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

REEVALUATION OF ENVIRONMENTAL ASSESSMENT AND FONSI
(with Section 4(f) *de minimis* Evaluation)

Route 1 (Jefferson Davis Highway) and Route 123 (Gordon Boulevard) Interchange
Prince William County, Virginia
State Project: 0123-076-F-29, PE101; UPC: 14633
Federal Project: STP-111-1(114)
From: Mary's Way
To: 0.11 Miles North of Annapolis Way

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

Approved for Public Availability:

7/22/11
Date

John Dimkins
for the Division Administrator

REEVALUATION OF ENVIRONMENTAL ASSESSMENT (EA)
AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ROUTE 1 (JEFFERSON DAVIS HIGHWAY)
AND ROUTE 123 (GORDON BOULEVARD) INTERCHANGE
PRINCE WILLIAM COUNTY, VIRGINIA

Federal Project Number: STP-111-1(114)
State Project Number: 0123-076-F-29, PE101

I. BACKGROUND

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing to construct an interchange at Route 1 and Route 123, and to improve certain associated roadways in Prince William County (see Attachment 1). Widening of Route 1 with an interchange at Route 123 has been discussed and planned for a number of years. The proposed actions are included in the Prince William County Comprehensive Plan, VDOT's Six Year Improvement Program, and the Metropolitan Washington Council of Governments' Constrained Long Range Plan.

In accordance with the National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) regulation for implementing NEPA (23 CFR 771), an Environmental Assessment (EA) was prepared for the project. The EA was approved for public availability by FHWA on October 6, 1999. Based on information set forth in the EA, a Finding of No Significant Impact (FONSI) was issued by FHWA on January 4, 2000. Due to the length of time since the FONSI was issued (resulting in possible changes to existing conditions and environmental statutes/regulations/policies) as well as changes to project scope and limits, environmental information and findings are being updated and documented via an EA Reevaluation.

In the process of developing this EA Reevaluation, federal, state, and local agencies, along with other interested parties were contacted, as needed, to obtain updated information regarding the potential impacts of the proposed project. The public also had the opportunity to review the proposed project at a Design Public Hearing held on March 24, 2011. This EA Reevaluation addresses substantive environmental comments received from the public hearing (see Section N, Public Involvement).

II. PURPOSE AND NEED

As set forth in the 1999 EA, the purpose of the project is to improve the flow of traffic, reduce accidents, and support traffic demand from planned development of the area. Projected population growth and traffic demands were initially based on Metropolitan Washington Council of Government (MWCOG) Round 5.3 forecasts for year 2020.

Beginning in 2008, the need for the project was revisited using most recently available traffic projection data (for design year 2036). Existing traffic volumes on Route 1 are approximately 40,800 vehicles per day (vpd) and Route 123 presently carries about 17,900 vpd. Traffic projections have been developed for the design year of 2036, and the projected traffic volumes for the design year are approximately 75,000 vpd for Route 1 and approximately 36,000 vpd for

Route 123. The traffic forecasts were developed using a regional travel simulation model to determine the roadway needs under the year 2036 conditions. Proposed improvements would allow the traffic operations on Route 1 and Route 123 to operate at level of service (LOS) C or better in the 2018 and 2036 a.m. and p.m. peak hours, with the exception of the Route 1 at Mary's Way/Mt. Pleasant Drive intersection and the Route 1 at Occoquan Road/Dawson Beach intersection, which would operate at LOS D or better. Year 2036 projections indicate that the purpose of the proposed project remains valid and that the need for the proposed project is even greater than earlier projected.

III. PROJECT DESCRIPTION

A. Original Description (1999 EA)

As described in the 1999 EA, the Selected Alternative (Alternative 3A, now referred to as "Original Selected Alternative") consisted of a partial cloverleaf interchange at Route 123 (Gordon Boulevard) and Route 1 (Jefferson Davis Highway) with a loop ramp in the northwest quadrant. The Original Selected Alternative also included realignment and widening of Route 1 (from four to six lanes) through the project area, relocation of Express Drive to provide increased spacing along Route 123, construction of a sidewalk and bicycle trail along Routes 1 and 123, and construction of a shared bicycle/automobile travel lane on the outside lane of each direction along Route 1.

B. Present Description

In response to updated population and traffic forecast data, reevaluation of the project began in 2008. This reevaluation process addresses the following proposed design modifications to the Selected Alternative (Modified Alternative 4, now referred to as the "Modified Selected Alternative"):

- The configuration of the proposed interchange has changed from a partial cloverleaf to a compressed diamond.
- Approximately 4,690 feet (0.89 mile) of roadway improvements have been added, specifically:
  - Proposed improvements to Route 1 have been extended to the south by 1,500 feet.
  - Proposed improvements to Route 123 have been extended to the west by 900 feet.
  - Proposed improvements to Occoquan Road have been extended to the west by 800 feet.
  - Proposed improvements to Belmont Bay Drive have been extended to the east by 280 feet.
  - Improvements to 880 feet of Horner Road have been added.
  - Approximately 330 feet of new roadway intersecting with Route 1 has been added (the Easy Street Connector).
- Annapolis Way has been changed to single-point access and approximately 440 feet of roadway would be narrowed to a single lane.
- As a result of the 1,500-foot extension along Route 1, a new bridge over Marumsco Creek and Prince William County Park Authority land is proposed.
- Raised grass medians are now proposed along Route 1 and Route 123.
- A ten-foot shared-use path and a six-foot sidewalk are now proposed along Route 1 and Route 123.

Specifically, the proposed action now involves the widening Route 1 from four to six lanes (from Mary's Way to 0.11 miles north of Annapolis Way) and providing a grade-separated interchange at Route 123. The existing Route 1 intersections with Gordon Boulevard and Occoquan Road are both signalized. These intersections operate at capacity during peak periods and would operate at unacceptable levels of service in the future. The interchange would grade separate the through-traffic movements, and would connect Route 123 to Belmont Bay Drive, thereby completing an important element of the region's transportation system. The proposed interchange would eliminate two existing at-grade signalized intersections on Route 1 at Route 123 and Annapolis Way. The signalized intersection at Route 1 and Occoquan Road would remain and traffic operations would be improved by adding additional through and turn lanes on Route 1 and Occoquan Road. Route 123 would also be widened from four to six lanes from the Route 1 interchange to just east of the I-95 interchange. Proposed improvements would allow the traffic operations on Route 1 and Route 123 to operate at level of service (LOS) C or better in the 2018 and 2036 a.m. and p.m. peak hours, with the exception of the Route 1 at Mary's Way/Mt. Pleasant Drive intersection and the Route 1 at Occoquan Road/Dawson Beach intersection, which would operate at LOS D or better.

Route 1 is proposed to be widened to six lanes (three through lanes in each direction) with a raised grass median between Mary's Way and a point 0.11 miles north of Annapolis Way. The improvements to Route 1 would include a new six-lane bridge over Marumsco Creek. A Tight Urban Diamond interchange is proposed at Route 123, which would eliminate the existing signalized intersection. Pedestrian facilities include a ten-foot shared-use path on the west side of Route 1 and a six-foot sidewalk on the east side of Route 1 throughout the length of the project. As part of interchange construction, Route 123 would be elevated to span Route 1 and the CSXT Railroad with a six-lane roadway and a raised grass median which would connect to the four-lane divided Belmont Bay Drive east of the railroad. Express Drive would be raised to connect to the new Route 123/Belmont Bay Drive. A ten-foot shared-use path is proposed on the north side of Route 123/Belmont Bay Drive with a six-foot sidewalk proposed on the south side. The Route 1 intersection traffic operations at Occoquan Road/Dawson Beach Road would be improved.

Additionally, the proposed project provides enhanced access to the existing Woodbridge VRE/Amtrak Station for vehicles, bicycles, and pedestrians. The project also provides for the construction of an important segment of the Potomac Heritage National Scenic Trail from the intersection at Route 123 and Annapolis Way to the Belmont Bay community.

VDOT's current plans are to build the project in phases. Phase I "Route 1 Widening" would consist of widening Route 1 to six lanes and improvements to Occoquan Road, with construction scheduled to begin in early 2015. The remaining improvements for the widening of Route 123 and the proposed interchange would be constructed in the future when additional funding has been identified.

IV. EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

Reevaluation and modification of the Modified Selected Alternative (as previously discussed) resulted in the following substantive changes to or additions to the Environmental Consequences documented in the 1999 EA:

- Improvements along the southern extension of Route 1 would entail partial acquisition (but not displacement) of nine additional businesses.
- Improvements along the western extension of Occoquan Road would entail partial acquisition within an undeveloped sliver of one commercial property to the north of Occoquan Road.
- Improvements at intersection of Route 1 and Occoquan Road would entail the relocation of two families (occupying one dwelling).
- Improvements and intersection construction west of Route 1 and south of the proposed Easy Street Connector would entail displacement of one church (the Bibleway Church, which was formerly a Total Auto Parts).
- Improvements along the southern extension of Route 1 would entail partial acquisition (a sliver of grassy area to accommodate sidewalk construction) of one church (Our Lady of Angels).
- Improvements along the southern extension of Route 1 would entail construction of a new bridge which would affect 150 linear feet of Marumsco Creek.
- Storm water outfalls associated with the new bridge would affect 703 square feet (0.016 acre) of wetlands and 30 linear feet of Marumsco Creek.
- The new bridge over Marumsco Creek along with two nearby stormwater outfalls would entail *de minimis* impacts to a Section 4(f) property (the "Jefferson Park site").
- Improvements along the southern extension of Route 1 would entail approximately 1.07 acres of encroachment into the 100-year floodplain along Marumsco Creek.

A. Socioeconomic Impacts

Since issuance of the FONSI in 2000, no statutory/regulatory/policy changes been implemented which would render the proposed project less-viable or less-needed from a socioeconomic perspective. The proposed project continues to be included in the Prince William County Comprehensive Plan. An important goal of the interchange project remains to establish a gateway into Prince William County and to the North Woodbridge and Belmont Bay communities. The new interchange would also provide more-direct access to the area east of Route 1 and to the Woodbridge commuter rail station. The area east of Route 1 contains the mixed-use Belmont project and the future Woodbridge Wildlife Refuge. This is one of four quality development areas targeted by the county for economic development and employment opportunities. The Modified Selected Alternative does not require relocation of the existing CSX railroad line, and rail services would be maintained during construction. The Modified Selected Alternative would not cause a divisive or disruptive effect on the general community served.

B. Right-of-Way Relocations

Compared to the Original Selected Alternative, the Modified Selected Alternative now includes improvements along the southern extension of Route 1 that would entail partial acquisition (but not displacement) of nine additional businesses. Also, the Modified Selected Alternative now

includes improvements along the western extension of Occoquan Road that would entail the displacement of six additional businesses. In total, 37 businesses would be displaced under the Modified Selected Alternative as compared to the 22 business that would have been displaced under the Original Selected Alternative discussed in the 1999 EA. Inspection of the proposed project and surrounding commercial area of the Route 1 corridor of Prince William County indicates there are replacement properties for sale or rent on the open real estate market. With assistance from VDOT, it is anticipated that the affected commercial properties would be able to find adequate replacement commercial properties, both improved and unimproved, to relocate their businesses.

Compared to the previous Selected Alternative, the Modified Selected Alternative now displaces two families and one church. Specifically, improvements at intersection of Route 1 and Occoquan Road would entail the relocation of one dwelling (housing two families). Improvements and intersection construction west of Route 1 and south of the proposed Easy Street Connector would entail displacement of the Bibleway Church (formerly Total Auto Parts).

All relocations would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act).

C. Environmental Justice

Comparison of U.S. Census Bureau data from the 2000 Census to U.S. Census Bureau 2005-2009 American Community Survey 5-Year Estimates indicates that the percentage of low-income individuals has risen within Prince William County from 4.4 percent in 2000 to 5.1 percent in 2009. This comparison also indicates that the percentage of minority persons has risen from 32.8 percent in 2000 to 45.4 percent in 2009 (with Hispanic populations accounting for the largest difference). Most recently available data applicable to the specific project area (U.S. Census Bureau TIGER dataset for the 2000 census) were used to conduct a statistical assessment of impacts to low-income and minority populations associated with the Modified Selected Alternative. Low-income populations affected by the proposed action were compared to like populations within Prince William County (low-income statistics specific to individual census block groups is not available). Minority populations affected by the proposed action were compared to like populations within the Route 1 corridor of Prince William County. As shown in Table 1 and Table 2, statistical comparison indicates that the Modified Selected Alternative, as now designed, would not disproportionately affect low-income or minority populations.

TABLE 1: LOW-INCOME POPULATIONS

Statistical Area	Percent Low-Income
Zip Code Encompassing the Project Area	5.5
Prince William County	5.1

TABLE 2: MINORITY POPULATIONS

Statistical Area	Percent Minority
Block Groups Comprising the Project Area	46.0
Zip Codes Comprising the Route 1 Corridor within Prince William County	49.2

D. Historic/Archaeological Resources

As part of the environmental assessment conducted in 1998 through 1999, a full cloverleaf interchange was analyzed because it would represent the "worst case" scenario for potential impacts to historic architectural and archaeological resources. At that time, the Virginia Department of Historic Resources (VDHR) verified that two historic houses are located within the project area (architectural resource numbers 076-5066 and 076-5067); however, both resources were determined not eligible for the National Register of Historic Properties (NRHP). An architectural survey conducted in August 2010 as part of the *Additional Architectural Survey and Archaeological Assessment* identified seven previously identified resources and 17 newly recorded resources. All architectural resources were recommended not eligible. No other historic properties are present or affected. The project corridor continues to consist primarily of commercial and residential development with very low potential for intact archaeological resources.

On December 7, 2010, VDHR concurred with VDOT findings pertaining to non-eligibility of architecture resources and with VDOT findings that no additional archaeological investigation is necessary. In the event of the discovery of prehistoric ruins, Indian or early settler sites, burial grounds, relics, or other articles of archaeological interest during construction, the contractor would comply with the guidelines outlined in VDOT's 2007 *Road and Bridge Specifications* (§I07.16(d)).

The Modified Selected Alternative, as now designed, would require the removal, storage, and relocated installation of two Historic Markers located immediately west of Route 1 and immediately north of Route 673 (Annapolis Way). These markers are marker number Z-144 (titled “Occoquan”) and marker number E-59 (titled “Prince William County”).

E. Agricultural/Ecological/Recreational Resources

1. Agricultural/Forestal Districts and Prime Farmlands

At the time the original EA was prepared in 1999, Prince William County had designated no Agricultural and Forestal Districts within the project area. Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to Agricultural and Forestal Districts. Specifically, the Modified Selected Alternative, as now designed, would not impact Agricultural and Forestal Districts.

During preparation of the 1999 EA, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) stated that form CPA-106 is not required because of prior conversion of the transportation corridor. Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to prime farmlands. Specifically, the Modified Selected Alternative, as now designed, would not impact prime farmlands.

2. Scenic Rivers

Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to federal or state scenic river programs. Specifically, the Modified Selected Alternative, as now designed, would not impact any

waterways on the National Park Service *Nationwide Inventory, Final List of Rivers*, or any potential State Scenic Rivers.

3. Open Space Easements

At the time the original EA was prepared in 1999, the Virginia Outdoors Foundation (VOF) had designated no open space easements within the project area. Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to open space. Specifically, the Modified Selected Alternative, as now designed, would not impact any VOF open space easements.

4. Recreational Areas

At the time the original EA was prepared in 1999, the project did not require the acquisition of any Title 49 U.S.C. Section 303(c) lands or use of any Section 4(f) properties. Since that time, the proposed project has been extended into a parcel along Marumsco Creek east of Route 1 which is owned by the Prince William Park Authority (PWCPA) and is known as the "Jefferson Park site". The Jefferson Park site is currently maintained as undeveloped open space and is identified in the PWCPA 2010-2013 Comprehensive Plan as a future neighborhood park for which no master plan presently exists. As verified by PWCPA records, no Section 6(f) of the Land and Water Conservation Act funds or other federal funds were used to acquire the property. As discussed in Section IV.M of this EA reevaluation, the Modified Selected Alternative, as now designed, would result in *de minimis* impacts to this 4(f) resource. No other existing recreational facilities, public or private, would be affected by the project.

F. Wildlife/Endangered Species

Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to critical wildlife habitat or threatened/ endangered species. Suitable nesting habitat for the bald eagle (*Haliaeetus leucocephalus*), a state-threatened species, is still reported to occur just within northern project limits; however, due to the distance to the nearest documented nest, no adverse impacts are expected to result from construction of the Modified Selected Alternative, as now designed. The project would have no adverse impact on state-listed or federal-listed threatened or endangered species.

G. Physiography/Soils

Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to physiography and soils. VDOT remains committed to those avoidance measures and best management practices set forth in the 1999 EA. Specifically, the Modified Selected Alternative, as now designed, would not significantly impact physiography or soils within the corridor.

H. Aquatic Resources

1. Hydrogeology/Groundwater Quality

Since issuance of the FONSI in 2000, conditions have not significantly changed within the project corridor nor have any statutory/regulatory changes been implemented which would alter those findings set forth in the 1999 EA with respect to hydrogeology and groundwater quality.

VDOT remains committed to those avoidance measures and best management practices set forth in the 1999 EA. Specifically, the Modified Selected Alternative, as now designed, would not significantly impact groundwater resources within or near the project corridor.

2. Surface Water

Under the Modified Selected Alternative, improvements along the southern extension of Route 1 would entail construction of a new six-lane bridge which would affect 150 linear feet of Marumsco Creek. Although natural stream attributes would be maintained where practicable, an additional 65 linear feet of stream would be unavoidably shaded by the new bridge deck. In addition, stormwater outfalls associated with the new bridge would require placement of riprap along 30 linear feet of Marumsco Creek. All applicable water quality permits would be obtained from the U. S. Army Corps of Engineers and the Virginia Department of Environmental Quality in accordance with Section 404 of the Clean Water Act and the Virginia Water Protection Permit Program, respectively. Best management practices would be implemented, and no significant impacts are anticipated.

3. Wetlands

Under the Modified Selected Alternative, stormwater outfalls associated with the new Route 1 bridge over Marumsco Creek would affect 703 square feet (0.016 acre) of palustrine emergent wetlands. As discussed in the 1999 EA, there remains the potential for minor wetland impacts associated with extension of an existing culvert at Express Drive. All applicable water quality permits would be obtained from the U. S. Army Corps of Engineers and the Virginia Department of Environmental Quality in accordance with Section 404 of the Clean Water Act and the Virginia Water Protection Permit Program, respectively. Best management practices would be implemented, and no significant impacts are anticipated.

I. On-site Hazardous Wastes/Pollutants

As part of the 1999 EA, subsurface investigation was recommended for seven parcels identified as having potential hazardous materials concerns (including four gasoline stations, two car repair facilities, and one car storage/distribution facility). A Phase II Hazardous Materials Investigation has since confirmed the presence of petroleum-contaminated soil, contaminated groundwater, and underground storage tanks on four of these parcels (parcel numbers 028, 037, 047, and 051 of the 1999 EA). Property owners and/or responsible parties would be required to remove the tanks and fulfill closure requirements with the Virginia Department of Environmental Quality prior to right-of-way acquisition. Any necessary remediation on the part of property owners and/or responsible parties would be completed prior to construction. No additional hazardous materials investigation is necessary.

J. Air Quality

The project has been assessed for potential air quality impacts and conformity with applicable air quality regulations and requirements (see 11 May 2011 Air Report in Attachment 2). The assessment indicates that the project would meet all applicable air quality requirements of the National Environmental Policy Act (NEPA) and federal and state transportation conformity regulations. As such, the project would not cause or contribute to a new violation, increase the frequency or severity of any violation, or delay timely attainment of national ambient air quality standards (NAAQS) as established by the U.S. Environmental Protection Agency (U.S. EPA).

A carbon monoxide (CO) hotspot analysis was completed for the project in 1999, which concluded that the project would meet all applicable air quality NEPA and transportation conformity requirements. The air study documented that, by using worst-case assumptions, the peak 1-hour and 8-hour CO concentrations were predicted to be 7.1 and 3.8 ppm, respectively, which are both significantly below the 1-hour and 8-hour CO NAAQS of 35 and 9 ppm, respectively. Consistent with the 28 October 2004 FHWA-VDOT Memorandum Agreement on procedures for updating air studies, the previously completed air study is still considered valid for reasons documented in the attached Air Report.

Following FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents (dated 30 September 2009) this project has been determined to have low potential MSAT effects, thereby requiring a qualitative MSAT analysis which is included in the attached Air Report. The analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented in the 11 May 2011 Air Report (Attachment 2) 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". Additionally, best available information indicates that, nationwide, regional levels of air toxics are expected to decrease in the future due to fleet turnover and the continued implementation of more stringent emission and fuel quality regulations. Nevertheless, it is possible that some localized areas may show an increase in emissions and ambient levels of these pollutants due to locally increased traffic levels associated with the project.

The project is located within a moderate ozone nonattainment area, a fine particulate matter ($PM_{2.5}$) nonattainment area, and a volatile organic compounds (VOC), and nitrogen oxide (NO_x) emissions control area. As such, all reasonable precautions should be taken to limit the emissions of VOC, NO_x, and particulate matter. In addition, the following DEQ air pollution regulations must be adhered to during the construction of this project: 9 VAC 5-130-10 et seq., Open Burning restrictions; 9 VAC 5-45-760 et seq., Cutback Asphalt restrictions; and 9 VAC 5-50-60 et seq., Fugitive Dust precautions.

Emissions may be produced in the construction of this project from heavy equipment and vehicle travel to and from the site, as well as from fugitive sources. Construction emissions are short term or temporary in nature. In order to mitigate these emissions, all construction activities are to be performed in accordance with VDOT Road and Bridge Specifications.

Federal conformity requirements apply, including specifically 40 CFR 93.114 and 40 CFR 93.115. The scope and concept of the project is consistent with what is modeled in the Nation Capital Region Transportation Planning Board's federally-approved Air Quality Conformity Determination of the 2010 Constrained Long Range Plan and the FY2011-2016 Transportation Improvement Program.

K. Noise Impacts

1. Traffic Noise

As part of the EA prepared in 1999, a noise sensitivity analysis was conducted to predict 2020 design year conditions. To address the presently proposed project design year horizon, an updated noise sensitivity analysis was conducted for 2036 design year conditions (Attachment 3).

As part of the updated noise sensitivity analysis, noise impacts were identified along the project study corridor under the design year (2036) "build condition" (*i.e.*, the Modified Selected Alternative). Noise sensitive sites studied include residential properties, commercial properties, a church building and a golf course. A total of 134 sites were studied, representing 144 residential properties, a golf course, one church facility (Our Lady of Angels Church), and four commercial facilities. Existing noise levels (due to traffic-generated noise and rail-generated noise) at the noise sensitive properties within the study corridor range from 54 to 69 dBA. Considering traffic-generated noise and rail-generated noise, two sites presently experience noise impact under existing conditions.

For the 2036 design year "build condition", total noise levels (*i.e.*, a combination of traffic-generated noise and rail-generated noise) are predicted to range from 52 dBA to 70 dBA. When considering this combination of rail-generated noise and traffic-generated noise, six sites are predicted to be impacted as a result of approaching or exceeding the Noise Abatement Criteria (NAC) under the 2036 design year "build condition"; however, because the federal-aid project evaluated by this EA Reevaluation applies only to highway improvement activities and associated traffic-generated noise impacts, impacts predicted by the updated noise sensitivity analysis excludes rail-generated noise. Analysis of traffic-generated noise alone predicts that 2036 design year "build condition" noise levels would range from 60 to 65 dBA; therefore, under this scenario, no sites would be impacted as a result of the substantial increase criteria under the 2036 design year "build condition". For a more detailed description of the results, refer to the Noise Sensitivity Analysis Technical Report (Attachment 3).

2. Construction Noise

Construction activity may cause intermittent fluctuations in noise levels. During the construction phase of the project, all reasonable measures would be taken to minimize noise impact from these activities. At a minimum, the contractor would be required to conform to VDOT's 2007 *Road and Bridge Specifications* to reduce the impact of construction noise on the surrounding community.

L. Floodplains and Floodways

No FEMA-mapped 100-year floodplains or FEMA-regulated floodways were to have been affected by the Original Selected Alternative evaluated in the 1999 EA; however, widening of Route 1 has been extended south to the Route 1270 (Mary's Way) intersection under the Modified Selected Alternative. This project extension now entails approximately 1.07 acres of encroachment into the 100-year floodplain along Marumsco Creek along with bridge construction over the Marumsco Creek floodway. The new bridge would be single-span extending from top-of-bank to top-of-bank, with no structures being placed below top-of-bank. Proposed construction would not increase the existing 100-year flood level established under the National Flood Insurance Program (NFIP).

M. Section 4(f) Properties

No Section 4(f) properties were to have been affected by the Original Selected Alternative addressed by the 1999 EA; however, widening of Route 1 has been extended south to the Route 1270 (Mary's Way) intersection under the Modified Selected Alternative. This project extension now requires the construction of a new bridge spanning Marumsco Creek and a portion of a 6.75-acre parcel owned by the Prince William County Park Authority (PWCPA) and referred to

as the "Jefferson Park site". The Jefferson Park site is located along Marumsco Creek just downstream (east of) Route 1. The Jefferson Park site is currently maintained as undeveloped open space and is identified in the PWCPA 2010-2013 Comprehensive Plan as a future neighborhood park for which no master plan presently exists. The new bridge would be single-span extending from top-of-bank to top-of-bank. With respect to the Jefferson Park site, activities proposed within a 4,062-square-foot area consist of:

- Acquisition of 1,390 square feet of PWCPA land for new right-of-way associated with construction of the new bridge over Marumsco Creek.
- The use of a 2,762-square-foot permanent drainage easement to construct and maintain two stormwater outfalls to Marumsco Creek.

FHWA intends to determine that the impacts associated with these activities are *de minimis* as defined under Section 4(f) and, accordingly, that they would not adversely affect the activities, features, or attributes of the Jefferson Park site. A final determination with respect to *de minimis* findings would occur following additional coordination with PWCPA.

N. Public Involvement

The public had the opportunity to review the proposed project at a Design Public Hearing held on March 24, 2011. The public hearing utilized an open forum, but also included a formal presentation by VDOT and its consultant staff. With the exception of one comment regarding the proposed multi-use trails, substantive comments received from the general public pertaining to environmental issues were focused on noise abatement and air quality. Specifically:

- Most of the 18 residents from the Belmont Bay communities who attended the public hearing were opposed to the project because of anticipated increases in noise, traffic, and speed. Eight commenters were concerned with increase in noise from trains along with Route 1 improvements, and the need for a noise wall. To address residents' concerns, Prince William County and VDOT held a Town Hall meeting to discuss the project and answer questions from the residents of the Belmont Bay communities. A detailed explanation was given on the noise study that had been conducted as part of the environmental process. Residents were informed that a barrier had been considered for the six houses located on Railroad Avenue that would be affected by a combination of rail and traffic noise. The residents were informed that construction of a barrier at this location was deemed not feasible because none of the sites are predicted to be affected solely as a result of traffic associated with the federal-aid project and because of insufficient right-of-way between Railroad Avenue and the rail line.

- Six comments were received from Belmont Bay residents concerned with the increase in noise as a result of rerouting traffic through their neighborhood. It was explained that, as most traffic is local traffic and this area is almost completely developed, only a minor increase of traffic on Belmont Bay Drive is anticipated. It was further explained that a temporary increase in noise can be expected during construction, as typical for any project of this size.

- Four comments were received from Belmont Bay residents concerned over air quality. It was explained that there would be temporary increases in air pollution due to construction activities, but that no significant increase in long term air pollution due to the project is anticipated. As typical for construction projects, properties adjacent to the construction site

would experience short-term increase in construction noise and dust. Residents were assured that specifications would be in place to control dust during construction.

- One comment was received concerning impacts to the church and school located at the intersection of Route 1 and Mary's Way. Specific environmental concerns included noise and air quality. It was explained that, as typical for construction projects, properties adjacent to the construction site would experience short-term increase in construction noise and dust. The commenter was assured that specifications would be in place to control dust during construction.

- One comment was received requesting that trees be used instead of "unsightly" walls for noise abatement. The commenter was informed that, based upon the noise study, no noise walls are required for the project; however, during the development of the landscaping design, consideration would be given to screening needs for nearby residential properties [(1)].

  [(1)] The updated noise study was prepared in accordance with the State Noise Abatement Program (SNAP) and 23 CFR 772. The study concluded that there are no traffic noise impacted properties in the project area and that no noise abatement measures were required. It should be noted that use of vegetation for noise abatement has been shown to be ineffective for similar urban settings, that planting of vegetation for noise abatement is not recognized under the SNAP, and that planting of vegetation for noise abatement purposes should not be construed to be a commitment under NEPA. Any planting of vegetation proposed as part of the project would be a project design commitment only and would be considered with the intent of providing visual screening only.

- One comment was received that proposed tying the proposed trails with existing trails and updating the rest of the Route 1 corridor with bike trails. It was explained that the proposed project provides the link from Annapolis Way to the Belmont Bay community for the Potomac Heritage Trail, and that a multi-use trail would be provided for the length of Route 1. The commenter was informed that, as future projects are developed, the multi-use trail would be extended to the south.

- Four comments were received requesting that sound-absorbing material be used on the retaining walls. The commenters were informed that, as final design plans are developed, the design team would investigate the potential for using sound-absorbing materials within the mechanically-shored earth (MSE) wall material or placing sound-absorbing material on the surface of the MSE walls [(2)].

  [(2)] It should be noted that any use of sound-absorbing materials within or on retaining walls should not be construed to be a commitment under NEPA. Further, any application of sound-absorbing materials to surfaces of MSE walls would be a project design commitment only and would be weighed against the need to periodically remove graffiti – a situation common to the Route 1 corridor in the area.

ATTACHMENT 1

THE MODIFIED SELECTED ALTERNATIVE

Route 1 (Jefferson Davis Highway) and Route 123 (Gordon Boulevard) Interchange

Federal Project Number: STP-111-1(114)
State Project Number 0123-076-F-29, PE101
UPC 14693

Prepared by:

VIRGINIA DEPARTMENT OF TRANSPORTATION

24 March 2011

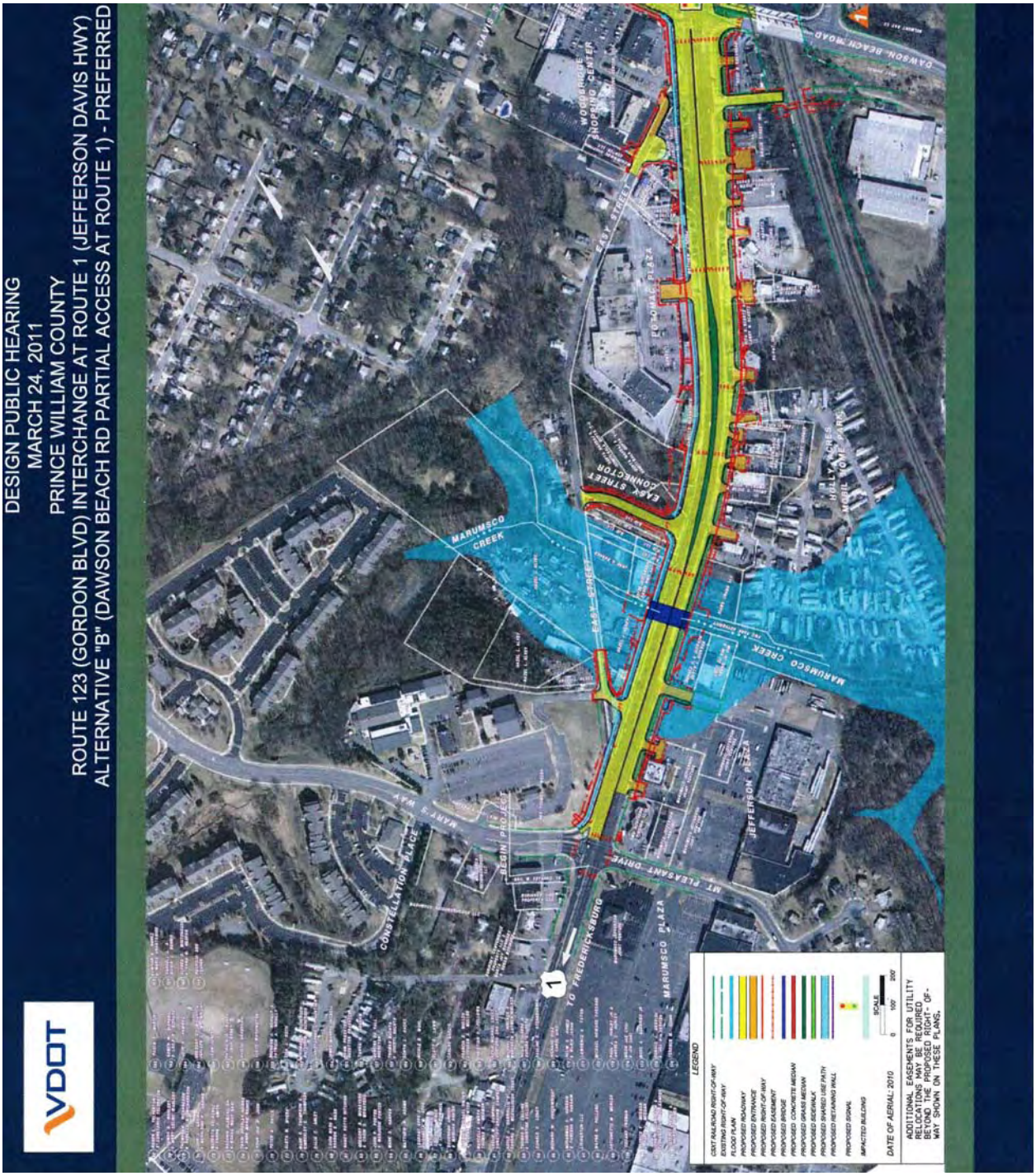


Figure 1-1: Modified Selected Alternative (Southern Portion)

Figure 1-2: Modified Selected Alternative (Northern Portion)

ATTACHMENT 2

AIR REPORT

Route 1 (Jefferson Davis Highway) and Route 123 (Gordon Boulevard) Interchange

Federal Project Number: STP-111-1(114)
State Project Number 0123-076-F-29, PE101
UPC 14693

Prepared by:

VIRGINIA DEPARTMENT OF TRANSPORTATION

11 May 2011

Air Report

Project Information

Project Name:	Rte 123 and 1 interchange 0123-076-F29_123&1		
Project Number:	0123-076-F29, B604, B605, C501, P101, R201	**UPC:**	14693
Route Number:	123		
Project Limit - From:	0.51 Miles South of Occoquan Road	**To:**	0.11 Miles North of Annapolis Way
District	**City/County**	**Residency**	
Northern Virginia	Prince William	Manassas	
IPM Project Description:	CONSTRUCT INTERCHANGE @ ROUTE 1/123 IN PWC (PE & RW only)		
Air Quality:	No		
Additional Project Description:	NEPA Reevaluation of EA/FONSI to Construct Interchange @ Route 123 and Route 1 in Prince William County. Project extended 1800 feet to southwest beyond limits in EA/FONSI.		
Funding Source:	Federal		

PPTA/LAP

Locally Administered?	Yes	**PPTA?**	No

Traffic Data

Design Year:	**Design Year Traffic ADT:**
Existing Year:	**Existing Year Traffic ADT:**
Project Opening Year:	

TASK INFORMATION

Task/Subtask	PED	AED	Assigned To
Air Determination	04/15/1998	04/15/1998	Curling, Samuel F.
Air Study	03/26/1998	03/26/1998	Lin, Teresa A.
Air Study Update	06/24/2011	05/11/2011	Ponticello, James

I. Carbon Monoxide

This project is located in: A Carbon Monoxide Attainment Area

CO Microscale Analysis Required for NEPA? No

- A project-level CO air quality analysis was conducted on 07/20/1999 and is still considered valid.

Comments: An air study was completed in 1999 for this project that concluded that the project would meet all applicable air quality NEPA and transportation conformity requirements and, as such, would not be expected to cause or contribute to a new air quality violation, increase the frequency or severity of any air quality violation, or delay timely attainment of the national ambient air quality standards (NAAQS) established by the US EPA. The air study documented that, by using worst-case assumptions, the peak 1-hour and 8-hour CO concentrations in 2020 were predicted to be 7.1 and 3.8 ppm, respectively, which are both significantly below the 1-hour and 8-hour CO NAAQS of 35 ppm and 9 ppm, respectively. Consistent with the FHWA-VDOT Memorandum Agreement dated October 28, 2004 on procedures for updating air studies, the previously-completed air study is still considered valid. Additional documentation supporting this determination is provided in the Comment section below.

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.

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: Traffic forecasts for the project indicate that the design year truck traffic will not reach a level to be of air quality concern. Design year forecasts from the consultant indicate that the maximum forecasted ADT along Route 1 corridor for the 2036 design year is 92,500 (between Mary's Way and Occoquan Road/Dawson Beach Road). The corresponding truck percentage for this link is 6 percent. These values are for both build options 6 and 7. This link also represents the highest truck percentage throughout the project limits.

[ ] [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: not applicable

[ ] [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: The project does not involve intersections with a significant number of diesel vehicles, based on the traffic forecasts referenced above.

[ ] [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 traffic volumes and diesel vehicle percentages are both below the levels that would be constitute a project of air quality concern.

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

Additional CO Documentation:
An air study was completed in 1999 that concluded that the project would meet all applicable air quality NEPA and transportation conformity requirements and, as such, would not be expected to cause or contribute to a new air quality violation, increase the frequency or severity of any air quality violation, or delay timely attainment of any NAAQS established by the EPA. The air study documented that, by using worst-case assumptions, the peak 1- and 8-hour CO concentrations in 2020 were predicted to be 7.1 and 3.8 ppm, respectively, which are both significantly below the 1- and 8-hour CO NAAQS of 35 and 9 ppm, respectively. Consistent with the FHWA-VDOT Memorandum Agreement dated October 28, 2004 on procedures for updating air studies, the original air study is still considered valid for the following reasons;

1.The CO background concentrations used in the original air study were 6 and 3 ppm for the 1- and 8-hour time periods, respectively, whereas updated CO background concentrations that are more representative of current conditions in the project area are 2.9 and 2.3 ppm for the 1- and 8-hour time periods, respectively. Had these updated background concentrations been used in the previously-completed analysis, the predicted peak CO concentrations would have been 4.0 and 3.1 ppm for the 1- and 8-hour time periods, respectively, which are more than 88% and 65% below the 1- and 8-hour CO NAAQS, respectively.
2.The original air study predicted peak CO concentrations for a design year of 2020, whereas this re-evaluation is evaluating the project for a design year of 2036. CO emission factors calculated using MOBILE6.2 drop significantly between 2020 and 2036 as vehicle technology improves and the fleet turns over. In addition, CO emission factors generated using MOVES2010a are even lower than those generated with MOBILE6.2, all else being equal. As such, the use of updated CO emissions factors for the new design year of 2036 would reduce anticipated peak CO concentrations even further.
3.The original air study estimated 2020 ADT to be 72,600 on US Route 1 in the vicinity of Route 123, whereas updated traffic estimates of peak ADT in the same Route 1 corridor for the 2036 design year are 92,500. Any anticipated increase in CO concentrations related to the increase in ADT between 2020 and 2036 is expected to be offset by the reduction in CO emission factors from improving vehicle technology over the same time period.
4.The original air study evaluated 5 sensitive receptor locations close the roadway within the project corridor. Although the limits of this re-evaluated project have been extended 1800 feet at the southern end on Route 1, it is not expected that any additional sensitive receptors would be exposed to peak CO concentrations any greater than those already predicted in the original air study, and peak CO concentrations are expected to stay well below both the levels of both the 1-hour and 8-hour CO NAAQS.

As demonstrated, the previously-completed CO hotspot analysis is still considered valid as the peak CO concentrations are expected to remain well below the 1- and 8-hour CO NAAQS with updated (and significantly lower) CO emissions factors and background concentrations factored in, even with the anticipated ADT increase by 2036 taken into account.

VDEQ SERP 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 5-130-10 et seq., Open Burning restrictions; 9 VAC 5-45-760 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.

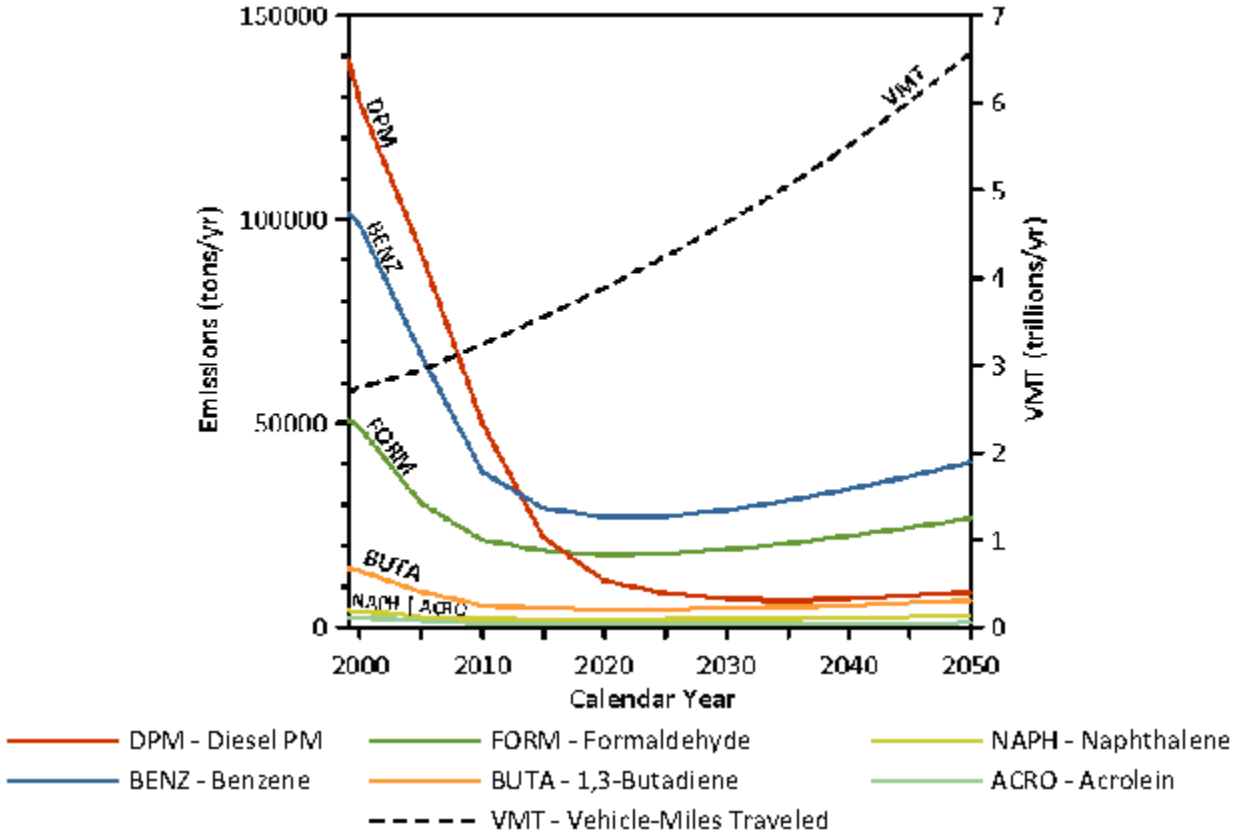
PROJECT-LEVEL MSAT DISCUSSION

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.

ATTACHMENT 3

NOISE SENSITIVITY ANALYSIS TECHNICAL REPORT

Route 1 (Jefferson Davis Highway) and Route 123 (Gordon Boulevard) Interchange

Federal Project Number: STP-111-1(114)
State Project Number 0123-076-F-29, PE101
UPC 14693

Prepared by:

VIRGINIA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION

March 2011

NOISE SENSITIVITY ANALYSIS TECHNICAL REPORT

Route 1 and 123 Interchange Improvement

Prince William County

PROJECT: 0123-076-F29, P-101

UPC: 14693
From: 0.51 Miles South of Occoquan Road
To: 0.11 Miles North of Annapolis Way

Prepared by:

Lovejoy Muchenje
Monica Franz
Environmental Division
Virginia Department of Transportation

March 2011

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List of Appendices

1. Summary

Potential traffic noise impacts associated with the proposed interchange project at the Route 1 and Route 123 intersection in Prince William County, Virginia, were assessed in accordance with the procedures and criteria approved by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT). The purpose of the project is to construct an interchange at the intersection of Route 1 and Route 123 in Prince William County, VA. The project also includes improvements at the existing intersections with Annapolis Way, Occoquan Road, and Express Drive. The project extends from 0.51 miles South of Occoquan Road to 0.11 miles North of Annapolis Way. A project location map is shown in ***Figure 1***.

A noise study was completed for design year 2020 conditions, as part of the environmental document prepared in 2004. So that the project design year horizon is satisfied, an update to 2036 is required. Results for the existing case, no-build, and design year 2020 build conditions are provided as a reference where appropriate in this report. Refer to the original study for further details.

Noise impacts were identified along the project study corridor under the design year (2036) build condition. Noise sensitive sites studied include residential properties, commercial properties, a church building and a golf course. A total of one hundred thirty four (134) sites were studied, representing one hundred forty four (144) residential properties, a golf course, one church facility (Our Lady of Angels Church), and four commercial facilities. Six (6) sites are predicted to be impacted under design year (2036) build condition (combination of rail and traffic noise), as a result of approaching or exceeding the Noise Abatement Criteria (NAC). However, no sites are predicted to be impacted in the design year (2036) build condition solely as a result of the federal-aid project. No sites are predicted to be impacted as a result of the substantial increase criteria. Two (2) sites are predicted to be impacted under design year (2020) no-build condition, and two (2) sites experience noise impact under the existing (1998) case. For all sites studied the noise level ranges presented below include the rail noise. The existing year noise levels range from 54 to 69 dBA. The design year (2020) no- build levels are predicted to range from 54 to 70

dBA. The design year (2020) build levels are predicted to range from 56 to 71 dBA, and the design year (2036) build levels are predicted to range from 52 dBA to 70 dBA.

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

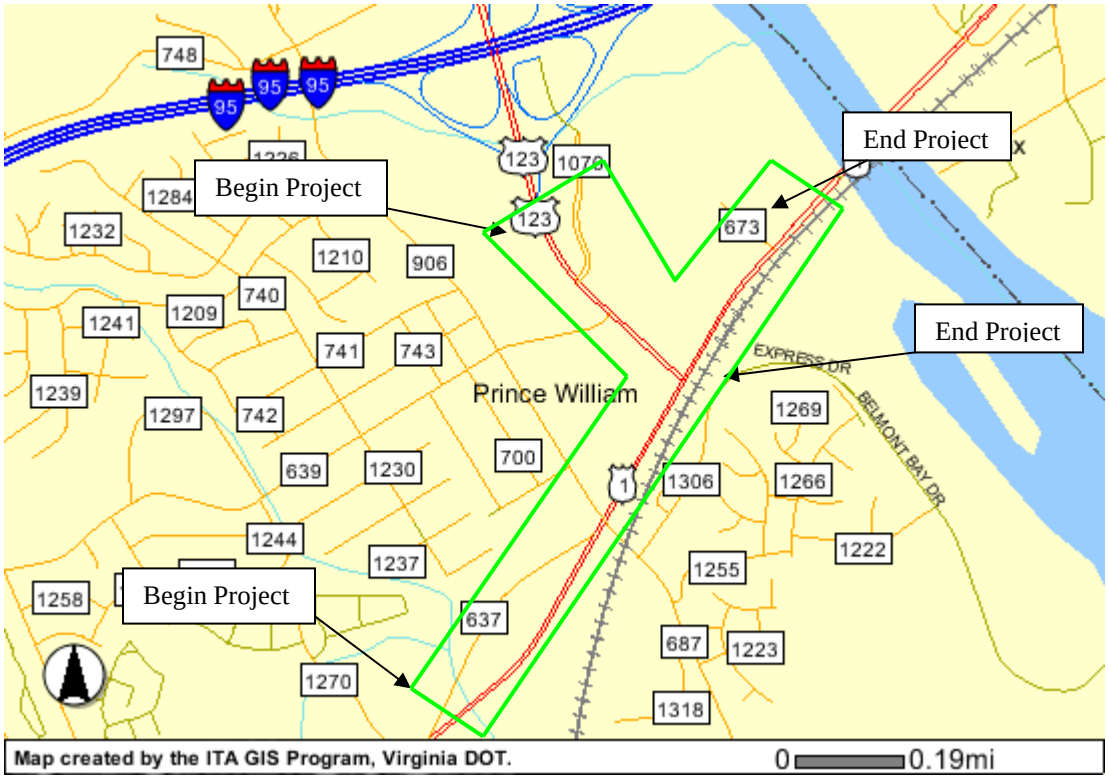


Figure 1: Study Area Overview

2. Introduction

The objective of this analysis is to assess the potential traffic noise impact associated with the proposed interchange project at the Route 1 and Route 123 intersection in Prince William County, and to evaluate potential noise abatement measures wherever impact is predicted to occur.

Noise impact assessment has been performed for all noise sensitive properties within the project corridor, including residential properties, commercial properties, a church building and a golf course. Noise impacts are predicted to occur under the design year (2036) condition at six (6) sites. The impacts are due to a combination of rail and traffic noise. However, this report will only address noise impacts associated with the federal-aid project therefore with the rail noise excluded; no sites are predicted to be impacted in the design year (2036). For reference, noise impacts were also predicted to occur at six (6) sites in the design year (2020) condition. Two (2) sites are predicted to experience noise impact under the (2020) no-build condition, and two (2) sites experience noise impact in the existing case. Existing noise levels at the noise sensitive properties in the study corridor range from 54 to 69 dBA. For the (2020) condition, the no-build noise levels are predicted to range from 54 to 70 dBA, while the build noise levels are predicted to range from 56 to 71 dBA. For the design year (2036) condition, noise levels (including rail noise) are predicted to range from 52 dBA to 70 dBA. The decrease in noise levels between design year (2020) build condition and design year (2036) build condition is due to the different versions of the noise model used in the studies. In the original noise study, an earlier version of the noise model (version 2.1) was used, while this analysis (2036 design year) uses version 2.5.

This report presents a description of noise terminology, the applicable standards and criteria, a description of the computations of existing and future noise levels, a projection of future noise levels, and a discussion of construction noise.

3. Guidelines and Criteria

The potential noise impact of the proposed project has been assessed in accordance with FHWA guidelines published in Volume 7, Chapter 7, Section 2 of the Federal Aid Policy Guide (FAPG 7-7-2) and with the State Noise Abatement Policy. In order to determine the degree of impact of highway traffic noise on human activity, the NAC, Table 1, established by FAPG 7-7-2 is used. The NAC, listed in ***Table 1*** for various activities, represent the upper limit of acceptable traffic noise conditions and also a balancing of that which may be desirable with that which may be achievable. The NAC applies to areas having regular human use and where lowered noise levels are desired. They do not apply to the entire tract of land on which the activity is based, but only to that portion where the activity takes place.

The NAC is given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The A-weighted sound level is a single number measure of sound intensity with weighted frequency characteristics that correspond to human subjective response to noise. However, since most environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number called the equivalent sound level (Leq). The Leq 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 traffic noise assessment, Leq is typically evaluated over a one-hour time period, and is denoted as Leq(h).

The noise impact assessment is made using the guidelines listed in ***Table 1***. The noise sensitive residential properties, recreational sites, church facility and commercial facilities affected by this project are in Category B and C. If, for a given activity, the design year noise levels “approach or exceed” the NAC, then the activity is impacted and a series of abatement measures must be considered. The VDOT State Noise Abatement Policy defines “approach” as 1 dBA less than the NAC.

There is another criterion for assessing noise impact provided in the Federal guidelines. A receiver can be noise impacted if the design year build noise levels are substantially higher than existing levels. The VDOT State Noise Abatement Policy defines a substantial increase as 10 decibels or more, even though the levels may not reach the NAC.

The final decision on whether or not to provide noise abatement along a project corridor will take into account the feasibility of the design and overall cost weighted against the environmental benefit.

Table 1: FHWA Noise Abatement Criteria

Hourly A-Weighted Sound Level Decibels (dBA)		
Activity Category	**Leq(h)**	**Description Of Activity Category**
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed land, properties or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.
Source: 23 CFR Part 772		

4. Noise Model and Projections

4.1 Highway Noise Computation Model

A review of the project corridor has established roadway traffic and rail traffic as the dominant sources of noise for the build alternative. Since roadway noise can be determined accurately through computer modeling techniques for areas that are dominated by road traffic, both existing and design year traffic noise calculations have been performed using the Federal Highway Administration's Traffic Noise Model (FHWA TNM®) Version 2.5. FHWA TNM ® was developed and sponsored by the U. S. Department of Transportation and John A. Volpe National Transportation Systems Center, Acoustics facility. The TNM computer model can account for such factors as ground absorption, roadway geometry, receiver distance, shielding from local

terrain and structures, vehicle volume, operating speed, and volumes of medium trucks (vehicles with 2 axles and 6 tires) and heavy trucks.

4.2 Traffic Data for Traffic Noise Computations

Noise impact assessment has been performed for all noise sensitive properties within the project corridor. Noise levels in the study area have been determined for the design year (2036) build condition. Noise levels have been predicted for that hour of the day when the vehicle volume, operating speed, and number of trucks (vehicles with 3 or more axles) combine to produce the worst noise conditions. The worst noise hour used in this study was the PM peak hour.

An active rail line is within the project corridor which serves CSX, VRE, and Amtrak trains. All rail traffic data was supplied by CSX. Rail traffic noise levels were predicted using the Federal Transit Administration's (FTA) Freight Rail Noise Model. The output from the rail noise model was then applied to a TNM roadway. The TNM roadway was placed along the rail alignment, and contained a mix of autos and heavy trucks which would produce a similar noise level to the rail traffic. For the analysis, it was assumed that the rail traffic data and track alignments were the same for existing, no-build, and build conditions.

4.3 Computed Existing and Future Noise Levels

Noise impact assessment has been performed for all noise sensitive properties within the project corridor. A total of one hundred thirty four (134) sites were studied, representing one hundred forty four (144) residential properties, a golf course, one church facility (Our Lady of Angels Church), and four commercial facilities were evaluated for purposes of noise prediction. Noise levels in the study area have been determined for the design year (2036) build condition. The existing condition and the (2020) no-build and build condition noise levels from the original report are provided as a reference.

Assessment of traffic noise impact requires the following comparisons:

(1) The noise levels under existing conditions must be compared to those under design year build conditions. This comparison shows the change in noise levels that will

occur between the existing year and the design year if the project is constructed, to determine if the substantial increase impact criteria has been met.

(2) The noise levels under design year no-build conditions must be compared to those under design year build conditions. This comparison shows how much of the change in noise levels can actually be attributed to the proposed project.

(3) The noise levels under design year build conditions must be compared to the applicable NAC. This comparison determines if the impact criteria has been met under future build conditions and can be used to assist in noise compatible land use planning.

Table 2 shows the computed loudest-hour noise levels at the prediction sites, computed with TNM. All noise levels computed were the A-weighted equivalent sound level, or Leq, in dBA (***Section 3*** provides a discussion of this descriptor).

Table 2: Computed Existing and Future Noise Levels

Receiver Number	Land Use	Modeled Noise Level (dBA)				Noise Abatement Criteria (dBA) *	Abatement Considered
		Existing	2020 No Build	2020 Build	2036 Build		
River Bend Estates							
1	Residence	55	55	57	53	65	No
2	Residence	55	56	57	52	65	No
3	Residence	55	55	58	54	65	No
4	Residence	55	55	57	54	65	No
5	Residence	56	56	59	55	66	No
6	Residence	55	56	60	55	65	No
7	Residence	55	56	59	54	65	No
8	Residence	55	55	59	55	65	No
9	Residence	59	60	59	57	66	No
10	Residence	59	60	59	57	66	No
11	Residence	60	60	58	55	66	No
12	Residence	57	58	56	54	66	No
Belmont Bay							
13	Residence	61	60	63	59	66	No
14	Residence	60	60	62	58	66	No
15	Residence	60	59	61	58	66	No
16	Residence	59	59	60	57	66	No
17	Residence	58	59	59	57	66	No
18	Residence	57	58	58	56	66	No

Receiver Number	Land Use	Modeled Noise Level (dBA)				Noise Abatement Criteria (dBA) *	Abatement Considered
		Existing	2020 No Build	2020 Build	2036 Build		
19	Residence	57	58	58	56	66	No
20	Residence	57	57	58	55	66	No
21	Residence	57	57	57	55	66	No
22	Residence	56	56	57	55	66	No
23	Residence	56	56	57	54	66	No
24	Residence	55	56	57	54	65	No
25	Residence	55	55	57	54	65	No
26	Residence	55	55	57	54	65	No
27	Residence	54	55	57	54	64	No
28	Residence	54	55	57	53	64	No
29	Residence	54	54	57	53	64	No
30	Residence	54	54	57	53	64	No
31	Residence	54	54	57	53	64	No
32	Residence	54	54	57	54	64	No
33	Residence	54	54	57	54	64	No
34	Residence	54	54	57	54	64	No
35	Residence	54	54	57	54	64	No
36	Residence	54	54	58	55	64	No
37	Residence	55	54	58	55	65	No
38	Residence	55	54	58	55	65	No
39	Residence	55	55	59	55	65	No
40	Residence	56	56	61	54	66	No
41	Residence	56	56	60	54	66	No
42	Residence	56	56	60	54	66	No
43	Residence	56	56	60	54	66	No
44	Residence	56	56	60	54	66	No
45	Residence	56	56	59	54	66	No
46	Residence	56	56	59	54	66	No
47	Residence	56	56	59	54	66	No
48	Residence	56	56	60	54	66	No
49	Residence	56	56	60	54	66	No
50	Residence	56	56	60	54	66	No
51	Residence	56	56	60	54	66	No
52	Residence	56	56	60	54	66	No
53	Residence	56	57	60	54	66	No
54	Residence	59	59	62	54	66	No
55	Residence	59	58	62	55	66	No
56	Residence	58	58	62	55	66	No
57	Residence	58	58	62	55	66	No
58	Residence	59	58	62	55	66	No
59	Residence	59	59	62	55	66	No
60	Residence	59	59	63	55	66	No
61	Residence	63	63	64	63	66	No
62	Residence	62	62	63	62	66	No
63	Residence	62	62	63	61	66	No
64	Residence	61	61	62	61	66	No
65	Residence	61	60	62	60	66	No
66	Residence	60	60	62	60	66	No

Receiver Number	Land Use	Modeled Noise Level (dBA)				Noise Abatement Criteria (dBA) *	Abatement Considered
		Existing	2020 No Build	2020 Build	2036 Build		
67	Residence	59	59	61	59	66	No
68	Residence	58	58	61	58	66	No
69	Residence	58	58	61	58	66	No
70	Residence	58	58	61	58	66	No
71	Residence	58	58	60	58	66	No
72	Residence	58	58	61	58	66	No
73	Residence	58	58	60	58	66	No
74	Residence	59	59	61	59	66	No
75	Residence	60	60	61	60	66	No
76	Residence	60	60	62	60	66	No
77	Residence	61	61	62	61	66	No
78	Residence	61	61	62	61	66	No
79	Residence	61	60	62	61	66	No
80	Residence	61	60	62	61	66	No
81	Residence	61	61	62	60	66	No
82	Residence	61	60	62	61	66	No
83	Residence	60	60	62	60	66	No
84	Residence	60	60	62	60	66	No
85	Residence	60	61	62	60	66	No
86	Residence	60	61	62	60	66	No
87	Residence	60	61	62	60	66	No
88	Residence	60	60	62	60	66	No
89	Residence	60	60	62	60	66	No
90	Residence	60	60	62	60	66	No
91	Residence	60	60	62	60	66	No
92	Residence	60	61	62	60	66	No
93	Residence	60	60	62	60	66	No
94	Residence	60	60	61	60	66	No
95	Residence	59	60	62	60	66	No
96	Residence	59	60	61	60	66	No
97	Residence	59	60	61	60	66	No
98	Residence	59	60	61	60	66	No
99	Residence	59	60	61	60	66	No
100	Residence	59	60	61	60	66	No
101	Residence	59	60	61	60	66	No
102	Residence	59	60	61	60	66	No
103	Residence	59	60	61	60	66	No
104	Residence	59	60	61	60	66	No
105	Residence	59	60	61	60	66	No
106	Residence	59	60	61	60	66	No
107	Residence	60	60	62	60	66	No
108	Residence	60	60	62	60	66	No
109	Residence	60	60	62	60	66	No
110	Residence	60	61	61	60	66	No
Railroad Avenue							
111	Residence (2)	64	65	66	66	66	Yes
		-	-	-	(60)	66	No
112	Residence	64	65	66	66	66	Yes

Receiver Number	Land Use	Modeled Noise Level (dBA)				Noise Abatement Criteria (dBA) *	Abatement Considered
		Existing	2020 No Build	2020 Build	2036 Build		
		-	-	-	(61)	66	No
113	Residence	69	70	71	70	66	Yes
					(63)	66	No
114	Residence	64	65	66	66	66	Yes
		-	-	-	(61)	66	No
115	Residence	69	70	70	70	66	Yes
		-	-	-	(65)	66	No
116	Residence (2)	63	64	66	67	66	Yes
		-	-	-	(62)	66	No
Ospreys Golf Course							
117	Recreational	56	56	59	56	66	No
118	Recreational	58	58	58	57	66	No
South of Occoquan Road							
C1	Church	-	-	-	57	66	No
R1	Commercial	-	-	-	58	71	No
R2	Residence	-	-	-	56	66	No
R3	Residence	-	-	-	55	66	No
R4	Residence	-	-	-	52	66	No
R5	Residence	-	-	-	52	66	No
R6	Residence (2)	-	-	-	61	66	No
R7	Residence	-	-	-	63	66	No
R8	Commercial	-	-	-	70	71	No
R9	Commercial	-	-	-	65	71	No
R10	Residence (4)	-	-	-	61	66	No
R11	Residence (4)	-	-	-	60	66	No
R12	Residence (4)	-	-	-	62	66	No
R13	Residence (4)	-	-	-	63	66	No
R14	Residence (3)	-	-	-	63	66	No
R15	Commercial	-	-	-	69	71	No
Number of Noise Impacts							
		2	**2**	**6**	**6**		
Noise Level Ranges							
	Minimum	54	54	56	52		
	Maximum	69	70	71	70		
*	Noise Abatement Criteria from applicable FHWA Noise Abatement Criterion, or substantial increase criterion, whichever is worse						
(#)	Indicates noise levels without rail noise						
	Indicates Noise Impact due to approaching or exceeding the applicable NAC. (Levels include rail noise).						

5. Noise Impact Assessment

One hundred thirty four (134) sites receptor sites were investigated for noise impacts. The sites evaluated include one hundred forty four (144) residential properties, a golf course, one church facility (Our Lady of Angels Church), and four commercial facilities.

The existing year noise levels range from 54 to 69 dBA. For the design year (2020) no-build condition, noise levels are predicted to range from 54 to 70 dBA. For the design year (2020) build condition, noise levels are predicted to range from 56 to 71 dBA. The design year (2036) build condition noise levels (including rail noise) are predicted to range from 52 to 70dBA.

Six (6) sites (exterior) are predicted to experience noise impact as a result of noise levels that approach or exceed the NAC in the design year (2036) build condition. The impacts are due to a combination of rail and traffic noise. However, without rail noise, no sites are predicted to be impacted in the design year (2036). Two (2) sites are predicted to experience noise impact in the no-build (2020) condition. Two (2) sites experience noise impact in the existing condition. For reference, six (6) sites were predicted to experience noise impact in the design year (2020) build condition.

5.1 Existing Condition

Two (2) sites are predicted to experience noise levels that approach or exceed the NAC in the existing condition. The noise levels are predicted to range from 54 to 69 dBA for the existing condition. Further details regarding the existing condition noise levels are found in the original noise analysis.

5.2 No-Build Condition

Two (2) sites are predicted to experience noise levels that approach or exceed the NAC in the design year (2036) no-build condition. The noise levels for all studied sites are predicted to

range from 54 to 70 dBA for the no-build condition. Further details regarding the no-build condition noise levels are found in the original noise analysis.

5.3 Build Condition

Six (6) sites are predicted to experience noise levels that approach or exceed the NAC in the design year (2036) build condition. The impacts are due to a combination of rail and traffic noise. However, without rail noise, no sites are predicted to be impacted in the design year (2036). The design year build noise levels for all studied sites are predicted to range from 52 to 70 dBA for the build condition. For details regarding the design year (2020) noise levels, refer to the original noise analysis.

River Bend Estates

Sites 1 through 12 represent single family residences in the River Bend Estates community, adjacent to Route 1 Northbound. The design year (2036) build noise levels are predicted to range from 52 to 57 dBA. Noise impact is not predicted to occur in the build condition.

Belmont Bay

Sites 13 through 110 represent townhouse style residences in the Belmont Bay community, adjacent to Route 1 Northbound. The design year (2036) build noise levels are predicted to range from 53 to 63 dBA. Noise impact is not predicted to occur in the build condition.

Railroad Avenue

Sites 111 through 116 represent single family residences along Railroad Avenue, adjacent to Route 1 Northbound. The rail line within the project corridor is approximately 65 ft west of these homes and runs parallel to Route 1. The location of the rail line in reference to the sites is shown in Sheet 4 of Appendix A. The design year (2036) build noise levels (with rail noise included) are predicted to range from 66 to 70 dBA. However, without the rail noise, design year (2036) build noise levels are predicted to range from 60 to 65 dBA, meaning that the design year (2036) build noise levels due to the proposed roadway project only are not predicted to approach or exceed the NAC. Per FHWA guidance, since design year (2036) noise levels from

the federal-aid project (without rail noise) do not approach or exceed the NAC, a noise barrier is not warranted.

However the original noise study performed in 1999 proposed a noise barrier to protect the properties that would be impacted by both the rail and traffic noise in the design year (2020). The proposed location for this barrier was between Railroad Ave and the rail line. For consistency with the original document, and for the purpose of abating rail and traffic noise in the design year (2036), a barrier was considered at this location. Due to a lack of sufficient right of way between the Railroad Avenue and the rail line, constructing a barrier at this location is not feasible. Shifting the roadway (Railroad Avenue) to provide sufficient right-of-way to accommodate a noise barrier would adversely impact the adjacent property owners.

Ospreys Golf Course

Sites 117 and 118 represent the Ospreys Golf Course, adjacent to Route 1 Northbound. The design year (2036) build noise levels range from 56 to 57 dBA. Noise impact is not predicted to occur in the build condition.

South of Occoquan Road

The original noise study performed in 1999 had project limits that began at Occoquan Road and therefore did not include noise sensitive sites south of Occoquan Road. However, the current project limits extend to 0.51 miles south of Occoquan Road. As such, noise sensitive sites C1, R1-R15 in the extended part of the project corridor have been added to the noise report. Because of this, levels for the existing (1999), design year no-build (2020) and design year build (2020) conditions for these sensitive sites are not included in ***Table 2***.

The design year (2036) build noise levels range from 52 to 70 dBA. Noise impact is not predicted to occur for Category B and C receptors in the build condition.

6. Noise Abatement

Design year (2036) noise levels due to the federal-aid project itself (excluding rail noise) have not been predicted to approach or exceed the VDOT NAC in any areas of the project corridor. Therefore, per VDOT's State Noise Abatement Policy, noise abatement considerations are not warranted.

If noise impact were predicted to occur, noise abatement alternatives, including construction of noise barriers, construction of earth berms, acoustical insulation of public use and non-profit facilities, alignment modifications, and traffic management would be considered to reduce noise levels in the areas identified with design year noise impacts. Potential mitigation measures would be evaluated for feasibility and reasonableness.

Findings in this report are based on developed design information. However, due to potential changes in the final design, these findings are not considered final. All areas will be reevaluated during the final design phase of the project.

The Noise Policy Code of Virginia (HB 2577) states: *"Requires that whenever the Commonwealth Development Board (CTB) or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Landscaping in such a design would be utilized to act as a visual screen if visual screening is required."*

Noise impacts are not predicted in the design year (2036) build condition within the project corridor. During the final noise abatement HB 2577 shall be given consideration.

7. Noise Contours

Noise contours are lines of equal noise exposure that parallel the roadway noise source, and diminish in intensity with distance. For the design year (2036) build alternative, the location of the 66 dBA noise contour line was determined for areas along the project corridor for the purpose of characterizing the noise environment in the study area. The 66 dBA contour line is a result of the federal-aid project only. The contour distance for the areas of the project is shown below in ***Table 3.*** The noise contour is illustrated in the graphics in ***Appendix A***. Any Category B noise sensitive properties within the noise contours should be considered noise impacted if no sound barrier is present to reduce noise levels.

Table 3: 66 dBA Noise Contours

Project Roadway	Distance from Roadway Centerline to 66 dBA Contour
Route 1 North of Route 123	~140 feet
Route 1 South of Route 123	~140 feet
Route 123	~128 feet

8. Construction Noise

Land uses that will be sensitive to traffic noise will also be sensitive to construction noise. A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, VDOT has developed and FHWA has approved a specification that establishes construction noise limits. This specification can be found in VDOT's 2007 *Road and Bridge Specifications,* Section 107.16(b.3), "Noise". The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

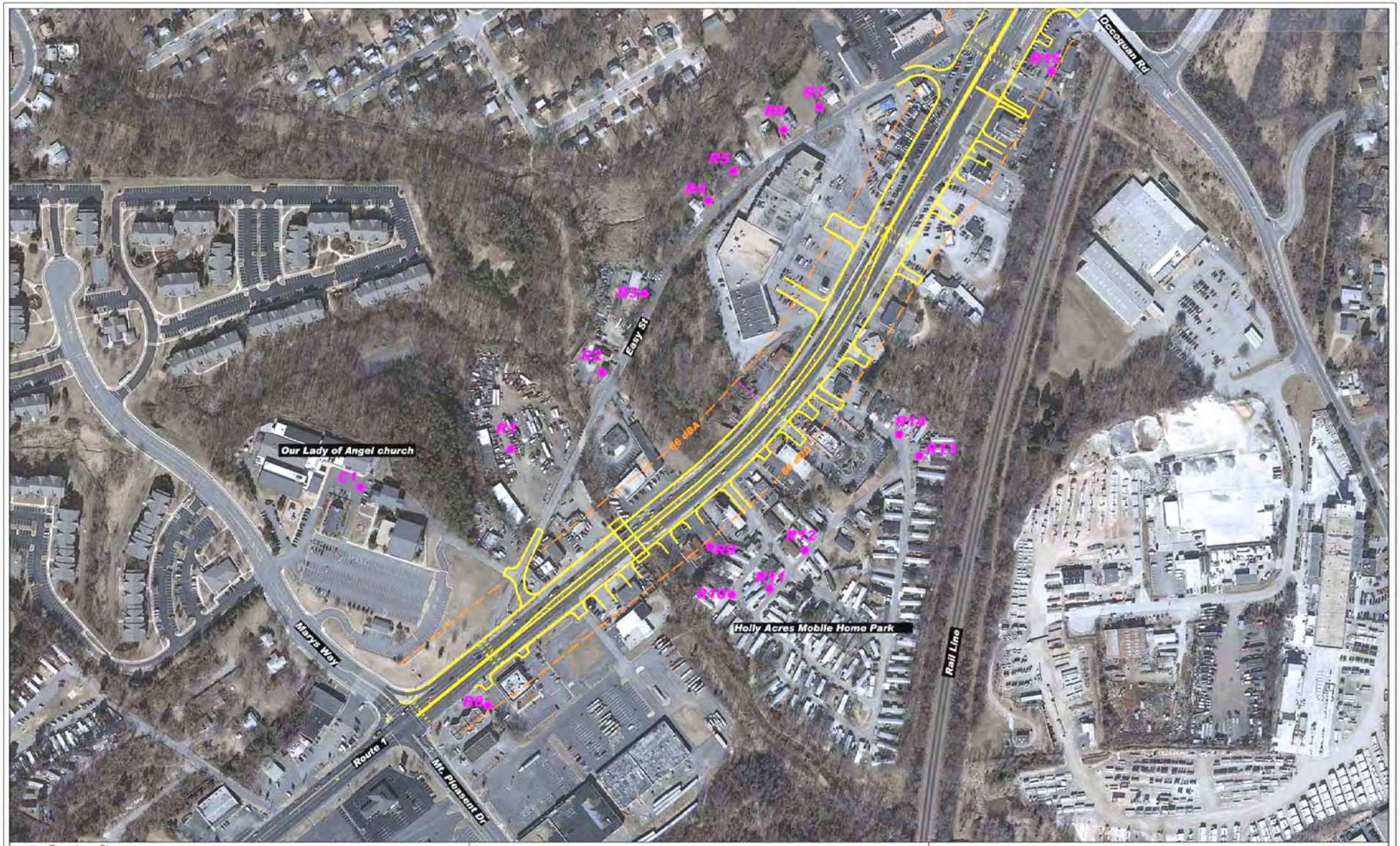
Appendix A

Coversheet

UPC: 14693 (Rte 123 and 1 Interchange)
State Project Number: 0123-076-F29, B604, B605, C501, P101, R201

VDOT

Sheet 1 of 4 Date: March 2011

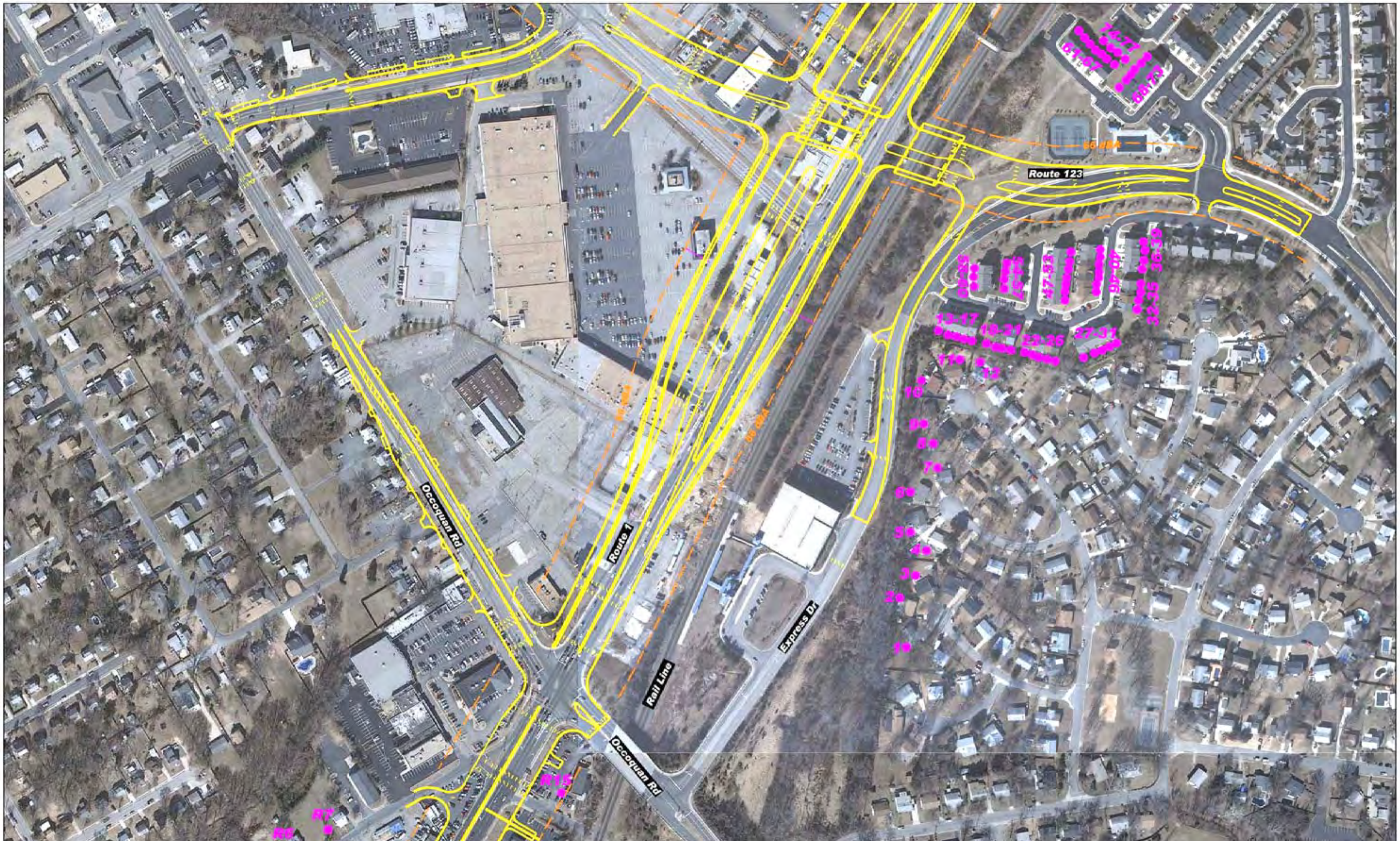


- Receiver Sites
- Proposed Alignment
- 66 dBA Noise Contour (For the Federal-aid project only)

SCALE
0 125' 250'

UPC: 14693 (Rte 123 and 1 Interchange)
State Project Number: 0123-076-F29, B604, B605, C501, P101, R201
VDOT

Sheet 2 of 4 Date: March 2011



- Receiver Sites
- Proposed Alignment
- 66 dBA Noise Contour (For the Federal-aid project only)

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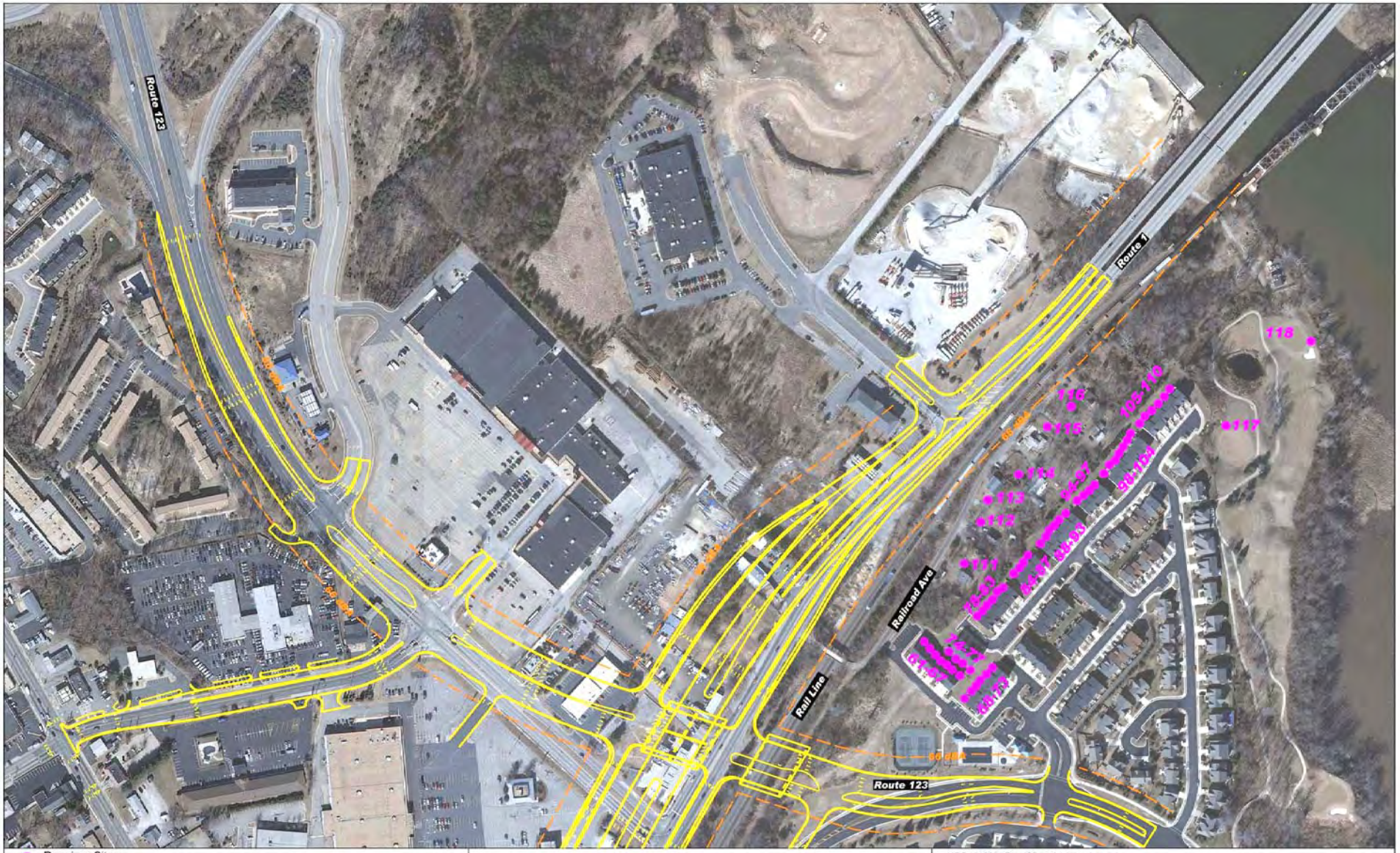
SCALE 0 125' 250'

UPC: 14693 (Rte 123 and 1 Interchange)
State Project Number: 0123-076-F29, B604, B605, C501, P101, R201
VDOT

Sheet 3 of 4 Date: March 2011


Route 123
Route 1
Railroad Ave
Rail Line
Route 123
118
116
115
117
114
113
112
111
105-110
Receiver Sites
Proposed Alignment
66 dBA Noise Contour (For the Federal-aid project only)
SCALE
0
125'
250
AERIAL IMAGERY COPYRIGHT 2005-2007 COMMONWEALTH OF VIRGINIA
UPC: 14693 (Rte 123 and 1 Interchange)
State Project Number: 0123-076-F29, B604, B605, C501, P101, R201
VDOT
Sheet 4 of 4
Date: March 2011