

ROUTE 1 IMPROVEMENTS AT FORT BELVOIR

Fort Belvoir, Virginia
Fairfax County, Virginia

ENVIRONMENTAL ASSESSMENT / DRAFT SECTION 4(f) EVALUATION

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

by

U.S. Department of Transportation
Federal Highway Administration
Eastern Federal Lands Highway Division



Melisa L. Ridenour, Division Engineer
Federal Highway Administration
Eastern Federal Lands Highway Division

1 Jun 12

Date of Approval

Cooperating Agencies

Fairfax County, Virginia
U.S. Army Garrison Fort Belvoir
Virginia Department of Transportation

TABLE OF CONTENTS

Table of Contents	i
List of Tables	iii
List of Figures	iii
Section 1 – PURPOSE AND NEED.....	1
1.1 Introduction	1
1.2 Project Background	1
1.3 Needs	4
1.3.1 Existing Conditions.....	4
1.3.2 Future Conditions.....	7
1.5 Purpose.....	9
1.6 Public Scoping.....	9
1.7 Other Projects and Plans In Area	10
Section 2 – ALTERNATIVES.....	12
2.1 Introduction	12
2.2 Methodology	12
2.3 Alternative A (No-Build Alternative)	13
2.4 Alternative B (Build Alternative).....	14
2.5 Alternative C (Build Alternative).....	25
2.6 Alternatives Considered But Dismissed.....	34
2.7 Preferred Alternative	36
Section 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES....	37
3.1 Introduction	37
3.2 Land Use, Community Facilities, and Relocations	43
3.2.1 Land Use	43
3.2.2 Community Facilities and Services.....	43
3.2.3 Right-of-Way and Displacements.....	44
3.3 Topography, Geology, and Soils	45
3.4 Prime and Unique Farmlands	45
3.5 Section 4(f).....	46
3.6 Historic Properties.....	47

3.6.1 Determining Adverse Effects 47

3.7 Water Resources 57

 3.7.1 Wetlands 57

 3.7.2 Streams..... 58

 3.7.3 Floodplains..... 58

 3.7.4 Water Quality 59

 3.7.5 Chesapeake Bay Protection Areas 60

 3.7.6 Virginia Coastal Zone Management Program (VCP) 60

3.8 Noise..... 61

3.9 Visual 61

3.10 Habitats and Wildlife..... 62

 3.10.1 Aquatic Habitat 62

 3.10.2 Terrestrial Habitat 63

 3.10.3 Wildlife Corridor..... 63

3.11 Threatened and Endangered Species 64

3.12 Hazardous Materials 65

3.13 Indirect Effects..... 66

3.14 Cumulative Impacts 66

Section 4 – COORDINATION AND COMMENTS 71

 4.1 Agency Coordination 71

 4.1.1 Federal and State Agency Coordination 71

 4.1.2 Regional and Local Agencies and Organizations 72

 4.1.3 Agency Partnering..... 73

 4.1.4 Section 106 Consulting Parties 73

 4.2 Public Involvement 76

 4.2.1 Public Scoping Meeting 76

 4.2.2 Public Information Meeting - Alternatives 76

 4.2.3 Inlet Cove Information Meetings 76

 4.2.3 Public Information Meeting - EA 77

REFERENCES 78

- Appendix A** – Memorandum of Agreement between U.S. Army and VDOT for Route 1 Improvements
- Appendix B** – Options for Stormwater Management Pond near Mount Vernon Memorial Hwy
- Appendix C** – Section 4(f) Evaluation
- Appendix D** – Determination of Consistency with Virginia’s Coastal Resources Management Program
- Appendix E** – Noise Impact Analysis Technical Report
- Appendix F** – Air Quality Technical Report

LIST OF TABLES

Table 2. Crash Data on Route 1 between Telegraph Road and Mt. Vernon Memorial Hwy	7
Table 3. Summary of Environmental Issues	37
Table 4. Summary of Impacts	41
Table 5. Changes in Access to Community Facilities.....	44
Table 6. Summary of Relocations.....	45
Table 7. Wetland Resources within Limits of Disturbance (acres)	57
Table 8. Stream Resources within Limits of Disturbance (linear feet).....	58
Table 9. Monitoring Status of Named Streams.....	59
Table 10. Habitat Areas within Limits of Disturbance (acres/percent).....	62
Table 11. Summary of Cumulative Effects.....	69

LIST OF FIGURES

Figure 1. Project Location.....	2
Figure 2. Proposed Roadway Typical Section	15
Figure 3. Alternative B.....	16
Figure 4. Alternative C.....	26
Figure 5. Environmental Resources within Study Area.....	42

SECTION 1 – PURPOSE AND NEED

1.1 INTRODUCTION

In this Environmental Assessment (EA), the Federal Highway Administration (FHWA) Eastern Federal Lands Highway Division, in cooperation with Fairfax County, U.S. Army Garrison Fort Belvoir, and the Virginia Department of Transportation (VDOT), presents alternatives for the improvement of deficiencies in the 3.4-mile section of U.S. Route 1 (Route 1) between Telegraph Road (Route 611) and Mount Vernon Memorial Highway (Route 235) in Fairfax County, Virginia. **Figure 1** shows the location of the project.

This section of Route 1 is one of two sections that have yet to be widened to six lanes to match the cross-section of Route 1 in the surrounding area.¹ The project termini are logical because Telegraph Road and Mount Vernon Memorial Highway are major decision points for turning traffic, and this section serves U.S. Army Garrison Fort Belvoir via Pohick Road (Tulley Gate) and Belvoir Road (Pence Gate), with a third gate to access North Post currently undergoing design. Funding for this project has been approved by the Office of Economic Adjustment (OEA) within the Department of Defense to improve patient access to the new Fort Belvoir Community Hospital, constructed under the 2005 Base Realignment and Closure (BRAC) legislation, and to accommodate the increase in traffic resulting from other BRAC-related traffic and growth in Fairfax County.

The study area consists of lands surrounding the proposed project on which there are human or natural resources that could potentially be affected by the project. More specifically, in addition to the lands adjacent to mainline Route 1, the study area includes the lands adjacent to the intersecting roadways where they cross Route 1 to include potential improvements at the study area intersections and the lands just north and south of the project limits to provide the necessary transitions to the existing roadway network.

1.2 PROJECT BACKGROUND

Route 1 is the oldest highway serving the East Coast, stretching 2,450 miles from Maine to Florida. It is part of the National Highway System, which consists of roadways important to the nation's economy, defense, and mobility, and it is included in the National Highway System (NHS) of the Intermodal Surface Transportation Efficiency Act (ISTEA). In Virginia, the facility was recently designated “Historic Route 1” by the Virginia General Assembly to promote tourism, transportation improvements, and economic development (House Bill No. 530, 2010 Session).

¹ The 2011 Metropolitan Washington Council of Governments’ Constrained Long Range Plan includes widening the four-lane section of Route 1 between Telegraph Road and Mount Vernon Memorial Highway to six lanes by 2020. The section just to the north of the study area, between Mount Vernon Memorial Highway (Route 235 south) and Mount Vernon Highway (Route 235 north) is included in the plan as a separate project to be widened to six lanes by 2025.

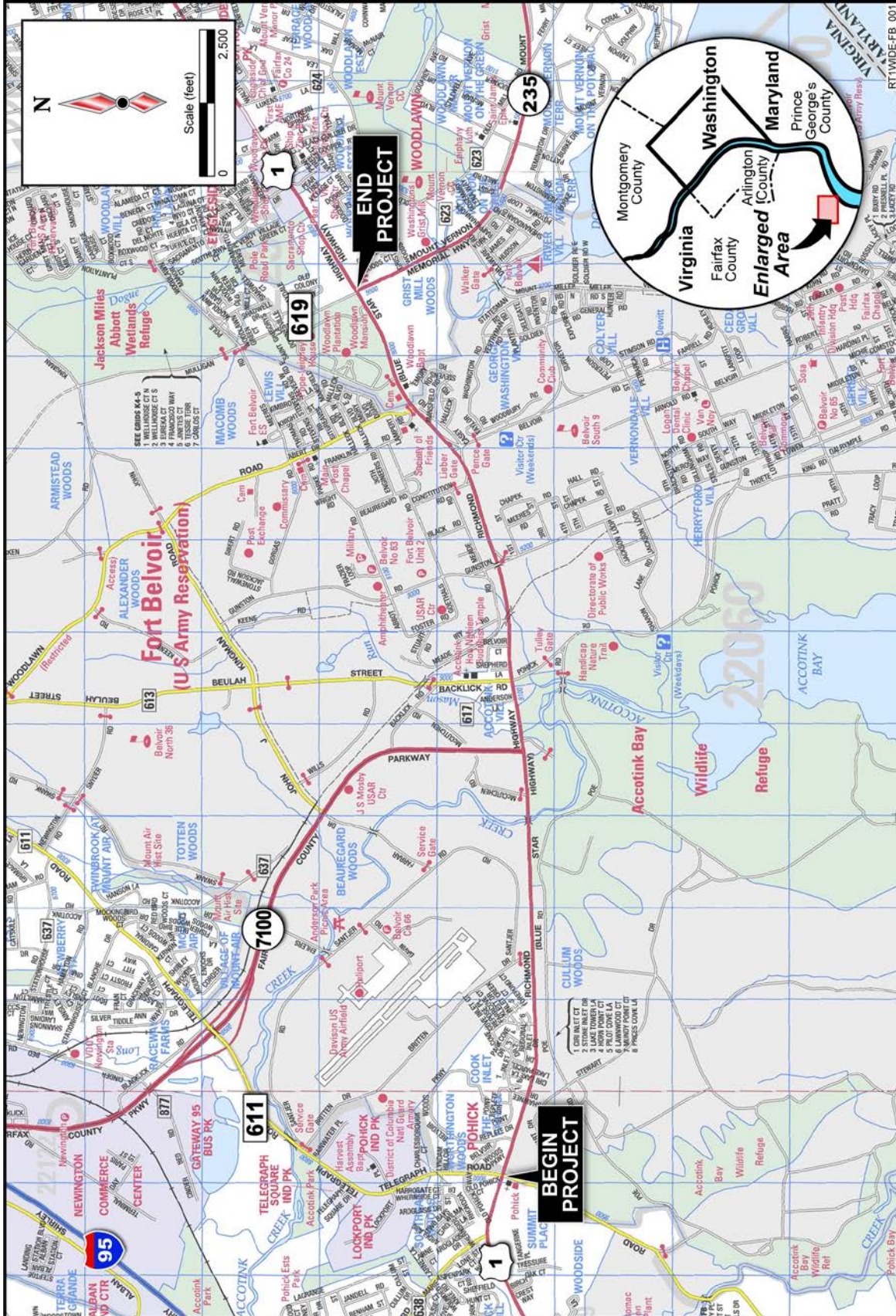


Figure 1. Project Location

Within the study area in Fairfax County, Route 1 bisects the Main Post of Fort Belvoir, a 7,760-acre U.S. Army installation with approximately 31,000 employees.² The missions at Fort Belvoir provide logistical, intelligence, and administrative support to a diverse mix of commands, activities, and agencies. There are more than 140 tenant and satellite organizations at the Fort, including two Army major command headquarters, 10 different Army major commands, 19 different agencies of the Department of Army, eight elements of the U.S. Army Reserve and the Army National Guard, an airfield, a regional military hospital, and 26 Department of Defense agencies. Also located at the Fort are a U.S. Navy construction battalion, a Marine Corps detachment, a U.S. Air Force activity, and an agency from the Department of the Treasury.

The 2005 Defense Base Realignment and Closure Act (BRAC) stipulated realignment and closure actions for domestic military installations, including the relocation of thousands of personnel to Fort Belvoir. Accordingly, the Army prepared an Environmental Impact Statement (EIS) (Final EIS approved June 2007, Record of Decision signed August 7, 2007) to evaluate the environmental consequences of the relocations to Fort Belvoir and to select an alternative land use and development plan to accommodate the moves. Among the new facilities constructed as part of the implementation of the BRAC requirements was a new 1.3-million-square-foot hospital. The Fort Belvoir Community Hospital, officially opened in October 2011, has three times the number of beds and twice the number of employees as the former Dewitt Army Community Hospital (now the Warrior Pavilion), and it will serve active-duty military service personnel, veterans, and their families throughout the Washington metropolitan region. A number of other new and renovated facilities will house other units relocating to Fort Belvoir.

The need for improvements to Route 1 within the study area has been identified in numerous previous studies and it was cited in the BRAC 2005 EIS as well. A location study conducted by VDOT in 2003 examined the widening of Route 1 from Stafford County to the Capital Beltway.³ The Environmental Assessment associated with the section of Route 1 from Belvoir Woods Parkway to the Capital Beltway was approved for public availability on March 28, 2003, and a public hearing was held on April 29, 2003. The Fairfax County Board of Supervisors reviewed and endorsed the document, but the study was subsequently halted due to a desire by Fairfax County officials to further consider potential transit options in the Route 1 Corridor.⁴ A National Environmental Policy Act (NEPA) decision document was not signed for this section and no recommendations were advanced or approved.

More recently, the BRAC 2005 EIS identified a series of transportation improvements to mitigate the effects of the proposed relocation alternatives on the transportation system. The widening of Route 1 through Fort Belvoir and interchanges at Route 1/Telegraph Road and Route 1/Fairfax County Parkway were identified as mitigation strategies for the two land use alternatives (Town

² As a result of 2005 BRAC, Main Post employment increased from approximately 23,000 (Pre-BRAC) to 27,000 employees (post-BRAC implemented), a net increase of 4,000 employees. Other activities/realignments have resulted in an additional increase of three to four thousand employees, bringing the total employment level at Fort Belvoir up to approximately 31,000.

³ U.S. Route 1 Location Study, Fairfax and Prince William Counties, 2003.

⁴ Fairfax County subsequently amended its Comprehensive Plan to include provisions for accommodating transit in the corridor.

Center and Satellite Campuses) that placed all BRAC-related development within the Main Post area. The improvements were not identified, however, for the Preferred Alternative identified in the EIS as BRAC impacts to Route 1 for that alternative did not reach the threshold needed for Defense Access Road Program certification (the funding mechanism for improvements), which would permit Military Construction (MILCON) funding. In short, while the BRAC 2005 EIS did declare a need for improvements to Route 1, existing and forecast background traffic suggested the need for improvements regardless of the BRAC action at Fort Belvoir.

From the study area south, Route 1 has already been widened to six lanes from Belvoir Woods Parkway, just north of the intersection with Telegraph Road/Old Colchester Road, to just south of Armistead Road. The 2011 Metropolitan Washington Council of Governments' Constrained Long Range Plan includes widening the four-lane section of Route 1 between Telegraph Road and Mount Vernon Memorial Highway to six lanes by 2020. The section of Route 1 between Mount Vernon Memorial Highway (Route 235 south) and Mount Vernon Highway (Route 235 north) is included in the plan as a separate project to be widened to six lanes by 2025. The Richmond Highway-Telegraph Road Connector (Mulligan Road) Project, which consists of the construction of a new connector road between Route 1 (at the intersection of Mount Vernon Memorial Highway) and Telegraph Road to the west of Route 1, is currently under construction. That project, scheduled to be completed in 2013, was taken into account in developing alternatives for the current study.

Route 1 project development was initiated by the Fairfax County Department of Transportation, and FHWA began development of the EA. While the EA for proposed improvements to Route 1 was underway, a proposal was submitted by Fairfax County to the U.S. Office of Economic Adjustment (OEA) within the Department of Defense to receive award funds that are being granted by OEA to improve patient access to military medical facilities constructed as a result of the 2005 BRAC realignments. Submitted in November 2011, the proposal was selected to receive \$180 million to widen Route 1 through Fort Belvoir from Telegraph Road to Mount Vernon Memorial Highway in order to improve patient access to medical care and to accommodate the increase in traffic resulting from other BRAC-related traffic and growth in Fairfax County. The grant's conditions are consistent with and support the project's purpose and need.

1.3 NEEDS

Increases in population and employment in the region and within the Route 1 corridor, in particular at Fort Belvoir within the study area, have fueled an increase in transportation demand. The existing four-lane roadway lacks amenities to serve pedestrians and bicyclists, includes an outdated and insufficient stormwater management system, does not adequately serve existing traffic demand, and would not safely accommodate the year 2040 forecasted traffic in the corridor due to regional growth and the BRAC relocations to Fort Belvoir Main Post.

1.3.1 Existing Conditions

Route 1 is the principal north-south route for local traffic in eastern Fairfax County for shopping and other general-purpose trips, and it serves as a major commuter route and an alternate route for nearby I-95. Currently, Metrobus and Fairfax Connector offer bus service along the project corridor, and service adjustments were recently launched by both agencies in response to the

increase in base personnel and the opening of the Fort Belvoir Community Hospital. Existing Route 1 within the project limits is a four-lane undivided highway with a posted speed limit of 45 to 50 miles per hour (mph).

Route 1 provides direct access to Fort Belvoir via Pohick Road (Tulley Gate) and Belvoir Road (Pence Gate). Several other access points exist along Route 1, but they are not actively used for security reasons (Britten Drive at Davison Army Airfield, McCutchen Road, Beulah Street, Constitution Road, and Woodlawn Road). Commercial (Accotink Village) and residential developments (Worthington Woods, The Fairfax, Inlet Cove, Accotink Village), Pohick Episcopal Church, the Accotink Bay Wildlife Refuge, Camp Humphreys Pump Station and Filter Building, Eleanor U. Kennedy Homeless Shelter, Woodlawn Baptist Church, Woodlawn Quaker Meetinghouse, Woodlawn Plantation/Pope-Leighey House, and Woodlawn Stables also are accessed from Route 1 within the study area.

Route 1 provides indirect access via intersecting roads to other developments and roadways in the area as well: Telegraph Road and Fairfax County Parkway provide a direct connection to I-95, the principal north-south route for long-distance East Coast travel and for regional commuting to employment centers, and access into the heart of Fairfax County. Mount Vernon Memorial Highway feeds into the George Washington Memorial Parkway to Alexandria and Washington, DC. Old Mill Road currently terminates at Pole Road a half mile to the west of the northern project limit intersection; however, Mulligan Road is currently under construction, and it will extend Old Mill Road north of Pole Road and complete the connection of Route 1 to Telegraph Road.

Given that Route 1 is a north-south commuter route serving through trips and is the gateway to Fort Belvoir, congestion is prevalent within this section of Route 1 during the weekday peak periods and frequently during other times of the day as well, primarily between the Fairfax County Parkway and Belvoir Road.

As part of the project scoping process, public input was gathered on transportation problems and deficiencies in the study area, and congestion ranked first, with construction and the influx of traffic from BRAC cited as primary contributors. Other leading deficiencies included the lack of public transit and pedestrian/bicycle access and crosswalks at intersections.

As shown in **Table 1**, current (2010) average daily traffic volumes between Telegraph Road and Mount Vernon Memorial Highway on this urban arterial highway range from 37,000 to 56,000 vehicles per day (vpd). Approximately 1,440 to 2,760 vehicles per hour (vph) travel northbound through the study area during the AM peak hour (7 to 8 AM) and 1,780 to 2,760 vph travel southbound through the study area during the PM peak hour (4 to 5 PM). These counts represent the “constrained” volumes, or the actual number of vehicles that pass through the traffic count locations during that time period. These “constrained” volumes do not take into account the additional vehicles waiting in queues within or outside of the study area that desire to travel during the designated peak hours. Queues are experienced daily during the weekday AM and PM peak periods between Telegraph Road and just north of Pohick Road and on occasion, can extend to Mount Vernon Memorial Highway or beyond the project limits. As described in detail in the *Route 1 Improvements at Fort Belvoir Transportation Technical Report* (Parsons, April 2012), delay times experienced at the major study area intersections (Telegraph Road, Fairfax County Parkway, Backlick Road/Pohick Road, Belvoir Road, and Mount Vernon Memorial

Table 1. Existing and Future Volumes and Levels of Service

Location on Route 1	DAILY (vpd)		PEAK HOUR* (vph)							
	2010 Existing	2040 No-Build	Dir	Number of Lanes	2010 Existing "Constrained"		2010 Existing "Unconstrained"		2040 No-Build****	
					Peak Hour Volume	Level of Service	Peak Hour Volume	Level of Service	Peak Hour Volume	Level of Service
Telegraph Road to Fairfax County Pkwy	37,000	46,000	NB	2	2,220	E	2,340	F	2,470	F
			SB	2	2,680	F	2,890	F	2,800	F
Fairfax County Pkwy to Pohick Road	56,000	55,000**	NB	2	2,760	F	2,970	F	3,050	F
			SB	2	2,760	F	2,930	F	2,530	F
Pohick Road to Belvoir Road	46,500	43,000**	NB	2	1,840	C	1,960	D	1,750	C
			SB	2	1,870	D	2,070	E	2,000	D
Belvoir Road to Mt Vernon Mem Hwy	46,500	53,000***	NB	2	1,440	B	1,530	B	2,260	E
			SB	2	1,780	C	1,780	C	2,420	F
North of Mt Vernon Mem Hwy	35,000	47,000	NB	2	1,030	B	1,090	B	1,870	D
			SB	2	1,330	B	1,330	B	1,890	D

*Green highlights AM peak direction, blue highlights PM peak direction, and yellow highlights segments of roadway that are congested due to downstream intersections or gate operations.

** Daily volumes on these two segments are slightly lower in 2040 than in existing conditions due to the redistribution of traffic with the opening of the Richmond Highway-Telegraph Road Connector (Mulligan Road).

*** Daily volumes are higher in this segment in large part due to the opening of the new hospital at Fort Belvoir.

**** The opening of Mulligan Road shifts some through movements to Telegraph Road, which lowers some Route 1 segment volumes when compared to 2010. Trips to/from the Fort Belvoir Community Hospital result in a reversal of the peak direction north of Belvoir Road.

Highway) range from 30 to 70 seconds at each location during the AM and PM peak periods, with a cumulative delay ranging from 3 to 5 minutes. Together with the stop-and-go conditions along the roadway between intersections, overall travel delays along the study corridor can reach upwards of 10 to 12 minutes within the 3.4 mile stretch in the peak direction.

“Unconstrained” volumes, which take into consideration the number of queued vehicles that desire to travel during the peak hour, better represent the travel demand on a roadway.⁵ As shown in Table 1, unconstrained volumes range from 1,530 to 2,970 vph in the AM peak hour (northbound) and 1,780 to 2,930 vph during the PM peak hour (southbound). Level of service (LOS) on roadway segments within the project limits is worse using the “unconstrained” peak hour volumes: LOS F between Telegraph Road and Pohick Road during both the AM and PM

⁵ Unconstrained volumes were developed by distributing the hourly queues downstream, proportionally splitting the volumes at each intersection based on the turning distribution of that approach. These unconstrained volumes were developed to determine how downstream intersections would operate if the total traffic demand could reach those points (i.e., eliminate the bottleneck at the chokepoint to allow for increased flow).

peak hours and then increasing to B/C approaching the northern project limit.⁶ The poor levels of service can be attributed to the high volumes of traffic on the roadway and the existing roadway geometry. Although the horizontal and vertical alignments of existing Route 1 are generally satisfactory, there are some locations where sight distance is less than desirable, and the existing cross-section provides no median to separate opposing traffic. Turn lanes are typically inadequate to accommodate turning movements, particularly for left turns. In addition, the spacing and inconsistency of access points (driveways and commercial entrances) contribute to operational and safety inefficiencies.

Historically, Route 1 has been one of the highest crash corridors in the Northern Virginia area. The most recent three-year period (2006-2008) saw 294 crashes on Route 1 between Telegraph Road and Mount Vernon Memorial Highway. Of these crashes, 113 resulted in injuries and two involved a fatality. **Table 2** translates this data to rates per million vehicle miles traveled (MVMT) and compares those to the averages for primary roads in Northern Virginia. This segment of Route 1 experienced crashes, injuries, and fatalities at a higher rate than the average Northern Virginia primary roadway during this time period. Last year (2011), two additional fatal crashes were recorded on Route 1 through Fort Belvoir.

Table 2. Crash Data on Route 1 between Telegraph Road and Mt. Vernon Memorial Hwy

Description	Route 1 Between Telegraph Road and Mt Vernon Memorial Hwy (2006-2008)	Average Northern Virginia Primary Roadway (2007)
Crashes (per MVMT)	200	168
Injuries (per MVMT)	109	83
Fatalities (per MVMT)	1.36	0.71

Source: Virginia Department of Transportation

1.3.2 Future Conditions

Long range planning shows continued growth in both population and employment in the Route 1 corridor and the southeastern region of Fairfax County. The Fairfax County Comprehensive Plan calls for the redevelopment of several areas that are served by this section of Route 1. Recent examples include proposals for the redevelopment of Accotink Village and construction of the Northern Virginia Industrial Park off of Telegraph Road. In addition, continued employment growth is also anticipated at Fort Belvoir. Currently, the Fort Belvoir Master Plan is being updated, and it includes an evaluation of various development scenarios. The scenarios include alternatives that show growth by up to 10,000 employees by 2040⁷, which will result in a

⁶ The level of service (LOS) characterizes the operating conditions on the facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. In general, LOS can be characterized as follows: A = free flow; B = reasonably free flow; C = stable flow; D = approaching unstable flow; E = unstable flow; F = forced or breakdown flow.

⁷ Current employment at Fort Belvoir totals approximately 31,000 persons, and this amount is projected to increase to just over 40,000 by 2040 as per the Real Property Master Plan – Fort Belvoir (November 2011). The Master Plan includes a Short Range Component (SRC) and Long Range Component (LRC) and it is currently being updated, with expected completion in late 2012.

corresponding increase in travel demand on Route 1. The travel demand forecasts for this study were developed using the Metropolitan Washington Council of Governments' travel demand model and cooperative forecasts for the region, thereby taking into consideration the extent and location of population and employment growth in the region.

The existing four through lanes on Route 1 within the study area provide insufficient capacity for traffic volumes and the existing turn lane configurations provide insufficient capacity for turning volumes at cross streets. As shown in Table 1, daily traffic volumes are projected to increase by 15 to 20 percent by the year 2040, and peak hour volumes by less than five percent. The latter increase is small because current peak hour volumes are at capacity. In some locations, the forecast peak hour volumes are even slightly lower in 2040 than existing conditions. During the AM peak hour, this difference can be explained by reviewing the breakdown of the total volume on the segment by turning movement (i.e., the number of vehicles turning left, right, or traveling through the intersection). For example, turning movement volumes for 2040 show that there is a substantial increase in the Route 1 northbound traffic turning right onto Pohick Road to enter Fort Belvoir. Since the roadway segment approaching Pohick Road is constrained, i.e., carrying as much traffic as can get there, an increase in the proportion of traffic turning right would result in a corresponding decrease in traffic traveling through the intersection, which means that the downstream segments experience lower volumes. As such, the peak hour volumes on Route 1 northbound in the AM peak hour are lower in 2040 than existing conditions on the segments north of Pohick Road through the study area.⁸ In this situation where hourly volumes cannot increase further, the lengths of queues and the number of hours in the peak period can be expected to increase considerably.

Three reasons can be cited to account for the lower 2040 PM peak hour volumes when compared to existing conditions: 1) the travel demand model shifts traffic away from Route 1 in 2040 due to improvements to Telegraph Road, along with the opening of Mulligan Road, 2) much of the employment growth at Fort Belvoir is located on North Post, and 3) the widening of Gunston Road to four lanes within Fort Belvoir shifts much of the North Post exiting traffic to Kingman Gate, avoiding Route 1 and its intersection with the Fairfax County Parkway.

Apart from the peak hour volumes, the imbalance in the number of lanes on Route 1 within the study area (four lanes) as compared to the sections of Route 1 immediately south and just north of the study area,⁹ coupled with the projected increases in travel demand, will further exacerbate the congestion and queues within and extending beyond the study area. In the AM peak period, the bottleneck at the Fairfax County Parkway and Fort Belvoir will create longer queues that

⁸ Side street traffic would be unable to fill in the unused capacity: in the morning, since the turning traffic into Fort Belvoir increases, the green time shifts to accommodate that turning traffic and no net increase of green time would be allotted to the through and left-turning traffic from the side streets. In the evening, the southbound through traffic and egress from Fort Belvoir both increase substantially, so again, no net increase of green time is available to side streets, such as Backlick Road through Accotink Village.

⁹ Route 1 south of Telegraph Road and north of Mount Vernon Highway is six lanes. The 2011 Metropolitan Washington Council of Governments' Constrained Long Range Plan includes widening the four-lane section in between to six lanes in two phases: between Telegraph Road and Mount Vernon Memorial Highway by 2020 and between Mount Vernon Memorial Highway (Route 235 south) and Mount Vernon Highway (Route 235 north) by 2025.

extend south along Route 1 and north along the Fairfax County Parkway. In the PM peak period, queues will extend farther back into Fort Belvoir and north along Route 1. The Route 1 segments that already experience deficient levels of service during peak hours today will experience similar or worse levels of service in the future over longer periods of the day.

1.5 PURPOSE

The purpose of the proposed project is to expand roadway capacity to accommodate travel demand, facilitate access to medical and other facilities on Fort Belvoir, implement facilities for pedestrian and bicycle travel, and provide space for future transit services pursuant to Fairfax County's Comprehensive Plan. The objectives that must be met in order for this project to be considered a success are:

- Designs should be consistent with existing and planned segments of Route 1 north and south of the project area.
- Designs should not preclude transit services in the Route 1 corridor.
- Designs should include provisions for bicycle and pedestrian movements.
- Design features should minimize adverse effects on sensitive historic resources, such as the Accotink Bay Wildlife Refuge and Woodlawn Historic District.
- The roadway section should not exceed the maximum width of 148 feet per the Memorandum of Agreement¹⁰ between VDOT and the U.S. Army.¹¹
- Designs should improve safety by reducing congestion and meeting minimum design standards.

1.6 PUBLIC SCOPING

A Public Scoping Meeting was held on December 2, 2010 at Mount Vernon High School in Fairfax County. Information on the study was provided at the meeting and a comment sheet was distributed to gather information from the public. When asked "*What Route 1 improvement options, if any, would you like to see considered in the study?*", the most frequently mentioned answers were transit, roadway widening, sidewalks and bicycle lanes, and other improvements beyond the study area. Most other suggestions fell into the following three categories:

- To address the congestion at Fort Belvoir, improve access/egress, and reduce impacts to those that commute past Fort Belvoir, suggestions included adding flyover lanes between Tulley Gate and Fairfax County Parkway, installing one-way or reversible lanes, or providing a grade-separated interchange at Route 1 and the Fairfax County Parkway.

¹⁰ Memorandum of Agreement between the Department of the Army and the Commonwealth of Virginia Department of Transportation for Construction of Roadway Improvements at the Intersections of Pohick Road and Barta Road with Richmond Highway/Route 1, Construction of a New Five-Lane Bridge on Gunston Road Over Richmond Highway/Route 1, and Construction of the Route 1 Widening Project, August 18, 2010 (see **Appendix A**).

¹¹ The base easement of 148 feet may be expanded once detailed design plans are developed to provide for utility relocation, stormwater management facilities, turn lanes, traffic signalization, temporary construction, slopes, a railroad/transit bridge over Route 1, maintenance of traffic during construction, and other ancillary improvements.

- Geometric and safety improvements that were suggested included straightening the roadway, adding longer acceleration/deceleration lanes, improving lighting, and reducing speed limits.
- To minimize noise, suggestions included adding buffers, such as trees, using quiet pavement, or constructing noise barriers to protect adjacent communities.

1.7 OTHER PROJECTS AND PLANS IN AREA

The project is consistent with the Fairfax County Comprehensive Plan and ongoing projects, including the following.

- **Fairfax County Comprehensive Plan.** Each build alternative considered for evaluation in this EA has a 32-foot wide median, which would be reserved for future transit on Route 1 in accordance with the Comprehensive Plan. The Policy component of the Comprehensive Plan under Transportation indicates a 176-foot-wide typical cross section for the Route 1 Enhanced Transportation Corridor from Huntington Metrorail Station to I-95. The median width indicated in the typical section is 58 feet. The reduced width of the median in the alternatives presented in the EA is consistent with the Agreement previously negotiated between the Army and VDOT (see Appendix A).
- **Accotink Village.** A concept plan has been developed for a 27-acre mixed-use revitalization plan for Accotink Village, located along Route 1 between Fairfax County Parkway and Fort Belvoir's Tulley Gate. Fairfax County has approved a Comprehensive Plan amendment¹² for walkable, mixed-use developments for ground floor retail with housing above, and a rezoning application has been submitted but not yet accepted. Coordination will take place between redevelopment efforts and the Route 1 improvements project.
- **Fort Belvoir Improvements.** Fort Belvoir has recently completed construction of the Gunston Road bridge and is nearing completion of improvements on Pohick Road and Belvoir Road. In addition, plans are underway to build Lieber Gate, a new Access Control Point to North Post across from Belvoir Road. These improvements constructed by the Department of Defense (DoD) as part of the on-post infrastructure program were designed and constructed in coordination with the development of the Route 1 widening alternatives and where possible, accommodations are being made within the VDOT right-of-way to minimize reconstruction of the improvements with the future widening of Route 1.

All on-post fences are planned outside the future, widened right-of-way and all DoD security improvements are located well within Fort Belvoir property to ensure no disruption of operational security during construction of the widening project. Further, the Gunston Road bridge constructed by DoD to connect North Post and South Post within the installation was planned and constructed to accommodate the proposed 148-foot-wide typical section, so no disruption to that bridge would be expected during the Route 1 widening project construction.

- **Mulligan Road Project.** FHWA is constructing a replacement roadway for the closed Woodlawn Road. This project includes the construction of a four-lane divided roadway between Route 1 and Telegraph Road and the widening of Telegraph Road from two to four

¹² Out of Turn Plan Amendment (OTPA) ST11-IV-LP1 (Village of Accotink).

lanes between Beulah Street and Leaf Road. The existing Old Mill Road (which currently terminates at Pole Road) will be upgraded to a four-lane divided facility and extended to Telegraph Road and the road will be renamed Mulligan Road from Route 1 to Telegraph Road. Also, the current offset intersection of Route 1 / Old Mill Road / Mount Vernon Memorial Highway will be reconfigured into a four-legged intersection as part of this project. Route 1 improvements are being developed in consideration of the proposed new intersection.

SECTION 2 – ALTERNATIVES

2.1 INTRODUCTION

This section describes the process used to develop the alternatives, the range of preliminary design alternatives considered to meet the project needs, and the alternatives carried forward for detailed study. The No-Build Alternative (Alternative A) was retained and it serves as a baseline for comparison with two build alternatives: Alternative B and Alternative C.

2.2 METHODOLOGY

Alternatives development consisted of a collaborative process to develop a range of alternatives to meet the project's needs. Criteria used in evaluating potential alternatives include the existing and programmed future road networks, the planned growth at Fort Belvoir and associated BRAC improvements, travel patterns, right-of-way considerations, and environmental impacts.

Conceptual design plans were initially developed by overlaying the proposed typical section on Route 1 within the study area assuming the same centerline as the existing roadway. Then during the course of the study and in consultation with the public and stakeholders, adjustments were made to the alignment at various locations along the corridor to minimize impacts to human, natural, and cultural resources within the study area.

At the onset of the study, a public scoping meeting was held to obtain input for use in defining the scope of the study.¹³ Further along in the process, a public information meeting was held to provide an update on project activities and to obtain suggestions and comments on the range of alternatives being considered to address transportation needs. As a follow-up to this public information meeting, three meetings were held with the Inlet Cove community to share project information and gather additional input.¹⁴ In response to comments and concerns that the roadway widening would predominantly occur on the north side of the highway to the detriment of their community, the alignment was shifted further south onto property owned by Fort Belvoir to minimize loss of the Inlet Cove frontage. In parallel with these proceedings, at a Fairfax County Board of Supervisors meeting held on February 28, 2012, Mount Vernon District Supervisor Gerry Hyland moved that the Board direct the Fairfax County Department of Transportation to develop an alternative that shows no encroachment and requires no acquisition of Inlet Cove's property as part of this project. Supervisor Hyland in the same motion reiterated his support for preserving right-of-way for transit during the alternatives development process. The motion was carried by unanimous vote.

Six consulting parties meetings were held during the course of the project as part of the Section 106 process (see Section 4 for more information). Activities during these meetings included 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. Conceptual alternatives were modified to minimize impacts to the Pohick Church historic property and the Woodlawn Historic District, and the efforts to minimize impacts to historic

¹³ See Section 4 for more information on the public outreach component of this study.

¹⁴ Meetings with Inlet Cove residents and community members were held on January 10, 2012, February 22, 2012, and April 10 2012 to present the alternatives under consideration and address residents' comments and concerns.

properties led to the development of the Southern Bypass Alignment (now part of build Alternative B) in the eastern portion of the corridor.

Finally, numerous individual coordination meetings were held with representatives of Pohick Church, Woodlawn Baptist Church, Woodlawn Quaker Meetinghouse, the National Trust for Historic Preservation, Mount Vernon Chamber of Commerce, Telegraph Road Homeowners Associations (Sumner Crossing, Lyndam Hill, and Worthington Woods), among others. In addition, beginning in November 2011, weekly partnering meetings were held with FHWA, Fairfax County, Fort Belvoir, VDOT, and other parties as required to facilitate project coordination and development.

2.3 ALTERNATIVE A (NO-BUILD ALTERNATIVE)

Analysis of the No-Build Alternative provides a basis for the comparison of other feasible alternatives. Under the No-Build Alternative, Route 1 within the study limits would remain in its existing configuration (i.e., four lanes undivided). Regular maintenance would be performed to preserve the structural integrity of the pavement and the existing bridges.

Under the No-Build Alternative, it is assumed that all other transportation projects funded for construction by the year 2040 in the Metropolitan Washington Council of Governments' (MWCOG) Constrained Long Range Plan (CLRP) will be in place. Improvements within the immediate study area that have recently been constructed or that are expected to be completed by 2040 are listed below:

- **Widening of Pohick Road “east”.** Pohick Road improvements on Fort Belvoir are nearing completion. The improvements include widening Pohick Road from two to four lanes from Route 1 to Gunston Road and improvements to Tulley Gate to increase the number of lanes for inspection/ID check. The westbound approach to Route 1 is being widened/reconfigured to two left-turn lanes and a shared through-right lane (Fort Belvoir improvement).
- **Widening of Belvoir Road.** This roadway improvement project is nearing completion and includes widening Belvoir Road from two to four lanes from Route 1 to 12th Street, improvements to Pence Gate, upgrading intersections, and adding a roundabout at the entrance to the new Fort Belvoir Community Hospital. The Belvoir Road approach to Route 1 is being widened to accommodate two left-turn lanes and a right-turn lane (Fort Belvoir improvement).
- **New Lieber Gate Access Control Point.** After September 11, 2001, security on Fort Belvoir was heightened and public access restricted. The number of access points to Fort Belvoir was subsequently reduced, including the old Lieber Gate (on Constitution Road) and Woodlawn Gate on Woodlawn Road. With the expansion of employment slated for Lower North Post due to the BRAC action, a new access control point (gate) is being constructed on Lower North Post; this access point will tie directly onto Route 1 opposite Belvoir Road, resulting in a traditional four-legged intersection. This configuration is preferred to providing off-set intersections along Route 1, which was the old configuration when multiple gates were provided along Route 1 in this section of the study area. The new roadway will have two lanes in each direction (Fort Belvoir improvement).
- **Construction of Mulligan Road.** After September 11, 2001, Woodlawn Road and other roadways on Fort Belvoir were closed to general public access. This closure meant that

traffic could no longer cut through Fort Belvoir to avoid congestion on Route 1 and Fairfax County Parkway. Since that time, the Department of Defense and FHWA, and VDOT as a party of interest, have examined developing a new roadway connecting Route 1 to Telegraph Road to replace the closed roadways. Mulligan Road, constructed as a four-lane facility, will cut across Fort Belvoir between the DCEETA complex and the Humphries complex and tie into the existing Old Mill Road at Pole Road. Old Mill Road will be renamed Mulligan Road and upgraded to a four-lane facility, and the offset intersection of Route 1 / Old Mill Road / Mount Vernon Memorial Highway will be reconfigured into a four-legged intersection (FHWA project).

2.4 ALTERNATIVE B (BUILD ALTERNATIVE)

Alternative B would entail reconstructing Route 1 to provide six through travel lanes between Telegraph Road and Mount Vernon Memorial Highway. All intersections with other streets would remain at-grade and appropriate turn lanes would be provided. A section of the alignment at the east end of the project would be shifted southward to new location through the Woodlawn Historic District (the existing alignment of Route 1 also passes through the Woodlawn Historic District).

The typical section of the proposed roadway measures 148 feet and consists of two 12-foot-wide lanes and a 14-foot-wide curb lane in each direction to accommodate on-road bicycles (see **Figure 2**). A 32-foot-wide median is provided for future transit, as well as a 10-foot-wide multi-use trail on the west side of the roadway and a 5-foot-wide concrete sidewalk on the east side of the roadway.¹⁵

The description of the roadway after the proposed widening is provided below, and the conceptual design plans, which also show the proposed locations of stormwater management features, are shown in **Figure 3**.¹⁶

Avoidance, minimization, and mitigation measures that would prevent or minimize adverse effects associated with the implementation of Alternative B are itemized in the National Historic Preservation Act Section 106 Programmatic Agreement, the development of which is currently underway. These measures would be incorporated into the project design and construction plans.

¹⁵ The median width of 32 feet reflects a reduction from the Fairfax County Comprehensive Plan Alternative, which measures 176 feet and includes a median width of 58 feet. The reduced median width of 32 feet proposed as part of this project was the product of negotiations between VDOT and the U.S. Army in conjunction with the necessity to set aside right-of-way for the Route 1 widening when the new Gunston Road bridge was designed and constructed. Since the MOA allows for widening to more than 148 feet at intersections, it was agreed that 32 feet would be adequate to accommodate two transit travel ways (26 feet) plus a 3-foot buffer/separation on each side of the travel way and platforms would be accommodated at intersections and where the roadway can be wider than 148 feet.

¹⁶ Currently, two locations are being considered for the stormwater management pond near Mount Vernon Memorial Highway. The size of the pond would be similar at the two locations, and both options are located on the same parcel of land. Figures showing the locations of the two options are provided in **Appendix B**. The pond located directly adjacent to Route 1 has been assumed to be in place for the assessment of impacts within the EA.

Description of Alternative B

In the northbound direction, from south to north, the conceptual design plans for Route 1 Alternative B call for:

- Modifying the northbound approach to Telegraph Road to include a third left-turn lane. The roadway would be widened to the north, and the existing Route 1 curb-line that abuts the historic Pohick Church property would remain unchanged.
- Constructing improvements to Telegraph Road to accommodate the turning movements (further details on Telegraph Road improvements provided below).
- Constructing three lanes from Telegraph Road to Cook Inlet Drive, with a left-turn lane at that intersection. Note that northbound access to Belvoir Woods Parkway and Inlet Cove Drive would be prohibited, as it is today.
- Constructing three lanes from Cook Inlet Drive to Fairfax County Parkway, with two left-turn lanes at Fairfax County Parkway.
- Constructing three lanes from Fairfax County Parkway to Pohick/Backlick Roads, with a left-turn lane and two right-turn lanes at the Pohick/Backlick intersection (full length auxiliary lanes from Fairfax County Parkway to Pohick Road).
- Constructing three lanes from Pohick Road to Belvoir Road, with two left-turn lanes (to the new Lieber Gate ACP) and one right-turn lane at the Belvoir Road intersection.
- Constructing three lanes from Belvoir Road to Woodlawn Road along the “Southern Bypass” Alignment, which shifts the road to the south around Woodlawn Baptist Church, with a left-turn lane at the Woodlawn Road intersection (existing Woodlawn Road would be extended to a signalized intersection with the proposed realigned Route 1 to provide access to Woodlawn Quaker Meetinghouse, Woodlawn Plantation, and Woodlawn Baptist Church).
- Constructing three lanes from Woodlawn Road to Mount Vernon Memorial Highway / Mulligan Road with two left-turn lanes and the rightmost of the three through lanes a “Right Lane Must Turn Right” lane, with only two lanes continuing through the intersection.

In the southbound direction, from north to south, the conceptual design plans for Route 1 Alternative B call for:

- Constructing three lanes from Mount Vernon Memorial Highway / Mulligan Road to Woodlawn Road along the Southern Bypass Alignment, with a right-turn lane at Woodlawn Road.
- Constructing three lanes from Woodlawn Road to Belvoir Road, with two left-turn lanes and a right-turn lane.
- Constructing three lanes from Belvoir Road to Pohick/Backlick Roads, with a left-turn lane and a right-turn lane at Pohick/Backlick Roads.
- Constructing three through lanes from Pohick/Backlick Roads to Fairfax County Parkway with two right-turn lanes, one of which is a full-length auxiliary lane and the other a turn bay, and a left-turn bay to allow U-turns to northbound Route 1 (see Figure 3, Sheet 3 of 6).
- Constructing three through lanes from Fairfax County Parkway to Cook Inlet Drive, with a right-turn lane into Cook Inlet Drive.
- Constructing three lanes from Cook Inlet Drive to Inlet Cove Drive, with a right-turn lane

into Inlet Cove Drive.

- Constructing three lanes from Inlet Cove Drive to Telegraph Road, with one left-turn lane and one right-turn lane at Telegraph Road. In order to minimize right-of-way impacts, the existing full-length right-turn lane at Belvoir Woods Parkway will be modified to a taper, which is sufficient given the number of right turns at that location.

Proposed Improvements to Telegraph Road

On the Telegraph Road approach to Route 1, a two-lane free-flow channelized right turn, not under signal control, would be constructed to replace the current triple right-turn lanes (see Figure 3, Sheet 1 of 6). The proposed change would convert the right-turn movement to a two-lane free-flow channelized right turn, not under signal control. The rightmost through lane on southbound Route 1 prior to the Telegraph Road intersection would be eliminated to allow the right turns from Telegraph Road to enter in a dedicated lane on southbound Route 1, thereby improving traffic flow.

Potential modifications to Telegraph Road northbound from the intersection with Route 1 include the addition of a third through-right lane to Whernside Street to accept the third left-turn lane from Route 1 northbound that is being constructed as part of this project. Widening would occur primarily on VDOT right-of-way on both sides of the roadway and modifications to existing access along Telegraph Road include the following:

- Old Pohick Way access would be moved to the existing service road across from Belvoir Woods Parkway at the existing signal. This signal would be modified to include a pedestrian phase, a pedestrian button, and countdown heads. Old Pohick Way would be converted to right-in only from Route 1.
- Lyndam Hill Circle access would be moved further north across from Whernside Street. A signal would be added at this new four-legged intersection.
- The Whernside Street and relocated Lyndam Hill Circle approaches to Telegraph Road would be reconfigured to provide a shared through-left and separate right-turn lane, and a new signal would be installed with concurrent side-street phasing (i.e., these two approaches would move at the same time), thereby allowing the allocation of more green time for through traffic on Telegraph Road.

Proposed Improvements to Fairfax County Parkway

On the Fairfax County Parkway approach to Route 1, a third eastbound left-turn lane and a second right-turn lane would be added to accommodate the turning movements to northbound and southbound Route 1.

Mitigation Measures

Minimization and mitigation measures associated with the implementation of Alternative B would include:

- The existing bridge at Accotink Creek would increase in length from approximately 60 feet to approximately 500 feet. A minimum of eight feet of vertical clearance would be provided at the Creek to improve hydrologic function and provide connectivity between wildlife habitats. The project would provide compensatory wetland and stream mitigation, most likely through the purchase of credits from a mitigation bank.

Construction staging in wetlands, floodplains, or Resource Protection Areas (RPAs) would not be permitted.

- Extensive efforts have been made to minimize the potential and mitigate for adverse effects to historic and archeological sites. A Programmatic Agreement is currently being completed in accordance with the National Historic Preservation Act. The mitigation would include measures such as landscaping, access improvements, interpretive signage, vibration monitoring, relocation, and Historic American Building Survey/Historic American Engineering Record documentation.
- Stormwater from the existing roadway surface in the project area is currently not treated. Stormwater treatment would be constructed in association with the proposed roadway improvements and would treat the stormwater from the new impervious area as well as from the existing impervious area.
- A preconstruction survey for the state-listed threatened wood turtle (*Glyptemis insculpta*) would be completed. Any wood turtles found in the project area would be relocated in cooperation with the Virginia Department of Conservation's Natural Heritage Division.
- No noise attenuation currently exists in the project area. Noise impacts resulting from the proposed project have been analyzed. Potential attenuation will be proposed, most likely in the form of noise barriers, for additional capacity resulting from the project as well as the existing traffic on Route 1.
- Revegetation of certain disturbed areas would be accomplished with native shrubs and trees in conformance with Fort Belvoir requirements thereby limiting introduction of invasive species.
- Some roadway intersections would be reconfigured and some driveway entrances on Route 1 would be closed or relocated to enhance safety and traffic operations for Route 1.
- Woodlawn Baptist Church would be provided with traffic signal access to Route 1, thereby enhancing safety and accessibility for the church.
- Pedestrian access to and across Route 1 would be facilitated through the improvement of cross walks.
- The proposed project would allow for the designation of the project's proposed multi-use trail as a segment of the Washington-Rochambeau Revolutionary Route National Historic Trail and the Potomac Heritage National Scenic Trail.
- An existing baseball field would be relocated further from Route 1 and a new soccer field would be constructed on a previously disturbed and now abandoned housing area within Fort Belvoir adjacent to the project.
- Mitigation is under discussion for accommodating/mitigating for possible impacts to existing land uses on National Trust for Historic Preservation property located at the north end of the project. These mitigations are subject to land owner input as well as lease holder input in accordance with provision of the current lease. Possible mitigations include multiple-use of stormwater management facilities with the intent of reducing visual impacts and possibly allowing dual use of the land area. A multi-purpose underpass for possible use by wildlife, pedestrians, maintenance equipment, drainage and/or equestrians/livestock could, with proper design, provide connectivity between the two parcels on each side of Route 1, thereby also providing more flexibility in how the two parcels may be used and managed in the future.

2.5 ALTERNATIVE C (BUILD ALTERNATIVE)

This alternative would be similar to Alternative B except for at the following three locations (see **Figure 4**):

- At the Telegraph Road intersection where Alternative B proposes triple left-turn lanes to accommodate the northbound Route 1 to northbound Telegraph Road traffic, this alternative proposes a grade-separated flyover to accommodate this movement. Along Telegraph Road, the flyover would tie in north of Belvoir Woods Parkway. Similar to Alternative B, Lyndam Hill Circle access would be moved further north across from Whernside Street. A signal is proposed at this new four-legged intersection.
- At the Fairfax County Parkway intersection where Alternative B proposes triple left-turn lanes to accommodate the southbound Fairfax County Parkway to northbound Route 1 traffic, Alternative C proposes a grade-separated flyover to accommodate this movement.
- North of Belvoir Road, where Alternative B diverts from Route 1 along the Southern Bypass Alignment, Alternative C would continue along the current Route 1 alignment.

Mitigation Measures

The minimization and mitigation measures discussed under Alternative B would also be implemented under Alternative C with the exception of:

- The baseball field would not be relocated.
- A Programmatic Agreement would be completed in accordance with the National Historic Preservation Act. The mitigation would also include measures such as landscaping, access improvements, interpretive signage, and Historic American Building Survey/Historic American Engineering Record documentation. Additional measures to mitigation for impacts to the Woodlawn Baptist Church and cemetery, Quaker Meetinghouse, and Grand View would likely be required.

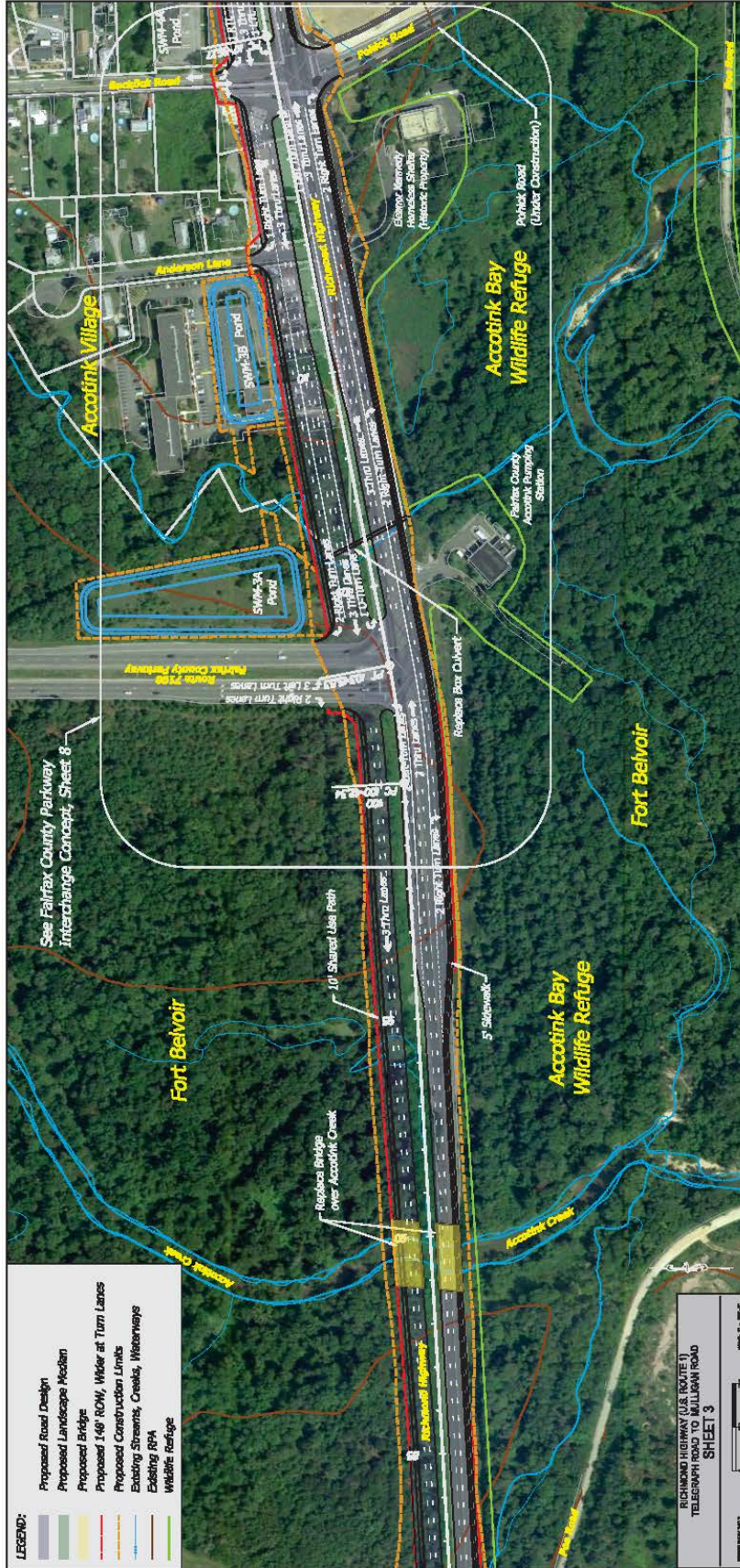


Figure 4. Alternative C
(Sheet 3 of 8)

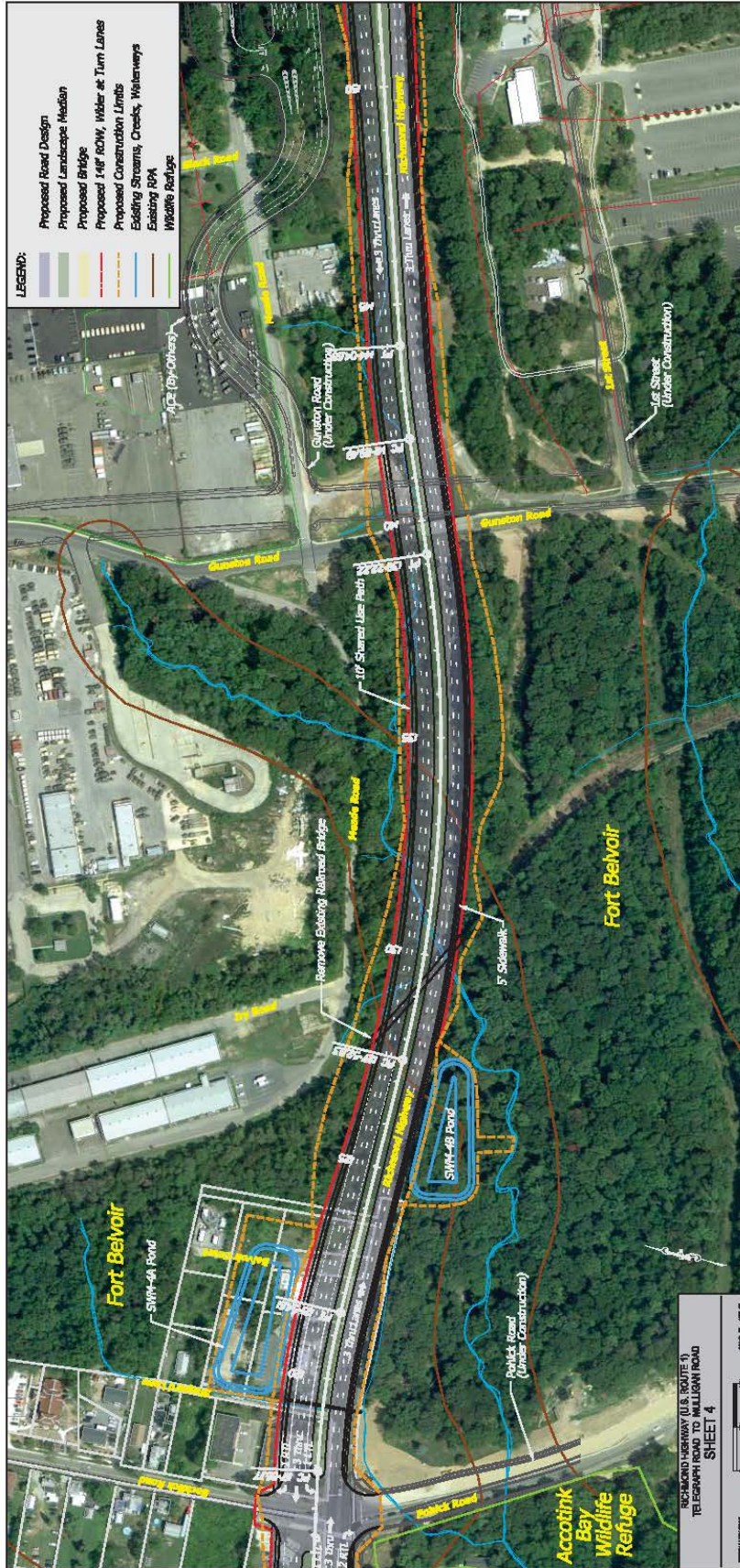


Figure 4. Alternative C
 (Sheet 4 of 8)

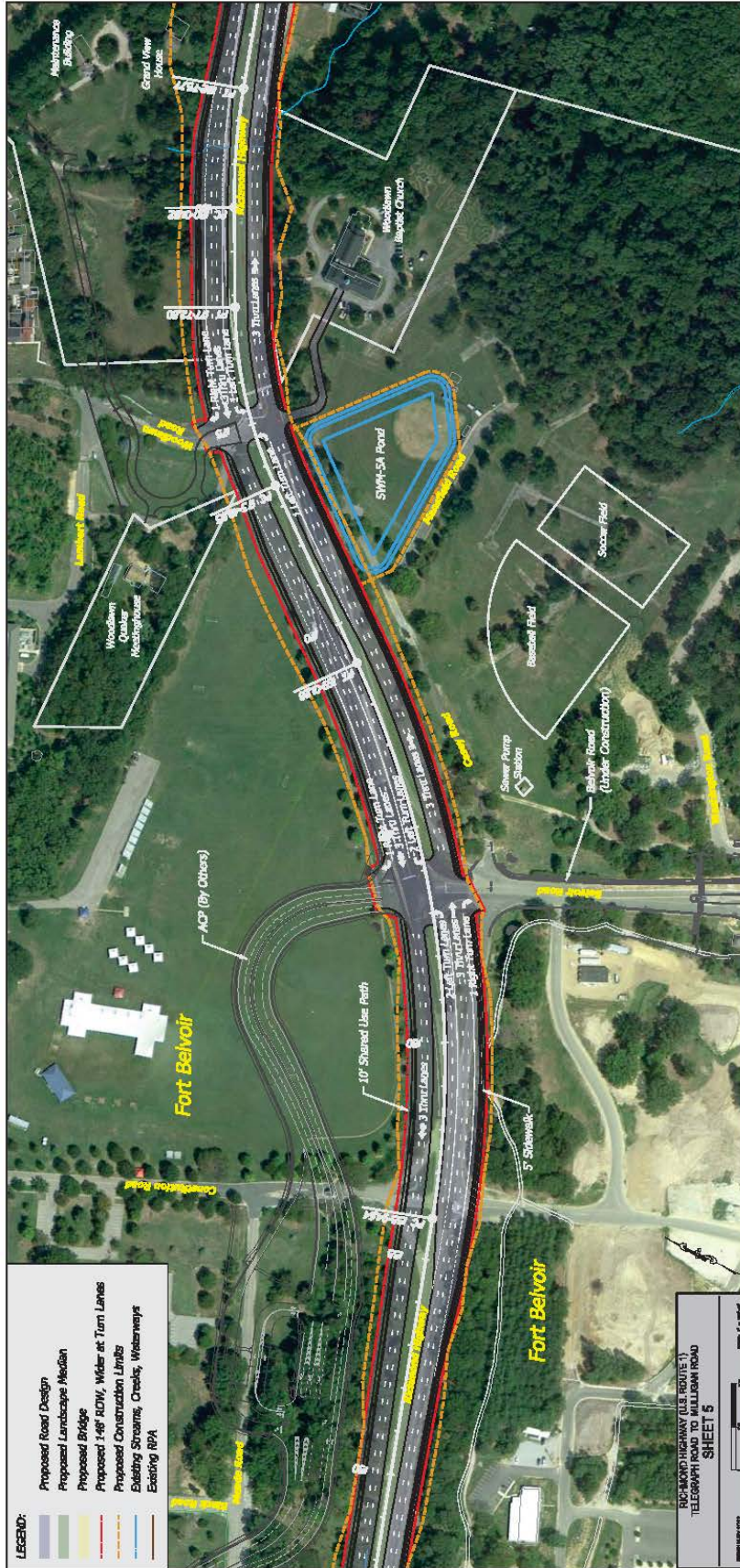


Figure 4. Alternative C
(Sheet 5 of 8)

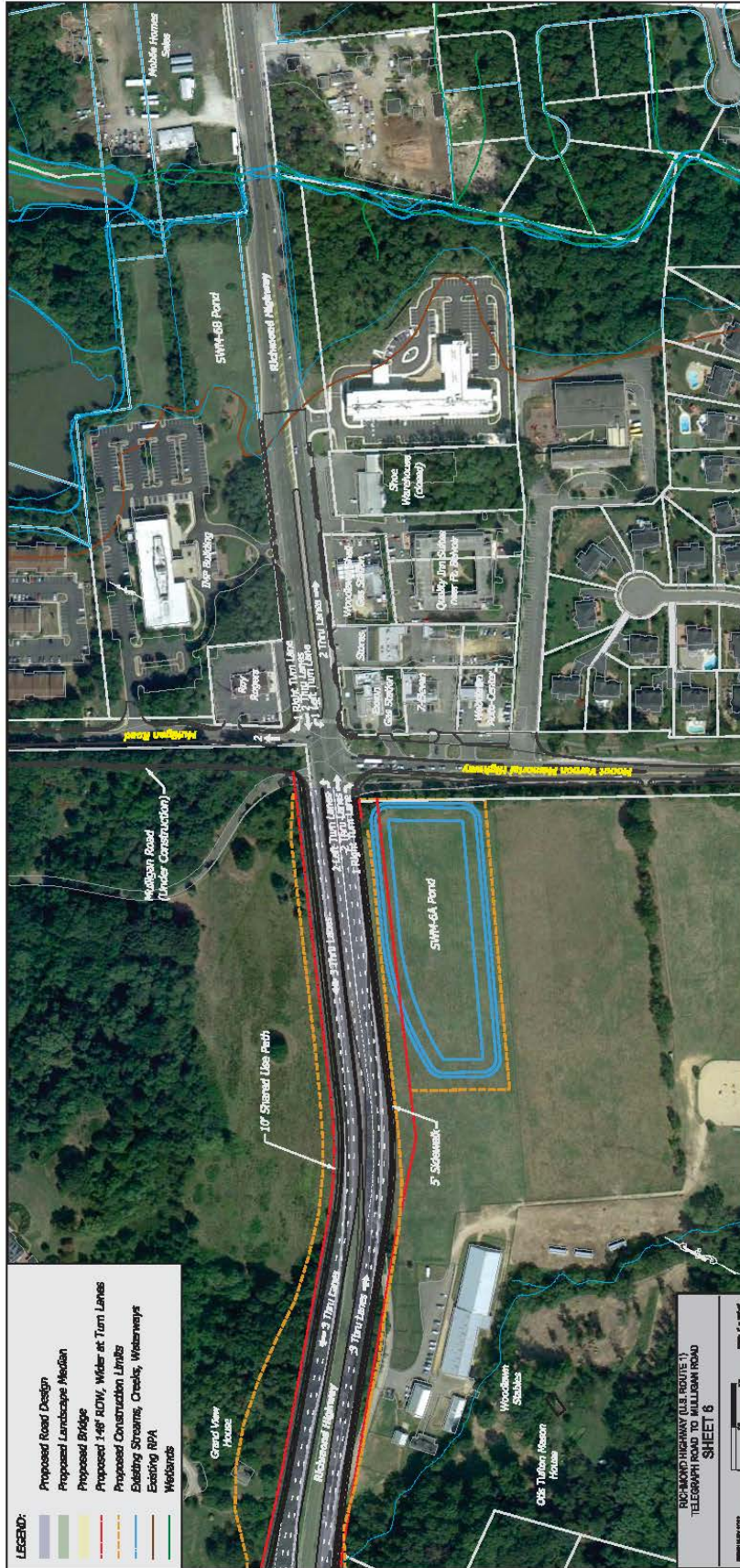


Figure 4. Alternative C
 (Sheet 6 of 8)

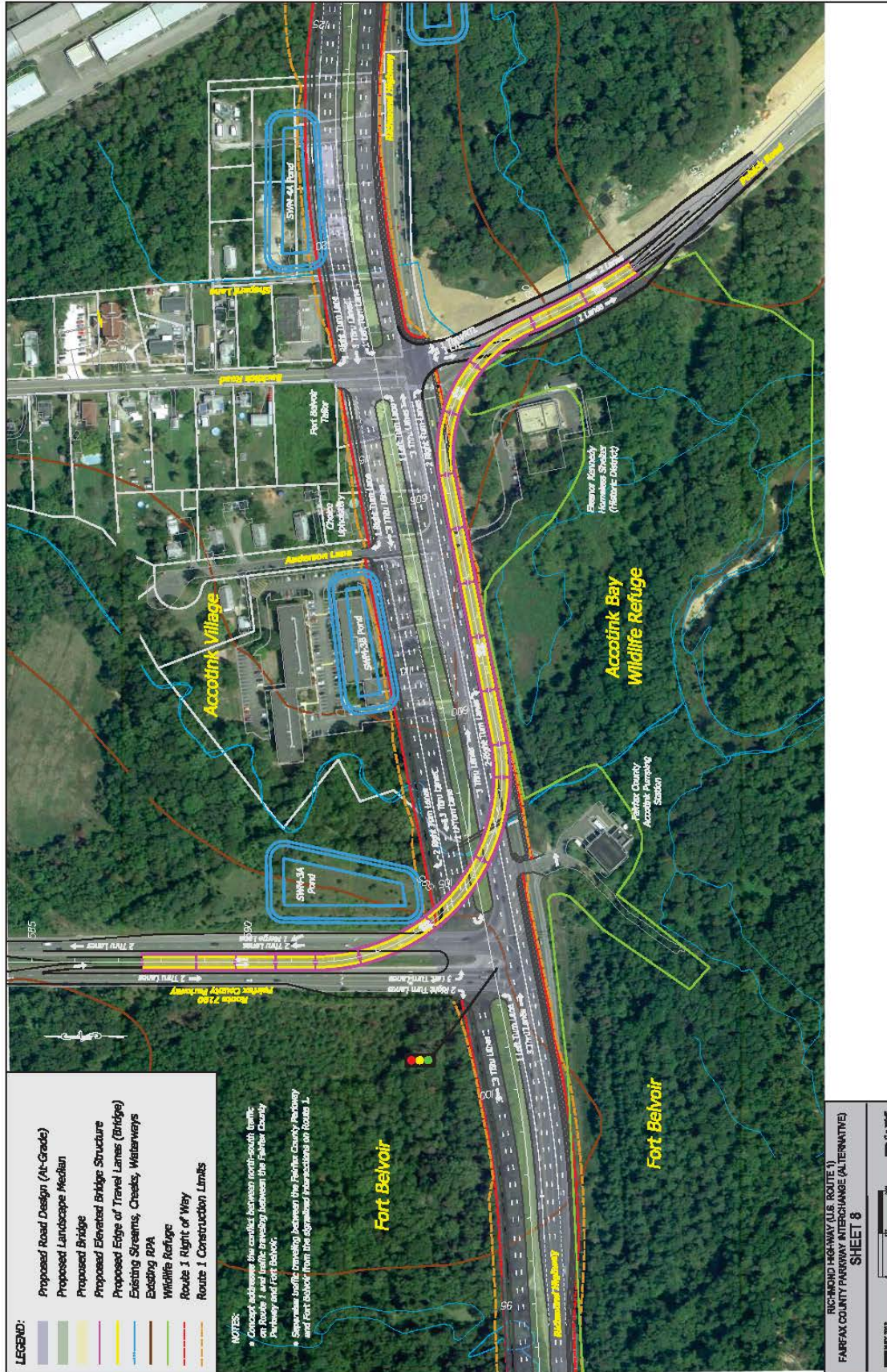


Figure 4. Alternative C

(Sheet 8 of 8)

2.6 ALTERNATIVES CONSIDERED BUT DISMISSED

Through the alternatives screening process, several concepts and alternatives were eliminated from further consideration and were not carried forward for detailed study. These alternatives are described below.

- **Woodlawn Historic District Bifurcated Cross-Section.** For the segment of roadway between Belvoir Road and Mount Vernon Memorial Highway, a bifurcated option was considered in the eastern portion of the study area (similar to the retaining wall option studied in the 2003 VDOT Location Study). This bifurcated cross-section was considered in an attempt to minimize harm to Woodlawn Historic District. It was dropped from further consideration for three reasons. First, the cumulative width of the both the northbound and southbound roadways with the bifurcated section, including all elements required by the design criteria, would be more than 148 feet. Second, the bifurcated cross-section does not allow for the maintenance of a 32-foot median for future transit, which is designated in the Fairfax County Comprehensive Plan. Finally, maintenance of traffic during construction of the bifurcated roadway would require the construction of a detour roadway and would likely incur even greater impacts to adjacent properties.
- **Transportation System Management (TSM) Alternative.** “TSM” generally means implementation of relatively low-cost actions to improve efficiency of existing transportation systems. Examples include traffic controls, signal synchronization, turn lanes, parking management, access management, operational modifications, flexible work hours, van pools, transit scheduling, bicycle and pedestrian improvements, modifying driver behavior with incentives, pricing, or restrictions. Such actions are important elements in the overall transportation plan for any urbanized area; however, none alone or in combination would provide the additional capacity needed to serve existing traffic demand and to safely accommodate the forecasted traffic (see Section 1.3).
- **Mass Transit Alternative.** Although transit expansions are necessary and desirable elements of the overall regional transportation system, and in fact are being developed independently of this highway project, as described further in the Environmental Assessment, there are none that would preclude the need to construct the proposed Route 1 improvements. Indeed, the proposed improvements would allow transit usage in the corridor to be more fully realized by reducing congestion, providing space for more user-friendly transit facilities such as bus stop shelters, and improving pedestrian mobility and safety with the addition of continuous sidewalks. In addition, the alternatives evaluated in the Environmental Assessment preserve right-of-way in the median for transit, in accordance with the Fairfax County Comprehensive Plan recommendations.
- **Eight Lanes on Route 1.** Year 2040 traffic forecasts developed for this study suggest that daily travel demand will increase 15 to 20 percent on Route 1 within the study area. Widening from four to six lanes represents a 50 percent increase in capacity, which would be adequate to meet this projected growth in traffic. Congestion may still be experienced during several hours of the day; however, the higher volumes during the AM and PM peak periods do not warrant the wider cross-section. The eight-lane alternative was therefore dropped from consideration.
- **LOS C Alternative.** FHWA generally requires that all highway projects be designed to meet LOS C criteria or better, but exceptions can be made in urban areas. Based on a qualitative

review, forecasts suggest that a LOS C alternative would most likely require six or eight lanes, with an interchange at the Fairfax County Parkway due to the heavy turning movements at this location. As described above, widening to eight lanes was dropped from consideration due to the limited benefits achieved when weighed against the greater impacts associated with wider cross-sections. In addition, as described in Section 2.2.2, the Memorandum of Agreement between VDOT and the U.S. Army for Route 1 improvements stipulates that the existing 80-foot easement may only be expanded to a maximum base easement of 148 feet.

Build Alternative A, which recommends widening Route 1 to six lanes and meets the 148-foot requirement, would reduce congestion and decrease delay time, even though operational improvements during the peak hour are measured within the ranges that define LOS D and E. These service levels may ultimately be higher given that traffic flows can and will vary on a regular basis along Route 1 depending on travel conditions on I-95, Telegraph Road, Fairfax County Parkway, the new Richmond Highway-Telegraph Road Connector (Mulligan Road), and other adjacent routes.

- **Telegraph Road Interchange - Grade-Separation of NB/SB Route 1.** The Fairfax County Comprehensive Plan calls for a future interchange or grade-separated improvements at this location. With this option, the southbound direction of Route 1 would be elevated above the existing intersection so that there would be separate intersections for northbound and southbound Route 1. A set of ramps would be added to provide access for all movements. This concept would reduce the number of conflict points from an operational perspective, thereby increasing the amount of green signal time for key movements. Outside of the interchange area, all roadways would retain their existing cross-sections. This concept was dropped from consideration due to the prohibitive high cost and visual impact to the Pohick Episcopal Church Historic District.

Representatives of Pohick Church, a National Register of Historic Places-listed site, have expressed strong opposition to any grade-separation options at this location due to potential physical and visual impacts to the historic property. Pohick Church and its surrounding environs are also designated as the Pohick Church Historic Overlay District, a Fairfax County local zoning entity.

- **Fairfax County Parkway Interchange - Thruway Interchange (aka Compressed Double Diamond Interchange).** The Fairfax County Comprehensive Plan also calls for a future interchange or grade-separated improvements at this location. This concept would best imitate the Franconia Road thruway adjacent to the Springfield Mall in Fairfax County, where the through movement for northbound/southbound Route 1 traffic would be elevated over the two signalized intersections. All other movements would be accommodated at the signalized intersections. A collector-distributor road would be located on either side of the thruway to connect the two intersections. This concept was dropped from consideration due to its higher costs and greater impacts to Accotink Village, the Fort Belvoir Forest and Wildlife Corridor, wetlands, and other resources.

2.7 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative B, which includes realignment of Route 1 south of its existing alignment through Woodlawn National Register Eligible Historic District. The Preferred Alternative avoids taking Woodlawn Baptist Church Cemetery property and the need to relocate a number of the graves located there. The Preferred Alternative also moves the roadway further from other historic properties in the Woodlawn National Register Eligible Historic District, including Woodlawn Quaker Meetinghouse, Grand View and Woodlawn Plantation National Historic Landmark, and therefore minimizes adverse effects to these properties.

The at-grade intersection at Telegraph Road under the Preferred Alternative would also have fewer adverse visual and auditory impacts to Pohick Episcopal Church and the Eleanor Kennedy Shelter, compared to the grade-separated interchange that is proposed under Alternative C.

SECTION 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This section describes the environmental consequences of the proposed project. These consequences are reported for the No-Build Alternative (Alternative A) and Build Alternatives B and C within the study area, which includes the lands adjacent to Route 1 and the intersecting roadways where they cross Route 1 as well as the lands just north and south of the project limits. **Table 3** summarizes environmental issues and their relevance to the project. **Table 4** quantifies the impacts within the construction impact zone, and some of these resources are shown in **Figure 5**. Key issues requiring further discussion are addressed 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 project area.

Table 3. Summary of Environmental Issues

Resource/Issue	Remarks
Land Use	Land uses along the corridor are dominated by military facilities associated with Fort Belvoir. Residential land uses are present along the north side of Route 1 in the vicinity of Telegraph Road and in Accotink Village. Commercial activities also are present in Accotink Village. The Woodlawn Historic District occupies lands on both sides of Route 1 at the east end of the project. Except for conversions of land to highway right-of-way, land uses are not expected to change as a result of the proposed improvements. See Section 3.2 for more details.
Community Facilities and Services	The following community facilities or services (churches, schools, civic organizations, law enforcement, or emergency services) are located along or near Route 1: Pohick Episcopal Church and Cemetery, Accotink Methodist Church and Cemetery, Woodlawn Baptist Church and Cemetery, Woodlawn Quaker Meetinghouse, Inlet Cove Community Swimming Pool, and the Eleanor Kennedy Homeless Shelter. Improvements would take into consideration these facilities and would address safer access to community services, including upgraded intersections and the addition of sidewalks and a 10-foot shared use pathway. See Section 3.2.2 for more details.
Community Access	Route 1 is the principal north-south route for local traffic in eastern Fairfax County and serves as a major commuter route. Congestion is prevalent within this section of Route 1 during the weekday peak periods and frequently during other times of the day as well, primarily between the Fairfax County Parkway and Belvoir Road. As part of the project scoping process, public input was gathered on transportation problems and deficiencies in the study area, and congestion ranked first, with construction and the influx of traffic from BRAC cited as one of the primary contributors. Other leading deficiencies included lack of pedestrian/bicycle access and crosswalks at intersections; lack of public transit; speeding; and safety. Improvements developed as part of this project are anticipated to address many of these concerns and provide safer access to community and emergency facilities.
Right-of-Way and Displacements	Alternative B would displace a single family home, four apartment buildings, 13 businesses, one historic property (the railroad bridge across Route 1), and two outbuildings. All relocations would be accomplished in accordance with the <i>Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970</i> , as amended. See Section 3.2.3 for more details.

Resource/Issue	Remarks
Demographics: Title VI and Environmental Justice	Of the 56 Census (2010) blocks for race along the alignment, only 20 contain residences. Of those 20, 16 blocks have a minority population percentage greater than 10% above the total county minority population percentage; however, relocations would only be required in three. All Census tracts along the proposed project area have poverty rates below the state average and within five percent of the county average (U.S. Census, 2010). The proposed project is located along an existing alignment and would be affecting all blocks bordering the roadway; therefore, there are no Environmental Justice or Title VI populations that would be disproportionately affected by the project.
Topography, Geology, Soils	Much of the soil along the alignment is limiting to road construction due to low strength, frost action, shrink-swell, or shallow depth to saturation, or has the possibility of producing acidic conditions. These characteristics will be considered in the design of the infrastructure to compensate for these limitations. See Section 3.3 for more details.
Prime and Unique Farmlands	Soils data indicate that there are 37.7 and 35.4 acres of soils present in the new areas of disturbance proposed for Alternatives B and C, respectively, that are listed by the USDA Natural Resources Conservation Service (NRCS) as either Prime Farmland or Farmland of Statewide Importance. Most of these lands already are committed to urban or military uses and there are no active commercial farming activities in the corridor. However, in partnership with the National Trust for Historic Preservation, Arcadia Farm was established in 2010 on the grounds of Woodlawn Plantation to further educational programs about food and agriculture at Woodlawn. See Section 3.4 for more details.
Agricultural and Forestal Districts	There are no Agricultural and Forestal Districts in the vicinity of the project.
Karst and Caves	According to the Department of Conservation and Recreation (DCR), the study area is not located in a county containing Karst topography.
Mines and Minerals	No mineral resources are located within the study area according to the Department of Mines, Minerals, and Energy online mapping system.
Parks and Recreational Resources	There are no publicly owned parks or recreation areas within the project limits.
Federal Properties	Important national defense and homeland security missions are carried out on Fort Belvoir lands. Fort Belvoir is a cooperating agency in this project and has been consulted throughout the study process.
Section 4(f) and Section 6(f)	Section 4(f) properties impacted by the project include Accotink Bay Wildlife Refuge; Fort Belvoir Forest and Wildlife Corridor; Fort Belvoir Military Railroad; and Woodlawn Historic District. There are no Section 6(f) properties in the corridor. See Section 3.5 and the Section 4(f) Evaluation in Appendix C for more details.
Open Space Easements	There are no open space easements in the project corridor. However, a historic preservation easement has been granted to the Virginia Department of Historic Resources on the Woodlawn Quaker Meetinghouse property.
Historic Properties	Pursuant to Section 106 of the National Historic Preservation Act, historic properties that are included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) and that are located within the proposed project's area of potential effects (APE) have been identified and evaluated. Surveys and research have been conducted as part of this EA for archaeological and architectural resources. The following historic properties are located within the APE: Pohick Church, Fort Belvoir Military Railroad, Camp Humphreys Pump Station and Filter Building, and Woodlawn Historic District (which encompasses several individually eligible and a number of contributing resources). See Section 3.6 for more details.
Waters of the U.S., including Wetlands	Water resources are regulated by the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality (DEQ) under provisions of the Clean Water Act. Executive Order 11990, <i>Protection of Wetlands</i> , mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural values. Alternatives B and C cross approximately 2.6 and 2.5 acres of mapped wetlands, respectively, and 1,526 and 1,451 linear feet of mapped streams, respectively, including: Accotink Creek, Mason Run, and two unnamed tributaries to Accotink Creek. See Section 3.7.1 and 3.7.2 for more details.

Resource/Issue	Remarks
Floodplains	Approximately 4.9 and 4.5 acres of the Accotink Creek Federal Emergency Management Agency (FEMA)-mapped 100-year floodplain are located within the limits of disturbance for Alternatives B and C, respectively. All project planning and construction occurring within the 100-year floodplain would be in accordance with Executive Order 11988, <i>Floodplain Management</i> . A larger bridge span is proposed for the crossing, which would better accommodate flood stage waters; therefore, it is anticipated that upgrades due to this project would allow for improved floodplain functions. See Section 3.7.3 for more details.
Water Quality	One stream (Accotink Creek) that would be crossed by the project and one (Dogue Creek) that would receive stormwater runoff from the project have been assessed by DEQ for water quality supporting uses in accordance with the Clean Water Act, Section 303(d). Both have been listed as impaired. See Section 3.7.4 for more details.
Public Water Supplies	No surface or groundwater public water supplies are located in the corridor. According to the Virginia Department of Health, 'There are no apparent impacts to public drinking water sources from this project'. There are no sole-source aquifers designated by the EPA located in this region.
Chesapeake Bay Protection Areas	Both build alternatives would cross approximately 13 acres of Resource Protection Areas for Accotink Creek and its tributaries. Under the Chesapeake Bay Preservation Area Designation and Management Regulations, public roads and their associated structures are conditionally exempt from regulation provided they are constructed in accordance with the Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia) and the Stormwater Management Act (§10.1-603. 1 et seq of the Code of Virginia). 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 3.7.5 for more details.
Virginia Coastal Zone Management Program	According to DEQ, Virginia's coastal zone "encompasses the 29 counties, 17 cities, and 42 incorporated towns in "Tidewater Virginia", as defined in the Code of Virginia 28.2-100" (VDEQ, 2011). The entire study area is located within Virginia's coastal zone. See Section 3.7.6 for more details.
Wild and Scenic Rivers	No Federal or State Wild or Scenic Rivers or Nationwide Rivers Inventory segments, are located in the project vicinity.
Environmental Quality Corridor	According to Fairfax County's Comprehensive Plan Map and updated online zoning, there are no Environmental Quality Corridors shown in the project vicinity.
Air Quality	The Washington, D.C. region is designated nonattainment for ozone and small particulate matter (PM _{2.5}). Assessment of potential impacts with respect to carbon monoxide (CO) and, PM _{2.5} show no violations of National Ambient Air Quality Standards arising from the project. Based on FHWA guidance, this project is of a type that would be expected to have low potential for impacts related to mobile source air toxics (MSAT). The project comes from a financially constrained long-range transportation plan that has been found to conform to the State Implementation Plan for attainment and maintenance of the National Ambient Air Quality standards. See Appendix F - <i>Air Quality Technical Report</i> for more details.
Noise	Noise impacts are predicted to occur in design year 2040 at 41 noise sensitive sites representing 63 residences, one pool area, three areas of a cemetery, six areas of a sports area, one church, and Arcadia Farm at Woodlawn Plantation. Based on the preliminary noise evaluation, eight noise barriers were evaluated along the study corridor and seven barriers were found to be feasible and reasonable. A more detailed review will be conducted during the final design. See Section 3.8 and Appendix E - <i>Noise Impact Analysis Technical Report</i> for more details.
Visual	The study area is located in an urbanized area, and the widening of an existing four-lane primarily undivided roadway to a six-lane divided roadway is not expected to substantially change the overall visual characteristics of the corridor. Alternative B realigns Route 1 along the Southern Bypass Alignment through the Woodlawn area in the eastern portion of the study area. Either of the build alternatives would have visual effects on the Woodlawn Historic District. See Section 3.9 for more details.

Resource/Issue	Remarks
Aquatic and Terrestrial Habitat and Wildlife	Portions of the project area are bordered by forested habitat and wetlands, and Route 1 crosses a wildlife corridor connecting Huntley Meadows Park to Accotink Bay Wildlife Refuge, which is located on Fort Belvoir land. Improvements would be designed, to the extent practicable, to minimize clearing of native vegetation, account for migration routes, and facilitate the passage of wildlife. Best management practices and strict adherence to state and local regulations would be followed to protect environmental resources. See Section 3.10 for more details.
Wildlife and Waterfowl Refuges/Corridors	Accotink Bay Wildlife Refuge lies along the south side of Route 1 on Fort Belvoir land and the Fort Belvoir Wildlife Corridor lies on both sides of Route 1. See Section 4(f) Evaluation in Appendix C.
Threatened and Endangered Species	Previous surveys were conducted in suitable habitat for small whorled pogonia, a federally listed threatened species, and the wood turtle, a state-listed threatened species, as suggested by U.S. Fish and Wildlife Service and the Virginia Division of Natural Heritage. No occurrences of the species were found. New surveys are being conducted by FHWA as part of ongoing studies. According to the Department of Conservation and Recreation, the project would not affect any documented state-listed plants or insects. See Section 3.11 for more details.
Marine and Estuarine Resources	No marine or estuarine resources are located in the corridor. Best management practices and strict adherence to state and local regulations would be followed to protect downstream resources.
Anadromous Fish and Shellfish	Accotink Creek is a known anadromous fish use water. Best management practices and strict adherence to state and local regulations would be followed to protect these resources. There are no shellfish resources in the corridor.
Invasive Species	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 would be minimized by prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law and follow standards and specifications to ensure that seed mixes are free of noxious species. While the right-of-way would be vulnerable to colonization by invasive plant species from other portions of the site and from adjacent properties, implementation of the stated provisions would reduce the potential for establishment and proliferation of invasive species.
Hazardous Materials Sites	Several sites or facilities along the corridor may contain hazardous materials. Coordination with appropriate authorities has been initiated and surveys are currently being conducted. Any hazardous materials encountered during construction would be remediated in accordance with applicable state and federal regulations. 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. See Section 3.12 for details.

Table 4. Summary of Impacts

Category	Alternative A	Alternative B	Alternative C
Total Length of Construction Limits (miles)	0	3.65	3.62
Total Area within Limits of Disturbance (LOD) (acres)	0	109	111
Total New Disturbed Area (excluding existing asphalt) (acres)	0	75	75
Homes Displaced	0	1	1
Apartment Buildings Displaced	0	4	4
Businesses Displaced	0	13	13
Schools Displaced	0	0	0
Religious Facilities Displaced	0	0	0
Cemeteries Displaced	0	0	1
Other Community Facilities (rescue squads, fire stations, etc.) Displaced	0	0	0
Prime and Unique Farmland (acres)	0	37.7	35.4
Forest (acres)	0	7.9	5.4
Section 4(f) Property Use (resources / acres)	0	4 / 33.3	4 / 36.8
Public Parks and Recreational Resources	0	0	0
Historic Properties within APE (number of properties)	0	7	7
Estimated Length of Streams Impacted (linear feet)	0	1,526	1,451
Estimated Wetlands Displaced (acres)	0	2.6	2.5
Floodplains Crossed (acres)	0	4.9	4.5
Resource Protection Areas (acres)	0	13	13
Noise Impacts (Number of Noise Sensitive Sites Impacted)	0	41	41
Hazardous Material Sites Impacted (number of mapped sites)	0	6	6

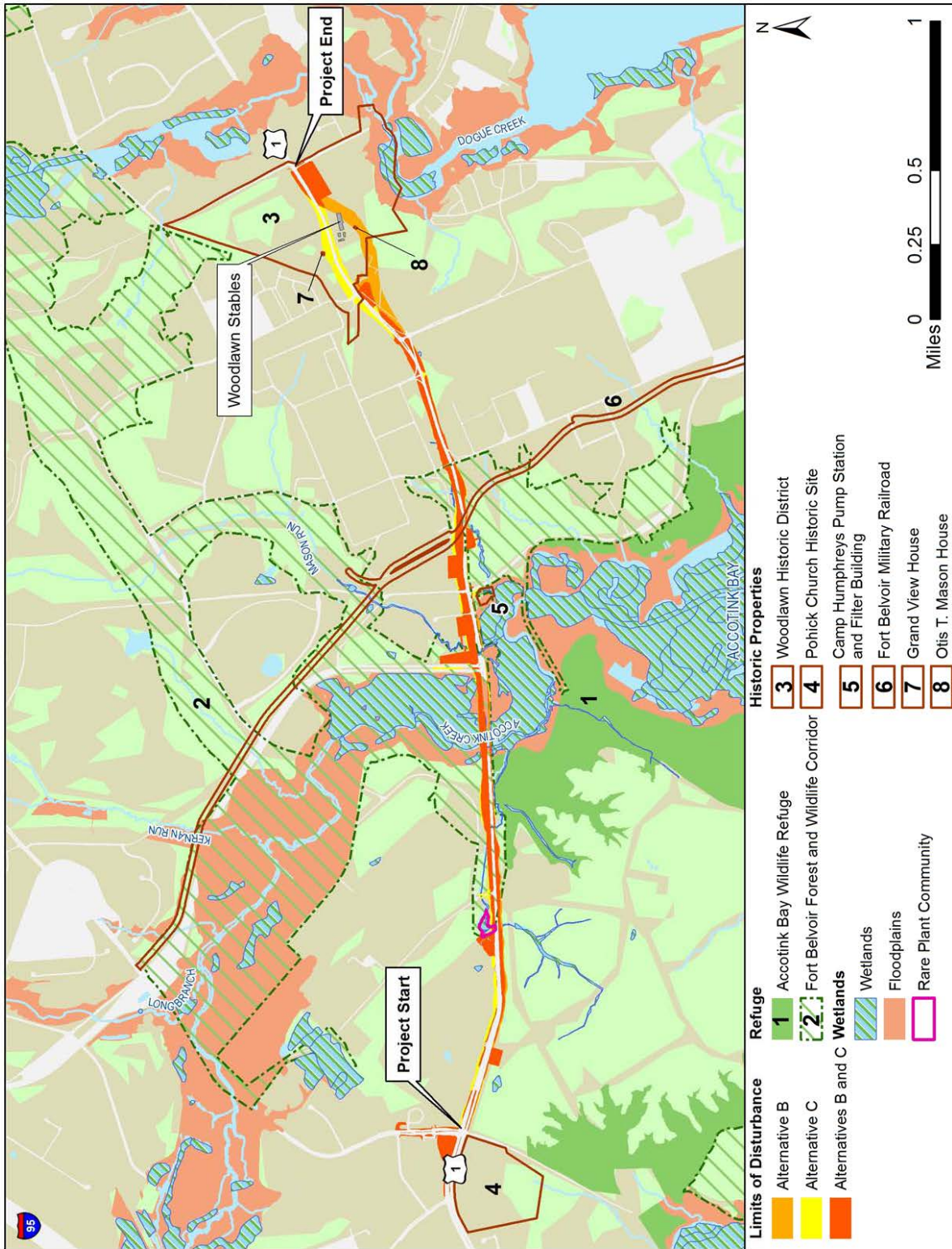


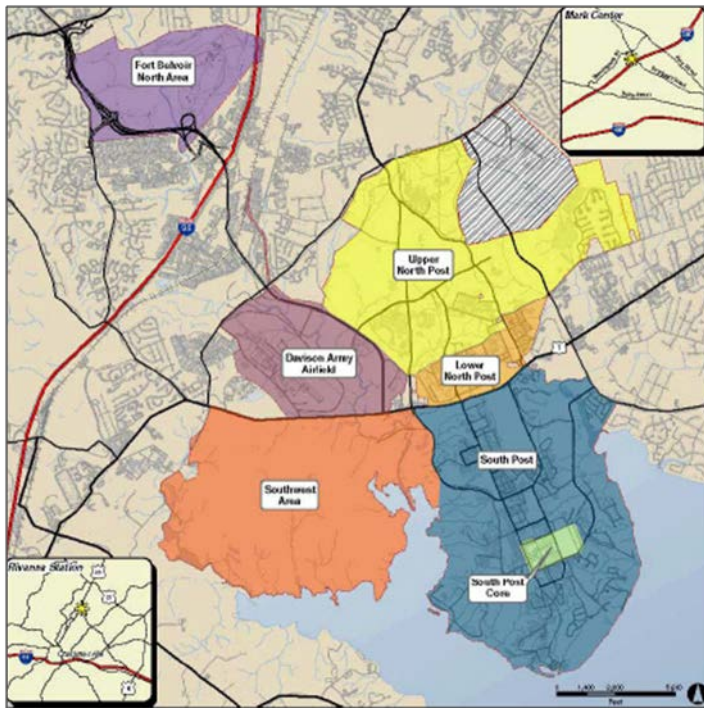
Figure 5. Environmental Resources within Study Area

3.2 LAND USE, COMMUNITY FACILITIES, AND RELOCATIONS

3.2.1 Land Use

The proposed project is located entirely within Fairfax County's Lower Potomac Planning District, which contains a variety of land uses. According to the Fairfax County Comprehensive Plan, only one change in land use or zoning in the project vicinity is planned at this time: a concept plan has been developed for a 27-acre mixed-use revitalization plan for Accotink Village, located along Route 1 between Fairfax County Parkway and Fort Belvoir's Tulley Gate. Fairfax County has approved a Comprehensive Plan amendment¹⁷ for walkable, mixed-use developments for ground floor retail with housing above, and a rezoning application has been submitted but not yet accepted. Coordination will take place between redevelopment efforts and the Route 1 improvements project.

The majority of the project area passes through Fort Belvoir land, which is mapped as government and institutional public facilities. Fort Belvoir land adjacent the alignment is a mix



of conservation areas, currently or previously used training grounds, an airfield, medical facilities (including the new Fort Belvoir Community Hospital), military housing, and offices. Smaller patches of land use along the corridor include residential (ranging from 2-3 dwellings an acre to 16-20 dwellings an acre), commercial (office, retail, and a stables/horseback riding business). The eastern end of the proposed project is located within the Fairfax County-designated Woodlawn Historic Overlay District and the western end is located in the Pohick Church Historic Overlay District (Fairfax County Department of Planning and Zoning, 2011).

The 2011 Draft Transportation Plan Map within the Comprehensive Plan highlights Route 1 and the Fort Belvoir Military Railroad (which is crossed by the alignment) as future enhanced public transportation corridors. Proposals in the plan for Route 1 include expanding the roadway to six lanes and the addition of metrorail/monorail/light rail transit/bus rapid transit from the Huntington Metro Station (Yellow Line of the Metrorail system) to the I-95/Route 1 interchange. Alternatives A, B, and C would have no direct impact to land use in the study area.

3.2.2 Community Facilities and Services

¹⁷ Out of Turn Plan Amendment (OTPA) ST11-IV-LP1 (Village of Accotink).

There are five community facilities located in the immediate project vicinity that have their main access from Route 1, as shown in Figures 3 and 4. Pohick Episcopal Church and cemetery are located at the western project limit and New Hope Housing - Eleanor Kennedy Shelter (a shelter for homeless families and individuals) is located near the middle of the study corridor. The Woodlawn Quaker Meetinghouse and the Woodlawn Baptist Church and cemetery are located in the eastern portion of the study area. Route 1 also provides access to the new Fort Belvoir Community Hospital. Changes in access to these facilities resulting from each of the alternatives are described in **Table 5**.

Table 5. Changes in Access to Community Facilities

Facility	Alternative A	Alternative B	Alternative C
Pohick Episcopal Church & Cemetery	No change	No change	No change
Eleanor Kennedy Shelter	No change	Currently, the shelter is accessible from both directions on Route 1. With this alternative, this facility would be accessible only from Route 1 traveling north. A U-turn would be required at the Fairfax County Parkway intersection for southbound vehicle access.	No change
Fort Belvoir Community Hospital	No change	No change	No change
Woodlawn Quaker Meetinghouse	No change	No change	No change
Woodlawn Baptist Church and Cemetery	No change	The current direct access from Route 1 would change to access from Woodlawn Road, which would be extended south to connect to the Southern Bypass Alignment.	The current access to the church would be relocated to the west directly across from Woodlawn Road to allow access from both directions.

During construction, Route 1 would be open to traffic and efforts would be made to cause as little disruption to these services as possible. Once construction has been completed, level of service on this road is expected to improve, thereby allowing for better access to these facilities.

3.2.3 Right-of-Way and Displacements

As shown in **Table 6**, there are relocations required along the alignment due to the expansion of the project outside the existing right-of-way. The acquisition of right-of-way and the relocation of displaced residents and facilities would be completed in accordance with the *Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (URA)*, as amended. Assurance is given that relocation resources would be available to all residential, business, and nonprofit displacees without discrimination.

Alternative A would not require relocations. Alternative B would require the relocation of one single family home, four apartment buildings, and 13 businesses. Two of the apartment buildings are in a community that is currently undergoing redevelopment. Apartment building residents as well as tenants occupying space in commercial buildings impacted by the project would be entitled to benefits under the URA. In addition, Alternative B would require the relocation of Otis Mason House, a contributing resource to the Woodlawn Historic District.

Alternative C would require similar relocations of homes, apartment buildings, and businesses, and it would require the relocation of graves in the Woodlawn Baptist Church cemetery.

Table 6. Summary of Relocations

Category	Alternative A	Alternative B	Alternative C
Homes	0	1	1
Apartment Buildings	0	4	4
Businesses	0	13	13
Schools	0	0	0
Churches	0	0	0
Cemeteries	0	0	1
Historic	0	1	0

3.3 TOPOGRAPHY, GEOLOGY, AND SOILS

Acidic soils throughout the state have contributed to road degradation and the destruction of vegetation, and they can severely disrupt ecosystems if they enter unchecked into waterways. The Virginia Tech - Department of Crop & Soil Environmental Sciences, with support from VDOT, has developed a GIS map of areas that are likely to produce problematic roadside management conditions that require intense reclamation efforts. According to this mapping, 8.5 and 7.1 acres of soil with an unknown potential for producing acidic conditions is located at the northern end of Alternative B and C, respectively. These soils have been documented as containing sulfides, and they may have the potential to compromise infrastructure; however, their actual potential for producing acidic conditions has not been determined. Management plans would be developed with proper procedures for methods to control acidic conditions that may be uncovered during construction. Treatment of acidic soils can include: lime remediation, addition of organic materials to help with vegetation, and removal of an acidic layer (Daniels 2002, 2006).

Alternative A would have no impact to topography, geology, or soils. Alternative B crosses 43 acres of soil that have been rated as “very limited” (Alternative C approximately 41 acres) and 11 acres of soil that have been rated as “somewhat limited” (Alternative C approximately 11 acres) due to frost action, low strength, slope, shallow depth to saturation, depth to cemented pan, flooding, ponding, shrink-swell, and subsidence for the construction of local streets. These ratings indicate that there are one or more factors that should be taken into consideration when such soils are used for that specified purpose. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance of the soil can be expected. (USDA, 2009).

3.4 PRIME AND UNIQUE FARMLANDS

In recognition of the need to identify and preserve lands that are important for the production of the nation’s food supply and major cash crops, the Natural Resources Conservation Service (NRCS) and the federal, state and local governments have coordinated to inventory important farmlands. Important farmlands fall into two nationwide categories, Prime and Unique Farmland, and can also be recognized on the state or local levels as Farmland of State or Local Importance.

Under the federal Farmland Protection Policy Act (FPPA), the U.S. Department of Agriculture defines “farmland” as:

- Prime farmland – land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.
- Unique farmland – land other than prime farmland that is used for production of specific high-value food and fiber crops.
- Farmland other than prime or unique farmland that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops.

The land may be in cultivation, forest, pasture, or other uses except for urban or built-up land or water uses.

Alternative A would have no impact to Prime and Unique Farmland resources. U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) mapping indicates that there are 37.7 and 35.4 acres of soils present in the proposed new areas of disturbance for Alternatives B and C, respectively that are listed as either Prime Farmland or Farmland of Statewide Importance. The only land being farmed within the project area is located on the north side of Route 1 on Woodlawn Plantation property. In partnership with the National Trust for Historic Preservation, Arcadia Farm was established in 2010 on the grounds of Woodlawn Plantation to further educational programs about food and agriculture at Woodlawn.

3.5 SECTION 4(F)

Section 4(f) refers to Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended, and as codified at Title 49, United States Code, Section 303, and at Title 23, United States Code, Section 138. Specifically, Section 4(f) states that the Secretary of Transportation (as delegated to FHWA under Title 49, Code of Federal Regulations, Section 1.48(b)(1)) may approve the use of publicly owned land of a publicly owned park, recreation area, wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site¹⁸ of national, state, or local significance only if a determination is made that:

- a) There is no feasible and prudent alternative to the use of the land from the property; and
- b) The action includes all possible planning to minimize harm to the property resulting from such use.

Either build alternative would require use of land from the Accotink Bay Wildlife Refuge, the Fort Belvoir Wildlife Corridor, the Fort Belvoir Military Railroad, and the Woodlawn Historic District. **Appendix C** contains a detailed Section 4(f) Evaluation for these properties.

¹⁸ “Historic site” means “...any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register [of Historic Places].” 23 CFR 774.17. This definition is identical to the definition of “historic property,” as defined at 36 CFR 800.16(l)1 in the Advisory Council on Historic Preservation’s regulations implementing the National Historic Preservation Act (16 U.S.C. 470). Section 4(f) does not apply to archaeological sites on or eligible for inclusion in the National Register of Historic Places if FHWA “concludes that the archeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place.” 23 CFR 774.13(b)(1).

3.6 HISTORIC PROPERTIES

In order to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the implementing regulations found in 36 CFR 800, FHWA must take into account the effects of this undertaking on historic properties, i.e. cultural resources that are listed or eligible for listing in the National Register of Historic Places (NRHP). National Historic Landmarks (NHL), designated by the U.S. Secretary of the Interior, are also included in this group.

In general, impacts to historic properties can take the form of physical impacts to a property, alterations to the property's setting, the introduction of visual or audible elements to the property or its immediate vicinity, or other actions. Impacts resulting from a project may or may not represent an "adverse effect" to identified cultural resources. The criteria of adverse effect must be applied to evaluate whether a project would result in an adverse effect to historic properties. These criteria provide the basis for determining the project's potential effect on historic properties.

3.6.1 Determining Adverse Effects

In order to identify historic properties that may be affected by the proposed undertaking, FHWA has defined the parameters of an Area of Potential Effect (APE) for the project. The APE is the geographic area, or areas, within which an undertaking may cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16).

For this project, FHWA established separate APEs for archaeological and architectural resources (Figure 6). The APE for archaeological resources is considered the area with potential direct effects. The archaeological APE generally includes those areas extending 100 feet on either side of existing roadway pavement, as well as extended areas for 1) intersections at Telegraph Road, Old Colchester Road, Fairfax County Parkway, Pohick Road, and Mount Vernon Memorial Highway; 2) a shifted alignment section in the vicinity of the Woodlawn Baptist Church and Cemetery; and 3) proposed stormwater management facilities.

The APE for architectural resources is considered the area with the potential for indirect effects, including visual and auditory effects. The architectural APE encompasses all above-ground resources (dwellings, buildings, bridges, culverts, etc.) in those areas extending 500 feet on either side of existing roadway pavement, from the area for the proposed realignment of Route 1 under Alternative B, and from the boundaries for adjacent NRHP-listed or eligible properties and districts.

The following surveys have been conducted as part of this EA for archaeological and architectural resources:

- *Archaeological Survey of Proposed Area of Potential Effects Route 1 Improvements at Fort Belvoir (Telegraph Road to Mount Vernon Memorial Highway), Fairfax County, Virginia, Coastal Carolina Research. April 2012.*
- *Architectural Survey of Proposed Area of Potential Effects Route 1 Improvements at Fort Belvoir (Telegraph Road to Mount Vernon Memorial Highway), Fairfax County, Virginia, Coastal Carolina Research. April 2012.*



Figure 6. Architectural and Archaeological Areas of Potential Effect (Sheet 1 of 4)



Figure 6. Architectural and Archaeological Areas of Potential Effect
(Sheet 2 of 4)

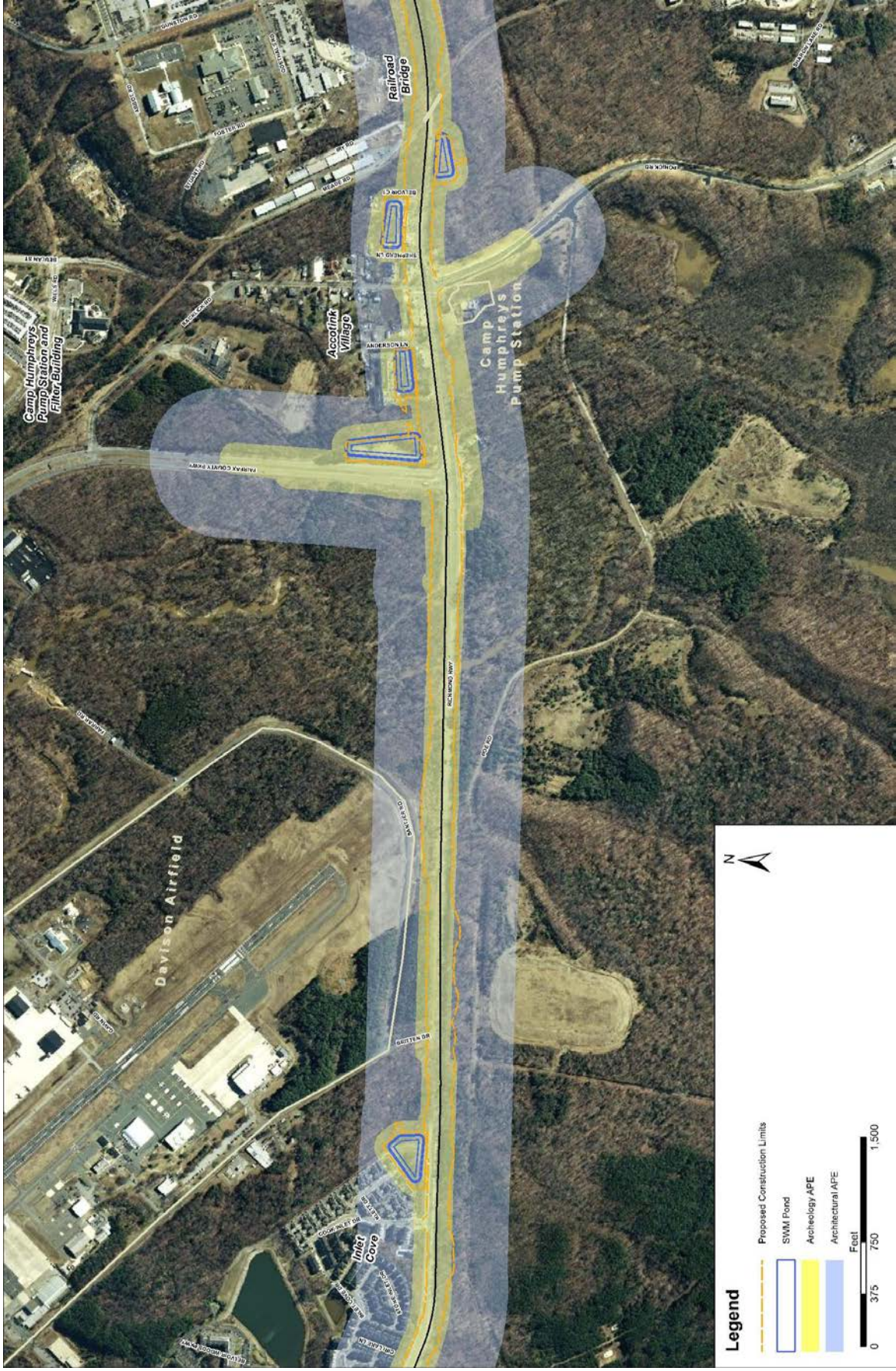


Figure 6. Architectural and Archaeological Areas of Potential Effect (Sheet 3 of 4)



Figure 6. Architectural and Archaeological Areas of Potential Effect
(Sheet 4 of 4)

Table 7-1 lists the historic properties identified within the project's architectural APE. **Table 7-2** lists the archaeological resources identified within the project's archaeological APE. The potential impacts to these properties also appear in the tables.

Archaeological survey has not been conducted in all portions of the APE, specifically in the vicinity of Accotink Village and near Telegraph Road. All areas within the archaeological APE would be surveyed prior to construction. If activities related to the project, and having the potential to impact archaeological resources, are to occur outside the previously identified APE, FHWA would identify and evaluate archaeological properties before initiating any land disturbing construction activities. If archaeological sites are identified that are eligible for listing in the NRHP, FHWA would implement stipulations described in the PA for their treatment. There are also stipulations for the treatment of previously unidentified archaeological resources, if any such resources are identified during construction activity.

FHWA has determined that the project would have no adverse effects on the following historic properties: Woodlawn Baptist Church Cemetery (44FX1212); Woodlawn Quaker Meetinghouse (029-0172); Woodlawn Quaker Meetinghouse Cemetery (44FX1211); Pope-Leighey House (029-0058), Grand View (029-0062); George Washington's Distillery and Grist Mill (029-0330); Sharpe Stable Complex Dairy, Corncrib and Stable (029-5181-0005); Camp A. A. Humphreys Pump Station and Filter Building (029-0096); and William Herris Gravemarker (029-0562).

FHWA has also determined that the project would have an adverse effect on the following historic properties: Woodlawn National Register Eligible Historic District (029-5181); Woodlawn Plantation (029-0056); Fort Belvoir Facility No. 1433 Railroad Bridge (029-5425); Fort Belvoir Military Railroad Bed (029-5648); Old Colchester Road/King's Highway (029-0953); Otis Tufton Mason House (029-5181-0006); and Sharpe Stable Complex Bank Barn (029-5181-0005).

FHWA is in the process of consulting with the SHPO to obtain the SHPO's concurrence with these determinations of effect. In addition, the effect of the project on Pohick Episcopal Church (029-0046) and the archaeological deposits at Woodlawn Plantation (44FX1146) cannot be determined now. FHWA would conduct additional monitoring and survey in order to determine the effects on these historic properties, and develop avoidance, minimization and mitigation measures as necessary.

Table 7-1. Summary of Historic Properties within the Architectural APE

Resource	NRHP/NHL Status	Impacts Under Alternative B	Mitigation Proposed in the Programmatic Agreement ¹⁹
Woodlawn National Register Eligible Historic District (Woodlawn HD) <i>VDHR # 029-5181</i>	NRHP eligible	Alteration of the viewshed; changes in relationship among the contributing properties; physical relocation of Otis T. Mason House; and changes in land use and circulation patterns	<ul style="list-style-type: none"> • Construction of a signalized intersection to provide safe access to Woodlawn Baptist Church, Woodlawn Quaker Meetinghouse, and National Trust for Historic Preservation properties within Woodlawn HD. • Landscaping to maintain viewsheds. • Interpretive signage. • FHWA would prepare a draft NRHP nomination. • Historic American Building Survey (HABS) of all NRHP eligible structures within the District.
Woodlawn Plantation <i>VDHR # 029-0056</i>	NHL/NRHP listed	Taking of Woodlawn Plantation property, changes in land use and access between different parts of the property, and alteration of the viewshed.	FHWA would oversee a \$500,000 monetary fund to implement the following measures, in prioritized order, until the fund is expended: <ul style="list-style-type: none"> • Water and sewer service to serve the property for regular operations and safety; • Improvements to internal access within the property; • Landscape buffers to reduce visual impacts; • Interpretive and wayfinding signage • Installation of three-phase electrical service • Installation of natural gas service
Pope-Leighey House <i>VDHR # 029-0058</i>	NRHP listed, contributing to Woodlawn HD	No adverse impacts	See mitigation for adverse impacts to Woodlawn HD
Grand View <i>VDHR # 029-0062</i>	NRHP eligible, contributing to Woodlawn HD	No adverse impacts	See mitigation for adverse impacts to Woodlawn HD
Woodlawn Baptist Church <i>VDHR # 0029-0070</i>	The church building is not eligible, but the property is contained within Woodlawn HD	See adverse effects to Woodlawn HD.	<ul style="list-style-type: none"> • FHWA would facilitate discussions for the granting of an easement from the Army to the church allowing limited usage of the land on Fort Belvoir located adjacent to the church and bounded by the realigned Route 1 and new access road. • Removal of pavement from the church's existing driveway to restore historic character. • Landscaping. • Documentation of the cemetery and a grave location survey.

¹⁹ Mitigation measures as proposed in the draft Programmatic Agreement dated May 10, 2012. The draft Programmatic Agreement was under review by the signatories and consulting parties as of May 31, 2012.

Resource	NRHP/NHL Status	Impacts Under Alternative B	Mitigation Proposed in the Programmatic Agreement ¹⁹
Woodlawn Baptist Church VDHR # 0029-0070	The church building is not eligible, but the property is contained within Woodlawn HD	See adverse effects to Woodlawn HD.	<ul style="list-style-type: none"> • FHWA would facilitate discussions for the granting of an easement from the Army to the church allowing limited usage of the land on Fort Belvoir located adjacent to the church and bounded by the realigned Route 1 and new access road. • Removal of pavement from the church's existing driveway to restore historic character. • Landscaping. • Documentation of the cemetery and a grave location survey.
George Washington's Distillery and Grist Mill VDHR # 029-0330	NRHP listed, contributing to Woodlawn HD	No adverse impacts	See mitigation for adverse impacts to Woodlawn HD
Old Colchester Road/King's Highway VDHR # 029-0953	NRHP eligible	No adverse impacts	Protective measures may be identified during final design.
Fort Belvoir Facility No. 1433 Railroad Bridge VDHR # 029-5425	NRHP eligible	The bridge would be removed from its current location, and may be permanently destroyed if a suitable recipient cannot be identified	<ul style="list-style-type: none"> • Historic American Engineering Record (HAER) Level I documentation of the bridge. • FHWA would develop a marketing plan to determine if there is a capable party willing to relocate and assume ownership of the bridge. FHWA would offer a one-time monetary incentive to ownership. • If a capable and willing party cannot be identified, FHWA would prepare photographic documentation of the bridge and complete a SHPO Intensive Level Survey Form.
Fort Belvoir Military Railroad Bed (FBMRR) VDHR # 029-5648	NRHP eligible	The portion of the railroad bed within the limits of construction will be physically altered and destroyed.	<ul style="list-style-type: none"> • Historic American Engineering Record (HAER) Level I documentation of the railroad bed within the APE. • Design and installation of interpretive historic markers. • Repairs to damaged sections of FBMRR track bed north of Telegraph Road.
Otis Tufton Mason House VDHR # 029-5181-0006	Contributing to Woodlawn HD	The realigned portion of Route 1 would go through the property.	Relocation of the house according to Virginia Department of Historic Resources guidelines for moving historic buildings.
Sharpe Stable Complex Bank Barn VDHR # 029-5181-0005	NRHP eligible	Changes in land use would impact the historic setting of the barn.	See mitigation for adverse impacts to Woodlawn HD

Resource	NRHP/NHL Status	Impacts Under Alternative B	Mitigation Proposed in the Programmatic Agreement ¹⁹
Sharpe Stable Complex Dairy, Corncrib and Stable <i>VDHR # 029-5181-0005</i>	Contributing to Woodlawn HD	No adverse impacts.	See mitigation for adverse impacts to Woodlawn HD
Pohick Episcopal Church <i>VDHR # 029-0046</i>	NRHP listed	Effects cannot be determined at present. The proposed alignment does not use the property and access would remain unchanged. The PA contains stipulations that require monitoring for vibration impacts.	<ul style="list-style-type: none"> • FHWA would begin vibration monitoring at the church prior to construction and establish existing conditions. The monitoring shall continue until construction is complete. If significant increases in vibration resulting from activities related to the project are detected, FHWA shall develop appropriate mitigation measures in consultation with the church and the SHPO. • Design workshops to evaluate alternative designs for proposed mitigation of adverse effects to the properties at the intersection of Telegraph Road and Route 1, such as earth berms to reduce noise impacts and vegetation to reduce visual impacts.
Woodlawn Quaker Meetinghouse and Cemetery <i>VDHR # 029-0172</i>	NRHP listed, contributing to Woodlawn HD	No adverse impacts	See mitigation for adverse impacts to Woodlawn HD
Camp A. A. Humphreys Pump Station and Filter Building <i>VDHR # 029-0096</i>	NRHP listed	No adverse impacts	None.
William Herris Gravemarker <i>VDHR # 029-0562</i>	Unevaluated, within the cemetery at NRHP listed Pohick Episcopal Church	No adverse impacts	None.

Table 7-2. Summary of Cultural Resources within the Archaeological APE

Resource	NRHP	Impacts Under Alternative B	Suggested Mitigation¹⁹
Woodlawn Plantation Archaeological Deposits VDHR # 44FX1146		The precise effects to these deposits cannot be determined at present. However, installation of water and sewer service that is proposed as mitigation for adverse impacts to Woodlawn Plantation has the potential to directly impact these deposits.	Update and complete an archaeological survey of the entire National Trust for Historic Preservation Property (conducted by the Chicora Foundation, Inc. in 1999). This information will be used to guide the design of mitigation measures so that impacts to any significant deposits can be avoided or minimized.
Woodlawn Baptist Church Cemetery VDHR #44FX1212	Contributing to Woodlawn HD	No adverse impacts	
Woodlawn Quaker Meetinghouse Cemetery VDHR #44FX1211		No adverse impacts	None.
VDHR # 44FX1810	Unevaluated		The site would be evaluated for NRHP eligibility. FHWA would consult with the signatories and consulting parties of the PA regarding the eligibility of the site, and seek concurrence and development of avoidance, minimization, or mitigation measures.
VDHR # 44FX 1936	Unevaluated		The site would be evaluated for NRHP eligibility. FHWA would consult with the signatories and consulting parties of the PA regarding the eligibility of the site, and seek concurrence and development of avoidance, minimization, or mitigation measures.

3.7 WATER RESOURCES

The project area is located in hydrologic unit code HUC8-02070010 Middle Potomac-Anacostia-Occoquan Watershed. Surface waters in the study area consist of two named streams, three unnamed tributaries to those streams, and wetlands. Section 404 of the Federal Water Pollution Control Act, also referred to as the Clean Water Act, provides protection for waters of the U.S. (WOUS). The Virginia Marine Resources Commission regulates activities in submerged lands, marine fisheries, and coastal resources.

Estimated areas of wetlands and lengths of streams within the proposed project areas were calculated from National Wetlands Inventory mapping and National Hydrography Dataset mapping.

3.7.1 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 the presence of surface and/or groundwater hydrology, hydric soils (soils that develop under wet conditions), and hydrophytic vegetation (plants that are favored by wet conditions).

This EA uses an abbreviated version of the classification system developed by the United States Fish and Wildlife Service (USFWS), also known as the Cowardin System. This system is also used to describe waters for regulation under the U.S. Corps of Engineers' (USCOE) Section 404 permitting. Wetlands found in the study area include palustrine emergent (PEM) and palustrine forested (PFO) systems, which are generally found along riparian corridors, in depressions, and associated with seeps and springs. Their functions include: groundwater discharge, nutrient removal, sediment/toxin retention, and wildlife habitat.

Mapped wetland resources are summarized in **Table 7** and shown in Figure 5. These categorizations and impacts may change when a more detailed analysis is performed for the permitting process.

Table 7. Wetland Resources within Limits of Disturbance (acres)

Wetland Description	Alternative A	Alternative B	Alternative C
Palustrine Freshwater Emergent (PEM)	0	0.03	0
Palustrine Freshwater Forested (PFO)	0	2.57	2.52
Total Wetlands	0	2.60	2.52

All available measures would be taken to avoid wetland impacts and to minimize effects where practicable. These measures could involve modifications as the design is finalized such as: minor alignment shifts to avoid or minimize impacts to wetlands, temporary and permanent stormwater management measures, and crossing linear systems at perpendicular angles where possible. Due to the scale of the project and the natural environment of the area, construction would result in unavoidable impacts.

Compensation for unavoidable and necessary wetland impacts from the project would be provided where required, in cooperation with the federal and state water quality permitting agencies. Such compensation, determined in cooperation with Fort Belvoir, would account for lost wetland types and functions and could include enhancement/restoration of existing wetlands

or wetland creation onsite or offsite, use of credits from an approved wetlands mitigation bank, or payments to the Virginia Wetlands Restoration Trust Fund.

3.7.2 Streams

The project is located in HUC8-02070010 Middle Potomac-Anacostia-Occoquan Watershed and is drained by Accotink Creek and Dogue Creek (HUC12-020700100402 and 020700100306), both of which are crossed by the proposed project. Approximately 1,526 linear feet of stream are located within the limits of disturbance for Alternative B and 1,451 linear feet for Alternative C, as summarized in **Table 8**. None of the waters crossed by the alignment are listed as navigable; however, Accotink Creek is a lower perennial stream large enough to provide habitat for fish. Route 1 within the project limits also crosses Mason Run and two unnamed tributaries to Accotink Creek that appear to be lower intermittent/perennial streams with enough flow to support crayfish, macro-invertebrates, amphibians, and possibly fish.

Table 8. Stream Resources within Limits of Disturbance (linear feet)

Stream	Alternative A	Alternative B	Alternative C
Unnamed tributary to Accotink Creek	0	668	608
Accotink Creek	0	176	164
Mason Run	0	449	466
Unnamed tributary to Accotink Creek	0	234	213
Total Streams	0	1,526	1,451

All practicable measures would be taken to avoid and minimize impacts to streams and other water bodies; however, due to the linear nature and size of this project, unavoidable impacts are anticipated. Minimization measures could include modifications to the final design such as: minor alignment shifts to avoid or minimize impacts, the use of bridges instead of culverts, the use of retaining walls, temporary and permanent stormwater management measures, and open bottom culverts to retain natural stream bottoms and avoid excess erosion. Unavoidable stream relocations would be performed using natural stream design, which means that the channel should mimic the dimension, pattern, and profile of a representative reference stream reach.

Compensation requirements would be determined as a part of the permitting process with the USCOE and the DEQ, in coordination with Fort Belvoir. Stream mitigation requirements vary by length, level of disturbance, and compensation type: restoration, creation, enhancement, and preservation. A detailed assessment of each crossing would be made and impairment type and amount would be analyzed to calculate mitigation. Such compensation would account for the quality of the impacted stream and could include activities onsite or offsite, use of credits from an approved mitigation bank, or payments to the Virginia Wetlands Restoration Trust Fund.

3.7.3 Floodplains

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Alternative B includes 4.9 acres of the 100-year floodplain for Accotink Creek and Alternative C includes 4.5 acres within their limits of disturbance (see Figure 5 for general location of the floodplain). The crossing for Accotink Creek would be upgraded, i.e., taller and wider, to eliminate restrictions of the existing crossing and minimize floodplain encroachments and possible flood level increases. Any construction occurring within the 100-year floodplain

would follow proper permitting procedures and guidelines in accordance with *Executive Order 11988, Floodplain Management*.

As a part of this project, stormwater management basins would be incorporated to address post-development stormflows and downstream channel capacity. Stormwater basins for this project would be designed to capture and treat the stormwater, ensuring that no substantial increases to flooding would occur. Restoration and preservation of the natural and beneficial values of floodplains in the project area would be considered and incorporated wherever feasible.

3.7.4 Water Quality

In compliance with reporting requirements of the Clean Water Act Section 303(d), DEQ monitors streams for a variety of water quality parameters, including temperature, dissolved oxygen, pH, fecal coliform, e. coli, enterococci, total phosphorus, chlorophyll a, benthic invertebrates, as well as metals and toxics in the water column, sediments, and fish tissues. The 303(d) list includes those water bodies and watersheds that exhibit levels of impairment requiring investigation and restoration. Not all parameters are monitored at each of the ambient water quality monitoring stations. Citizen groups and federal agencies also monitor some streams and provide their data to the DEQ for compilation.

Of the streams located in the proposed project area, only Accotink Creek, Mason Run, and Dogue Creek have been assessed (**Table 9**). Accotink Creek north of Route 1 is considered to be a stream, and south of Route 1, it is mapped as an estuary. Mason Run has insufficient data to determine impairment. Dogue Creek is supporting of all uses at the point where it crosses Route 1 beyond the project terminus; however, approximately 0.5 linear miles downstream (~0.25 miles south of the project corridor), it is impaired (DEQ, 2010).

Table 9. Monitoring Status of Named Streams

Waterbody	Stretch	Uses Supported	Impairment/Cause
Accotink Creek 5D	Segment begins at the confluence with Calamo Branch and continues downstream until the tidal waters of Accotink Bay.	Wildlife – Yes Aquatic Life – No Recreation – No Fish Consumption – No PWS* - N/A	Benthic-Macroinvertebrate Bioassessments, Escherichia coli, PCB in Fish Tissue
Accotink Bay (estuary) 4A	Segment includes tidal waters of Accotink Creek until the confluence with the tidal waters of Pohick Bay/Gunston Cove.	Wildlife – Not assessed Aquatic Life – Yes Recreation – Not assessed Fish Consumption – No SAV – Yes Open Water - Yes	PCB in Fish Tissue
Dogue Creek (estuary, ~0.5 miles downstream of project area)	Segment includes all tidal waters of Dogue Creek, extending from approximately rivermile 2.1 until the confluence with the Potomac River.	Wildlife – Yes Aquatic Life – Yes Recreation – No Fish Consumption – No SAV – Yes Shellfish – N/A	Escherichia coli, PCB in Fish Tissue

Source: VDEQ, 2010.

* PWS – Public Water Supply

During construction, non-point source pollutants could possibly enter groundwater or surface water from stormwater runoff. To minimize these impacts, appropriate erosion and sediment control practices would be implemented in accordance with local, state, and federal regulations. These specifications also prohibit contractors from discharging any contaminant that may affect water quality. 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.

Minor long-term water quality effects could occur as a result of increases in impervious pavement surfaces, increases in traffic volumes, and consequent increases in pollutants washed from the road surface into receiving streams. Pollution from spills, stormwater runoff, and other materials associated with roads could potentially affect water quality. Temporary and permanent stormwater management measures, including detention basins, vegetative controls, and other measures, would be implemented to minimize potential degradation of water quality. These measures would reduce or detain discharge volumes and allow for the settlement of pollutants. The requirements and special conditions of any required permits for work in and around surface waters would be incorporated into construction contract documents. The contractor would be required to comply with those conditions.

The Alternative A would have no impacts to water quality.

3.7.5 Chesapeake Bay Protection Areas

President Obama's Executive Order in 2009 on the Chesapeake Bay included goals for restoring clean water by reducing nitrogen, phosphorus, sediment, and other pollutants; recovering habitat by restoring a network of land and water habitats to support priority species and other public benefits; sustaining fish and wildlife; and conserving land and increasing public access. The Chesapeake Bay Preservation Act was enacted by the Virginia General Assembly in 1988 to protect and manage Virginia's "coastal zone". The Act requires local governments to include water quality protection measures in their zoning and subdivision ordinances and in their comprehensive plans.

Resource Protection Areas (RPAs) include tidal wetlands, tidal shores, non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or perennial water bodies, and highly erodible soils, as well as a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow within the Chesapeake Bay watershed. When preserved in their natural condition, RPAs protect water quality, filter and reduce the volume of runoff, prevent erosion, and perform other important biological and ecological functions. These areas are subject to local Bay Act requirements to minimize land disturbance, preserve indigenous vegetation, minimize impervious surfaces, control stormwater runoff, and implement erosion and sediment control plans for land disturbances. Activities within RPAs are further restricted to water dependent or redevelopment related activities.

RPAs were mapped according to field verified waters with the addition of a 100-foot buffer to the water's edge. These resources have not been given a jurisdictional determination and may be subject to change with further evaluation needed for permitting. Approximately 13 acres of RPAs were mapped in the study corridor. All additional land within the study corridor is considered Resource Management Area (RMA). RMA includes all land outside the RPA, which if improperly used or developed, has the potential to degrade water quality or diminish the functions of the RPA.

3.7.6 Virginia Coastal Zone Management Program (VCP)

The entire study area is located within Virginia's coastal zone. Federal actions occurring within or with the likelihood of affecting any land or water use or natural resource of a state's coastal zone, including cumulative and secondary effects, must be consistent with a state's federally approved Coastal Zone Management Plan (CZMP) according to Section 307 of the Federal

Coastal Zone Management Act of 1972, as amended (CZMA), and National Oceanic and Atmospheric Administration (NOAA) regulations (15 CFR part 930).

A Determination of Consistency with Virginia's Coastal Resources Management Program was obtained from VDEQ on March 27, 2012 (see **Appendix D**).

3.8 NOISE

Potential traffic noise impacts associated with the proposed project were assessed in accordance with the procedures and criteria approved by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT). As described in the *Noise Impact Analysis Technical Report*, a total of 95 noise sensitive sites were modeled in the project study area representing 165 outdoor human use areas. Noise impacts are predicted to occur at 41 noise sensitive sites representing 63 residences, one pool area, three areas of a cemetery, six areas of a sports area, one church, and Arcadia Farm at Woodlawn Plantation as a result of approaching or exceeding the Noise Abatement Criteria (NAC) in the design year (2040) build condition. No sites are predicted to be impacted due to substantial noise increases. For all sites studied, the existing year noise levels range from 53 to 72 dBA. The design year build noise levels range from 55 to 73 dBA.

Noise abatement was evaluated where future traffic noise impacts are predicted to occur. A preliminary noise evaluation was performed as part of this EA (see **Appendix E**), and a more detailed review would be completed during final design. As such, noise barriers that are found to be feasible and reasonable during this preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction. Eight barriers were evaluated along the study corridor and seven barriers were found to be feasible and reasonable.

For noise barriers determined to be feasible and reasonable, the affected public would be given an opportunity to decide whether they are in favor of construction of the noise barrier. Before final decisions and approvals can be made to construct a noise barrier, a final design noise analysis would be performed. Approved barriers would be incorporated into the road project plans.

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

3.9 VISUAL

Visual resources are those physical features that make up the visual landscape, including land, water, vegetation, and man-made elements. These elements are the stimuli upon which one's visual experience is based. Visual and aesthetic resources within the project area include the undeveloped open space/natural areas and historic structures.

The majority of the area in the southern portion of the study area is property of Fort Belvoir and remains undeveloped, offering a view of the wildlife corridor to the north and Accotink Wildlife Refuge to the south. In the northern section, Route 1 is located near several visually sensitive resources within Woodlawn Historic District. The remainder of the corridor is a mix of commercial, residential, and private recreation properties.

FHWA’s Visual Impact Assessment for Highway Projects (VIAHP) manual (1981) takes into consideration viewer response to views “of” and “from” the roadway as part of the evaluation of visual impacts. Alternative B realigns Route 1 along the Southern Bypass Alignment through the Woodlawn area in the northern portion of the study area, and Alternative C widens the roadway along the existing alignment. Either of the build alternatives would have visual effects on the Woodlawn Historic District. As such, sight-line profiles were prepared to assist in visualizing the proposed improvements in the Woodlawn area, as shown in Attachment 4 of the Section 4(f) Evaluation, which can be found in Appendix C.

3.10 HABITATS AND WILDLIFE

As shown in **Table 10** and described in the subsections below, the proposed alignment crosses several habitat types including: forested, field, and aquatic. Each of these habitats is important for a number of different species, some of which use several habitat types throughout their lifecycles.

Table 10. Habitat Areas within Limits of Disturbance (acres/percent)

Habitat Type	Alternative A	Alternative B	Alternative C
Forested	0	7.86	5.38
Field	0	6.60	4.52
Aquatic Habitat	0	0.67	.63
Developed	0	93.53	100.52
Total Area	0	108.66	111.05

3.10.1 Aquatic Habitat

The DEQ, State Water Control Board, and the EPA regulate water resources and water pollution in Virginia. Together, they administer programs created by the federal Water Pollution Control Act of 1972, commonly known as the Clean Water Act, the federal Water Quality Act of 1987, and a 1984 amendment to the federal Resource Conservation and Recovery Act.

Aqueous habitats account for approximately 0.6% of both build alternatives’ limits of disturbance. Waters in the study area represent a variety of habitat types and include: relatively permanent waters (perennial streams that support fish), intermittent tributaries, and several wetland types. Intermittent tributary streams and wetlands provide good habitat for invertebrates, amphibians, birds, hydrophytic plants, and provide water for terrestrial wildlife; however, they are not deep or stable enough to support fish species.

Coordination with VDCR indicates that the project area is located within the Pohick/Accotink Wetlands Conservation Site. This conservation site has been given a high biodiversity significance for river bulrush (*Schoenoplectus fluviatilis*), wood turtle (*Glyptemys insculpta*), and tidal freshwater marsh community (VDCR, 2011). Actions with the possibility of changing water quality by causing siltation, water pattern changes, additional runoff, or changes in water temperature due to the removal of trees may pose a concern for these communities. All practicable measures would be taken to avoid and minimize impacts to aquatic resources. FHWA would minimize affects to aquatic resources by following Best Management Practices (BMPs) and implementing appropriate erosion and sediment control practices in accordance with state, and local regulations.

Water resources are discussed in further detail in Section 3.8.

Anadromous Fish

Both Dogue Creek (just downstream from Route 1) and Accotink Creek (where crossed by the alignment) are confirmed Anadromous Fish Use Areas. Dogue Creek supports alewife (*Alosa pseudoharengus*), striped bass (*Morone saxatilis*), blueback herring (*Alosa aestivalis*), and yellow perch (*Perca flavescens*), and Accotink Creek supports alewife and yellow perch (VDGIF, 2012a).

The existing bridge crossing at Accotink Creek would be replaced by two bridges, one for each direction of traffic, which would be substantially longer and higher in elevation than the current bridge. The new bridge design would accommodate existing flood conditions and allow for wildlife passage, natural stream conditions, and fish passage. Dogue Creek would not be crossed by the project; however, the eastern end of the alignment is located within its watershed.

Time-of-year restrictions depend on the type of work planned and its location relative to the water body in question. General restrictions for all in-stream work in Anadromous Fish Use Areas and their tributaries, recommended by DGIF, are February 15 through June 30. Exact restrictions may vary depending on the species, type of work, and location.

During construction, non-point source pollutants could possibly enter groundwater or surface water from stormwater runoff. These pollutants have the potential to impact quality of aquatic habitat, as described in Section 3.8.4 Water Quality.

3.10.2 Terrestrial Habitat

The majority of the area located in the limits of disturbance is the previous alignment and other developed areas. Route 1 crosses a natural wildlife corridor associated with Accotink Creek. Due to its use as training grounds and later protections placed on the area, the riparian buffer along Accotink Creek remains largely untouched and wooded.

Both Alternative B and Alternative C would expand beyond the boundary of the existing right-of-way; construction would be limited to habitat edges and would not further divide existing undeveloped areas. Selective vegetation clearing would be practiced to minimize habitat alterations, and native plants would be used to reseed disturbed areas to facilitate habitat regeneration.

Rare Plant Communities

Located adjacent to, and just north of, Route 1 is a Coastal Plain/Piedmont Acidic Seepage Swamp, a state listed rare plant community. The plant community is approximately 1.4 acres, located in a bend of the western unnamed tributary to Accotink Creek. Alternative B would disturb approximately 0.29 acres, or 20 percent of the community. Alternative C would disturb approximately 0.35 acres.

3.10.3 Wildlife Corridor

The proposed project crosses a 15-mile long wildlife corridor, as shown in Figure 5. The corridor was established by Fort Belvoir as a mitigation commitment to protect an established wildlife habitat and migratory corridor. The corridor is currently an integral part of a continuous area of protected lands including: Huntley Meadows Park, Jackson Miles Abbott Wetland Refuge (JMAWR), Accotink Bay Wildlife Refuge (ABWR), Area-17 (an additional wildlife preservation

area on Fort Belvoir Property), Pohick Bay Regional Park and Golf Course, Mason Neck State Park, and Mason Neck National Wildlife Refuge.

The wildlife corridor includes a wide range of wetlands and riparian forest buffers, and it allows animal movement between the larger forested areas, thus maintaining a diverse gene pool and helping ensure species survival. The primary goal of this area is conservation. The wildlife corridor contains habitat for the state-listed wood turtle and several high-priority breeding species listed with the Partners in Flight (PIF) program, and it includes waterways for passage of, and spawning habitats for, anadromous fish. This area is also used for environmental education, scientific research and study, low-intensity recreation, and low-intensity military training and testing, as long as the access and use are compatible with resource conservation.

In accordance with Fort Belvoir's tree protection policy, trees removed because of this action would be replaced on a 2:1 basis (or 4:1 with seedlings), and disturbed areas would be reseeded with native vegetation to assist with habitat regeneration. Construction of a wildlife crossing as part of Route 1's crossing of Accotink Creek would help maintain and enhance wildlife habitat connection between the Forest and Wildlife Corridor north of Route 1 and the Refuge south of Route 1. The new proposed bridge would be substantially lengthened and raised to promote wildlife passage, with sufficient clearance for the largest animals that would be expected (white-tail deer). The bridge also would provide more than adequate accommodation of fish passage. In addition, the Fort's ongoing native habitat restoration program could serve as a framework for restoring an area in the Refuge as compensation for impacts, with such an area to be identified in future coordination with Fort Belvoir representatives.

3.11 THREATENED AND ENDANGERED SPECIES

3.11.1 Small Whorled Pogonia

The U.S. 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. USFWS 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.

Using the USFWS's Information, Planning, and Consultation system (IPaC), the federally listed threatened small whorled pogonia (*Isotria medeoloides*) was the only federally listed species identified as potentially being present in the project area. According to a USFWS fact sheet, the small whorled pogonia is a herbaceous perennial orchid. It has a widely scattered distribution in the eastern United States along the Atlantic coast from Maine to Georgia with outlying occurrences in the midwest and Canada. Suitable habitat consists of upland forests with an open understory and a closed canopy where the topography is typically moderately sloping or almost level. The plants are usually associated with decaying vegetative matter such as fallen trunks and limbs, leaf litter, bark, and tree roots. The pogonia is found in soils that are acidic sandy loams with low nutrient content. No critical habitat rules have been published for the small whorled pogonia.

A survey for this species completed in during the 2001 study of the Route 1 corridor did not result in finding any of the plants. Notwithstanding, a single small whorled pogonia was found on the Fort Belvoir North Area west of I-95 and it is believed that potential remains for the species occurring in suitable habitat on Fort Belvoir's Main Post. Accordingly, another survey

along the project corridor will be conducted in 2012 during optimal time of year for observing the species .

3.11.2 Wood Turtle

Input received from the Virginia Department of Conservation's Natural Heritage Division (VDCR, DNH) indicated the potential presence of the state-listed threatened wood turtle (*Glyptemis insculpta*) in the project corridor. According to a Virginia Department of Game and Inland Fisheries fact sheet, this is a medium-sized turtle, up to 9 inches in length, with a keeled, sculptured carapace. This species 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 waterway, or just sits on the bottom or crawls up under the overhanging roots of trees along the bank. Virginia specimens observed in the winter were under submerged logs, in beaver lodges, and in muskrat burrows. Although highly terrestrial, wood turtles must remain in moist habitats as they experience a greater evaporative water loss than the more terrestrial box turtles.

The wood turtle is found in most New England states, Nova Scotia, west to Michigan and Minnesota, and south to Virginia. Overall, the distribution is disjunct with populations often being small and isolated. Roughly 30% of its total population is in Canada. In Virginia, this species has a restricted range extending from Arlington and northern Fairfax counties westward through Loudoun and Clarke counties to Frederick, Warren, and Shenandoah counties. At the wetland located between the Eleanor Kennedy Shelter and the Pump Station, a male wood turtle was observed in August of 1998, a confirmed male was observed in May of 1999, and a female was reported in the spring of 2005. This area has been identified by Fort Belvoir as wood turtle habitat. A survey for this species during the 2001 study of the Route 1 corridor did not result in finding any of the turtles. Dogue Creek and Accotink Creek are also areas where occurrences have been recorded by others. Accordingly, another survey along the project corridor would be conducted prior to construction. Any individuals found would be relocated in coordination with the VDCR, DNH.

3.12 HAZARDOUS MATERIALS

Regulation of hazardous materials is carried out by the U.S. Environmental Protection Agency (EPA) at the federal level and the DEQ for the Commonwealth of Virginia. The ability of the federal government to respond to the release or threatened release of hazardous substances and to manage the clean-up of abandoned or uncontrolled hazardous waste sites is provided by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), more commonly referred to as Superfund. Disposal of solid and hazardous waste is governed by the Resource Conservation and Recovery Act of 1976 (RCRA).

Both Alternatives B and C limits of construction would disturb area that includes two gas stations, Fort Belvoir training grounds, gas lines, and two properties with HAZMAT listings. Alternative B includes 6,417 feet of gas line, and Alternative C includes 6,367 feet.

According to VDOT's comprehensive GIS database and GIS data from Fort Belvoir, hazardous materials sites located within 500 feet of the limits of construction include:

- 1 active hazardous waste sites listed by the EPA
- 16 petroleum release sites listed by VDEQ

- 2 closed solid waste management facilities
- 3 VDEQ listed petroleum registered facilities
- Fort Belvoir property, which contains training grounds, landfills, tanks, an airfield, and several restricted sites
- A gas line runs along Route 1 from Pohick Road to just north of Woodlawn Road, including 2 gas valves

A containment survey is being conducted within the project area, and hazardous materials, such as contaminated soil, hazardous waste, solid waste, groundwater, and unexploded ordinance associated with Fort Belvoir, would be remediated to the extent that it would impact this project in accordance with applicable state and federal regulations. 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. Undocumented hazardous materials may be uncovered during construction. *Special Provisions* would be included in the construction contract providing procedures to follow in the event such material is discovered during construction, and which outline the notification of appropriate authorities and proper removal, disposal, treatment, and/or remediation of the material, as necessary.

3.13 INDIRECT EFFECTS

Indirect effects are those that are caused by the proposed action but occur later in time or farther in distance than the direct impacts discussed elsewhere in this document. The most common indirect effects associated with roadway projects have to do with induced development, that is, development and the impacts of such development that would not otherwise occur if the project were not constructed. Lands surrounding the proposed project corridor currently can be accessed by the existing road network. As such, they are subject to development even in the absence of implementation of this project. Indeed, privately owned lands adjacent to the entire project corridor currently include or are planned for residential, commercial, industrial, and institutional development and substantial development already has occurred in nearby areas without this project being implemented. Moreover, the project would not provide any new direct access to adjacent undeveloped lands where access does not currently exist. In summary, the proposed project would serve traffic generated by development on adjoining lands, but would not cause such development. Moreover, the project is consistent with local comprehensive planning regarding land use goals in the surrounding area and transportation in the project corridor.

3.14 CUMULATIVE IMPACTS

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

In this case, the project is located in a corridor that is heavily developed and past actions, including transportation projects and residential, commercial, and government development, have already impacted most of the historic cultural, and natural resources. Ongoing and potential

future projects in the areas surrounding the project could affect the same resources that would be affected by this project. Present and reasonably foreseeable future actions include the following:

- **The BRAC Action at Fort Belvoir.** As a result of 2005 BRAC, Main Post employment increased from approximately 23,000 (Pre-BRAC) to 27,000 employees (post-BRAC implemented), a net increase of 4,000 employees.²⁰ These numbers do not include increases in employment due to temporary activities, such as construction, as these employees depart once construction is finished. The BRAC Action at Main Post includes the construction of a new hospital, which has three times the number of beds and twice the number of employees as the former Dewitt Army Community Hospital, now the Warrior Pavilion, and it will serve active-duty military service personnel, veterans, and their families throughout the Washington metropolitan region. Also as part of the BRAC Action is the addition of a Warrior Transition Unit that will house 276 warriors in transition requiring long-term care after they leave Fort Belvoir Community Hospital and a Dental Clinic that will contain a total of 40 dental treatment rooms and accommodate 15 dentists and 62 staff.
- **Fort Belvoir On-post Improvements.** Pohick Road, Belvoir Road, and Gunston Road are being widened from two to four lanes. A new access control point (ACP) is being constructed to replace the Woodlawn Gate and Lieber Gate.
- **Opening of Mulligan Road, with Associated Improvements at Route 1 and Telegraph Road.** Currently, traffic from the Kingstowne area on Beulah Street destined to Route 1 (north of Fort Belvoir) or the Mount Vernon area must use Telegraph Road and the Fairfax County Parkway and travel through Fort Belvoir on Route 1 to reach the intersection of Route 1/Mount Vernon Memorial Highway and points beyond – a total travel distance of approximately 5.2 miles. With the opening of Mulligan Road, drivers would no longer have to travel through the congestion on the Fairfax County Parkway and Route 1 as the new roadway will provide an alternative route. Mulligan Road and Beulah Street are approximately 0.8 miles apart on Telegraph Road, and the total travel distance is approximately 3.0 miles, but this route allows drivers to avoid the congestion around Fort Belvoir.
- **Fairfax County Annual Plan Review Amendment APR 09-IV-12LP**, adopted on September 13, 2011, includes the widening of Telegraph Road to six-lanes from Route 1 to the Fairfax County Parkway.
- **The Richmond Highway Public Transportation Initiative** - Since 2004, Fairfax County has been implementing the Richmond Highway Public Transportation Initiative, a \$55 million program to upgrade transit services and facilities along the Richmond Highway (Route 1) corridor between the Capital Beltway and Mount Vernon Highway. The program includes improvements at 29 intersections, new sidewalks to fill 5.6 miles of missing sidewalks, and various bus stop improvements along Route 1, the most heavily-used transit corridor in Fairfax County.

²⁰ Other activities/realignments have resulted in an additional increase of three to four thousand employees, bringing the total employment level at Fort Belvoir up to approximately 31,000.

- Commercial and residential redevelopment along the project corridor, consistent with local comprehensive plans and zoning, including Accotink Village and the Northern Virginia Industrial Park off of Telegraph Road, just north of Route 1.

Despite the dramatic changes in the landscape that have occurred over time due to human settlement in the surrounding area, the intensity of the incremental impacts of this project are considered small when viewed in the context of impacts from other past, present, and reasonably foreseeable future actions and would not rise to a level that would cause significant cumulative impacts.

Table 11 summarizes the more prominent environmental resources in the project study area that would be impacted by the proposed project, the impact that these resources have experienced from past and present actions, the incremental impact expected from the proposed project, identification of potential reasonably foreseeable future actions, and the potential impact that may occur from other reasonably foreseeable future actions in or near the study area.

Table 11. Summary of Cumulative Effects

ENVIRONMENTAL RESOURCES IN STUDY AREA	IMPACTS FROM PAST AND PRESENT ACTIONS	IMPACT FROM PROPOSED PROJECT	POTENTIAL FUTURE ACTIONS	POTENTIAL IMPACT ON RESOURCES FROM POTENTIAL FUTURE ACTIONS AND PROPOSED PROJECT
Air Quality	Decrease in air quality as area population, industry, and traffic increases, offset by improvements to air quality resulting from increasingly stringent emissions and fuel standards.	No violations of NAAQS; project in conformity with State Implementation Plan.	Continuing development in region, accompanied by increasing regional traffic volumes; construction of other roadway improvements as programmed in the Constrained Long Range Plan.	Continuing improvements in vehicle and fuel technology, and resulting cleaner emissions, anticipated to offset increases in volumes of vehicles on regional travel network and potential impacts from other road improvements; cumulative effect not substantial.
Noise	Increase in noise levels as urbanization and traffic increase.	No substantial increase in noise is predicted to occur.	Continued urbanization with accompanying increases in traffic volumes.	Continued increases in traffic would increase noise levels; cumulative effect not substantial.
Waters of the U.S., including Wetlands	Filling of water resources to associated with development.	Potential impacts to approximately 1,526/1,451 (Alternative B/C) linear miles of stream and 2.6/2.5 (B/C) acres of wetlands; temporary siltation during construction and increase in pollutant loadings, which would be minimized through implementation of best management practices and stormwater management measures.	Continued urbanization with accompanying fills to wetlands and waters of the U.S.	Continued urbanization with accompanying fills to wetlands and waters of the U.S.; cumulative effect not substantial.
Water Quality	Degradation of water quality from agricultural and other runoff, impervious surfaces, increased runoff and sediment volumes.	Minor impacts as a result of increases in impervious pavement and vehicle pollutants	Additional impervious surfaces and conversion of resources for growing urban area; long-term water quality effects could occur as a result of increased impervious surface; spills from vehicles; an increase in non-point source pollutants from asphalt, grease, oil, metals, nutrients, nitrogen, deicing salts, roadside vegetation management chemicals, and suspended solids and other elements associated with roadways.	Increased impervious surfaces may affect water tables and streamflow volume and quality; adverse effects offset by enforcement of stormwater management, erosion and sediment controls, and water quality permitting requirements under local, state, and federal laws, including compensation requirements; cumulative effect not substantial.
Terrestrial and Aquatic Habitat and Wildlife	Conversion of wildlife habitat to other uses, and degradation of remaining habitat from urban impacts and fragmentation.	Potential impacts to approximately 7.9/5.4 (Alternative B/C) acres of forest, 6.6/4.5 (B/C) acres of field, and 0.7/0.6 (B/C) acres of aquatic habitat.	Continued urbanization and population growth.	Continued degradation of remaining habitat due to urban influences; cumulative effect not substantial.

ENVIRONMENTAL RESOURCES IN STUDY AREA	IMPACTS FROM PAST AND PRESENT ACTIONS	IMPACT FROM PROPOSED PROJECT	POTENTIAL FUTURE ACTIONS	POTENTIAL IMPACT ON RESOURCES FROM POTENTIAL FUTURE ACTIONS AND PROPOSED PROJECT
Threatened and Endangered Species	Reduction in habitat and population numbers as urbanization increases.	Potential habitat may be impacted. The species would be avoided or relocated.	Continued reduction in potential habitat as development and urbanization continues.	Continued reduction in potential habitat as the land is developed; cumulative effect not substantial.
Prime and Unique Farmlands	Reduction in prime farmland as the land is developed.	Approximately 37.7 and 35.4 (Alternative B/C) of Prime Farmland and Farmland of Statewide Importance would be impacted.	Continued reduction of Prime Farmland and Farmland of Statewide Importance from urbanization.	Continued reduction of Prime Farmland and Farmland of Statewide Importance; cumulative effect not substantial.
Cultural Resources	Urbanization not subject the National Historic Preservation Act has reduced the number of historic structures and archeological sites.	Historic designated property would be impacted under Alternatives B and C; however, those impacts would be mitigated as appropriate.	Continued urbanization would impact historic properties and archeological resources.	Continued impacts to cultural resources as redevelopment and urbanization continues; cumulative effect not substantial.

SECTION 4 – COORDINATION AND COMMENTS

FHWA, in cooperation with Fairfax County, U.S. Army Garrison Fort Belvoir, and VDOT, has coordinated extensively with local, state, and federal agencies on the Route 1 improvements. FHWA has also conducted an inclusive public involvement program and hosted three public meetings during the course of the study. Local, state, and federal agencies and the general public were contacted early in the study and asked to identify issues of concern and to provide information about environmental resources within the study area. The agency and public comments received in response to these coordination efforts were instrumental in defining the scope of the EA. In addition, throughout the process, the public was notified about study findings via the project website (<http://www.efl.fhwa.dot.gov/projects/environment.aspx>) and given opportunities to provide comments about transportation needs, potential alternatives, and environmental concerns.

4.1 AGENCY COORDINATION

4.1.1 Federal and State Agency Coordination

Federal and state agencies were provided the opportunity to comment and provide information on environmental issues at the beginning of project development as part of the scoping process. This feedback helped FHWA identify key environmental concerns within the study area and initiate coordination with appropriate agencies in avoiding and minimizing adverse environmental impacts.

The following agencies were contacted:

- U.S. Army Corps of Engineers, Norfolk District
- U.S. Army Garrison Fort Belvoir
- U.S. Department of Housing and Urban Development
- U.S. Department of the Interior, Fish and Wildlife Service – Virginia Field Office
- U.S. Environmental Protection Agency – Virginia Field Office
- Federal Highway Administration – Division Administrator
- National Marine Fisheries Service
- Virginia Department of Agricultural and Consumer Services
- Virginia Department of Conservation and Recreation – Planning Bureau Manager
- Virginia Department of Conservation and Recreation – Natural Heritage Division
- Virginia Department of Conservation and Recreation – Planning and Recreation
- Virginia Department of Conservation and Recreation – Soil and Water Conservation Division
- Virginia Department of Environmental Quality – Air Division
- Virginia Department of Environmental Quality – Land Protection and Revitalization Division

- Virginia Department of Environmental Quality – Water Division
- Virginia Department of Forestry
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Health
- Virginia Department of Historic Resources
- Virginia Department of Mines, Minerals, and Energy
- Virginia Marine Resources Commission
- Virginia Museum of Natural History
- Virginia Outdoors Foundation

The following fundamental issues and concerns were mentioned in the responses from the agencies:

- Potential presence of protected species within the study area.
- Presence of known historic resources within the study area.
- Study area is in a nonattainment area for ozone, fine particulate matter, and a VOC and NO_x emission control area.
- Potential presence of hazardous materials sites within the study area.
- Presence of Potomac Heritage National Scenic Trail within the study area.
- Presence of regulated waters and/or wetlands within the study area.

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 local agencies and organizations:

- Fairfax County Department of Health – Environmental Health Supervisor
- Fairfax County Department of Housing and Community Development
- Fairfax County Department of Planning and Zoning
- Fairfax County Department of Transportation – BRAC Coordinator
- Fairfax County Economic Development Authority
- Fairfax County Environmental Coordinator
- Fairfax County Fire and Rescue Department
- Fairfax County Health Department
- Fairfax County History Commission
- Fairfax County Office of Emergency Management
- Fairfax County Office of the County Executive

- Fairfax County Park Authority
- Fairfax County Planning Director
- Fairfax County Public Schools
- Historical Society of Fairfax County
- Northern Virginia Planning District Commission
- Northern Virginia Regional Park Authority
- Southeast Fairfax Development Corporation

In their responses, these agencies mentioned the following key issues:

- Potential presence of private wells and on-site sewage disposal systems.
- Concerns regarding natural resource protection (wildlife corridors, stormwater management, vegetation restoration), environmental quality, cultural resource protection, non-motorized connections, Mount Vernon, transportation, and emergency services.
- Route 1 designation as an evacuation route.

4.1.3 Agency Partnering

FHWA invited several agencies, including the U.S. Army Corps of Engineers (Baltimore and Norfolk Districts), U.S. Army Garrison Fort Belvoir, and the U.S. Fish and Wildlife Service, to participate as *cooperating* agencies in the earliest stages of project development. The latter declined the opportunity to participate in e-mail correspondence dated July 1, 2011. The U.S. Army Corps of Engineers, both districts, and U.S. Army Garrison Fort Belvoir accepted the invitations to serve as cooperating/participating federal agencies.

Both Fairfax County and VDOT accepted invitations to serve as *participating* agencies in the preparation of the EA. Beginning in November 2011, weekly partnering meetings were held with FHWA, Fairfax County, Fort Belvoir, VDOT, and other parties as required to facilitate project coordination and development.

4.1.4 Section 106 Consulting Parties

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f) (NHPA), FHWA in cooperation with U.S. Army Garrison Fort Belvoir, Fairfax County, and VDOT initiated a process of identifying and meeting with 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. The following entities were invited to be consulting parties:

- Advisory Council on Historic Preservation (declined to participate)
- Virginia Department of Historic Resources (State Historic Preservation Office)
- National Park Service (Secretary of Interior's designee for National Historic Landmarks)
- Potomac Heritage National Scenic Trail (National Park Service)

- George Washington Memorial Parkway (National Park Service)
- Washington-Rochambeau Revolutionary Route National Historic Trail (National Park Service)
- Catawba Indian Nation
- Virginia Council on Indians
- U.S. Army Garrison Fort Belvoir
- Virginia Department of Transportation
- Fairfax County Architectural Review Board
- Fairfax County Department of Planning and Zoning
- Fairfax County Department of Transportation
- Fairfax County History Commission
- Fairfax County Office of the County Executive
- Fairfax County Park Authority, Cultural Resources Management and Protection Section
- Fairfax County Planning Commission
- The National Trust for Historic Preservation
- Woodlawn Plantation
- Woodlawn Baptist Church
- Alexandria Monthly Meeting of the Religious Society of Friends
- Historical Society of Fairfax County, Virginia
- Gum Springs Historical Society
- Mount Vernon Ladies Association
- Pohick Episcopal Church
- Accotink United Methodist Church
- Inlet Cove Homeowners Association
- Save Woodlawn Stables

Six consulting party meetings were held during the course of the study. Meeting minutes, handouts from the meetings, and comment/response matrices that were prepared following each meeting were posted on the project website throughout the process. Each of the meetings is summarized in the following sections.

June 16, 2011

The first consulting parties meeting included discussions on the project and its relationship to other on-going and previous improvements in the area; alternatives and design considerations;

the area of potential effects (APE); cultural resources identification efforts; potential effects; and potential mitigation.

Responses were requested from the consulting parties on the following specific questions to ensure that all organizations with interests in the project were represented and to help define the scope of the Section 106 process:

- Should any other Consulting Parties be invited to join the process?
- Should the APE be modified, and if so, what is your suggestion on the change in boundaries?
- Are there any other cultural resources not identified at the meeting that you believe should be considered for this undertaking?
- Are there any other issues that should be addressed in this NEPA document?

November 3, 2011

This consulting parties meeting included discussions regarding follow-up from the previous meeting; the purpose and need of the EA and preliminary alternatives developed to meet those needs; the APE; historic properties; a draft Memorandum of Agreement (MOA) with a resolution of adverse effect; and an outline of the next steps in the process. These next steps would include development of alternatives, a milestone schedule, the Phase I survey schedule, the analysis of effects, the EA, and the MOA.

January 12, 2012

The third consulting parties meeting included an update on the project design and alternatives; an update on the historic property identification process; a preliminary discussion of effects; a discussion regarding avoidance, minimization, and mitigation; and a preliminary discussion of agreement contents.

February 9, 2012

The fourth consulting parties meeting included an update on the project design, in particular, interchange options at the Telegraph Road and Fairfax County Parkway intersections and avoidance options at Inlet Cove and the Woodlawn area; a review of the APE; discussion on the status of investigations and research of eligibility, files, and concurrences for architectural and archeological sites within the APE; and an overview of the work-in-progress draft MOA. Comment/response matrices were also available at this meeting to document all comments received to date on the Section 106 process.

March 27, 2012

During this consulting parties meeting, the Route 1 widening project conceptual design was described in detail, noting that the Southern Bypass Alignment was favored for selection at that time. In addition, the comment/response matrix from the prior meeting was reviewed with the group. The rest of the meeting was spent examining the “Whereas” clauses in the draft Programmatic Agreement (PA) (between the February and March meetings, it was decided that a PA would be more appropriate than a MOA).

May 14, 2012

During this final consulting parties meeting, attendees were updated on the NEPA and NHPA processes, discussed responses to comments from the prior meeting, and reviewed site identification as well as site evaluation and eligibility. In addition, the group discussed the determination of effects on historic properties and the updated PA.

4.2 PUBLIC INVOLVEMENT

4.2.1 Public Scoping Meeting

FHWA held a Public Scoping Meeting on December 2, 2010 to obtain public input for use in defining the scope of the study. At the meeting, the study team presented maps and displays describing the location study process, environmental constraints, and other study information. A total of 68 citizens signed the attendance log and submitted 22 comment sheets. Before and after the meeting during the comment period, 18 e-mails/letters and 16 comment sheets were submitted. Citizens ranked transportation deficiencies, with congestion on Route 1 ranking the highest. The public also noted human, natural, and cultural resources in the study area that should be considered as part of the evaluation of transportation improvements. A variety of transportation options were also identified by the public to be considered in the project process.

4.2.2 Public Information Meeting - Alternatives

FHWA held a Public Information Meeting on October 19, 2011 to provide an update on project activities and to obtain suggestions and comments on the range of alternatives being considered to address transportation needs in the Route 1 corridor near Fort Belvoir. At the meeting, the study team exhibited presentation boards displaying: comments from the previous meeting; the proposed typical section of Route 1 and its evolution; other projects near the study area; environmental considerations; transit considerations; and next steps in the study process. In addition, the conceptual design for the six-lane widening alternative was presented, along with two interchange options at both the Telegraph Road and Fairfax County Parkway intersections. The meeting included a presentation in which FHWA summarized the purpose of the meeting and the information available for review, followed by a brief question and answer (Q&A) session. Many of the citizens that spoke during the Q&A session and attended the meeting expressed general support for the project and all of those that submitted comments sheets (8) during and after the meeting expressed agreement with the project purpose and need. When asked their opinion of the six-lane alternative presented during the meeting, several comments were received regarding the need to consider the transition of the proposed six-lane alternative with the four-lane section north of the study limits; the interface of turning vehicles, bicyclists, and pedestrians; and the connection with future transit in the corridor. Suggestions for additional improvement alternatives and modifications to the proposed six-lane alternative were also received during the public comment period and these were considered during the alternatives development process. For example, the Inlet Cove residential community expressed concern about noise and property impacts, which resulted in a shift of the alignment in that section of the study area, and Woodlawn Baptist Church submitted three proposals for shifting the alignment of Route 1 near their church and cemetery, which led to the development of the Southern Bypass Alignment. During the meeting, 81 citizens signed the attendance log, leaving behind six comment sheets. Before and after the meeting during the comment period, ten e-mails/letters and two comment sheets were submitted.

4.2.3 Inlet Cove Information Meetings

Information meetings were held with members of the Inlet Cove Homeowner's Association and community members on January 10, 2011, February 22, 2012, and April 10, 2012. The meetings were held to discuss the project design and respond to comments and questions submitted by property owners. In particular, residents were concerned that the preliminary roadway design

plans showed that the widening would predominantly occur on the north side of the highway to the detriment of their community. In response, the alignment was shifted further south onto property owned by Fort Belvoir to avoid any permanent right-of-way impacts to the Inlet Cove frontage.

4.2.3 Public Information Meeting - EA

A public meeting is scheduled for June 5, 2012 to present the preliminary project design, present the findings of the EA, provide a discussion forum between the public and project team, and obtain input and comments from the community. All comments received during the public meeting and public comment period will be considered, and all substantive comments will be addressed in a Revised Environmental Assessment and in reaching a decision on the study.

REFERENCES

- City Data. Online detailed profile for Fairfax County, Virginia. http://www.city-data.com/county/Fairfax_County-VA.html. Accessed 4/17/2012.
- Cowardin, L.M., V. Cater, F.C. Golet, and E.T. LaRoe. *Classification of Wetlands and Deepwater Habitats of the United States*. Prepared for the USDI-US FWS. FWS/OBS-79/31. Washington, D.C. 1979.
- Daniels, W. Lee. *Characterization and Reclamation of Acid Sulfate Soils in Virginia*. Virginia Tech. 2006. <http://www.cses.vt.edu/revegetation/remediation.html>. Accessed 1/30/09.
- Daniels, W. Lee and Senah Orndorff. *Delineation and Management of Sulfidic Materials in Virginia Highway Corridors*. Virginia Polytechnic and State University. 2002.
- Deetz, Eric J., Jeroen van den Hurk, Lindsay Flood, Jonathan R. Libbon, and Susan E. Bamann. *Archaeological Survey of Proposed Area of Potential Effects Route 1 Improvements at Fort Belvoir (Telegraph Road to Mount Vernon Memorial Highway), Fairfax County, Virginia*. Prepared for Federal Highway Administration, Virginia and Parsons Transportation Group, Inc by Coastal Carolina Research. Washington, DC. April 2012.
- DMME (Virginia Department of Mines, Minerals, and Energy). Online geologic information catalog. <http://www.dmme.virginia.gov/DgmrGoogleMap/frmMain.aspx>. Accessed 3/10/2011.
- EPA (Environmental Protection Agency). Online EnviroMapper for Envirofacts. <http://www.epa.gov/emefmap/index.html?minx=&miny=&maxx=&maxy=&ve=6,37.510231018066406,-78.64920043945312&>. Accessed 1/18/2012.
- Fairfax County. Fairfax County, Virginia Comprehensive Land Use Plan. Readopted November 1, 2011a.
- Fairfax County. Fairfax County, Virginia Transportation Plan. Readopted November 1, 2011b.
- Irons, Ellie. Federal Consistency Determination for the Route 1 Improvements at Fort Belvoir, Fairfax Count. Personal Communication. Letter to Jack Van Dop, Federal Highway Administration, Eastern Federal Lands Highway Division from Ellie Irons, Program Manager, Environmental Impact Review, Virginia Department of Environmental Quality. Dated March 27, 2012.
- NPS (National Park Service). Rivers, Trails & Conservation Program, Nationwide Rivers Inventory. <http://www.nps.gov/ncrc/programs/rtca/nri/eligb.html>. Accessed 10/6/2011.
- National Wild and Scenic Rivers List. <http://www.rivers.gov/wildriverslist.html>. Accessed 2012.

- Parsons. *Route 1 Improvements at Fort Belvoir Air Quality Technical Report*. Prepared for Federal Highway Administration, Eastern Federal Lands Highway Division by Parsons. May 2012.
- Parsons. *Route 1 Improvements at Fort Belvoir Noise Impact Analysis Technical Report*. Prepared for Federal Highway Administration, Eastern Federal Lands Highway Division by Parsons. May 2012.
- Parsons. *Route 1 Improvements at Fort Belvoir Transportation Technical Report*. Prepared for Federal Highway Administration, Eastern Federal Lands Highway Division by Parsons. April 2012.
- USDA (United States Department of Agriculture). Online Web Soil Survey National Cooperative Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>. Accessed 3/10/2011.
- USACE (United States Army Corps of Engineers). *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Washington, D.C. 1987.
- United States Census Bureau. 2005-2009 American Community Survey. <http://2010.census.gov/2010census/data/>.
- United States Census Bureau. 2010 Survey, P9. Hispanic or Latino and Not Hispanic or Latino by Race [73] - Universe: Total Population. <http://2010.census.gov/2010census/data/>.
- Van den Hurk, Jeroen, D. Allen Poyner, and Susan E. Bamann. *Architectural Survey of Proposed Area of Potential Effects Route 1 Improvements at Fort Belvoir (Telegraph Road to Mount Vernon Memorial Highway), Fairfax County, Virginia*. Prepared for Federal Highway Administration, Virginia and Parsons Transportation Group, Inc by Coastal Carolina Research. Washington, DC. April 2012.
- VDCR (Virginia Department of Conservation and Recreation). Online Virginia Conservation Lands. <http://www.vaconservedlands.org/gis.aspx>. Accessed 03/10/2011a.
- VDCR (Virginia Department of Conservation and Recreation). *Virginia Scenic Rivers*. http://www.dcr.virginia.gov/recreational_planning/srmain.shtml. Revised September 24, 2010. Accessed 11/12/2011b.
- VDEQ (Virginia Department of Environmental Quality). 2010 Impaired Waters Fact Sheets. <http://gisweb.deq.virginia.gov/FactSheets2010/FactSheets.aspx>. Accessed 03/10/2011.
- VDEQ (Virginia Department of Environmental Quality). Virginia Environmental Geographic Information Systems – Impaired Waters, HAZMAT. http://www.deq.virginia.gov/mapper_ext/default.aspx?service=wimby. Accessed 1/19/2012.
- VDGIF (Virginia Department of Game and Inland Fisheries). Virginia Birding and Wildlife Trails. <http://www.dgif.virginia.gov/vbwt/loop.asp?trail=1&loop=CMN>. Accessed 6-16-2011.

VDGIF (Virginia Department of Game and Inland Fisheries). *VDGIF Time of Year Restrictions (TOYR) Table*. Updated April 13, 2011. Accessed 1/26/2012.

VDGIF (Virginia Department of Game and Inland Fisheries). VaFWIS Search Report. Accessed 1/26/2012.

VDGIF (Virginia Department of Game and Inland Fisheries). 2012 Catchable Trout Stocking Plan. <http://www.dgif.virginia.gov/fishing/trout/catchable-trout-stocking-program/>. Accessed 1/26/2012.

VDOT (Virginia Department of Transportation). *Official State Bicycling Map*. 2006.

VDOT (Virginia Department of Transportation). GIS data Layers. 2011.

West Virginia Department of Transportation, *Coalfields Expressway Final Environmental Impact Statement*. November, 1999.

William and Mary Department of Education, *Geology of Virginia*. http://web.wm.edu/geology/virginia/provinces/app_plateau/app_plateau. Accessed 3/9/2009.