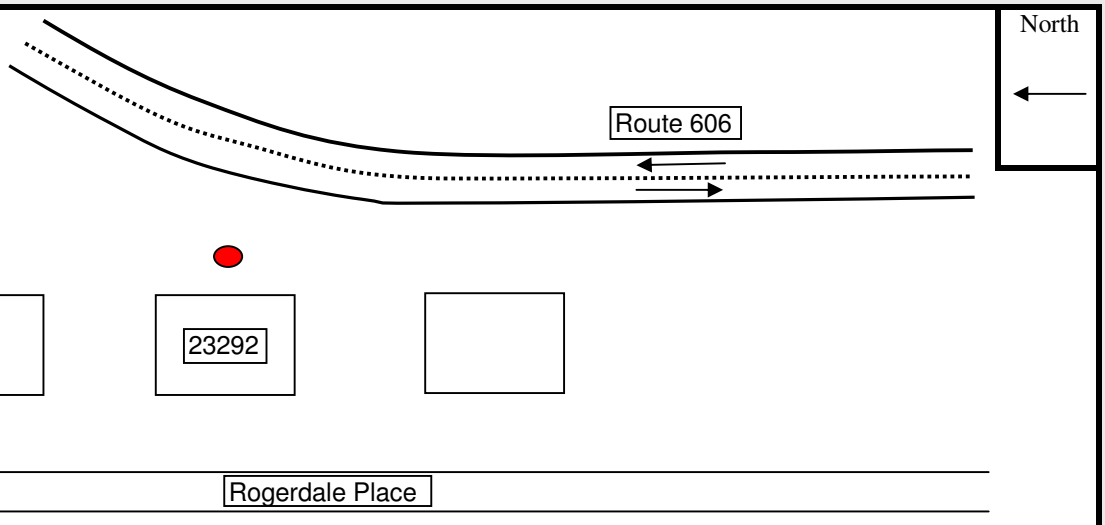
	Start	End
Date	4/3/2012	4/3/2012
Time	13:40	14:40

Traffic	**NB/EB**	**SB/WB**
Cars	524	544
MT	20	52
HT	48	36
Motorcycles	0	0
Buses	0	4
Total	**592**	**636**

Notes: **Aircraft gets drowned out by truck accelerations. Aircraft flyovers: 13:50, 13:52, 14:00, 14:02, 14:06, 14:08, 14:14, 14:16, 14:25, 14:29, 14:31, 14:34, 14:37**

Traffic was counted for 15 minutes

Wind Speed (mph) >1 **Temp. (°F)** 64 **Humidity (%)**



McCormick Taylor, Inc

Appendix C
Noise Monitoring Data
Metrosonics Printouts

****
Filename.....SITE2~1
Test Location.....
Employee Name.....
Employee Number.....
Department.....

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 3908
REPORT PRINTED ON 04/04/12 at 10:33:55

User ID: _____

LOGGING STARTED.....04/03/12 at 12:49:00
TOTAL LOGGING TIME...0 DAYS 02:08:14
LOGGING STOPPED.....04/03/12 at 14:57:14
TOTAL INTERVALS.....129
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....04/03/12 AT 12:30:10
PRE-TEST CALIBRATION RANGE...39.4 TO 139.4 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 57.1dB
Lav (80)..... 39.4dB

Lav (90)..... 39.4dB
SEL..... 95.8dB

TWA..... 51.3dB
TWA (80)..... 39.4dB
TWA (90)..... 39.4dB

Lmax..... 76.7dB 04/03/12 at 13:50:09
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav	Lmax	Lpk	L(10.0)	L(99.9)
	dBA	dBA	dBC	dBA	dBA
4/3/2012					
12:49:00	53.5	58.3	UNDER	55.4	49.4
12:50:00	51.3	56.3	UNDER	54.4	46.4
12:51:00	53.4	57.1	UNDER	56.4	48.4
12:52:00	51.2	55.1	UNDER	53.4	47.4
12:53:00	55.6	59.5	UNDER	58.4	48.4
12:54:00	53.8	59.5	UNDER	57.4	48.4
12:55:00	62.8	76.1	UNDER	67.4	48.4
12:56:00	52.3	57.1	UNDER	55.4	43.4
12:57:00	50.7	55.5	UNDER	54.4	44.4
12:58:00	52.9	60.2	UNDER	56.4	44.4
12:59:00	54.4	63.0	UNDER	59.4	45.4
13:00:00	58.0	64.6	UNDER	62.4	43.4
13:01:00	58.4	66.6	UNDER	63.4	45.4
13:02:00	53.8	60.3	UNDER	56.4	48.4
13:03:00	65.0	73.8	UNDER	70.4	45.4
13:04:00	54.3	61.1	UNDER	58.4	44.4
13:05:00	52.3	56.6	UNDER	54.4	48.4
13:06:00	57.1	62.7	UNDER	60.4	51.4
13:07:00	53.8	58.1	UNDER	56.4	47.4
13:08:00	62.5	72.4	UNDER	67.4	51.4
13:09:00	54.1	60.3	UNDER	57.4	47.4
13:10:00	58.3	64.0	UNDER	62.4	49.4
13:11:00	53.4	59.5	UNDER	57.4	44.4
13:12:00	61.4	68.2	UNDER	66.4	48.4
13:13:00	54.6	60.3	UNDER	57.4	50.4
13:14:00	55.3	59.1	UNDER	57.4	47.4
13:15:00	51.8	56.0	UNDER	54.4	46.4
13:16:00	57.0	63.9	UNDER	60.4	47.4
13:17:00	52.5	60.2	UNDER	56.4	46.4
13:18:00	58.7	66.2	UNDER	64.4	44.4

13:19:00	57.0	63.7	UNDER	60.4	48.4			
13:20:00	52.3	57.5	UNDER	55.4	46.4			
13:21:00	50.3	53.3	UNDER	52.4	46.4			
13:22:00	64.7	75.5	UNDER	68.4	49.4			
13:23:00	56.0	63.1	UNDER	60.4	48.4			
13:24:00	52.0	57.1	UNDER	55.4	45.4			
13:25:00	52.3	57.7	UNDER	55.4	46.4			
13:26:00	52.0	56.7	UNDER	55.4	48.4			
13:27:00	52.6	59.5	UNDER	57.4	43.4			
13:28:00	47.5	52.5	UNDER	50.4	41.4			
13:29:00	58.8	67.9	UNDER	64.4	42.4			
13:30:00	52.4	58.3	UNDER	56.4	43.4			
13:31:00	53.4	58.3	UNDER	56.4	49.4			
13:32:00	54.7	62.7	UNDER	57.4	49.4			
13:33:00	53.4	56.7	UNDER	55.4	49.4			
13:34:00	51.4	54.2	UNDER	53.4	46.4			
13:35:00	53.0	58.7	UNDER	56.4	45.4			
13:36:00	57.7	65.9	UNDER	60.4	45.4			
13:37:00	56.3	63.4	UNDER	59.4	45.4			
13:38:00	59.5	69.9	UNDER	62.4	47.4			
13:39:00	55.2	64.5	UNDER	59.4	45.4	1 min Leq	1 min Leq in energy	
13:40:00	53.7	59.9	UNDER	55.4	46.4	53.7	234422.8815	
13:41:00	55.2	59.9	UNDER	58.4	49.4	55.2	331131.1215	
13:42:00	55.2	60.8	UNDER	59.4	48.4	55.2	331131.1215	
13:43:00	55.9	63.1	UNDER	61.4	43.4	55.9	389045.145	
13:44:00	53.0	59.6	UNDER	56.4	45.4	53	199526.2315	
13:45:00	54.5	60.1	UNDER	57.4	43.4	54.5	281838.2931	
13:46:00	54.8	58.2	UNDER	57.4	48.4	54.8	301995.172	
13:47:00	49.5	54.4	UNDER	51.4	46.4	49.5	89125.09381	
13:48:00	54.9	63.9	UNDER	57.4	48.4	54.9	309029.5433	
13:49:00	55.3	65.5	UNDER	58.4	45.4	55.3	338844.1561	
13:50:00	67.9	76.7	UNDER	73.4	47.4	67.9	6165950.019	
13:51:00	55.4	63.5	UNDER	61.4	46.4	55.4	346736.8505	
13:52:00	56.1	62.3	UNDER	60.4	49.4	56.1	407380.2778	
13:53:00	56.0	62.4	UNDER	60.4	47.4	56	398107.1706	
13:54:00	52.3	56.7	UNDER	54.4	45.4	52.3	169824.3652	
13:55:00	52.3	55.0	UNDER	53.4	48.4	52.3	169824.3652	
13:56:00	54.4	59.9	UNDER	57.4	44.4	54.4	275422.8703	
13:57:00	55.6	60.4	UNDER	58.4	47.4	55.6	363078.0548	
13:58:00	55.2	63.5	UNDER	58.4	48.4	55.2	331131.1215	
13:59:00	54.8	60.6	UNDER	58.4	44.4	54.8	301995.172	
14:00:00	60.2	70.3	UNDER	64.4	49.4	60.2	1047128.548	
14:01:00	54.7	61.1	UNDER	58.4	46.4	54.7	295120.9227	
14:02:00	57.7	65.5	UNDER	62.4	46.4	57.7	588843.6554	
14:03:00	51.7	54.6	UNDER	53.4	43.4	51.7	147910.8388	
14:04:00	55.3	62.8	UNDER	58.4	47.4	55.3	338844.1561	
14:05:00	62.0	71.1	UNDER	67.4	43.4	62	1584893.192	
14:06:00	55.6	62.3	UNDER	60.4	43.4	55.6	363078.0548	
14:07:00	59.8	69.1	UNDER	63.4	49.4	59.8	954992.586	
14:08:00	55.9	61.5	UNDER	59.4	47.4	55.9	389045.145	
14:09:00	54.9	61.5	UNDER	58.4	47.4	54.9	309029.5433	
14:10:00	50.3	55.1	UNDER	54.4	41.4	50.3	107151.9305	

14:11:00	51.9	57.9	UNDER	54.4	43.4	51.9	154881.6619
14:12:00	57.1	63.0	UNDER	61.4	47.4	57.1	512861.384
14:13:00	52.4	55.8	UNDER	54.4	47.4	52.4	173780.0829
14:14:00	56.4	62.7	UNDER	61.4	48.4	56.4	436515.8322
14:15:00	57.9	62.8	UNDER	61.4	51.4	57.9	616595.0019
14:16:00	51.7	57.0	UNDER	55.4	43.4	51.7	147910.8388
14:17:00	56.5	62.3	UNDER	60.4	45.4	56.5	446683.5922
14:18:00	57.5	63.5	UNDER	60.4	49.4	57.5	562341.3252
14:19:00	53.0	57.1	UNDER	55.4	46.4	53	199526.2315
14:20:00	54.0	60.3	UNDER	58.4	45.4	54	251188.6432
14:21:00	54.1	60.7	UNDER	56.4	48.4	54.1	257039.5783
14:22:00	57.5	63.9	UNDER	62.4	48.4	57.5	562341.3252
14:23:00	52.6	57.9	UNDER	55.4	49.4	52.6	181970.0859
14:24:00	58.5	64.6	UNDER	62.4	49.4	58.5	707945.7844
14:25:00	58.2	66.6	UNDER	61.4	49.4	58.2	660693.448
14:26:00	57.2	61.1	UNDER	60.4	50.4	57.2	524807.4602
14:27:00	51.9	60.3	UNDER	54.4	45.4	51.9	154881.6619
14:28:00	54.8	60.2	UNDER	58.4	48.4	54.8	301995.172
14:29:00	55.4	60.3	UNDER	58.4	43.4	55.4	346736.8505
14:30:00	54.9	60.5	UNDER	57.4	44.4	54.9	309029.5433
14:31:00	54.6	61.1	UNDER	56.4	48.4	54.6	288403.1503
14:32:00	51.1	57.8	UNDER	56.4	43.4	51.1	128824.9552
14:33:00	52.1	57.1	UNDER	55.4	45.4	52.1	162181.0097
14:34:00	59.0	63.5	UNDER	62.4	52.4	59	794328.2347
14:35:00	55.7	63.5	UNDER	61.4	47.4	55.7	371535.2291
14:36:00	54.3	64.1	UNDER	57.4	43.4	54.3	269153.4804
14:37:00	59.4	68.6	UNDER	62.4	50.4	59.4	870963.59
14:38:00	50.8	54.7	UNDER	51.4	47.4	50.8	120226.4435
14:39:00	54.0	58.3	UNDER	57.4	48.4	54	251188.6432
14:40:00	51.2	55.5	UNDER	52.4	47.4	51.2	131825.6739
14:41:00	51.7	59.0	UNDER	56.4	42.4		
14:42:00	56.4	61.9	UNDER	58.4	49.4		
14:43:00	62.8	71.8	UNDER	68.4	45.4		
14:44:00	53.7	59.4	UNDER	56.4	46.4		
14:45:00	53.0	58.3	UNDER	56.4	43.4		
14:46:00	56.2	62.3	UNDER	59.4	46.4		
14:47:00	57.6	63.5	UNDER	61.4	47.4		
14:48:00	57.8	64.3	UNDER	62.4	48.4		
14:49:00	56.8	63.5	UNDER	62.4	45.4		
14:50:00	53.1	58.7	UNDER	57.4	45.4		
14:51:00	56.9	63.0	UNDER	61.4	49.4		
14:52:00	58.2	65.9	UNDER	63.4	48.4		
14:53:00	58.5	64.2	UNDER	62.4	51.4		
14:54:00	55.9	63.1	UNDER	60.4	45.4		
14:55:00	60.2	69.9	UNDER	65.4	45.4		
14:56:00	60.8	70.3	UNDER	65.4	47.4		
14:57:00	66.1	71.9	UNDER	69.4	53.4		
						56.73458	

****
Filename.....SITE3~1
Test Location.....
Employee Name.....
Employee Number.....
Department.....

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.11 SERIAL # 2555
REPORT PRINTED ON 04/04/12 at 10:36:04

User ID: _____

LOGGING STARTED.....04/03/12 at 12:58:00
TOTAL LOGGING TIME...0 DAYS 01:57:07
LOGGING STOPPED.....04/03/12 at 14:55:07
TOTAL INTERVALS.....118
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....04/03/12 AT 12:54:15
PRE-TEST CALIBRATION RANGE...39.7 TO 139.7 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 53.6dB
Lav (80)..... 39.7dB

Lav (90)..... 39.7dB
SEL..... 91.9dB

TWA..... 47.5dB
TWA (80)..... 39.7dB
TWA (90)..... 39.7dB

Lmax..... 77.4dB 04/03/12 at 13:50:25
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
4/3/2012					
12:58:00	50.5	56.2	UNDER	53.7	43.7
12:59:00	57.0	70.2	UNDER	57.7	44.7
13:00:00	53.6	62.7	UNDER	58.7	42.7
13:01:00	49.5	56.0	UNDER	53.7	42.7
13:02:00	47.0	51.4	UNDER	49.7	43.7
13:03:00	58.4	66.5	UNDER	64.7	43.7
13:04:00	59.4	68.9	UNDER	65.7	43.7
13:05:00	51.4	57.9	UNDER	55.7	43.7
13:06:00	48.9	56.9	UNDER	51.7	44.7
13:07:00	52.7	63.5	UNDER	57.7	44.7
13:08:00	58.3	70.5	UNDER	58.7	47.7
13:09:00	47.6	55.1	UNDER	50.7	43.7
13:10:00	50.7	55.0	UNDER	53.7	45.7
13:11:00	47.5	52.1	UNDER	50.7	41.7
13:12:00	56.2	65.3	UNDER	60.7	46.7
13:13:00	49.9	59.6	UNDER	52.7	42.7
13:14:00	56.5	68.9	UNDER	59.7	46.7
13:15:00	47.4	58.8	UNDER	47.7	43.7
13:16:00	47.9	51.4	UNDER	50.7	41.7
13:17:00	47.9	53.5	UNDER	50.7	41.7
13:18:00	53.0	65.6	UNDER	53.7	43.7
13:19:00	52.9	57.8	UNDER	55.7	46.7
13:20:00	60.5	73.8	UNDER	63.7	42.7
13:21:00	44.1	45.7	UNDER	45.7	42.7
13:22:00	53.1	62.2	UNDER	58.7	43.7
13:23:00	54.2	67.4	UNDER	51.7	43.7
13:24:00	53.7	64.9	UNDER	58.7	42.7
13:25:00	53.8	64.5	UNDER	56.7	44.7
13:26:00	45.4	49.8	UNDER	47.7	42.7
13:27:00	45.0	48.9	UNDER	47.7	42.7

13:28:00	43.2	44.9	UNDER	44.7	41.7		
13:29:00	46.6	56.6	UNDER	49.7	41.7		
13:30:00	54.5	65.1	UNDER	59.7	45.7		
13:31:00	53.6	64.8	UNDER	57.7	44.7		
13:32:00	50.7	57.1	UNDER	53.7	44.7		
13:33:00	52.5	63.9	UNDER	54.7	45.7		
13:34:00	48.4	59.2	UNDER	50.7	43.7		
13:35:00	49.6	55.0	UNDER	53.7	42.7		
13:36:00	48.4	56.2	UNDER	51.7	42.7		
13:37:00	46.6	50.2	UNDER	49.7	42.7		
13:38:00	47.2	52.2	UNDER	49.7	42.7		
13:39:00	49.3	56.1	UNDER	54.7	42.7	1 min Leq	1 min Leq in energy
13:40:00	44.9	47.3	UNDER	46.7	41.7	44.9	30902.95433
13:41:00	49.6	55.9	UNDER	51.7	45.7	49.6	91201.08394
13:42:00	49.2	52.1	UNDER	51.7	45.7	49.2	83176.37711
13:43:00	52.1	63.0	UNDER	52.7	43.7	52.1	162181.0097
13:44:00	46.0	52.6	UNDER	48.7	42.7	46.0	39810.71706
13:45:00	47.2	52.9	UNDER	49.7	42.7	47.2	52480.74602
13:46:00	56.0	65.7	UNDER	60.7	46.7	56.0	398107.1706
13:47:00	48.0	52.9	UNDER	51.7	43.7	48.0	63095.73445
13:48:00	49.4	55.4	UNDER	52.7	44.7	49.4	87096.359
13:49:00	47.3	51.4	UNDER	49.7	43.7	47.3	53703.17964
13:50:00	68.8	77.4	UNDER	73.7	45.7	68.8	7585775.75
13:51:00	51.8	66.5	UNDER	53.7	44.7	51.8	151356.1248
13:52:00	53.4	62.4	UNDER	56.7	48.7	53.4	218776.1624
13:53:00	48.6	53.0	UNDER	52.7	44.7	48.6	72443.59601
13:54:00	47.1	53.2	UNDER	50.7	42.7	47.1	51286.1384
13:55:00	45.7	48.5	UNDER	47.7	42.7	45.7	37153.52291
13:56:00	60.4	73.5	UNDER	62.7	45.7	60.4	1096478.196
13:57:00	47.6	51.6	UNDER	49.7	44.7	47.6	57543.99373
13:58:00	47.2	54.3	UNDER	51.7	43.7	47.2	52480.74602
13:59:00	56.1	70.0	UNDER	56.7	42.7	56.1	407380.2778
14:00:00	55.9	66.3	UNDER	58.7	44.7	55.9	389045.145
14:01:00	52.5	61.2	UNDER	57.7	46.7	52.5	177827.941
14:02:00	53.9	60.7	UNDER	57.7	46.7	53.9	245470.8916
14:03:00	47.1	51.7	UNDER	48.7	45.7	47.1	51286.1384
14:04:00	52.3	64.3	UNDER	53.7	44.7	52.3	169824.3652
14:05:00	53.2	61.3	UNDER	57.7	45.7	53.2	208929.6131
14:06:00	50.5	59.0	UNDER	54.7	42.7	50.5	112201.8454
14:07:00	55.3	66.6	UNDER	56.7	43.7	55.3	338844.1561
14:08:00	47.4	52.5	UNDER	50.7	42.7	47.4	54954.08739
14:09:00	47.3	58.6	UNDER	48.7	42.7	47.3	53703.17964
14:10:00	45.7	56.4	UNDER	46.7	41.7	45.7	37153.52291
14:11:00	50.1	60.5	UNDER	52.7	41.7	50.1	102329.2992
14:12:00	53.0	64.9	UNDER	54.7	43.7	53.0	199526.2315
14:13:00	46.3	50.5	UNDER	47.7	42.7	46.3	42657.95188
14:14:00	48.4	54.3	UNDER	50.7	44.7	48.4	69183.09709
14:15:00	48.5	54.1	UNDER	51.7	42.7	48.5	70794.57844
14:16:00	47.6	53.7	UNDER	50.7	41.7	47.6	57543.99373
14:17:00	48.1	53.7	UNDER	52.7	41.7	48.1	64565.4229
14:18:00	48.4	53.3	UNDER	51.7	41.7	48.4	69183.09709
14:19:00	45.9	49.8	UNDER	48.7	42.7	45.9	38904.5145

14:20:00	44.6	47.3	UNDER	46.7	42.7	44.6	28840.31503
14:21:00	47.5	51.8	UNDER	50.7	42.7	47.5	56234.13252
14:22:00	48.1	53.8	UNDER	51.7	42.7	48.1	64565.4229
14:23:00	48.1	54.6	UNDER	52.7	42.7	48.1	64565.4229
14:24:00	56.0	68.8	UNDER	55.7	45.7	56.0	398107.1706
14:25:00	48.2	51.4	UNDER	50.7	43.7	48.2	66069.3448
14:26:00	48.6	52.5	UNDER	51.7	43.7	48.6	72443.59601
14:27:00	45.4	50.4	UNDER	49.7	42.7	45.4	34673.68505
14:28:00	47.7	52.9	UNDER	50.7	42.7	47.7	58884.36554
14:29:00	53.4	59.0	UNDER	56.7	48.7	53.4	218776.1624
14:30:00	47.7	52.3	UNDER	50.7	43.7	47.7	58884.36554
14:31:00	49.2	55.1	UNDER	52.7	45.7	49.2	83176.37711
14:32:00	45.5	50.5	UNDER	48.7	41.7	45.5	35481.33892
14:33:00	45.2	49.7	UNDER	46.7	42.7	45.2	33113.11215
14:34:00	52.9	60.2	UNDER	56.7	44.7	52.9	194984.46
14:35:00	50.2	57.6	UNDER	53.7	43.7	50.2	104712.8548
14:36:00	46.1	59.0	UNDER	46.7	42.7	46.1	40738.02778
14:37:00	53.4	62.5	UNDER	56.7	45.7	53.4	218776.1624
14:38:00	51.4	63.3	UNDER	53.7	43.7	51.4	138038.4265
14:39:00	49.7	58.0	UNDER	53.7	42.7	49.7	93325.43008
14:40:00	50.8	62.7	UNDER	52.7	42.7	50.8	120226.4435
14:41:00	46.7	52.0	UNDER	49.7	42.7		
14:42:00	55.7	67.4	UNDER	59.7	42.7		
14:43:00	53.6	60.0	UNDER	57.7	45.7		
14:44:00	45.8	49.7	UNDER	48.7	42.7		54.058689
14:45:00	47.0	51.4	UNDER	49.7	42.7		
14:46:00	47.4	53.3	UNDER	50.7	42.7		
14:47:00	49.8	56.1	UNDER	53.7	42.7		
14:48:00	49.7	54.9	UNDER	53.7	43.7		
14:49:00	45.6	48.1	UNDER	47.7	43.7		
14:50:00	48.6	55.7	UNDER	52.7	43.7		
14:51:00	48.6	53.7	UNDER	51.7	44.7		
14:52:00	55.4	65.8	UNDER	60.7	45.7		
14:53:00	49.9	53.8	UNDER	52.7	44.7		
14:54:00	59.1	72.9	UNDER	58.7	45.7		
14:55:00	53.1	55.4	UNDER	54.7	51.7		
						54.05869	

****
Filename.....SITE4~1
Test Location.....
Employee Name.....
Employee Number.....
Department.....

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 2557
REPORT PRINTED ON 04/04/12 at 10:36:25

User ID: _____

LOGGING STARTED.....04/03/12 at 13:10:00
TOTAL LOGGING TIME...0 DAYS 01:40:09
LOGGING STOPPED.....04/03/12 at 14:50:09
TOTAL INTERVALS.....101
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....04/03/12 AT 13:01:54
PRE-TEST CALIBRATION RANGE...38.8 TO 138.8 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 68.3dB
Lav (80)..... 67.0dB

Lav (90)..... 65.6dB
SEL..... 105.9dB

TWA..... 61.5dB
TWA (80)..... 60.2dB
TWA (90)..... 58.8dB

Lmax..... 94.8dB 04/03/12 at 14:03:55
Lpk..... 110.1dB 04/03/12 at 14:03:51
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.10%
PROJ. DOSE (80).. 0.47%
DOSE (90)..... 0.07%
PROJ. DOSE (90).. 0.33%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA	
4/3/2012						
13:10:00	57.7	62.2	UNDER	60.8	49.8	
13:11:00	58.5	65.6	UNDER	62.8	49.8	
13:12:00	52.9	57.7	UNDER	56.8	46.8	
13:13:00	56.1	60.0	UNDER	58.8	48.8	
13:14:00	49.9	56.2	UNDER	54.8	41.8	
13:15:00	55.8	61.9	UNDER	60.8	44.8	
13:16:00	56.4	64.5	UNDER	60.8	45.8	
13:17:00	56.9	68.4	UNDER	58.8	44.8	
13:18:00	58.2	64.0	UNDER	62.8	42.8	
13:19:00	53.2	59.0	UNDER	55.8	45.8	
13:20:00	54.4	59.6	UNDER	56.8	50.8	
13:21:00	57.0	63.5	UNDER	60.8	49.8	
13:22:00	53.6	61.3	UNDER	56.8	49.8	
13:23:00	55.7	64.8	UNDER	60.8	45.8	
13:24:00	53.6	59.3	UNDER	56.8	48.8	
13:25:00	50.5	55.6	UNDER	52.8	44.8	
13:26:00	52.5	58.1	UNDER	56.8	44.8	
13:27:00	51.6	57.6	UNDER	55.8	46.8	
13:28:00	51.6	59.0	UNDER	54.8	45.8	
13:29:00	57.2	65.7	UNDER	62.8	45.8	
13:30:00	54.6	59.6	UNDER	57.8	46.8	
13:31:00	55.1	61.6	UNDER	59.8	43.8	
13:32:00	53.3	59.6	UNDER	57.8	46.8	
13:33:00	51.9	56.5	UNDER	54.8	48.8	
13:34:00	50.7	57.3	UNDER	56.8	43.8	
13:35:00	57.6	68.9	UNDER	60.8	44.8	
13:36:00	57.7	66.5	UNDER	64.8	46.8	
13:37:00	52.3	60.1	UNDER	56.8	46.8	
13:38:00	59.3	66.6	UNDER	64.8	51.8	
13:39:00	51.4	60.0	UNDER	54.8	43.8	1 min Leq 1 min Leq in energy

13:40:00	54.9	64.0	UNDER	58.8	47.8	54.9	309029.5433
13:41:00	57.5	64.8	UNDER	61.8	46.8	57.5	562341.3252
13:42:00	59.6	67.2	UNDER	64.8	50.8	59.6	912010.8394
13:43:00	52.2	59.3	UNDER	56.8	45.8	52.2	165958.6907
13:44:00	53.5	60.8	UNDER	57.8	46.8	53.5	223872.1139
13:45:00	54.9	60.5	UNDER	58.8	47.8	54.9	309029.5433
13:46:00	54.6	62.2	UNDER	59.8	47.8	54.6	288403.1503
13:47:00	51.5	56.0	UNDER	55.8	44.8	51.5	141253.7545
13:48:00	54.6	60.8	UNDER	57.8	45.8	54.6	288403.1503
13:49:00	64.9	73.6	UNDER	70.8	46.8	64.9	3090295.433
13:50:00	56.5	63.0	UNDER	60.8	47.8	56.5	446683.5922
13:51:00	55.2	60.8	UNDER	57.8	50.8	55.2	331131.1215
13:52:00	59.1	67.3	UNDER	62.8	50.8	59.1	812830.5162
13:53:00	55.7	62.1	UNDER	58.8	49.8	55.7	371535.2291
13:54:00	56.0	62.4	UNDER	59.8	45.8	56	398107.1706
13:55:00	54.0	57.9	UNDER	56.8	45.8	54	251188.6432
13:56:00	54.0	56.5	UNDER	55.8	51.8	54	251188.6432
13:57:00	56.2	62.8	UNDER	59.8	48.8	56.2	416869.3835
13:58:00	76.3	81.4	109.8	79.8	61.8	76.3	
13:59:00	70.7	75.7	UNDER	73.8	62.8	70.7	
14:00:00	73.3	81.3	UNDER	74.8	65.8	73.3	
14:01:00	65.5	71.3	UNDER	69.8	53.8	65.5	
14:02:00	56.5	63.4	UNDER	60.8	50.8	56.5	446683.5922
14:03:00	85.1	94.8	110.1	92.8	55.8	85.1	
14:04:00	79.3	93.4	UNDER	77.8	63.8	79.3	
14:05:00	62.9	67.7	UNDER	66.8	44.8	62.9	
14:06:00	59.6	67.0	UNDER	63.8	49.8	59.6	912010.8394
14:07:00	58.2	62.8	UNDER	61.8	46.8	58.2	660693.448
14:08:00	58.1	63.2	UNDER	61.8	48.8	58.1	645654.229
14:09:00	56.3	60.4	UNDER	58.8	50.8	56.3	426579.5188
14:10:00	51.6	55.7	UNDER	54.8	46.8	51.6	144543.9771
14:11:00	57.5	63.3	UNDER	61.8	47.8	57.5	562341.3252
14:12:00	52.7	58.0	UNDER	55.8	45.8	52.7	186208.7137
14:13:00	54.1	57.6	UNDER	57.8	47.8	54.1	257039.5783
14:14:00	56.2	61.7	UNDER	59.8	46.8	56.2	416869.3835
14:15:00	57.4	64.4	UNDER	62.8	47.8	57.4	549540.8739
14:16:00	58.8	67.4	UNDER	63.8	50.8	58.8	758577.575
14:17:00	59.0	69.4	UNDER	63.8	49.8	59	794328.2347
14:18:00	54.5	60.0	UNDER	57.8	48.8	54.5	281838.2931
14:19:00	60.6	64.2	UNDER	62.8	53.8	60.6	
14:20:00	77.9	88.2	109.8	82.8	56.8	77.9	
14:21:00	76.8	88.8	109.8	80.8	53.8	76.8	
14:22:00	59.1	64.0	UNDER	63.8	52.8	59.1	812830.5162
14:23:00	55.0	60.3	UNDER	58.8	42.8	55	316227.766
14:24:00	53.7	60.3	UNDER	57.8	44.8	53.7	234422.8815
14:25:00	62.0	71.3	UNDER	64.8	51.8	62	1584893.192
14:26:00	61.5	67.6	UNDER	64.8	48.8	61.5	
14:27:00	69.6	77.3	UNDER	75.8	54.8	69.6	
14:28:00	64.4	71.7	UNDER	70.8	52.8	64.4	
14:29:00	55.7	60.1	UNDER	58.8	51.8	55.7	371535.2291
14:30:00	58.3	66.3	UNDER	63.8	51.8	58.3	676082.9754
14:31:00	53.6	60.9	UNDER	57.8	45.8	53.6	229086.7653

14:32:00	51.2	56.8	UNDER	54.8	46.8		51.2	131825.6739
14:33:00	58.7	65.6	UNDER	64.8	47.8		58.7	741310.2413
14:34:00	58.2	66.2	UNDER	62.8	50.8		58.2	660693.448
14:35:00	54.7	58.4	UNDER	57.8	50.8		54.7	295120.9227
14:36:00	58.7	69.3	UNDER	63.8	48.8		58.7	741310.2413
14:37:00	52.6	56.8	UNDER	55.8	45.8		52.6	181970.0859
14:38:00	52.5	59.2	UNDER	55.8	46.8		52.5	177827.941
14:39:00	52.7	56.0	UNDER	55.8	48.8		52.7	186208.7137
14:40:00	49.6	55.2	UNDER	52.8	42.8		49.6	91201.08394
14:41:00	59.1	64.8	UNDER	63.8	52.8			
14:42:00	56.4	62.9	UNDER	60.8	46.8			
14:43:00	64.7	73.8	UNDER	70.8	53.8			
14:44:00	59.7	65.2	UNDER	63.8	51.8			
14:45:00	59.3	66.6	UNDER	63.8	51.8			
14:46:00	62.8	66.8	UNDER	65.8	52.8			
14:47:00	63.9	69.8	UNDER	67.8	58.8			
14:48:00	64.2	70.7	UNDER	67.8	58.8			
14:49:00	64.1	69.7	UNDER	67.8	57.8			
14:50:00	61.2	63.0	UNDER	62.8	58.8			
						56.99794		

****
Filename.....SITE5~1
Test Location.....
Employee Name.....
Employee Number.....
Department.....

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 3904
REPORT PRINTED ON 04/04/12 at 10:36:36

User ID: _____

LOGGING STARTED.....04/03/12 at 13:18:00
TOTAL LOGGING TIME...0 DAYS 01:26:56
LOGGING STOPPED.....04/03/12 at 14:44:56
TOTAL INTERVALS.....87
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....04/03/12 AT 13:12:42
PRE-TEST CALIBRATION RANGE...40.1 TO 140.1 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 57.9dB
Lav (80)..... 40.1dB

Lav (90)..... 40.1dB
SEL..... 94.9dB

TWA..... 50.5dB
TWA (80)..... 40.1dB
TWA (90)..... 40.1dB

Lmax..... 71.6dB 04/03/12 at 13:49:10
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA		
4/3/2012							
13:18:00	56.2	63.4	UNDER	60.1	45.1		
13:19:00	48.0	52.9	UNDER	51.1	43.1		
13:20:00	55.5	65.8	UNDER	59.1	44.1		
13:21:00	51.7	57.2	UNDER	55.1	44.1		
13:22:00	53.2	62.0	UNDER	58.1	43.1		
13:23:00	48.3	53.8	UNDER	52.1	41.1		
13:24:00	49.3	57.1	UNDER	53.1	42.1		
13:25:00	48.5	54.9	UNDER	51.1	42.1		
13:26:00	47.3	53.8	UNDER	51.1	41.1		
13:27:00	46.2	48.2	UNDER	47.1	43.1		
13:28:00	48.5	57.7	UNDER	51.1	41.1		
13:29:00	55.2	63.4	UNDER	60.1	47.1		
13:30:00	52.1	59.3	UNDER	55.1	44.1		
13:31:00	47.2	53.4	UNDER	50.1	42.1		
13:32:00	49.8	53.8	UNDER	52.1	44.1		
13:33:00	45.7	52.5	UNDER	47.1	41.1		
13:34:00	50.3	57.8	UNDER	53.1	42.1		
13:35:00	55.1	65.0	UNDER	58.1	44.1		
13:36:00	50.6	55.9	UNDER	53.1	42.1		
13:37:00	54.6	63.1	UNDER	59.1	41.1		
13:38:00	49.3	56.6	UNDER	54.1	43.1		
13:39:00	48.8	56.2	UNDER	51.1	43.1	1 min Leq	1 min Leq in energy
13:40:00	49.3	54.6	UNDER	53.1	44.1	49.3	85113.80382
13:41:00	54.6	59.8	UNDER	57.1	46.1	54.6	288403.1503
13:42:00	51.0	56.5	UNDER	54.1	44.1	51	125892.5412
13:43:00	49.9	56.2	UNDER	52.1	45.1	49.9	97723.7221
13:44:00	53.1	59.9	UNDER	57.1	44.1	53.1	204173.7945
13:45:00	53.6	57.6	UNDER	56.1	48.1	53.6	229086.7653
13:46:00	49.6	53.8	UNDER	52.1	46.1	49.6	91201.08394
13:47:00	51.7	56.2	UNDER	53.1	47.1	51.7	147910.8388

13:48:00	56.4	65.4	UNDER	59.1	48.1	56.4	436515.8322
13:49:00	62.6	71.6	UNDER	67.1	48.1	62.6	
13:50:00	52.3	59.0	UNDER	55.1	46.1	52.3	169824.3652
13:51:00	54.4	59.3	UNDER	57.1	50.1	54.4	275422.8703
13:52:00	54.3	60.3	UNDER	58.1	48.1	54.3	269153.4804
13:53:00	53.7	60.6	UNDER	55.1	48.1	53.7	234422.8815
13:54:00	51.8	55.8	UNDER	54.1	46.1	51.8	151356.1248
13:55:00	50.5	54.2	UNDER	52.1	47.1	50.5	112201.8454
13:56:00	50.8	54.6	UNDER	53.1	45.1	50.8	120226.4435
13:57:00	59.1	63.1	UNDER	62.1	51.1	59.1	812830.5162
13:58:00	62.6	65.9	UNDER	64.1	54.1	62.6	1819700.859
13:59:00	56.6	60.1	UNDER	58.1	53.1	56.6	457088.1896
14:00:00	62.3	65.8	UNDER	64.1	57.1	62.3	
14:01:00	58.9	64.2	UNDER	62.1	53.1	58.9	776247.1166
14:02:00	59.2	62.6	UNDER	62.1	53.1	59.2	831763.7711
14:03:00	61.8	64.6	UNDER	63.1	55.1	61.8	
14:04:00	58.4	65.3	UNDER	60.1	55.1	58.4	691830.9709
14:05:00	62.6	65.4	UNDER	63.1	58.1	62.6	
14:06:00	57.5	61.8	UNDER	59.1	54.1	57.5	562341.3252
14:07:00	60.9	64.2	UNDER	63.1	54.1	60.9	
14:08:00	58.4	63.4	UNDER	62.1	52.1	58.4	691830.9709
14:09:00	58.3	61.4	UNDER	60.1	54.1	58.3	676082.9754
14:10:00	61.5	65.1	UNDER	63.1	56.1	61.5	1412537.545
14:11:00	59.0	62.6	UNDER	61.1	55.1	59	794328.2347
14:12:00	62.4	65.4	UNDER	63.1	57.1	62.4	1737800.829
14:13:00	60.3	64.3	UNDER	63.1	56.1	60.3	1071519.305
14:14:00	61.2	64.6	UNDER	63.1	55.1	61.2	
14:15:00	61.6	65.2	UNDER	63.1	56.1	61.6	
14:16:00	59.6	63.7	UNDER	62.1	55.1	59.6	912010.8394
14:17:00	62.3	65.3	UNDER	63.1	57.1	62.3	
14:18:00	58.5	62.6	UNDER	61.1	55.1	58.5	707945.7844
14:19:00	61.1	63.8	UNDER	63.1	56.1	61.1	1288249.552
14:20:00	60.6	63.4	UNDER	62.1	57.1	60.6	1148153.621
14:21:00	60.0	64.2	UNDER	62.1	56.1	60	1000000
14:22:00	61.3	64.8	UNDER	63.1	56.1	61.3	1348962.883
14:23:00	60.5	63.4	UNDER	62.1	56.1	60.5	1122018.454
14:24:00	61.5	66.9	UNDER	63.1	58.1	61.5	
14:25:00	59.9	61.8	UNDER	61.1	56.1	59.9	977237.221
14:26:00	59.6	61.8	UNDER	61.1	57.1	59.6	912010.8394
14:27:00	60.0	62.5	UNDER	61.1	57.1	60	1000000
14:28:00	60.4	62.3	UNDER	61.1	58.1	60.4	1096478.196
14:29:00	61.2	64.6	UNDER	63.1	57.1	61.2	
14:30:00	61.6	64.4	UNDER	63.1	57.1	61.6	
14:31:00	62.7	64.5	UNDER	63.1	59.1	62.7	
14:32:00	59.9	63.4	UNDER	62.1	55.1	59.9	977237.221
14:33:00	57.9	63.7	UNDER	61.1	45.1	57.9	616595.0019
14:34:00	53.3	60.9	UNDER	57.1	44.1	53.3	213796.209
14:35:00	58.2	70.6	UNDER	60.1	43.1	58.2	660693.448
14:36:00	47.5	54.8	UNDER	49.1	41.1	47.5	56234.13252
14:37:00	49.0	56.4	UNDER	51.1	43.1	49	79432.82347
14:38:00	49.3	52.2	UNDER	51.1	45.1	49.3	85113.80382
14:39:00	48.0	54.6	UNDER	51.1	42.1	48	63095.73445

14:40:00	53.3	59.7	UNDER	56.1	43.1	53.3	213796.209
14:41:00	51.5	59.0	UNDER	55.1	44.1		
14:42:00	58.9	68.2	UNDER	63.1	46.1		
14:43:00	47.8	55.0	UNDER	51.1	41.1		
14:44:00	54.1	62.4	UNDER	58.1	41.1		
						57.84801	

Appendix D
Traffic Data Summary

Freeport Place and Old Ox Rd. (Route 606) - 2011 Traffic PM Peak

	Total Vehicles	Cars	Medium Trucks	Heavy Trucks
Southbound Approach	1277	1163	76	38
Southbound Departure	1307	1196	74	37
Northbound Approach	537	489	32	16
Northbound Departure	617	570	31	16

Freeport Place and Old Ox Rd. (Route 606) - 2036 Traffic PM Peak

	Total Vehicles	Cars	Medium trucks	Heavy Trucks
Southbound Approach	1910	1739	114	57
Southbound Departure	1945	1778	112	55
Northbound Approach	793	725	46	22
Northbound Departure	888	818	47	23

Old Ox Road (Route 606) and Evergreen Mills Road (Route 621) - 2011 Traffic PM Peak

	Total Vehicles	Cars	Medium trucks	Heavy Trucks
Southbound Approach	1385	1260	83	42
Northbound Departure	530	482	32	16
Southbound Departure	1710	1505	120	85
Northbound Approach	1220	1074	85	61
Evergreen Mills Road (both directions)	460	418	28	14

Old Ox Road (Route 606) and Evergreen Mills Road (Route 621) - 2036 Traffic PM Peak

	Total Vehicles	Cars	Medium trucks	Heavy Trucks
Southbound Approach	2042	1858	123	61
Northbound Departure	780	709	47	24
Southbound Departure	2447	2154	171	122
Northbound Approach	1645	1449	115	82
Evergreen Mills Road (both directions)	576	524	35	17

Appendix E
TNM Noise Levels:
Validation, Existing, and Build

MT 19 July 2012
RVH TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Validation
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver2	1	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Receiver3	2	1	0.0	53.0	66	53.0	10	----	53.0	0.0	8	-8.0
Receiver4	3	1	0.0	58.6	66	58.6	10	----	58.6	0.0	8	-8.0
Receiver5	4	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT 20 July 2012
RVH TNM 2.5
Calculated with TNM 2.5
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver2	1	3	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Receiver3	2	4	0.0	56.0	66	56.0	10	----	56.0	0.0	8	-8.0
Receiver4	3	3	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
Receiver5	4	5	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
Modeling Receiver 1	5	4	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Modeling Receiver 2	6	4	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
Modeling Receiver 3	7	3	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
Modeling Receiver 4	8	3	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Modeling Receiver 5	9	2	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Modeling Receiver 6	10	7	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Modeling Receiver 7	11	7	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
Modeling Receiver 8	12	3	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
Modeling Receiver 9	13	2	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0
Modeling Receiver 10	14	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Modeling Receiver 12	15	3	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
Modeling Receiver 11	16	1	0.0	58.2	66	58.2	10	----	58.2	0.0	8	-8.0
Modeling Receiver 13	17	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	56	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS **VDOT On Call**

MT **19 July 2012**
RVH **TNM 2.5**
Calculated with TNM 2.5
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: **VDOT On Call**
RUN: **Dulles Loop Build (2036)**
BARRIER DESIGN: **INPUT HEIGHTS**
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS: **20 deg C, 50% RH**

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver2	1	3	0.0	64.8	66	64.8	10	----	57.5	7.3	8	-0.7
Receiver3	2	4	0.0	58.2	66	58.2	10	----	53.6	4.6	8	-3.4
Receiver4	3	3	0.0	66.3	66	66.3	10	Snd Lvl	58.4	7.9	8	-0.1
Receiver5	4	5	0.0	64.2	66	64.2	10	----	64.1	0.1	8	-7.9
Modeling Receiver 1	5	4	0.0	61.6	66	61.6	10	----	58.7	2.9	8	-5.1
Modeling Receiver 2	6	4	0.0	60.8	66	60.8	10	----	57.1	3.7	8	-4.3
Modeling Receiver 3	7	3	0.0	62.6	66	62.6	10	----	57.7	4.9	8	-3.1
Modeling Receiver 4	8	3	0.0	65.6	66	65.6	10	----	59.5	6.1	8	-1.9
Modeling Receiver 5	9	2	0.0	58.1	66	58.1	10	----	54.1	4.0	8	-4.0
Modeling Receiver 6	10	4	0.0	66.8	66	66.8	10	Snd Lvl	57.9	8.9	8	0.9
Modeling Receiver 7	11	7	0.0	57.9	66	57.9	10	----	53.2	4.7	8	-3.3
Modeling Receiver 8	12	3	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
Modeling Receiver 12	15	3	0.0	67.7	66	67.7	10	Snd Lvl	60.9	6.8	8	-1.2
Modeling Receiver 11	16	1	0.0	62.3	66	62.3	10	----	61.8	0.5	8	-7.5
Modeling Reciever 13	17	1	0.0	67.2	66	67.2	10	Snd Lvl	60.9	6.3	8	-1.7

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	50	0.0	4.6	8.9
All Impacted	11	6.3	7.5	8.9
All that meet NR Goal	4	8.9	8.9	8.9

MT 20 July 2012
RVH TNM 2.5
Calculated with TNM 2.5

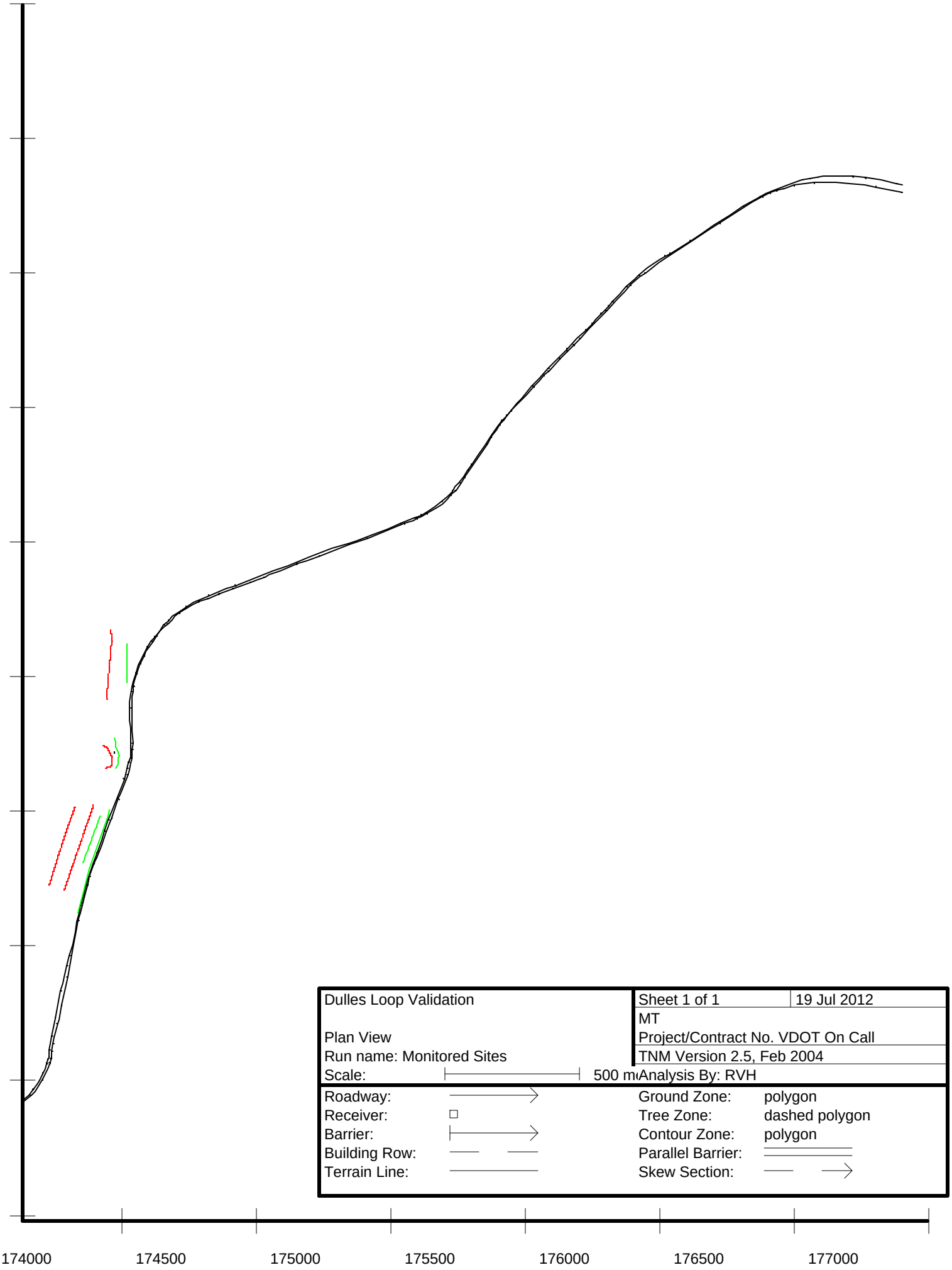
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

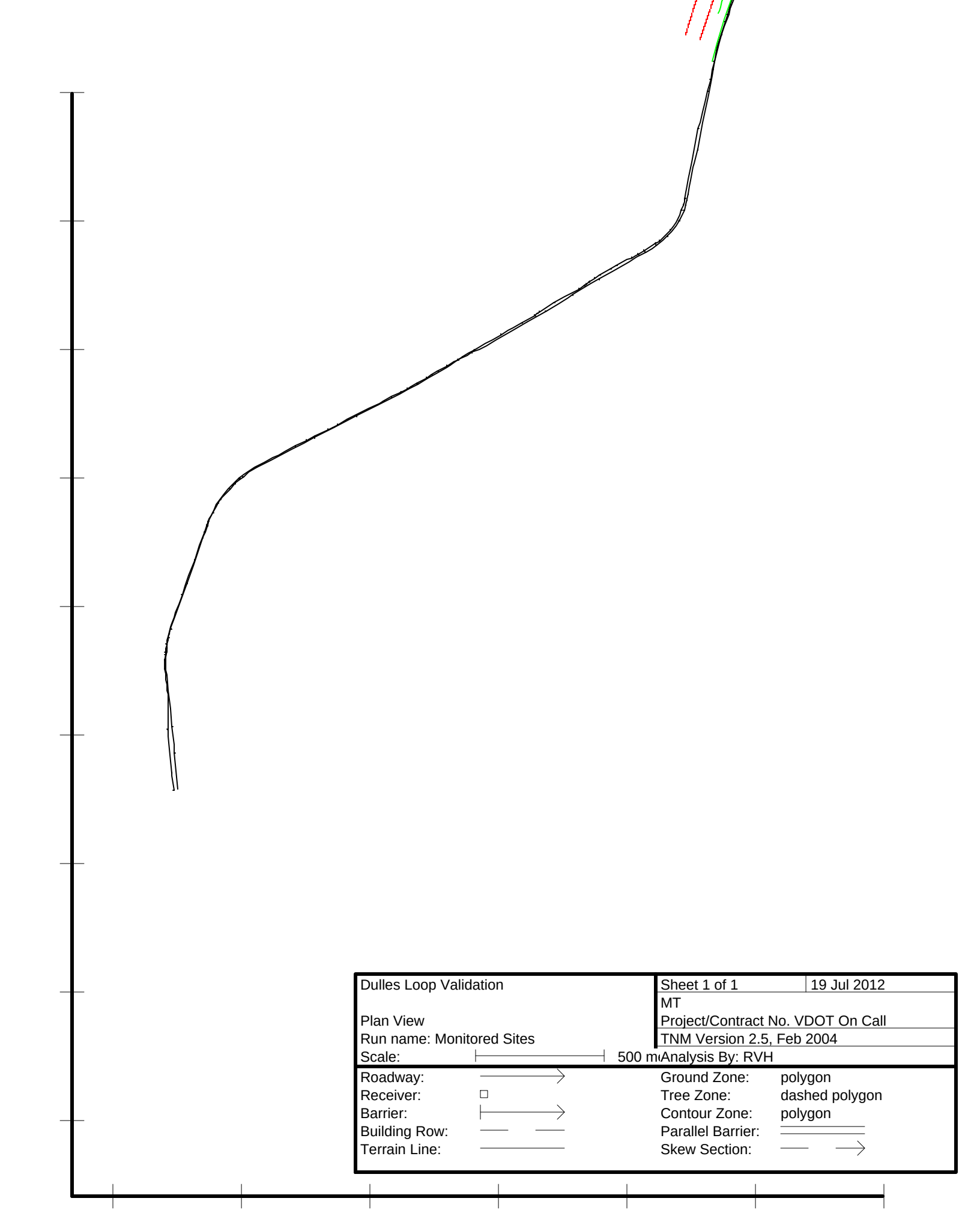
Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Modeling Receiver 9	13	2	0.0	63.2	66	63.2	10	----	63.1	0.1	8	-7.9
Modeling Receiver 10	14	1	0.0	72.1	66	72.1	10	Snd Lvl	66.1	6.0	8	-2.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.1	3.1	6.0
All Impacted	1	6.0	6.0	6.0
All that meet NR Goal	0	0.0	0.0	0.0

Appendix F
TNM Inputs



Dulles Loop Validation		Sheet 1 of 1	19 Jul 2012
		MT	
Plan View		Project/Contract No. VDOT On Call	
Run name: Monitored Sites		TNM Version 2.5, Feb 2004	
Scale:	500 m	Analysis By: RVH	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	


Dulles Loop Validation
Plan View
Run name: Monitored Sites
Scale:
500 m
Sheet 1 of 1
19 Jul 2012
MT
Project/Contract No. VDOT On Call
TNM Version 2.5, Feb 2004
Analysis By: RVH
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
171500
172000
172500
173000
173500
174000
174500

MT	19 July 2012
RVH	TNM 2.5

INPUT: ROADWAYS	Average pavement type shall be used unless
PROJECT/CONTRACT:	VDOT On Call a State highway agency substantiates the use
RUN:	Dulles Loop Validation of a different type with the approval of FHWA

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	m			m	m	m		km/h	%		
Old Ox SB	3.7	point248	248	176,899.0	333,832.5	26.80				Average	
		point252	252	176,875.3	333,838.6	26.80				Average	
		point251	251	176,815.9	333,852.1	26.80				Average	
		point250	250	176,759.1	333,860.6	26.80				Average	
		point249	249	176,712.3	333,865.6	26.80				Average	
		point247	247	176,676.3	333,868.2	26.80				Average	
		point148	148	176,638.4	333,867.7	26.80				Average	
		point246	246	176,603.4	333,865.9	26.20				Average	
		point245	245	176,581.1	333,863.6	26.20				Average	
		point244	244	176,552.6	333,858.5	26.20				Average	
		point243	243	176,525.0	333,852.1	26.20				Average	
		point242	242	176,470.0	333,834.4	25.60				Average	
		point241	241	176,413.3	333,812.0	24.90				Average	
		point240	240	176,387.5	333,801.5	24.90				Average	
		point239	239	176,366.2	333,789.3	24.40				Average	
		point238	238	176,305.6	333,752.8	24.40				Average	
		point237	237	176,257.4	333,721.9	24.40				Average	
		point236	236	176,196.9	333,682.8	24.40				Average	
		point235	235	176,148.3	333,651.9	24.90				Average	
		point234	234	176,107.9	333,626.0	24.90				Average	
		point233	233	176,068.6	333,600.3	25.60				Average	
		point232	232	176,033.4	333,579.4	24.90				Average	
		point231	231	176,014.9	333,569.1	24.90				Average	
		point230	230	175,989.9	333,553.7	25.60				Average	
		point229	229	175,949.4	333,525.3	25.60				Average	

		point228	228	175,917.7	333,497.5	25.60				Average	
		point227	227	175,899.8	333,481.7	25.60				Average	
		point226	226	175,871.6	333,454.8	25.60				Average	
		point225	225	175,845.1	333,427.9	26.80				Average	
		point224	224	175,820.1	333,401.6	27.40				Average	
		point223	223	175,802.4	333,382.1	27.40				Average	
		point222	222	175,777.3	333,355.0	27.40				Average	
		point221	221	175,757.0	333,333.0	27.40				Average	
		point220	220	175,742.6	333,316.9	27.40				Average	
		point219	219	175,718.9	333,294.1	27.40				Average	
		point218	218	175,687.7	333,264.1	28.00				Average	
		point217	217	175,649.5	333,224.5	27.40				Average	
		point216	216	175,617.2	333,189.0	27.40				Average	
		point215	215	175,581.1	333,150.5	26.80				Average	
		point214	214	175,546.3	333,112.6	26.80				Average	
		point213	213	175,520.6	333,084.5	26.80				Average	
		point212	212	175,481.3	333,040.8	26.20				Average	
		point211	211	175,462.4	333,020.4	26.20				Average	
		point210	210	175,442.0	332,998.2	26.20				Average	
		point209	209	175,423.4	332,976.6	26.20				Average	
		point208	208	175,408.1	332,958.2	26.20				Average	
		point207	207	175,393.0	332,938.0	26.20				Average	
		point206	206	175,369.7	332,904.9	26.20				Average	
		point205	205	175,344.1	332,866.8	26.20				Average	
		point204	204	175,323.3	332,834.6	26.20				Average	
		point203	203	175,296.5	332,794.1	26.20				Average	
		point202	202	175,282.5	332,773.0	26.20				Average	
		point201	201	175,265.6	332,749.9	26.20				Average	
		point200	200	175,247.1	332,727.2	26.20				Average	
		point199	199	175,234.2	332,711.3	26.20				Average	
		point198	198	175,223.0	332,695.5	26.20				Average	
		point197	197	175,203.6	332,674.9	26.20				Average	
		point196	196	175,184.1	332,656.3	26.20				Average	
		point195	195	175,157.9	332,639.0	26.20				Average	
		point194	194	175,130.6	332,619.8	26.20				Average	
		point193	193	175,106.0	332,607.3	26.20				Average	
		point192	192	175,080.5	332,595.5	26.20				Average	
		point191	191	175,031.1	332,575.2	26.20				Average	
		point190	190	174,979.7	332,554.3	26.20				Average	

		point189	189	174,928.3	332,534.2	26.20				Average	
		point188	188	174,867.7	332,510.8	26.20				Average	
		point187	187	174,839.2	332,502.3	26.20				Average	
		point186	186	174,809.0	332,493.4	26.20				Average	
		point185	185	174,773.8	332,483.0	26.20				Average	
		point184	184	174,692.1	332,452.3	26.20				Average	
		point183	183	174,611.2	332,419.6	26.20				Average	
		point182	182	174,554.9	332,398.0	26.20				Average	
		point181	181	174,508.8	332,380.7	26.20				Average	
		point180	180	174,462.6	332,362.7	26.80				Average	
		point179	179	174,417.3	332,345.2	26.80				Average	
		point178	178	174,383.3	332,332.6	26.80				Average	
		point177	177	174,315.8	332,307.8	26.80				Average	
		point176	176	174,262.1	332,281.6	26.80				Average	
		point175	175	174,234.2	332,266.2	26.80				Average	
		point174	174	174,205.0	332,246.6	26.80				Average	
		point173	173	174,183.1	332,229.5	26.80				Average	
		point172	172	174,167.4	332,214.3	26.80				Average	
		point171	171	174,152.2	332,197.7	26.80				Average	
		point170	170	174,134.1	332,176.1	26.80				Average	
		point169	169	174,116.8	332,154.3	26.80				Average	
		point168	168	174,105.1	332,137.7	26.80				Average	
		point167	167	174,091.2	332,116.3	26.80				Average	
		point166	166	174,079.8	332,096.3	26.20				Average	
		point165	165	174,065.6	332,067.3	26.20				Average	
		point164	164	174,057.5	332,047.3	26.20				Average	
		point163	163	174,047.3	332,018.4	26.80				Average	
		point162	162	174,038.0	331,988.4	26.80				Average	
		point161	161	174,032.5	331,969.9	26.80				Average	
		point160	160	174,027.7	331,941.3	26.80				Average	
		point159	159	174,025.0	331,913.0	26.80				Average	
		point158	158	174,024.2	331,886.3	26.80				Average	
		point157	157	174,024.8	331,842.4	26.80				Average	
		point156	156	174,027.9	331,813.9	26.80				Average	
		point155	155	174,029.4	331,781.2	26.80				Average	
		point154	154	174,029.8	331,751.7	26.80				Average	
		point153	153	174,028.8	331,730.0	26.80				Average	
		point152	152	174,026.8	331,710.7	26.80				Average	
		point151	151	174,021.3	331,686.8	26.80				Average	

		point150	150	174,016.3	331,664.7	26.80				Average	
		point149	149	174,002.9	331,626.1	26.80				Average	
		point147	147	173,984.8	331,576.4	26.80				Average	
		point146	146	173,958.7	331,507.1	26.80				Average	
		point145	145	173,946.6	331,473.0	26.80				Average	
		point144	144	173,932.4	331,434.1	26.80				Average	
		point143	143	173,919.9	331,399.7	26.80				Average	
		point142	142	173,901.4	331,349.8	26.80				Average	
		point141	141	173,887.9	331,310.9	26.80				Average	
		point140	140	173,878.3	331,282.6	26.80				Average	
		point139	139	173,865.1	331,240.4	26.80				Average	
		point138	138	173,849.7	331,184.2	26.80				Average	
		point137	137	173,843.2	331,158.1	26.80				Average	
		point136	136	173,836.3	331,127.6	26.80				Average	
		point135	135	173,829.7	331,094.8	26.80				Average	
		point134	134	173,822.3	331,059.3	26.80				Average	
		point133	133	173,812.8	331,010.4	26.80				Average	
		point132	132	173,801.7	330,969.4	26.80				Average	
		point131	131	173,791.7	330,931.3	26.80				Average	
		point130	130	173,781.6	330,890.7	26.80				Average	
		point129	129	173,775.1	330,865.4	26.80				Average	
		point128	128	173,768.1	330,838.0	26.80				Average	
		point127	127	173,748.1	330,737.7	26.80				Average	
		point126	126	173,735.5	330,670.9	27.40				Average	
		point125	125	173,730.0	330,643.0	27.40				Average	
		point124	124	173,726.9	330,620.8	27.40				Average	
		point123	123	173,723.4	330,593.7	27.40				Average	
		point122	122	173,720.8	330,583.6	27.40				Average	
		point121	121	173,716.9	330,569.7	27.40				Average	
		point120	120	173,709.2	330,547.7	27.40				Average	
		point119	119	173,702.3	330,532.1	27.40				Average	
		point118	118	173,687.3	330,502.3	27.40				Average	
		point117	117	173,678.4	330,488.2	27.40				Average	
		point116	116	173,665.7	330,472.2	27.40				Average	
		point115	115	173,647.7	330,452.0	27.40				Average	
		point114	114	173,622.6	330,430.7	27.40				Average	
		point113	113	173,607.3	330,421.1	27.40				Average	
		point112	112	173,564.4	330,393.1	27.40				Average	
		point111	111	173,541.0	330,378.9	28.00				Average	

		point110	110	173,529.9	330,373.0	28.00				Average	
		point109	109	173,513.9	330,365.2	28.00				Average	
		point108	108	173,497.1	330,356.4	28.00				Average	
		point107	107	173,457.7	330,334.4	28.00				Average	
		point106	106	173,432.9	330,320.0	28.00				Average	
		point105	105	173,391.2	330,296.0	28.00				Average	
		point104	104	173,372.0	330,285.1	28.70				Average	
		point103	103	173,350.0	330,271.5	28.00				Average	
		point101	101	173,337.6	330,261.8	28.00				Average	
		point2	2	173,331.4	330,257.0	28.00				Average	
		point100	100	173,308.8	330,243.9	26.80				Average	
		point99	99	173,290.4	330,233.2	26.80				Average	
		point98	98	173,254.5	330,212.1	26.80				Average	
		point97	97	173,214.1	330,188.5	26.80				Average	
		point96	96	173,184.5	330,170.6	26.80				Average	
		point95	95	173,157.1	330,154.0	26.20				Average	
		point94	94	173,148.2	330,147.1	26.20				Average	
		point93	93	173,139.4	330,140.5	26.20				Average	
		point92	92	173,087.8	330,110.3	26.20				Average	
		point91	91	173,052.0	330,090.0	25.60				Average	
		point90	90	173,033.9	330,081.2	25.60				Average	
		point89	89	173,007.7	330,066.3	25.60				Average	
		point88	88	172,972.4	330,045.9	26.20				Average	
		point87	87	172,946.8	330,031.1	26.20				Average	
		point86	86	172,923.2	330,017.4	26.20				Average	
		point85	85	172,901.5	330,004.9	26.20				Average	
		point84	84	172,881.4	329,993.0	26.80				Average	
		point83	83	172,859.3	329,980.3	26.80				Average	
		point82	82	172,837.7	329,967.7	26.80				Average	
		point81	81	172,824.9	329,960.3	26.80				Average	
		point80	80	172,798.0	329,944.8	26.80				Average	
		point79	79	172,761.4	329,923.7	26.80				Average	
		point78	78	172,737.2	329,909.8	26.80				Average	
		point77	77	172,716.6	329,897.3	26.80				Average	
		point76	76	172,681.2	329,877.0	26.80				Average	
		point75	75	172,657.8	329,864.1	26.00				Average	
		point74	74	172,641.2	329,854.9	26.20				Average	
		point73	73	172,616.5	329,841.8	26.20				Average	
		point72	72	172,581.1	329,823.5	25.60				Average	

		point71	71	172,550.7	329,807.8	25.60				Average	
		point70	70	172,533.0	329,798.7	24.90				Average	
		point69	69	172,491.2	329,777.3	24.40				Average	
		point68	68	172,446.4	329,754.3	24.90				Average	
		point67	67	172,410.4	329,735.4	24.90				Average	
		point66	66	172,369.6	329,714.8	24.90				Average	
		point65	65	172,333.6	329,696.2	24.90				Average	
		point64	64	172,284.4	329,670.9	25.60				Average	
		point63	63	172,251.2	329,654.1	25.60				Average	
		point62	62	172,208.3	329,631.9	25.60				Average	
		point61	61	172,165.7	329,610.0	26.20				Average	
		point60	60	172,141.1	329,597.6	25.60				Average	
		point59	59	172,118.6	329,586.0	25.60				Average	
		point58	58	172,086.8	329,569.5	25.60				Average	
		point57	57	172,066.5	329,558.9	25.60				Average	
		point56	56	172,048.0	329,548.4	25.60				Average	
		point55	55	172,034.9	329,540.2	26.20				Average	
		point54	54	172,021.2	329,531.0	26.20				Average	
		point53	53	172,006.5	329,520.0	26.20				Average	
		point52	52	171,989.4	329,506.1	26.20				Average	
		point51	51	171,976.0	329,494.5	26.20				Average	
		point50	50	171,961.7	329,480.5	26.80				Average	
		point49	49	171,945.6	329,465.1	26.80				Average	
		point48	48	171,926.0	329,440.5	26.80				Average	
		point47	47	171,914.7	329,424.7	26.80				Average	
		point46	46	171,901.7	329,405.1	27.40				Average	
		point45	45	171,888.2	329,381.2	27.40				Average	
		point44	44	171,878.9	329,363.5	28.00				Average	
		point43	43	171,871.7	329,348.5	28.00				Average	
		point42	42	171,866.7	329,336.5	28.00				Average	
		point41	41	171,861.6	329,323.2	28.00				Average	
		point40	40	171,851.3	329,295.4	28.00				Average	
		point39	39	171,842.1	329,269.3	28.00				Average	
		point38	38	171,833.9	329,247.2	28.00				Average	
		point37	37	171,834.0	329,247.4	28.00				Average	
		point36	36	171,813.6	329,188.0	28.00				Average	
		point35	35	171,792.5	329,128.6	28.00				Average	
		point34	34	171,778.5	329,087.6	28.00				Average	
		point33	33	171,766.7	329,054.9	28.00				Average	

		point32	32	171,753.1	329,016.0	28.70				Average	
		point31	31	171,741.5	328,983.6	28.70				Average	
		point30	30	171,734.6	328,965.0	28.70				Average	
		point29	29	171,727.4	328,943.2	28.70				Average	
		point28	28	171,722.2	328,927.5	28.70				Average	
		point27	27	171,717.0	328,910.8	28.70				Average	
		point26	26	171,711.9	328,890.8	28.70				Average	
		point25	25	171,708.4	328,875.8	28.70				Average	
		point24	24	171,705.9	328,860.9	28.70				Average	
		point23	23	171,703.2	328,843.6	28.70				Average	
		point22	22	171,701.6	328,830.9	28.70				Average	
		point21	21	171,701.1	328,821.4	28.70				Average	
		point20	20	171,699.9	328,800.0	28.70				Average	
		point19	19	171,699.7	328,784.9	28.70				Average	
		point18	18	171,700.4	328,764.8	28.70				Average	
		point17	17	171,702.2	328,745.2	28.70				Average	
		point16	16	171,704.3	328,724.1	28.70				Average	
		point15	15	171,706.8	328,704.4	28.70				Average	
		point14	14	171,709.7	328,681.1	28.70				Average	
		point13	13	171,711.8	328,665.1	28.70				Average	
		point12	12	171,712.6	328,657.0	28.70				Average	
		point11	11	171,712.8	328,635.2	28.70				Average	
		point10	10	171,712.8	328,618.2	28.70				Average	
		point9	9	171,712.4	328,598.2	28.70				Average	
		point8	8	171,711.4	328,558.9	28.70				Average	
		point7	7	171,710.8	328,528.5	28.70				Average	
		point6	6	171,711.8	328,504.3	28.70				Average	
		point5	5	171,717.3	328,451.9	28.70				Average	
		point4	4	171,727.1	328,359.7	28.70				Average	
		point3	3	171,728.5	328,347.5	28.70				Average	
		point1	1	171,734.6	328,293.7	28.70					
Old Ox NB	3.7	point466	466	171,751.4	328,297.3	28.70				Average	
		point470	470	171,737.8	328,439.1	28.70				Average	
		point469	469	171,735.1	328,471.5	28.70				Average	
		point468	468	171,728.7	328,540.1	28.70				Average	
		point467	467	171,722.0	328,612.4	28.70				Average	
		point465	465	171,713.3	328,680.1	28.70				Average	
		point366	366	171,705.8	328,743.3	28.70				Average	
		point464	464	171,704.5	328,760.8	28.70				Average	

		point463	463	171,703.6	328,779.2	28.70				Average	
		point462	462	171,703.4	328,793.4	28.70				Average	
		point461	461	171,704.2	328,811.0	28.70				Average	
		point460	460	171,705.8	328,833.7	28.70				Average	
		point459	459	171,707.6	328,847.4	28.70				Average	
		point458	458	171,709.6	328,861.3	28.70				Average	
		point457	457	171,712.8	328,877.9	28.70				Average	
		point456	456	171,715.0	328,887.8	28.70				Average	
		point455	455	171,718.8	328,903.6	28.70				Average	
		point454	454	171,724.2	328,922.5	28.70				Average	
		point453	453	171,737.5	328,961.1	28.70				Average	
		point452	452	171,773.9	329,064.6	28.00				Average	
		point451	451	171,786.5	329,100.3	28.00				Average	
		point450	450	171,810.1	329,167.7	28.00				Average	
		point449	449	171,848.8	329,277.9	28.00				Average	
		point448	448	171,856.4	329,299.2	28.00				Average	
		point447	447	171,865.9	329,324.2	28.00				Average	
		point446	446	171,873.5	329,343.5	28.00				Average	
		point445	445	171,887.9	329,373.4	27.40				Average	
		point444	444	171,900.5	329,396.1	27.40				Average	
		point443	443	171,911.3	329,413.4	27.40				Average	
		point442	442	171,925.2	329,432.8	26.80				Average	
		point441	441	171,937.6	329,448.5	26.80				Average	
		point440	440	171,954.3	329,467.8	26.80				Average	
		point439	439	171,974.0	329,487.9	26.80				Average	
		point438	438	171,992.2	329,503.6	26.20				Average	
		point437	437	172,005.1	329,514.4	26.20				Average	
		point436	436	172,027.3	329,530.6	26.20				Average	
		point435	435	172,057.0	329,549.9	25.60				Average	
		point434	434	172,114.1	329,580.0	26.20				Average	
		point433	433	172,196.2	329,621.6	25.60				Average	
		point432	432	172,240.9	329,644.5	25.60				Average	
		point431	431	172,281.6	329,665.5	25.60				Average	
		point430	430	172,355.7	329,703.9	24.90				Average	
		point429	429	172,445.2	329,749.8	24.90				Average	
		point428	428	172,528.8	329,792.7	24.90				Average	
		point427	427	172,559.9	329,808.7	25.60				Average	
		point426	426	172,615.2	329,837.0	26.20				Average	
		point425	425	172,646.2	329,853.9	26.20				Average	

		point424	424	172,683.5	329,874.6	26.80				Average	
		point423	423	172,720.6	329,895.7	26.80				Average	
		point422	422	172,763.3	329,920.6	26.80				Average	
		point421	421	172,796.1	329,939.3	26.80				Average	
		point420	420	172,796.2	329,939.3	26.80				Average	
		point419	419	172,808.5	329,946.5	26.80				Average	
		point418	418	172,845.6	329,968.5	26.80				Average	
		point417	417	172,876.9	329,986.5	26.80				Average	
		point416	416	172,895.8	329,996.6	26.20				Average	
		point415	415	172,922.1	330,009.0	26.20				Average	
		point414	414	172,950.6	330,023.8	26.20				Average	
		point413	413	172,990.0	330,045.6	25.60				Average	
		point412	412	173,052.9	330,082.0	25.60				Average	
		point411	411	173,111.4	330,115.8	26.80				Average	
		point410	410	173,182.6	330,157.3	26.80				Average	
		point409	409	173,231.4	330,186.3	26.80				Average	
		point408	408	173,270.8	330,211.1	26.80				Average	
		point407	407	173,287.6	330,221.9	26.80				Average	
		point406	406	173,311.7	330,237.4	26.80				Average	
		point405	405	173,358.4	330,264.4	28.00				Average	
		point404	404	173,389.4	330,281.7	28.70				Average	
		point403	403	173,443.2	330,312.0	28.00				Average	
		point402	402	173,507.3	330,349.8	28.00				Average	
		point401	401	173,536.5	330,367.3	28.00				Average	
		point400	400	173,570.4	330,387.4	27.40				Average	
		point399	399	173,594.9	330,402.0	27.40				Average	
		point398	398	173,612.9	330,413.7	27.40				Average	
		point397	397	173,637.6	330,432.5	27.40				Average	
		point396	396	173,657.7	330,450.9	27.40				Average	
		point395	395	173,672.7	330,468.0	27.40				Average	
		point394	394	173,688.5	330,488.9	27.40				Average	
		point393	393	173,701.9	330,510.5	27.40				Average	
		point392	392	173,712.5	330,530.8	27.40				Average	
		point391	391	173,720.2	330,550.1	27.40				Average	
		point390	390	173,728.0	330,572.3	27.40				Average	
		point389	389	173,732.3	330,590.6	27.40				Average	
		point388	388	173,736.3	330,614.4	27.40				Average	
		point387	387	173,740.8	330,642.5	27.40				Average	
		point386	386	173,744.9	330,666.8	27.40				Average	

		point385	385	173,755.6	330,718.3	26.80				Average	
		point384	384	173,761.1	330,733.1	26.80				Average	
		point383	383	173,771.9	330,786.1	26.80				Average	
		point382	382	173,792.7	330,891.2	26.80				Average	
		point381	381	173,813.9	330,998.4	26.80				Average	
		point380	380	173,829.0	331,075.3	26.80				Average	
		point379	379	173,834.3	331,100.4	26.80				Average	
		point378	378	173,840.4	331,130.3	26.80				Average	
		point377	377	173,849.4	331,168.8	26.80				Average	
		point376	376	173,859.1	331,206.1	26.80				Average	
		point375	375	173,867.4	331,234.9	26.80				Average	
		point374	374	173,876.6	331,265.5	26.80				Average	
		point373	373	173,892.3	331,313.8	26.80				Average	
		point372	372	173,900.7	331,335.4	26.80				Average	
		point371	371	173,909.9	331,357.6	26.80				Average	
		point370	370	173,920.2	331,382.3	26.80				Average	
		point369	369	173,936.0	331,423.5	26.80				Average	
		point368	368	173,949.2	331,461.0	26.80				Average	
		point367	367	173,957.3	331,482.8	26.80				Average	
		point365	365	173,983.9	331,553.0	26.80				Average	
		point364	364	173,991.5	331,574.4	26.80				Average	
		point363	363	173,999.6	331,596.1	26.80				Average	
		point362	362	174,009.0	331,621.3	26.80				Average	
		point361	361	174,017.6	331,644.9	26.80				Average	
		point360	360	174,023.2	331,662.2	26.80				Average	
		point359	359	174,028.1	331,686.1	26.80				Average	
		point358	358	174,031.5	331,703.9	26.80				Average	
		point356	356	174,034.9	331,736.2	26.80				Average	
		point257	257	174,035.5	331,761.8	26.80				Average	
		point355	355	174,033.5	331,808.4	26.80				Average	
		point354	354	174,032.9	331,850.4	26.80				Average	
		point353	353	174,031.9	331,871.3	26.80				Average	
		point352	352	174,031.3	331,892.4	26.80				Average	
		point351	351	174,031.9	331,913.1	26.80				Average	
		point350	350	174,033.5	331,932.5	26.80				Average	
		point349	349	174,036.0	331,952.3	26.80				Average	
		point348	348	174,039.8	331,973.2	26.80				Average	
		point347	347	174,043.7	331,993.2	26.80				Average	
		point346	346	174,051.3	332,019.3	26.80				Average	

		point345	345	174,056.7	332,036.3	26.80				Average	
		point344	344	174,061.8	332,048.9	26.80				Average	
		point343	343	174,065.4	332,058.1	26.80				Average	
		point342	342	174,070.4	332,069.6	26.80				Average	
		point341	341	174,078.0	332,085.6	26.80				Average	
		point340	340	174,086.4	332,101.3	26.80				Average	
		point339	339	174,098.5	332,121.8	26.80				Average	
		point338	338	174,110.6	332,139.8	26.80				Average	
		point337	337	174,125.3	332,159.7	26.80				Average	
		point336	336	174,138.1	332,175.3	26.80				Average	
		point335	335	174,151.5	332,189.9	26.80				Average	
		point334	334	174,166.9	332,205.4	26.80				Average	
		point333	333	174,182.8	332,219.3	26.80				Average	
		point332	332	174,193.8	332,231.0	26.80				Average	
		point331	331	174,210.4	332,243.8	26.80				Average	
		point330	330	174,232.9	332,259.3	26.80				Average	
		point329	329	174,259.2	332,274.2	26.80				Average	
		point328	328	174,283.8	332,286.5	26.80				Average	
		point327	327	174,316.8	332,298.2	26.80				Average	
		point326	326	174,358.2	332,314.2	26.80				Average	
		point325	325	174,409.6	332,333.7	26.80				Average	
		point324	324	174,475.3	332,358.3	26.80				Average	
		point323	323	174,502.3	332,368.4	26.20				Average	
		point322	322	174,526.6	332,378.3	26.20				Average	
		point321	321	174,542.0	332,385.3	26.20				Average	
		point320	320	174,584.3	332,402.1	26.20				Average	
		point319	319	174,647.7	332,426.1	26.20				Average	
		point318	318	174,683.9	332,438.8	26.20				Average	
		point317	317	174,732.0	332,456.1	26.20				Average	
		point316	316	174,839.7	332,497.0	26.20				Average	
		point315	315	174,909.6	332,523.5	26.20				Average	
		point314	314	174,990.1	332,554.3	26.20				Average	
		point313	313	175,047.6	332,576.3	26.20				Average	
		point312	312	175,079.6	332,588.5	26.20				Average	
		point311	311	175,092.8	332,594.3	26.20				Average	
		point310	310	175,108.3	332,602.9	26.20				Average	
		point309	309	175,130.0	332,613.7	26.20				Average	
		point308	308	175,163.0	332,634.3	26.20				Average	
		point307	307	175,186.4	332,649.9	26.20				Average	

		point306	306	175,205.2	332,666.7	26.20				Average	
		point305	305	175,221.4	332,682.7	26.20				Average	
		point304	304	175,237.0	332,701.3	26.20				Average	
		point303	303	175,256.0	332,727.4	26.20				Average	
		point302	302	175,270.9	332,749.0	26.20				Average	
		point301	301	175,353.0	332,874.0	26.20				Average	
		point300	300	175,368.7	332,897.6	26.20				Average	
		point299	299	175,387.8	332,925.2	26.20				Average	
		point298	298	175,402.0	332,944.6	26.20				Average	
		point297	297	175,415.9	332,962.5	26.20				Average	
		point296	296	175,427.4	332,976.1	26.20				Average	
		point295	295	175,444.7	332,996.0	26.20				Average	
		point294	294	175,469.6	333,023.2	26.20				Average	
		point293	293	175,500.6	333,055.6	26.20				Average	
		point292	292	175,528.1	333,084.6	26.20				Average	
		point291	291	175,549.0	333,106.4	26.80				Average	
		point290	290	175,567.9	333,127.8	26.80				Average	
		point289	289	175,583.1	333,144.6	26.80				Average	
		point288	288	175,624.1	333,188.0	27.40				Average	
		point287	287	175,652.4	333,215.7	27.40				Average	
		point286	286	175,676.4	333,239.8	27.40				Average	
		point285	285	175,699.8	333,264.7	28.00				Average	
		point284	284	175,735.4	333,302.7	27.40				Average	
		point283	283	175,762.6	333,331.2	27.40				Average	
		point282	282	175,797.0	333,366.6	27.40				Average	
		point281	281	175,836.7	333,408.8	27.40				Average	
		point280	280	175,865.7	333,439.4	26.00				Average	
		point279	279	175,887.6	333,463.2	25.60				Average	
		point278	278	175,920.8	333,492.9	25.60				Average	
		point277	277	175,942.2	333,509.5	25.60				Average	
		point276	276	175,991.2	333,545.5	25.60				Average	
		point275	275	176,030.7	333,572.4	25.60				Average	
		point274	274	176,113.0	333,625.2	25.60				Average	
		point273	273	176,184.1	333,670.8	24.90				Average	
		point272	272	176,218.9	333,692.9	24.90				Average	
		point271	271	176,337.1	333,768.3	24.90				Average	
		point270	270	176,377.4	333,790.9	24.40				Average	
		point269	269	176,405.1	333,804.8	24.90				Average	
		point268	268	176,433.2	333,813.7	24.90				Average	

		point267	267	176,456.7	333,820.2	24.90				Average	
		point266	266	176,497.5	333,832.2	24.90				Average	
		point265	265	176,532.8	333,838.0	25.60				Average	
		point264	264	176,569.3	333,842.1	26.20				Average	
		point263	263	176,599.1	333,844.0	26.20				Average	
		point262	262	176,631.1	333,844.0	26.20				Average	
		point261	261	176,650.3	333,843.0	26.80				Average	
		point260	260	176,700.2	333,839.2	26.80				Average	
		point259	259	176,756.9	333,833.2	26.80				Average	
		point258	258	176,799.6	333,826.9	26.80				Average	
		point256	256	176,896.0	333,805.6	26.80					

MT 20 July 2012
RVH TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Validation

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Old Ox SB	point248	248	524	64	3	64	48	64	0	0	0	0
	point252	252	524	64	3	64	48	64	0	0	0	0
	point251	251	524	64	3	64	48	64	0	0	0	0
	point250	250	524	64	3	64	48	64	0	0	0	0
	point249	249	524	64	3	64	48	64	0	0	0	0
	point247	247	524	64	3	64	48	64	0	0	0	0
	point148	148	524	64	3	64	48	64	0	0	0	0
	point246	246	524	64	3	64	48	64	0	0	0	0
	point245	245	524	64	3	64	48	64	0	0	0	0
	point244	244	524	64	3	64	48	64	0	0	0	0
	point243	243	524	64	3	64	48	64	0	0	0	0
	point242	242	524	64	3	64	48	64	0	0	0	0
	point241	241	524	64	3	64	48	64	0	0	0	0
	point240	240	524	64	3	64	48	64	0	0	0	0
	point239	239	524	64	3	64	48	64	0	0	0	0
	point238	238	524	64	3	64	48	64	0	0	0	0
	point237	237	524	64	3	64	48	64	0	0	0	0
	point236	236	524	64	3	64	48	64	0	0	0	0
	point235	235	524	64	3	64	48	64	0	0	0	0
	point234	234	524	64	3	64	48	64	0	0	0	0
	point233	233	524	64	3	64	48	64	0	0	0	0
	point232	232	524	64	3	64	48	64	0	0	0	0
	point231	231	524	64	3	64	48	64	0	0	0	0

	point230	230	524	64	3	64	48	64	0	0	0	0
	point229	229	524	64	3	64	48	64	0	0	0	0
	point228	228	524	64	3	64	48	64	0	0	0	0
	point227	227	524	64	3	64	48	64	0	0	0	0
	point226	226	524	64	3	64	48	64	0	0	0	0
	point225	225	524	64	3	64	48	64	0	0	0	0
	point224	224	524	64	3	64	48	64	0	0	0	0
	point223	223	524	64	3	64	48	64	0	0	0	0
	point222	222	524	64	3	64	48	64	0	0	0	0
	point221	221	524	64	3	64	48	64	0	0	0	0
	point220	220	524	64	3	64	48	64	0	0	0	0
	point219	219	524	64	3	64	48	64	0	0	0	0
	point218	218	524	64	3	64	48	64	0	0	0	0
	point217	217	524	64	3	64	48	64	0	0	0	0
	point216	216	524	64	3	64	48	64	0	0	0	0
	point215	215	524	64	3	64	48	64	0	0	0	0
	point214	214	524	64	3	64	48	64	0	0	0	0
	point213	213	524	64	3	64	48	64	0	0	0	0
	point212	212	524	64	3	64	48	64	0	0	0	0
	point211	211	524	64	3	64	48	64	0	0	0	0
	point210	210	524	64	3	64	48	64	0	0	0	0
	point209	209	524	64	3	64	48	64	0	0	0	0
	point208	208	524	64	3	64	48	64	0	0	0	0
	point207	207	524	64	3	64	48	64	0	0	0	0
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	point205	205	524	64	3	64	48	64	0	0	0	0
	point204	204	524	64	3	64	48	64	0	0	0	0
	point203	203	524	64	3	64	48	64	0	0	0	0
	point202	202	524	64	3	64	48	64	0	0	0	0
	point201	201	524	64	3	64	48	64	0	0	0	0
	point200	200	524	64	3	64	48	64	0	0	0	0
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	point198	198	524	64	3	64	48	64	0	0	0	0
	point197	197	524	64	3	64	48	64	0	0	0	0
	point196	196	524	64	3	64	48	64	0	0	0	0
	point195	195	524	64	3	64	48	64	0	0	0	0

	point194	194	524	64	3	64	48	64	0	0	0	0
	point193	193	524	64	3	64	48	64	0	0	0	0
	point192	192	524	64	3	64	48	64	0	0	0	0
	point191	191	524	64	3	64	48	64	0	0	0	0
	point190	190	524	64	3	64	48	64	0	0	0	0
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	point182	182	524	64	3	64	48	64	0	0	0	0
	point181	181	524	64	3	64	48	64	0	0	0	0
	point180	180	524	64	3	64	48	64	0	0	0	0
	point179	179	524	64	3	64	48	64	0	0	0	0
	point178	178	524	64	3	64	48	64	0	0	0	0
	point177	177	524	64	3	64	48	64	0	0	0	0
	point176	176	524	64	3	64	48	64	0	0	0	0
	point175	175	524	64	3	64	48	64	0	0	0	0
	point174	174	524	64	3	64	48	64	0	0	0	0
	point173	173	524	64	3	64	48	64	0	0	0	0
	point172	172	524	64	3	64	48	64	0	0	0	0
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	point170	170	524	64	3	64	48	64	0	0	0	0
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	point168	168	524	64	3	64	48	64	0	0	0	0
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	point162	162	524	64	3	64	48	64	0	0	0	0
	point161	161	524	64	3	64	48	64	0	0	0	0
	point160	160	524	64	3	64	48	64	0	0	0	0
	point159	159	524	64	3	64	48	64	0	0	0	0

	point158	158	524	64	3	64	48	64	0	0	0	0
	point157	157	524	64	3	64	48	64	0	0	0	0
	point156	156	524	64	3	64	48	64	0	0	0	0
	point155	155	524	64	3	64	48	64	0	0	0	0
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	point124	124	524	64	3	64	48	64	0	0	0	0
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	point120	120	524	64	3	64	48	64	0	0	0	0
	point119	119	524	64	3	64	48	64	0	0	0	0
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	point114	114	524	64	3	64	48	64	0	0	0	0
	point113	113	524	64	3	64	48	64	0	0	0	0
	point112	112	524	64	3	64	48	64	0	0	0	0
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	point110	110	524	64	3	64	48	64	0	0	0	0
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	point100	100	524	64	3	64	48	64	0	0	0	0
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	point93	93	524	64	3	64	48	64	0	0	0	0
	point92	92	524	64	3	64	48	64	0	0	0	0
	point91	91	524	64	3	64	48	64	0	0	0	0
	point90	90	524	64	3	64	48	64	0	0	0	0
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	point86	86	524	64	3	64	48	64	0	0	0	0

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	point71	71	524	64	3	64	48	64	0	0	0	0
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	point68	68	524	64	3	64	48	64	0	0	0	0
	point67	67	524	64	3	64	48	64	0	0	0	0
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	point52	52	524	64	3	64	48	64	0	0	0	0
	point51	51	524	64	3	64	48	64	0	0	0	0
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	point48	48	524	64	3	64	48	64	0	0	0	0
	point47	47	524	64	3	64	48	64	0	0	0	0
	point46	46	524	64	3	64	48	64	0	0	0	0
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	point33	33	524	64	3	64	48	64	0	0	0	0
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	point29	29	524	64	3	64	48	64	0	0	0	0
	point28	28	524	64	3	64	48	64	0	0	0	0
	point27	27	524	64	3	64	48	64	0	0	0	0
	point26	26	524	64	3	64	48	64	0	0	0	0
	point25	25	524	64	3	64	48	64	0	0	0	0
	point24	24	524	64	3	64	48	64	0	0	0	0
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	point22	22	524	64	3	64	48	64	0	0	0	0
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	point19	19	524	64	3	64	48	64	0	0	0	0
	point18	18	524	64	3	64	48	64	0	0	0	0
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	point16	16	524	64	3	64	48	64	0	0	0	0
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	point14	14	524	64	3	64	48	64	0	0	0	0

	point13	13	524	64	3	64	48	64	0	0	0	0
	point12	12	524	64	3	64	48	64	0	0	0	0
	point11	11	524	64	3	64	48	64	0	0	0	0
	point10	10	524	64	3	64	48	64	0	0	0	0
	point9	9	524	64	3	64	48	64	0	0	0	0
	point8	8	524	64	3	64	48	64	0	0	0	0
	point7	7	524	64	3	64	48	64	0	0	0	0
	point6	6	524	64	3	64	48	64	0	0	0	0
	point5	5	524	64	3	64	48	64	0	0	0	0
	point4	4	524	64	3	64	48	64	0	0	0	0
	point3	3	524	64	3	64	48	64	0	0	0	0
	point1	1										
Old Ox NB	point466	466	544	64	52	64	36	64	0	0	4	64
	point470	470	544	64	52	64	36	64	0	0	4	64
	point469	469	544	64	52	64	36	64	0	0	4	64
	point468	468	544	64	52	64	36	64	0	0	4	64
	point467	467	544	64	52	64	36	64	0	0	4	64
	point465	465	544	64	52	64	36	64	0	0	4	64
	point366	366	544	64	52	64	36	64	0	0	4	64
	point464	464	544	64	52	64	36	64	0	0	4	64
	point463	463	544	64	52	64	36	64	0	0	4	64
	point462	462	544	64	52	64	36	64	0	0	4	64
	point461	461	544	64	52	64	36	64	0	0	4	64
	point460	460	544	64	52	64	36	64	0	0	4	64
	point459	459	544	64	52	64	36	64	0	0	4	64
	point458	458	544	64	52	64	36	64	0	0	4	64
	point457	457	544	64	52	64	36	64	0	0	4	64
	point456	456	544	64	52	64	36	64	0	0	4	64
	point455	455	544	64	52	64	36	64	0	0	4	64
	point454	454	544	64	52	64	36	64	0	0	4	64
	point453	453	544	64	52	64	36	64	0	0	4	64
	point452	452	544	64	52	64	36	64	0	0	4	64
	point451	451	544	64	52	64	36	64	0	0	4	64
	point450	450	544	64	52	64	36	64	0	0	4	64
	point449	449	544	64	52	64	36	64	0	0	4	64
	point448	448	544	64	52	64	36	64	0	0	4	64

	point447	447	544	64	52	64	36	64	0	0	4	64
	point446	446	544	64	52	64	36	64	0	0	4	64
	point445	445	544	64	52	64	36	64	0	0	4	64
	point444	444	544	64	52	64	36	64	0	0	4	64
	point443	443	544	64	52	64	36	64	0	0	4	64
	point442	442	544	64	52	64	36	64	0	0	4	64
	point441	441	544	64	52	64	36	64	0	0	4	64
	point440	440	544	64	52	64	36	64	0	0	4	64
	point439	439	544	64	52	64	36	64	0	0	4	64
	point438	438	544	64	52	64	36	64	0	0	4	64
	point437	437	544	64	52	64	36	64	0	0	4	64
	point436	436	544	64	52	64	36	64	0	0	4	64
	point435	435	544	64	52	64	36	64	0	0	4	64
	point434	434	544	64	52	64	36	64	0	0	4	64
	point433	433	544	64	52	64	36	64	0	0	4	64
	point432	432	544	64	52	64	36	64	0	0	4	64
	point431	431	544	64	52	64	36	64	0	0	4	64
	point430	430	544	64	52	64	36	64	0	0	4	64
	point429	429	544	64	52	64	36	64	0	0	4	64
	point428	428	544	64	52	64	36	64	0	0	4	64
	point427	427	544	64	52	64	36	64	0	0	4	64
	point426	426	544	64	52	64	36	64	0	0	4	64
	point425	425	544	64	52	64	36	64	0	0	4	64
	point424	424	544	64	52	64	36	64	0	0	4	64
	point423	423	544	64	52	64	36	64	0	0	4	64
	point422	422	544	64	52	64	36	64	0	0	4	64
	point421	421	544	64	52	64	36	64	0	0	4	64
	point420	420	544	64	52	64	36	64	0	0	4	64
	point419	419	544	64	52	64	36	64	0	0	4	64
	point418	418	544	64	52	64	36	64	0	0	4	64
	point417	417	544	64	52	64	36	64	0	0	4	64
	point416	416	544	64	52	64	36	64	0	0	4	64
	point415	415	544	64	52	64	36	64	0	0	4	64
	point414	414	544	64	52	64	36	64	0	0	4	64
	point413	413	544	64	52	64	36	64	0	0	4	64
	point412	412	544	64	52	64	36	64	0	0	4	64

	point411	411	544	64	52	64	36	64	0	0	4	64
	point410	410	544	64	52	64	36	64	0	0	4	64
	point409	409	544	64	52	64	36	64	0	0	4	64
	point408	408	544	64	52	64	36	64	0	0	4	64
	point407	407	544	64	52	64	36	64	0	0	4	64
	point406	406	544	64	52	64	36	64	0	0	4	64
	point405	405	544	64	52	64	36	64	0	0	4	64
	point404	404	544	64	52	64	36	64	0	0	4	64
	point403	403	544	64	52	64	36	64	0	0	4	64
	point402	402	544	64	52	64	36	64	0	0	4	64
	point401	401	544	64	52	64	36	64	0	0	4	64
	point400	400	544	64	52	64	36	64	0	0	4	64
	point399	399	544	64	52	64	36	64	0	0	4	64
	point398	398	544	64	52	64	36	64	0	0	4	64
	point397	397	544	64	52	64	36	64	0	0	4	64
	point396	396	544	64	52	64	36	64	0	0	4	64
	point395	395	544	64	52	64	36	64	0	0	4	64
	point394	394	544	64	52	64	36	64	0	0	4	64
	point393	393	544	64	52	64	36	64	0	0	4	64
	point392	392	544	64	52	64	36	64	0	0	4	64
	point391	391	544	64	52	64	36	64	0	0	4	64
	point390	390	544	64	52	64	36	64	0	0	4	64
	point389	389	544	64	52	64	36	64	0	0	4	64
	point388	388	544	64	52	64	36	64	0	0	4	64
	point387	387	544	64	52	64	36	64	0	0	4	64
	point386	386	544	64	52	64	36	64	0	0	4	64
	point385	385	544	64	52	64	36	64	0	0	4	64
	point384	384	544	64	52	64	36	64	0	0	4	64
	point383	383	544	64	52	64	36	64	0	0	4	64
	point382	382	544	64	52	64	36	64	0	0	4	64
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	point380	380	544	64	52	64	36	64	0	0	4	64
	point379	379	544	64	52	64	36	64	0	0	4	64
	point378	378	544	64	52	64	36	64	0	0	4	64
	point377	377	544	64	52	64	36	64	0	0	4	64
	point376	376	544	64	52	64	36	64	0	0	4	64

	point375	375	544	64	52	64	36	64	0	0	4	64
	point374	374	544	64	52	64	36	64	0	0	4	64
	point373	373	544	64	52	64	36	64	0	0	4	64
	point372	372	544	64	52	64	36	64	0	0	4	64
	point371	371	544	64	52	64	36	64	0	0	4	64
	point370	370	544	64	52	64	36	64	0	0	4	64
	point369	369	544	64	52	64	36	64	0	0	4	64
	point368	368	544	64	52	64	36	64	0	0	4	64
	point367	367	544	64	52	64	36	64	0	0	4	64
	point365	365	544	64	52	64	36	64	0	0	4	64
	point364	364	544	64	52	64	36	64	0	0	4	64
	point363	363	544	64	52	64	36	64	0	0	4	64
	point362	362	544	64	52	64	36	64	0	0	4	64
	point361	361	544	64	52	64	36	64	0	0	4	64
	point360	360	544	64	52	64	36	64	0	0	4	64
	point359	359	544	64	52	64	36	64	0	0	4	64
	point358	358	544	64	52	64	36	64	0	0	4	64
	point356	356	544	64	52	64	36	64	0	0	4	64
	point257	257	544	64	52	64	36	64	0	0	4	64
	point355	355	544	64	52	64	36	64	0	0	4	64
	point354	354	544	64	52	64	36	64	0	0	4	64
	point353	353	544	64	52	64	36	64	0	0	4	64
	point352	352	544	64	52	64	36	64	0	0	4	64
	point351	351	544	64	52	64	36	64	0	0	4	64
	point350	350	544	64	52	64	36	64	0	0	4	64
	point349	349	544	64	52	64	36	64	0	0	4	64
	point348	348	544	64	52	64	36	64	0	0	4	64
	point347	347	544	64	52	64	36	64	0	0	4	64
	point346	346	544	64	52	64	36	64	0	0	4	64
	point345	345	544	64	52	64	36	64	0	0	4	64
	point344	344	544	64	52	64	36	64	0	0	4	64
	point343	343	544	64	52	64	36	64	0	0	4	64
	point342	342	544	64	52	64	36	64	0	0	4	64
	point341	341	544	64	52	64	36	64	0	0	4	64
	point340	340	544	64	52	64	36	64	0	0	4	64
	point339	339	544	64	52	64	36	64	0	0	4	64

	point338	338	544	64	52	64	36	64	0	0	4	64
	point337	337	544	64	52	64	36	64	0	0	4	64
	point336	336	544	64	52	64	36	64	0	0	4	64
	point335	335	544	64	52	64	36	64	0	0	4	64
	point334	334	544	64	52	64	36	64	0	0	4	64
	point333	333	544	64	52	64	36	64	0	0	4	64
	point332	332	544	64	52	64	36	64	0	0	4	64
	point331	331	544	64	52	64	36	64	0	0	4	64
	point330	330	544	64	52	64	36	64	0	0	4	64
	point329	329	544	64	52	64	36	64	0	0	4	64
	point328	328	544	64	52	64	36	64	0	0	4	64
	point327	327	544	64	52	64	36	64	0	0	4	64
	point326	326	544	64	52	64	36	64	0	0	4	64
	point325	325	544	64	52	64	36	64	0	0	4	64
	point324	324	544	64	52	64	36	64	0	0	4	64
	point323	323	544	64	52	64	36	64	0	0	4	64
	point322	322	544	64	52	64	36	64	0	0	4	64
	point321	321	544	64	52	64	36	64	0	0	4	64
	point320	320	544	64	52	64	36	64	0	0	4	64
	point319	319	544	64	52	64	36	64	0	0	4	64
	point318	318	544	64	52	64	36	64	0	0	4	64
	point317	317	544	64	52	64	36	64	0	0	4	64
	point316	316	544	64	52	64	36	64	0	0	4	64
	point315	315	544	64	52	64	36	64	0	0	4	64
	point314	314	544	64	52	64	36	64	0	0	4	64
	point313	313	544	64	52	64	36	64	0	0	4	64
	point312	312	544	64	52	64	36	64	0	0	4	64
	point311	311	544	64	52	64	36	64	0	0	4	64
	point310	310	544	64	52	64	36	64	0	0	4	64
	point309	309	544	64	52	64	36	64	0	0	4	64
	point308	308	544	64	52	64	36	64	0	0	4	64
	point307	307	544	64	52	64	36	64	0	0	4	64
	point306	306	544	64	52	64	36	64	0	0	4	64
	point305	305	544	64	52	64	36	64	0	0	4	64
	point304	304	544	64	52	64	36	64	0	0	4	64
	point303	303	544	64	52	64	36	64	0	0	4	64

	point302	302	544	64	52	64	36	64	0	0	4	64
	point301	301	544	64	52	64	36	64	0	0	4	64
	point300	300	544	64	52	64	36	64	0	0	4	64
	point299	299	544	64	52	64	36	64	0	0	4	64
	point298	298	544	64	52	64	36	64	0	0	4	64
	point297	297	544	64	52	64	36	64	0	0	4	64
	point296	296	544	64	52	64	36	64	0	0	4	64
	point295	295	544	64	52	64	36	64	0	0	4	64
	point294	294	544	64	52	64	36	64	0	0	4	64
	point293	293	544	64	52	64	36	64	0	0	4	64
	point292	292	544	64	52	64	36	64	0	0	4	64
	point291	291	544	64	52	64	36	64	0	0	4	64
	point290	290	544	64	52	64	36	64	0	0	4	64
	point289	289	544	64	52	64	36	64	0	0	4	64
	point288	288	544	64	52	64	36	64	0	0	4	64
	point287	287	544	64	52	64	36	64	0	0	4	64
	point286	286	544	64	52	64	36	64	0	0	4	64
	point285	285	544	64	52	64	36	64	0	0	4	64
	point284	284	544	64	52	64	36	64	0	0	4	64
	point283	283	544	64	52	64	36	64	0	0	4	64
	point282	282	544	64	52	64	36	64	0	0	4	64
	point281	281	544	64	52	64	36	64	0	0	4	64
	point280	280	544	64	52	64	36	64	0	0	4	64
	point279	279	544	64	52	64	36	64	0	0	4	64
	point278	278	544	64	52	64	36	64	0	0	4	64
	point277	277	544	64	52	64	36	64	0	0	4	64
	point276	276	544	64	52	64	36	64	0	0	4	64
	point275	275	544	64	52	64	36	64	0	0	4	64
	point274	274	544	64	52	64	36	64	0	0	4	64
	point273	273	544	64	52	64	36	64	0	0	4	64
	point272	272	544	64	52	64	36	64	0	0	4	64
	point271	271	544	64	52	64	36	64	0	0	4	64
	point270	270	544	64	52	64	36	64	0	0	4	64
	point269	269	544	64	52	64	36	64	0	0	4	64
	point268	268	544	64	52	64	36	64	0	0	4	64
	point267	267	544	64	52	64	36	64	0	0	4	64

	point266	266	544	64	52	64	36	64	0	0	4	64
	point265	265	544	64	52	64	36	64	0	0	4	64
	point264	264	544	64	52	64	36	64	0	0	4	64
	point263	263	544	64	52	64	36	64	0	0	4	64
	point262	262	544	64	52	64	36	64	0	0	4	64
	point261	261	544	64	52	64	36	64	0	0	4	64
	point260	260	544	64	52	64	36	64	0	0	4	64
	point259	259	544	64	52	64	36	64	0	0	4	64
	point258	258	544	64	52	64	36	64	0	0	4	64
	point256	256										

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RVH TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Validation

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Receiver2	1	1	173,854.0	331,378.5	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver3	2	1	173,824.1	331,448.0	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver4	3	1	173,966.8	331,724.8	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver5	4	1	173,982.1	332,048.3	26.20	1.50	0.00	66	10.0	8.0	Y

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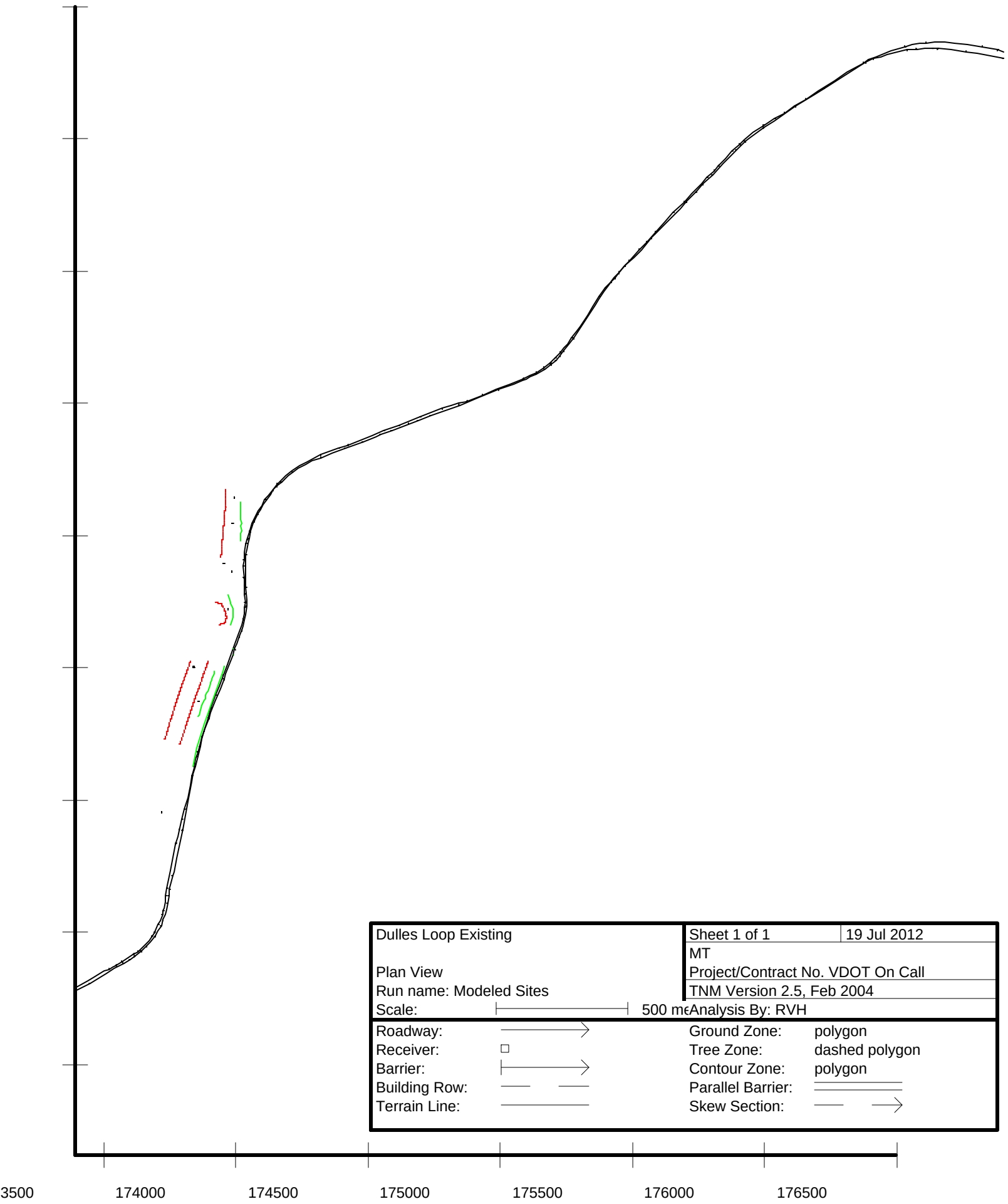
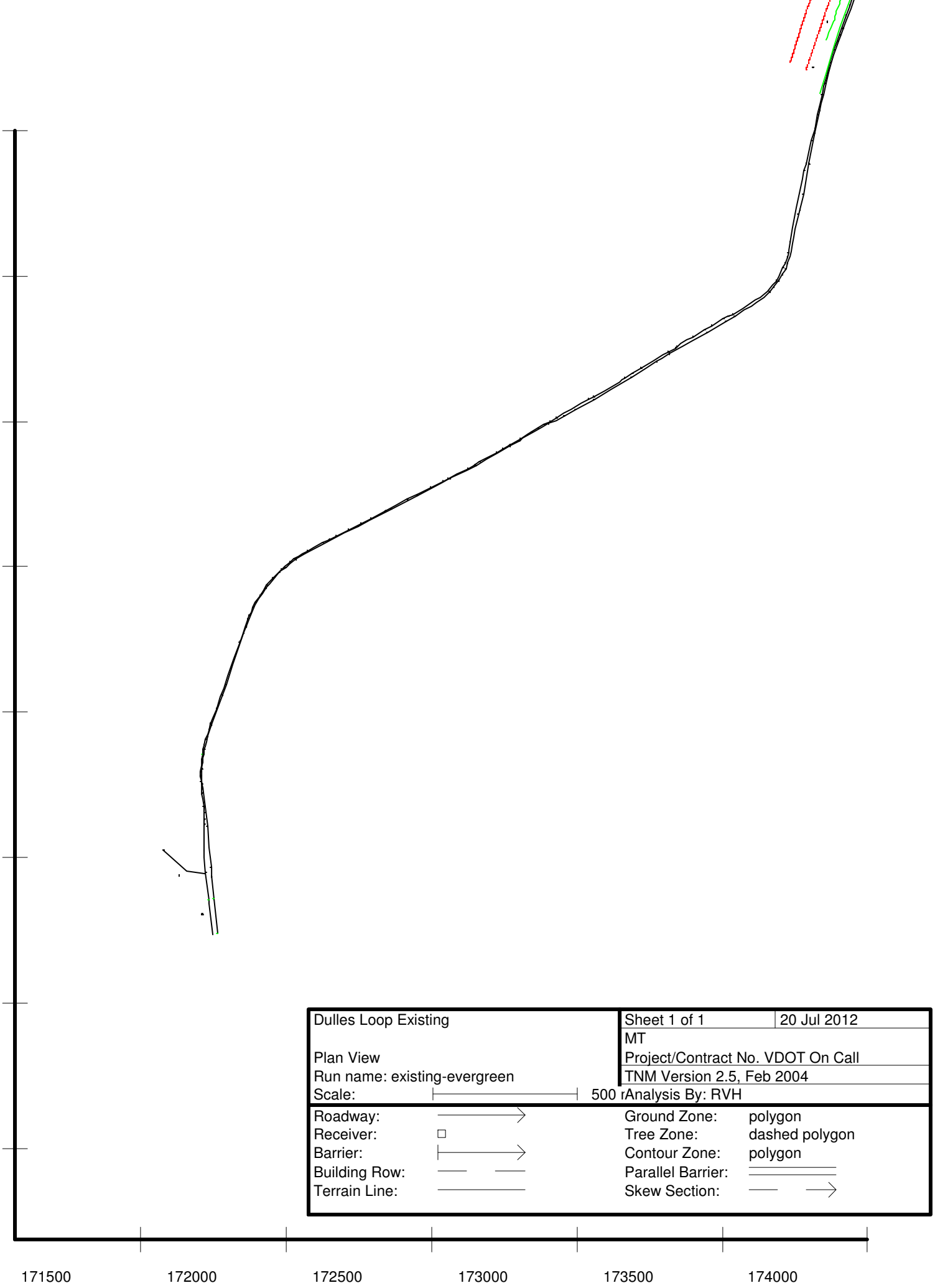
RVH					**TNM 2.5**	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	**VDOT On Call**					
RUN:	**Dulles Loop Validation**					
Building Row			**Points**			
Name	**Average Height**	**Building Percent**	**No.**	**Coordinates (ground) X**	**Y**	**Z**
	m	%		m	m	m
Building1	7.50	20	1	173,955.4	332,178.3	26.20
			2	173,957.4	332,137.6	26.20
			3	173,943.9	331,984.5	26.80
			4	173,938.7	331,923.9	26.80
Building2	7.50	20	5	173,919.5	331,751.6	27.40
			6	173,940.2	331,744.4	26.80
			7	173,957.8	331,709.7	26.80
			8	173,958.7	331,691.4	26.80
			9	173,956.3	331,675.0	26.80
			10	173,933.9	331,666.3	27.40
Building3	7.50	20	11	173,890.2	331,528.8	26.80
			12	173,831.2	331,359.8	26.80
			13	173,782.6	331,215.0	26.80
Building4	7.50	20	14	173,822.6	331,528.0	27.40
			15	173,771.3	331,380.1	26.80
			16	173,726.0	331,233.5	26.80

MT			**20 July 2012**	
RVH			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**VDOT On Call**			
RUN:	**Dulles Loop Validation**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		m	m	m
Terrain Line2	12	173,973.0	331,665.1	26.80
	13	173,979.5	331,679.7	26.80
	14	173,982.7	331,693.8	26.80
	15	173,982.9	331,704.3	26.80
	16	173,984.9	331,713.8	26.80
	17	173,982.7	331,724.1	26.80
	18	173,982.7	331,729.5	26.80
	19	173,977.5	331,738.6	26.80
	20	173,974.1	331,746.1	26.80
	21	173,972.8	331,751.4	26.80
	22	173,970.3	331,765.1	26.80
	23	173,967.0	331,777.5	26.80
Terrain Line3	24	173,851.8	331,318.0	26.80
	25	173,856.2	331,323.9	26.80
	26	173,861.2	331,341.8	26.80
	27	173,867.9	331,360.7	26.80
	28	173,875.8	331,379.3	26.80
	29	173,878.9	331,385.3	26.80
	30	173,880.9	331,392.1	26.80
	31	173,881.8	331,398.3	26.80
	32	173,884.9	331,408.8	26.80
	33	173,887.3	331,414.1	26.80
	34	173,893.1	331,431.2	26.80
	35	173,896.8	331,441.7	26.80

	36	173,900.0	331,448.2	26.80
	37	173,902.4	331,456.1	26.80
	38	173,905.8	331,463.7	26.80
	39	173,908.1	331,470.9	26.80
	40	173,911.1	331,481.7	26.80
	41	173,912.3	331,485.6	26.80
	42	173,915.5	331,489.1	26.80
Terrain Line4	43	174,013.3	331,982.9	26.80
	44	174,014.2	332,003.4	26.80
	45	174,014.2	332,012.0	26.80
	46	174,015.7	332,020.4	26.80
	47	174,014.9	332,040.1	26.80
	48	174,016.2	332,047.3	26.20
	49	174,015.2	332,051.0	26.20
	50	174,014.5	332,065.5	26.20
	51	174,014.4	332,091.0	26.20
	52	174,013.8	332,115.6	26.20
	53	174,013.3	332,130.4	26.20
Terrain Line5	54	173,949.1	331,510.8	27.10
	55	173,945.9	331,488.1	27.10
	56	173,898.9	331,360.1	26.80
	57	173,876.2	331,292.6	26.80
	58	173,848.9	331,201.0	26.80
	59	173,830.9	331,131.3	26.50


Dulles Loop Existing
Plan View
Run name: Modeled Sites
Scale:
500 me
Sheet 1 of 1
19 Jul 2012
MT
Project/Contract No. VDOT On Call
TNM Version 2.5, Feb 2004
Analysis By: RVH
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
3500
174000
174500
175000
175500
176000
176500


Dulles Loop Existing
Plan View
Run name: existing-evergreen
Scale:
500 r
Sheet 1 of 1
20 Jul 2012
MT
Project/Contract No. VDOT On Call
TNM Version 2.5, Feb 2004
Analysis By: RVH
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
171500
172000
172500
173000
173500
174000

MT 20 July 2012
RVH TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Existing

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement)							
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	m			m	m	m		km/h	%		
Old Ox SB 1	3.7	point248	248	176,899.0	333,832.5	26.80				Average	
		point252	252	176,875.3	333,838.6	26.80				Average	
		point251	251	176,815.9	333,852.1	26.80				Average	
		point250	250	176,759.1	333,860.6	26.80				Average	
		point249	249	176,712.3	333,865.6	26.80				Average	
		point247	247	176,676.3	333,868.2	26.80				Average	
		point148	148	176,638.4	333,867.7	26.80				Average	
		point246	246	176,603.4	333,865.9	26.20				Average	
		point245	245	176,581.1	333,863.6	26.20				Average	
		point244	244	176,552.6	333,858.5	26.20				Average	
		point243	243	176,525.0	333,852.1	26.20				Average	
		point242	242	176,470.0	333,834.4	25.60				Average	
		point241	241	176,413.3	333,812.0	24.90				Average	
		point240	240	176,387.5	333,801.5	24.90				Average	
		point239	239	176,366.2	333,789.3	24.40				Average	
		point238	238	176,305.6	333,752.8	24.40				Average	
		point237	237	176,257.4	333,721.9	24.40				Average	
		point236	236	176,196.9	333,682.8	24.40				Average	
		point235	235	176,148.3	333,651.9	24.90				Average	
		point234	234	176,107.9	333,626.0	24.90				Average	
		point233	233	176,068.6	333,600.3	25.60				Average	
		point232	232	176,033.4	333,579.4	24.90				Average	
		point231	231	176,014.9	333,569.1	24.90				Average	
		point230	230	175,989.9	333,553.7	25.60				Average	
		point229	229	175,949.4	333,525.3	25.60				Average	

		point228	228	175,917.7	333,497.5	25.60				Average	
		point227	227	175,899.8	333,481.7	25.60				Average	
		point226	226	175,871.6	333,454.8	25.60				Average	
		point225	225	175,845.1	333,427.9	26.80				Average	
		point224	224	175,820.1	333,401.6	27.40				Average	
		point223	223	175,802.4	333,382.1	27.40				Average	
		point222	222	175,777.3	333,355.0	27.40				Average	
		point221	221	175,757.0	333,333.0	27.40				Average	
		point220	220	175,742.6	333,316.9	27.40				Average	
		point219	219	175,718.9	333,294.1	27.40				Average	
		point218	218	175,687.7	333,264.1	28.00				Average	
		point217	217	175,649.5	333,224.5	27.40				Average	
		point216	216	175,617.2	333,189.0	27.40				Average	
		point215	215	175,581.1	333,150.5	26.80				Average	
		point214	214	175,546.3	333,112.6	26.80				Average	
		point213	213	175,520.6	333,084.5	26.80				Average	
		point212	212	175,481.3	333,040.8	26.20				Average	
		point211	211	175,462.4	333,020.4	26.20				Average	
		point210	210	175,442.0	332,998.2	26.20				Average	
		point209	209	175,423.4	332,976.6	26.20				Average	
		point208	208	175,408.1	332,958.2	26.20				Average	
		point207	207	175,393.0	332,938.0	26.20				Average	
		point206	206	175,369.7	332,904.9	26.20				Average	
		point205	205	175,344.1	332,866.8	26.20				Average	
		point204	204	175,323.3	332,834.6	26.20				Average	
		point203	203	175,296.5	332,794.1	26.20				Average	
		point202	202	175,282.5	332,773.0	26.20				Average	
		point201	201	175,265.6	332,749.9	26.20				Average	
		point200	200	175,247.1	332,727.2	26.20				Average	
		point199	199	175,234.2	332,711.3	26.20				Average	
		point198	198	175,223.0	332,695.5	26.20				Average	
		point197	197	175,203.6	332,674.9	26.20				Average	
		point196	196	175,184.1	332,656.3	26.20				Average	
		point195	195	175,157.9	332,639.0	26.20				Average	
		point194	194	175,130.6	332,619.8	26.20				Average	
		point193	193	175,106.0	332,607.3	26.20				Average	
		point192	192	175,080.5	332,595.5	26.20				Average	
		point191	191	175,031.1	332,575.2	26.20				Average	
		point190	190	174,979.7	332,554.3	26.20				Average	

		point189	189	174,928.3	332,534.2	26.20				Average	
		point188	188	174,867.7	332,510.8	26.20				Average	
		point187	187	174,839.2	332,502.3	26.20				Average	
		point186	186	174,809.0	332,493.4	26.20				Average	
		point185	185	174,773.8	332,483.0	26.20				Average	
		point184	184	174,692.1	332,452.3	26.20				Average	
		point183	183	174,611.2	332,419.6	26.20				Average	
		point182	182	174,554.9	332,398.0	26.20				Average	
		point181	181	174,508.8	332,380.7	26.20				Average	
		point180	180	174,462.6	332,362.7	26.80				Average	
		point179	179	174,417.3	332,345.2	26.80				Average	
		point178	178	174,383.3	332,332.6	26.80				Average	
		point177	177	174,315.8	332,307.8	26.80				Average	
		point176	176	174,262.1	332,281.6	26.80				Average	
		point175	175	174,234.2	332,266.2	26.80				Average	
		point174	174	174,205.0	332,246.6	26.80				Average	
		point173	173	174,183.1	332,229.5	26.80				Average	
		point172	172	174,167.4	332,214.3	26.80				Average	
		point171	171	174,152.2	332,197.7	26.80				Average	
		point170	170	174,134.1	332,176.1	26.80				Average	
		point169	169	174,116.8	332,154.3	26.80				Average	
		point168	168	174,105.1	332,137.7	26.80				Average	
		point167	167	174,091.2	332,116.3	26.80				Average	
		point166	166	174,079.8	332,096.3	26.20				Average	
		point165	165	174,065.6	332,067.3	26.20				Average	
		point164	164	174,057.5	332,047.3	26.20				Average	
		point163	163	174,047.3	332,018.4	26.80				Average	
		point162	162	174,038.0	331,988.4	26.80				Average	
		point161	161	174,032.5	331,969.9	26.80				Average	
		point160	160	174,027.7	331,941.3	26.80				Average	
		point159	159	174,025.0	331,913.0	26.80				Average	
		point158	158	174,024.2	331,886.3	26.80				Average	
		point157	157	174,024.8	331,842.4	26.80				Average	
		point156	156	174,027.9	331,813.9	26.80				Average	
		point155	155	174,029.4	331,781.2	26.80				Average	
		point154	154	174,029.8	331,751.7	26.80				Average	
		point153	153	174,028.8	331,730.0	26.80				Average	
		point152	152	174,026.8	331,710.7	26.80				Average	
		point151	151	174,021.3	331,686.8	26.80				Average	

		point150	150	174,016.3	331,664.7	26.80				Average	
		point149	149	174,002.9	331,626.1	26.80				Average	
		point147	147	173,984.8	331,576.4	26.80					
Old Ox NB 1	3.7	point466	466	171,756.8	328,244.9	28.70	Signal	0.00	100	Average	
		point475	475	171,744.4	328,362.2	28.70					
Old Ox SB 2	3.7	point471	471	173,984.8	331,576.4	26.80	Signal	0.00	100	Average	
		point146	146	173,958.7	331,507.1	26.80				Average	
		point145	145	173,946.6	331,473.0	26.80				Average	
		point144	144	173,932.4	331,434.1	26.80				Average	
		point143	143	173,919.9	331,399.7	26.80				Average	
		point142	142	173,901.4	331,349.8	26.80				Average	
		point141	141	173,887.9	331,310.9	26.80				Average	
		point140	140	173,878.3	331,282.6	26.80				Average	
		point139	139	173,865.1	331,240.4	26.80				Average	
		point138	138	173,849.7	331,184.2	26.80				Average	
		point137	137	173,843.2	331,158.1	26.80				Average	
		point136	136	173,836.3	331,127.6	26.80				Average	
		point135	135	173,829.7	331,094.8	26.80				Average	
		point134	134	173,822.3	331,059.3	26.80				Average	
		point133	133	173,812.8	331,010.4	26.80				Average	
		point132	132	173,801.7	330,969.4	26.80				Average	
		point131	131	173,791.7	330,931.3	26.80				Average	
		point130	130	173,781.6	330,890.7	26.80				Average	
		point129	129	173,775.1	330,865.4	26.80				Average	
		point128	128	173,768.1	330,838.0	26.80				Average	
		point127	127	173,748.1	330,737.7	26.80				Average	
		point126	126	173,735.5	330,670.9	27.40				Average	
		point125	125	173,730.0	330,643.0	27.40				Average	
		point124	124	173,726.9	330,620.8	27.40				Average	
		point123	123	173,723.4	330,593.7	27.40				Average	
		point122	122	173,720.8	330,583.6	27.40				Average	
		point121	121	173,716.9	330,569.7	27.40				Average	
		point120	120	173,709.2	330,547.7	27.40				Average	
		point119	119	173,702.3	330,532.1	27.40				Average	
		point118	118	173,687.3	330,502.3	27.40				Average	
		point117	117	173,678.4	330,488.2	27.40				Average	
		point116	116	173,665.7	330,472.2	27.40				Average	
		point115	115	173,647.7	330,452.0	27.40				Average	
		point114	114	173,622.6	330,430.7	27.40				Average	

		point113	113	173,607.3	330,421.1	27.40				Average	
		point112	112	173,564.4	330,393.1	27.40				Average	
		point111	111	173,541.0	330,378.9	28.00				Average	
		point110	110	173,529.9	330,373.0	28.00				Average	
		point109	109	173,513.9	330,365.2	28.00				Average	
		point108	108	173,497.1	330,356.4	28.00				Average	
		point107	107	173,457.7	330,334.4	28.00				Average	
		point106	106	173,432.9	330,320.0	28.00				Average	
		point105	105	173,391.2	330,296.0	28.70				Average	
		point104	104	173,372.0	330,285.1	28.70				Average	
		point103	103	173,350.0	330,271.5	28.00				Average	
		point101	101	173,337.6	330,261.8	28.00				Average	
		point2	2	173,331.4	330,257.0	28.00				Average	
		point100	100	173,308.8	330,243.9	26.80				Average	
		point99	99	173,290.4	330,233.2	26.80				Average	
		point98	98	173,254.5	330,212.1	26.80				Average	
		point97	97	173,214.1	330,188.5	26.80				Average	
		point96	96	173,184.5	330,170.6	26.80				Average	
		point95	95	173,157.1	330,154.0	26.20				Average	
		point94	94	173,148.2	330,147.1	26.20				Average	
		point93	93	173,139.4	330,140.5	26.20				Average	
		point92	92	173,087.8	330,110.3	26.20				Average	
		point91	91	173,052.0	330,090.0	25.60				Average	
		point90	90	173,033.9	330,081.2	25.60				Average	
		point89	89	173,007.7	330,066.3	25.60				Average	
		point88	88	172,972.4	330,045.9	26.20				Average	
		point87	87	172,946.8	330,031.1	26.20				Average	
		point86	86	172,923.2	330,017.4	26.20				Average	
		point85	85	172,901.5	330,004.9	26.20				Average	
		point84	84	172,881.4	329,993.0	26.80				Average	
		point83	83	172,859.3	329,980.3	26.80				Average	
		point82	82	172,837.7	329,967.7	26.80				Average	
		point81	81	172,824.9	329,960.3	26.80				Average	
		point80	80	172,798.0	329,944.8	26.80				Average	
		point79	79	172,761.4	329,923.7	26.80				Average	
		point78	78	172,737.2	329,909.8	26.80				Average	
		point77	77	172,716.6	329,897.3	26.80				Average	
		point76	76	172,681.2	329,877.0	26.80				Average	
		point75	75	172,657.8	329,864.1	26.20				Average	

		point74	74	172,641.2	329,854.9	26.20				Average	
		point73	73	172,616.5	329,841.8	26.20				Average	
		point72	72	172,581.1	329,823.5	25.60				Average	
		point71	71	172,550.7	329,807.8	25.60				Average	
		point70	70	172,533.0	329,798.7	24.90				Average	
		point69	69	172,491.2	329,777.3	24.40				Average	
		point68	68	172,446.4	329,754.3	24.90				Average	
		point67	67	172,410.4	329,735.4	24.90				Average	
		point66	66	172,369.6	329,714.8	24.90				Average	
		point65	65	172,333.6	329,696.2	24.90				Average	
		point64	64	172,284.4	329,670.9	25.60				Average	
		point63	63	172,251.2	329,654.1	25.60				Average	
		point62	62	172,208.3	329,631.9	25.60				Average	
		point61	61	172,165.7	329,610.0	26.20				Average	
		point60	60	172,141.1	329,597.6	25.60				Average	
		point59	59	172,118.6	329,586.0	25.60				Average	
		point58	58	172,086.8	329,569.5	25.60				Average	
		point57	57	172,066.5	329,558.9	25.60				Average	
		point56	56	172,048.0	329,548.4	25.60				Average	
		point55	55	172,034.9	329,540.2	26.20				Average	
		point54	54	172,021.2	329,531.0	26.20				Average	
		point53	53	172,006.5	329,520.0	26.20				Average	
		point52	52	171,989.4	329,506.1	26.20				Average	
		point51	51	171,976.0	329,494.5	26.20				Average	
		point50	50	171,961.7	329,480.5	26.80				Average	
		point49	49	171,945.6	329,465.1	26.80				Average	
		point48	48	171,926.0	329,440.5	26.80				Average	
		point47	47	171,914.7	329,424.7	26.80				Average	
		point46	46	171,901.7	329,405.1	27.40				Average	
		point45	45	171,888.2	329,381.2	27.40				Average	
		point44	44	171,878.9	329,363.5	28.00				Average	
		point43	43	171,871.7	329,348.5	28.00				Average	
		point42	42	171,866.7	329,336.5	28.00				Average	
		point41	41	171,861.6	329,323.2	28.00				Average	
		point40	40	171,851.3	329,295.4	28.00				Average	
		point39	39	171,842.1	329,269.3	28.00				Average	
		point38	38	171,833.9	329,247.2	28.00				Average	
		point37	37	171,834.0	329,247.4	28.00				Average	
		point36	36	171,813.6	329,188.0	28.00				Average	

		point35	35	171,792.5	329,128.6	28.00				Average	
		point34	34	171,778.5	329,087.6	28.00				Average	
		point33	33	171,766.7	329,054.9	28.00				Average	
		point32	32	171,753.1	329,016.0	28.70				Average	
		point31	31	171,741.5	328,983.6	28.70				Average	
		point30	30	171,734.6	328,965.0	28.70				Average	
		point29	29	171,727.4	328,943.2	28.70				Average	
		point28	28	171,722.2	328,927.5	28.70				Average	
		point27	27	171,717.0	328,910.8	28.70				Average	
		point26	26	171,711.9	328,890.8	28.70				Average	
		point25	25	171,708.4	328,875.8	28.70				Average	
		point24	24	171,705.9	328,860.9	28.70					
Old Ox NB 2	3.7	point472	472	173,983.9	331,553.0	26.80	Signal	0.00	100	Average	
		point364	364	173,991.5	331,574.4	26.80				Average	
		point363	363	173,999.6	331,596.1	26.80				Average	
		point362	362	174,009.0	331,621.3	26.80				Average	
		point361	361	174,017.6	331,644.9	26.80				Average	
		point360	360	174,023.2	331,662.2	26.80				Average	
		point359	359	174,028.1	331,686.1	26.80				Average	
		point358	358	174,031.5	331,703.9	26.80				Average	
		point356	356	174,034.9	331,736.2	26.80				Average	
		point257	257	174,035.5	331,761.8	26.80				Average	
		point355	355	174,033.5	331,808.4	26.80				Average	
		point354	354	174,032.9	331,850.4	26.80				Average	
		point353	353	174,031.9	331,871.3	26.80				Average	
		point352	352	174,031.3	331,892.4	26.80				Average	
		point351	351	174,031.9	331,913.1	26.80				Average	
		point350	350	174,033.5	331,932.5	26.80				Average	
		point349	349	174,036.0	331,952.3	26.80				Average	
		point348	348	174,039.8	331,973.2	26.80				Average	
		point347	347	174,043.7	331,993.2	26.80				Average	
		point346	346	174,051.3	332,019.3	26.80				Average	
		point345	345	174,056.7	332,036.3	26.80				Average	
		point344	344	174,061.8	332,048.9	26.80				Average	
		point343	343	174,065.4	332,058.1	26.80				Average	
		point342	342	174,070.4	332,069.6	26.80				Average	
		point341	341	174,078.0	332,085.6	26.80				Average	
		point340	340	174,086.4	332,101.3	26.80				Average	
		point339	339	174,098.5	332,121.8	26.80				Average	

		point338	338	174,110.6	332,139.8	26.80				Average	
		point337	337	174,125.3	332,159.7	26.80				Average	
		point336	336	174,138.1	332,175.3	26.80				Average	
		point335	335	174,151.5	332,189.9	26.80				Average	
		point334	334	174,166.9	332,205.4	26.80				Average	
		point333	333	174,182.8	332,219.3	26.80				Average	
		point332	332	174,193.8	332,231.0	26.80				Average	
		point331	331	174,210.4	332,243.8	26.80				Average	
		point330	330	174,232.9	332,259.3	26.80				Average	
		point329	329	174,259.2	332,274.2	26.80				Average	
		point328	328	174,283.8	332,286.5	26.80				Average	
		point327	327	174,316.8	332,298.2	26.80				Average	
		point326	326	174,358.2	332,314.2	26.80				Average	
		point325	325	174,409.6	332,333.7	26.80				Average	
		point324	324	174,475.3	332,358.3	26.80				Average	
		point323	323	174,502.3	332,368.4	26.20				Average	
		point322	322	174,526.6	332,378.3	26.20				Average	
		point321	321	174,542.0	332,385.3	26.20				Average	
		point320	320	174,584.3	332,402.1	26.20				Average	
		point319	319	174,647.7	332,426.1	26.20				Average	
		point318	318	174,683.9	332,438.8	26.20				Average	
		point317	317	174,732.0	332,456.1	26.20				Average	
		point316	316	174,839.7	332,497.0	26.20				Average	
		point315	315	174,909.6	332,523.5	26.20				Average	
		point314	314	174,990.1	332,554.3	26.20				Average	
		point313	313	175,047.6	332,576.3	26.20				Average	
		point312	312	175,079.6	332,588.5	26.20				Average	
		point311	311	175,092.8	332,594.3	26.20				Average	
		point310	310	175,108.3	332,602.9	26.20				Average	
		point309	309	175,130.0	332,613.7	26.20				Average	
		point308	308	175,163.0	332,634.3	26.20				Average	
		point307	307	175,186.4	332,649.9	26.20				Average	
		point306	306	175,205.2	332,666.7	26.20				Average	
		point305	305	175,221.4	332,682.7	26.20				Average	
		point304	304	175,237.0	332,701.3	26.20				Average	
		point303	303	175,256.0	332,727.4	26.20				Average	
		point302	302	175,270.9	332,749.0	26.20				Average	
		point301	301	175,353.0	332,874.0	26.20				Average	
		point300	300	175,368.7	332,897.6	26.20				Average	

		point299	299	175,387.8	332,925.2	26.20				Average	
		point298	298	175,402.0	332,944.6	26.20				Average	
		point297	297	175,415.9	332,962.5	26.20				Average	
		point296	296	175,427.4	332,976.1	26.20				Average	
		point295	295	175,444.7	332,996.0	26.20				Average	
		point294	294	175,469.6	333,023.2	26.20				Average	
		point293	293	175,500.6	333,055.6	26.20				Average	
		point292	292	175,528.1	333,084.6	26.20				Average	
		point291	291	175,549.0	333,106.4	26.80				Average	
		point290	290	175,567.9	333,127.8	26.80				Average	
		point289	289	175,583.1	333,144.6	26.80				Average	
		point288	288	175,624.1	333,188.0	27.40				Average	
		point287	287	175,652.4	333,215.7	27.40				Average	
		point286	286	175,676.4	333,239.8	27.40				Average	
		point285	285	175,699.8	333,264.7	28.00				Average	
		point284	284	175,735.4	333,302.7	27.40				Average	
		point283	283	175,762.6	333,331.2	27.40				Average	
		point282	282	175,797.0	333,366.6	27.40				Average	
		point281	281	175,836.7	333,408.8	27.40				Average	
		point280	280	175,865.7	333,439.4	26.20				Average	
		point279	279	175,887.6	333,463.2	25.60				Average	
		point278	278	175,920.8	333,492.9	25.60				Average	
		point277	277	175,942.2	333,509.5	25.60				Average	
		point276	276	175,991.2	333,545.5	25.60				Average	
		point275	275	176,030.7	333,572.4	25.60				Average	
		point274	274	176,113.0	333,625.2	25.60				Average	
		point273	273	176,184.1	333,670.8	24.90				Average	
		point272	272	176,218.9	333,692.9	24.90				Average	
		point271	271	176,337.1	333,768.3	24.90				Average	
		point270	270	176,377.4	333,790.9	24.40				Average	
		point269	269	176,405.1	333,804.8	24.90				Average	
		point268	268	176,433.2	333,813.7	24.90				Average	
		point267	267	176,456.7	333,820.2	24.90				Average	
		point266	266	176,497.5	333,832.2	24.90				Average	
		point265	265	176,532.8	333,838.0	25.60				Average	
		point264	264	176,569.3	333,842.1	26.20				Average	
		point263	263	176,599.1	333,844.0	26.20				Average	
		point262	262	176,631.1	333,844.0	26.20				Average	
		point261	261	176,650.3	333,843.0	26.80				Average	

		point260	260	176,700.2	333,839.2	26.80				Average	
		point259	259	176,756.9	333,833.2	26.80				Average	
		point258	258	176,799.6	333,826.9	26.80				Average	
		point256	256	176,896.0	333,805.6	26.80					
Old Ox SB 2-2	3.7	point473	473	171,705.9	328,860.9	28.70	Signal	0.00	100	Average	
		point23	23	171,703.2	328,843.6	28.70				Average	
		point22	22	171,701.6	328,830.9	28.70				Average	
		point21	21	171,701.1	328,821.4	28.70				Average	
		point20	20	171,699.9	328,800.0	28.70				Average	
		point19	19	171,699.7	328,784.9	28.70				Average	
		point18	18	171,700.4	328,764.8	28.70				Average	
		point17	17	171,702.2	328,745.2	28.70				Average	
		point16	16	171,704.3	328,724.1	28.70				Average	
		point15	15	171,706.8	328,704.4	28.70				Average	
		point14	14	171,709.7	328,681.1	28.70				Average	
		point13	13	171,711.8	328,665.1	28.70				Average	
		point12	12	171,712.6	328,657.0	28.70				Average	
		point11	11	171,712.8	328,635.2	28.70				Average	
		point10	10	171,712.8	328,618.2	28.70				Average	
		point9	9	171,712.4	328,598.2	28.70				Average	
		point8	8	171,711.4	328,558.9	28.70				Average	
		point7	7	171,710.8	328,528.5	28.70				Average	
		point6	6	171,711.8	328,504.3	28.70				Average	
		point5	5	171,717.3	328,451.9	28.70				Average	
		point4	4	171,727.1	328,359.7	28.70					
Old Ox NB 1-2	3.7	point474	474	171,709.6	328,861.3	28.70	Signal	0.00	100	Average	
		point457	457	171,712.8	328,877.9	28.70				Average	
		point456	456	171,715.0	328,887.8	28.70				Average	
		point455	455	171,718.8	328,903.6	28.70				Average	
		point454	454	171,724.2	328,922.5	28.70				Average	
		point453	453	171,737.5	328,961.1	28.70				Average	
		point452	452	171,773.9	329,064.6	28.00				Average	
		point451	451	171,786.5	329,100.3	28.00				Average	
		point450	450	171,810.1	329,167.7	28.00				Average	
		point449	449	171,848.8	329,277.9	28.00				Average	
		point448	448	171,856.4	329,299.2	28.00				Average	
		point447	447	171,865.9	329,324.2	28.00				Average	
		point446	446	171,873.5	329,343.5	28.00				Average	
		point445	445	171,887.9	329,373.4	27.40				Average	

		point444	444	171,900.5	329,396.1	27.40				Average	
		point443	443	171,911.3	329,413.4	27.40				Average	
		point442	442	171,925.2	329,432.8	26.80				Average	
		point441	441	171,937.6	329,448.5	26.80				Average	
		point440	440	171,954.3	329,467.8	26.80				Average	
		point439	439	171,974.0	329,487.9	26.80				Average	
		point438	438	171,992.2	329,503.6	26.20				Average	
		point437	437	172,005.1	329,514.4	26.20				Average	
		point436	436	172,027.3	329,530.6	26.20				Average	
		point435	435	172,057.0	329,549.9	25.60				Average	
		point434	434	172,114.1	329,580.0	26.20				Average	
		point433	433	172,196.2	329,621.6	25.60				Average	
		point432	432	172,240.9	329,644.5	25.60				Average	
		point431	431	172,281.6	329,665.5	25.60				Average	
		point430	430	172,355.7	329,703.9	24.90				Average	
		point429	429	172,445.2	329,749.8	24.90				Average	
		point428	428	172,528.8	329,792.7	24.90				Average	
		point427	427	172,559.9	329,808.7	25.60				Average	
		point426	426	172,615.2	329,837.0	26.20				Average	
		point425	425	172,646.2	329,853.9	26.20				Average	
		point424	424	172,683.5	329,874.6	26.80				Average	
		point423	423	172,720.6	329,895.7	26.80				Average	
		point422	422	172,763.3	329,920.6	26.80				Average	
		point421	421	172,796.1	329,939.3	26.80				Average	
		point420	420	172,796.2	329,939.3	26.80				Average	
		point419	419	172,808.5	329,946.5	26.80				Average	
		point418	418	172,845.6	329,968.5	26.80				Average	
		point417	417	172,876.9	329,986.5	26.80				Average	
		point416	416	172,895.8	329,996.6	26.20				Average	
		point415	415	172,922.1	330,009.0	26.20				Average	
		point414	414	172,950.6	330,023.8	26.20				Average	
		point413	413	172,990.0	330,045.6	25.60				Average	
		point412	412	173,052.9	330,082.0	25.60				Average	
		point411	411	173,111.4	330,115.8	26.80				Average	
		point410	410	173,182.6	330,157.3	26.80				Average	
		point409	409	173,231.4	330,186.3	26.80				Average	
		point408	408	173,270.8	330,211.1	26.80				Average	
		point407	407	173,287.6	330,221.9	26.80				Average	
		point406	406	173,311.7	330,237.4	26.80				Average	

		point405	405	173,358.4	330,264.4	28.00				Average	
		point404	404	173,389.4	330,281.7	28.70				Average	
		point403	403	173,443.2	330,312.0	28.00				Average	
		point402	402	173,507.3	330,349.8	28.00				Average	
		point401	401	173,536.5	330,367.3	28.00				Average	
		point400	400	173,570.4	330,387.4	27.40				Average	
		point399	399	173,594.9	330,402.0	27.40				Average	
		point398	398	173,612.9	330,413.7	27.40				Average	
		point397	397	173,637.6	330,432.5	27.40				Average	
		point396	396	173,657.7	330,450.9	27.40				Average	
		point395	395	173,672.7	330,468.0	27.40				Average	
		point394	394	173,688.5	330,488.9	27.40				Average	
		point393	393	173,701.9	330,510.5	27.40				Average	
		point392	392	173,712.5	330,530.8	27.40				Average	
		point391	391	173,720.2	330,550.1	27.40				Average	
		point390	390	173,728.0	330,572.3	27.40				Average	
		point389	389	173,732.3	330,590.6	27.40				Average	
		point388	388	173,736.3	330,614.4	27.40				Average	
		point387	387	173,740.8	330,642.5	27.40				Average	
		point386	386	173,744.9	330,666.8	27.40				Average	
		point385	385	173,755.6	330,718.3	26.80				Average	
		point384	384	173,761.1	330,733.1	26.80				Average	
		point383	383	173,771.9	330,786.1	26.80				Average	
		point382	382	173,792.7	330,891.2	26.80				Average	
		point381	381	173,813.9	330,998.4	26.80				Average	
		point380	380	173,829.0	331,075.3	26.80				Average	
		point379	379	173,834.3	331,100.4	26.80				Average	
		point378	378	173,840.4	331,130.3	26.80				Average	
		point377	377	173,849.4	331,168.8	26.80				Average	
		point376	376	173,859.1	331,206.1	26.80				Average	
		point375	375	173,867.4	331,234.9	26.80				Average	
		point374	374	173,876.6	331,265.5	26.80				Average	
		point373	373	173,892.3	331,313.8	26.80				Average	
		point372	372	173,900.7	331,335.4	26.80				Average	
		point371	371	173,909.9	331,357.6	26.80				Average	
		point370	370	173,920.2	331,382.3	26.80				Average	
		point369	369	173,936.0	331,423.5	26.80				Average	
		point368	368	173,949.2	331,461.0	26.80				Average	
		point367	367	173,957.3	331,482.8	26.80				Average	

		point365	365	173,983.9	331,553.0	26.80					
Old Ox NB 1-2	3.7	point476	476	171,744.4	328,362.2	28.70	Signal	0.00	100	Average	
		point470	470	171,737.8	328,439.1	28.70				Average	
		point469	469	171,735.1	328,471.5	28.70				Average	
		point468	468	171,728.7	328,540.1	28.70				Average	
		point467	467	171,722.0	328,612.4	28.70				Average	
		point465	465	171,713.3	328,680.1	28.70				Average	
		point366	366	171,705.8	328,743.3	28.70				Average	
		point464	464	171,704.5	328,760.8	28.70				Average	
		point463	463	171,703.6	328,779.2	28.70				Average	
		point462	462	171,703.4	328,793.4	28.70				Average	
		point461	461	171,704.2	328,811.0	28.70				Average	
		point460	460	171,705.8	328,833.7	28.70				Average	
		point459	459	171,707.6	328,847.4	28.70				Average	
		point458	458	171,709.6	328,861.3	28.70					
Old Ox SB 2-2-2	3.7	point477	477	171,727.1	328,359.7	28.70	Signal	0.00	100	Average	
		point3	3	171,728.5	328,347.5	28.70				Average	
		point1	1	171,741.0	328,238.1	28.70					
Roadway24	7.3	point478	478	171,715.4	328,449.0	28.70				Average	
		point479	479	171,650.7	328,458.3	28.70				Average	
		point480	480	171,571.8	328,530.0	28.70					

MT 20 July 2012
RVH TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Existing

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S km/h	MTrucks V veh/hr	MTrucks S km/h	HTrucks V veh/hr	HTrucks S km/h	Buses V veh/hr	Buses S km/h	Motorcycles V veh/hr	Motorcycles S km/h
Old Ox SB 1	point248	248	1163	40	76	40	38	40	0	0	0	0
	point252	252	1163	40	76	40	38	40	0	0	0	0
	point251	251	1163	40	76	40	38	40	0	0	0	0
	point250	250	1163	40	76	40	38	40	0	0	0	0
	point249	249	1163	40	76	40	38	40	0	0	0	0
	point247	247	1163	40	76	40	38	40	0	0	0	0
	point148	148	1163	40	76	40	38	40	0	0	0	0
	point246	246	1163	40	76	40	38	40	0	0	0	0
	point245	245	1163	40	76	40	38	40	0	0	0	0
	point244	244	1163	40	76	40	38	40	0	0	0	0
	point243	243	1163	40	76	40	38	40	0	0	0	0
	point242	242	1163	40	76	40	38	40	0	0	0	0
	point241	241	1163	40	76	40	38	40	0	0	0	0
	point240	240	1163	40	76	40	38	40	0	0	0	0
	point239	239	1163	40	76	40	38	40	0	0	0	0
	point238	238	1163	40	76	40	38	40	0	0	0	0
	point237	237	1163	40	76	40	38	40	0	0	0	0
	point236	236	1163	40	76	40	38	40	0	0	0	0
	point235	235	1163	40	76	40	38	40	0	0	0	0
	point234	234	1163	40	76	40	38	40	0	0	0	0
	point233	233	1163	40	76	40	38	40	0	0	0	0
	point232	232	1163	40	76	40	38	40	0	0	0	0
	point231	231	1163	40	76	40	38	40	0	0	0	0

	point230	230	1163	40	76	40	38	40	0	0	0	0
	point229	229	1163	40	76	40	38	40	0	0	0	0
	point228	228	1163	40	76	40	38	40	0	0	0	0
	point227	227	1163	40	76	40	38	40	0	0	0	0
	point226	226	1163	40	76	40	38	40	0	0	0	0
	point225	225	1163	40	76	40	38	40	0	0	0	0
	point224	224	1163	40	76	40	38	40	0	0	0	0
	point223	223	1163	40	76	40	38	40	0	0	0	0
	point222	222	1163	40	76	40	38	40	0	0	0	0
	point221	221	1163	40	76	40	38	40	0	0	0	0
	point220	220	1163	40	76	40	38	40	0	0	0	0
	point219	219	1163	40	76	40	38	40	0	0	0	0
	point218	218	1163	40	76	40	38	40	0	0	0	0
	point217	217	1163	40	76	40	38	40	0	0	0	0
	point216	216	1163	40	76	40	38	40	0	0	0	0
	point215	215	1163	40	76	40	38	40	0	0	0	0
	point214	214	1163	40	76	40	38	40	0	0	0	0
	point213	213	1163	40	76	40	38	40	0	0	0	0
	point212	212	1163	40	76	40	38	40	0	0	0	0
	point211	211	1163	40	76	40	38	40	0	0	0	0
	point210	210	1163	40	76	40	38	40	0	0	0	0
	point209	209	1163	40	76	40	38	40	0	0	0	0
	point208	208	1163	40	76	40	38	40	0	0	0	0
	point207	207	1163	40	76	40	38	40	0	0	0	0
	point206	206	1163	40	76	40	38	40	0	0	0	0
	point205	205	1163	40	76	40	38	40	0	0	0	0
	point204	204	1163	40	76	40	38	40	0	0	0	0
	point203	203	1163	40	76	40	38	40	0	0	0	0
	point202	202	1163	40	76	40	38	40	0	0	0	0
	point201	201	1163	40	76	40	38	40	0	0	0	0
	point200	200	1163	40	76	40	38	40	0	0	0	0
	point199	199	1163	40	76	40	38	40	0	0	0	0
	point198	198	1163	40	76	40	38	40	0	0	0	0
	point197	197	1163	40	76	40	38	40	0	0	0	0
	point196	196	1163	40	76	40	38	40	0	0	0	0
	point195	195	1163	40	76	40	38	40	0	0	0	0

	point194	194	1163	40	76	40	38	40	0	0	0	0
	point193	193	1163	40	76	40	38	40	0	0	0	0
	point192	192	1163	40	76	40	38	40	0	0	0	0
	point191	191	1163	40	76	40	38	40	0	0	0	0
	point190	190	1163	40	76	40	38	40	0	0	0	0
	point189	189	1163	40	76	40	38	40	0	0	0	0
	point188	188	1163	40	76	40	38	40	0	0	0	0
	point187	187	1163	40	76	40	38	40	0	0	0	0
	point186	186	1163	40	76	40	38	40	0	0	0	0
	point185	185	1163	40	76	40	38	40	0	0	0	0
	point184	184	1163	40	76	40	38	40	0	0	0	0
	point183	183	1163	40	76	40	38	40	0	0	0	0
	point182	182	1163	40	76	40	38	40	0	0	0	0
	point181	181	1163	40	76	40	38	40	0	0	0	0
	point180	180	1163	40	76	40	38	40	0	0	0	0
	point179	179	1163	40	76	40	38	40	0	0	0	0
	point178	178	1163	40	76	40	38	40	0	0	0	0
	point177	177	1163	40	76	40	38	40	0	0	0	0
	point176	176	1163	40	76	40	38	40	0	0	0	0
	point175	175	1163	40	76	40	38	40	0	0	0	0
	point174	174	1163	40	76	40	38	40	0	0	0	0
	point173	173	1163	40	76	40	38	40	0	0	0	0
	point172	172	1163	40	76	40	38	40	0	0	0	0
	point171	171	1163	40	76	40	38	40	0	0	0	0
	point170	170	1163	40	76	40	38	40	0	0	0	0
	point169	169	1163	40	76	40	38	40	0	0	0	0
	point168	168	1163	40	76	40	38	40	0	0	0	0
	point167	167	1163	40	76	40	38	40	0	0	0	0
	point166	166	1163	40	76	40	38	40	0	0	0	0
	point165	165	1163	40	76	40	38	40	0	0	0	0
	point164	164	1163	40	76	40	38	40	0	0	0	0
	point163	163	1163	40	76	40	38	40	0	0	0	0
	point162	162	1163	40	76	40	38	40	0	0	0	0
	point161	161	1163	40	76	40	38	40	0	0	0	0
	point160	160	1163	40	76	40	38	40	0	0	0	0
	point159	159	1163	40	76	40	38	40	0	0	0	0

	point158	158	1163	40	76	40	38	40	0	0	0	0
	point157	157	1163	40	76	40	38	40	0	0	0	0
	point156	156	1163	40	76	40	38	40	0	0	0	0
	point155	155	1163	40	76	40	38	40	0	0	0	0
	point154	154	1163	40	76	40	38	40	0	0	0	0
	point153	153	1163	40	76	40	38	40	0	0	0	0
	point152	152	1163	40	76	40	38	40	0	0	0	0
	point151	151	1163	40	76	40	38	40	0	0	0	0
	point150	150	1163	40	76	40	38	40	0	0	0	0
	point149	149	1163	40	76	40	38	40	0	0	0	0
	point147	147										
Old Ox NB 1	point466	466	1074	88	85	88	61	88	0	0	0	0
	point475	475										
Old Ox SB 2	point471	471	1196	88	74	88	37	88	0	0	0	0
	point146	146	1196	88	74	88	37	88	0	0	0	0
	point145	145	1196	88	74	88	37	88	0	0	0	0
	point144	144	1196	88	74	88	37	88	0	0	0	0
	point143	143	1196	88	74	88	37	88	0	0	0	0
	point142	142	1196	88	74	88	37	88	0	0	0	0
	point141	141	1196	88	74	88	37	88	0	0	0	0
	point140	140	1196	88	74	88	37	88	0	0	0	0
	point139	139	1196	88	74	88	37	88	0	0	0	0
	point138	138	1196	88	74	88	37	88	0	0	0	0
	point137	137	1196	88	74	88	37	88	0	0	0	0
	point136	136	1196	88	74	88	37	88	0	0	0	0
	point135	135	1196	88	74	88	37	88	0	0	0	0
	point134	134	1196	88	74	88	37	88	0	0	0	0
	point133	133	1196	88	74	88	37	88	0	0	0	0
	point132	132	1196	88	74	88	37	88	0	0	0	0
	point131	131	1196	88	74	88	37	88	0	0	0	0
	point130	130	1196	88	74	88	37	88	0	0	0	0
	point129	129	1196	88	74	88	37	88	0	0	0	0
	point128	128	1196	88	74	88	37	88	0	0	0	0
	point127	127	1196	88	74	88	37	88	0	0	0	0
	point126	126	1196	88	74	88	37	88	0	0	0	0
	point125	125	1196	88	74	88	37	88	0	0	0	0

	point124	124	1196	88	74	88	37	88	0	0	0	0
	point123	123	1196	88	74	88	37	88	0	0	0	0
	point122	122	1196	88	74	88	37	88	0	0	0	0
	point121	121	1196	88	74	88	37	88	0	0	0	0
	point120	120	1196	88	74	88	37	88	0	0	0	0
	point119	119	1196	88	74	88	37	88	0	0	0	0
	point118	118	1196	88	74	88	37	88	0	0	0	0
	point117	117	1196	88	74	88	37	88	0	0	0	0
	point116	116	1196	88	74	88	37	88	0	0	0	0
	point115	115	1196	88	74	88	37	88	0	0	0	0
	point114	114	1196	88	74	88	37	88	0	0	0	0
	point113	113	1196	88	74	88	37	88	0	0	0	0
	point112	112	1196	88	74	88	37	88	0	0	0	0
	point111	111	1196	88	74	88	37	88	0	0	0	0
	point110	110	1196	88	74	88	37	88	0	0	0	0
	point109	109	1196	88	74	88	37	88	0	0	0	0
	point108	108	1196	88	74	88	37	88	0	0	0	0
	point107	107	1196	88	74	88	37	88	0	0	0	0
	point106	106	1196	88	74	88	37	88	0	0	0	0
	point105	105	1196	88	74	88	37	88	0	0	0	0
	point104	104	1196	88	74	88	37	88	0	0	0	0
	point103	103	1196	88	74	88	37	88	0	0	0	0
	point101	101	1196	88	74	88	37	88	0	0	0	0
	point2	2	1196	88	74	88	37	88	0	0	0	0
	point100	100	1196	88	74	88	37	88	0	0	0	0
	point99	99	1196	88	74	88	37	88	0	0	0	0
	point98	98	1196	88	74	88	37	88	0	0	0	0
	point97	97	1196	88	74	88	37	88	0	0	0	0
	point96	96	1196	88	74	88	37	88	0	0	0	0
	point95	95	1196	88	74	88	37	88	0	0	0	0
	point94	94	1196	88	74	88	37	88	0	0	0	0
	point93	93	1196	88	74	88	37	88	0	0	0	0
	point92	92	1196	88	74	88	37	88	0	0	0	0
	point91	91	1196	88	74	88	37	88	0	0	0	0
	point90	90	1196	88	74	88	37	88	0	0	0	0
	point89	89	1196	88	74	88	37	88	0	0	0	0

	point88	88	1196	88	74	88	37	88	0	0	0	0
	point87	87	1196	88	74	88	37	88	0	0	0	0
	point86	86	1196	88	74	88	37	88	0	0	0	0
	point85	85	1196	88	74	88	37	88	0	0	0	0
	point84	84	1196	88	74	88	37	88	0	0	0	0
	point83	83	1196	88	74	88	37	88	0	0	0	0
	point82	82	1196	88	74	88	37	88	0	0	0	0
	point81	81	1196	88	74	88	37	88	0	0	0	0
	point80	80	1196	88	74	88	37	88	0	0	0	0
	point79	79	1196	88	74	88	37	88	0	0	0	0
	point78	78	1196	88	74	88	37	88	0	0	0	0
	point77	77	1196	88	74	88	37	88	0	0	0	0
	point76	76	1196	88	74	88	37	88	0	0	0	0
	point75	75	1196	88	74	88	37	88	0	0	0	0
	point74	74	1196	88	74	88	37	88	0	0	0	0
	point73	73	1196	88	74	88	37	88	0	0	0	0
	point72	72	1196	88	74	88	37	88	0	0	0	0
	point71	71	1196	88	74	88	37	88	0	0	0	0
	point70	70	1196	88	74	88	37	88	0	0	0	0
	point69	69	1196	88	74	88	37	88	0	0	0	0
	point68	68	1196	88	74	88	37	88	0	0	0	0
	point67	67	1196	88	74	88	37	88	0	0	0	0
	point66	66	1196	88	74	88	37	88	0	0	0	0
	point65	65	1196	88	74	88	37	88	0	0	0	0
	point64	64	1196	88	74	88	37	88	0	0	0	0
	point63	63	1196	88	74	88	37	88	0	0	0	0
	point62	62	1196	88	74	88	37	88	0	0	0	0
	point61	61	1196	88	74	88	37	88	0	0	0	0
	point60	60	1196	88	74	88	37	88	0	0	0	0
	point59	59	1196	88	74	88	37	88	0	0	0	0
	point58	58	1196	88	74	88	37	88	0	0	0	0
	point57	57	1196	88	74	88	37	88	0	0	0	0
	point56	56	1196	88	74	88	37	88	0	0	0	0
	point55	55	1196	88	74	88	37	88	0	0	0	0
	point54	54	1196	88	74	88	37	88	0	0	0	0
	point53	53	1196	88	74	88	37	88	0	0	0	0

	point52	52	1196	88	74	88	37	88	0	0	0	0
	point51	51	1196	88	74	88	37	88	0	0	0	0
	point50	50	1196	88	74	88	37	88	0	0	0	0
	point49	49	1196	88	74	88	37	88	0	0	0	0
	point48	48	1196	88	74	88	37	88	0	0	0	0
	point47	47	1196	88	74	88	37	88	0	0	0	0
	point46	46	1196	88	74	88	37	88	0	0	0	0
	point45	45	1196	88	74	88	37	88	0	0	0	0
	point44	44	1196	88	74	88	37	88	0	0	0	0
	point43	43	1196	88	74	88	37	88	0	0	0	0
	point42	42	1196	88	74	88	37	88	0	0	0	0
	point41	41	1196	88	74	88	37	88	0	0	0	0
	point40	40	1196	88	74	88	37	88	0	0	0	0
	point39	39	1196	88	74	88	37	88	0	0	0	0
	point38	38	1196	88	74	88	37	88	0	0	0	0
	point37	37	1196	88	74	88	37	88	0	0	0	0
	point36	36	1196	88	74	88	37	88	0	0	0	0
	point35	35	1196	88	74	88	37	88	0	0	0	0
	point34	34	1196	88	74	88	37	88	0	0	0	0
	point33	33	1196	88	74	88	37	88	0	0	0	0
	point32	32	1196	88	74	88	37	88	0	0	0	0
	point31	31	1196	88	74	88	37	88	0	0	0	0
	point30	30	1196	88	74	88	37	88	0	0	0	0
	point29	29	1196	88	74	88	37	88	0	0	0	0
	point28	28	1196	88	74	88	37	88	0	0	0	0
	point27	27	1196	88	74	88	37	88	0	0	0	0
	point26	26	1196	88	74	88	37	88	0	0	0	0
	point25	25	1196	88	74	88	37	88	0	0	0	0
	point24	24										
Old Ox NB 2	point472	472	570	88	31	88	16	88	0	0	0	0
	point364	364	570	88	31	88	16	88	0	0	0	0
	point363	363	570	88	31	88	16	88	0	0	0	0
	point362	362	570	88	31	88	16	88	0	0	0	0
	point361	361	570	88	31	88	16	88	0	0	0	0
	point360	360	570	88	31	88	16	88	0	0	0	0
	point359	359	570	88	31	88	16	88	0	0	0	0

	point358	358	570	88	31	88	16	88	0	0	0	0
	point356	356	570	88	31	88	16	88	0	0	0	0
	point257	257	570	88	31	88	16	88	0	0	0	0
	point355	355	570	88	31	88	16	88	0	0	0	0
	point354	354	570	88	31	88	16	88	0	0	0	0
	point353	353	570	88	31	88	16	88	0	0	0	0
	point352	352	570	88	31	88	16	88	0	0	0	0
	point351	351	570	88	31	88	16	88	0	0	0	0
	point350	350	570	88	31	88	16	88	0	0	0	0
	point349	349	570	88	31	88	16	88	0	0	0	0
	point348	348	570	88	31	88	16	88	0	0	0	0
	point347	347	570	88	31	88	16	88	0	0	0	0
	point346	346	570	88	31	88	16	88	0	0	0	0
	point345	345	570	88	31	88	16	88	0	0	0	0
	point344	344	570	88	31	88	16	88	0	0	0	0
	point343	343	570	88	31	88	16	88	0	0	0	0
	point342	342	570	88	31	88	16	88	0	0	0	0
	point341	341	570	88	31	88	16	88	0	0	0	0
	point340	340	570	88	31	88	16	88	0	0	0	0
	point339	339	570	88	31	88	16	88	0	0	0	0
	point338	338	570	88	31	88	16	88	0	0	0	0
	point337	337	570	88	31	88	16	88	0	0	0	0
	point336	336	570	88	31	88	16	88	0	0	0	0
	point335	335	570	88	31	88	16	88	0	0	0	0
	point334	334	570	88	31	88	16	88	0	0	0	0
	point333	333	570	88	31	88	16	88	0	0	0	0
	point332	332	570	88	31	88	16	88	0	0	0	0
	point331	331	570	88	31	88	16	88	0	0	0	0
	point330	330	570	88	31	88	16	88	0	0	0	0
	point329	329	570	88	31	88	16	88	0	0	0	0
	point328	328	570	88	31	88	16	88	0	0	0	0
	point327	327	570	88	31	88	16	88	0	0	0	0
	point326	326	570	88	31	88	16	88	0	0	0	0
	point325	325	570	88	31	88	16	88	0	0	0	0
	point324	324	570	88	31	88	16	88	0	0	0	0
	point323	323	570	88	31	88	16	88	0	0	0	0

	point322	322	570	88	31	88	16	88	0	0	0	0
	point321	321	570	88	31	88	16	88	0	0	0	0
	point320	320	570	88	31	88	16	88	0	0	0	0
	point319	319	570	88	31	88	16	88	0	0	0	0
	point318	318	570	88	31	88	16	88	0	0	0	0
	point317	317	570	88	31	88	16	88	0	0	0	0
	point316	316	570	88	31	88	16	88	0	0	0	0
	point315	315	570	88	31	88	16	88	0	0	0	0
	point314	314	570	88	31	88	16	88	0	0	0	0
	point313	313	570	88	31	88	16	88	0	0	0	0
	point312	312	570	88	31	88	16	88	0	0	0	0
	point311	311	570	88	31	88	16	88	0	0	0	0
	point310	310	570	88	31	88	16	88	0	0	0	0
	point309	309	570	88	31	88	16	88	0	0	0	0
	point308	308	570	88	31	88	16	88	0	0	0	0
	point307	307	570	88	31	88	16	88	0	0	0	0
	point306	306	570	88	31	88	16	88	0	0	0	0
	point305	305	570	88	31	88	16	88	0	0	0	0
	point304	304	570	88	31	88	16	88	0	0	0	0
	point303	303	570	88	31	88	16	88	0	0	0	0
	point302	302	570	88	31	88	16	88	0	0	0	0
	point301	301	570	88	31	88	16	88	0	0	0	0
	point300	300	570	88	31	88	16	88	0	0	0	0
	point299	299	570	88	31	88	16	88	0	0	0	0
	point298	298	570	88	31	88	16	88	0	0	0	0
	point297	297	570	88	31	88	16	88	0	0	0	0
	point296	296	570	88	31	88	16	88	0	0	0	0
	point295	295	570	88	31	88	16	88	0	0	0	0
	point294	294	570	88	31	88	16	88	0	0	0	0
	point293	293	570	88	31	88	16	88	0	0	0	0
	point292	292	570	88	31	88	16	88	0	0	0	0
	point291	291	570	88	31	88	16	88	0	0	0	0
	point290	290	570	88	31	88	16	88	0	0	0	0
	point289	289	570	88	31	88	16	88	0	0	0	0
	point288	288	570	88	31	88	16	88	0	0	0	0
	point287	287	570	88	31	88	16	88	0	0	0	0

	point286	286	570	88	31	88	16	88	0	0	0	0
	point285	285	570	88	31	88	16	88	0	0	0	0
	point284	284	570	88	31	88	16	88	0	0	0	0
	point283	283	570	88	31	88	16	88	0	0	0	0
	point282	282	570	88	31	88	16	88	0	0	0	0
	point281	281	570	88	31	88	16	88	0	0	0	0
	point280	280	570	88	31	88	16	88	0	0	0	0
	point279	279	570	88	31	88	16	88	0	0	0	0
	point278	278	570	88	31	88	16	88	0	0	0	0
	point277	277	570	88	31	88	16	88	0	0	0	0
	point276	276	570	88	31	88	16	88	0	0	0	0
	point275	275	570	88	31	88	16	88	0	0	0	0
	point274	274	570	88	31	88	16	88	0	0	0	0
	point273	273	570	88	31	88	16	88	0	0	0	0
	point272	272	570	88	31	88	16	88	0	0	0	0
	point271	271	570	88	31	88	16	88	0	0	0	0
	point270	270	570	88	31	88	16	88	0	0	0	0
	point269	269	570	88	31	88	16	88	0	0	0	0
	point268	268	570	88	31	88	16	88	0	0	0	0
	point267	267	570	88	31	88	16	88	0	0	0	0
	point266	266	570	88	31	88	16	88	0	0	0	0
	point265	265	570	88	31	88	16	88	0	0	0	0
	point264	264	570	88	31	88	16	88	0	0	0	0
	point263	263	570	88	31	88	16	88	0	0	0	0
	point262	262	570	88	31	88	16	88	0	0	0	0
	point261	261	570	88	31	88	16	88	0	0	0	0
	point260	260	570	88	31	88	16	88	0	0	0	0
	point259	259	570	88	31	88	16	88	0	0	0	0
	point258	258	570	88	31	88	16	88	0	0	0	0
	point256	256										
Old Ox SB 2-2	point473	473	1260	88	83	88	41	88	0	0	0	0
	point23	23	1260	88	83	88	41	88	0	0	0	0
	point22	22	1260	88	83	88	41	88	0	0	0	0
	point21	21	1260	88	83	88	41	88	0	0	0	0
	point20	20	1260	88	83	88	41	88	0	0	0	0
	point19	19	1260	88	83	88	41	88	0	0	0	0

	point18	18	1260	88	83	88	41	88	0	0	0	0
	point17	17	1260	88	83	88	41	88	0	0	0	0
	point16	16	1260	88	83	88	41	88	0	0	0	0
	point15	15	1260	88	83	88	41	88	0	0	0	0
	point14	14	1260	88	83	88	41	88	0	0	0	0
	point13	13	1260	88	83	88	41	88	0	0	0	0
	point12	12	1260	88	83	88	41	88	0	0	0	0
	point11	11	1260	88	83	88	41	88	0	0	0	0
	point10	10	1260	88	83	88	41	88	0	0	0	0
	point9	9	1260	88	83	88	41	88	0	0	0	0
	point8	8	1260	88	83	88	41	88	0	0	0	0
	point7	7	1260	88	83	88	41	88	0	0	0	0
	point6	6	1260	88	83	88	41	88	0	0	0	0
	point5	5	1260	88	83	88	41	88	0	0	0	0
	point4	4										
Old Ox NB 1-2	point474	474	489	88	32	88	16	88	0	0	0	0
	point457	457	489	88	32	88	16	88	0	0	0	0
	point456	456	489	88	32	88	16	88	0	0	0	0
	point455	455	489	88	32	88	16	88	0	0	0	0
	point454	454	489	88	32	88	16	88	0	0	0	0
	point453	453	489	88	32	88	16	88	0	0	0	0
	point452	452	489	88	32	88	16	88	0	0	0	0
	point451	451	489	88	32	88	16	88	0	0	0	0
	point450	450	489	88	32	88	16	88	0	0	0	0
	point449	449	489	88	32	88	16	88	0	0	0	0
	point448	448	489	88	32	88	16	88	0	0	0	0
	point447	447	489	88	32	88	16	88	0	0	0	0
	point446	446	489	88	32	88	16	88	0	0	0	0
	point445	445	489	88	32	88	16	88	0	0	0	0
	point444	444	489	88	32	88	16	88	0	0	0	0
	point443	443	489	88	32	88	16	88	0	0	0	0
	point442	442	489	88	32	88	16	88	0	0	0	0
	point441	441	489	88	32	88	16	88	0	0	0	0
	point440	440	489	88	32	88	16	88	0	0	0	0
	point439	439	489	88	32	88	16	88	0	0	0	0
	point438	438	489	88	32	88	16	88	0	0	0	0

	point437	437	489	88	32	88	16	88	0	0	0	0
	point436	436	489	88	32	88	16	88	0	0	0	0
	point435	435	489	88	32	88	16	88	0	0	0	0
	point434	434	489	88	32	88	16	88	0	0	0	0
	point433	433	489	88	32	88	16	88	0	0	0	0
	point432	432	489	88	32	88	16	88	0	0	0	0
	point431	431	489	88	32	88	16	88	0	0	0	0
	point430	430	489	88	32	88	16	88	0	0	0	0
	point429	429	489	88	32	88	16	88	0	0	0	0
	point428	428	489	88	32	88	16	88	0	0	0	0
	point427	427	489	88	32	88	16	88	0	0	0	0
	point426	426	489	88	32	88	16	88	0	0	0	0
	point425	425	489	88	32	88	16	88	0	0	0	0
	point424	424	489	88	32	88	16	88	0	0	0	0
	point423	423	489	88	32	88	16	88	0	0	0	0
	point422	422	489	88	32	88	16	88	0	0	0	0
	point421	421	489	88	32	88	16	88	0	0	0	0
	point420	420	489	88	32	88	16	88	0	0	0	0
	point419	419	489	88	32	88	16	88	0	0	0	0
	point418	418	489	88	32	88	16	88	0	0	0	0
	point417	417	489	88	32	88	16	88	0	0	0	0
	point416	416	489	88	32	88	16	88	0	0	0	0
	point415	415	489	88	32	88	16	88	0	0	0	0
	point414	414	489	88	32	88	16	88	0	0	0	0
	point413	413	489	88	32	88	16	88	0	0	0	0
	point412	412	489	88	32	88	16	88	0	0	0	0
	point411	411	489	88	32	88	16	88	0	0	0	0
	point410	410	489	88	32	88	16	88	0	0	0	0
	point409	409	489	88	32	88	16	88	0	0	0	0
	point408	408	489	88	32	88	16	88	0	0	0	0
	point407	407	489	88	32	88	16	88	0	0	0	0
	point406	406	489	88	32	88	16	88	0	0	0	0
	point405	405	489	88	32	88	16	88	0	0	0	0
	point404	404	489	88	32	88	16	88	0	0	0	0
	point403	403	489	88	32	88	16	88	0	0	0	0
	point402	402	489	88	32	88	16	88	0	0	0	0

	point401	401	489	88	32	88	16	88	0	0	0	0
	point400	400	489	88	32	88	16	88	0	0	0	0
	point399	399	489	88	32	88	16	88	0	0	0	0
	point398	398	489	88	32	88	16	88	0	0	0	0
	point397	397	489	88	32	88	16	88	0	0	0	0
	point396	396	489	88	32	88	16	88	0	0	0	0
	point395	395	489	88	32	88	16	88	0	0	0	0
	point394	394	489	88	32	88	16	88	0	0	0	0
	point393	393	489	88	32	88	16	88	0	0	0	0
	point392	392	489	88	32	88	16	88	0	0	0	0
	point391	391	489	88	32	88	16	88	0	0	0	0
	point390	390	489	88	32	88	16	88	0	0	0	0
	point389	389	489	88	32	88	16	88	0	0	0	0
	point388	388	489	88	32	88	16	88	0	0	0	0
	point387	387	489	88	32	88	16	88	0	0	0	0
	point386	386	489	88	32	88	16	88	0	0	0	0
	point385	385	489	88	32	88	16	88	0	0	0	0
	point384	384	489	88	32	88	16	88	0	0	0	0
	point383	383	489	88	32	88	16	88	0	0	0	0
	point382	382	489	88	32	88	16	88	0	0	0	0
	point381	381	489	88	32	88	16	88	0	0	0	0
	point380	380	489	88	32	88	16	88	0	0	0	0
	point379	379	489	88	32	88	16	88	0	0	0	0
	point378	378	489	88	32	88	16	88	0	0	0	0
	point377	377	489	88	32	88	16	88	0	0	0	0
	point376	376	489	88	32	88	16	88	0	0	0	0
	point375	375	489	88	32	88	16	88	0	0	0	0
	point374	374	489	88	32	88	16	88	0	0	0	0
	point373	373	489	88	32	88	16	88	0	0	0	0
	point372	372	489	88	32	88	16	88	0	0	0	0
	point371	371	489	88	32	88	16	88	0	0	0	0
	point370	370	489	88	32	88	16	88	0	0	0	0
	point369	369	489	88	32	88	16	88	0	0	0	0
	point368	368	489	88	32	88	16	88	0	0	0	0
	point367	367	489	88	32	88	16	88	0	0	0	0
	point365	365										

INPUT: TRAFFIC FOR LAeq1h Volumes **VDOT On Call**

Old Ox NB 1-2	point476	476	482	88	32	88	16	88	0	0	0	0
	point470	470	482	88	32	88	16	88	0	0	0	0
	point469	469	482	88	32	88	16	88	0	0	0	0
	point468	468	482	88	32	88	16	88	0	0	0	0
	point467	467	482	88	32	88	16	88	0	0	0	0
	point465	465	482	88	32	88	16	88	0	0	0	0
	point366	366	482	88	32	88	16	88	0	0	0	0
	point464	464	482	88	32	88	16	88	0	0	0	0
	point463	463	482	88	32	88	16	88	0	0	0	0
	point462	462	482	88	32	88	16	88	0	0	0	0
	point461	461	482	88	32	88	16	88	0	0	0	0
	point460	460	482	88	32	88	16	88	0	0	0	0
	point459	459	482	88	32	88	16	88	0	0	0	0
	point458	458										
Old Ox SB 2-2-2	point477	477	1505	88	120	88	85	88	0	0	0	0
	point3	3	1505	88	120	88	85	88	0	0	0	0
	point1	1										
Roadway24	point478	478	418	56	28	56	14	56	0	0	0	0
	point479	479	418	56	28	56	14	56	0	0	0	0
	point480	480										

MT 20 July 2012
RVH TNM 2.5

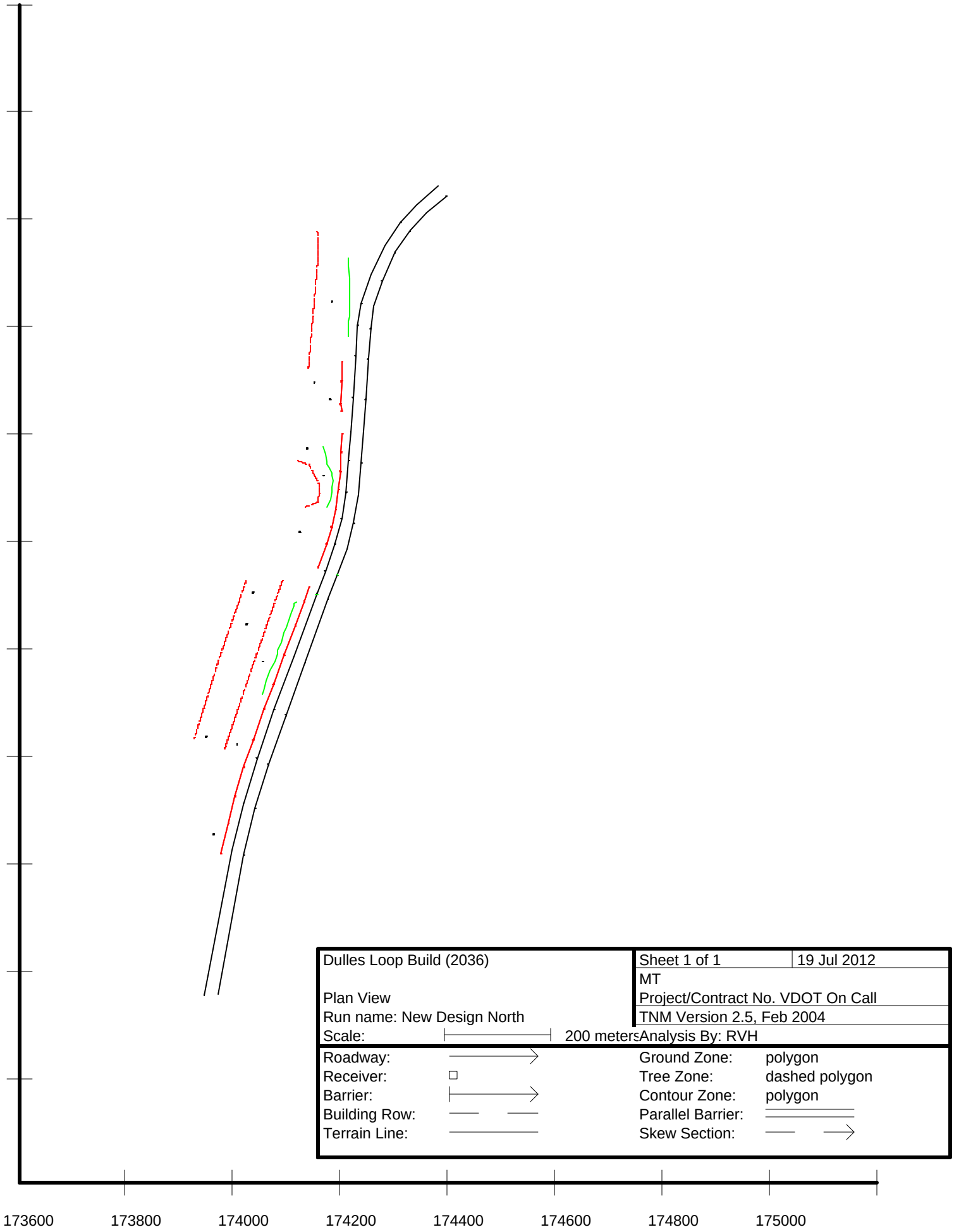
INPUT: RECEIVERS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Existing

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Receiver2	1	3	173,854.0	331,378.5	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver3	2	4	173,824.1	331,448.0	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver4	3	3	173,966.8	331,724.8	26.80	1.50	0.00	66	10.0	8.0	Y
Receiver5	4	5	173,982.1	332,048.3	26.20	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 1	5	4	173,949.2	331,898.0	27.10	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 2	6	4	173,936.4	331,775.1	27.10	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 3	7	3	173,922.9	331,619.2	27.10	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 4	8	3	173,893.0	331,486.5	27.10	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 5	9	2	173,835.5	331,506.7	27.10	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 6	10	7	173,805.5	331,223.6	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 7	11	7	173,748.7	331,238.2	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 8	12	3	173,989.6	332,146.2	26.20	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 9	13	2	171,626.9	328,442.6	28.70	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 10	14	1	171,705.0	328,310.0	28.70	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 12	15	3	173,762.2	331,056.3	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 11	16	1	173,714.3	330,956.9	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Reciever 13	17	1	173,979.2	331,866.7	27.10	1.50	0.00	66	10.0	8.0	Y

MT					**20 July 2012**	
RVH					**TNM 2.5**	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	**VDOT On Call**					
RUN:	**Dulles Loop Existing**					
Building Row			**Points**			
Name	**Average**	**Building**	**No.**	**Coordinates (ground)**		
	Height	**Percent**		**X**	**Y**	**Z**
	m	%		m	m	m
Building1	7.50	20	1	173,955.4	332,178.3	26.20
			2	173,957.4	332,137.6	26.20
			3	173,943.9	331,984.5	26.80
			4	173,938.7	331,923.9	26.80
Building2	7.50	20	5	173,919.5	331,751.6	27.40
			6	173,940.2	331,744.4	26.20
			7	173,957.8	331,709.7	26.20
			8	173,958.7	331,691.4	26.20
			9	173,956.3	331,675.0	26.20
			10	173,933.9	331,666.3	27.40
Building3	7.50	20	11	173,890.2	331,528.8	26.80
			12	173,831.2	331,359.8	26.80
			13	173,782.6	331,215.0	26.80
Building4	7.50	20	14	173,822.6	331,528.0	27.40
			15	173,771.3	331,380.1	26.80
			16	173,726.0	331,233.5	26.80

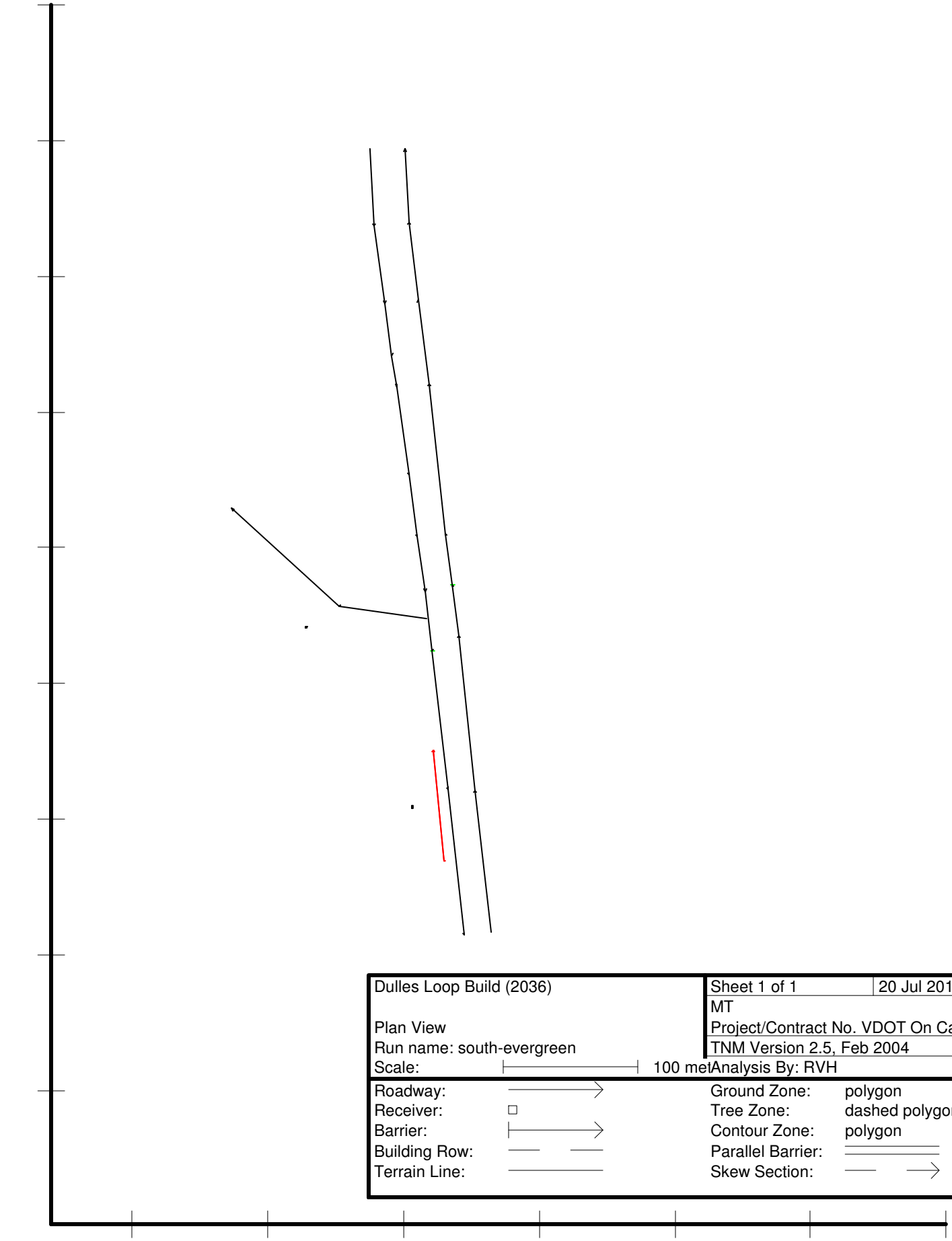
MT			**20 July 2012**	
RVH			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**VDOT On Call**			
RUN:	**Dulles Loop Existing**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		m	m	m
Terrain Line2	12	173,973.0	331,665.1	26.80
	13	173,979.5	331,679.7	26.80
	14	173,982.7	331,693.8	26.80
	15	173,982.9	331,704.3	26.80
	16	173,984.9	331,713.8	26.80
	17	173,982.7	331,724.1	26.80
	18	173,982.7	331,729.5	26.80
	19	173,977.5	331,738.6	26.80
	20	173,974.1	331,746.1	26.80
	21	173,972.8	331,751.4	26.80
	22	173,970.3	331,765.1	26.80
	23	173,967.0	331,777.5	26.80
Terrain Line3	24	173,851.8	331,318.0	26.80
	25	173,856.2	331,323.9	26.80
	26	173,861.2	331,341.8	26.80
	27	173,867.9	331,360.7	26.80
	28	173,875.8	331,379.3	26.80
	29	173,878.9	331,385.3	26.80
	30	173,880.9	331,392.1	26.80
	31	173,881.8	331,398.3	26.80
	32	173,884.9	331,408.8	26.80
	33	173,887.3	331,414.1	26.80
	34	173,893.1	331,431.2	26.80
	35	173,896.8	331,441.7	26.80

	36	173,900.0	331,448.2	26.80
	37	173,902.4	331,456.1	26.80
	38	173,905.8	331,463.7	26.80
	39	173,908.1	331,470.9	26.80
	40	173,911.1	331,481.7	26.80
	41	173,912.3	331,485.6	26.80
	42	173,915.5	331,489.1	26.80
Terrain Line4	43	174,013.3	331,982.9	26.80
	44	174,014.2	332,003.4	26.80
	45	174,014.2	332,012.0	26.80
	46	174,015.7	332,020.4	26.80
	47	174,014.9	332,040.1	26.80
	48	174,016.2	332,047.3	26.20
	49	174,015.2	332,051.0	26.20
	50	174,014.5	332,065.5	26.20
	51	174,014.4	332,091.0	26.20
	52	174,013.8	332,115.6	26.20
	53	174,013.3	332,130.4	26.20
Terrain Line5	54	173,949.1	331,510.8	27.10
	55	173,945.9	331,488.1	27.10
	56	173,898.9	331,360.1	26.80
	57	173,876.2	331,292.6	26.80
	58	173,848.9	331,201.0	26.80
	59	173,830.9	331,131.3	26.50



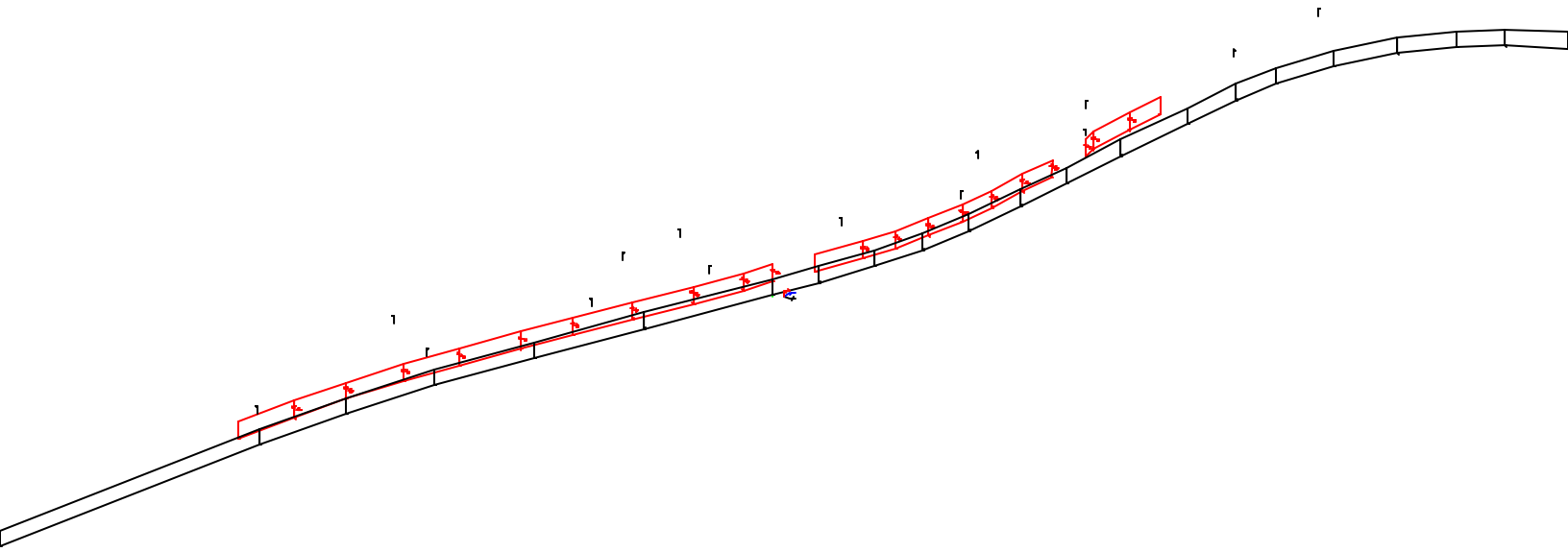
Dulles Loop Build (2036)		Sheet 1 of 1	19 Jul 2012
		MT	
Plan View		Project/Contract No. VDOT On Call	
Run name: New Design North		TNM Version 2.5, Feb 2004	
Scale:	200 meters	Analysis By: RVH	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	



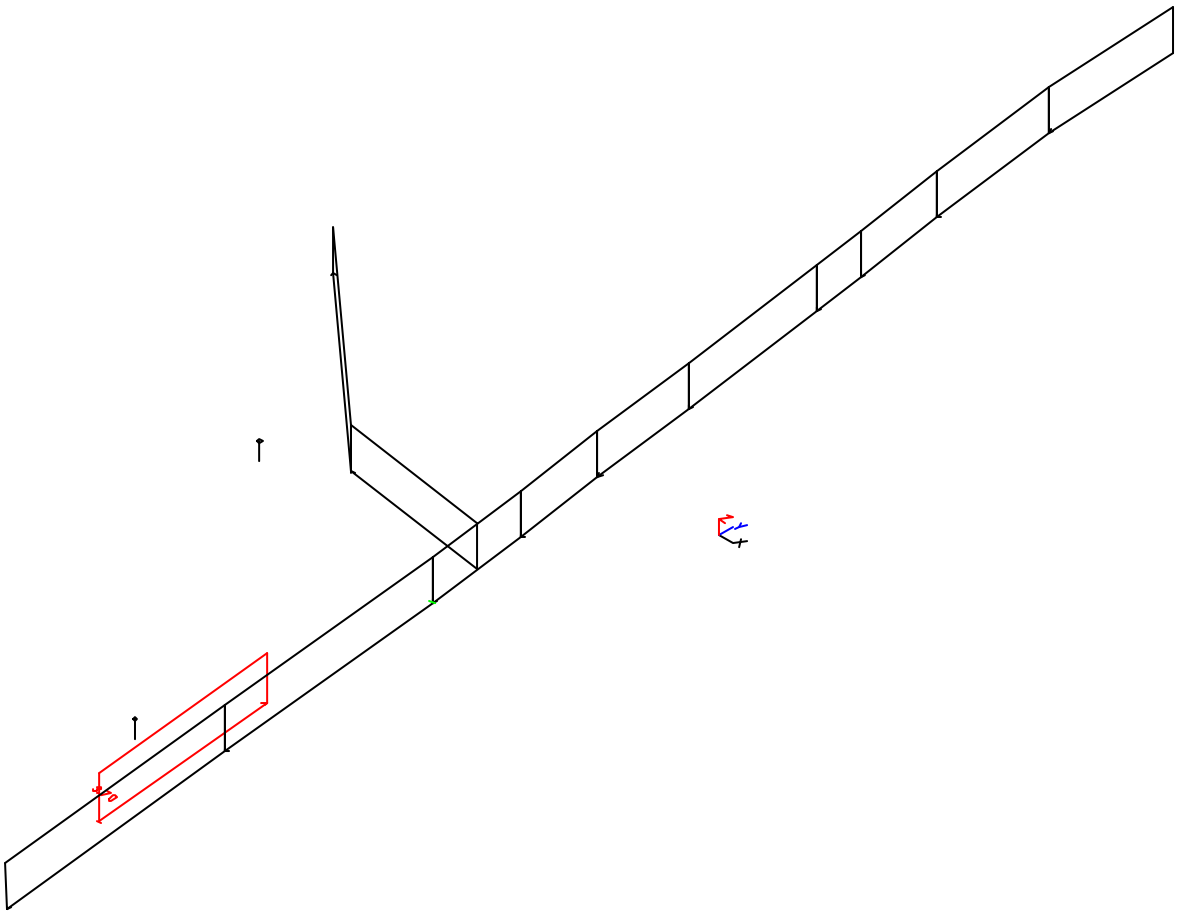
Dulles Loop Build (2036)		Sheet 1 of 1	20 Jul 2012
		MT	
Plan View		Project/Contract No. VDOT On Call	
Run name: south-evergreen		TNM Version 2.5, Feb 2004	
Scale:	100 met	Analysis By: RVH	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	



Dulles Loop Build (2036)	Sheet 1 of 1	20 Jul 2012
	MT	
Barrier View-CNE A system	Project/Contract No. VDOT On Call	
Run name: New Design North	TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>	Analysis By: RVH	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	



Dulles Loop Build (2036)		Sheet 1 of 1	20 Jul 2012
		MT	
Barrier View-unsaved		Project/Contract No. VDOT On Call	
Run name: south-evergreen		TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>		Analysis By: RVH	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

MT 20 July 2012
RVH TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	m			m	m	m		km/h	%		
Old Ox NB	7.3	point478	478	173,770.3	330,758.8	26.50				Average	
		point479	479	173,818.5	331,018.4	26.50				Average	
		point480	480	173,839.9	331,106.0	26.50				Average	
		point481	481	173,864.6	331,187.6	26.80				Average	
		point482	482	173,896.7	331,279.3	26.80				Average	
		point483	483	173,933.3	331,378.2	26.80				Average	
		point484	484	173,976.0	331,494.8	26.80				Average	
		point485	485	173,992.9	331,539.1	26.80					
Old Ox SB	7.3	point500	500	174,181.2	332,263.8	26.50				Average	
		point501	501	174,139.3	332,227.8	26.50				Average	
		point502	502	174,110.8	332,196.1	26.50				Average	
		point503	503	174,080.7	332,152.0	26.50				Average	
		point504	504	174,054.6	332,098.4	26.50				Average	
		point505	505	174,037.6	332,043.8	26.50				Average	
		point506	506	174,030.8	332,002.4	26.50				Average	
		point507	507	174,026.7	331,946.7	26.50				Average	
		point508	508	174,021.5	331,868.5	26.80				Average	
		point509	509	174,017.4	331,805.0	26.80				Average	
		point510	510	174,014.2	331,751.8	27.10				Average	
		point511	511	174,008.9	331,692.4	27.10				Average	
		point512	512	174,000.5	331,643.8	27.10				Average	
		point513	513	173,987.6	331,595.8	27.10				Average	
		point514	514	173,969.8	331,545.7	26.80				Average	
		point515	515	173,954.2	331,503.3	26.80					
Old Ox NB-2	7.3	point522	522	173,992.9	331,539.1	26.80	Signal	0.00	100	Average	

		point486	486	174,011.1	331,588.7	27.10				Average	
		point487	487	174,023.5	331,636.8	27.10				Average	
		point488	488	174,032.4	331,688.7	27.10				Average	
		point489	489	174,037.6	331,748.3	27.10				Average	
		point490	490	174,041.4	331,806.5	26.80				Average	
		point491	491	174,045.3	331,868.1	26.80				Average	
		point492	492	174,050.2	331,942.9	26.50				Average	
		point493	493	174,054.5	331,999.8	26.50				Average	
		point494	494	174,060.8	332,039.1	26.50				Average	
		point495	495	174,075.8	332,087.6	26.50				Average	
		point496	496	174,101.2	332,140.7	26.50				Average	
		point497	497	174,129.3	332,181.3	26.50				Average	
		point498	498	174,159.9	332,214.6	26.50				Average	
		point499	499	174,196.3	332,245.4	26.50					
Old Ox SB-2	7.3	point523	523	173,954.2	331,503.3	26.80	Signal	0.00	100	Average	
		point516	516	173,911.0	331,387.0	26.80				Average	
		point517	517	173,875.0	331,288.0	26.80				Average	
		point518	518	173,842.4	331,196.6	26.80				Average	
		point519	519	173,817.1	331,112.0	26.50				Average	
		point520	520	173,795.9	331,026.6	26.50				Average	
		point521	521	173,744.0	330,756.3	26.50					

MT 20 July 2012
RVH TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Old Ox NB	point478	478	725	88	46	88	22	88	0	0	0	0
	point479	479	725	88	46	88	22	88	0	0	0	0
	point480	480	725	88	46	88	22	88	0	0	0	0
	point481	481	725	88	46	88	22	88	0	0	0	0
	point482	482	725	88	46	88	22	88	0	0	0	0
	point483	483	725	88	46	88	22	88	0	0	0	0
	point484	484	725	88	46	88	22	88	0	0	0	0
	point485	485										
Old Ox SB	point500	500	1739	88	115	88	57	88	0	0	0	0
	point501	501	1739	88	115	88	57	88	0	0	0	0
	point502	502	1739	88	115	88	57	88	0	0	0	0
	point503	503	1739	88	115	88	57	88	0	0	0	0
	point504	504	1739	88	115	88	57	88	0	0	0	0
	point505	505	1739	88	115	88	57	88	0	0	0	0
	point506	506	1739	88	115	88	57	88	0	0	0	0
	point507	507	1739	88	115	88	57	88	0	0	0	0
	point508	508	1739	88	115	88	57	88	0	0	0	0
	point509	509	1739	88	115	88	57	88	0	0	0	0
	point510	510	1739	88	115	88	57	88	0	0	0	0
	point511	511	1739	88	115	88	57	88	0	0	0	0
	point512	512	1739	88	115	88	57	88	0	0	0	0
	point513	513	1739	88	115	88	57	88	0	0	0	0
	point514	514	1739	88	115	88	57	88	0	0	0	0

	point515	515										
Old Ox NB-2	point522	522	818	88	47	88	23	88	0	0	0	0
	point486	486	818	88	47	88	23	88	0	0	0	0
	point487	487	818	88	47	88	23	88	0	0	0	0
	point488	488	818	88	47	88	23	88	0	0	0	0
	point489	489	818	88	47	88	23	88	0	0	0	0
	point490	490	818	88	47	88	23	88	0	0	0	0
	point491	491	818	88	47	88	23	88	0	0	0	0
	point492	492	818	88	47	88	23	88	0	0	0	0
	point493	493	818	88	47	88	23	88	0	0	0	0
	point494	494	818	88	47	88	23	88	0	0	0	0
	point495	495	818	88	47	88	23	88	0	0	0	0
	point496	496	818	88	47	88	23	88	0	0	0	0
	point497	497	818	88	47	88	23	88	0	0	0	0
	point498	498	818	88	47	88	23	88	0	0	0	0
	point499	499										
Old Ox SB-2	point523	523	1778	88	112	88	55	88	0	0	0	0
	point516	516	1778	88	112	88	55	88	0	0	0	0
	point517	517	1778	88	112	88	55	88	0	0	0	0
	point518	518	1778	88	112	88	55	88	0	0	0	0
	point519	519	1778	88	112	88	55	88	0	0	0	0
	point520	520	1778	88	112	88	55	88	0	0	0	0
	point521	521										

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INPUT: RECEIVERS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Receiver2	1	3	173,854.0	331,378.5	26.80	1.50	0.00	66	10.0	8.0	
Receiver3	2	4	173,824.1	331,448.0	26.80	1.50	0.00	66	10.0	8.0	
Receiver4	3	3	173,966.8	331,724.8	26.80	1.50	0.00	66	10.0	8.0	
Receiver5	4	5	173,982.1	332,048.3	26.20	1.50	0.00	66	10.0	8.0	
Modeling Receiver 1	5	4	173,949.2	331,898.0	27.10	1.50	0.00	66	10.0	8.0	
Modeling Receiver 2	6	4	173,936.4	331,775.1	27.10	1.50	0.00	66	10.0	8.0	
Modeling Receiver 3	7	3	173,922.9	331,619.2	27.10	1.50	0.00	66	10.0	8.0	
Modeling Receiver 4	8	3	173,893.0	331,486.5	27.10	1.50	0.00	66	10.0	8.0	
Modeling Receiver 5	9	2	173,835.5	331,506.7	27.10	1.50	0.00	66	10.0	8.0	
Modeling Receiver 6	10	4	173,805.5	331,223.6	26.80	1.50	0.00	66	10.0	8.0	
Modeling Receiver 7	11	7	173,748.7	331,238.2	26.80	1.50	0.00	66	10.0	8.0	
Modeling Receiver 8	12	3	173,989.6	332,146.2	26.20	1.50	0.00	66	10.0	8.0	
Modeling Receiver 12	15	3	173,762.2	331,056.3	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 11	16	1	173,714.3	330,956.9	26.80	1.50	0.00	66	10.0	8.0	Y
Modeling Reciever 13	17	1	173,979.2	331,866.7	27.10	1.50	0.00	66	10.0	8.0	Y

MT **20 July 2012**
RVH **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **VDOT On Call**
RUN: **Dulles Loop Build (2036)**

Barrier									**Points**										
Name	**Type**	**Height**		**If Wall**	**If Berm**			**Add'tnl**	**Name**	**No.**	**Coordinates (bottom)**			**Height**	**Segment**				
		Min	**Max**	**$ per**	**$ per**	**Top**	**Run:Rise**	**$ per**			**X**	**Y**	**Z**	**at**	**Seg Ht Perturbs**			**On**	**Important**
				Unit	**Unit**	**Width**		**Unit**						**Point**	**Incre-**	**#Up**	**#Dn**	**Struct?**	**Reflec-**
				Area	**Vol.**			**Length**							**ment**				**tions?**
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Barrier5	W	0.00	30.48	0.00				0.00	point6	6	174,002.2	331,802.1	27.10	3.70	1.20	1	0		
									point7	7	174,000.1	331,767.8	27.10	3.70	1.20	1	0		
									point8	8	173,997.9	331,732.0	27.10	3.70	1.20	1	0		
									point9	9	173,995.0	331,697.4	27.10	3.70	1.20	1	0		
									point10	10	173,989.3	331,661.9	27.10	3.70	1.20	1	0		
									point11	11	173,981.7	331,628.2	27.10	3.70	1.20	1	0		
									point12	12	173,972.5	331,597.2	27.10	3.70	1.20	1	0		
									point13	13	173,956.5	331,552.7	27.10	3.70					
Barrier6	W	0.00	30.48	0.00				0.00	point14	14	173,940.4	331,517.9	26.80	3.70	1.20	1	0		
									point15	15	173,930.5	331,490.0	26.80	3.70	1.20	1	0		
									point16	16	173,914.0	331,444.8	26.80	3.70	1.20	1	0		
									point17	17	173,893.6	331,389.9	26.80	3.70	1.20	1	0		
									point18	18	173,873.6	331,336.3	26.80	3.70	1.20	1	0		
									point19	19	173,856.2	331,289.0	26.80	3.70	1.20	1	0		
									point20	20	173,835.8	331,232.6	26.80	3.70	1.20	1	0		
									point21	21	173,818.4	331,181.7	26.80	3.70	1.20	1	0		
									point22	22	173,802.2	331,126.9	26.80	3.70	1.20	1	0		
									point23	23	173,789.1	331,075.9	26.50	3.70	1.20	1	0		
									point24	24	173,775.9	331,019.3	26.50	3.70					
Barrier7	W	0.00	30.48	0.00				0.00	point25	25	174,000.6	331,845.2	27.10	3.70	1.20	1	0		
									point26	26	173,998.2	331,857.5	27.10	3.70	1.20	1	0		
									point27	27	174,000.2	331,901.1	27.10	3.70	1.20	1	0		
									point28	28	174,001.8	331,936.7	27.10	3.70					

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INPUT: BUILDING ROWS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)

Building Row Name	Average Height	Building Percent	Points No.	Coordinates (ground) X	Y	Z
	m	%		m	m	m
Building1	7.50	20	1	173,955.4	332,178.3	26.20
			2	173,957.4	332,137.6	26.20
			3	173,943.9	331,984.5	26.80
			4	173,938.7	331,923.9	26.80
Building2	7.50	20	5	173,919.5	331,751.6	27.40
			6	173,940.2	331,744.4	26.20
			7	173,957.8	331,709.7	26.20
			8	173,958.7	331,691.4	26.20
			9	173,956.3	331,675.0	26.20
			10	173,933.9	331,666.3	27.40
Building3	7.50	20	11	173,890.2	331,528.8	26.80
			12	173,831.2	331,359.8	26.80
			13	173,782.6	331,215.0	26.80
Building4	7.50	20	14	173,822.6	331,528.0	27.40
			15	173,771.3	331,380.1	26.80
			16	173,726.0	331,233.5	26.80

MT			**20 July 2012**	
RVH			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**VDOT On Call**			
RUN:	**Dulles Loop Build (2036)**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		m	m	m
Terrain Line2	12	173,973.0	331,665.1	26.80
	13	173,979.5	331,679.7	26.80
	14	173,982.7	331,693.8	26.80
	15	173,982.9	331,704.3	26.80
	16	173,984.9	331,713.8	26.80
	17	173,982.7	331,724.1	26.80
	18	173,982.7	331,729.5	26.80
	19	173,977.5	331,738.6	26.80
	20	173,974.1	331,746.1	26.80
	21	173,972.8	331,751.4	26.80
	22	173,970.3	331,765.1	26.80
	23	173,967.0	331,777.5	26.80
Terrain Line3	24	173,851.8	331,318.0	26.80
	25	173,856.2	331,323.9	26.80
	26	173,861.2	331,341.8	26.80
	27	173,867.9	331,360.7	26.80
	28	173,875.8	331,379.3	26.80
	29	173,878.9	331,385.3	26.80
	30	173,880.9	331,392.1	26.80
	31	173,881.8	331,398.3	26.80
	32	173,884.9	331,408.8	26.80
	33	173,887.3	331,414.1	26.80
	34	173,893.1	331,431.2	26.80
	35	173,896.8	331,441.7	26.80

	36	173,900.0	331,448.2	26.80
	37	173,902.4	331,456.1	26.80
	38	173,905.8	331,463.7	26.80
	39	173,908.1	331,470.9	26.80
	40	173,911.1	331,481.7	26.80
	41	173,912.3	331,485.6	26.80
	42	173,915.5	331,489.1	26.80
Terrain Line4	43	174,013.3	331,982.9	26.80
	44	174,014.2	332,003.4	26.80
	45	174,014.2	332,012.0	26.80
	46	174,015.7	332,020.4	26.80
	47	174,014.9	332,040.1	26.80
	48	174,016.2	332,047.3	26.20
	49	174,015.2	332,051.0	26.20
	50	174,014.5	332,065.5	26.20
	51	174,014.4	332,091.0	26.20
	52	174,013.8	332,115.6	26.20
	53	174,013.3	332,130.4	26.20

MT				**20 July 2012**						
RVH				**TNM 2.5**						
RESULTS: BARRIER DESCRIPTIONS										
PROJECT/CONTRACT:	**VDOT On Call**									
RUN:	**Dulles Loop Build (2036)**									
BARRIER DESIGN:	**INPUT HEIGHTS**									
Barriers										
Name	**Type**	**Heights along Barrier**			**Length**	**If Wall**	**If Berm**			**Cost**
		Min	**Avg**	**Max**		**Area**	**Volume**	**Top Width**	**Run:Rise**	
		m	m	m	m	sq m	cu m	m	m:m	$
Barrier5	W	3.70	3.70	3.70	255	944				0
Barrier6	W	3.70	3.70	3.70	526	1945				0
Barrier7	W	3.70	3.70	3.70	92	340				0
									Total Cost:	0

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RESULTS: BARRIER-SEGMENT DESCRIPTIONS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)
BARRIER DESIGN: INPUT HEIGHTS

Barriers		Segments										
Name	Type	Name	No.	Heights			Length	If Wall			If Berm	Cost
				First Point	Average	Second Point		Area	On Struc?	Important Reflections?	Volume	
				m	m	m	m	sq m			cu m	$
Barrier5	W	point6	6	3.70	3.70	3.70	34	127				0
		point7	7	3.70	3.70	3.70	36	133				0
		point8	8	3.70	3.70	3.70	35	128				0
		point9	9	3.70	3.70	3.70	36	133				0
		point10	10	3.70	3.70	3.70	35	128				0
		point11	11	3.70	3.70	3.70	32	120				0
		point12	12	3.70	3.70	3.70	47	175				0
Barrier6	W	point14	14	3.70	3.70	3.70	30	110				0
		point15	15	3.70	3.70	3.70	48	178				0
		point16	16	3.70	3.70	3.70	59	217				0
		point17	17	3.70	3.70	3.70	57	212				0
		point18	18	3.70	3.70	3.70	50	187				0
		point19	19	3.70	3.70	3.70	60	222				0
		point20	20	3.70	3.70	3.70	54	199				0
		point21	21	3.70	3.70	3.70	57	211				0
		point22	22	3.70	3.70	3.70	53	195				0
		point23	23	3.70	3.70	3.70	58	215				0
Barrier7	W	point25	25	3.70	3.70	3.70	13	47				0
		point26	26	3.70	3.70	3.70	44	161				0
		point27	27	3.70	3.70	3.70	36	132				0

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Calculated with TNM 2.5

RESULTS: BARRIER DESIGN
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 20 deg C, 50% RH

Selected Receivers

Name	No.	Calc	Noise Reduction			Barrier Reviewed	Important Segments			Partial
		LAeq1h	Calc	Goal	Calc-Goal		Name	No.	Height	LAeq1h
		dBA	dB	dB	dB				m	dBA
Receiver2	1	57.5	7.2	8	-0.8	Barrier6	point17	17	3.7	53.3
						Barrier6	point16	16	3.7	50.6
						Barrier6	point18	18	3.7	49.1
						Barrier6	point15	15	3.7	48.1
						Barrier6	point19	19	3.7	45.9
						Barrier6	point20	20	3.7	42.8
						Barrier6	point14	14	3.7	39.1
						Barrier5	point12	12	3.7	34.9
						Barrier5	point11	11	3.7	31.8
						Barrier5	point10	10	3.7	31.6
Receiver3	2	53.6	4.6	8	-3.4	Barrier6	point15	15	3.7	46.2
						Barrier6	point16	16	3.7	46.1
						Barrier6	point17	17	3.7	44.4
						Barrier6	point14	14	3.7	44.2
						Barrier6	point18	18	3.7	41.3
						Barrier6	point19	19	3.7	39.7
						Barrier5	point12	12	3.7	37.7
						Barrier6	point20	20	3.7	37.3
						Barrier6	point21	21	3.7	35.6
						Barrier6	point22	22	3.7	35.2
Receiver4	3	58.4	7.9	8	-0.1	Barrier5	point8	8	3.7	51.5

						Barrier5	point7	7	3.7	50.4
						Barrier5	point9	9	3.7	48.9
						Barrier5	point6	6	3.7	46.5
						Barrier5	point10	10	3.7	45.8
						Barrier5	point11	11	3.7	42.9
						Barrier5	point12	12	3.7	42.3
						Barrier7	point25	25	3.7	39.7
						Barrier7	point26	26	3.7	38.7
						Barrier6	point15	15	3.7	36.3
Receiver5	4	64.1	0.1	8	-7.9	Barrier7	point27	27	3.7	38.4
						Barrier7	point26	26	3.7	35.9
						Barrier5	point6	6	3.7	30.5
						Barrier5	point12	12	3.7	29.7
						Barrier6	point20	20	3.7	28.9
						Barrier5	point7	7	3.7	28.5
						Barrier5	point9	9	3.7	27.3
						Barrier5	point8	8	3.7	26.8
						Barrier5	point10	10	3.7	26.6
						Barrier5	point11	11	3.7	26.0
Modeling Receiver 1	5	58.7	2.9	8	-5.1	Barrier7	point26	26	3.7	49.3
						Barrier7	point27	27	3.7	48.0
						Barrier5	point6	6	3.7	41.9
						Barrier7	point25	25	3.7	41.1
						Barrier5	point7	7	3.7	39.6
						Barrier5	point8	8	3.7	37.0
						Barrier5	point10	10	3.7	36.7
						Barrier5	point9	9	3.7	36.1
						Barrier6	point19	19	3.7	35.0
						Barrier5	point11	11	3.7	32.0
Modeling Receiver 2	6	57.1	3.7	8	-4.3	Barrier5	point7	7	3.7	47.0
						Barrier5	point6	6	3.7	46.7
						Barrier5	point8	8	3.7	45.0
						Barrier5	point9	9	3.7	43.1
						Barrier7	point26	26	3.7	43.0
						Barrier7	point27	27	3.7	41.7
						Barrier5	point10	10	3.7	40.9

						Barrier7	point25	25	3.7	40.6
						Barrier5	point11	11	3.7	37.6
						Barrier5	point12	12	3.7	35.0
Modeling Receiver 3	7	57.7	4.9	8	-3.1	Barrier5	point12	12	3.7	50.1
						Barrier5	point11	11	3.7	48.2
						Barrier5	point10	10	3.7	46.8
						Barrier5	point9	9	3.7	44.6
						Barrier6	point14	14	3.7	43.6
						Barrier5	point8	8	3.7	42.3
						Barrier6	point15	15	3.7	42.1
						Barrier6	point16	16	3.7	40.0
						Barrier5	point7	7	3.7	39.1
						Barrier6	point17	17	3.7	37.9
Modeling Receiver 4	8	59.5	6.1	8	-1.9	Barrier6	point15	15	3.7	54.2
						Barrier6	point14	14	3.7	53.3
						Barrier6	point16	16	3.7	49.6
						Barrier6	point17	17	3.7	44.6
						Barrier5	point12	12	3.7	43.5
						Barrier6	point18	18	3.7	41.5
						Barrier6	point19	19	3.7	40.8
						Barrier5	point11	11	3.7	38.7
						Barrier5	point10	10	3.7	37.3
						Barrier5	point9	9	3.7	35.7
Modeling Receiver 5	9	54.1	4.0	8	-4.0	Barrier6	point14	14	3.7	46.2
						Barrier6	point15	15	3.7	45.7
						Barrier6	point16	16	3.7	44.2
						Barrier5	point12	12	3.7	41.7
						Barrier6	point17	17	3.7	41.4
						Barrier6	point18	18	3.7	38.7
						Barrier6	point19	19	3.7	37.4
						Barrier5	point10	10	3.7	36.6
						Barrier5	point11	11	3.7	36.6
						Barrier6	point20	20	3.7	35.5
Modeling Receiver 6	10	57.9	8.9	8	0.9	Barrier6	point20	20	3.7	54.7
						Barrier6	point19	19	3.7	51.2
						Barrier6	point21	21	3.7	49.3

						Barrier6	point17	17	3.7	44.6
						Barrier6	point18	18	3.7	44.5
						Barrier6	point22	22	3.7	44.2
						Barrier6	point23	23	3.7	37.9
						Barrier6	point16	16	3.7	37.1
						Barrier6	point15	15	3.7	31.9
						Barrier6	point14	14	3.7	27.8
Modeling Receiver 7	11	53.2	4.7	8	-3.3	Barrier6	point20	20	3.7	46.0
						Barrier6	point21	21	3.7	45.8
						Barrier6	point19	19	3.7	45.0
						Barrier6	point22	22	3.7	42.6
						Barrier6	point18	18	3.7	41.5
						Barrier6	point23	23	3.7	40.6
						Barrier6	point17	17	3.7	39.6
						Barrier6	point16	16	3.7	39.4
						Barrier6	point15	15	3.7	38.6
						Barrier6	point14	14	3.7	30.6
Modeling Receiver 8	12	60.6	0.0	8	-8.0	Barrier7	point27	27	3.7	31.4
						Barrier5	point12	12	3.7	29.6
						Barrier6	point20	20	3.7	27.9
						Barrier6	point19	19	3.7	25.9
						Barrier6	point16	16	3.7	25.8
						Barrier7	point26	26	3.7	25.8
						Barrier6	point17	17	3.7	25.5
						Barrier6	point18	18	3.7	25.4
						Barrier5	point11	11	3.7	25.1
						Barrier6	point15	15	3.7	25.0
Modeling Receiver 12	15	60.9	6.8	8	-1.2	Barrier6	point23	23	3.7	56.0
						Barrier6	point22	22	3.7	50.9
						Barrier6	point21	21	3.7	45.8
						Barrier6	point20	20	3.7	41.1
						Barrier6	point19	19	3.7	29.1
						Barrier6	point18	18	3.7	22.9
						Barrier5	point8	8	3.7	22.4
						Barrier5	point7	7	3.7	22.4
						Barrier5	point9	9	3.7	22.2

						Barrier7	point26	26	3.7	21.9
Modeling Receiver 11	16	61.8	0.5	8	-7.5	Barrier6	point23	23	3.7	45.9
						Barrier6	point22	22	3.7	42.5
						Barrier6	point21	21	3.7	39.5
						Barrier6	point20	20	3.7	36.7
						Barrier6	point19	19	3.7	34.8
						Barrier6	point18	18	3.7	24.6
						Barrier6	point17	17	3.7	22.5
						Barrier5	point9	9	3.7	20.8
						Barrier5	point6	6	3.7	20.6
						Barrier6	point16	16	3.7	20.1
Modeling Reciever 13	17	60.9	6.3	8	-1.7	Barrier7	point26	26	3.7	54.2
						Barrier7	point27	27	3.7	49.3
						Barrier7	point25	25	3.7	47.9
						Barrier5	point6	6	3.7	44.8
						Barrier5	point7	7	3.7	41.3
						Barrier5	point8	8	3.7	38.4
						Barrier5	point9	9	3.7	37.7
						Barrier5	point12	12	3.7	36.6
						Barrier5	point10	10	3.7	36.5
						Barrier5	point11	11	3.7	33.2
Total Cost, All Barriers (including additional cost(s))					$0					

MT					**20 July 2012**						
RVH					**TNM 2.5**						
INPUT: ROADWAYS							**Average pavement type shall be used unless**				
PROJECT/CONTRACT:	**VDOT On Call**						**a State highway agency substantiates the use**				
RUN:	**Dulles Loop Build (2036)**						**of a different type with the approval of FHWA**				
Roadway		**Points**									
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**	
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**
	m			m	m	m		km/h	%		
Old Ox NB-2	7.3	point515	515	171,734.5	328,473.8	29.00	Signal	0.00	100	Average	
		point496	496	171,729.7	328,511.4	29.00				Average	
		point497	497	171,717.5	328,621.4	29.00				Average	
		point498	498	171,709.1	328,683.7	29.00				Average	
		point499	499	171,702.5	328,740.4	29.00				Average	
		point500	500	171,699.5	328,794.6	29.00					
Old Ox NB	7.3	point493	493	171,762.7	328,218.1	29.00				Average	
		point494	494	171,751.3	328,322.4	29.00				Average	
		point513	513	171,739.3	328,436.2	29.00				Average	
		point514	514	171,734.5	328,473.8	29.00					
Old Ox SB-2	7.3	point516	516	171,719.9	328,425.0	29.00	Signal	0.00	100	Average	
		point510	510	171,731.2	328,323.2	29.00				Average	
		point511	511	171,743.0	328,215.5	29.00					
Old Ox SB	7.3	point501	501	171,674.1	328,795.3	29.00				Average	
		point502	502	171,676.7	328,738.5	29.00				Average	
		point503	503	171,684.7	328,681.4	29.00				Average	
		point504	504	171,690.2	328,642.4	29.00				Average	
		point505	505	171,693.4	328,619.9	29.00				Average	
		point506	506	171,702.5	328,554.6	29.00				Average	
		point507	507	171,708.4	328,509.1	29.00				Average	
		point512	512	171,714.8	328,469.2	29.00				Average	
		point509	509	171,719.9	328,425.0	29.00					
Roadway36	7.3	point517	517	171,715.4	328,449.0	28.70				Average	
		point518	518	171,650.7	328,458.3	28.70				Average	
		point519	519	171,571.8	328,530.0	28.70					

MT				**20 July 2012**								
RVH				**TNM 2.5**								
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	**VDOT On Call**											
RUN:	**Dulles Loop Build (2036)**											
Roadway	**Points**											
Name	**Name**	**No.**	**Segment**									
			Autos		**MTrucks**		**HTrucks**		**Buses**		**Motorcycles**	
			V	**S**	**V**	**S**	**V**	**S**	**V**	**S**	**V**	**S**
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Old Ox NB-2	point515	515	709	88	47	88	24	88	0	0	0	0
	point496	496	709	88	47	88	24	88	0	0	0	0
	point497	497	709	88	47	88	24	88	0	0	0	0
	point498	498	709	88	47	88	24	88	0	0	0	0
	point499	499	709	88	47	88	24	88	0	0	0	0
	point500	500										
Old Ox NB	point493	493	1149	88	115	88	82	88	0	0	0	0
	point494	494	1149	88	115	88	82	88	0	0	0	0
	point513	513	1149	88	115	88	82	88	0	0	0	0
	point514	514										
Old Ox SB-2	point516	516	2154	88	171	88	122	88	0	0	0	0
	point510	510	2154	88	171	88	122	88	0	0	0	0
	point511	511										
Old Ox SB	point501	501	1858	88	123	88	61	88	0	0	0	0
	point502	502	1858	88	123	88	61	88	0	0	0	0
	point503	503	1858	88	123	88	61	88	0	0	0	0
	point504	504	1858	88	123	88	61	88	0	0	0	0
	point505	505	1858	88	123	88	61	88	0	0	0	0
	point506	506	1858	88	123	88	61	88	0	0	0	0
	point507	507	1858	88	123	88	61	88	0	0	0	0
	point512	512	1858	88	123	88	61	88	0	0	0	0
	point509	509										
Roadway36	point517	517	524	40	35	40	17	40	0	0	0	0

	point518	518	524	40	35	40	17	40	0	0	0	0
	point519	519										

MT						**20 July 2012**					
RVH						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**VDOT On Call**										
RUN:	**Dulles Loop Build (2036)**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			m	m	m	m	dBA	dBA	dB	dB	
Modeling Receiver 9	13	2	171,626.9	328,442.6	28.70	1.50	0.00	66	10.0	8.0	Y
Modeling Receiver 10	14	1	171,705.0	328,310.0	28.70	1.50	0.00	66	10.0	8.0	

MT 20 July 2012
RVH TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Barrier5	W	0.00	30.48	0.00				0.00	point6	6	171,728.7	328,270.3	28.70	3.70	1.20	1	0		
									point7	7	171,720.1	328,352.2	28.70	3.70					

MT				**20 July 2012**						
RVH				**TNM 2.5**						
RESULTS: BARRIER DESCRIPTIONS										
PROJECT/CONTRACT:	**VDOT On Call**									
RUN:	**Dulles Loop Build (2036)**									
BARRIER DESIGN:	**INPUT HEIGHTS**									
Barriers										
Name	**Type**	**Heights along Barrier**			**Length**	**If Wall**	**If Berm**			**Cost**
		Min	**Avg**	**Max**		**Area**	**Volume**	**Top Width**	**Run:Rise**	
		m	m	m	m	sq m	cu m	m	m:m	$
Barrier5	W	3.70	3.70	3.70	82	305				0
									Total Cost:	0

MT 20 July 2012
RVH TNM 2.5

RESULTS: BARRIER-SEGMENT DESCRIPTIONS
PROJECT/CONTRACT: VDOT On Call
RUN: Dulles Loop Build (2036)
BARRIER DESIGN: INPUT HEIGHTS

Barriers		Segments										
Name	Type	Name	No.	Heights			Length	If Wall			If Berm	Cost
				First	Average	Second		Area	On	Important	Volume	
				Point		Point			Struc?	Reflections?		
				m	m	m	m	sq m			cu m	$
Barrier5	W	point6	6	3.70	3.70	3.70	82	305				0

MT									**20 July 2012**	
RVH									**TNM 2.5**	
									Calculated with TNM 2.5	
RESULTS: BARRIER DESIGN										
PROJECT/CONTRACT:		**VDOT On Call**								
RUN:		**Dulles Loop Build (2036)**								
BARRIER DESIGN:		**INPUT HEIGHTS**								
ATMOSPHERICS:		**20 deg C, 50% RH**								
Selected Receivers										
Name	**No.**									
		Calc	**Noise Reduction**			**Barrier Reviewed**	**Important Segments**			**Partial**
		LAeq1h	**Calc**	**Goal**	**Calc-Goal**		**Name**	**No.**	**Height**	**LAeq1h**
		dBA	dB	dB	dB				m	dBA
Modeling Receiver 9	13	63.1	0.1	8	-7.9	Barrier5	point6	6	3.7	48.8
Modeling Receiver 10	14	66.1	6.0	8	-2.0	Barrier5	point6	6	3.7	60.0
Total Cost, All Barriers (including additional cost(s))					$0					

Appendix G
Warranted, Feasible, and Reasonable Worksheets

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

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

Date:	18-May-12
Project No. and UPC:	0606-053-983, PE-101 UPC 97529
County:	Loudoun County
District:	
Barrier System ID:	CNE A Barrier
Community Name and/or CNE#	CNE A
Noise Abatement Category(s)	
Design phase:	Preliminary design

Warranted

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

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	14
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	14
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	34,370 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	14
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	10
d.	Total number of benefited receptors.	24
e.	Surface Area per benefited receptor unit. (ft^2/BR)	1,432 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	2,864 ft
b.	Height range of the proposed noise barrier. (ft)	
c.	Average height of the proposed noise barrier. (ft)	12 ft
d.	Cost per square foot. ($/$ft^2$)	$48/SF
e.	Total Barrier Cost ($)	$1,649,760
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

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

Additional Reasons for Decision:

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

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

Date:	18-May-12
Project No. and UPC:	0606-053-983, PE-101 UPC 97529
County:	Loudoun County
District:	
Barrier System ID:	CNE B Barrier
Community Name and/or CNE#	CNE B
Noise Abatement Category(s)	
Design phase:	Preliminary design

Warranted

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

Feasibility

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

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	3,228 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d.	Total number of benefited receptors.	1
e.	Surface Area per benefited receptor unit. (ft^2/BR)	3,228 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	269 ft
b.	Height range of the proposed noise barrier. (ft)	
c.	Average height of the proposed noise barrier. (ft)	12 ft
d.	Cost per square foot. ($/$ft^2$)	$48/SF
e.	Total Barrier Cost ($)	$154,944
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier** Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

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

Additional Reasons for Decision:

Appendix H
HB 2577 Documentation

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

Gregory A. Whirley
Commissioner

May 15, 2012

MEMORANDUM

TO: Kimberly McCool, Project Manager
Martin Mitchell, Environmental Contact

FROM: Robyn Hartz (McCormick Taylor, Inc.), Noise Abatement Engineer

SUBJECT: UPC 97529

The 2009 General Assembly passed Chapter 120 (HB 2577, as amended by HB2025), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2025 States: Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2025 we are asking for your input (per Chapter VI of Materials Division's Manual of Instruction and Section 2B-3 Determination of Roadway Design of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are seeking your professional opinion by providing comments for the project noted above. Please distribute this memorandum to the appropriate District staff and combine all responses into one response.

Should you have any questions, please contact me at (804) 762-5800. Thank you for your time and consideration regarding this request.

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

Response: One property identified as a noise sensitive receptor is located at the extreme southern end of the project. This is located in an area where the roadway alignment is transitioning to match the existing roadway. There is no change to the existing vertical alignment. The current design provides the most efficient transition while minimizing utility and other property impacts. The other areas identified as noise sensitive receptors are in an area with horizontal curves that best match the existing roadway while minimizing impacts to properties. The vertical alignment is also designed to match existing conditions. (Kim McCool, NoVA Location & Design)

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

Response: The Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration.

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

Response: Yes, landscaping can be used as a visual screen if required. The landscaping must be placed outside of the clear zone, must not decrease driver sight distance and must not require additional right of way. The property owners should agree to the placement of the landscaping. (Kim McCool, NoVA Location & Design)

Note: Please provide the name of each responder.

Appendix I
References

References

- Virginia State Noise Abatement Policy.
- Virginia Department of Transportation, Highway Traffic Noise Impact Analysis Guidance Manual, approved March 15, 2011, effective July 13, 2011, updated September 16, 2011.
- Virginia Department of Transportation, Section 107.14(b) 3 Noise (VDOT, 2002).
- Federal Highway Administration, Federal Aid Policy Guide 23 CFR 772, U.S. Government Printing Office, updated December 9, 1991.
- U.S. Department of Transportation, Federal Highway Administration "FHWA Traffic Noise Model User's Guide," FHWA Report No. FHWA-PD-96-009, January 1998.
- U.S. Department of Transportation, Federal Highway Administration "Highway Traffic Noise Analysis and Abatement Policy and Guidance," June 1995.

Appendix J
List of Preparers and Reviewers

List of Preparers / Reviewers

McCormick Taylor, Inc.

Rich A. Butala
Contract Manager
Education: B.S., Environmental Resource Management
Professional Experience: 24.5 Years
Role: QA/QC

Robyn V. Hartz
Transportation Environmental Specialist
Education: M.S., Transportation Engineering, M.C.R.P, Transportation Planning, B.S., Civil Engineering
Professional Experience: 11.1 Years
Role: Project Coordination, Report Preparation, Noise Monitoring

T. Ross Hudnall
Noise Specialist/GIS Coordinator
Education: B.A. Geospatial Environmental Analysis
Professional Experience: 7 Years
Role: Noise Monitoring, Report Preparation

Alex J. Nies
Noise Specialist/Environmental Planner
Education: B.S., Environmental Science
Professional Experience: 1 year
Role: Noise Monitoring, Report Preparation

Brennan S. Collier
Senior Environmental Planner
Education: B.A. Geology, B.A. Environmental Science
Professional Experience: 15 Years
Role: QA/QC

Carolyn L. Keeler
Senior Environmental Planner
Education: M.S. Biology, B.S. Biology
Professional Experience: 18 Years
Role: QA/QC

Virginia Department of Transportation (VDOT)

Paul Kohler
VDOT Noise Abatement Section Manager
Education: B.S. Terrestrial Ecology
Professional Experience: 18 Years
Role: Technical Analysis Reviewer

Lovejoy Muchenje, P.E.
VDOT Noise Abatement Engineer
Education: B.S. Mechanical Engineering
Professional Experience: 4 Years
Role: Project Manager

Appendix IV

Agency Scoping Comments and Other Relevant Correspondence

ENVIRONMENTAL ASSESSMENT

Route 606 (Loudoun County Parkway/Old Ox Road) Reconstruction Project
Loudoun County, Virginia

AGENCIES CONTACTED
NEPA SCOPING PROCESS - ENVIRONMENTAL ASSESSMENT
ROUTE 606 RECOSTRUCTION PROJECT (UPC 97529)

FEDERAL AGENCIES

Federal Aviation Administration; Washington Airports District Office
National Marine Fisheries Service; Northeast Regional Office
U.S. Army Corps of Engineers; Norfolk District Corps of Engineers; Regulatory Branch
U.S. Department of Agriculture; Natural Resources Conservation Service
U.S. Department of Housing & Urban Development
U.S. Department of the Interior; Office of Environmental Policy and Compliance
U.S. Department of Transportation; Federal Railroad Administration
U.S. Environmental Protection Agency, Region III; Environmental Assessment & Innovation Division; Office of Environmental Programs
U.S. Fish and Wildlife Service; Virginia Field Office
U.S. Forest Service; Ecosystem Management Coordination

COMMONWEALTH OF VIRGINIA AGENCIES

Department of Agriculture and Consumer Services
Department of Conservation and Recreation
Department of Environmental Quality
Department of Forestry
Department of Game and Inland Fisheries
Department of Health
Department of Historic Resources
Department of Housing and Community Development
Department of Mines, Minerals, and Energy
Department of Rail and Public Transportation
Virginia Economic Development Partnership
Virginia Marine Resources Commission
Virginia Outdoors Foundation; Northern Piedmont Region Office

LOUDOUN COUNTY AGENCIES

Board of Supervisors
Department of Economic Development
Department of Family Services
Department of Fire, Rescue and Emergency Management
Department of Parks and Recreation
Health Department
Office of Transportation Services
Planning Department
Public Schools
Sheriff’s Department

Loudoun County, Virginia
Department of Planning
1 Harrison Street, S.E., 3rd Floor, P.O. Box 7000, Leesburg, VA 20177-7000
Telephone (703) 777-0246 • Fax (703) 777-0441

March 9, 2012

Martin L. Mitchell, NEPA Specialist
NOVA – Environmental
Virginia Department of Transportation
4975 Alliance Drive
Fairfax, Virginia 22030

Re: Route 606 – Dulles Loop
VDOT Project #0606-053-983, P101
From: Route 621 (Evergreen Mills Road) to Route 267 (Dulles Greenway)

Dear Mr. Mitchell,

Thank you for the opportunity to comment on the proposed Route 606 improvements and widening. The *2010 Countywide Transportation Plan* (2010 CTP) plans for Route 606 from the Dulles Greenway to Loudoun County Parkway in its ultimate condition to be a six-lane, limited-access, median-divided roadway within a 200-foot right-of-way. The portion of Route 606 from Arcola Road/future Arcola Boulevard south to Evergreen Mills Road is planned in its ultimate condition as an eight-lane, limited-access, median-divided roadway within a 200-foot right-of-way (*2010 CTP, Appendix 1, Planning Guidelines for Major Roadways*). The 2010 CTP also calls for the study of alternative uses (e.g., HOV, bus lanes) to be considered when Route 606 is expanded to its ultimate condition. The 200-foot right-of-way for Route 606 was established to allow for these potential multi-modal uses to be located within the median. The County believes the best way to preserve this option and to reduce costs in the long-term is to design the interim section to the outside of the full 200-foot right-of-way, such that widening to the ultimate condition would occur to the inside in the median, but would also accommodate any potential expansion for multi-modal uses to occur in the median.

PROJECT DETAILS

Loudoun County views the expansion of Route 606 to four lanes around the Dulles Airport as a top priority (*2010 CTP, Appendix 3, Improvement Priorities*). Our understanding is that the project involves reconstructing and widening the existing two-lane rural roadway to a four-lane divided Urban Collector with a depressed grass median from Route 621 (Evergreen Mills Road) north to Route 267 (Dulles Greenway), a distance of 4.85 miles.

The widening of Route 606 to four lanes from Route 621 (Evergreen Mills Road) to Route 267 (Dulles Greenway) will help to improve level of service conditions in the Dulles Community. The Board of Supervisors at their December 6, 2011 Business Meeting voted to direct staff to conduct a traffic analysis of the Ashburn-Sterling "traffic funnel", which includes the Route 606 corridor. The County model is proposed to be updated as part of the analysis process to better understand options to improve problem areas.

While the widening of Route 606 to four lanes is a County priority, it appears the project does not take into account the future widening to eight lanes planned for the segment of Route 606 from Arcola Road/future Arcola Boulevard south to Evergreen Mills Road or future multi-modal uses within the median, as envisioned in the 2010 CTP. The February 3, 2012 NEPA scoping letter provides the median

will only be wide enough to allow for future expansion to a six-lane section. As stated above, the County prefers the design of the roadway take into account the full 200-foot right-of-way to allow for future expansion for multi-modal uses to be accommodated in the median.

LAND USE

The Route 606 project is within the Dulles Community of the Suburban Policy Area. A portion of the project is located on Dulles Airport property. The remainder of the project, outside of the airport property, is planned for Industrial uses with densities up to 0.40 floor area ratio (*Revised General Plan, Chapter 7, Planned Land Use Map*). Areas planned for industrial uses are predominately labor-intensive industrial and commercial uses with outdoor storage requirements, noise levels, and emissions that make them incompatible with residential uses (*Revised General Plan, Chapter 6, General Industrial text*). While the area is planned for Industrial uses, a by-right residential community, Loudoun Valley Estates III was developed along the Route 606 corridor west of the National Oceanographic Atmospheric Administration. The area immediately south of the project area, south of Route 621 (Evergreen Mills Road) is planned for Business uses (*Revised General Plan, Chapter 7, Planned Land Use Map*).

The project area generally features parcels zoned Planned Development – General Industry (PD-GI). The Zoning District is established primarily for industrial uses with a public nuisance potential, and necessary accessory uses and facilities. The area also contains parcels regulated by the Airport Impact Overlay District (AI), Floodplain Overlay District (FOD), and steep slope standards.

BICYCLE AND PEDESTRIAN FACILITIES

The Bicycle and Pedestrian Mobility Master Plan (Bike/Ped Plan), Revised General Plan, and 2010 CTP recognize the need for a safe, convenient, efficient, and environmentally-sound, multi-modal transportation system to serve the needs of all members of the Loudoun community (*Bike/Ped Plan, Chapter 1, Section B text*). The overarching objective of the Bike/Ped Plan is to identify a network that provides countywide connectivity and recognizes the need for careful and flexible facility design to meet the needs of many types of bicyclists and pedestrians (*Bike/Ped Plan, Chapter 1, Section E text*). The network will include shared-use paths, on-road bike lanes, wide curb lanes, paved shoulders, retrofitted intersections, and pedestrian and bicycle over and under-passes (*2010 CTP, Chapter 4, Pedestrian and Bicycle Facilities for Roadways Policy 1*).

Route 606 is identified as a Baseline Connecting Roadway in the Bike/Ped Plan (*Bike/Ped Plan, Network Map*). These routes were selected to provide comprehensive connectivity for both bicyclists and pedestrians throughout the County and its most populated areas (*Bike/Ped Plan, Chapter 5, Baseline Connecting Roadways text*). The 2010 CTP identifies a 10-foot wide shared use path on both sides as the appropriate bicycle and pedestrian facilities for Route 606 (*2010 CTP, Appendix 6*).

GREEN INFRASTRUCTURE

County records indicate river and stream corridor resources, forest resources, wetlands, historic resources and steep and moderately steep slopes in the project area. County policies call for integrated management strategies that respect and preserve the holistic nature of these and other elements of the Green Infrastructure (*Revised General Plan, Chapter 5, Green Infrastructure Policy 2*).

River and Stream Corridors & Stormwater Management

Because of the diversity and importance of the natural systems of river and stream corridors, Loudoun County desires to protect these resources by preserving, conserving, and restoring their water quality, flood protection, aquatic and wildlife habitat, and scenic value (*Revised General Plan, Chapter 5, River and Stream Corridor Resources text*).

Loudoun County recommends the roadway alignment and design minimize encroachment into stream and drainage areas. To preclude streambed scouring and streambank erosion and to preclude pollution by substances deposited on the roadway, such as litter, road salt, oil, grease, and heavy metals,

Loudoun County recommends that stream and drainage areas be buffered and construction methods chosen that minimize disturbance of water resources. Special attention should be given to the integrity of stream bottoms. As with other surface water features, Loudoun County recommends that small surface streams be spanned rather than placed in underground pipes. Please note any construction performed on the embankment of Horsepen Run must address state dam safety regulations.

Wetlands
The County supports the federal goal of no net loss to wetlands (*Revised General Plan, Chapter 5, River and Stream Corridor Resources Policy 23*). Wetlands perform several functions: trap sediment, reduce nutrient loads, provide wildlife habitat, receive groundwater discharges, and attenuate flood waters.

In addition to the US Army Corps of Engineers and the Virginia Department of Environmental Quality, VDOT should coordinate with the Loudoun County Department of Building and Development regarding mitigation measures for any wetlands impacts.

Low Impact Development
For all phases of project development, construction, and maintenance, Loudoun County policies promote low impact development (LID) techniques that integrate hydrologically functional designs with methods for preventing pollution and the degradation of County resources (*Revised General Plan, Chapter 5, Surface Water Policy 2*). LID is particularly salient in regards to erosion and sediment control. We request that VDOT coordinate with the appropriate State and County agencies to ensure compliance with the applicable regulations as the project progresses.

It is important to note that in accordance with Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations,

> "The Department [of Conservation and Recreation] shall not approve a conservation plan submitted by a federal or state agency for a project involving a land-disturbing activity in one locality with a local program with more stringent regulations than those of the state program unless the conservation plan is consistent with the requirements of the local program" (§10.1-564).

Because Loudoun County program regulations have been submitted to the Department of Conservation and Recreation, VDOT should be advised that the more stringent local standards might control some aspects of development. These can be found in Part 10 (Section 1096) and Part 12 (Section 1220) of the Codified Ordinances of Loudoun County.

The County also envisions stricter erosion and sediment control measures than the minimum standards in the Virginia Erosion and Sediment Control Handbook (VESCH). Two stricter measures recommended in the program applicable to roadway construction include doubling the current sediment trap/basin standard of 134 cubic yards/acre (Minimum Standard 6 of the VESCH) and verifying adequate channel conditions downstream of sediment traps/basins using the 1-year, 24-hour storm instead of the 2-year/24-hour storm (Minimum Standard 19 of the VESCH) (Table 4-1).

Forest Resources
The County promotes tree planting and preservation as a means to improve air quality (*Revised General Plan, Chapter 5, Air Quality Policy 2*). Planting of indigenous vegetation is encouraged (*Revised General Plan, Chapter 5, Plant and Wildlife Habitats Policy 5*). County policies encourage the preservation of existing vegetation and wildlife habitat on developing properties (*Revised General Plan*, Chapter 5, Forest, Trees, and Vegetation Policy 10). Critical components of tree preservation include the protection of critical root zones and the maintenance of healthy soil structure.

Loudoun County recommends the replacement of affected forest resources within the project area, whenever practicable. Construction agencies should consult the County Forester regarding the details of

such mitigation to include location, site preparation, species type, and stocking density.

Historic Resources
The identification and preservation of historic and archaeological resources both enriches and perpetuates the County's heritage (*Revised General Plan, Chapter 5, Heritage Resource Assets text*). In addition to Section 106 requirements, VDOT should coordinate with the Loudoun County Department of Building and Development regarding preservation of identified resources and measures for mitigation.

Steep & Moderately Steep Slopes
County policies call for a prohibition of land disturbance on slopes with a grade of more than 25 percent and special performance standards to protect slopes with grades from 15 to 25 percent. Performance standards can include best management practices, locational clearances for clearing and grading, and avoidance of natural drainageways (*Revised General Plan, Chapter 5, Steep Slope and Moderately Steep Slope Policies 1 & 3*). Such consideration gives the County some assurance that steep and moderately steep slopes and their associated resources, such as surface waters, forests, and wetlands, will be protected.

Because the project area features some areas of steep and moderately steep slopes, Loudoun County recommends that the steep and moderately steep slopes in the project area be considered when determining the final alignment of road facilities. While many of the steep slopes appear to be man-made, associated with the embankment for Horsepen Lake, construction methods should avoid impacts to natural slopes of greater than 25 percent and minimize impacts to slopes from 15 to 25 percent with particular attention to slopes in conjunction with streams and drainageways. Section 5-1508 of the Revised 1993 Zoning Ordinance provides further guidance.

LIGHTING
County policies call for appropriate lighting to achieve the following:

- Promote the use of lighting for convenience and safety without the nuisance associated with light pollution;
- Promote a glare-free environment through proper lighting performance standards to improve visibility and enhance public safety;
- Promote appropriate lighting standards to conserve energy; and
- Develop appropriate lighting standards to prohibit unnecessary and intrusive light trespass that detracts from the beauty and view of the night sky (*Revised General Plan, Chapter 5, Lighting and Night Sky Policy 1*).

Additionally, Loudoun County policies stress a strategic approach to landscaping, lighting, berming, and other related design issues that can enhance a sense of security for cyclists and pedestrians (*Bike/Ped Plan, Chapter 7, Security and Enforcement Policy 1*).

If any lighting is to be included as part of the project, Loudoun County recommends that it be downward directed, fully shielded, provide a glare-free environment, and have illumination levels that are no greater than necessary for a light's intended purpose. All lighting should be mounted as low as practicable and designed to preclude light trespass onto adjoining properties, glare, skyglow, and deterioration of the nighttime environment. Landscaping, lighting, berming, and other related design issues should enhance safety and security for motorists, bicyclists, and pedestrians.

CONCLUSION
Loudoun County views the widening of Route 606 from Evergreen Mills Road to the Dulles Greenway as an important component of the multi-modal network and a project that will improve safety and connectivity in the area for motorists, bicyclists, and pedestrians. The improvements will also help the County to continue to attract and retain businesses within this important business corridor. Our concerns

relate primarily to the right-of-way width and the ability for future expansion to accommodate multi-modal uses in the median as well as sensitivity to elements of the Green Infrastructure.

We look forward to working with VDOT to address the County's concerns and would appreciate further opportunities to review the project as it proceeds through the NEPA process.

If you have any questions regarding the comments in this memorandum, please contact Marie Genovese, Planner III, at 703-777-0246.

Sincerely,

Julie Pastor

Julie Pastor, AICP
Director

cc: Tim Hemstreet, County Administrator
Linda Neri, Deputy County Administrator
Charles Yudd, Assistant County Administrator
Andrew Beacher, Director, Office of Transportation Services (OTS) (via email)
Dale Castellow, Assistant Director, OTS (via email)
Lou Mosurak, AICP, Senior Coordinator, OTS (via email)
Arkopal Goswami, Bicycle & Pedestrian Coordinator, OTS (via email)
Cindy Keegan, AICP, Program Manager, Community Planning (via email)
Marie Genovese, AICP, Planner III, Community Planning
William Marsh, Program Manager, Environmental Review Team, Department of Building & Development (via email)

Attachments:
1. Response to Questions, Loudoun County Health Department, 02/13/12
2. Response to Questions, Office of Transportation Services, 02/16/12
3. Response to Questions, Department of Family Services, 02/17/12
4. Response to Questions, Department of Economic Development, 02/23/12
5. Response to Questions, Department of Fire, Rescue and Emergency Management, 02/23/12
6. Response to Questions, Loudoun County Office of the Sherriff, 02/23/12
7. Response to Questions, Loudoun County Public Schools, 03/01/12
8. Response to Questions, Department of Planning, 03/06/12
9. Response to Questions, Department of Parks, Recreation and Community Services, 03/06/12

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

Route Number:	**606**
State Project Number:	**0606-053-983, P101**
VDOT UPC:	**97529**
Town/City/County:	**Loudoun County**
VDOT iPM Project Description:	**Route 606 - Dulles Loop**
Project Limits:	**From Route 621 (Evergreen Mills Road)**
	To Route 267 (Dulles Greenway)

GENERAL QUESTIONS FOR LOUDOUN COUNTY HEALTH DEPARTMENT

6. Will the proposed project affect drinking water wells or a public water supply? If so, can you briefly describe them? Please refer to the attached letter regarding on-site wells. Public water supplies are under the authority of Loudoun Water.

7. Do you have any other concerns regarding public health in connection with this project? If so, can you briefly describe them? For information on the on-site septic systems, please refer to the attached letter.

Please feel free to make any additional comments in the space provided below or through separate attachments. no additional comments

J. Randall Stoutenburgh, Environmental Health Specialist
Printed Name, Title

J. Randall Stoutenburgh
Signature

2/13/2012
Date

Attachments: [if any]

ATTACHMENT 1

Loudoun County Health Department

P.O. Box 7000
Leesburg VA 20177-7000

Environmental Health
Phone: 703 / 777-0234
Fax: 703 / 771-5023

Community Health
Phone: 703 / 777-0236
Fax. 703 / 771-5393

February 13, 2012

FOIA Request for VODT Project # 0606-053-983, P101, UPC 97529, Rt. 606 – Dulles Loop from Route 621 to Route 267

Dear Ms. Genovese:

The Loudoun County Health Department has completed your request for information on the above referenced project provided in your e-mail dated February 9, 2012. General locations of septic systems and wells that may be affected by the project are shown on the set of county maps. The key defines each symbol for wells and septic systems. The maps show each of the wells and septic systems with the year it was installed.

Some of the older wells may have been abandoned, especially the dug wells. The wells known to have been properly abandoned are labeled on the larger scale maps. Dug wells, springs, and wells drilled in the 1970s and before, have a greater potential for being affected by construction activity in the area.

The septic system points are usually shown close to the center of a septic field area. The septic fields vary greatly in size and shape. They may range anywhere from a 30' x 50' area to a 100' x 100' area or more. Take note of where the fields are mapped. Consider how the house building sewers, septic tanks, and conveyance lines connect to the field areas. Septic tanks and other septic system components may be close to, or under, sidewalks, driveways and patios. In cases where the septic systems are closer to the road, defining the corners of an existing septic field should be completed before any excavation begins.

A copy of your FOIA request is enclosed with the county maps. If you have any questions, or require more detailed information on the septic systems or wells, please contact me at 703-777-0643.

Respectfully,

J. Randall Stoutenburgh

J. Randall Stoutenburgh
Environmental Health Specialist

cc: file
JRS/JDF/jrs
enclosures

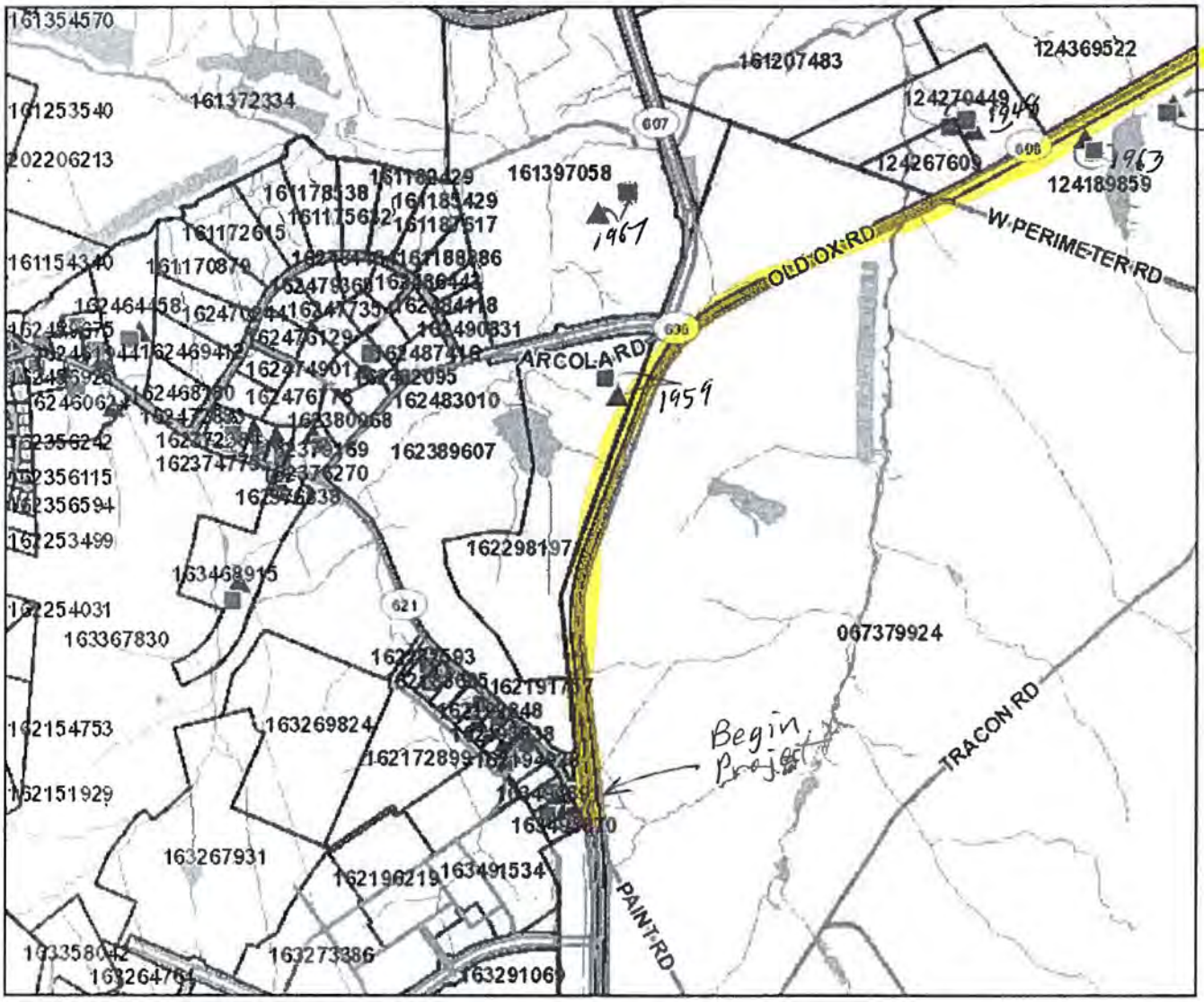
VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



■ septic systems
▲ wells

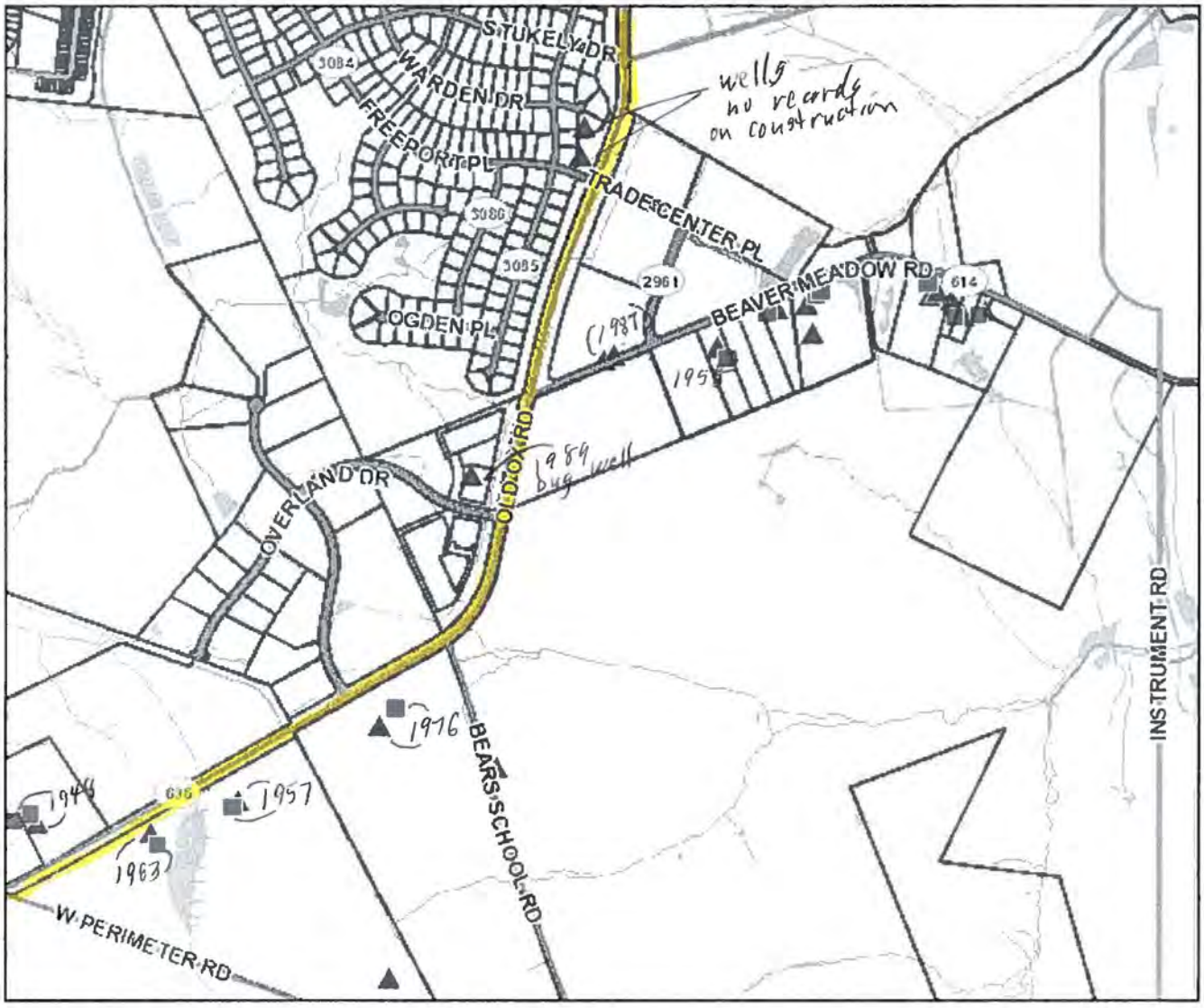
* dates indicate the year the well and septic systems were installed.

Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



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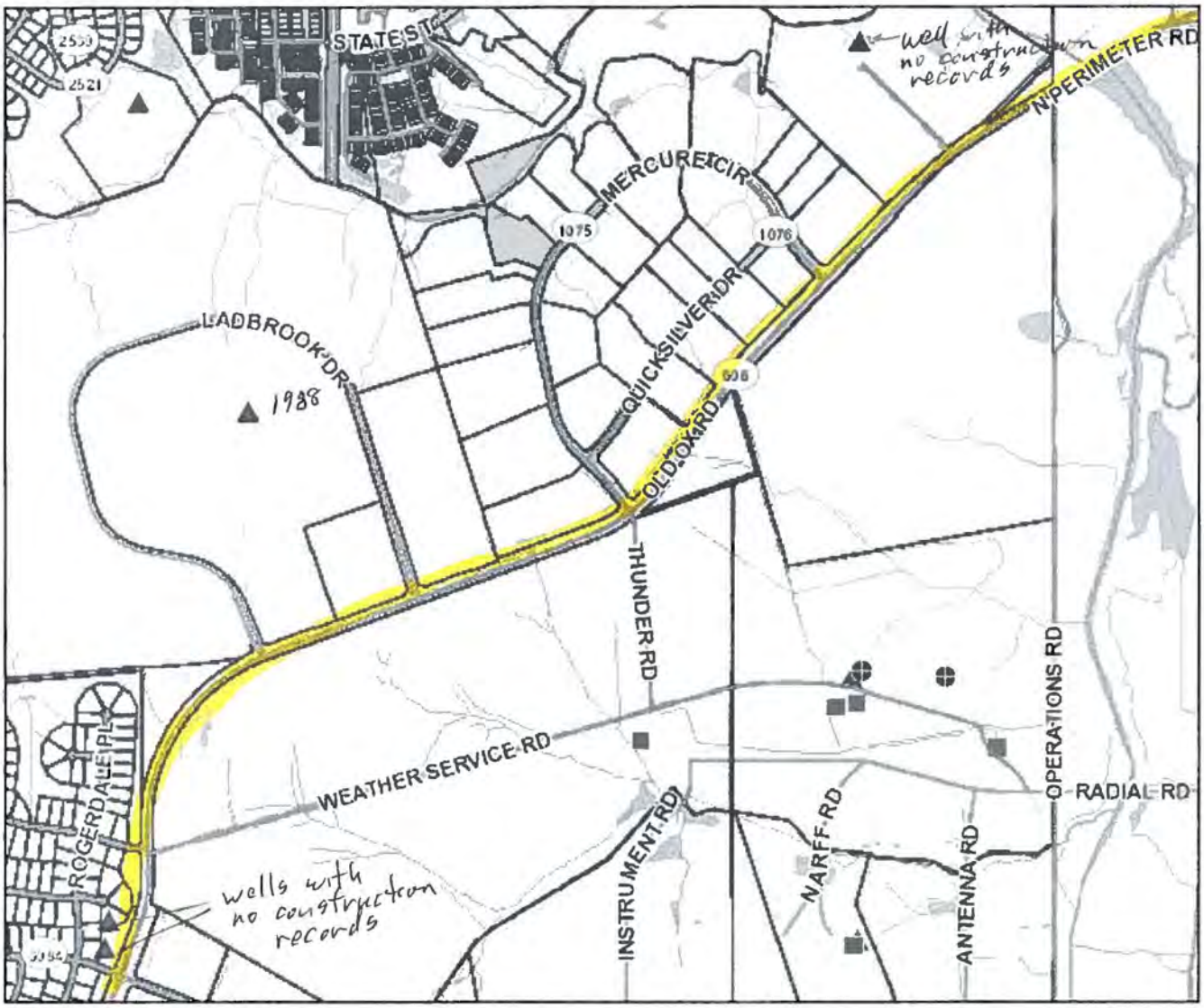
Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



■ Septic Systems
▲ Wells

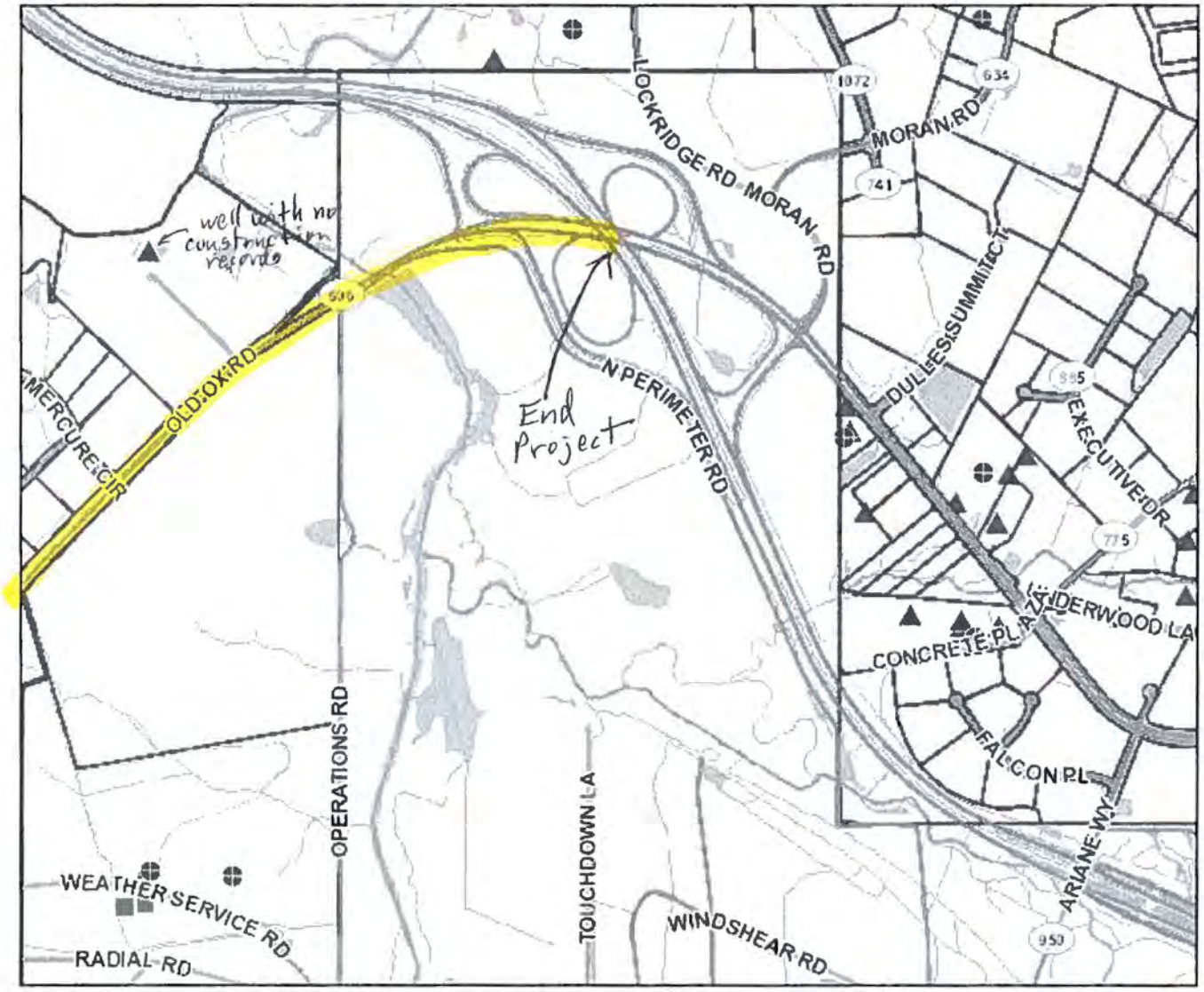
4

Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



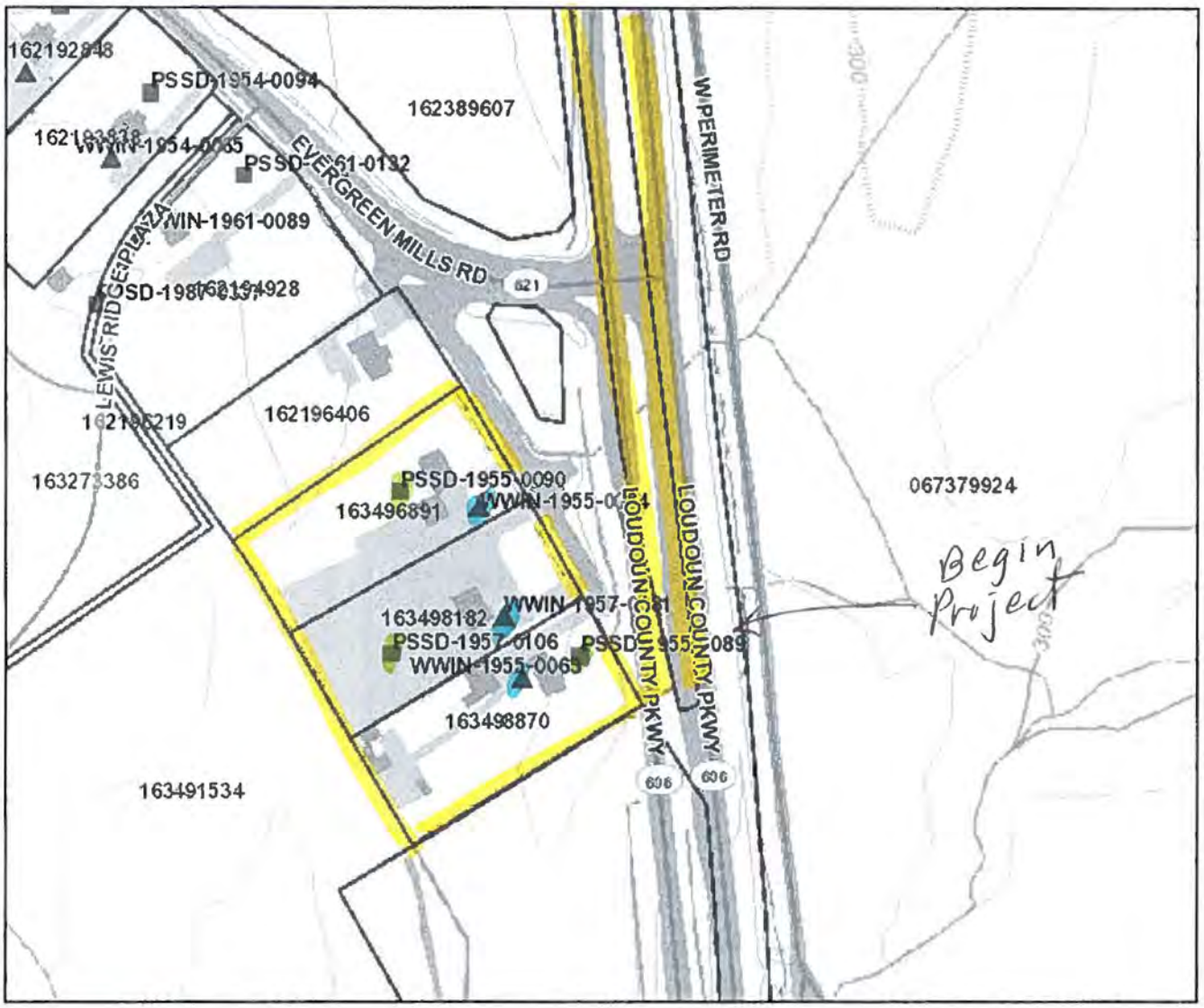
■ Septic Systems
▲ Wells

Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



Well

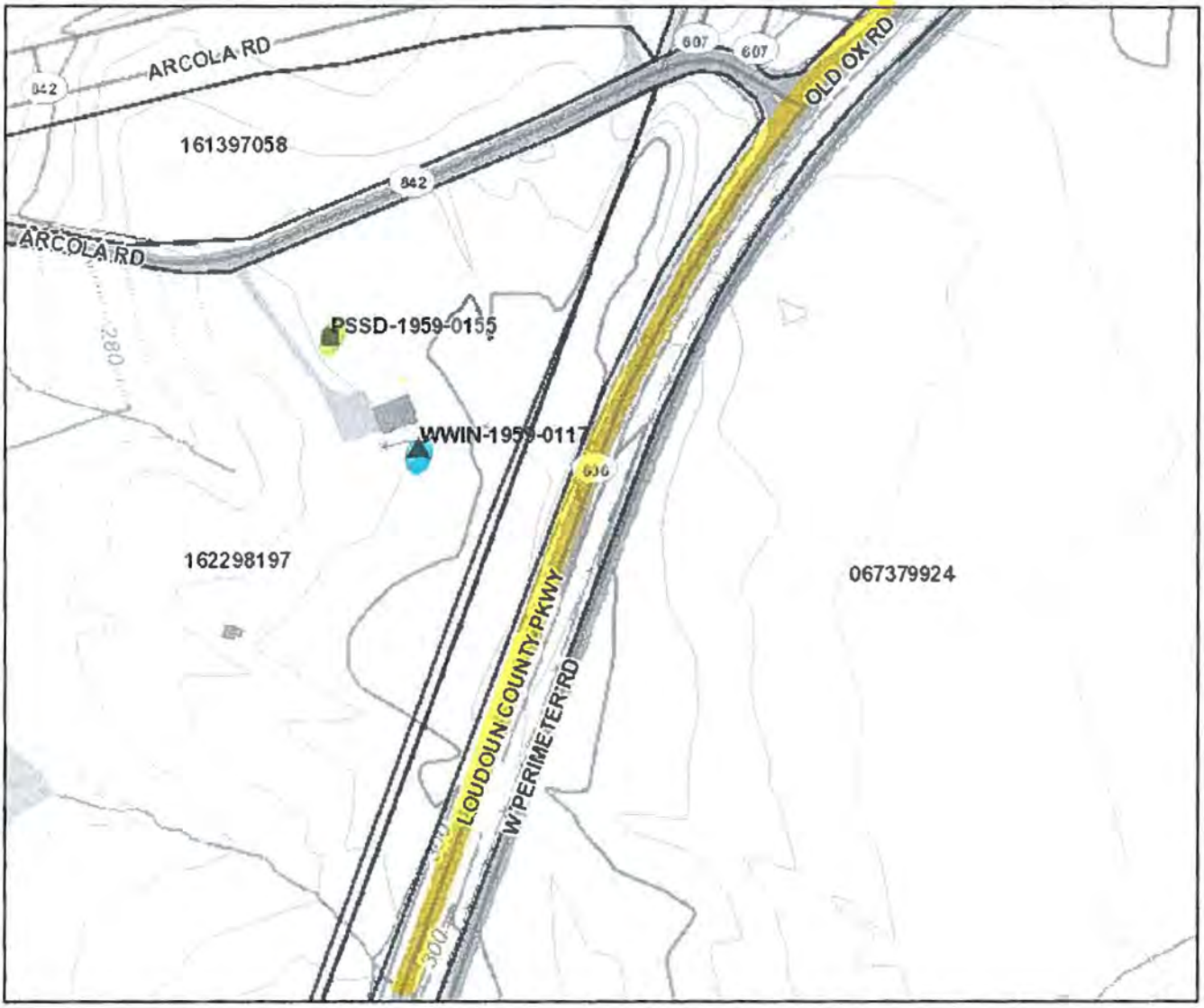
Septic systems

Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)

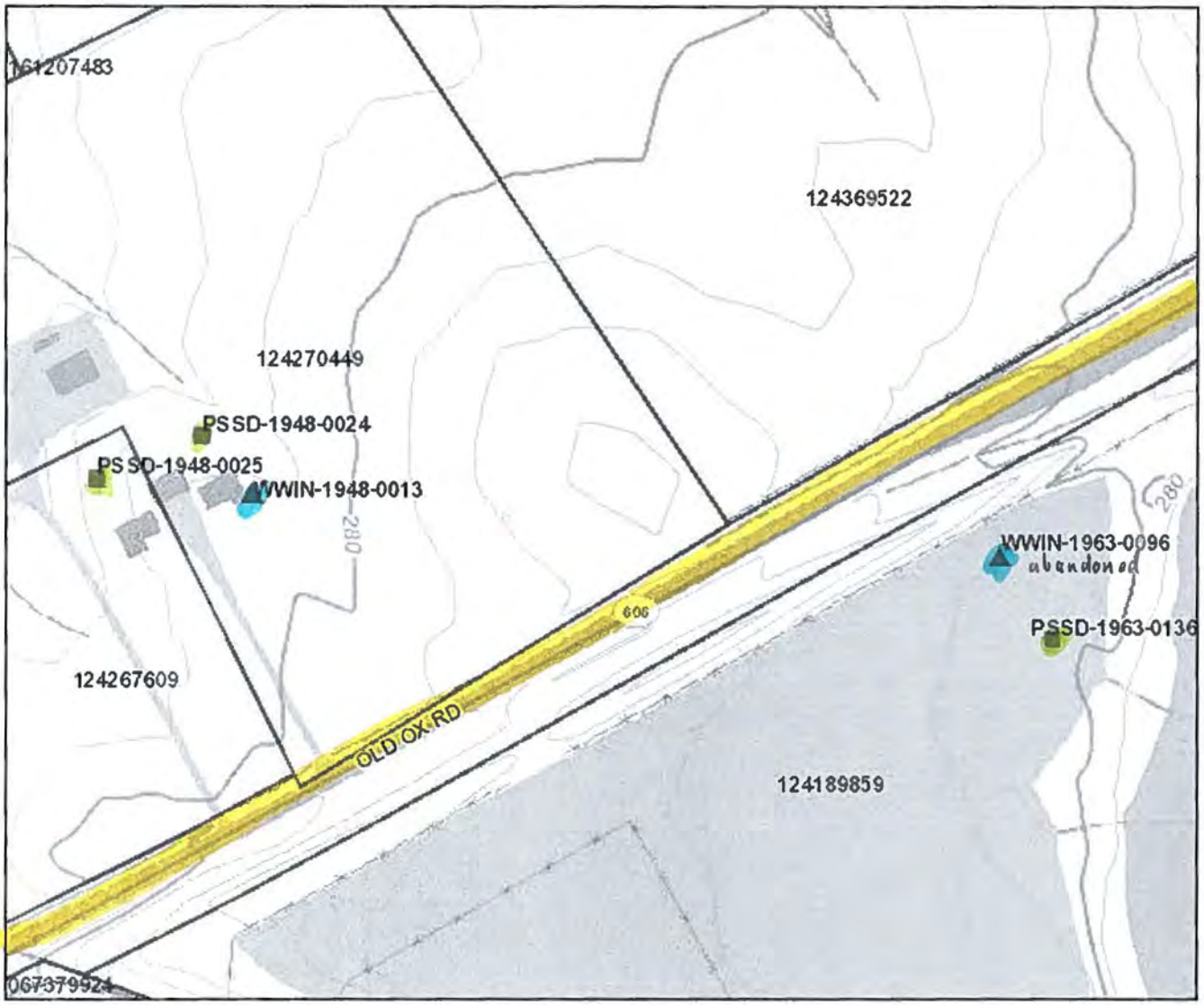


Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)



Friday, February 10, 2012

Loudoun County, Virginia

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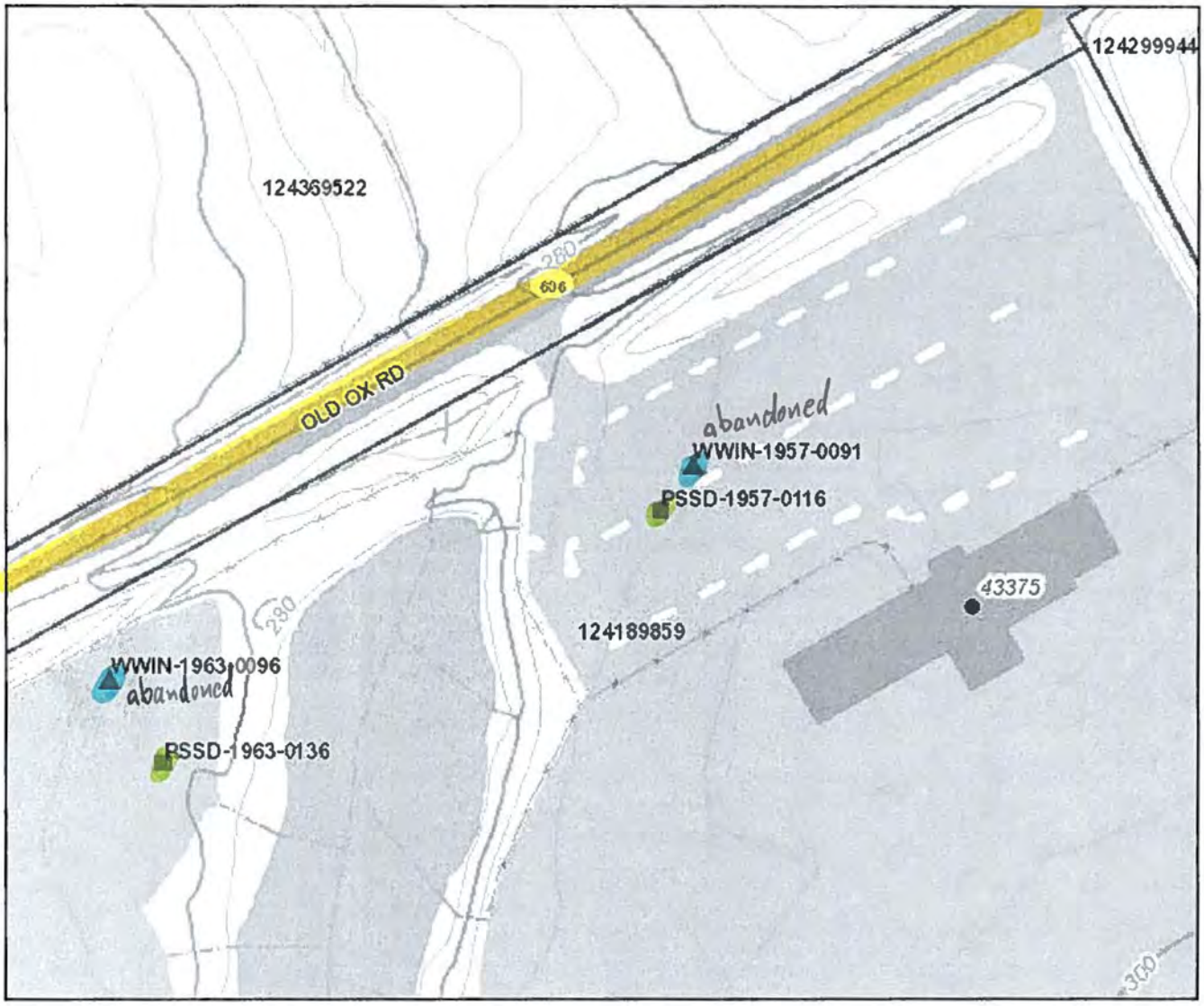

Friday, February 10, 2012

Loudoun County, Virginia

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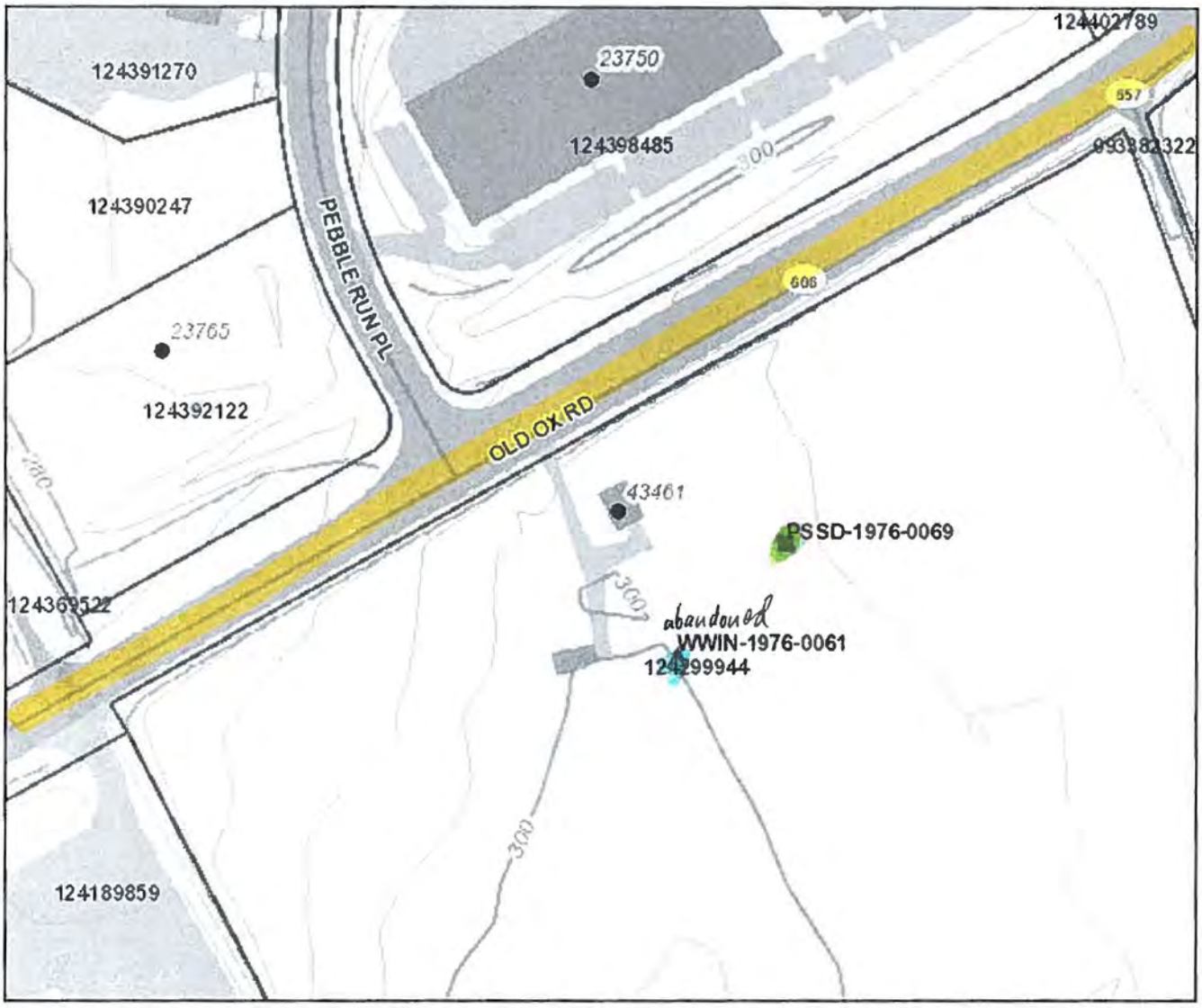
(map not to scale)



Friday, February 10, 2012

Loudoun County, Virginia

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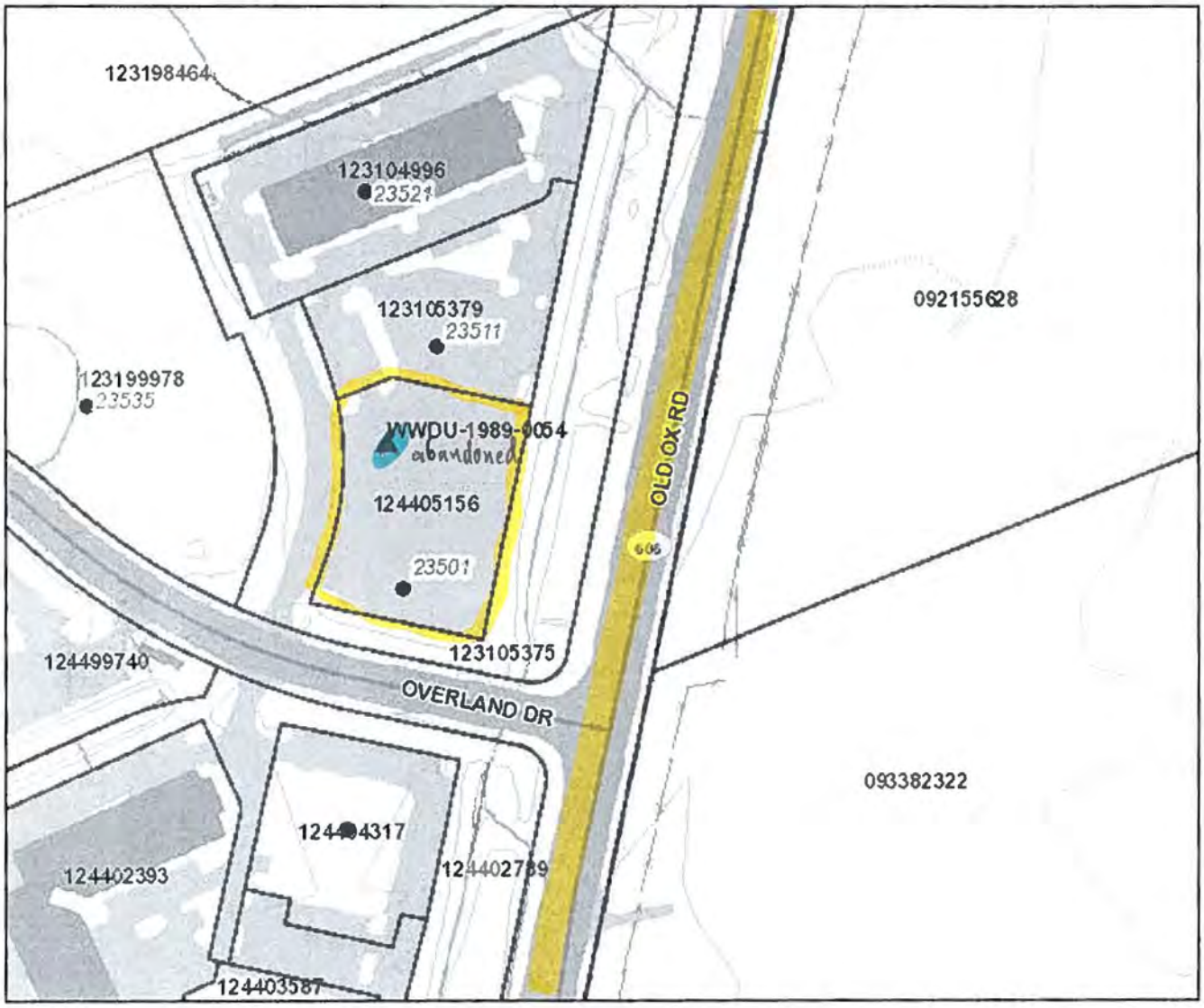
(map not to scale)



Friday, February 10, 2012

Loudoun County, Virginia

www.loudoun.gov

(map not to scale)

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

Route Number:	**606**
State Project Number:	**0606-053-983, P101**
VDOT UPC:	**97529**
Town/City/County:	**Loudoun County**
VDOT iPM Project Description:	**Route 606 - Dulles Loop**
Project Limits:	**From Route 621 (Evergreen Mills Road) To Route 267 (Dulles Greenway)**

GENERAL QUESTIONS FOR LOUDOUN COUNTY OFFICE OF TRANSPORTATION

1. Do you anticipate or are you aware of any organized opposition to the proposed project? If so, can you briefly describe it?

Office of Transportation (OTS) is not aware of any organized opposition to the proposed project.

2. Where is the proposed project ranked in county transportation improvement needs?

The 2010 Countywide Transportation Plan (*2010 CTP*) lists the expansion of Route 606 to four lanes between Dulles Greenway and VA Route 621 as one of the near-term priority projects. This method of prioritizing is consistent with the prioritization process of the TransAction 2030 Regional Transportation Plan as developed by the Northern Virginia Transportation Authority (NVTA).

3. Is the county developing any mass transit options for this corridor? If so, what are they?

Currently, the County operates a commuter bus route along Route 606. In the future, as per the 2010 CTP, a second service will be added along Route 606. The Dulles South Circulator will be a fixed route service providing connections along Route 606 between the Arcola Center Park and Ride Lot and Dulles North Transit Center.

4. Does the county have a preferred scheme of development for the project? If so can you briefly describe it?

N/A

Please feel free to make any additional comments in the space provided below or through separate attachments.

Arkopal K. Goswami, Senior Transportation Planner
Printed Name, Title

Signature

February 16, 2012
Date

Attachments: [if any]

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

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GENERAL QUESTIONS FOR LOUDOUN COUNTY DEPARTMENT OF FAMILY SERVICES

3. Will the project affect any neighborhood programs under the Office of Housing and Community Development jurisdiction? If so, can you briefly describe them?

The project, as described, will not affect any neighborhood programs under the Housing and Community Development (HCD) jurisdiction. The specific programs under HCD include the Neighborhood Stabilization Program, the Loudoun County Home Improvement Program and the Community Development Block Grant Program.

Please feel free to make any additional comments in the space provided below or through separate attachments.

JAN BOOTHBY, COMMUNITY DEVELOPMENT PROGRAM MANAGER
Printed Name, Title

Signature

2/17/12
Date

ATTACHMENT 3

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

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GENERAL QUESTIONS FOR LOUDOUN COUNTY DEPARTMENT OF ECONOMIC DEVELOPMENT

1. Will the proposed project affect economic development in the area? If so, can you briefly describe how?
    a. Yes—Route 606 is an important business corridor and improvement to this corridor is critical to continued business attraction and retention

2. Do you have any other concerns with regard to economic development in connection with this project? If, so can you briefly describe what they are?
    a. No concerns other than assuring the funding of the project upon the study completion.

Please feel free to make any additional comments in the space provided below or through separate attachments.

Robyn Bailey Mgr Business Infrastructure
Printed Name, Title

Signature

2-23-12
Date

ATTACHMENT 4

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
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GENERAL QUESTIONS FOR LOUDOUN COUNTY DEPARTMENT OF FIRE, RESCUE, AND EMERGENCY MANAGEMENT

4. Based on the project location, will the project affect the emergency operations of Loudoun County Department of Fire, Rescue and Emergency Management? If so, can you briefly describe how?

Any changes, even improvements to a road network can create difficulties for emergency responders. Hopefully as we work together on this process, we can identify issues / concerns and provide comments early enough to be evaluated and incorporated into the design before they can become a problem for service delivery.

5. Are there concerns associated with the construction of the project regarding the overall functions of the Loudoun County Department of Fire, Rescue and Emergency Management? If so, can you briefly describe them?

Staff respectfully requests to be informed of any changes regarding closing of median crossovers, roads and/or and emergency access to ensure adequate access and circulation of emergency vehicles and to be able to assess any potential service delivery issues and increased response times during construction. Also, as soon as more detailed information becomes available, Staff requests that we are afforded an opportunity to review and comment.

Please feel free to make any additional comments in the space provided below or through separate attachments.

Maria Figueroa Taylor, Fire-Rescue Planner
Printed Name, Title

Signature

2-23-12
Date

Attachments: [if any]

ATTACHMENT 5

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

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GENERAL QUESTIONS FOR LOUDOUN COUNTY SHERIFF'S DEPARTMENT

16. In the Department's opinion, is the project necessary to correct an existing or potential safety hazard?

    The road as it is currently configured allows traffic to back up at several points during the morning and evening rush hours. This is due in large part to the lack of road capacity for the volume that is present. These backups create more accidents and increase motorist frustration which may lead to an increase in aggressive driving behavior.

17. Is the existing accident rate within or in the vicinity of the project corridor excessively high? If so, why?

    The accident rate has steadily increased during the last three years. The corridor has seen a 17% increase in accidents from 2009 to 2010 and a 30% increase from 2010 to 2011. The increased growth of the surrounding area contributes to an increased volume of traffic along a corridor whose capacity to move traffic safely and efficiently has been exceeded.

18. In the Department's opinion, will the proposed project serve to improve safety hazards and/or emergency response times?

    Yes the improvements will improve safety hazards and will improve emergency response time.

Please feel free to make any additional comments in the space provided below or through separate attachments.

John Fraga, Major

Printed Name, Title

Signature

02/23/2012
Date

Attachments: [if any]

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
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GENERAL QUESTIONS FOR LOUDOUN COUNTY PUBLIC SCHOOLS

1. Will any new or existing schools be impacted by the project? If so can you list them and their location? **Yes – We have 4 schools that will be affected. Our school busses travel Rte. 606 to service Rosa Lee Carter Elementary, Stone Hill Middle, Freedom High and John Champe High.**

2. Do you have any other concerns regarding public schools in connection with this project? If so, can you briefly describe them? **Yes, Construction will affect our busses keeping their schedules - picking up and dropping off students.**

3. Will the proposed project affect school bus routes and schedules? If so, can you briefly describe them? **Yes, our busses travel Rte. 606 between 7 - 9 am, 10:30 - 11:30 am and 2:30 - 4:30 pm.**

4. Do you have any other concerns regarding public school transportation services in connection with this project? If so, can you briefly describe them?

Please feel free to make any additional comments in the space provided below or through separate attachments.

Don Patin – Transportation Traffic Specialist
Printed Name, Title

Don Patin
Signature

3/1/12
Date

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

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GENERAL QUESTIONS FOR LOUDOUN PLANNING DEPARTMENT

1. Do you anticipate or are you aware of any organized opposition to the proposed project? If so, can you briefly describe it?

We are not aware of any opposition to the current project.

2. Will the project disrupt a community or its planned development? If so, can you briefly describe it or them?

No

3. Will the project affect any neighborhood programs under Redevelopment and Housing Authority jurisdictions? If so, can you briefly describe them?

No

4. Are you aware of any disproportionately high and adverse effects to minorities or low income populations that could result from this project? If so can you briefly describe their general location?

No

5. Is the project consistent with community goals, such as proposed land use? If not, can you briefly describe the discrepancy?

Yes. The Route 606 Corridor is planned as the County's industrial center. The area is intended to accommodate the continued operation and expansion of major industrial uses in the County. The proposed improvements will help to attract and retain industrial development within the Route 606 Corridor.

6. What is the existing and proposed zoning for this area?

Existing zoning consists primarily of Planned Development – General Industry (PD-GI) consistent with the planned land use for this area.

7. Will the proposed project be compatible with your county planning? If not, can you briefly describe the discrepancy?

Yes. Route 606 is anticipated as a limited access, median-divided, urban arterial, as envisioned in the 2010 Countywide Transportation Plan, an element of the County Comprehensive Plan. The 2010 CTP calls for the study of alternative uses (e.g., HOV, bus lanes) to be considered when Route 606 is expanded to its ultimate condition. The ultimate right-of-way width (200 feet) was established to accommodate the ultimate condition to include potential multi-modal uses.

8. Are there any agricultural/forestal districts within the proposed project boundaries? If so, can you briefly describe their location?

No

9. Has the project area been included in any county historical research? If so can you briefly describe that effort?

No

10. Is the project, as proposed, in the County's most recent Comprehensive plan?

Yes. See answer #7 above.

11. Does the proposed project appear to be compatible with overall county planning, including transportation plans and proposed highway development in the area? If not, can you briefly describe the discrepancy?

Yes. See answers #5, #7, and #11.

12. Is the county developing any mass transit options for this corridor?

See the Office of Transportation Services February 16, 2012 response to question #3.

10. Are there any historic sites in close proximity to the proposed project? If so, can you briefly describe them?

See attached map.

11. Does the county have a preferred scheme of development for this project? If so can you briefly describe it?

The County believes the best way to preserve the option for multi-modal uses in the median as well as to save costs in the long-term is to design the interim four-lane section as part of the ultimate 200-foot right-of-way width. This will allow widening to the ultimate condition as well as potential expansion for multi-modal uses to be accommodated in the median.

12. As required by 23 CFR 772.11(c)(2)(vii), for a proposed development to be considered eligible for noise mitigation where warranted, a building permit must have been issued. Have any building permits been issued for development of property along the proposed project corridor? If so, please include the location, a brief description of proposed development, and a copy of the development plan(s) (preferably in digital format).

To answer this question, the Assessor's improvements database was reviewed with regard to all permitted improvements with addresses (i.e. buildings under construction or permitted for construction). No building permits were found along the proposed project corridor.

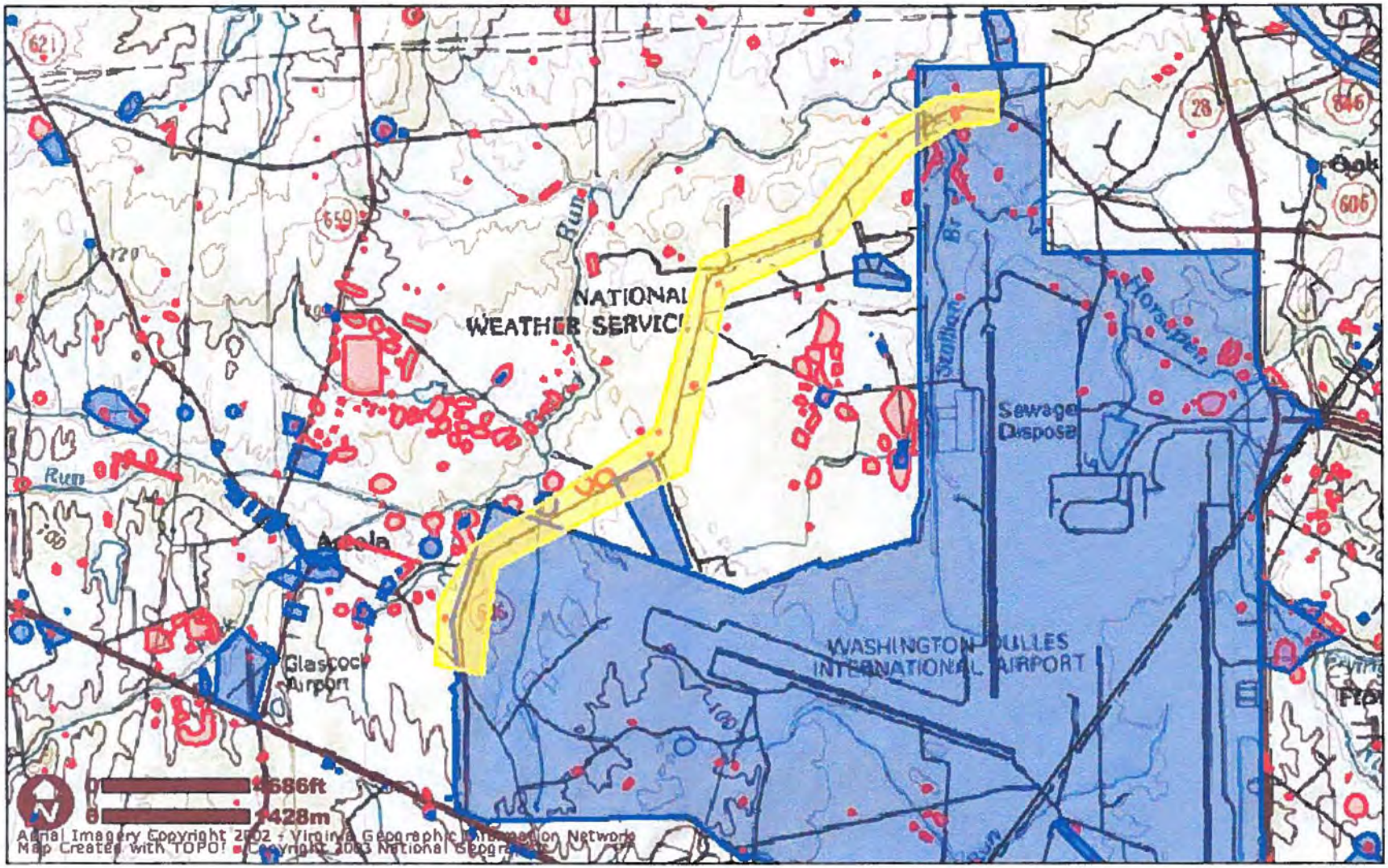
Please feel free to make any additional comments in the space provided below or through separate attachments.

Marie Genovese, Planner III
Printed Name, Title

Marie Genovese
Signature

3-6-12
Date

Attachments: [if any]


NATIONAL
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INTERNATIONAL AIRPORT
Glascock
Airport
Aerial Imagery Copyright 2002 - Virginia Geographic Information Network
Map Created with TOPO!

Historic Structures

DHR_ID	COUNTY_NAME	RESOURCE_NAME	SIGNIFICANT_EVENTS
053-5258	Loudoun	1) Building 16, National Weather Service Sterling Facility	Not Evaluated
053-0008	Loudoun	1) Dulles International Airport	1) Federal Det. Of Eligibility-1978/03/28
053-5693	Loudoun	1) House, 43228 Old Ox Road	1) DHR Staff: Not Eligible-2006/12/01
053-5255	Loudoun	1) Building 18, National Weather Service Sterling Facility	Not Evaluated
053-6086	Loudoun	1) House, 43461 Old Ox Road	1) DHR Staff: Not Eligible-2006/12/01

Archaeological Sites

DHR_ID	COUNTY_NAME	HISTORIC_EXAMPLE	SIGNIFICANT_EVENTS
44LD0644	Loudoun	1) Dwelling, single	Not Evaluated
44LD1154	Loudoun	1) Agricultural field 2) Lithic scatter	1) DHR Staff: Not Eligible-2007/05/11 2) DHR Staff: Not Eligible-2005/07/01
44LD1049	Loudoun	1) Trash scatter	Not Evaluated
44LD0170	Loudoun	1) Camp, temporary	Not Evaluated
44LD0945	Loudoun	1) Dwelling, multiple	Not Evaluated
44LD0474	Loudoun	1) Other	Not Evaluated
44LD0946	Loudoun	1) Trash scatter	Not Evaluated
44LD0473	Loudoun		Not Evaluated
44LD1050	Loudoun	1) Trash scatter	Not Evaluated
44LD0381	Loudoun		Not Evaluated
44LD0172	Loudoun	1) Camp, temporary 2) Trash scatter 3) Lithic scatter	1) DHR Staff: Potentially Eligible-2006/12/01
44LD0169	Loudoun	1) Camp, temporary	Not Evaluated
44LD1017	Loudoun	1) Dwelling, single	Not Evaluated

PROJECT SCOPING
PURSUANT TO PREPARATION OF AN ENVIRONMENTAL ASSESSMENT (EA)
UNDER THE NATIONAL ENVIRONMENTAL POLICT ACT (NEPA)

Route Number:	**606**
State Project Number:	**0606-053-983, P101**
VDOT UPC:	**97529**
Town/City/County:	**Loudoun County**
VDOT iPM Project Description:	**Route 606 - Dulles Loop**
Project Limits:	**From Route 621 (Evergreen Mills Road)** **To Route 267 (Dulles Greenway)**

GENERAL QUESTIONS FOR LOUDOUN DEPARTMENT OF PARKS AND RECREATION

1. Are there any existing recreational facilities, either public or private, that will be affected? If so, what effect will this project have on them?

   There are no recreational facilities located within the proposed area of this project..

2. Are there any planned recreational resources for the area that might be affected? If so, what effect will this project have on them?
   There are no planned recreational resources planned for this area.

3. Were any existing lands or facilities purchased with or improved through use of funds obtained under Section 6 of the Land and Water Conservation Act?

   No

Please feel free to make any additional comments in the space provided below or through separate attachments.

Mark A. Novak, Chief Park Planner County of Loudoun Department of Parks Recreation and Community Services

Printed Name, Title

Mark A Novak

Signature

3.6.12

Date

Attachments: [if any]

ATTACHMENT 9

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

March 2, 2012

Mr. Martin Mitchell
Virginia DOT
Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Dear Mr. Mitchell:

On February 15, 2012, the Department of Environmental Quality received your letter regarding the VDOT's proposed Route 606 (Dulles Loop) project. The DEQ Division of Land Protection & Revitalization staff has reviewed your letter and has the following comments concerning the waste issues associated with this project:

Neither solid nor hazardous waste issues were addressed in the scoping request. The request did not include a search of waste-related data bases. The Waste Division staff performed a cursory review of its data files and determined that there are/may be a number of waste sites located within the same zip code (22901), however their proximity to the subject site is unknown.

When the environmental impact report is written or compiled, it should include an environmental investigation on and near the property to identify any waste related or hazardous waste sites or issues. The report author should analyze the data in the web-based DEQ databases to determine if the project would affect or be affected by any sites identified in the databases. These are the CERCLA Facilities and Hazardous Waste Facilities databases, and the Virginia Environmental Geographic Information Systems (VEGIS) database.

CERCLA Facilities Database
A list of active and archived CERCLA (EPA Superfund Program) sites.

Hazardous Waste Facilities Database
A list of hazardous waste generators, hazardous waste transporters, and hazardous waste storage and disposal facilities. Data for the CERCLA Facilities and Hazardous Waste Facilities databases are periodically downloaded by the Waste Division from U.S. EPA's website.

Virginia Environmental Geographic Information System
Provides database search options for specific environmental metrics and sites (zip code as one example).

Accessing the DEQ Databases:

The report author should access this information on the DEQ website at http://www.deq.virginia.gov/waste/waste.html. Scroll down to the databases which are listed under Real Estate Search Information heading.

The ***Superfund information*** will be listed by clicking on the Search EPA's CERCLIS database tab and opening the file (Search Superfund Site Information). Enter the project zip code, then click on Search. A database report will be the result of the search.

The ***hazardous waste*** information can be accessed by clicking on the Hazardous Waste Facility tab. Enter the project zip code, and click on Search. The hazardous waste facilities in the project zip code will be listed, and those within a defined range of the project site can be determined by visiting the "MAP" option for each listing.

This database search will include most waste-related site information for each locality. In many cases, especially when the project is located in an urban area, the database output for that locality will be extensive.

DEQ also recommends a search using the VEGIS database to search for possible petroleum leak, VRP and solid waste facility sites in the project area. As the project alignment indicates routing through both commercial and residential areas, it is possible that petroleum contaminated soils might be detected along the route. From DEQ's main web site (http://www.deq.virginia.gov), click on the VEGIS link under Tools & Resources. From the VEGIS web page, click on "What's in My Backyard?". On this page, click on the drop-down box, "Pick a Quick Search Here", select address search, and then enter the project zip code (22901) into the adjacent "Search" box. At this point you can search a number of environmental databases, but specifically for VRP sites, Solid Waste sites, and Petroleum Release sites. The search is implemented by identifying the search metric (Identify in the drop-down box), establishing an area range (.1, .25, or .5 mile ranges are normal), and then clicking on the map in the area represented by the route of the project. The result will be a listing of sites which representing the metric/range selected.

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 et seq.; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); and Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq., the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous materials, 49 CFR Parts 107. Any questions may be directed to Ms. Kathryn Persyzk at DEQ's Northern Regional Office (703-583-3800).

Also, if an older structure will be demolished as part of this project, the structure should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP). If they are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-80-640 for ACM and 9VAC 20-60-261 for LBP must be followed.

Finally, DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All

hazardous wastes should be minimized. Any questions on construction material recycling may be directed to Steve Coe at 804-698-4029.

If you have any questions or need further information, please contact Steve Coe at (804) 698-4029.

Sincerely,

G. Stephen "Steve" Coe

G. Stephen Coe
Environmental Specialist II

Cc: EIR Program, DEQ

Mitchell, Martin L.

From: Rhur, Robbie (DCR) [Robbie.Rhur@dcr.virginia.gov]
Sent: Wednesday, March 14, 2012 1:55 PM
To: Mitchell, Martin L.
Subject: DCR

Afternoon Martin:

The Division of Planning and Recreational resources has no comments regarding the Route 606 Dulles Loop road. Thank you for the opportunity to comment.

Robbie Rhur

Environmental Review Coordinator

804-371-2594

M E M O R A N D U M

DATE: March 1, 2012

TO: Martin Mitchell, VDOT

FROM: S. René Hypes, DCR-DNH

SUBJECT: Due March 5, 2012
0606-053-983, P101 – Dulles Loop

The Department of Conservation and Recreation (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Broad Run – Route 607 Stream Conservation Unit (SCU) is located within the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Broad Run – Route 607 SCU has been given a biodiversity ranking of B5, which represents a site of general biodiversity significance. The natural heritage resource associated with this site is the:

Lampsilis cariosa	Yellow lampmussel	G3G4/S2/NL/NL

The Yellow lampmussel ranges from Nova Scotia to Georgia in Atlantic slope drainages (NatureServe, 2009). In Virginia, it is recorded from the Roanoke, Chowan, James, York, and Potomac drainages. It is found in larger streams and rivers where good currents exist over sand and gravel substrates and in small creeks and ponds (Johnson, 1970).

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered

plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

All VDOT projects on state-owned lands must comply with the Virginia Erosion & Sediment Control (ESC) Law and Regulations, the Virginia Stormwater Management (SWM) Law and Regulations, the most current version of the DCR approved VDOT Annual ESC and SWM Specifications and Standards, and the project-specific ESC and SWM plans. [Reference: VESCL §10.1-560, §10.1-564; VESCR §4VAC50-30 et al; VSWML §10.1-603 et al; VSWMR §4VAC-3-20 et al].

The VDGIF maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis, or contact Shirl Dressler at (804) 367-6913.

Thank you for the opportunity to comment on this project.

CC: Robbie Rhur, DCR-DPRR

Literature Cited

Johnson, R.I. 1970. The systematics and zoogeography of the Unionidae (Mullusca: Bilvava) of the southern Atlantic slope region. Bulletin Museum of Comparative Zoology vol 140(6): 362-365.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: April 27, 2010).

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-9.

Mitchell, Martin L.

From: Forsgren, Diedre (VDH) [Diedre.Forsgren@vdh.virginia.gov]
Sent: Tuesday, March 06, 2012 4:18 PM
To: Mitchell, Martin L.
Cc: Fisher, John (DEQ); Fulcher, Valerie (DEQ)
Subject: NEPA Scoping Process for Route 606 (Dulles Loop)

Name: NEPA Scoping Process for Route 606 (Dulles Loop)
Sponsor: VDOT
Location: Loudon County

VDH – Office of Drinking Water has reviewed the above request for scoping comments. Below are our comments as they relate to proximity to **public drinking water** sources (groundwater wells, springs and surface water intakes).

One groundwater well is within a 1 mile radius of the project site. Project does not fall within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources.

There are no apparent impacts to public drinking water sources due to this project.

Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

Diedre Forsgren
Office Services Specialist
VIRGINIA DEPARTMENT OF HEALTH
Office of Drinking Water, Room 622-A
109 Governor Street
Richmond, VA 23219
Phone: (804) 864-7241
email: diedre.forsgren@vdh.virginia.gov

orpd_Scoping Lette rcpt_Dulles Loop_UPC 97529.txt

From: OfficeofRPD@dot.gov
Sent: Friday, February 24, 2012 12:28 PM
To: Mitchell, Martin L.
Subject: RE: NEPA Scoping Letter_Route 606 segment of Proposed Dulles Loop_Loudoun County, Virginia_UPC 97529

The Office of Railroad Policy & Development (RPD) has received your electronic message.

We are currently reviewing your inquiry and will send a response as soon as possible.

If your issue/concern requires immediate attention, please call the main RPD line at (202) 493-6381.

Thank you.