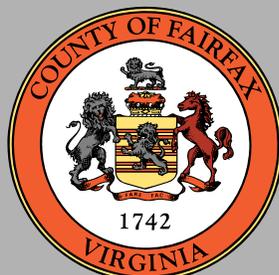


SOAPSTONE CONNECTOR

Fairfax County Project No. 2G40-078
From: Sunrise Valley Drive
To: Sunset Hills Road
Reston, VA

August 16, 2017

ENVIRONMENTAL ASSESSMENT



In Coordination With
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION

In Coordination With
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

ENVIRONMENTAL ASSESSMENT

Soapstone Connector

Fairfax County Project No. 2G40-078
From: Sunrise Valley Drive
To: Sunset Hills Road
Reston, VA

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

Project Name: Soapstone Drive Connector

Based on my review of the Draft Environmental Assessment submitted by VDOT, I find the document acceptable and sufficient for public availability.



Kevin Jones, 08/16/2017
Federal Highway Administration
Virginia Division Office

CONTENTS

SECTION 1. PURPOSE AND NEED

1.1 Project Location	1-1
1.2 History.....	1-1
1.3 Needs – Existing Conditions.....	1-3
1.4 Needs – Future Conditions.....	1-6
1.5 Purpose Summary	1-7

SECTION 2. ALTERNATIVES

2.1 Introduction.....	2-1
2.2 Alternatives Development and Screening Process	2-1
2.2.1 Step I. Develop Conceptual Alternatives	2-1
2.2.2 Step II. Purpose and Need Addressed?	2-2
2.2.3 Step III. Other Considerations.....	2-2
2.3 Alternatives Not Carried Forward for Detailed Study.....	2-2
2.4 Alternatives Carried Forward	2-3
2.4.1 No Build Alternative	2-3
2.4.2 Build Alternatives.....	2-5

SECTION 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction and Overview of Environmental Issues	3-1
3.2 Social and Economic Resources	3-6
3.2.1 Community and Neighborhoods	3-6
3.2.2 Population and Employment	3-8
3.2.3 Environmental Justice	3-8
3.2.4 Limited English Proficiency and Age Demographics.....	3-10
3.2.5 Relocations	3-11
3.3 Air Quality	3-11
3.4 Noise	3-12
3.5 Visual Quality	3-13
3.6 Historic Properties	3-14
3.7 Hazardous Materials	3-15
3.8 Water Resources	3-18
3.9 Coastal Zone Management Areas	3-23
3.10 Threatened and Endangered Species	3-23
3.11 Indirect Effects.....	3-26
3.12 Cumulative Effects.....	3-33

SECTION 4. COORDINATION AND COMMENTS

4.1 Agency Coordination	4-1
4.1.1 Federal and State Agency Coordination.....	4-1
4.1.2 Regional and Local Agencies and Organizations.....	4-1
4.1.3 Section 106 Coordination.....	4-2

4.2 Public Involvement 4-2
 4.2.1 Public Scoping Meeting 4-2
 4.2.2 Public Information Meeting 4-3
 4.2.3 Location Public Hearing..... 4-3

REFERENCES

LIST OF FIGURES

1-1 Project Location Map..... 1-2
 1-2 Illustration of Weaving on Wiehle Avenue with Metrorail Station Egress 1-5
 2-1 Alternatives Screening Process..... 2-1
 2-2 Alternative 1..... 2-9
 2-3 Alternative 2..... 2-10
 2-4 Comparison of Alternatives 1 and 2 North of Dulles Corridor 2-11
 2-5 Typical Roadway Section 2-12
 2-6 Typical Bridge Section 2-12
 2-7 Fairfax County Funded Bicycle and Pedestrian Projects..... 2-13
 3-1 Community Resources 3-7
 3-2 Age Demographics by Census Tract..... 3-10
 3-3 Hazardous Materials Sites..... 3-17
 3-4 Water Resources 3-19

LIST OF TABLES

1-1 Intersection Operations – 2015 Existing Conditions 1-3
 1-2 Intersection Operations – 2015 Existing and 2046 No Build Conditions..... 1-6
 2-1 Existing (2015) and Forecast (2046) Daily Volumes 2-6
 2-2 Intersection Operations – 2046 No Build and Build Conditions 2-7
 3-1 Summary of Environmental Resources in Study Corridor 3-1
 3-2 Summary of Potential Impacts..... 3-5
 3-3 Demographic Data in 2014 3-9
 3-4 Hazardous Materials Facilities/Sites within Alternatives 3-16
 3-5 Special Status Species Potentially Occurring in Corridor 3-24
 3-6 Present and Reasonably Foreseeable Future Actions 3-34

Section 1

PURPOSE AND NEED

1.1 PROJECT LOCATION

The Fairfax County Department of Transportation (FCDOT), in coordination with the Virginia Department of Transportation (VDOT) and the Federal Highway Administration (FHWA), is preparing an Environmental Assessment (EA) to evaluate the potential social, economic, and environmental effects associated with the Soapstone Connector. The Soapstone Connector would be a new roadway, approximately one-half mile long between Sunrise Valley Drive and Sunset Hills Road, in Fairfax County (Reston), Virginia. The project is located just west of the new Wiehle-Reston East Metrorail Station and would include a new crossing over the Dulles Corridor, which includes VA Route 267 (Dulles Toll Road (DTR)), the Dulles International Airport Access Highway (DIAAH), and the Silver Line of the Metrorail system, as shown in **Figure 1-1**.

1.2 HISTORY

The following studies were completed to identify improvements to address transportation needs in the vicinity of the Wiehle-Reston East Metrorail Station and support access to and from the station area:

Wiehle Avenue/Reston Parkway Station Access Management Plans, April 2008.

- Initiated to consider the current status and future needs in the vicinity of the two Metrorail stations proposed for the Reston area at Reston Parkway and Wiehle Avenue.
- Study recommendations included additional roadway capacity, travel demand management (TDM) strategies, additions to the network of pedestrian paths, and spot safety improvements.
- Soapstone Connector included in the list of recommended roadway projects.
- Recommendations divided into three groups based on date of implementation; Soapstone Connector included in the first group that would be required at the opening of the Wiehle Avenue station.

Soapstone Connector Feasibility Study, November 2013.

- Assessed the engineering feasibility of a multimodal roadway that would provide a connection for motorists, pedestrians, bicyclists, and transit vehicles between Sunset Hills Road and Sunrise Valley Drive.
- Identified and screened multiple alternative alignments to narrow down the list to a limited number of feasible candidate alternatives.
- Conducted a more detailed evaluation of the short list of alternatives and assessed the alternatives in terms of traffic, environmental, land use, and engineering criteria.
- Conducted a type, size and location (TS&L) analysis of a new bridge over the Dulles Corridor and identified the most promising alignment for the Soapstone Connector.

Subsequently, in February 2014, the Soapstone Connector was included as a recommended roadway network improvement in an Amendment to the Fairfax County Comprehensive Plan.¹

¹ Amendment No. 2013-05, adopted February 11, 2014 by the Fairfax County Board of Supervisors, replaced the following: Fairfax County Comprehensive Plan, 2013 Edition, Area III, Upper Potomac Planning District as amended through 12-3-2013, Reston-Herndon Suburban Center and Transit Station Areas, pages 28-80.

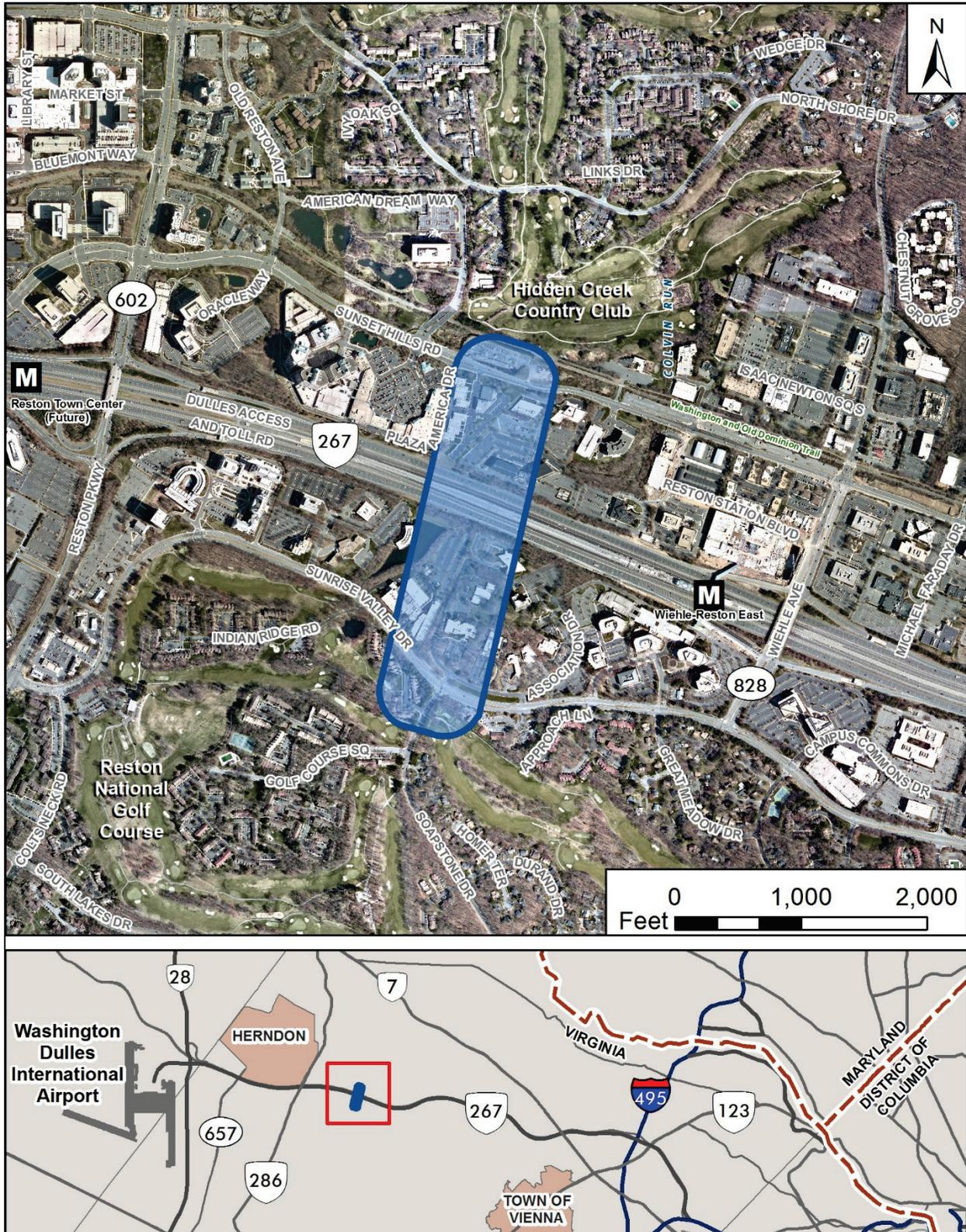


Figure 1-1. Project Location Map

1.3 NEEDS – EXISTING CONDITIONS

Traffic Congestion. The current roadway network in the project area includes two crossings of the Dulles Corridor on either side of the Wiehle-Reston East Metrorail Station, at Reston Parkway (Route 602) to the west and Wiehle Avenue (Route 828) to the east. Traffic traveling within the project area, traveling to and from the Metrorail station, and entering and exiting the Dulles Toll Road all compete for the same road space on these two roadways. Direct access to the Metrorail station, which opened in July 2014, is provided by way of Wiehle Avenue. Sunrise Valley Drive and Sunset Hills Road serve east-west travel to the south and north of the Dulles Corridor, respectively.

The traffic analysis area encompasses Reston Parkway, Wiehle Avenue, Sunrise Valley Drive, and Sunset Hills Road. Existing levels of service (LOS)² and associated delay times at intersections within the traffic analysis area are presented in **Table 1-1**.

Table 1-1. Intersection Operations – 2015 Existing Conditions*

Intersection No.	Intersection Name	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
1	Sunset Hills Rd at Reston Parkway	63.2	E	57.6	E
2	Sunset Hills Rd at Oracle Way & Old Reston Ave	27.3	C	27.6	C
3	Sunset Hills Rd at Plaza America Dr	5.5	A	11.8	B
4	Sunset Hills Rd at American Dream Way	23.1	C	33.2	C
5	Sunset Hills Rd at Isaac Newton Sq & Metro Ctr Dr	17.0	B	28.8	C
6	Wiehle Ave at Sunset Hills Road	43.7	D	58.4	E
7	Wiehle Ave at Reston Station Blvd	19.4	B	32.0	C
8	Wiehle Ave at WB DTR Ramps	20.0	C	20.8	C
9	Wiehle Ave EB DTR Ramps	29.4	C	19.4	B
10	Wiehle Avenue at Sunrise Valley Drive	50.4	D	50.6	D
11	Sunrise Valley Dr at Soapstone Dr	18.4	B	16.6	B
12	Sunrise Valley Drive at Sheraton Plaza	9.7	A	11.3	B
13	Sunrise Valley Dr at Colts Neck Road	26.0	C	11.1	B
14	Sunrise Valley Drive at Reston Pkwy	66.0	E	82.0	F

* Intersections of the four major roadways in the traffic analysis area are highlighted in grey.

As shown in Table 1-1, the intersections of the four major roadways in the traffic analysis area (highlighted in grey) are all operating at LOS D or lower under existing conditions, with average delay ranging from 40 to 80 seconds at each location. Congestion at these intersections acts as a constraint to traffic mobility within the area surrounding the station.

Multimodal Connectivity. There are currently no designated bike lanes on Wiehle Avenue in either the northbound or southbound direction. Wiehle Avenue, along with Sunrise Valley Drive, Sunset Hills Road, and portions of Reston Parkway, is designated as a “Less Preferred Street and Road” for bicycle travel on the Fairfax County Bike Map.³ A sidewalk on the west side of Wiehle Avenue connects with a walkway on Sunrise Valley Drive to the south and Sunset Hills Road to the north. There are no pedestrian facilities on the east side of Wiehle Avenue between these two endpoints.

² Level of service (LOS) provides a comparative measure of the traffic performance of roads and intersections through a letter grading from A (best) to F (worst).

³ <http://www.fairfaxcounty.gov/fcdot/bike/bikemap/>

The Wiehle-Reston East Metrorail Station includes entrances via pedestrian bridges on both sides of the Dulles Corridor. Fifteen bicycle racks are located on both the north and south sides; there is also a secure reserved bike room. The Wiehle-Reston East Station Bike Room is Fairfax County's first enclosed, secure bicycle parking facility with a capacity for more than 200 bicycles. There are bus drop-off/pick-up locations on either side of the Dulles Corridor, with Kiss & Ride facilities on the north side only. Wiehle Avenue currently serves as the only access to the Metrorail station for buses; these buses experience congestion and delays on Wiehle Avenue as described above.

Accessibility and Mobility. The transportation network around the Wiehle-Reston East Metrorail Station is comprised primarily of major roadways (i.e., Wiehle Avenue, Sunset Hills Road, and Sunrise Valley Drive) and much smaller streets and driveways that provide access to individual buildings and developments. Consequently, most vehicles traveling in the area must use one of the major congested routes or intersections.

The Wiehle-Reston East Metrorail Station includes a 3,300-space covered parking garage north of the Dulles Corridor. The heavy traffic exiting the parking garage by way of Reston Station Boulevard during the PM peak period creates weaving conditions on all travel lanes on the southbound segment of Wiehle Avenue between Sunset Hills Road and the Dulles Toll Road, as shown in **Figure 1-2**. As documented in the April 2008 study, most vehicles turning right when they exit the Metrorail station (shown in yellow in Figure 1-2) are not destined to the westbound Dulles Toll Road; therefore, they must move over at least one lane once they turn onto Wiehle Avenue, weaving with vehicles on southbound Wiehle Avenue destined for the westbound exit ramp (pink arrows). The weaving is indicated by the blue arrows in Figure 1-2. If a vehicle exiting the Metrorail station is destined to the eastbound Dulles Toll Road ramp, they must weave across four lanes to enter into the left-turn bays. The situation is exacerbated by the short distance (320 feet) between the Wiehle-Reston East Metrorail Station access and the intersection with the westbound ramps; in addition, there is only an additional 500 feet on Wiehle Avenue between the westbound and eastbound exit ramps. Combined with the overall high traffic volumes, much of the delay is caused by vehicles forcing their way across travel lanes over this short distance in order to reach their desired lane.

The other bottlenecks along Wiehle Avenue are at the intersections with Sunset Hills Road and Sunrise Valley Drive. The lack of turn lanes for the heavy movements adds to the delays at these locations.

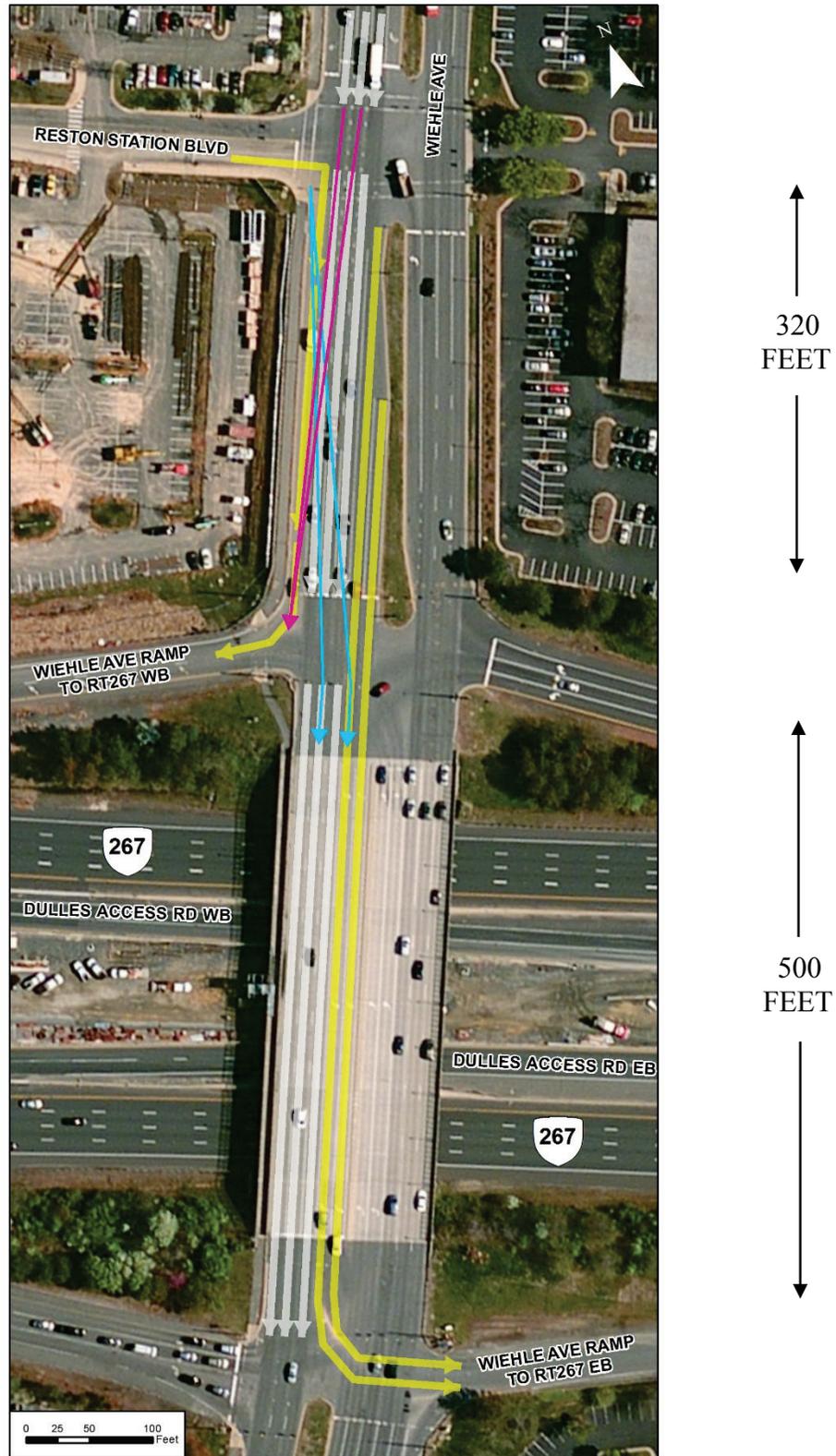


Figure 1-2. Illustration of Weaving on Wiehle Avenue with Metrorail Station Egress

1.4 NEEDS – FUTURE CONDITIONS

Traffic Congestion. The burden on the transportation network in the project area is expected to increase substantially by 2046 with the completion of Phase 2 of the Dulles Corridor Metrorail Project⁴ and changes in land use in the areas surrounding the Wiehle-Reston East and future Reston Town Center Metrorail Stations. As indicated in the new Comprehensive Plan for Reston and the Reston website (Reston, 2016): “The community’s greatest densities will be at the three Metro station areas and the Reston Town Center core area.” As more people find these areas highly desirable as residential and commercial locations, density of both residences and offices is planned to increase in the areas closest to the stations. Table 3-6 in the Environmental Consequences Section of this EA includes a list of 20 development projects that are planned, under construction, or recently completed in the area surrounding the two stations, based on information gathered from the Fairfax County Department of Planning and Zoning (DPZ).

In addition, as the whole region (and particularly Loudoun County) continues to grow, travel through the Reston area is also projected to increase. By 2046, the existing transportation network will not be able to accommodate the projected peak hour demand for vehicular travel within the traffic analysis area. The increased volume of traffic would result in worse levels of service and delay, as shown in **Table 1-2**. Estimated average delay at the intersections of the four major roadways in the traffic analysis area (highlighted in grey) is projected to increase from 40 to 80 seconds under existing conditions to a range of 60 to over 140 seconds by 2046. Additional details are provided in the *Traffic Technical Memorandum*.

Table 1-2. Intersection Operations – 2015 Existing and 2046 No Build Conditions*

Intersection No.	Intersection Name	2015 Existing Conditions				2046 No Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		AM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Reston Pkwy at Sunset Hills Rd	63.2	E	57.6	E	86.9	F	103.4	F
2	Sunset Hills Rd at Oracle Way & Old Reston Ave	27.3	C	27.6	C	41.7	D	50.0	D
3	Sunset Hills Rd at Plaza America Dr	5.5	A	11.8	B	5.6	A	12.4	B
4	Sunset Hills Rd at American Dream Way	23.1	C	33.2	C	25.3	C	41.8	D
5	Sunset Hills Rd at Isaac Newton Sq & Metro Ctr Dr	17.0	B	28.8	C	116.5	F	191.3	F
6	Wiehle Ave at Sunset Hills Road	43.7	D	58.4	E	79.2	E	101.3	F
7	Wiehle Ave at Reston Station Blvd	19.4	B	32.0	C	30.5	C	74.8	E
8	Wiehle Ave at WB DTR Ramps	20.0	C	20.8	C	29.3	C	41.2	D
9	Wiehle Ave EB DTR Ramps	29.4	C	19.4	B	39.5	D	22.7	C
10	Wiehle Avenue at Sunrise Valley Drive	50.4	D	50.6	D	62.6	E	65.1	E

⁴ The Dulles Corridor Metrorail Project is a 23-mile extension of Washington’s existing Metrorail System, which is being built in two phases by the Metropolitan Washington Airports Authority (MWAA). Phase 1 of the new line opened on July 26, 2014, connecting East Falls Church with Tysons Corner and Reston, Virginia (at the Wiehle-Reston East Metrorail Station), with downtown Washington, DC and Largo, Maryland. Known as the Silver Line, the extension is operated by the Metropolitan Washington Area Transit Authority (WMATA). Preliminary construction for Phase 2 began in 2014. The extension will run from the Wiehle-Reston East Metrorail Station west to Washington Dulles International Airport and Ashburn in eastern Loudoun County. Within the Reston area, the Reston Town Center Station will be located in the median of the Dulles Toll Road/Dulles International Airport Access Highway just west of the Reston Parkway overpass. This station will have no dedicated parking. Additional information on the project can be found here: <http://www.dullesmetro.com/>.

Intersection No.	Intersection Name	2015 Existing Conditions				2046 No Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		AM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
11	Sunrise Valley Dr at Soapstone Dr	18.4	B	16.6	B	26.6	C	29.0	C
12	Sunrise Valley Drive at Sheraton Plaza	9.7	A	11.3	B	3.9	A	8.8	A
13	Sunrise Valley Dr at Colts Neck Road	26.0	C	11.1	B	46.0	D	30.7	C
14	Sunrise Valley Drive at Reston Pkwy	66.0	E	82.0	F	105.6	F	144.7	F

* The No Build Alternative is described in Section 2.4.1. Intersections of the four major roadways in the traffic analysis area are highlighted in grey.

Multimodal Connectivity. As indicated above, the density of both residences and offices is planned to increase in the area surrounding the Wiehle-Reston East Metrorail Station, which will generate many more pedestrian and bicycle trips. In addition, the Metrorail station itself will generate additional pedestrian, bicycle, and bus trips in the surrounding area. Additional pathways for these modes of travel must be considered as higher volumes of traffic will make it increasingly more difficult for pedestrians and bicyclists to travel in this area since there are limited sidewalks and no bike lanes.⁵ Increased congestion and delays on the roadway network will also reduce the efficiency of bus service, which is programmed to increase by FCDOT; planning is already underway to reroute bus lines in the vicinity in order to serve the two rail stations and accommodate the development growth.

Accessibility and Mobility. As development in the area and traffic demand increases, accessibility and mobility will be further constrained. The Reston Town Center Metrorail Station that will open as part of Phase 2 of the Dulles Metrorail Project does not include dedicated parking; therefore, vehicular demand at the parking facilities at Wiehle-Reston East Metrorail Station will continue and likely increase, further exacerbating weaving conflicts along Wiehle Avenue.⁶ Queue lengths and delays at intersections in the area surrounding the station will also likely worsen with the higher traffic volumes in 2046.

1.5 PURPOSE SUMMARY

Based on the existing and future needs, the purpose of the proposed project is to:

- Reduce congestion and travel delay at intersections along Wiehle Avenue and within the traffic analysis area.
- Improve multimodal connectivity to the Wiehle-Reston East Metrorail Station.
- Improve accessibility and mobility to and within the area surrounding the Wiehle-Reston East Metrorail Station.

⁵ Comments were received during project scoping related to safety for pedestrians and bicyclists and connectivity to existing sidewalks, trails, and bike facilities. While safety has not been included as a primary element of purpose and need, the improvements aimed at increasing multimodal connectivity would also inherently improve safety for pedestrians and bicyclists.

⁶ As indicated in the footnote above, safety has not been included as a primary element of purpose and need; however, improvements aimed at providing additional access to and from the Metrorail station and reducing congestion along Wiehle Avenue would minimize weaving conflicts and inherently improve safety on the roadway network.

Section 2

ALTERNATIVES

2.1 INTRODUCTION

This section describes the process used to develop the alternatives evaluated in the EA, including the range of alternatives considered for study and the alternatives carried forward for detailed analysis. Additional information on alternatives and the alternatives development process can be found in the *Alternatives Technical Memorandum*.

2.2 ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS

Figure 2-1 illustrates the step-by-step process that was used to identify, develop, and screen alternatives. This process considered a full range of alternatives, including those identified in previous studies that could potentially address the identified purpose and need. Each of these steps is further described below.

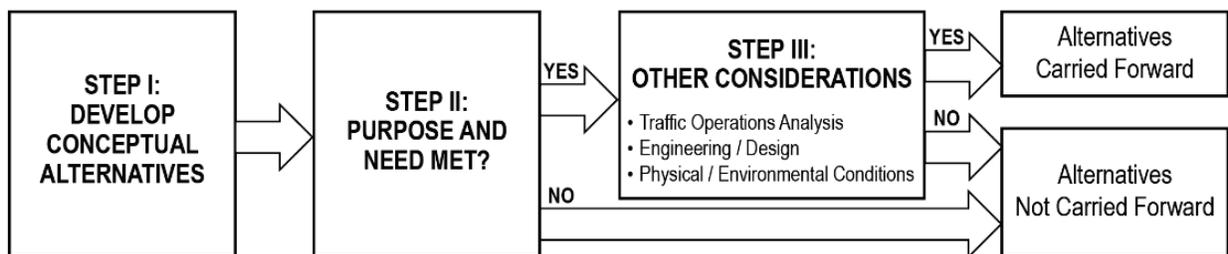


Figure 2-1. Alternatives Screening Process

2.2.1 Step I. Develop Conceptual Alternatives

The alternatives development process began with the identification of the purpose and need of the EA, as described in Section 1. Subsequently, the following documents that were introduced in Section 1.2 were reviewed and data from these sources were utilized to develop alternative concepts as appropriate:

- *Wiehle Avenue/Reston Parkway Station Access Management Plans*, April 2008
- *Soapstone Connector Feasibility Study*, November 2013

Additionally, in October 2015, a Public Scoping Meeting was held for the public and scoping letters were mailed to federal, state, and local agencies to provide an opportunity to offer suggestions on the proposed project and scope of issues to be addressed in the EA (see Section 4 for additional information on the scoping process). Input was solicited on the **purpose and need** (confirming the transportation problem(s) to be solved); **alternatives** (suggestions for alternative improvement concepts); and **environment** (reporting natural, cultural, and human environment considerations). During the scoping process, several comments were made by the public that traffic operations is a widespread concern in the study area, especially with respect to congestion along Wiehle Avenue and Reston Parkway. In addition, the potential impact of the Soapstone Connector on traffic volumes on Soapstone Drive south of the study area was also expressed by several citizens as a traffic concern. Numerous comments were also received relating to safety for pedestrians and bicyclists and connectivity to existing sidewalks, trails, and bike facilities, as well as environmental concerns such as impacts to air, noise, and parks/recreation and public facilities in the study area.

2.2.2 Step II. Purpose and Need Addressed?

The 2008 and 2013 studies referenced above informed development of the purpose and need for the Soapstone Connector and established the basis from which initial alternative concepts were developed. Additional studies have been completed as part of the EA to reaffirm what was identified in those studies. Traffic studies included the development of 2046 travel demand forecasts and the operational analysis of existing and future no build and build conditions. The updated traffic analyses have confirmed the deficiencies in traffic level of service due to volumes exceeding available capacity on Wiehle Avenue and reaffirmed the need to provide additional north-south capacity in the study area. From a traffic perspective, this need is met by all of the alternatives developed for the Soapstone Connector. Other considerations made in screening alternatives are described below.

2.2.3 Step III. Other Considerations

In addition to preparing traffic forecasts and associated analyses to evaluate the effectiveness of conceptual alternatives in addressing the identified purpose and need, engineering/design and physical/environmental conditions in the study corridor were also considered in the screening of alternatives. In the 2013 *Soapstone Connector Feasibility Study*, a wide array of alignments was developed to connect Sunrise Valley Drive and Sunset Hills Road, west of the Wiehle-Reston East Metrorail Station. These alignments were screened initially taking multiple factors into consideration, such as engineering feasibility, right of way/displacements, traffic/transportation, and environmental impacts. The most promising five alignments from the initial screening were then developed further and evaluated once again. This second screening included engineering feasibility, Type, Size and Location (TS&L) analysis, environmental features, traffic analysis, pedestrian and bicycle assessment, land use assessment, and cost estimates.

2.3 ALTERNATIVES NOT CARRIED FORWARD FOR DETAILED STUDY

As described above, in the 2013 *Soapstone Connector Feasibility Study*, a variety of alignments were identified that connected Sunrise Valley Drive and Sunset Hills Road, west of the Wiehle-Reston East Station. In total, 30 alternative alignments were initially identified and screened, resulting in five alternatives that were developed further and evaluated once again in more detail (more information on these alternatives and the screening process can be found in the *Alternatives Technical Memorandum* and the 2013 *Soapstone Connector Feasibility Study*). After extensive study, none of the alternatives emerged as being superior compared to the other alternatives with respect to roadway network performance, engineering/design, and physical/environmental conditions. Below are the main reasons the five alternatives were not moved forward.

- *Alternative 1C*. This alternative would require a second bridge to traverse the floodplain north of the Dulles Corridor and it would require the demolition of an existing multi-level parking garage. It also had poorer roadway network performance metrics compared to other alternatives.
- *Alternative 3D*. This alternative would require a second bridge to traverse the floodplain north of the Dulles Corridor and it would require the demolition of an existing multi-level parking garage.
- *Alternative 4D*. This alternative would traverse the Transcontinental Gas Pipeline Corporation's easement and cross over the pipeline, which would require additional mitigation. It would also require the acquisition of the entire property and require the

demolition of a 36,000-sf building currently owned by the National Association of Secondary School Principals.

- *Alternative 5C.* This alternative would traverse the Transcontinental Gas Pipeline Corporation’s easement and cross over the pipeline, which would require additional mitigation. It would also require the acquisition of the entire property and the demolition of the existing 33,000-sf Musica LLC office building.
- *Alternative 6E.* This alternative would traverse the Transcontinental Gas Pipeline Corporation’s easement and cross over the pipeline, which would require additional mitigation. It would also require additional mitigation since the alignment runs parallel and adjacent to an existing stormwater retention pond. This alignment also had poorer roadway network performance metrics compared to other alternatives.

A Transportation System Management (TSM) Alternative was also considered in the 2008 *Wiehle Avenue/Reston Parkway Station Access Management Plans* study but not carried forward for detailed consideration in the EA due to its inability to address the project purpose and need. TSM generally includes implementation of relatively low-cost actions to improve the efficiency of existing transportation systems. Some examples include traffic controls, signal synchronization, turn lanes, parking management, access management, operational modifications, flexible work hours, vanpools, transit scheduling, bicycle and pedestrian improvements, and modifying driver behavior with incentives, pricing, or restrictions. Such actions were identified in the 2008 *Wiehle Avenue/Reston Parkway Station Access Management Plans* study:

Congestion and safety for all modes of transportation will be major issues in Reston for 2030 unless a set of comprehensive actions are implemented to accommodate the projected growth in travel demand. This report details an array of strategies and projects that can be used to improve conditions for all travelers, residents and employees in Reston. Increased roadway capacity, travel demand management (TDM) strategies, additions to the network of pedestrian paths, and spot safety improvements are all represented in these recommendations.

At the conclusion of the study, recommendations in all of the categories were divided into three groups based on date of implementation. The Soapstone Connector was included in the first group that would be required at the opening of the Wiehle Avenue station. It was concluded that the other actions identified in the study, which include roadway, pedestrian, bicycle, transit, and feeder bus recommendations, would undergo additional planning and implementation as needs arise and funding becomes available. Individually, the TSM-type improvements would not meet the identified needs for this study, i.e., to reduce traffic congestion on Wiehle Avenue and to increase multimodal connectivity and accessibility to the Wiehle-Reston East Metrorail Station. Accordingly, this alternative as a stand-alone solution was eliminated from further study in the EA.

2.4 ALTERNATIVES CARRIED FORWARD

2.4.1 No Build Alternative

Description. In accordance with the implementing regulations for NEPA (40 CFR § 1502.14(d)), the No Build Alternative has been retained for detailed study and serves as a benchmark for comparison with the Build Alternative. The No Build Alternative assumes that

the Soapstone Connector would not be constructed. The transportation network would include existing roads and projects within the study area that are programmed in the National Capital Region's 2015 Financially Constrained Long-Range Transportation Plans (CLRP), adopted by the Transportation Planning Board (TPB) in October 2015. Projects included in VDOT's Six-Year Improvement Program (SYIP) are also assumed to be completed. The following projects were included in the No Build Alternative:

- Dulles Airport Access Road – Widen from 4 to 6 lanes from Dulles Airport to VA 123
- VA 286 Fairfax County Pkwy HOV – Convert from 6 to 4+2 from Dulles Toll Road to Sunrise Valley Drive
- VA 286 Fairfax County Pkwy HOV – Widen from 4 to 4+2 from Sunrise Valley Drive to West Ox Road
- Collector-Distributor Rd EB – New 2 lane road from Wiehle Avenue to Spring Hill Road
- Collector-Distributor Rd WB – New 2 lane road from Spring Hill Road to Wiehle Avenue
- East Elden Street – Widen from 4 to 6 lanes from Monroe Street to Fairfax County Parkway
- Spring Street – Widen from 4 to 6 lanes from Herndon Parkway to Fairfax County Parkway
- Route 602 Reston Pkwy – Widen from 4 to 6 lanes from Sunrise Valley Drive to Baron Cameron Avenue

Ability to Meet Needs.

Traffic Congestion. By 2046, the existing transportation network will not be able to accommodate the projected peak hour demand for vehicular travel within the traffic analysis area. LOS and delay will increase, particularly at the intersections of the four major roadways and at all of the intersections along Wiehle Avenue, as shown previously in Table 1-2. Additional details are provided in the *Traffic Technical Memorandum*.

Multimodal Connectivity. As discussed in Section 1.4 Needs – Future Conditions, the density of both residences and offices is planned to increase in the area surrounding the Wiehle-Reston East Metrorail Station, which will generate many more pedestrian and bicycle trips. Additional pathways for these modes of travel must be considered as higher volumes of traffic will make it increasingly more difficult for pedestrians and bicyclists to travel in this area since there are limited sidewalks and no bike lanes. Increased congestion and delays on the roadway network will also reduce the efficiency of bus service, which is programmed to increase, with planning already underway to reroute bus lines in the vicinity to serve the two rail stations and accommodate the development growth.

Accessibility and Mobility. As discussed in Section 1.4 Needs – Future Conditions, as development in the area and traffic demand increases, accessibility and mobility will be further constrained. The Reston Town Center Metrorail Station that will open as part of Phase 2 of the Dulles Metrorail Project does not include dedicated parking; therefore, vehicular demand at the parking facilities at Wiehle-Reston East Metrorail Station will continue and increase, further exacerbating weaving conflicts along Wiehle Avenue. Queue lengths and delays at intersections in the area surrounding the station will also likely worsen with the higher traffic volumes in 2046.

2.4.2 Build Alternatives

The screening process in the 2013 Feasibility Study resulted in the development of a “hybrid” alternative for further consideration. The “hybrid” alternative (which combined Alternative 5C north of the Dulles Corridor and Alternative 4D south of the Dulles Corridor) was deemed to offer advantages compared to the five evaluated alternatives in terms of consistency with the typical section on Soapstone Drive, construction costs, and enhanced mobility for bicyclists and motorists, among other reasons. This “hybrid” alternative, referred to as Alternative 1 hereafter, is described below.

In addition to Alternative 1, a variation of this alignment was also developed as part of the alternatives development process described in Section 2.2 and is also being assessed in the EA.⁷ The alignment for Alternative 2 follows the same alignment as Alternative 1 south of the Dulles Corridor, but north of the crossing, the alignments diverge and are offset by up to 150 feet. Given the similarities between the two alternatives, and the fact that they are functionally equivalent for the purposes of traffic operations and analysis, the alternatives are described concurrently within each section below.

Description. The Build Alternatives assume completion of those projects identified in the No Build Alternative and the addition of the Soapstone Connector between Sunrise Valley Drive and Sunset Hills Road. The southern terminus of Alternative 1 is located at the intersection of Soapstone Drive and Sunrise Valley Drive while the northern terminus would connect to Sunset Hills Road, as shown in **Figure 2-2**. In the figure, the alternative is represented as a 200-foot-wide corridor, which would be wide enough to encompass minor variations in actual roadway alignments and design features during the design phase, should a build alternative be selected, and to illustrate the maximum potential impacts of the alternative. The corridor has been estimated for planning purposes and decision-making during the NEPA process, but would be further refined during final design.

The 200-foot-wide corridor for Alternative 2 is shown in **Figure 2-3**, and the alignment is the same as Alternative 1 south of the Dulles Corridor. North of the Dulles Corridor crossing, Alternative 2 is aligned slightly to the east of Alternative 1. A closer view of the differences between the two alternatives north of the Dulles Access and Roll Road is shown in **Figure 2-4**.

The typical section of the new roadway would feature a three-lane cross-section (one travel lane in each direction and a two-way, left-turn-only lane); 5-foot-wide on-road bicycle lanes on each side; a 5-foot-wide concrete sidewalk on the west side; and a 10-foot-wide shared use path on the east side, as shown in **Figure 2-5**. The typical section for the bridge includes four travel lanes, as shown in **Figure 2-6**.

There are four planned access points throughout the length of the roadway. North of the Dulles Toll Road, access points include an at-grade intersection south of Sunset Hills Road and the intersection with Sunset Hills Road at its northern terminus. South of the Dulles Toll Road, access points include an intersection north of Sunrise Valley Drive and the intersection with

⁷ Subsequent to the completion of the November 2013 *Soapstone Connector Feasibility Study*, an additional alignment north of the Dulles Toll Road was presented to FCDOT by Linden Development Partners, LLC. Linden Development requested that their alignment be included in the EA, even though the engineering feasibility of such an alignment had not been previously studied by FCDOT. Ultimately, FCDOT determined that the EA would include both the Board of Supervisors’ approved alignment, identified as the “hybrid” alternative in the Feasibility Study, and Linden Development’s additional alignment north of Dulles Toll Road. See *Alternatives Technical Memorandum* for additional information.

Sunrise Valley Drive at its southern terminus. The locations of the two additional Soapstone Connector intersections to the north and south of the Dulles Toll Road will be determined during preliminary engineering. As this time, potential locations have been identified as part of the Reston Network Analysis, with the northern intersection including a potential connection to Reston Station Boulevard.⁸

At the northern and southern termini, additional turn lanes would be provided at the intersections of Sunset Hills Road and Sunrise Valley Drive with the Soapstone Connector to accommodate the new or increased turning movement volumes, with the maximum number of lanes constrained to the downstream receiving conditions. The build assumptions at the intersections were made primarily for the purposes of the traffic analysis; the details of each intersection configuration, including number of turn lanes and turning bay length, would be determined during final design.

Ability to Meet Needs.

Traffic Congestion. Future year (2046) traffic forecasts were developed to support comparative analyses between the No Build and Build Alternatives. Approximately 18,000 vehicles per day (vpd) are projected to use the Soapstone Connector in 2046, as shown in **Table 2-1**.

Table 2-1. Existing (2015) and Forecast (2046) Daily Volumes

		Daily Volume (NB + SB) (vehicles per day)						
		2015	2046		No Build vs Existing		Build vs No Build	
		Existing	No Build	Build	Growth	%	Difference	%
Reston Parkway	North of DTR	51,300	68,000	62,000	16,700	33%	-6,000	-10%
	South of DTR	43,700	63,800	57,300	20,100	46%	-6,500	-11%
Soapstone Connector	North of DTR	-	-	18,100	-	-	18,100	-
	South of DTR	-	-	18,300	-	-	18,300	-
Wiehle Avenue	North of DTR	36,900	46,800	37,400	9,900	27%	-9,400	-25%
	South of DTR	34,900	38,500	29,500	3,600	10%	-9,000	-31%

On Wiehle Avenue north of the Dulles Corridor, the 2046 No Build forecast of 46,800 vpd decreases to 37,400 vpd (which is similar to the existing volume of 36,900 vpd) when the Soapstone Connector is added to the roadway network. In other words, north of the Dulles Corridor, the volume on Wiehle Avenue grows by about 10,000 vpd between 2015 and 2046, and nearly all of that is absorbed by the Soapstone Connector under build conditions. There is less growth on Wiehle Avenue south of the Dulles Corridor than north, which leads to lower volumes under the build condition than existing year (year 2015, 2046 No Build, and 2046 Build volumes are 34,900, 38,500, and 29,500 vpd, respectively).

On Reston Parkway, there is also a reduction in traffic in 2046 with the addition of the Soapstone Connector, but the difference from the No Build condition is somewhat lower (both overall volume and in percentage terms) than the difference between the Build and No Build volume on Wiehle Avenue.

⁸ <http://www.fairfaxcounty.gov/fcdot/restonnetworkanalysis/>

On a peak hour basis, the levels of service and delay shown in **Table 2-2** confirm that travel delays at intersections on Wiehle Avenue (shown in bold font) are anticipated to be lower in the Build condition with the addition of the Soapstone Connector (compared to the No Build condition). This result satisfies an element of the purpose of the Soapstone Connector project, which is to reduce traffic congestion and delay along Wiehle Avenue.

Table 2-2. Intersection Operations – 2046 No Build and Build Conditions

Intersection No.	Intersection Name	2046 No Build Conditions				2046 Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Reston Pkwy at Sunset Hills Rd	86.9	F	103.4	F	82.7	F	93.2	F
2	Sunset Hills Rd at Oracle Way & Old Reston Ave	41.7	D	50.0	D	63.7	E	41.3	D
3	Sunset Hills Rd at Plaza America Dr	5.6	A	12.4	B	6.5	A	12.7	B
4	Sunset Hills Rd at American Dream Way	25.3	C	41.8	D	25.2	C	52.9	D
NEW	Sunset Hills Rd at Soapstone Connector	-	-	-	-	28.5	C	20.9	C
5	Sunset Hills Rd at Isaac Newton Sq & Metro Ctr Dr	116.5	F	191.3	F	53.9	D	97.6	F
6	Wiehle Ave at Sunset Hills Road	79.2	E	101.3	F	64.2	E	75.7	E
7	Wiehle Ave at Reston Station Blvd	30.5	C	74.8	E	24.5	C	46.9	E
8	Wiehle Ave at WB DTR Ramps	29.3	C	41.2	D	22.9	C	50.9	D
9	Wiehle Ave EB DTR Ramps	39.5	D	22.7	C	26.1	C	22.4	C
10	Wiehle Avenue at Sunrise Valley Drive	62.6	E	65.1	E	39.6	D	46.4	D
11	Sunrise Valley Dr at Soapstone Dr	26.6	C	29.0	C	83.5	F	88.0	F
12	Sunrise Valley Drive at Sheraton Plaza	3.9	A	8.8	A	6.3	A	8.6	A
13	Sunrise Valley Dr at Colts Neck Road	46.0	D	30.7	C	33.1	C	25.8	C
14	Sunrise Valley Drive at Reston Pkwy	105.6	F	144.7	F	95.1	F	123.4	F

In general, the provision of the Soapstone Connector serves to redistribute traffic within the traffic analysis area and relieve the two north-south roadways, Wiehle Avenue and Reston Parkway. Overall, it can be expected that once the Soapstone Connector is in place, travel patterns and route choice will change within the study area, and volumes are likely to fluctuate for a short period of time.

Multimodal Connectivity. This alternative provides additional roadway capacity for buses to cross over the Dulles Corridor. This would play a key role in improving the bus network in Reston by providing direct access across the Dulles Corridor and to the station without requiring travel on Wiehle Avenue.

The Soapstone Connector would have two bike lanes, one sidewalk, and one shared use path, which would provide access for pedestrians and bicyclists to safely cross the Dulles Corridor. These facilities would connect with the existing sidewalks and bike lane on Soapstone Drive, the latter extending south to Lawyers Road. Additional multimodal improvements that would connect to the Soapstone Connector are shown in **Figure 2-7**, including a proposed cycle track and sidewalk on Sunrise Valley Drive. At the northern terminus, pedestrians and bicyclists would tie into the existing sidewalk on Sunset Hills Road and could then connect to the Washington & Old Dominion (W&OD) Trail. A new bridge is planned on the W&OD Trail that

will extend over Wiehle Avenue and replace the existing at-grade crossing. The new bridge will accommodate both the gravel path and asphalt W&OD Trail. According to the W&OD trail map⁹, the gravel path is designated as a “Bridle Path” through Reston, so it could be used for equestrian purposes. Minor roadway, sidewalk, and median modifications will also be made to Wiehle Avenue at this location to accommodate the bridge.

Accessibility and Mobility. The Soapstone Connector would alleviate congestion on Wiehle Avenue by providing an additional road crossing over the Dulles Corridor, and it would enhance accessibility to the Wiehle-Reston East Metrorail Station and mobility in the surrounding area by providing pedestrian, bicycle, and vehicular access to the Metrorail Station by way of Reston Station Boulevard (or another connection that would be determined during the preliminary engineering stage).

As indicated in Section 1.2, the Soapstone Connector was included as a recommended roadway network improvement in the Reston Transit Station Areas Comprehensive Amendment to the Fairfax County Comprehensive Plan in February 2014. At that time, a follow on motion by the Board of Supervisors directed staff to “conduct a detailed evaluation and operational analysis of the enhanced street network shown on the Reston Master Plan, prioritize these improvements, and develop an implementation strategy.” Accordingly, the Reston Network Analysis was initiated to take a long-range look at the transportation conditions in the Reston Transit Station Areas (TSAs) in 2030 and 2050. The Network Analysis is evaluating the conceptual grid of streets in the Reston TSAs adopted in the Reston Phase I Plan Amendment, which includes the Soapstone Connector. In the immediate vicinity of the Soapstone Connector, the grid of streets includes an extension of Reston Station Boulevard to the Connector. From a connectivity perspective, this extension would provide a direct connection to the kiss-and-ride area, the parking garage for the Metrorail station, and future development in the vicinity of the station.

⁹ <https://www.novaparks.com/parks/washington-and-old-dominion-railroad-regional-park>

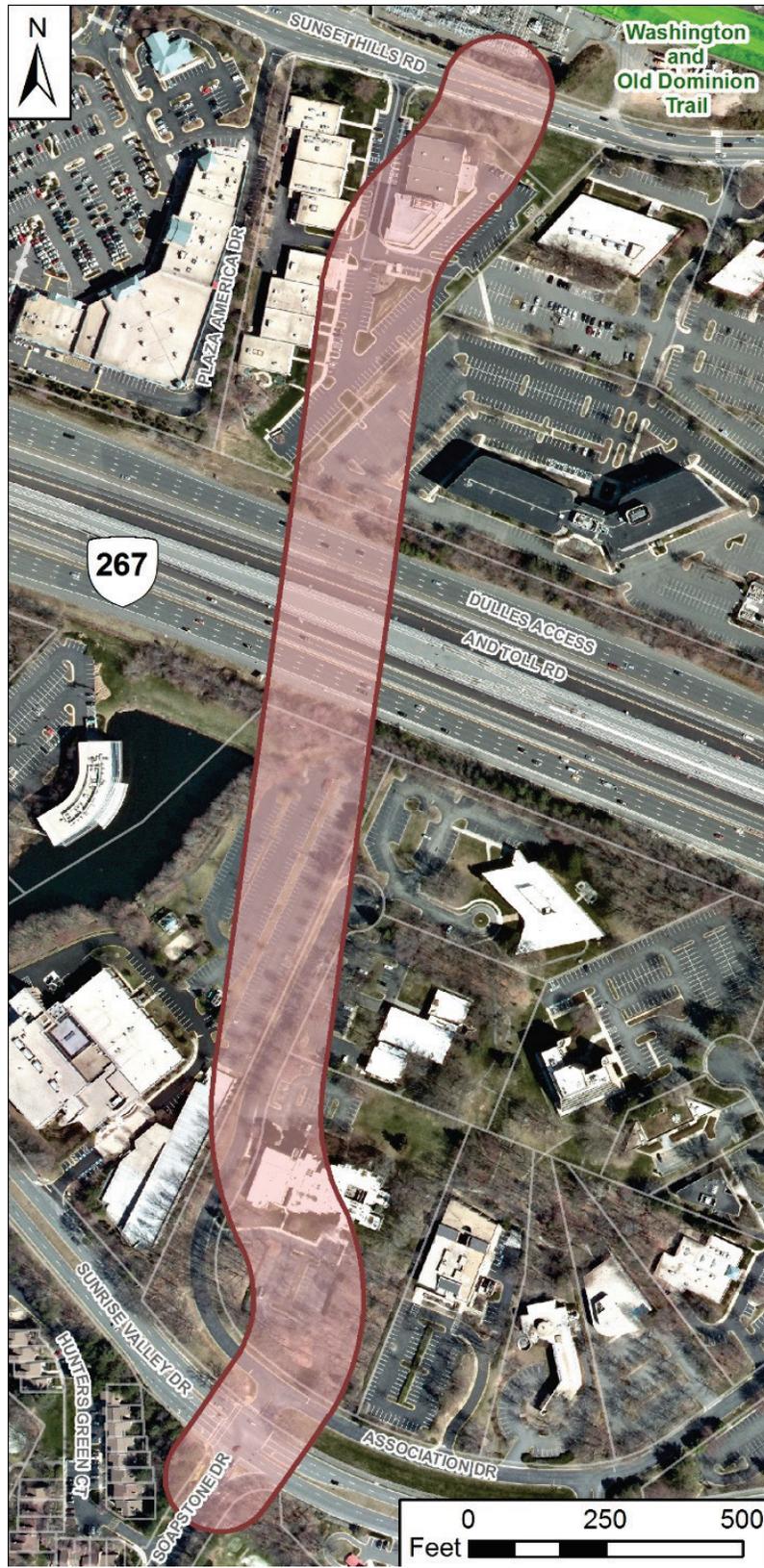


Figure 2-2. Alternative 1

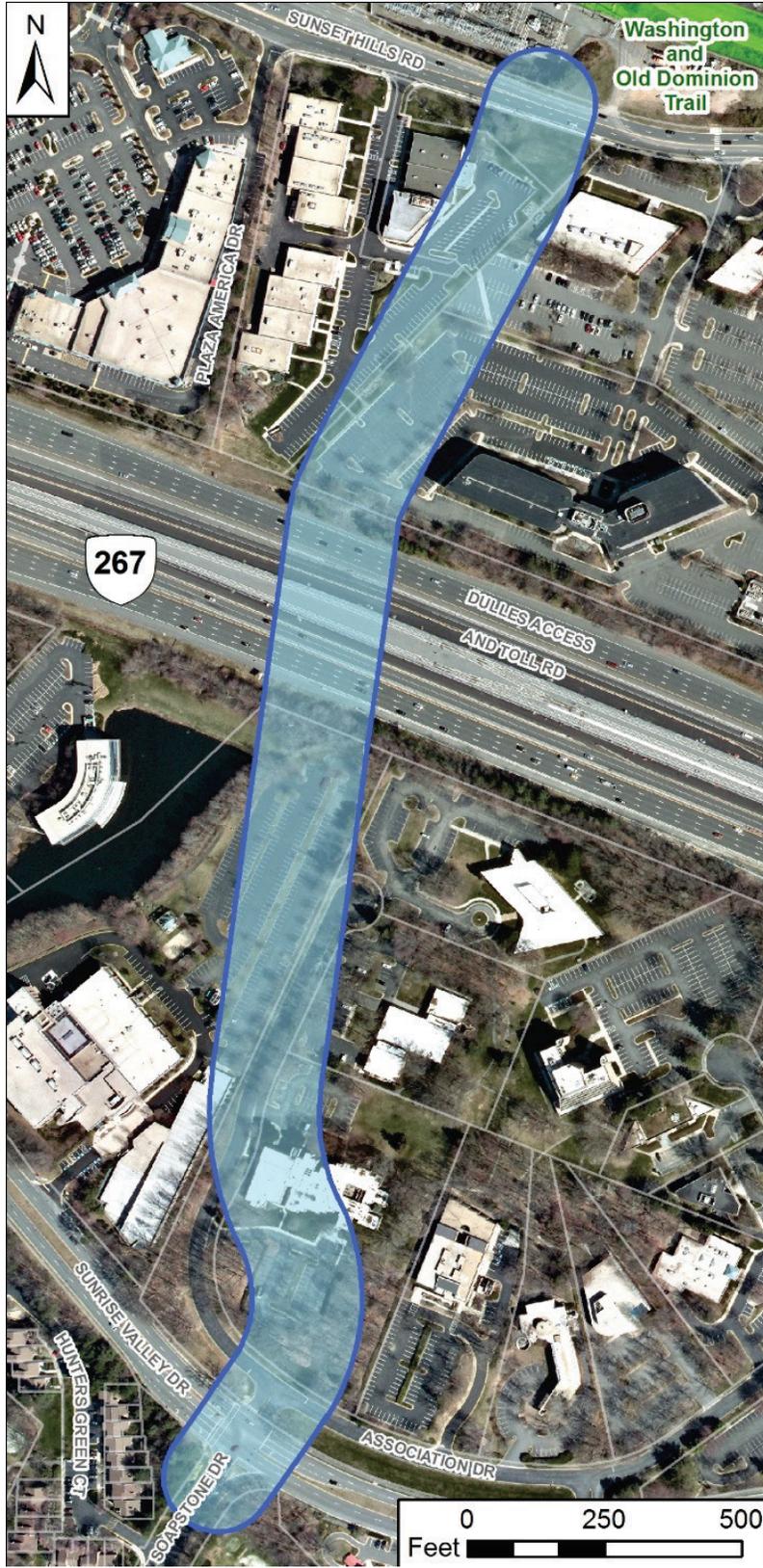


Figure 2-3. Alternative 2

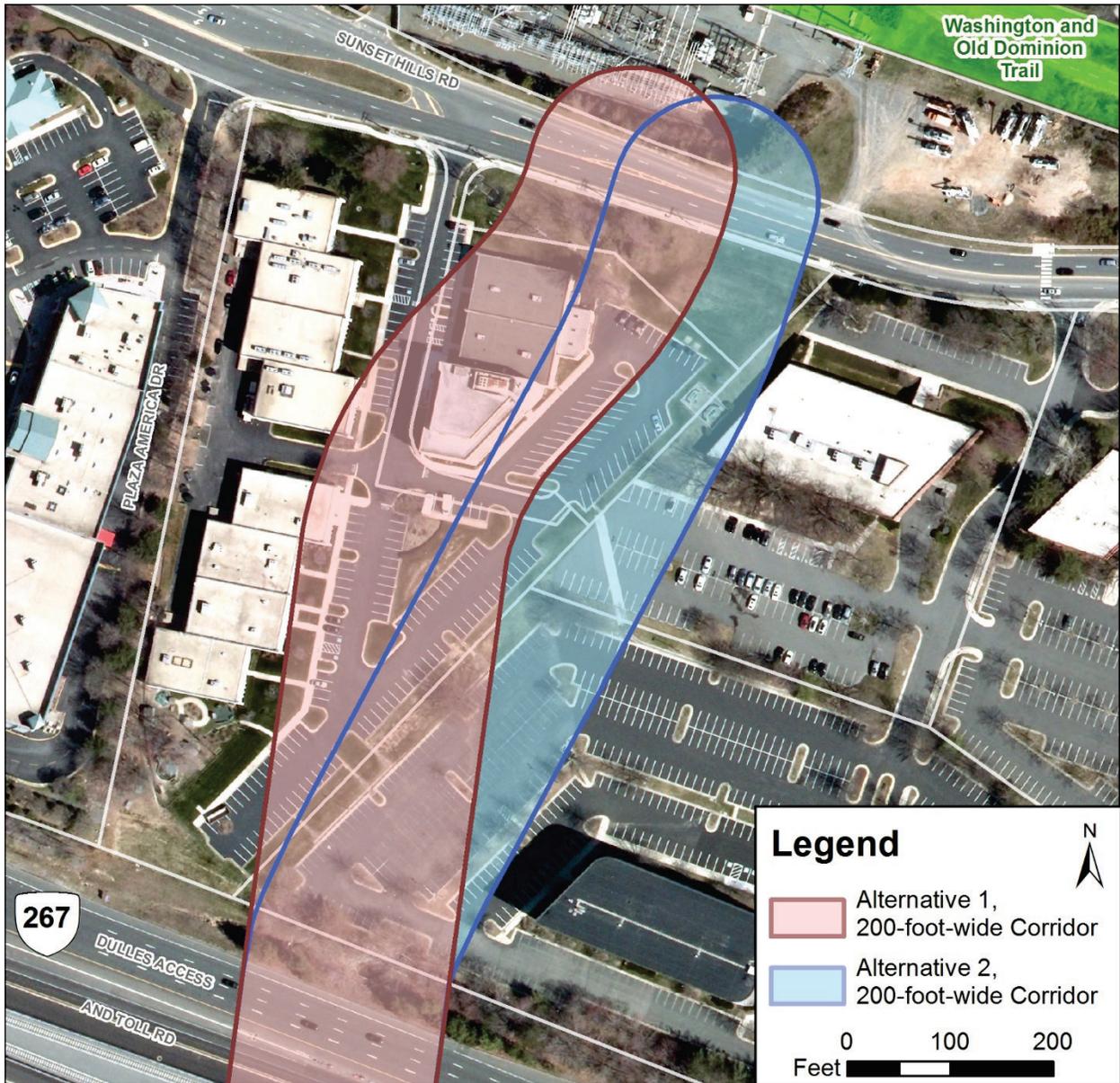


Figure 2-4. Comparison of Alternatives 1 and 2 North of Dulles Corridor

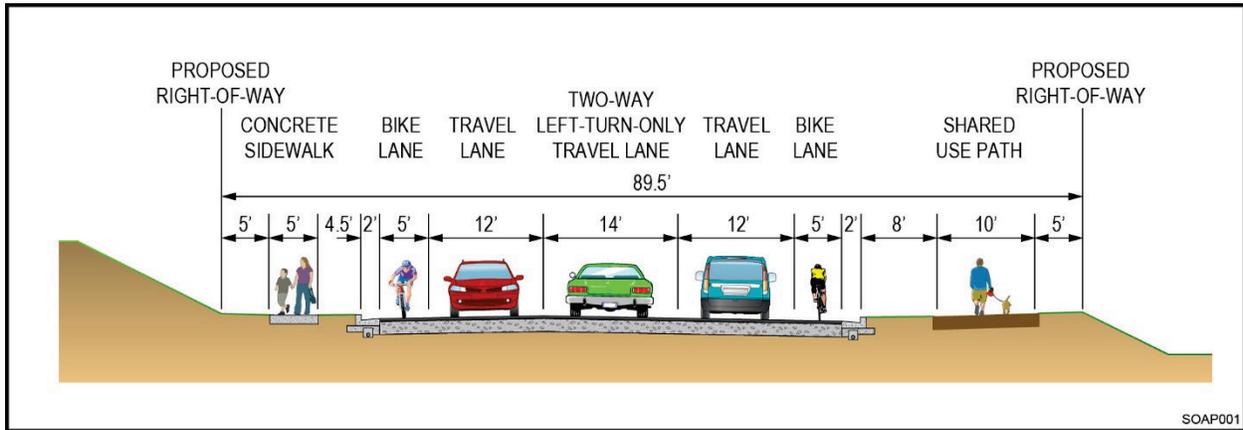


Figure 2-5. Typical Roadway Section

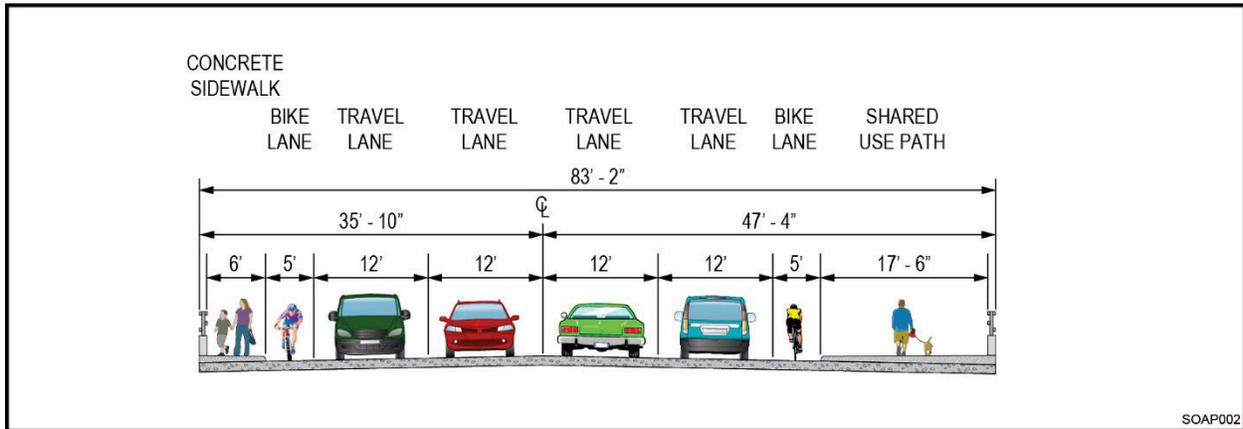


Figure 2-6. Typical Bridge Section

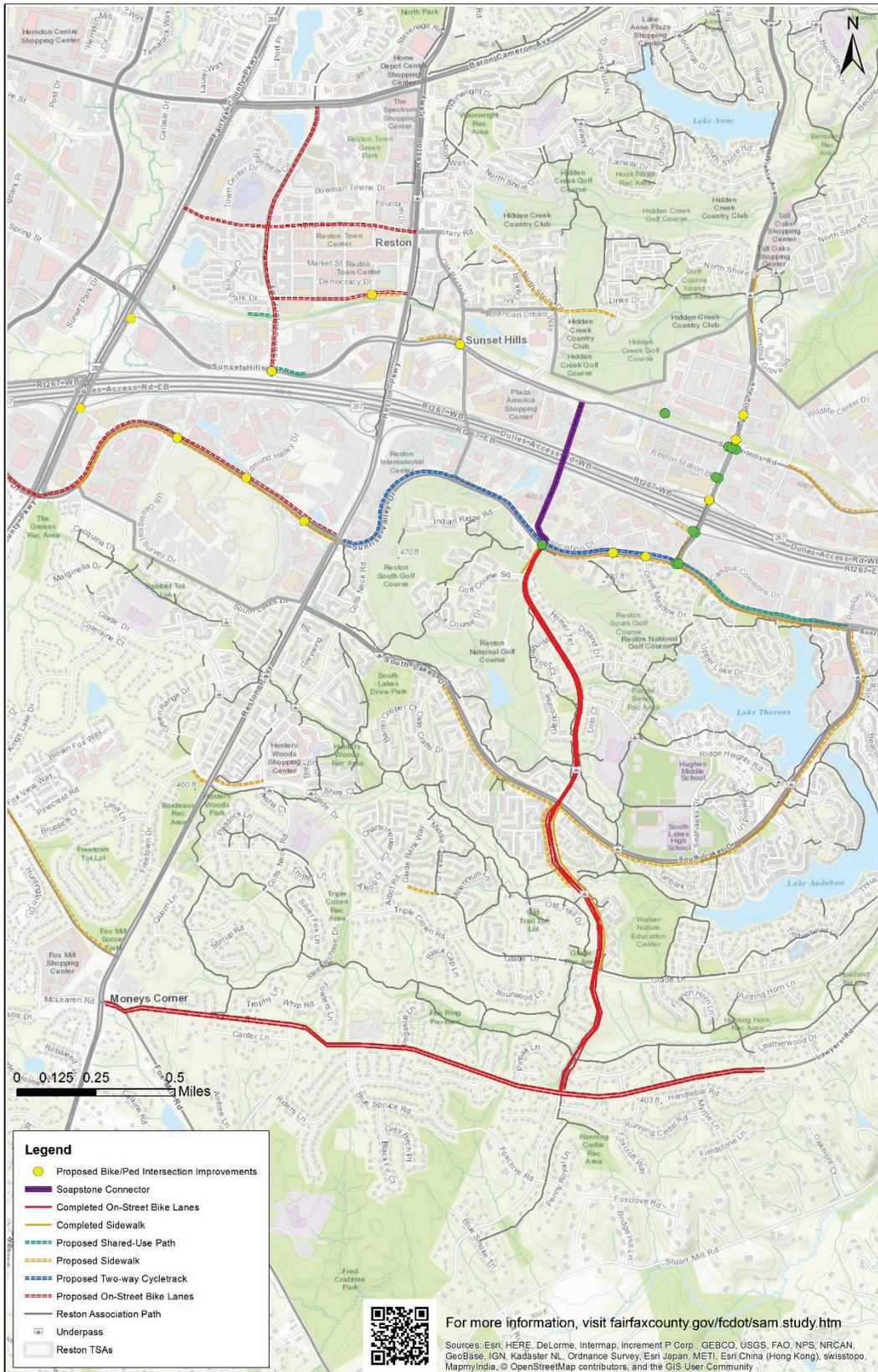


Figure 2-7. Fairfax County Funded Bicycle and Pedestrian Projects

Section 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION AND OVERVIEW OF ENVIRONMENTAL ISSUES

This section describes the affected environment and potential direct, indirect, and cumulative environmental consequences of the proposed project. Potential direct environmental impacts were estimated and described based on the implementation of each Build Alternative within a 200-foot-wide corridor, as described in Section 2. This planning-level corridor was estimated for the purposes of evaluating alternatives and decision-making during the NEPA process, and the analysis assumes that the entire area within the 200-foot-wide corridors would be impacted. The actual limits of disturbance would be further refined during design and as additional information becomes available. All efforts would be made to avoid or minimize direct impacts to environmental resources within the right of way limits of the selected Build Alternative. Indirect impacts are "...effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8(b)). Finally, cumulative impacts are: "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Indirect and cumulative impacts are discussed at the end of this chapter.

Table 3-1 summarizes environmental issues and their relevance to the project. **Table 3-2** quantifies and compares the impacts between the No Build and Build Alternatives. Issues that are pertinent to the study corridor are discussed further following the tables. The environmental data and findings presented herein were gathered from federal, state, and local agencies; previous area studies; existing literature and websites; aerial photography; geographic information system (GIS) databases; and site visits to the study corridor.

Table 3-1. Summary of Environmental Resources in Study Corridor

Resource	Discussion
Land Use	Land use in the vicinity of the proposed project is office, mixed use, and transportation. The proposed project would convert land currently in use as office and mixed use to a transportation use. This is consistent with the land use identified for the area surrounding the project within the Fairfax County Comprehensive Plan. This project is presented within the transportation section of the Comprehensive Plan as a proposed highway overpass. The project is therefore consistent with the Fairfax County Comprehensive Plan.
Communities/ Neighborhoods & Community Access	The project area lies north of the Reston National Golf Course and the housing developments that surround the golf course. On the north side of the Dulles Corridor, the project is within a retail and office area of the community of Sunset Hills. VA Route 267 (Dulles Toll Road (DTR)) provides access to the transportation network through dedicated interchanges. The proposed project is

Table 3-1. Summary of Environmental Resources in Study Corridor

Resource	Discussion
	located between two of these interchanges, Wiehle Avenue (Route 828) and Reston Parkway (Route 602). Sunset Hills Road and Sunrise Valley Drive parallel the DTR and provide access to businesses and residences. See Section 3.2.1 .
Population and Employment	The most current (July 2015) total population for Fairfax County is 1,129,330 persons (Weldon Cooper, 2016). The County population is projected to grow almost 20 percent by 2040, to 1,350,245 (Weldon Cooper, 2012). The total employment within the County in 2014 was estimated at 577,313 (VEC, 2016). See Section 3.2.2 .
Minority and Low-income Populations	In 2014, 46.8% of the County population was minority. There are two Census tracts traversed by the project, both with minority percentages lower than Fairfax County as a whole. Household median income for the two Census tracts were compared to the US Department of Health and Human Services (HHS) 2014 Poverty Guidelines. Neither Census tract has a median household income at or below the threshold. No residential relocations will occur, and no disproportionately high and adverse effects to minority and low-income populations will occur as a result of the project. See Section 3.2.3 .
Public Parks, Recreation Areas, and Open Space Easements	The project corridor was examined for any existing public parks, recreation areas, wildlife and waterfowl refuges, and open-space easements, including those associated with public schools. One resource, the Washington and Old Dominion (W&OD) Railroad Regional Park, was identified just beyond the north end of the proposed project (see Figure 3-1). The 45-mile-long W&OD contains a regional bicycle and pedestrian trail owned and operated by NOVA Parks (formerly the Northern Virginia Regional Park Authority). Use of publicly owned parks, recreation areas, and wildlife/waterfowl refuges are subject to the requirements set forth in Section 4(f) of the US Department of Transportation Act of 1966. Properties that were acquired or improved with the use of Land and Water Conservation Funds are subject to the requirements of Section 6(f) of the Land and Water Conservation Fund Act of 1965. The W&OD Railroad Regional Park is a Section 4(f) and Section 6(f) protected property. The No Build Alternative requires no right of way acquisition and has no direct adverse impacts to any park or recreation areas. Alternatives 1 and 2 would not require the temporary or permanent use of land from the W&OD Railroad Regional Park.
Farmlands and Agricultural/Forestal Districts	As required by the federal Farmland Protection Policy Act (FPPA), Form CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects, was submitted to the Natural Resources Conservation Service (NRCS) for assistance in evaluating farmland impacts. According to NRCS, no prime or statewide important farmland exists in the project area due to the fact that the project area is committed to urban uses. There are no agricultural or forestal districts within the project area.
Forest	No commercial forest resources exist in the project corridor.
Air Quality	The project is located in Fairfax County, which has been designated by the US Environmental Protection Agency (EPA) as nonattainment for the eight-hour ozone national ambient air quality standard (NAAQS), attainment for the annual fine particulate matter (PM _{2.5}) NAAQS, and attainment for the carbon monoxide (CO) NAAQS. The air quality analysis indicates that the project would not cause or contribute to a new violation, increase the frequency or severity of any violation, or delay timely attainment of the NAAQS established by EPA. In addition, in accordance with recent guidance issued by FHWA, the project area is

Table 3-1. Summary of Environmental Resources in Study Corridor

Resource	Discussion
	characterized as a project with low potential mobile source air toxics (MSAT) effects. See Section 3.3 .
Noise	Land uses within the project area that are subject to FHWA Noise Abatement Criteria (NAC) are predominately commercial/office with multi-family residential along Sunrise Valley Drive as well as two daycare centers, two golf courses, and a trail. There are six common noise environments (CNE) within the project area, two of which are predicted to experience noise impacts. Studies indicate that noise abatement using a noise barrier may be feasible and reasonable for one of them. One barrier evaluated for other impacted receptors was not found to be feasible and reasonable. Additional studies will be necessary during the final design phase when more detailed design information is available. See Section 3.4 .
Visual Quality	Visual resources are those physical features that comprise the visual landscape, including land, water, vegetation, and man-made elements. The Dulles Corridor is the predominant transportation feature within the study area, and development on the north and south sides of the Dulles Corridor includes commercial, residential, and park/recreation facilities, including two golf courses and the Washington & Old Dominion (W&OD) Railroad Regional Park. See Section 3.5 .
Historic Properties	There is one historic property within the area of potential effects (APE): the Washington & Old Dominion (W&OD) Railroad Historic District. The Virginia Department of Historic Resources (VDHR) concurred that the Soapstone Connector project would have no adverse effect on historic properties in January 2017. See Section 3.6 .
Hazardous Materials	A review was conducted of the most recent available federal and state databases of facilities with the potential for containing hazardous materials and/or wastes. Two parcels with hazardous materials are within the 200-foot-wide corridors of the two Build Alternatives. See Section 3.7 .
Streams	The alternative corridors are located within the Potomac-Shenandoah River major watershed, within the Middle Potomac-Catoctin 8-digit hydrologic unit code HUC boundaries (HUC code 02070008) and within the Difficult Run 12-digit HUC boundaries (HUC code 020700081004). The alternative corridors cross one unnamed tributary to Colvin Run. See Section 3.8 .
Wetlands	According to the National Wetlands Inventory (NWI), there are no wetlands within or adjacent to the alternative corridors. See Section 3.8 .
Water Quality	There are no impaired waters within the alternative corridors. Colvin Run, which is impaired for aquatic use, lies approximately 0.6 mile downstream from the alternative corridors. See Section 3.8 . There are no public drinking water surface resource watersheds, public groundwater wells, or US Environmental Protection Agency (EPA)-designated sole source aquifers within 1.0 mile of the alternative corridors. There are no surface water intakes located within 5.0 miles of the alternative corridors. While the Potomac surface water intake and the alternative corridors are both located within the Middle Potomac-Catoctin 8-digit HUC watershed (HUC code 02070008), the alternative corridors do not share the same 12-digit HUC subwatershed and therefore do not drain toward this surface water intake.
Chesapeake Bay Protection Areas	The project is located within Fairfax County, which is a Tidewater jurisdiction subject to the Chesapeake Bay Preservation Act. There are no Resource Protection Areas within 500 feet of the project. Under Fairfax County’s Chesapeake Bay

Table 3-1. Summary of Environmental Resources in Study Corridor

Resource	Discussion
	Preservation Ordinance (Fairfax County Code of Ordinances, Article 5, Section 118-5-2), public roads and their associated structures are conditionally exempt from regulation provided they are constructed in accordance with the Erosion and Sediment Control Law (§62.1-44.15:51 et seq. of the Code of Virginia), the Stormwater Management Act (§62.1-44.15:24 et seq. of the Code of Virginia), and Chapter 104 (Erosion and Sediment Control) and Chapter 124 (Stormwater Management Ordinance) of the County Code. Given the exemption for public roads, as long as the necessary requirements are followed, the proposed project would be consistent with the Chesapeake Bay Preservation Act and Regulations. See Section 3.8 .
Environmental Quality Corridor	A stormwater management pond to the west of the project (outside of the 200-foot-wide corridors for Alternatives 1 and 2) has been identified as an environmental quality corridor (EQC) consistent with Policy Plan Objective 9 of the Environment Element of the 2013 Fairfax County Comprehensive Plan. EQC boundaries are identified based on the presence of streams, floodplains, steep slopes, and wetlands. Supportable activities in EQCs include trails and passive recreation, road and utility crossings, and regional stormwater management ponds. As roads are among the supportable activities, the proposed project would be consistent with the County’s EQC regulations. See Section 3.8 .
Coastal Zone Management Areas	Fairfax County is located within Virginia’s coastal zone. See Section 3.9 .
Floodplains	There are no Federal Emergency Management Agency (FEMA)-designated 100-year floodplains within the alternative corridors. A 100-year floodplain associated with Colvin Run is located approximately 1,000 feet northeast of the alternative corridors. Neither the No Build nor the Build Alternatives would impact 100-year floodplains.
Wild and Scenic Rivers	There are no federally listed Wild and Scenic Rivers in the corridor.
Wildlife Habitat	<p>The project is located within urban lands developed for commercial and office use that do not provide natural habitat conditions for wildlife. Common urban wildlife species may use the adjacent stormwater management pond, the small clusters of trees that provide aesthetic landscaping within the office and commercial developments, and the narrow strip of trees bordering the Dulles Corridor. Wildlife species that may be present include common mammals, birds, reptiles, and amphibians that are adapted to living in urban environments. While individual trees may provide nesting and foraging opportunities for wildlife species typically found in urban and suburban environments, no forests or other naturally-occurring habitat areas are present within the alternative corridors. The No Build Alternative would not result in the removal or disturbance of wildlife habitat. Alternatives 1 and 2 would require the removal of individual trees; however, there would be no loss of forest or other sensitive wildlife habitats, as none are present within the alternative corridors.</p> <p>No anadromous fish, trout waters, or shellfish exist in the project area. Best management practices and strict adherence to state and local regulations will be followed to protect downstream resources.</p>
Wildlife and Waterfowl Refuges	No wildlife or waterfowl refuges are present within 1.0 mile of the project.

Table 3-1. Summary of Environmental Resources in Study Corridor

Resource	Discussion
Natural Heritage Sites	According to the Virginia Department of Conservation and Recreation (VD CR) Natural Heritage GIS database, there are no Natural Heritage Sites within 1.0 mile of the alternative corridors. During project scoping, VD CR indicated that the proposed project is not likely to adversely impact natural heritage resources due to the scope of the activity and the distance to the resources (VD CR, 2015).
Threatened and Endangered Species	Based on the US Fish and Wildlife Service (USFWS) Information Planning and Conservation (IPaC) online review database, one federally listed species could potentially occur along the corridor - the northern long-eared bat (<i>Myotis septentrionalis</i>). Additionally, the state-listed wood turtle (<i>Glyptemys insculpta</i>) has the potential to occur along the corridor. See Section 3.10 .
Invasive Species	The alternative corridors have been previously disturbed for construction of the commercial and office buildings and parking areas. Invasive species commonly occur within disturbed environments and are likely present within the alternative corridors. In accordance with Executive Order 13112, <i>Invasive Species</i> , the potential for the establishment of invasive terrestrial or aquatic animal or plant species during construction of the project would be minimized by following provisions in VDOT's <i>Road and Bridge Specifications</i> . These provisions require prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications to ensure that seed mixes are free of noxious species. While the project corridor is previously disturbed and likely to contain invasive species, best management practices and implementation of the stated provisions would reduce the potential for the establishment and proliferation of invasive species.

Table 3-2. Summary of Potential Impacts

Category	Impacts within 200-foot-wide Corridor		
	No Build*	Alternative 1	Alternative 2
Total Area (acres)	0	13.0	12.9
Businesses Displaced (no.)	0	2	2
Section 4(f) Property (acres)	0	0	0
Historic Properties Within Area of Potential Effects (no.)	0	1**	1**
Stream Crossings (no.)	0	1	1
Length of Streams (linear feet)	0	259	278
Wetlands (acres)	0	0	0
Floodplains (acres)	0	0	0
Forest Area (acres)	0	0	0
Natural Heritage Resources (Conservation Sites and Stream Conservation Units)	0	0	0
Federally Listed Threatened or Endangered Species Identified by USFWS that may be affected by the Proposed Project (no.)	0	1	1
Hazardous Material Sites of Recognized Environmental Concern (no.)	0	2	2

Table 3-2. Summary of Potential Impacts

Category	Impacts within 200-foot-wide Corridor		
	No Build*	Alternative 1	Alternative 2
Agricultural and Forestal District Land Used (acres)	0	0	0
Prime and Unique Farmland (acres)	0	0	0
Violations of National Ambient Air Quality Standards (no.)	0	0	0
Noise Receptors Impacted Without Mitigation (no.)	--	7 (6 residential outdoor use areas and the playground of a daycare center)	7 (6 residential outdoor use areas and the playground of a daycare center)

* The No Build Alternative, as described in Section 2.4.1 in Section 2, Alternatives, includes several planned and programmed projects. These projects may impact resources included in this table. However, the exact nature and extent of impacts of these future projects are unknown and reporting them would be speculative. Regardless, any such impacts would occur for the Build Alternatives as well, so the relative outcome of effects for comparing the alternatives, as shown in this table, would be no different.

** The Virginia Department of Historic Resources (VDHR) concurred on January 12, 2017 that the Soapstone Connector project would have no adverse effect on historic properties.

3.2 SOCIAL AND ECONOMIC RESOURCES

The transportation network surrounding the project area is typical of a densely settled urban/suburban area. Multiple modes of transportation, including Metrorail, Washington Metropolitan Area Transit Authority (WMATA) and Fairfax Connector bus services, and bicycle and pedestrian facilities provide access to the communities and neighborhoods of Reston, Virginia.

3.2.1 Communities and Neighborhoods

The project corridor lies within Reston, a planned community within Fairfax County (see **Figure 3-1**). Individual neighborhoods within the project corridor include Sunset Hills and housing developments surrounding the Reston National Golf Course, a part of the Reston Association. Reston Town Center is northwest of the project corridor.

The community of Sunset Hills lies on the northern side of the Dulles Corridor between Wiehle Avenue and Reston Parkway. Within Sunset Hills, commercial, retail, and light industrial are the primary land uses and types of development between Sunset Hills Road and the Dulles Corridor. Residential and recreational areas of the community are located north of Sunset Hills Road.

South of the Dulles Corridor, the project corridor is within the commercial and industrial area north of Sunrise Valley Drive. South of Sunrise Valley Drive, the residential communities surrounding the Reston National Golf Course are a part of the Reston Association. This association is a non-profit organization that provides support for the entire community of Reston in both the natural and man-made environments (Reston, 2016). There are individual homeowners associations within the Reston Association that are based on clusters of housing, condominiums, and single family associations. The homeowners associations adjacent to the project corridor and along Soapstone Drive are in the South Lakes District of the Reston



Figure 3-1. Community Resources

Association and include: Golf Course View, Golf Course Square, Hunters Green, and Glencourse.

Because the project is located in the retail, commercial, and industrial areas on either side of the Dulles Corridor, these neighborhoods and communities are not expected to be adversely affected by the project. In fact, the Soapstone Connector may actually serve to better link and provide a direct route between the residential communities in the south along Soapstone Drive and the developments north of the Dulles Corridor within Sunset Hills, such as Plaza America, particularly for pedestrians and bicyclists given the multimodal facilities proposed on the new crossing.

An analysis of the potential increase in traffic volumes along Soapstone Drive was completed in response to concerns by some members of the community that the addition of the Soapstone Connector would result in an increase in volumes on Soapstone Drive south of Sunrise Valley Drive. The travel demand forecast modeling performed for this study indicates that the Soapstone Connector could result in increases in traffic volumes on a daily basis to Soapstone Drive just south of Sunrise Valley Drive (from 12,400 vehicles per day (vpd) in the No Build condition to 14,800 vpd in the Build condition, an increase of approximately 19%). On an hourly basis, based on rule-of-thumb directional and peak hour factors, the one-way hourly volume difference in the peak hour between the No Build and Build condition would be about 100 to 120 vehicles at the most. The difference in volumes on Soapstone Drive between the No Build and Build conditions decreases as distance increases from the Soapstone Connector south on Soapstone Drive (additional details on this analysis are included in the *Traffic Technical Memorandum*).

3.2.2 Population and Employment

Fairfax County is the most populous jurisdiction in the Commonwealth; the total population estimate for 2015 is 1,129,330 persons (Weldon Cooper, 2016). The County population is projected to continue to grow to 1,350,245 by 2040 (Weldon Cooper, 2012). The total employment within the County in 2014 was estimated at 577,313 (VEC, 2016). As a large employment center immediately outside of Washington DC, the County's population and employment affect both the county itself and the region.

3.2.3 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", states that each Federal agency "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Accordingly, demographic data for Fairfax County were analyzed to determine whether the Build Alternatives would have disproportionately high and adverse human health or environmental effects on minority and low-income populations. As defined in FHWA Order 6640.23A, minority populations include citizens or lawful permanent residents of the US who are:

- Black: a person having origins in any of the black racial groups of Africa;
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central, or South American, or other Spanish culture or origin, regardless of race;

- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
- American Indian and Alaskan Native: a person having origins in any of the original people of North America or South America (including Central America) and who maintains cultural identification through tribal affiliation or community recognition; or
- Native Hawaiian and Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Table 3-3 provides demographic data for Fairfax County and the two Census tracts within the project corridor. The Census tracts appear graphically in **Figure 3-2**. The minority data for the two Census tracts were acquired from the American Community Survey (ACS) 2010-2014 5-Year Estimates. As shown in Table 3-3, both Census tracts have percentages of minority populations lower than the County as a whole.

Table 3-3. Demographic Data in 2014

Location	Total Population	Minorities (%)	Median Household Income	Total Limited English Proficiency (%)*	Age 65 and Over (%)
Fairfax County	1,117,072	522,943 (46.8%)	\$112,102	151,152 (14.5%)	141,704 (12.7%)
Census Tract 4822.02	3,215	1,001 (31.1%)	\$83,289	404 (12.8%)	700 (21.8%)
Census Tract 4823.01	4,695	988 (21.0%)	\$132,819	162 (3.63%)	981 (20.9%)

Source: US Census Bureau: 2010-2014 American Community Survey.

Note: *Based on the population aged 5 years and over.

The Council on Environmental Quality's *Environmental Justice Guidance Under the National Environmental Policy Act* indicates that a minority population should be considered present when: (a) the minority population of the census block group exceeds 50 percent of total study area population or (b) the minority population percentage in the affected area is "meaningfully greater" than the minority population percentage in the general population or other appropriate unit of geographical analysis (CEQ, 1997).

For the Soapstone Connector, Fairfax County as a whole is considered the general population against which to consider whether the minority population percentage of the affected area is "meaningfully greater". As both Census tracts have percentages of minority populations lower than the County as a whole, no minority populations are present; therefore, no disproportionately high and adverse effects to minority populations will occur as a result of the project.

Low-income populations are defined as those whose median household income is below the US Department of Health and Human Services (HHS) poverty guidelines. Household median income Census data were acquired from the ACS 2010-2014 5-Year Estimates, *Median Income in the Past 12 Months (in 2014 Inflation-Adjusted Dollars)*. The data were compared to the HHS 2014 Poverty Guidelines (79 FR 3593, January 22, 2014) because they are both for the same year, 2014. The average household size ranges from 1.68 to 2.27 persons within the two Census tracts. Therefore, the 2014 HHS poverty threshold for a family of 3, \$19,790, was used for comparison. Neither Census tract has a median household income at or below the threshold; therefore, no disproportionately high and adverse effects to low-income populations will occur as a result of the project.

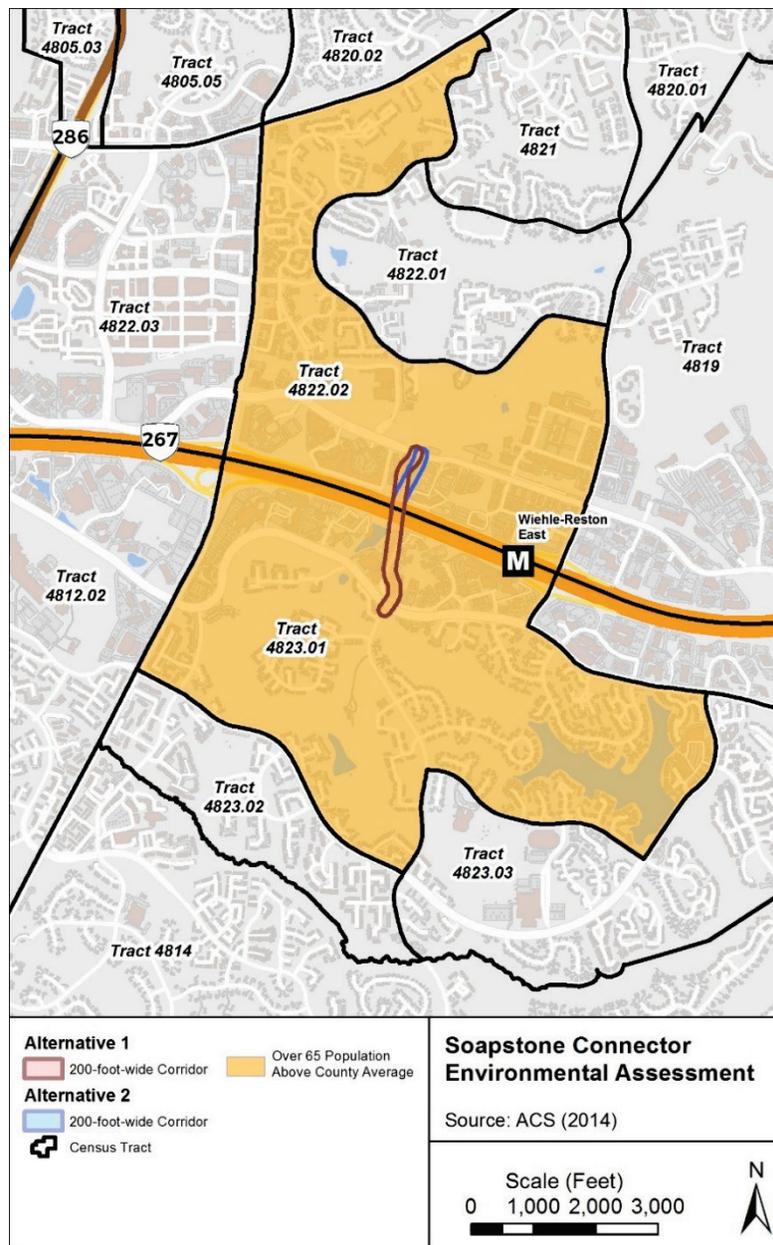


Figure 3-2. Age Demographics by Census Tract

3.2.4 Limited English Proficiency and Age Demographics

Executive Order 13166 “Improving Access to Services for Persons with Limited English Proficiency” directs federal agencies to “examine the services they provide, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system to provide those services so LEP persons can have meaningful access to them.” As a part of EO 13166, the Department of Justice issued guidance on implementing the LEP EO because of the connection between Title VI of the Civil Rights Act of 1964 barring of discrimination based on national origin and EO 13166. Data collection to determine the presence of persons with LEP has occurred as a part of this project.

As shown in Table 3-3, both Census tracts do not have a higher proportion of persons with LEP than the County as a whole, but of the two, Tract 4822.02 has a high number of persons that speak a specific language other than English. The top three languages spoken are Persian, Chinese, and Spanish. Both Census tracts have higher percentages of persons over 65 years of age than the County as a whole, as illustrated in Figure 3-2.

3.2.5 Relocations

The No Build Alternative requires no right of way acquisition and therefore requires no relocations and has no direct adverse impacts to residences, businesses, and environmental justice populations.

Both Build Alternatives 1 and 2 have the potential for two business relocations, the National Association of Secondary School Principals at 1904 Association Drive and the property owned by Musica LLC at 11501 Sunset Hills Road. Acquisition of right of way from up to six additional parcels may also be required.

For the purposes of this assessment, it is assumed that the entire area within the 200-foot-wide corridors would be affected. The project footprint and right of way acquisition estimates would be further refined during design as additional information becomes available. All efforts would be made to avoid or minimize relocations and right of way acquisition. The acquisition of right of way and the relocation of displacees would be conducted in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended. Under the law, the purchase price for property acquired would be fair market value as determined by an appraisal prepared by a qualified appraiser. Assurance is given that relocation resources will be available to all displacees without discrimination.

3.3 AIR QUALITY

In accordance with NEPA, air quality impacts of transportation improvement projects must be considered at both the regional and local level. The project is located in Fairfax County, which has been designated by the US Environmental Protection Agency (EPA) as nonattainment for the eight-hour ozone national ambient air quality standard (NAAQS) and attainment for all other NAAQS. The air quality analysis completed for the Soapstone Connector indicates that the project would not cause or contribute to a new violation, increase the frequency or severity of any violation, or delay timely attainment of the NAAQS established by EPA.

The methodologies and findings for the air quality analysis are summarized below and described in detail in the *Air Quality Technical Memorandum*.

Carbon Monoxide (CO) Analysis. In order to screen projects for CO impacts, a programmatic agreement for project-level air quality CO analyses (Programmatic Agreement) was executed between the FHWA Virginia Division Office and VDOT in April 2016. It uses worst-case modeling to identify the conditions for which a proposed project or action would require either a quantitative or qualitative CO hot-spot analysis to meet requirements under NEPA. Based on the agreement and applicable federal requirements, the Soapstone Connector project is consistent with (and does not exceed) the project types and conditions¹⁰ listed in the Programmatic

¹⁰ The geometric features of the two new intersections created by the Soapstone Connector with Sunrise Valley Drive and Sunset Hills Road were considered in the qualitative analysis, including intersection skew angle, roadway grade of the approaches, and forecast approach speeds.

Agreement for streamlining the project-level air quality analysis process for carbon monoxide. Furthermore, it has been determined that projects such as this one would not significantly impact air quality and would not cause or contribute to a new violation, increase the frequency or severity of an existing violation, or delay timely attainment of the CO NAAQS. Additional information can be found in the *Air Quality Technical Memorandum*.

Fine Particulate Matter (PM_{2.5}) Analysis. The project is located in an attainment area for PM and therefore is not subject to a PM conformity assessment.

Mobile Source Air Toxics (MSAT) Analysis. In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources, and stationary sources (e.g., factories or refineries). On October 18, 2016, FHWA issued a memorandum titled *Updated Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. In accordance with the guidance, the project area is best characterized as a project with “low potential MSAT effects” since design year traffic is projected to be significantly less than 140,000 to 150,000 annual average daily traffic (AADT) thresholds. As a result, a qualitative assessment of emissions projections was prepared in accordance with the guidance. See *Air Quality Technical Memorandum* for additional details.

Construction Emission Analysis. The temporary air quality impacts from construction are not expected to be significant. Emissions will be produced during the construction of this project by heavy equipment and vehicle travel to and from the site. Earthmoving and ground-disturbing operations will generate airborne dust. 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’s *Road and Bridge Specifications*. These specifications require compliance with all applicable local, state, and federal air quality regulations.

Regional Conformity Considerations. The Soapstone Connector is located in an eight-hour ozone nonattainment area; therefore, conformity applies, which typically requires that projects be included in a conforming financially constrained regional long-range transportation plan adopted by the Metropolitan Planning Organization (MPO). However, it has been determined by the Metropolitan Washington Council of Governments (MWCOG) that the Soapstone Connector would be considered Not Regionally Significant for air quality conformity purposes and therefore does not need to be included in the air quality conformity analysis associated with the CLRP, thereby satisfying the conformity requirement.

3.4 NOISE

A noise analysis was conducted in accordance with requirements of 23 CFR 772, FHWA’s *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. For purposes of the noise analysis, the project was divided into six areas of common noise environment (CNE). CNEs are groupings of receptor sites that, by location, form distinct communities within the project area and contain receptors with similar exposures to noise sources. These areas are used to evaluate traffic noise impacts and potential noise abatement options to residential developments or communities as a whole, and to assess the feasibility and reasonableness of possible noise abatement measures for those communities.

If noise levels “approach” or “exceed” noise abatement criteria (NAC) for the design year build alternative at any receptor, then an impact occurs and abatement measures are to be considered. The NAC for most land uses along the corridor is either Category B (Residential), 67 dBA (A-

weighted decibels)¹¹, or Category E (Commercial/Offices), 72 dBA. VDOT defines “approach” as being within 1 dBA of the NAC and therefore the criterion can actually be considered 66 or 71 dBA, respectively, for the two categories. A noise impact is also deemed to occur if design year build noise levels are substantially higher than existing levels, even though the levels may not reach the NAC. The State Noise Abatement Policy defines a substantial increase as 10 dBA or more.

The noise analysis prepared for the project showed that under both Design Year (2046) Build Alternatives 1 and 2, a total of four receptors that represent six residential outdoor use areas and the playground of a daycare center are predicted to experience noise impacts. Noise abatement measures (i.e., a noise barrier) have been determined to be feasible (provide the minimum noise reduction) and reasonable (meet the cost-effectiveness criteria, based on a square foot cost) for one CNE at this time. The barrier would provide noise reduction benefits to three impacted receptors that represent six multi-family outdoor use areas, as described further in the technical report. Preliminary decisions regarding both recommended and non-recommended noise barriers may change between the environmental document and final design as a result of changes in the transportation improvement project design, design year traffic, or the level of detail the design contained at the time of the preliminary report.

The conclusions are preliminary because the noise analysis has been based on conceptual design and topographic information; additional detailed analysis would be conducted during the final design phase of the project. The noise impact estimates may change and potential abatement measures will be reevaluated. Final decisions at that time on whether to provide noise abatement measures will take into account design feasibility, cost, and the opinions of property owners impacted by the noise.

During the construction phase of the proposed project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Any construction noise impacts that may occur as a result of roadway construction are anticipated to be temporary in nature and would cease upon completion of the project construction phase. The contractor will be required to conform to the specifications found in VDOT's 2016 *Road and Bridge Specifications*, Section 107.16(b.3), “Noise.” Adherence to this policy of establishing a maximum level of noise that construction operations can generate would reduce the potential impact of construction noise on the surrounding community.

The *Noise Analysis Technical Report* provides additional detail on analysis methodology, findings, and abatement considerations.

3.5 VISUAL QUALITY

Visual resources are those physical features that comprise the visual landscape, including land, water, vegetation, and man-made elements. These elements are the stimuli upon which a person’s visual experience is based. Potential sensitive visual receptors would include areas or users affected by changes in the visual and aesthetic environment.

¹¹ Noise levels for traffic noise are typically reported in terms of A-weighted decibels, or dBA. The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with traffic noise.

Because the project is within a developed suburban area, the viewshed for this visual and aesthetic resource assessment is primarily limited to adjacent land uses. The Dulles Corridor is the predominant transportation feature within the study area. This multimodal transportation corridor includes a four-lane divided limited access highway (Route 267, the Dulles Toll Road) that provides access to adjacent land uses by way of the Wiehle Avenue and Reston Parkway interchanges on either side of the study area; a four-lane divided limited access highway (Dulles International Airport Access Highway) that provides access to and from Washington Dulles International Airport; and the Silver Line of the Metrorail System, including the Wiehle-Reston East Metrorail Station just to the east of the study area.

Development on the north and south sides of the Dulles Corridor includes commercial (office parks, office buildings, a medical center, hotels, and shopping centers), residential (single-family townhouses and apartment buildings), and park/recreation facilities, including two golf courses and a walking and biking trail, the W&OD Railroad Regional Park. A Dominion Virginia Power substation is located on the north side of Sunset Hills Road north of the Dulles Corridor. A 2.4-acre stormwater management pond also exists to the west of the Soapstone Connector alternatives south of the Dulles Corridor. On both the north and south sides are also pockets of trees and vegetation, including the small vegetated area south of Sunset Hills Road and west of Metro Center Drive, that provide some relief to the numerous parking lots and commercial/residential buildings. A bank of trees also lines most of the Dulles Corridor.

The No Build Alternative would maintain the existing visual character along the Dulles Corridor and within the surrounding area. This alternative would also not result in any temporary construction impacts to visual and aesthetic resources.

Though the Build Alternatives would alter the landscape with the construction of a three-lane roadway on either side of the Dulles Corridor and a bridge over the Dulles Corridor, the resulting overall landscape would remain in character with the existing visual environment, which already features many roadways, driveways, and parking lots, as well as the overpasses for Wiehle Avenue, Reston Parkway, and pedestrian access to the Wiehle-Reston East Metrorail Station. Addition of a new roadway and associated elements (e.g., overpass, traffic signals, utility poles) would not add any visual intrusions that do not already occur within the viewshed of the surrounding development.

The views from adjacent development would be similar, albeit of a different form of paved roadway; north of the Dulles Corridor, the Soapstone Connector would primarily replace surface parking lots, and south of the Dulles Corridor, the Soapstone Connector would primarily replace surface parking and Association Drive. As mentioned above, the trees and vegetation that form natural barriers between properties would likely block views of the Soapstone Connector from most buildings.

Views from the Soapstone Connector would be of the adjacent commercial development. From the overpass, views would be of the Dulles Corridor, the trees that border the Dulles Corridor on both sides, and some of the higher office and residential structures in the greater Reston area.

Temporary visual impacts, such as visibility of construction materials, cranes, and other equipment, would occur during construction of either Build Alternative.

3.6 HISTORIC PROPERTIES

Phase IA and Phase IB cultural resources surveys were prepared in support of the EA. The surveys included an assessment of archaeological potential based on prior disturbance and

development in the project area; research on buildings and structures that are located in and near the area of potential effect (APE) that may be 50 years old or older or those that might be considered “heritage resources” within Fairfax County; photo-documentation of viewsheds (vantage points) to and from the proposed roadway corridor to identify the potential for new visual intrusions on the landscape from roadway elements (e.g., overpass, traffic signals, utility poles); and recommendations for additional investigations.

The site files search indicated that no archaeological sites have been identified in the APE. In addition, there is limited potential for archaeological resources to be located in the archaeological APE due to prior disturbance. The Virginia Department of Historic Resources (VDHR) concurred with this determination on April 12, 2016.

Two previously identified architectural resources occur in the architectural APE, the Washington and Old Dominion (W&OD) Railroad Historic District (053-0276) and the Wiehle/Sunset Hills Historic District (029-0014). The W&OD Railroad Historic District is a former rail line constructed around 1855 that was later converted into a park and trail. It was previously determined by VDHR to be eligible for listing in the National Register of Historic Places (NRHP), and it was recommended that this resource retain its status as individually eligible for listing in the NRHP. VDHR concurred with this determination in January 2017.

In 1987, DHR staff received a Preliminary Information Form (PIF), the first step in a two-step process for a property to be listed on the NRHP, for the Wiehle/Sunset Hills Historic District but did not make a formal eligibility determination on the district. Since that time, the majority of the proposed district has continued to undergo extensive development. Most of the buildings are under 50 years of age and lack outstanding architectural characteristics or associations with individuals or events of historical significance. Therefore, it was recommended that the Wiehle/Sunset Hills Historic District be not eligible for listing in the NRHP. VDHR concurred with this determination in January 2017.

No additional resources likely to be eligible for the NRHP were identified in the architectural APE. In addition, there is limited potential for adverse effects to the one previously identified historic property. The W&OD Railroad Historic District is actively used as a regional park, with a paved bicycle and pedestrian trail, and the surrounding area has already been subject to suburban development. It is bounded by an electrical substation and visible to and from existing roadways and office buildings; therefore, the Soapstone Connector will not create any additional visual intrusions because they are similar to other features that already occur adjacent to the historic district. Finally, the grade of the trail within the APE is below the grade at which the end of the new Soapstone Connector would intersect with Sunset Hills Road. Views to and from the trail are partially obscured by trees and the electrical substation. VDHR concurred in January 2017 that the Soapstone Connector project would have no adverse effect on historic properties.

See the May 2016 *Phase IA Cultural Resources Survey of the Proposed Soapstone Connector, Fairfax County, Virginia* and the October 2016 *Phase IB Architectural Survey of the Proposed Soapstone Connector, Fairfax County, Virginia* for additional information.

3.7 HAZARDOUS MATERIALS

The federal government and Commonwealth of Virginia, primarily through the US Environmental Protection Agency (EPA) and the Virginia Department of Environmental Quality (VDEQ), respectively, regulate hazardous materials under multiple statutes. These agencies maintain databases of sites and facilities regulated by these statutes. A review was conducted of

the most recent available federal and state databases of facilities with the potential for containing hazardous materials and/or wastes.

Two parcels within the 200-foot-wide corridors of the Build Alternatives contain facilities with the potential for hazardous materials/wastes (**Table 3-4**). As indicated in the Introduction, the analysis assumes that the entire area within the 200-foot-wide corridors would be impacted; however, as shown in **Figure 3-3**, given the location of the buildings within these two parcels, it is likely that they would be avoided.

Table 3-4. Hazardous Materials Facilities/Sites within Alternatives

Site Type	Alternative 1	Alternative 2
Total Facilities (Site Types)	2	2
RCRA Regulated Generator, Transporter, Treatment/Storage Disposal Facilities	1	1
VA Regulated Tank Facility	1	1

Source: VDOT, CEDAR, 2016.

Prior to the acquisition of right of way and construction, a Phase I Environmental Site Assessment (ESA) as per the American Society for Testing and Materials (ASTM) method E1527-13 would be conducted to determine whether any of the sites are potentially contaminated. Based on findings from the ASTM Phase I ESA, an ASTM Phase II may be conducted. All solid waste material resulting from clearing and grubbing, demolition, or other construction operations would be removed from the project area and disposed of according to regulations. Any additional hazardous materials discovered during construction of a Build Alternative would be removed and disposed of in compliance with all applicable federal, state, and local regulations. All structures scheduled for demolition or renovation would be inspected for asbestos containing materials (ACM) and lead-based paint (LBP) prior to work. If ACM or LBP are found, in addition to the federal waste-related regulations, state regulations for ACM and for LBP would be followed. All necessary remediation would be conducted in compliance with applicable federal, state, and local environmental laws and would be coordinated with the EPA, VDEQ, and other federal or state or local agencies as necessary. Prior to, during, and after construction, all applicable federal, state, and local regulations will be complied with by the contractor.

The Soapstone Connector would cross the Transcontinental Gas Pipeline easement, or more specifically, four pipelines and potentially a mainline valve setting. At this time and until the design phase of the project, it is uncertain which alternative would have a greater impact. According to the Williams Gas Company, with any replacement or relocation, there are many factors to be considered. One major factor is the location of construction areas and access to the pipelines. With permanent structures, accessibility is more difficult. Increased traffic near the mainline valve setting would need to be considered, and other considerations include items such as blocking off areas (access points for pedestrians and/or traffic) when replacing or relocating the lines and the mainline valve setting; purging gas to allow for work completion as well as other activities not presently named that may be necessary to ensure safety to the public; and the integrity of the pipelines. Coordination with Williams Gas Company would continue throughout the design and construction phases of the project as needed.

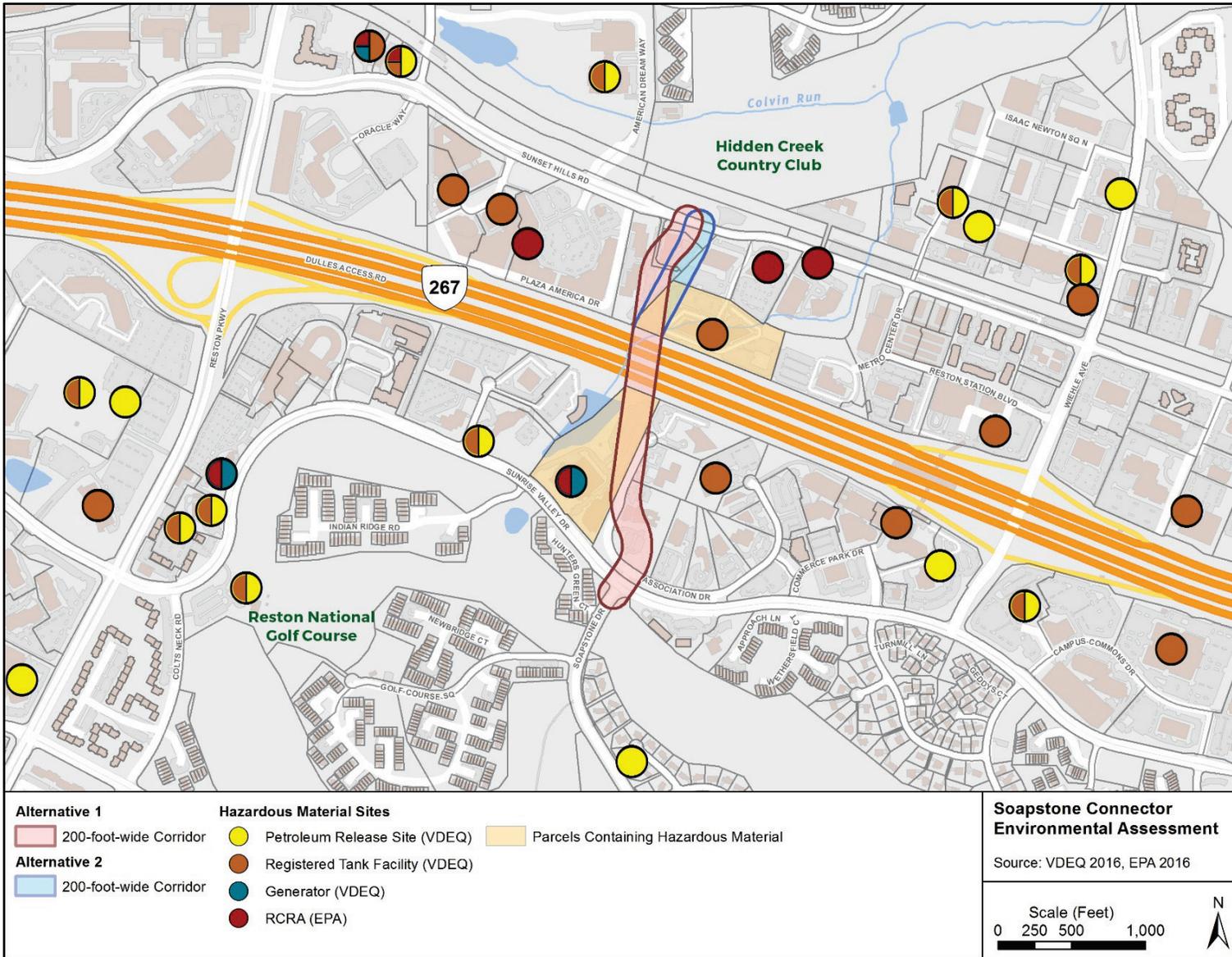


Figure 3-3. Hazardous Materials Sites

3.8 WATER RESOURCES

Water resources are regulated by the US Environmental Protection Agency (EPA) and the US Army Corps of Engineers (USACE) under the federal Clean Water Act and Safe Drinking Water Act (SDWA). Section 404 of the Clean Water Act regulates discharges of dredged or fill material into Waters of the United States (WOUS). WOUS can be generally defined as all navigable waters and waters that have been or can be used for interstate or foreign commerce, their tributaries, and any waters that, if impacted, could affect the former. WOUS include surface waters (streams, lakes, bays, etc.) and their associated wetlands (inundated or saturated areas that support vegetation adapted for life in wet soils). The EPA, USACE, VDEQ, and the Virginia Marine Resources Commission (VMRC) all participate in the issuance of permits for various activities in, under, and over WOUS.

Water resources within and surrounding the study area, as shown in **Figure 3-4**, were identified based on a combination of GIS databases, aerial photography, published lists maintained by federal and state agencies, and field reconnaissance. A detailed delineation of WOUS subject to USACE jurisdiction, including wetlands, will be performed during project design.

Streams and Open Water. The alternative corridors are located within the Potomac-Shenandoah River major watershed. This watershed encompasses a total of 5,702 square miles in Virginia and extends into adjacent states. Within this watershed, the alternative corridors are located within the Middle Potomac-Catoctin 8-digit hydrologic unit code HUC boundaries (HUC code 02070008). More specifically, the alternative corridors are within the Difficult Run 12-digit HUC boundaries (HUC code 020700081004).

According to the National Hydrography Dataset (NHD), the alternative corridors traverse one stream. The stream is identified in the NHD as “Colvin Run,” however, it appears to be a tributary to Colvin Run, which is located approximately 500 feet to the north of the alternative corridors. The tributary that traverses the alternative corridors is an intermittent stream that originates at the stormwater management pond west of the alternative corridors and runs northeastward to its confluence with Colvin Run. The stream is contained within culverts under the Dulles Corridor, parking areas to the north of the Dulles Corridor, and Sunset Hills Road. It daylight briefly between the Dulles Corridor and parking areas, and again within a small open space corridor south of Sunset Hills Road and west of Metro Center Drive.

A 2.4-acre stormwater management pond exists to the west of the alternative corridors on the south side of the Dulles Corridor. The pond has been identified as an environmental quality corridor (EQC) consistent with Policy Plan Objective 9 of the Environment Element of the 2013 Fairfax County Comprehensive Plan. EQCs are established by Fairfax County for the purposes of preserving wildlife habitat and corridors, protecting streams, and reducing pollution. The establishment of EQCs is negotiated between the County and the developer during the permit review process. The core of the EQC system consists of the county’s stream valleys. EQC boundaries are identified based on the presence of streams, floodplains, steep slopes, and wetlands. Supportable activities in EQCs include trails and passive recreation, road and utility crossings, and regional stormwater management ponds (Fairfax County, 2013).

The No Build Alternative would not require alteration of any streams or open water.

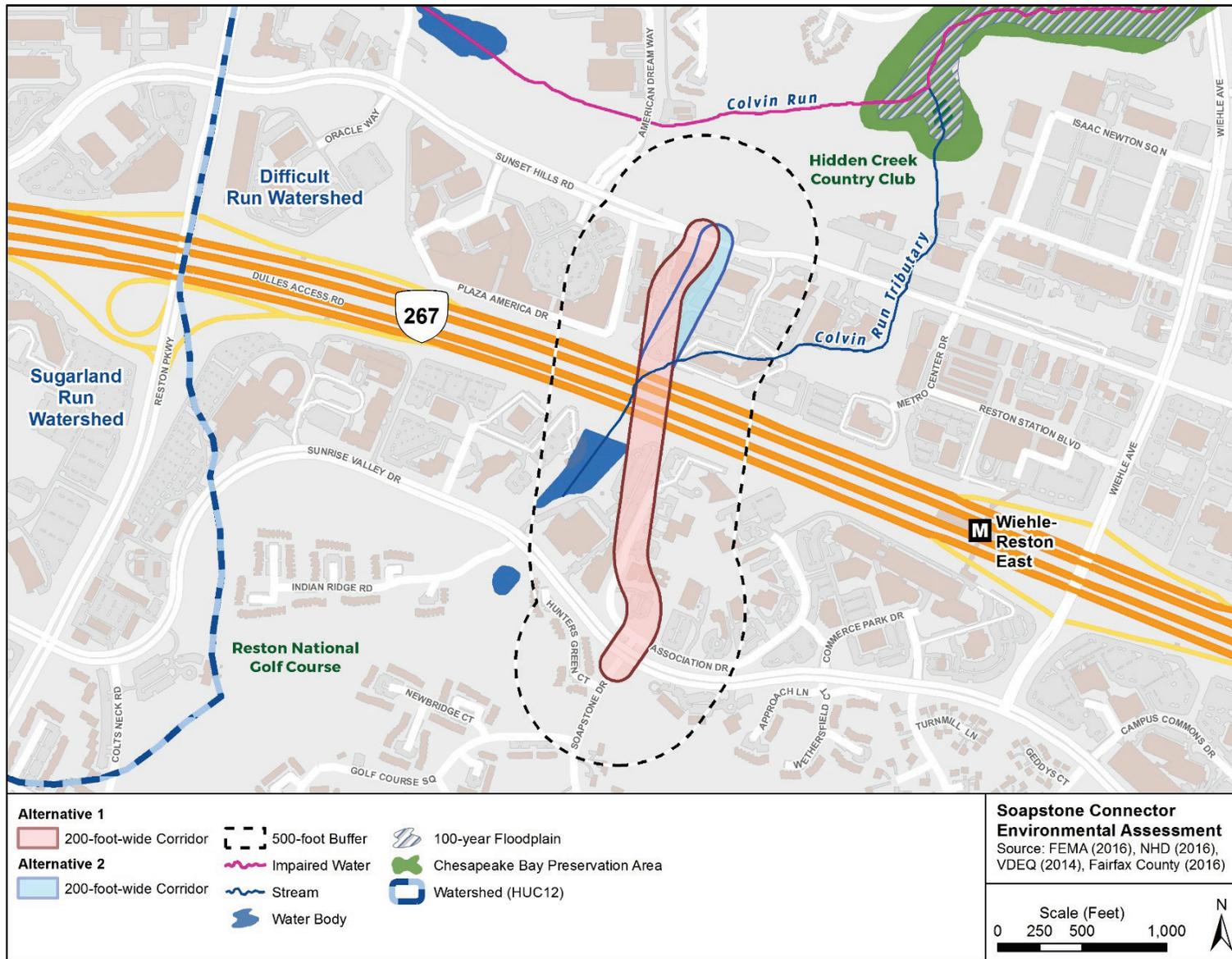


Figure 3-4. Water Resources

Alternative 1 and Alternative 2 would impact up to 259 and 278 linear feet of a tributary to Colvin Run, respectively. Approximately half of the segment of the stream that is within the alternative corridors currently passes through a culvert under the Dulles Corridor and would be unaffected by construction of the Soapstone Connector bridge. The remaining half of the stream segment within the alternative corridors daylights briefly north of the Dulles Corridor before passing through a culvert again under parking areas. This segment of stream would likely be placed within culvert to accommodate construction of the northern Soapstone Connector bridge approach.

A more detailed analysis of stream impacts based on proposed limits of grading for a Build Alternative would be conducted during project design. It is anticipated that permanent impacts to waters of the US, including wetlands, under either Alternative 1 or Alternative 2 would be less than the 1/3 acre threshold for linear transportation projects eligible for CWA Section 404 coverage under the State Program General Permit (12-SPGP-01). Under 12-SPGP-01, permittees must also obtain a VDEQ Virginia Water Protection (VWP) Permit and a VMRC permit (when required) prior to commencement of work in waters of the US. Authorizations under 12-SPGP-01 also require that permittees ensure that their projects are designed and constructed in a manner consistent with all state and local requirements pursuant to Chesapeake Bay Preservation Act (Virginia Code 10.1-2100 *et seq.*) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20-10 *et seq.*), the Virginia Erosion and Sediment Control Regulations (4 VAC 30-50-10 *et seq.*), and the Virginia Stormwater Management Program (VSMP) Permit Regulation (4 VAC 50-60-10 *et seq.*).

Under 12-SPGP-01, stream mitigation is generally required where the total permanent stream channel impacts exceed 300 linear feet for transportation projects. If stream mitigation is required for a Build Alternative, purchase of credits from an approved mitigation bank or payments to the Virginia Aquatic Resources Trust Fund is the anticipated form of stream mitigation. Potential stream impacts occur in the Middle Potomac-Catoctin eight-digit HUC watershed.

Wetlands. Executive Order 11990, Protection of Wetlands, mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural values.

Wetlands are defined by USACE (33 CFR 328.3[b]) and EPA (40 CFR 230.3[t]) as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

According to the National Wetlands Inventory (NWI), there are no wetlands within or adjacent to the alternative corridors. A delineation of wetlands and waters of the US will be performed consistent with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* during project design to verify the presence or absence of wetlands within the alternative corridors. Given that the project is located within urban lands developed for commercial and office use, there is limited probability of identifying extensive wetland features.

The No Build Alternative would have no impact on wetlands.

No impacts to wetlands are anticipated for Alternative 1 or Alternative 2. As noted above, it is anticipated that permanent impacts to waters of the US, including wetlands, under either Alternative 1 or Alternative 2 would be less than the 1/3-acre threshold for linear transportation projects eligible for CWA Section 404 coverage under the 12-SPGP-01. Mitigation for any unavoidable wetland impacts would be developed in coordination with the USACE and VDEQ during the permitting process. Use of credits from an approved mitigation bank or payments to the Virginia Aquatic Resources Trust Fund would be the anticipated form of wetlands mitigation for the project, if mitigation is necessary.

Water Quality. The following discussions address potential project effects on impaired surface waters and public drinking water supplies. Pollutants of concern, sources of pollutants, and programs to restore water quality in the affected water bodies are described to provide a context for evaluating potential project effects on water quality.

Impaired Waters

In compliance with Sections 303(d), 305(b), and 314 of the federal Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA), the VDEQ monitors streams for a variety of water quality parameters, including temperature, dissolved oxygen, pH, fecal coliform, e. coli, enterococci, total phosphorus, chlorophyll a, and benthic invertebrates, as well as metals and toxics in the water column, sediments, and fish tissues. VDEQ regularly rates Virginia's streams and other water bodies based on their ability to support designated uses of the waters by humans or aquatic life. Waters designated as "impaired" are those that do not support one or more uses, which include aquatic life use, fish consumption use, shellfishing use, recreation use (swimming, boating), public water supply, and wildlife use. Both human activities and natural processes can cause impaired water quality. All human-caused impaired waters in Virginia are placed on a federally mandated 303(d) impaired waters list.

Virginia's 1997 Water Quality Monitoring Information and Restoration Act (Section 62.1-44.19.7) requires a plan to restore water quality and associated designated use(s) of impaired waters. VDEQ schedules each of these waters for development of a Total Maximum Daily Load (TMDL), which is a reduction plan that defines the limit of a pollutant(s) that a water body can receive and still meet water quality standards. A TMDL Implementation Plan is developed after a TMDL is approved by EPA. Once developed, a TMDL Implementation Plan is incorporated into the appropriate Water Quality Management Plan in accordance with CWA Section 303(e). Once fully implemented, the Water Quality Management Plan will restore the impaired waters and maintain its water quality.

While there are no impaired waters within the alternative corridors, the unnamed tributary that crosses the alternative corridors drains into Colvin Run, which is listed as impaired for aquatic life from its headwaters to its confluence with an unnamed tributary flowing from Lake Anne (VDEQ, 2016a). The impaired segment of Colvin Run is approximately 0.6 mile downstream from the alternative corridors. There is currently no TMDL Report for Colvin Run; however, information regarding causes of impairment in the TMDL report for Difficult Run, which is also impaired for aquatic life and is downstream from Colvin Run, suggests that similar causes may be applicable to Colvin Run. Those causes are primarily sedimentation and higher runoff flows attributable to ongoing urbanization of the watershed.

According to the Difficult Run TMDL report, improvement of the benthic community in the biologically impaired segment of Difficult Run is dependent upon reducing sediment loadings within the watershed through stormwater control, as well as restoring instream and riparian habitat to alleviate the impacts of urbanization on the river (VDEQ, 2008).

The No Build Alternative would not introduce new ground disturbance, result in an increase in impervious surfaces, or introduce chemicals of concern within the project area. Therefore, the No Build Alternative would not contribute to erosion and sedimentation levels and toxicity within nearby streams.

The Build Alternatives could potentially result in a short-term increase in sedimentation and possible spills or non-point source pollutants entering groundwater or surface water from storm runoff during project construction. Potential short-term impacts of the proposed project will be minimized with implementation of appropriate erosion and sediment control practices in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT's *Road and Bridge Specifications*. These specifications also prohibit contractors from discharging any contaminant that may affect water quality. Care will be taken while transporting materials in and out of the project site. In the event of accidental spills, the contractor is required to immediately notify all appropriate local, state, and federal agencies and to take immediate action to contain and remove the contaminant. Additionally, the requirements and special conditions of any required permits for work in and around surface waters would be incorporated into construction contract documents, so that the contractor would be required to comply with such conditions.

Minor long-term water quality effects could occur as a result of the Build Alternatives. Potential long-term effects include increases in impervious surfaces, increases in traffic volumes, and consequent increases in pollutants washed from the road surface into receiving water bodies. Increases in impervious surfaces can potentially increase stormwater flows, thus increasing sedimentation and turbidity problems in benthic impaired waters, such as Colvin Run.

Conveyance of stormwater from the Build Alternatives will require compliance with the Virginia Pollutant Discharge Elimination System (VPDES) standards and stormwater management regulations. Detailed hydrological studies will be conducted during project design to develop stormwater management measures in accordance with federal, state, and local regulations to minimize potential water quality impacts. The hydrological studies will include examination of whether the existing stormwater management pond west of the alternative corridors would provide adequate detention and treatment volume to accommodate stormwater flows from the project site, or if additional stormwater management measures, such as vegetated swales, infiltration trenches, and other measures, are warranted. Stormwater management measures will be designed to reduce or detain discharge volumes and remove sediments and other pollutants, thus avoiding substantial further degradation of impaired water bodies in the project vicinity.

Chesapeake Bay Regulations

Stormwater runoff from the project area ultimately drains into the Potomac River; therefore, by way of the Potomac River, the project area is part of the watershed of the Chesapeake Bay. In 1988, the Virginia General Assembly enacted the Chesapeake Bay Preservation Act (Bay Act) to improve water quality in the Chesapeake Bay and other waters of the State by requiring the use of effective land management and land use planning. The lands that make up Chesapeake Bay Preservation Areas are those that have the potential to impact water quality most directly (VDEQ, 2016b).

To implement the Bay Act, Fairfax County adopted the Chesapeake Bay Preservation Ordinance in 1993, which regulates the kinds of development that can occur in sensitive areas along streams that drain into the Potomac River and eventually the Bay. These sensitive areas are known as Resource Protection Areas (RPAs) and include the following features: 1) tidal shores and wetlands, 2) water bodies with perennial flow, 3) nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow, and 4) a buffer area that includes any land within a major floodplain or any land within 100 feet of the listed features.

There are no RPAs within the alternative corridors. The one stream that traverses the corridors is an intermittent stream. There are no wetlands or floodplains within the alternative corridors.

On May 12, 2009, President Obama signed Executive Order (EO) 13508 on Chesapeake Bay Protection and Restoration, which directs certain federal agencies to collaboratively develop strategies and recommendations for protecting and restoring the Chesapeake Bay. One of the outcomes of those strategies and recommendations was the establishment by EPA of the Chesapeake Bay TMDL in 2010 under the auspices of the federal Clean Water Act. The Bay TMDL establishes limits for the amount of nutrients and sediment allowed to flow into the Bay from Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025, with at least 60 percent of the actions completed by 2017.

The No Build Alternative would not alter development within RPAs or contribute additional nutrient and sediment loads toward the TMDL for the Bay.

Neither Alternative 1 nor Alternative 2 propose any development within RPAs, as there are no RPAs within the alternative corridors. Construction of either alternative will require a VPDES permit, which requires consistency with TMDL waste load allocations in accordance with federal Clean Water Act regulations. Accordingly, the project will conform to the goals of Executive Order 13508.

3.9 COASTAL ZONE MANAGEMENT AREAS

The federal Coastal Zone Management Act (CZMA) of 1972 and federal consistency regulations (15 CFR § 930) stipulate that federal activities in Virginia's coastal zone must be consistent with the enforceable policies of the Coastal Zone Management Program (CZMP). VDEQ administers the Virginia CZMP through a network of state agencies and local governments, which share responsibility for administering the enforceable policies. The policies are related to fisheries management, subaqueous lands management, wetlands management, dunes management, non-point source pollution control, point source pollution control, shoreline sanitation, air pollution control, and coastal lands management. The entire project is within Virginia's designated coastal zone. Therefore, a consistency determination will be coordinated with VDEQ during the permitting phase. Implementation of the project will be conducted in a manner that is consistent with the Virginia CZMP to the maximum extent practicable as defined in 15 CFR § 930.32.

3.10 THREATENED AND ENDANGERED SPECIES

The US Fish and Wildlife Service (USFWS) is responsible for listing, protecting, and managing federally listed threatened and endangered species under the Endangered Species Act of 1973, as amended (ESA). The ESA defines an endangered species as one that is in danger of extinction throughout all or in a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future (16 USC 1532).

Information regarding threatened and endangered species that may be affected by the proposed project was requested from USFWS via the Information Planning and Conservation (IPaC) on-line system in July 2016. One of the goals of the IPaC system is to streamline the environmental review process associated with Section 7 of the ESA. Based on an official species list received from the USFWS in response to the IPaC request for the project (USFWS, 2016a), one federally listed species was identified with the potential to occur in the alternative corridors, the northern long-eared bat (*Myotis septentrionalis*), as listed in **Table 3-5**. In addition, the bald eagle (*Haliaeetus leucocephalus*), which is protected by the Bald and Golden Eagle Protection Act (16 USC 669 et seq.), was mentioned in the USFWS IPaC response.

The Commonwealth of Virginia also has a listing of state endangered or threatened species. VDCR and VDGIF are responsible for listing, protecting, and managing State listed threatened and endangered species. The VDGIF's Species Observation Database (SppObs) contains no known occurrences of federal or state listed wildlife species in the corridor (VDOT, 2015a). However, correspondence with the VDGIF identified one state-listed species known to occur in the region and thus having the potential to occur in the alternative corridors, the wood turtle (*Glyptemys insculpta*), as listed in Table 3-5 (VDGIF, 2015).

Table 3-5. Special Status Species Potentially Occurring in Corridor

Common Name	Scientific Name	Status	Habitat
REPTILES			
Wood turtle	<i>Glyptemys insculpta</i>	State Listed Threatened	Forested floodplains, fields, wet meadows, and farmland, with nearby streams
MAMMALS			
Northern long-eared bat	<i>Myotis septentrionalis</i>	Federally listed Threatened	Caves and cave-like structures (hibernacula), forests, trees (roosting and foraging)
BIRDS			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not Listed, Protected by Bald and Golden Eagle Protection Act	Nest in tall hardwood trees with open canopies in close proximity to water bodies where they forage

Source: USFWS, 2016a; VDGIF, 2015; VDOT 2015a

Additional information on these species is provided below, along with characterizations of potential effects of the Build Alternatives on them, if present.

Northern Long-eared Bat. The northern long-eared bat (*Myotis septentrionalis*) was federally listed as threatened effective May 4, 2015 (80 FR 17974). The northern long-eared bat is a medium-sized bat weighing 0.2 to 0.3 oz. As indicated by its name, the northern long-eared bat is distinguished from other *Myotis* species by its relatively long ears (average 0.7 inches). The northern long-eared bat ranges across much of the eastern and north central United States (including all or portions of 37 States and the District of Columbia) and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia. Winter habitat includes underground caves and cave-like structures such as abandoned or active mines, tunnels, and

highway underpasses. These hibernacula typically have high humidity, minimal air currents, large passages with cracks and crevices for roosting, and maintain a relatively cool temperature, 32 to 48 degrees Fahrenheit. During summer, northern long-eared bats typically roost singly or in colonies underneath bark or in cavities or crevices of both live trees and snags. Northern long-eared bats most likely are not dependent on certain species of trees for roosts throughout their range; rather, many tree species that form suitable cavities or retain bark will be used by the bats opportunistically. Northern long-eared bats also will roost in manmade structures, such as barns and the undersides of bridges. Northern long-eared bats migrate between their winter hibernacula and summer habitat, typically between mid-March and mid-May in the spring, and mid-August and mid-October in the fall. They are considered a short-distance migrant (typically 35 - 55 mi). Northern long-eared bats are nocturnal foragers, catching a diverse variety of insects in flight or picking them from surfaces. Most foraging occurs above the understory 3 to 10 feet above the ground, but under the canopy on forested hillsides and ridges, rather than along riparian areas. Mature forests are an important habitat type for foraging. The primary threat cited for listing the species is white-nose syndrome, an infectious disease caused by the fungus *Pseudogynous destructans*. However, other threats do exist, such as modifications or destruction of hibernacula and forest conversions or modifications,

There are no known northern long-eared bat hibernacula in the vicinity of the alternative corridors. Nor are there any known occurrences of summer roosting or foraging northern long-eared bats in the vicinity of the alternative corridors. Northern long-eared bats could potentially roost in trees within the alternative corridors; however, foraging habitat conditions within 0.5 mile of the alternative corridors are poor due to fragmentation from urban development.

The No Build Alternative would not impact hibernacula or summer roosting and foraging habitat for northern long-eared bats. The Build Alternatives would disturb potential summer roosting habitat for northern long-eared bat through tree removal. The USFWS issued a 4(d) Rule for the Northern Long-Eared Bat (50 CFR Part 17) on January 14, 2016, which prohibits incidental take resulting from tree removal if it 1) occurs within a 0.25-mile radius of known northern long-eared bat hibernacula; or 2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1 through July 31). Incidental take of northern-long-eared bats from activities not prohibited by the 4(d) rule were evaluated within the USFWS's *Programmatic Biological Opinion for the Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions*. The Biological Opinion concluded that such activities are not likely to jeopardize the continued existence of the northern long-eared bat. Federal agencies may rely on the Biological Opinion to fulfill their project-specific Section 7 consultation responsibilities and no additional coordination regarding the species is required (USFWS, 2016b).

Bald Eagle. The bald eagle (*Haliaeetus leucocephalus*) is not federally listed as threatened or endangered but is nevertheless protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 669 *et seq*). Therefore, it is often included, as here, in discussions of threatened and endangered species. In Virginia, bald eagles are most commonly found along the James, Rappahannock, and Potomac Rivers. This species builds nests in tall hardwood trees with open canopies in close proximity to water bodies, where they forage. The nearest known bald eagle nest is approximately four miles from the proposed project area. The USFWS recommends a buffer of 660 feet around bald eagle nests for proposed clearing, construction, and landscaping activities (USFWS, 2007). The Build Alternatives are not expected to affect bald eagles because there are no bald eagle concentration areas along the alternative corridors and the nearest nest is

well over 660 feet from the project site. No impacts to this species would occur under the No Build Alternative either.

Wood Turtle. The wood turtle (*Glyptemys insculpta*) is listed as state threatened and also listed under Tier 1 of the Virginia Wildlife Action Plan as “Critical Conservation Need” (VDGIF, 2016a). This species is a medium-sized turtle, up to 9 inches in length, with a keeled, sculpted carapace.

In Virginia, the wood turtle has a restricted range extending from Arlington and northern Fairfax Counties westward through Loudoun and Clarke Counties to Frederick, Warren, and Shenandoah Counties. It inhabits a variety of habitats, such as forested floodplains, fields, wet meadows, and farmland, with a creek or stream nearby. The wood turtle is generally terrestrial during the warm part of the year and aquatic during cool spells and hibernation. It hibernates in deep pools or under the mud or sand bottom of its waterways, or sits on the bottom or under overhanging roots of trees along the bank.

Wood turtle populations have declined due to degradation of aquatic habitats, loss of wetlands, fragmentation of habitats, urbanization, being killed by vehicular traffic, and from the collection of adults and juveniles for the pet trade (VDGIF, 2016b).

Habitat conditions for wood turtles within and adjacent to the alternative corridors are poor because there is a lack of forested floodplains, wet meadows, fields, or farmland, and aquatic habitat along the unnamed tributary that traverses the corridors has been impacted by culverts. It is therefore unlikely that wood turtles are present within the alternative corridors. The nearest potential habitat for wood turtles occurs along Colvin Run, approximately 250 feet north of the alternative corridors.

Neither the No Build Alternative nor the Build Alternatives would require removal of potential habitat for wood turtles. Because of the lack of suitable wood turtle habitat to either side of the alternative corridors, the proposed roadway is not likely to present a collision hazard for turtles.

3.11 INDIRECT EFFECTS

Indirect effects are those that are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8(a)). The analysis of indirect effects followed a seven-step process described in the Transportation Research Board’s (TRB) National Cooperative Highway Research Program (NCHRP) Report 466, *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (TRB, 2002) and outlined below. To complete these steps, the required analyses rely on planning judgment. The NCHRP 25-25 program, Task 22, *Forecasting Indirect Land Use Effects on Transportation Projects*, documents means of applying planning judgment to indirect and cumulative effects analyses (TRB, 2007). The direction provided in the TRB document is the basis for the indirect effects analyses presented below.

Step 1: Scoping. Fairfax County, in cooperation with VDOT and FHWA, has coordinated with local, state, and federal agencies throughout the Soapstone Connector environmental review process. Fairfax County has also conducted an inclusive public involvement program. Additional details on the coordination can be found in Section 4 Comments and Coordination.

Step 2: Identify Study Area Direction and Goals. The alternative corridors shown in Figure 3-1 were the starting point for identifying boundaries of the resource-specific study areas described

below. Each resource-specific study area includes the alternative corridors plus additional lands that contain resources that are in some way connected to the area of direct effects of the proposed project. The following study areas have been defined for use in both the indirect and cumulative effects analyses. These areas have been designed to be large enough to encompass regional resources of concern that were identified during the scoping phase.

Social and Economic Resources, and Parks, Recreation, and Open Space Easements: This study area includes the residential communities, businesses, and recreational facilities of Reston, Virginia, a planned community within Fairfax County, which surrounds the alternative corridors. It is the people who live and/or work within Reston that would be affected by construction and operation of the Soapstone Connector. This study area is designed to be broad enough to consider whether the proposed project would result in induced growth effects and how direct right of way impacts might affect the availability of certain land uses within the community as a whole.

Historic Properties: The study area for indirect and cumulative effects to historic properties is the same as the area of potential effects (APE) for architectural and archaeological resources as defined in the historic properties analysis. For archaeological resources, the APE includes the project area footprint, inclusive of any areas where soil-disturbing activities are planned. For architectural resources, the APE includes a broader area beyond the roadway footprint to assess potential visual and audible effects the new roadway and overpass.

Natural Resources: The study area for indirect and cumulative effects to natural resources includes the Difficult Run 12-digit HUC boundaries (HUC code 020700081004) that encompass the project limits. This is the area within which there is potential for indirect effects on waters downstream of the project. This area is roughly bounded by Reston Parkway to the west, Georgetown Pike to the north, the I-495 Capital Beltway to the east, and I-66 to the south. It includes lower density residential developments and parklands that provide habitat for wildlife, which could potentially be indirectly affected by the Build Alternatives.

Each of the above study areas are within the jurisdiction of Fairfax County, which has been experiencing steady growth since the 1950s. Population projections by the Weldon Cooper Center predict continued growth. Employment also is projected to continue increasing over the next several decades.

The development of Reston is guided by the Reston Master Plan, which is part of the adopted Fairfax County Comprehensive Plan. A principal design concept for Reston is the clustering of neighborhoods served by a Village Center. The Village Centers provide community gathering spaces, neighborhood-serving retail, personal services, office, and civic uses. Employment uses were planned for areas north and south of the Dulles Corridor. This area, which includes the alternative corridors, is now the focus for mixed use development oriented to three Metrorail stations. Another key feature of the Reston Master Plan is lower density residential development or open space buffers along the boundaries of the community in order to be compatible with low density neighborhoods adjacent to Reston (Fairfax County, 2013).

Step 3: Identify Notable Features in the Study Area. The objective of this step is to identify specific environmental issues within the indirect effects study areas against which the proposed project may be assessed. This is accomplished through conducting an inventory of notable features for each resource of concern. Notable features include specific valued, vulnerable, or unique elements of the environment. For the purposes of this analysis, all resources included for evaluation were identified as notable features, for which indirect effects were considered.

Notable features considered within the alternative corridors are summarized in Table 3-1. More specific information regarding notable features for each resource, including features that lie outside of the alternative corridors, is provided in Sections 3.2 through 3.11.

Step 4: Identify Impact Causing Activities of the Proposed Alternatives. Step 4 identifies the impact-causing activities of the alternatives so that they may be compared with the goals and trends identified in Step 2 and the notable features identified in Step 3 to assess whether a potential for indirect effects exists (Step 5). General types of project impact-causing activities include earthwork (clearing, excavation, and filling); landscaping and erosion control; remediation and reforestation; changes in traffic patterns; and changes in access. These activities have been considered in the analysis of direct effects for each resource in Sections 3.2 through 3.11. Direct effects that may result from the proposed project can potentially trigger indirect effects through encroachment and alteration of the environment farther in distance or time.

In addition to indirect effects that can be triggered by project encroachment, indirect effects can also occur as a result of induced changes in land use patterns, population density, or growth rate that would otherwise not be expected without implementation of a proposed project. General circumstances influencing the likelihood of induced development within a region that is undergoing urbanization include:

- Extent and maturity of existing transportation infrastructure
- Accessibility
- Location attractiveness
- State of the regional economy
- Land availability and value
- Availability of utilities
- Area vacancy rates
- Local political/regulatory conditions
- Land use controls

The influence of roadway projects on growth and development depends in part upon the extent and accessibility of the existing transportation infrastructure. The potential for growth inducement as a result of roadway projects is generally greatest where existing transportation infrastructure is lacking (TRB, 2002). The project is located adjacent to the Dulles Corridor, which includes VA Route 267 (Dulles Toll Road), the Dulles International Airport Access Highway (DIAAH), and the Silver Line of the Metrorail system. The Wiehle-Reston East Metrorail Station provides access to the Metrorail system and connects Reston to many locations within the greater Washington, DC metropolitan area. Main roadways in the study area include Reston Parkway, Wiehle Avenue, Sunset Hills Road, and Sunrise Valley Drive. Smaller streets and driveways provide access to individual buildings and developments within the study area. The Soapstone Connector would reduce congestion and improve accessibility, mobility, and multimodal connectivity to and within the area surrounding the Wiehle-Reston East Metrorail Station. These improvements represent incremental improvements to access within an area that is already developed and currently has access to the Wiehle-Reston East Metrorail Station rather than opening up new access where none existed before. Therefore, the potential for the project to induce growth due to increased accessibility is expected to be low.

A location's attractiveness and the strength of the regional economy are positively correlated with the potential for growth in a given area. Fairfax County is a major employment center in the greater Washington, DC metropolitan area. Predictions for continued population growth (see

Section 3.2.2) attest to the high level of attractiveness and the strength of the economy of Fairfax County. The presence of the Wiehle-Reston East Metrorail Station likely attracts people to live or establish businesses in proximity to the station. The Build Alternatives would reduce congestion and improve access and mobility in and around the Wiehle-Reston East Metrorail Station; however, these improvements are not expected to noticeably contribute to the attractiveness of the project vicinity.

The rate of population growth and development within a locality depends upon land availability and local political conditions and land use controls. The availability of developable land within Reston is limited due to development restrictions designed to maintain low-density residential communities and open space within much of Reston. A review of property listings on realty business websites (Tulia.com and Loopnet.com) in August 2016 revealed a considerable number of home and business vacancies, including 416 homes and four commercial properties for sale, and 195 homes and 44 commercial properties for lease. These vacancies will serve to accommodate just a small fraction of the total population growth projected for Fairfax County.

While local demographic and economic conditions (i.e., growing population, increased employment opportunities, and low property taxes) are generally favorable for increased development within Reston, development is regulated and controlled by the Reston Master Plan, the use of the Planned Residential Community zoning district, and planned community deed covenants. A large proportion of Reston is currently designated for low density residential and protected open space (Fairfax County, 2013). Regulatory requirements, such as Municipal Separate Storm Sewer System (MS4) permit requirements, also may influence local land use decisions.

In conclusion, the Build Alternatives would not provide access to any currently inaccessible areas that would act as a catalyst for development that could not occur in the absence of the project. It is anticipated that the Build Alternatives would not substantially encourage or accelerate any changes in land use that are not already anticipated. In fact, the Soapstone Connector is presented within the transportation section of the Fairfax County Comprehensive Plan as a proposed highway overpass. Therefore, the Build Alternatives are consistent with the future condition of land use that is already anticipated and planned for by Fairfax County.

Step 5: Identify Indirect Effects for Analysis. The objective of this step is to assess whether notable features identified in Step 3 would be indirectly affected by the Build Alternatives, taking into consideration the impact-causing activities and direct effects in Step 4. The following subjects were determined to potentially experience indirect effects from the Build Alternatives and were thus selected to move forward to the analysis of indirect effects in Step 6:

- Socioeconomics and Economic Resources
- Parks, Recreation and Open Space Easements
- Historic Properties
- Water Resources
- Wildlife and Threatened and Endangered Species

Step 6: Analyze Indirect Effects and Evaluate Analysis Results.

Social and Economic Resources

Under the No Build Alternative, the population of Fairfax County is expected to continue to grow. Several development and transportation projects are ongoing or planned in Reston. As discussed in Step 4, the proposed project is not expected to substantially encourage or accelerate

any changes in land use that are not already expected within the analysis area. The proposed project lies within a well-developed urban area, and it would not provide access to any currently inaccessible areas that would act as a catalyst for industrial, commercial, or residential development that could not occur in the absence of the project, nor would the project reduce the attractiveness of the area for residents or businesses already located there.

Both Alternatives 1 and 2 have the potential to require the relocation of two businesses. Given that alternative commercial properties are available within the community of Reston, no indirect impacts on the availability of the commercial properties are anticipated.

Parks, Recreation, and Open Space Easements

One park and recreation resource, the Washington and Old Dominion (W&OD) Railroad Regional Park, lies just beyond the northern terminus of the alternative corridors. Under the No Build Alternative, the W&OD Railroad Regional Park would continue to be affected by proximity effects such as air quality, noise, and visual impacts from adjacent commercial development and traffic along Sunset Hills Road.

The Build Alternatives would not require direct and permanent use of land from the W&OD Railroad Regional Park. There would be no additional air quality or noise impacts from the proposed project on this recreational resource.

Historic Properties

A determination of no adverse effect has been made and concurred in by the Virginia State Historic Preservation Officer. VDHR concurred that the Soapstone Connector project will have no adverse effect on historic properties on January 12, 2017.

Water Resources

Under the No Build Alternative, stormwater runoff from existing urban development within and adjacent to the alternative corridors will continue to transport sediments and contaminants to local waterbodies, including impaired streams.

Both Build Alternatives involve direct impacts to an unnamed tributary as a result of roadway and bridge construction. This discussion focuses on the potential indirect effects of these activities on water resources from a water quality perspective, while the potential indirect effects on aquatic communities from a habitat perspective are discussed below.

Potential temporary indirect impacts of the Build Alternatives during project construction include increased downstream sedimentation and turbidity from in-stream work, and possible spills or non-point source pollutants entering groundwater or surface water from storm runoff. Each of the Build Alternatives involve construction of new roadway, which will increase the amount of impervious surface within the alternative corridors, resulting in increased stormwater runoff flows from the roadway. If untreated, increased flows would incrementally increase the transport of sediments and roadway contaminants to the unnamed tributary crossed by the alternative alignments. These pollutants can then be transported further downstream and into wetland areas. Increased sedimentation is particularly of concern in benthic impaired waters such as Colvin Run and Difficult Run.

Pollutant levels in runoff and the extent of downstream impacts are very difficult to quantify because there are many variables, including traffic volumes, rainfall volume and frequency, surrounding land use, and stream dynamics. Given that a meaningful projection of the extent of pollutant loads from each alternative cannot be made without extensive analysis, the best

predictor of relative degree of impacts would then be the number of stream crossings and the amount of increase in impervious surfaces for each alternative. Both Build Alternatives would require one crossing of one unnamed tributary to Colvin Run. Specific quantities of additional impervious surfaces for each Build Alternative are not yet known, but are expected to be similar given that the same number of travel lanes and similar roadway length are proposed. In addition, the amount of existing impervious surface within each 200-foot-wide alternative corridor is similar (59% for Alternative 1 and 58% for Alternative 2).

Wildlife and Threatened and Endangered Species

Wildlife habitat within the study area is highly fragmented and previously disturbed by the Dulles Corridor, other roadways, and commercial and residential development. While the No Build Alternative would not result in further fragmentation of wildlife habitats, present and planned future development and transportation projects would continue to reduce habitat areas. Under the No Build Alternative, wildlife that occupy nearby forested habitats within parks and low-density residential areas will continue to experience disturbance from traffic noise, habitat degradation from soil erosion and contamination, introduction of invasive plants, and risk of collision with vehicles. Stream hydrology and water quality within aquatic habitats downstream of the project site are currently affected by erosive stormwater velocities and transport of sediment and roadway contaminants in stormwater runoff.

The Build Alternatives would require the removal of individual trees within existing office and commercial developments. The Build Alternatives would not result in the direct loss of forest or other sensitive wildlife habitats and therefore would not contribute to habitat fragmentation within the study area. The nearest natural habitat areas are more than 0.5 mile from the alternative corridors and would not be subject to traffic noise from the new roadway. The unnamed tributary to Colvin Run that would be impacted by the Build Alternatives is almost entirely within culverts within 500 feet to either side of the alternative corridors and thus currently provides poor quality habitat for aquatic life.

The indirect impacts to water quality discussed above would potentially affect habitat quality for aquatic species living in streams and wetlands downstream of the alternative corridors. Sediments and pollutants in runoff may contribute to changes in macrobenthic community structure and composition, affecting fish and amphibian populations that rely on them as a food source, as well as birds and mammals higher on the food chain.

Direct impacts to the one federal and one state-listed threatened and endangered species (northern long-eared bat and wood turtle, respectively) that potentially occur within the project vicinity are not anticipated because habitat conditions within and adjacent to the alternative corridors are poor and the presence of these species is not likely. Potential indirect effects to downstream habitat is a concern for the wood turtle.

The Build Alternatives would increase the proportion of the unnamed tributary that is placed within culverts. Current stream flow volumes or velocities are influenced by existing culverts. New culverts would be designed to avoid or minimize increases in stream flow volumes and velocities. However, these modifications would result in further hardening of the stream corridor, making it incrementally more difficult for animals and aquatic organisms to cross through pipes. Notwithstanding, no significant indirect impacts to aquatic communities as a result of changes in hydrology, stream bank erosion, or vegetative species composition are anticipated.

Step 7: Assess Consequences and Develop Mitigation. Potential indirect effects to water resources and aquatic habitats were identified for the Build Alternatives in Step 6. While planning judgment allows for the identification of potential indirect effects, insufficient data exists to fully assess the consequences of these indirect effects. For example, while it is reasonable to predict that direct impacts to water quality may occur at the stream crossings, there is not enough information to determine how far downstream such impacts would actually occur. Despite the lack of detailed data, the consequences of the indirect effects are expected to be minimal because the Build Alternatives would convert one type of urban use (commercial and office use) to another urban use (transportation) that is consistent with local plans and would result in minimal direct impacts. In addition, indirect effects of the Build Alternatives would be minimized with the application of avoidance, minimization, and mitigation measures described in the following paragraphs.

Water Resources

Some impacts, such as increased downstream sedimentation and turbidity from in-stream work, and possible spills or non-point source pollutants entering groundwater or surface water from storm runoff, may occur during construction. These short-term impacts would be minimized with the implementation of appropriate erosion and sediment control practices in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT's *Road and Bridge Specifications*. As noted in Step 6, increased sedimentation is of particular concern in benthic impaired waters such as Colvin Run and Difficult Run. Stormwater management measures, such as vegetated swales, infiltration trenches and other measures, will be implemented in accordance with federal, state, and local regulations to minimize on-site and downstream water quality impacts. These stormwater management measures will reduce or detain discharge volumes and remove sediments and other pollutants, thus avoiding substantial further degradation of impaired streams and wetlands.

Wildlife Habitat and Threatened and Endangered Species

The potential for the establishment of invasive species during construction would be minimized by following provisions in VDOT's *Road and Bridge Specifications*. In order to prevent the introduction of new invasive species and to prevent the spread of existing populations, best management practices would be followed, including washing machinery before it enters the area, minimizing ground disturbance, and reseeded of disturbed area with seeds that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications that ensure that seed mixes are free of noxious species. It is unlikely that the risk of wildlife-vehicle collisions would perceptibly increase under the Build Alternatives due to the lack of forested areas, riparian corridors, or other natural habitat areas to either side of the proposed roadway. Potential indirect effects to water quality downstream of the alternative corridors is a concern for the state-listed wood turtle. As indicated in the Water Resources paragraph above, stormwater management measures, such as vegetated swales, infiltration trenches, and other measures will be implemented in accordance with federal, state, and local regulations to minimize on-site and downstream water quality impacts. These measures will reduce or detain discharge volumes and remove sediments and other pollutants, thus avoiding substantial further degradation of impaired streams and wetlands.

3.12 CUMULATIVE EFFECTS

Cumulative effects are defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative effects analysis is based on a five-part evaluation process based on FHWA guidance (FHWA, 2014):

1. What is the geographic area affected by the project?
2. What are the resources affected by the project?
3. What are the other past, present, and reasonably foreseeable actions that have impacted these resources?
4. What were those impacts?
5. What is the overall impact on these various resources from the accumulation of the actions?

Geographic Area and Time Span. The geographic limits of the resource specific study areas used for the cumulative effects analysis is the same as those used for the indirect effects analysis, described in Section 3.12. The time span for the analysis is from the early 1960s (when the construction of Reston began) to 2046, which is the design year for the project (the horizon year for traffic analysis and project design).

Affected Resources. The resources that are affected by the proposed project are those listed as potentially impacted in Table 3-2.

Past, Present, and Reasonably Foreseeable Actions. The past, present and reasonably foreseeable future actions that contribute to cumulative effects are described below. The focus of the discussion is Reston, which encompasses the cumulative study area for social and economic resources and historic resources. A brief discussion of communities outside of Reston that lie within the outer boundaries of the natural resources study area is also provided.

Past Actions

Reston

Prior to 1887, the area that is now Reston was rolling timberland. Between 1887 and 1901, Dr. Carl Adolph Max Wiehle established a small town consisting of a post office, a Town Hall, a church, his mansion, and six or seven homes along the Washington and Old Dominion Railroad east of what is now Town Center Parkway in Reston. The first industry in the area included a mill built for the Maryland and Virginia Serpentine and Talc Company of Baltimore. In 1923, the A. Smith Bowman family bought much of the town from Dr. Wiehle's heirs and established a distillery in the town's old industrial buildings (Gulf Reston, Inc., 1973).

In 1961, all but the distillery and the former Wiehle mansion was acquired by Robert E. Simon, Jr. Simon envisioned establishing a full-scale self-contained city, which he named Reston (the name derived from his initials). The Reston Master Plan was initially adopted in July 1962 and updated periodically through 1989 by the various master developer entities that constructed areas of Reston over time. A principle design concept for Reston is the clustering of neighborhoods in such a way that they can be served by a Village Center (Fairfax County, 2013).

The construction of Reston began in 1963 with the building of a dam within Colvin Run to form the 30-acre Lake Anne and the construction of Lake Anne Village. By the time the 50,000 square-foot commercial development called Lake Anne Village Center was officially opened in

December 1965, there were 227 townhouses, 113 apartments, a 15-story high-rise, and 100 single family detached homes in Lake Anne Village. Recreational facilities included a golf course, riding center, swimming pools, tennis and volleyball courts, playgrounds, and several miles of pedestrian walkways. The residential population was approximately 500 (Gulf Reston, Inc., 1973).

By 1980, the population of Reston had grown substantially and there was much traffic congestion in the area. The Dulles Toll Road was constructed in 1984 to provide local access to communities located between the Capital Beltway (I-495) and Washington Dulles International Airport, including Reston.

In 1991, the portion of Reston located along the Dulles Corridor was designated a Suburban Center in the Fairfax County Comprehensive Plan. The Suburban Center has since been redefined as three separate but contiguous Transit Station Areas (TSA) centered around three Metrorail stations, including the Wiehle-Reston East Metro Station, which opened in 2014.

Other Communities

In addition to Reston, the cumulative study area for natural resources, which includes the Difficult Run watershed (HUC code 020700081004), encompasses portions of the communities of Oakton, Vienna, and Tysons Corner. Like much of northern Virginia, these communities were largely agricultural until the late 1800s. The introduction of the Alexandria, Loudoun, and Hampshire Railroad in 1859 was an impetus for growth within the Town of Vienna, which was originally established in 1767 as Ayr Hill (Town of Vienna, 2016). In the mid-1800s, Oakton was a small rural community, having constructed its first school house in 1854 (Robison, 2004).

With the movement of many Americans from the cities into the suburbs after World War II, the suburban communities of northern Fairfax County grew substantially. The first of Vienna’s modern shopping centers opened in 1954, followed in quick succession by more shopping centers. The commercial development of Tysons Corner began with a Fairfax County Planning Commission proposal in 1961 to make it a “regional business, convention and residential center” (Washington Post, 2014). The Vienna Metrorail Station was constructed in 1986. The Tysons Corner, Greensboro, and Spring Hill Metrorail Stations, which serve the Tysons Corner area, were completed in 2014.

Present and Reasonably Foreseeable Future Actions

Present and reasonably foreseeable future actions are listed in **Table 3-6**. These include transportation projects identified in the *VDOT Six-Year Improvement Program (SYIP)* (VDOT, 2016) as well as other development projects that are planned, under construction, or recently completed in the study area, based on information gathered from the Fairfax County Department of Planning and Zoning (DPZ).

Table 3-6. Present and Reasonably Foreseeable Future Actions

Project Name	Project Description	Status
Reston Metrorail Access Group Recommendations	Facilities for Pedestrians and Bicycles for Reston Town Center Metrorail Station and Wiehle-Reston East Metrorail Station.	Implementation of this project is currently underway. [SYIP]
Sunrise Valley Drive (south side) Sidewalk	Construct sidewalk from Soapstone Drive to South Lakes Drive.	This project is currently in the engineering design phase, with construction projected to be complete

Project Name	Project Description	Status
		in 2017. [SYIP]
Sunrise Valley Drive (north side) Sidewalk	Reconstruct sidewalk from Association Drive to Preston White Drive.	This project is currently in the engineering design phase, with construction projected to be complete in 2017. [SYIP]
Wiehle Avenue and Isaac Newton Square Intersection	Reconstruct intersection of Wiehle Avenue and Isaac Newton Square.	Engineering and right of way acquisition on this project are complete. [SYIP]
Wiehle Avenue and Dulles Toll Road Ramps Sidewalk	Construct facilities for pedestrians and bicycles along the Dulles Toll Road Ramps.	This project is currently under construction. [SYIP]
Wiehle Avenue and the W&OD Trail	Construct a grade-separated crossing of Wiehle Avenue and the W&OD Trail.	This project is currently in the right of way acquisition phase, with construction projected to be complete in 2020. [SYIP]
Sunrise Valley Drive (south side) Sidewalk	Construct sidewalk from Glade Drive to Reston Parkway.	This project is currently in the right of way acquisition phase, with construction projected to be complete in 2018. [SYIP]
Metrorail/Dulles Corridor Project	Extension of Metrorail Silver Line along Dulles Corridor to Dulles International Airport.	Stations west of the project area to be complete by 2020.
Reston Station, Reston Metro Plaza	Mixed-use development with 3,500+ underground parking spaces located directly adjacent to the Wiehle-Reston East Metrorail Station.	Residential building open; Starbucks (the first full-time retailer) opened its doors in September 2016, with a restaurant expected to follow in 2017; 16-story office building under construction; and a hotel is planned for the future.
Reston Heights Expansion, 11844 Sunrise Valley Drive	Expansion of Reston Heights residential, commercial, and office development to include six-story and 15-story residential developments, five-story mixed-use building, and 10-story office, retail, and parking building.	Approved by Fairfax County Board of Supervisors in 2013. Construction ongoing.
RTC West, 12100 Sunset Hills Road	Phase 1: 40,100 square feet of new and converted retail space to complement the office uses at Sunset Hills Road and Town Center Parkway. Phase 2: Add 675,000 square feet residential (700 dwelling units) and 650,000 square feet office space.	Construction on Phase 1 ongoing, with anticipated delivery fall 2017.
General Dynamics Headquarters, 11011 Sunset Hills Road	Construction of a 190,000 square foot office building at 11011 Sunset Hills Road just east of the project area.	Development plans approved by Fairfax County Board of Supervisors in September 2016; site plan has been submitted and is under review; construction anticipated to start by 2018.
Triangle Park, 11501-11519 Sunset Hills Road	Option 1: Residential/office mixed use development with 400 dwelling units, 195,000 square feet of office,	Application accepted for review in March 2016; zoning review in progress but has been on hold due to

Project Name	Project Description	Status
	and 12,000 square feet of retail. Option 2: 400 dwelling units plus an additional 312 residential units and 12,000 square feet of retail. Both options include a possibility for independent/assisted living units within the residential units.	numerous conflicts.
Golf Course Overlook, northwest of the W&OD Trail, currently Golf Course Plaza, a three-story office building with surface parking	Proposed 413 residential dwelling units and 1,000 square feet of secondary retail use.	Application accepted for review in June 2016; zoning review in progress.
Reston Promenade (CRS Sunset Hills, LC)	Proposed 500 residential dwelling units, 91,000 square feet of retail, 178,000 square feet of either office use or hotel.	Application accepted for review in December 2016; zoning review in progress.
CESC Commerce Executive Park, Vornado, 1850 Centennial Park Drive, 11400 and 11440 Commerce Park Drive	1,097,189 square feet mixed use development (residential, office, and hotel) in addition to the 356,496 square feet of existing office uses on site.	Approved by Fairfax County Board of Supervisors in December 2016.
Wiehle Station Ventures, Lincoln at Commerce Park, north of Sunrise Valley Drive, east of Association Drive, and west of Commerce Park Drive	260 residential dwelling units while retaining the 72,637 square feet of existing office uses on site.	Approved by Fairfax County Board of Supervisors in December 2016.
11690 Sunrise Valley Drive, Sekas East (formerly American Press Institute Building)	34 single family attached dwelling units (townhouses) and 10-unit multifamily building.	Approved by Fairfax County Board of Supervisors in July 2016.
11720 Sunrise Valley Drive, Sekas West	54 single family attached dwelling units (townhouses).	Approved by Fairfax County Board of Supervisors in October 2016.
1808 Michael Faraday Court	Seven-story multi-family building with 261 dwelling units.	Zoning application under review.
Lofts at Reston Station (1825 Michael Faraday Drive)	44 dwelling units (32 multi-family units and 12 2-over-2 townhouse units).	Approved by Fairfax County Board of Supervisors in November 2016. Site Plan submitted for review/approval.
1831 Michael Faraday Drive	283 multi-family units and 3 townhouse units.	Planning Commission hearing scheduled for June 2017.
11111 Sunset Hills Road	A multi-family building with 175 dwelling units and 13 townhouse units.	Zoning application under review.
1831 Wiehle Avenue-Midline	(i) Five mid/high-rise multi-family buildings consisting of 739,618 square feet and 713 residential units; (ii) Two multi-family buildings consisting of 203,030 square feet and 127 residential units; (iii) 60 single-family attached residential units consisting of 123,162 square feet; (iv) an independent living facility of 155,100 square feet with 130 units; (v) a high-rise office building consisting of 205,917 square feet of	Zoning application under review

Project Name	Project Description	Status
	office space; and (vi) 260,945 square feet of ground floor retail uses.	
American Armed Forces Mutual Aid Association (AAFMAA), 1850 Old Reston Avenue	Two three-story office buildings totaling approximately 140,000 square feet with the two buildings connected by a below-grade parking structure.	Zoning application under review.
One Reston, Two Reston, 12000 and 12010 Sunrise Valley Drive	2,260 residential dwelling units; 64,000 square feet retail/commercial uses; 90,000 square feet hotel (160 rooms); and a total of 1.18 million square feet of office.	Zoning application under review.
1941 Roland Clarke Place	Two multi-family residential buildings with parking garages.	Zoning application has been submitted.

Impacts. Past actions identified above have changed the landscape dramatically and have resulted in the conversion of forest and agricultural lands to residential, commercial, and industrial uses as the population and economy of communities within the cumulative study area have grown. The effects of these past actions are reflected in the present socioeconomic and environmental conditions that form the baseline for consideration of environmental effects of present and reasonably foreseeable future actions, which include continued residential and commercial developments and transportation improvements to accommodate forecasted growth and provide multimodal options for travel. As indicated in Table 3-6, various development and transportation projects have either been recently completed, are under construction, or are being planned within the study area. These projects include widespread bicycle and pedestrian access improvements; extension of the Metrorail Silver Line to Dulles International Airport; mixed use developments adjacent to Wiehle-Reston East Metrorail Station and along Sunrise Valley Drive; and retail and office developments along Sunset Hills Road.

The resources potentially affected by the Build Alternatives and by past, present, and reasonably foreseeable future actions include social and economic resources; historic properties; water resources; wildlife and threatened and endangered species; air quality; and noise. These resources are taken into consideration in the following discussions of cumulative impacts.

As discussed in Sections 3.2 through Section 3.11, the nature of the direct and indirect impacts under Alternative 1 and Alternative 2 are very similar. While there exist some differences in the extent of resource impacts associated with each alternative, these differences are negligible in the context of the effects of past, present, and reasonably foreseeable future actions. Therefore, the cumulative effects of the Build Alternatives are assumed to be similar and are discussed as one.

Social and Economic Resources

Under the No Build Alternative, the population within the cumulative effects study area is expected to continue to grow. Several development projects are ongoing or planned in the study area. Congestion within the cumulative study area, especially surrounding the Wiehle-Reston East Metrorail Station, would continue to increase.

The Build Alternatives would reduce congestion and improve accessibility, mobility, and multimodal connectivity to and within the area surrounding the Wiehle-Reston East Metrorail

Station. These improvements to mobility would contribute positively to the quality of life in Reston and support the anticipated continued growth of the regional economy.

Like other past, present, and reasonably foreseeable actions, the Build Alternatives are anticipated to require the relocation of businesses. Displacements would occur in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (as amended, 1987). Present and foreseeable future projects would be subject to these regulatory processes that are designed to help avoid substantial impacts to communities. Present and future projects would also be guided by the Fairfax County Comprehensive Plan, which identifies areas for compatible planned growth while accommodating future planned transportation improvements.

Historic Properties

Damage or loss of historic resources was far more prevalent from past actions that occurred prior to the National Historic Preservation Act of 1966. This Act combined with the establishment of historic resource protection objectives at the local planning level have reduced the rate of impacts to historic resources. Still, conflicts between protection of historic properties and development and transportation projects are expected to continue under the No Build Alternative, especially since non-federal actions such as private developments are not subject to the act. Potential cumulative effects include permanent loss and proximity effects (noise and visual impacts) from present and planned future development and transportation projects.

The Build Alternatives would not physically encroach on any historic properties and would have no adverse effect on historic properties (VDHR, 2017). Therefore, the Build Alternatives would not meaningfully contribute to cumulative effects on historic properties.

Water Resources

Past actions have resulted in direct loss of streams and wetlands and degradation of water quality as evidenced by the presence of impaired streams like Colvin Run and Difficult Run within the cumulative study area. The establishment of protections under the Clean Water Act have put into place requirements to protect, monitor, and restore water resources. Fairfax County has established preservation and conservation programs that serve to improve water quality by protecting streams and controlling development. Fairfax County's Environmental Quality Corridor (EQC) system, for example, protects the county's stream valleys by incorporating them into a system of connected parklands and trail systems. The EQC system provides buffer lands that separate streams from land uses and development activities that have the potential to degrade the ecological quality of streams (Fairfax County, 2013). In addition, Fairfax County prepares watershed management plans or studies, such as the Difficult Run Watershed Management Plan, that assess, monitor, and evaluate water quality and identify priorities and best management practices for improving water quality. In the plan, recommended actions are identified for Colvin Run, which is a tributary of Difficult Run. The Colvin Run subwatershed is identified as one of 18 subwatersheds in the Difficult Run watershed, and sites for improvement within the subwatershed are discussed in terms of the specific impairment, a description of the project, and the goal of the project.

While federal regulations, local conservation programs, and improvements in stormwater best management practices have minimized water quality impacts, many waters continue to be impaired and additional efforts are needed to restore water quality to impaired streams. Adverse

cumulative effects on water quality from past, present, and future actions are anticipated to continue under the No Build Alternative.

The Build Alternatives would involve direct loss of a small segment of an unnamed tributary as a result of bridge construction. Stormwater management measures, such as vegetated swales, infiltration trenches, and other measures, will be implemented in accordance with federal, state, and local regulations to minimize on-site and downstream water quality impacts of the Build Alternatives. These measures will reduce or detain discharge volumes and remove sediments and other pollutants, thus avoiding substantial further degradation of impaired water bodies.

Wildlife and Threatened and Endangered Species

Although individual trees and small groups of trees are scattered throughout the alternative corridors, the best wildlife habitat in general, and for the federally threatened northern long-eared bat in particular, would be expected on properties with more expansive contiguous mature tree cover, such as parks that are protected from residential and commercial development. Such properties within the cumulative study area include Lake Fairfax Park, Difficult Run Stream Valley Park, Tamarack Park, and Fred Crabtree Park.

Wildlife habitat within the cumulative study area has been heavily impacted by past actions. Forests and aquatic habitats have been converted to agricultural lands and then to suburban and urban developments. Patches of forest and aquatic habitats are present within the cumulative study area where lands have been protected as public parks and open space preserves. Aquatic habitats have suffered from degradation of water quality as evidenced by the listing of streams like Colvin Run and Difficult Run as impaired waters.

Adverse effects of past, present, and future actions on wildlife habitats are expected to continue with the anticipated population growth in the region under the No Build Alternative. The relative contribution of the Build Alternatives to the effects of habitat loss is minimal given the limited natural resources present within the alternative corridors and the existing fragmented condition of habitats within the cumulative study area. The contribution of the Build Alternatives to degradation of water quality within aquatic habitats is also minimal given the minimal stream impacts and the stormwater management measures that will be implemented in accordance with federal, state, and local regulations to minimize on-site and downstream water quality impacts.

Air Quality

Fairfax County is designated by EPA as attainment for the annual fine particulate matter (PM_{2.5}) and carbon monoxide NAAQS and nonattainment for ozone. The ongoing implementation of ever more stringent motor vehicle emission and fuel quality standards helps to minimize the potential for growth in emissions and associated impacts even with long-term growth in economic activity and associated traffic. Trends in ambient air quality data show the benefit of these controls for specific pollutants. The No Build Alternative would not contribute additional sources of CO, mobile source air toxic, or temporary construction emissions to cumulative air quality conditions.

A qualitative assessment of the potential for cumulative impacts to air quality from the Build Alternatives concluded that any potential impacts that may be attributable to the Build Alternatives are not expected to be significant for several reasons. First, much of the area in which the project is located is already highly developed, which limits the potential for incremental cumulative impacts. Second, ongoing implementation of ever more stringent motor

vehicle emission and fuel quality standards helps to minimize the potential for growth in emissions and associated impacts. Additionally, based on coordination with the Metropolitan Washington Council of Governments (MWCOCG), the region's MPO, it has been determined that the Soapstone Connector would be considered Not Regionally Significant for air quality conformity purposes and therefore does not need to be included in the air quality conformity analysis associated with the CLRP. This designation supports a general conclusion that the potential for cumulative impacts attributable to the proposed project are not expected to be significant. The project would be included in the Transportation Improvement Program (TIP) (and therefore the CLRP, as the TIP is a subset of the CLRP) if any federal funding will be used for the project.

Noise

As indicated in Section 3.5, the noise analysis estimated the number of sensitive receptors that would be affected by noise in the design year (2046), which includes the cumulative noise influence of past, present, and reasonably foreseeable future projects within the study area. Under the Build Alternative, a total of four receptors that represent six residential outdoor use areas and the playground of a daycare center are predicted to experience noise impacts in the design year (2046).

Noise abatement measures (i.e., a noise barrier) appear to be feasible and reasonable for one CNE at this time, which would provide noise reduction benefits to the six residential outdoor use areas within the CNE, as described in the technical report. Preliminary decisions regarding both recommended and non-recommended noise barriers may change between the EA and final design as a result of changes in the transportation improvement project design, design year traffic, or the level of detail the design contained at the time of the preliminary report.

Construction noise will be temporary and minimal in comparison to the existing noise levels and would not substantially contribute to the cumulative noise environment. Regardless, during the construction phase of the project, all reasonable measures will be taken to minimize noise impacts from these construction-related activities. VDOT's *Road and Bridge Specifications* establish construction noise limits and the contractor will be required to conform to this specification to reduce any impacts of construction noise.

Overall Impacts. Overall, the No Build Alternative would not contribute to adverse cumulative effects; however, communities within the study area would also not benefit from the reduced congestion and improved accessibility, mobility, and multimodal connectivity that would accompany the Build Alternatives. Adverse cumulative impacts from past, present, and future projects are anticipated under the No Build and the Build Alternatives for social and economic resources (i.e., relocations), historic properties, water resources, wildlife and threatened and endangered species, air quality, and noise. The majority of these adverse effects are largely attributable to past actions that occurred prior to the establishment of protective environmental regulations. Current regulatory requirements and planning practices are helping to avoid or minimize the contribution of present and future actions to adverse cumulative effects. In summary, considerable adverse impacts to natural resources have occurred over time, first due to agricultural uses of the land, and then to residential, commercial, industrial, institutional, and public infrastructure development. When considered in the context of the project setting, the magnitude and intensity of the impacts of the Build Alternatives would not contribute substantially to cumulative impacts, particularly in light of the efforts to minimize adverse impacts of the project and other mitigation measures to be implemented.

Section 4

COMMENTS AND COORDINATION

Early and continuous coordination with the general public and appropriate agencies is an essential part of the National Environmental Policy Act (NEPA) review process to determine the scope of environmental documentation, level of analysis, potential impacts, and necessary mitigation measures and related environmental requirements. Fairfax County, in cooperation with VDOT and FHWA, has coordinated with local, state, and federal agencies throughout the Soapstone Connector environmental review process. Fairfax County has also conducted an inclusive public involvement program. The agency, public, and elected official comments received in response to these coordination efforts were instrumental in defining the scope of the project and in preparing the EA. The project has a dedicated website, <http://www.fairfaxcounty.gov/fcdot/soapstoneconnector.htm>, and e-mail blasts have been transmitted to disseminate information as much as possible to all interested parties.

4.1 AGENCY COORDINATION

4.1.1 Federal and State Agency Coordination

The agencies listed below were contacted at the beginning of the study process and provided information on the project and a map detailing its location. Agencies were invited to provide feedback on issues and concerns regarding the proposed project. Agencies that sent a response to the scoping letters are marked with an asterisk.

- Federal Transit Administration
- US Army Corps of Engineers, Norfolk District*
- US Department of the Agriculture, Natural Resources Conservation Service*
- US Department of the Interior, Fish and Wildlife Service, Virginia Field Office
- US Environmental Protection Agency, Region III, Environmental Programs Branch
- Virginia Department of Agricultural and Consumer Services
- Virginia Department of Conservation and Recreation, Environmental Review Coordinator*
- Virginia Department of Environmental Quality*
- Virginia Department of Game and Inland Fisheries*
- Virginia Department of Health – Office of Drinking Water*
- Virginia Department of Historic Resources*
- Virginia Department of Transportation, ADA for Project Development
- Virginia Outdoors Foundation

Key issues and concerns included in the comments were: addressing the overall transportation network, completion of air and noise studies, potential for threatened and endangered species, historic resources, and water quality.

4.1.2 Regional and Local Agencies and Organizations

Scoping letters requesting information and comments for use in the study were sent to the following regional and local agencies and organizations. Those that responded are marked by an asterisk.

- Metropolitan Washington Airports Authority
- Metropolitan Washington Council of Governments, Transportation Planning
- NOVA Parks (formerly Northern Virginia Regional Park Authority)
- Washington Metropolitan Area Transit Authority
- Fairfax County Department of Housing and Community Development
- Fairfax County Department of Planning and Zoning*
- Fairfax County Department of Public Works and Environmental Services*
- Fairfax County Fire and Rescue
- Fairfax County Park Authority*
- Fairfax County Police Department*
- Fairfax County Public Schools
- Hunter Mill District, Supervisor
- Williams Gas Company*

Key issues and concerns included in the comments were: land use and relocations, stormwater management and water quality, park and recreation facilities (both existing and planned), and potential impacts to the gas pipelines within the project area.

4.1.3 Section 106 Coordination

Pursuant to Section 106 of the National Historic Preservation Act (54 USC §306108) (NHPA), Fairfax County initiated a process to identify consulting parties on this project. The consulting parties were invited to participate in the process pursuant to 36 CFR §800.3(f) by consulting on the identification of historic properties, the evaluation of effects on those properties, and the identification of measures to avoid, minimize, and mitigate adverse effects to the properties. Each of the parties listed below was contacted by letter during October 2015 and provided an opportunity to participate in Section 106 consultation.

- Virginia Department of Historic Resources
- Fairfax County Architectural Review Board
- Fairfax County Department of Planning and Zoning
- Metropolitan Washington Airports Authority
- NOVA Parks (formerly Northern Virginia Regional Park Authority)
- Washington Metropolitan Area Transit Authority

4.2 PUBLIC INVOLVEMENT

4.2.1 Public Scoping Meeting

Fairfax County held a Public Scoping Meeting on October 26, 2015 at South Lakes High School in Reston to obtain citizen input for use in defining the scope of the study, including alternatives to be analyzed and environmental issues to be considered. At the outset of the meeting, the study team presented maps and displays describing the study process, the purpose and need for the project, alternatives and improvement concepts, environmental considerations, and other study information in an informal setting. In the latter half of the meeting, a formal presentation was given by Fairfax County staff to further review the information, followed by a question and answer session. All meeting materials were available (and continue to be available) on the project website. The Public Scoping Meeting sign-in sheets indicate that at least 42 citizens attended the meeting. A total of 38 comments were collected during the comment period,

including both comments sheets and e-mails. Comment subjects that were the most frequent included: the overall study process, traffic concerns, the location and type of improvements, property impacts, parks and recreation facilities, and safety. The public also noted human and natural resources in the study area that should be considered as part of the transportation improvements.

4.2.2 Public Information Meeting

Fairfax County held a Public Information Meeting on June 15, 2016 at South Lakes High School in Reston to obtain citizen input on the project purpose and need and the conceptual alternatives. In addition, information was shared with attendees on the study process and its status. The meeting consisted of two parts. First, an informal information session was held during which displays and documents were available for review and Fairfax County staff and consultant personnel were available for discussion. Second, a formal presentation was given by Fairfax County staff to provide information on the project. Following this presentation, there was a brief question and answer session. The following primary topics relevant to the project were discussed during the question and answer session and referenced in the comment sheets submitted after the meeting:

- The typical section of the Soapstone Connector.
- Indirect effects (in particular, on Soapstone Drive between Sunrise Valley Drive and South Lakes Drive) and cumulative impacts and how they will be considered in the environmental document.
- Pedestrian and bicycle features on the Soapstone Connector and connections to other facilities.
- Environmental resources that will be studied in the Environmental Assessment, such as air quality and noise.

The attendance sign-in sheets show that 37 people attended the meeting. Comment sheets were completed by 14 people at the public meeting. When asked whether they agreed with the project purpose and need, of the 14 meeting attendees that submitted a comment sheet, 12 answered in the affirmative and the remaining two did not respond. No other comments were received during the comment period following the meeting. All meeting materials were available (and continue to be available) on the project website.

4.2.3 Location Public Hearing

Fairfax County will hold a Location Public Hearing for this project. The purpose of the meeting will be to provide an opportunity for the public to review current information about the project, including the EA. The public will be invited to provide input and comments on the EA, and substantive comments will be addressed in a Revised EA prior to a final decision by FHWA.

REFERENCES

Code of Federal Regulations

- 2016 23 CFR Part 772. *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, 23 Codes of Federal Regulations, Part 772, July 2016.

Dovetail

- 2016 *Phase IB Architectural Survey of the Proposed Soapstone Connector*, Fairfax County, Virginia, Fairfax County Project No. 2G40-078, DHR #2015-1168, October 2016.

Fairfax County

- 2007 Difficult Run Watershed Management Plan, Adopted by Fairfax County Board of Supervisors February 26, 2007.
http://www.fairfaxcounty.gov/dpwes/watersheds/publications/dr/01_df_wmp_full_ada.pdf
- 2013 *Fairfax County Comprehensive Plan*, 2013 Edition, Amended through 10-20-2015.
- 2016a Resource Protection Areas, Fairfax County Open Data.
http://data.fairfaxcountygis.opendata.arcgis.com/datasets/8f323403e47b42bd902de823e761b535_2
- 2016b Department of Tax Administration's Real Estate Assessment Information Site.
<http://icare.fairfaxcounty.gov/>

Federal Emergency Management Agency

- 2016 National Flood Hazard (NFHL) Layer. <https://msc.fema.gov/>

Federal Highway Administration (FHWA)

- 1992 *Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process*.
- 2004 US Department of Transportation, FHWA Traffic Noise Model, TNM 2.5, Report No. FHWA-PD-96-010, Revision No. 1, April 2004.
- 2011 US Department of Transportation, *FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance*, December 2011.
- 2014 *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*.

Gulf Reston, Inc.

- 1973 *A brief history of Reston, Virginia*.

Heffernan, K., E. Engle, C. Richardson

- 2014 Virginia Invasive Plant Species List. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Natural Heritage Technical Document 14-11.

Loopnet.com

2016 Reston Commercial Real Estate. <http://www.loopnet.com/Virginia/Reston-Commercial-Real-Estate/>, Accessed August 30, 2016.

Parsons

2016 *Phase IA Cultural Resources Survey of the Proposed Soapstone Connector*, Fairfax County, Virginia, Fairfax County Project No. 2G40-078, March 8, 2016.

2017a Air Quality Technical Memorandum, February 24, 2017.

2017b Alternatives Technical Memorandum, March 31, 2017.

2017c Noise Analysis Technical Report, March 3, 2017.

2017d Traffic Technical Memorandum, February 3, 2017.

Reston Association

2016 www.reston.org. Accessed April 28, 2016.

Robison, Debbie

2004 Northern Virginia History Notes, Oakton Schoolhouse. http://www.novahistory.org/Oakton_Schoolhouse.htm, Accessed August 30, 2016.

The Washington Post

2014 *Before it was a concrete jungle, Tysons Corner was a tiny crossroads*. Article by John Kelly, December 13, 2014.

Town of Vienna

2016 Vienna, VA – Official Website- History of the Town. <https://www.viennava.gov/index.aspx?nid=335>, Accessed August 30, 2016.

Transportation Research Board

2002 *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*, National Cooperative Highway Research Program (NCHRP) Report 466.

2007 *Forecasting Indirect Land Use Effects on Transportation Projects*, NCHRP 25-25 Program.

Tulia.com

2016 Reston, VA Homes For Sale & Real Estate. <http://www.trulia.com/VA/Reston/>, Accessed August 30, 2016.

United States Army Corps of Engineers (USACE)

1987 *Corps of Engineers Wetlands Delineation Manual*, Wetlands Research Program, Technical Report Y-87-1, January 1987.

- 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0), Wetlands Regulatory Assistance Program, ERDC/EL TR-12-9, April 2012.

United States Census Bureau

- 1990 US Decennial Census, 1990. Washington, DC.
2000 US Decennial Census, 2000. Washington, DC.
2010 US Decennial Census, 2010. Washington, DC.
2016 American Community Survey 2010-2014. Washington, DC.

United States Department of Health and Human Services

- 2014 *2014 Poverty Guidelines*. Published January 22, 2014, 79 FR 3593.

United States Environmental Protection Agency (EPA)

- 2010 Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment, US EPA in collaboration with Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia, December 29, 2010.
2011 National Sole Source Aquifers GIS Layer.
<http://catalog.data.gov/dataset/national-sole-source-aquifer-gis-layer>

United States Fish and Wildlife Service (USFWS)

- 2007 National Bald Eagle Management Guidelines, May 2007.
2015 Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat with 4(d) Rule; Final Rule and Interim Rule, 50 CFR Part 17, Vol.80, No. 63, April 2, 2015.
2016 National Wetlands Inventory (NWI). <https://www.fws.gov/wetlands/data/data-download.html>
2016a Letter from USFWS. List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project, Soapstone Connector, July 26, 2016.
2016b Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions, U.S. Fish and Wildlife Service, Regions 2,3,4,5 and 6, January 5, 2016.

USFWS and National Marine Fisheries Service

- 1998 *Endangered Species Consultation Handbook*, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act, March 1998.

United States Geological Survey (USGS)

2016 National Hydrography Dataset (NHD). Streams and Stream Areas, Waterbodies, HUC Boundaries. <ftp://nhdftp.usgs.gov/DataSets/Staged/States/FileGDC/HighResolution/>

Virginia Department of Conservation and Recreation (VDCR)

2015 Letter from Alli Baird, LA, ASLA, Coastal Zone Locality Liaison, VDCR, to Audra Bandy, Fairfax County, dated November 6, 2015. Subject: Soapstone Connector Environmental Assessment.

Virginia Department of Environmental Quality (VDEQ)

2008 *Bacterial TMDL for the Difficult Run Watershed*. Prepared by George Mason University and The Louis Berger Group, Inc. on behalf of VDEQ, April 25, 2008.

2014 *2014 Integrated Water Quality Report*. Impaired Estuaries, Reservoirs, and Streams. <http://www.deq.state.va.us/ConnectWithDEQ/VEGIS/VEGISDatasets.aspx>

2016a Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report, Approved May 19, 2016.

2016b VDEQ website, Chesapeake Bay Preservation Act, <http://www.deq.virginia.gov/Programs/Water/ChesapeakeBay/ChesapeakeBayPreservationAct.aspx>, Accessed August 9, 2016.

2016c Regulated Hazardous Waste Management Facilities in Virginia (12/17/15), Petroleum Releases (4/8/16), and Registered Petroleum Facilities (4/8/16). <http://www.deq.state.va.us/ConnectWithDEQ/VEGIS/VEGISDatasets.aspx>

Virginia Department of Game and Inland Fisheries (VDGIF)

2015 Email from Ernie Aschenbach, Environmental Services Biologist for VDGIF to Surbhi Ashton and Stuart Tyler, Parsons Transportation Group. Subject: ESSLog 36125; Consultant/Locality administered VDOT project – preliminary scoping request for Environmental Assessment, for the Soapstone Connector in Fairfax County, VA. Sent: Monday, October 26, 2015 1:39PM.

2016a Special Legal Status Faunal Species in Virginia. July 27, 2016.

2016b Wood Turtle (*Glyptemys insculpta*). www.dgif.virginia.gov/wildlife/information/?s=030062, Accessed September 15, 2016.

Virginia Department of Historic Resources (VDHR)

2017 Signed Letter from VDHR to Audra Bandy concurring with Fairfax County Department of Transportation recommendations regarding Fairfax County Project No. 2G40-078 (DHR File #2015-1168). January 12, 2017.

Virginia Department of Transportation (VDOT)

2015a VDOT GIS layers compiled from data from the following agencies:

- 2003a Cold water streams survey. VDGIF. Layer name: SDE_VDGIF_TROUT_STREAMS.
- 2003b Reaches that are confirmed or potential migration pathways, spawning grounds, or nursery areas for anadromous fish. Virginia Department of Game and Inland Fisheries (VDGIF). <http://www.dgif.virginia.gov/gis/gis-data.asp>. Layer name: SDE_DGIF_ANADROMOUS.
- 2009 Threatened and endangered species observations. VDGIF. Layer name: SDE_DGIF_TE_WATER_SEG.
- 2014 Lands of Conservation and Recreational Interest. Virginia Department of Conservation and Recreation (VDCR) - Division of Natural Heritage. http://www.dcr.virginia.gov/natural_heritage/cldownload.shtml. Layer name: SDE_VDCR_CNSRV_LND.
- 2015a NH Screening Coverage - biologically sensitive areas. Virginia Department of Conservation and Recreation (VDCR) - Division of Natural Heritage. http://www.dcr.virginia.gov/natural_heritage/cldownload.shtml. Layer name: SDE_VDCR_NTRL_HRTG_SCRN.
- 2015b Threatened and endangered species data, semi-annual updates. Layer name: SDE_VDGIF_TE_SPECIES. Accessed July 2015.
- 2015c Virginia Department of Health (VDH), Office of Water Programs, Division of Water Supply Engineering, and as altered for presentation by the GIS Program Office of the Virginia Department of Transportation. <http://www.vdh.state.va.us/ODW/>. Layer name: SDE_VDH_GNDWTR_SRC.
- 2015d VDH, Office of Water Programs, Division of Water Supply Engineering, and as altered for presentation by the GIS Program Office of the Virginia Department of Transportation. <http://www.vdh.state.va.us/ODW/>. Layer name: SDE_VDH_SRFC_WTR_INTK.
- 2015e VDH, Office of Water Programs, Division of Water Supply Engineering, and as altered for presentation by the GIS Program Office of the Virginia Department of Transportation. <http://www.vdh.state.va.us/ODW/>. Layer name: SDE_VDH_SRFC_WTR_INTK_WTRSHD.
- 2015f Virginia Forest Cover Map (VFCM). Virginia Department of Forestry, Forest Inventory and Analysis. <http://www.dof.virginia.gov/gis/datadownload.shtml>. Layer name: SDE_VDOF_FOREST_COVER.
- 2015g Environmental Protection Agency, RCRA Sites. Layer Name: SDE_US_EPA_RCRA.
- 2016 VDGIF Threatened and Endangered Species – Bald Eagle Nests. Layer name: SDE_VDGIF_TE_SPEC_EAGLES.

- 2015b *Highway Traffic Noise Impact Analysis Guidance Manual*. Version No. 7. July 2015.
- 2015c *Noise Report Development and Guidance Document*. Version No. 5. August 2015.
- 2016a Six-Year Improvement Program. <http://syip.virginiadot.org/Pages/allProjects.aspx>, Accessed May 2016.
- 2016b *Project-Level Air Quality Analysis Resource Document*, April 2016.
- 2016c *FHWA-VDOT Programmatic Agreement for Project-Level Air Quality Analyses for Carbon Monoxide*, April 2016.
- 2016d *Scoping Guidelines for Project-Level Air Quality Analyses*, July 2016.
- 2016e *Road and Bridge Specifications*, Section 107.16(b.3), “Noise”.

Virginia Employment Commission

- 2016 Community Profile: Fairfax County. Richmond, VA.

Weldon Cooper Center for Public Service

- 2012 Total Population Projections for Virginia and its Localities. Charlottesville, VA.
- 2016 July 1, 2015 Population Estimates for Virginia and its Counties and Cities. Charlottesville, VA.

