

Richmond Highway-Telegraph Road Connector Fairfax County, Virginia Environmental Assessment

July 2006



RICHMOND HIGHWAY/ TELEGRAPH ROAD CONNECTOR

Richmond Highway (U.S. Route 1) – Telegraph Road (VA Route 611)
Fairfax County, Virginia

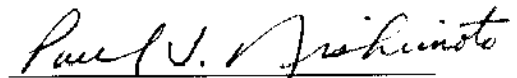
ENVIRONMENTAL ASSESSMENT

and

Section 4(f) Evaluation
in accordance with the U.S. Department of Transportation Act of 1966,
49 U.S.C. 303 (c)

Submitted Pursuant to 42 U.S.C. 4332 (2) (c), 23 U.S.C. 128(a), and 16 U.S.C. 470(f)

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



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7/18/06
Date of Approval

Cooperating Agencies:

U.S. Army Garrison Fort Belvoir
U.S. Army Corps of Engineers Baltimore District
U.S. Army Corps of Engineers Humphreys Engineer Center
U.S. Army Defense Access Road Program
Virginia Department of Transportation
Fairfax County Department of Transportation

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EXECUTIVE SUMMARY

S.1 Project Location and Description

This study evaluates environmental impacts related to a replacement connector road between Richmond Highway (U.S. Route 1) and Telegraph Road (VA Route 611) in the vicinity of Fort Belvoir in Fairfax County, Virginia. The project is located in Fairfax County, approximately 6 miles south of the Capitol Beltway (I-495), 3 miles east of I-95, and 6 miles west of George Washington's Mount Vernon estate and the Potomac River. See **Figure S-1**.

The U.S. Department of Defense (DoD) eliminated public access to Beulah Street (VA Route 613) and Woodlawn Road (VA Route 618) within Fort Belvoir following events of September 11, 2001. These roads linked U.S. Route 1, a north-south principal arterial, and Telegraph Road (VA Route 611) north-south minor arterial. The two roads are otherwise connected about two miles to the south by the east-west cross-county Fairfax County Parkway (VA 7100), and about 7 miles north via South Kings Highway. See **Figure S-2**.

Fort Belvoir is a garrison of the U.S. Army, originally created as Camp A.A. Humphreys in the early twentieth century. Fort Belvoir's Main Post comprises approximately 7,682 acres with multiple missions to support the military. The Humphreys Engineer Center (HEC) is a 583 acre U.S. Army Corps of Engineers (USACE) facility located contiguous to the northeast portion of Fort Belvoir.

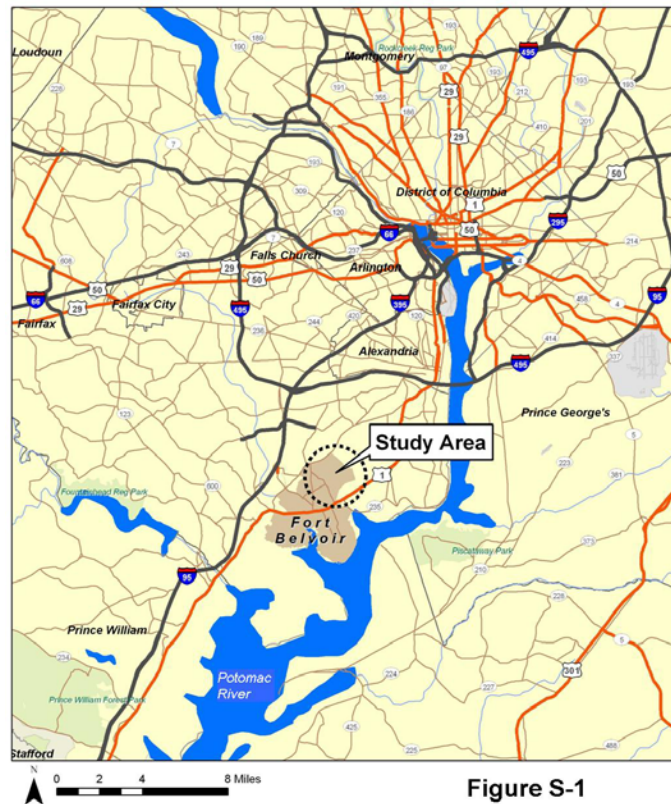


Figure S-1

The Federal Highway Administration (FHWA) is the lead federal agency for the proposed replacement project. FHWA proposes to provide a replacement facility to the closed Woodlawn Road, in conjunction with U.S. Department of the Army Defense Access Roads (DAR) Program, U.S. Army Fort Belvoir Garrison, HEC, USACE Baltimore District, Virginia Department of Transportation (VDOT), and the Fairfax County Department of Transportation (FCDOT). The proposed project would be funded in part through the DAR program and possibly from other federal, state and local sources. The U.S. Army has committed to fund two lanes of the facility. The proposed project is a four-lane roadway with median.

S.2 Project Purpose and Need

The purpose of this project is to restore the link between U.S. Route 1 and Telegraph Road with a roadway on an alignment that maintains required security of Fort Belvoir and HEC facilities. Removal of these access routes through this portion of southeastern Fairfax County substantially diminished the flexibility of traffic movement. The proposed Connector Road is projected to carry over 20,000 vehicles per day.

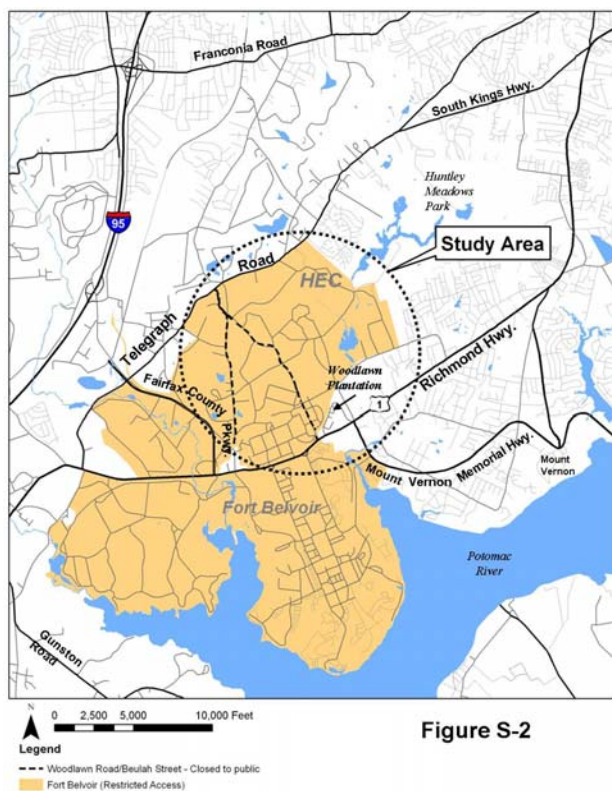


Figure S-2

S.3 Alternatives Considered

The USACE completed a *Preliminary Feasibility Study of Richmond Highway and Telegraph Road Connector, Fairfax County, VA* in 2003. This *Environmental Assessment (EA)* builds on the USACE study. FHWA conducted an independent review of the USACE study and considered other alternatives. At the January 2005 agency scoping meeting for the current project, FHWA recommended eliminating any alternative concept which traversed Huntley Meadows Park, which is protected

under the U.S. Department of Interior land transfer agreement as well as Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303). Section 4(f) regulation binds FHWA from using any publicly owned park or wildlife refuge where a prudent and feasible alternative exists. FHWA also recommended an approximately 3-mile diameter study area generally centered on the North Post of Fort Belvoir in order to provide a replacement facility in close proximity to the closed roadways.

During the evaluation process, FHWA considered reopening Woodlawn Road (USACE Alternative A) but DoD policy and national security concerns require that public roadways be properly separated from facilities on military property. Additional roadways to provide internal connectivity within the post would add costs and impacts to environmental resources.

Similarly, a connection with Beulah Street extending through portions of the Fort Belvoir golf course (USACE Alternative B) would require construction of additional access for internal connectivity within the Fort. An alternative along the northern edge of HEC adjacent to a major power transmission line (USACE Alternative D) would require land from a residential community, involve significant impacts to wetlands, traverse nearly 5,000 feet of a designated Forest and Wildlife Corridor, and abut the Jackson Miles Abbot Wetland Refuge.

As the study progressed, none of these alternatives, or combinations among them, offered any advantages over an alternative corridor generally extending from Old Mill Road to Telegraph Road near Piney Run (USACE Alternative C). FHWA found no satisfactory alternative other than using Old Mill Road as the terminus for U.S. Route 1, although the

Woodlawn Plantation Historic District would be adversely effected as defined by the National Historic Preservation Act. FHWA consulted with numerous historical interest groups, citizens, and agency stakeholders regarding amelioration of impacts to the Woodlawn Plantation. FHWA conducted two public information meetings, in February and October 2005. The consensus was to focus on variations of Alternative C.



Woodlawn Plantation

Multiple variations of Alternative C are shown in Figure S-3. The numerous constraints noted on the

figure (wetlands, parks, historic resources, streams, etc.) are identified and discussed in detail in Chapters 3 and 4.

S. 4 Avoidance and Minimization of Impacts

FHWA evaluated several horizontal and vertical alignments within the Alternative C corridor, in order to avoid and reduce impacts on natural, cultural, socio-economic, physical and other resources. A summary of efforts to optimize the placement of the Preferred Alternative are presented below:

Through Fort Belvoir/HEC, the road alignment follows ridgelines. By holding a higher elevation, this placement:

- Avoids and minimizes impacts to low-lying water resources.
- Minimizes the amount of earthwork required for the Connector Road's construction.
- Reduces direct impact to many terrestrial and nearly all aquatic species.
- Allows the alignment to span wetlands and Resource Protection Areas (RPAs)
- Avoids filling wetlands.
- Avoids filling floodplains.
- Allows use of natural ravines to provide "wildlife crossings".

Along Old Mill Road, FHWA recommends aligning Old Mill Road with Mount Vernon Memorial Highway at the U.S. Route 1 intersection. Expected as part of this aligning:

- Shifts Mount Vernon Memorial Highway away from the Woodlawn Plantation stables property.



Figure S-3

- Reduces the amount of land required from the Woodlawn Plantation National Historic Landmark (NHL) property to 2.24 acres.
- Provides a meandering shared-use path interior to the Woodlawn Plantation property to increase pedestrian and bicyclist opportunities to experience the historic resource.
- Adds two lanes and a median (for turning lanes) to Old Mill Road.
- Provides reduced turning lane distances for approaches to the intersection.
- Eliminates the awkward off-set five-way intersection of Old Mill, Mount Vernon, U.S. Route 1 and the Woodlawn Plantation driveway.
- Provides new entrance driveway to Woodlawn Plantation.
- Provides new shared-use path as extension of the National Park Service's Potomac Heritage Scenic Trail (specific placement to be finalized during design).
- Provides turn lanes and storage capacity on U.S. Route 1 in order to improve the intersection's level of service.



More details related to the proposed alignment along Old Mill Road are found in Chapter 2, Section 2.1.5.

In general, the typical section for the connector road applies design standards for a minor arterial roadway. Some of these features may be further reduced during design in an attempt to reduce the amount of clearing and right-of-way required. Current features include:

- Four 12-foot travel lanes.
- 16-foot median which tapers to allow turn lanes; additional turn lanes would be needed at the termini intersections of U.S. Route 1 and Telegraph Road.
- Speed limit of 45 miles per hour (mph) for the Pole Road to Telegraph Road section, with a possible 35 mph posting for the Pole Road to U.S. Route 1 section. (Reduced speed and design criteria will be further evaluated in design.)
- A 10' shared-use path the length of the project; this is envisioned to be a meandering path to avoid unnecessary cutting of trees.
- A sidewalk (as exists now) in addition to the shared-use path along Old Mill Road.
- 2:1 outside slopes to reduce the limits of cut and fill.
- No new access to Fort Belvoir/HEC except for an emergency use only gated access for HEC personnel. (This gated access is anticipated to be near unpaved Kingman Road; an alternative location may be considered by HEC.)

FHWA is committed to continue discussions with VDOT, FCDOT, and Fort Belvoir environmental management staff regarding further opportunities to achieve reductions to the alignment footprint and minimize environmental impacts.

S.4 Environmental Consequences

The Preferred Alternative will have beneficial and adverse social, economic, and natural environmental effects. Particular focus is given in this analysis to impacts and mitigation for natural resources, cultural resources, noise effects, and transportation within the study area.

The study team has sought to minimize impacts wherever possible.

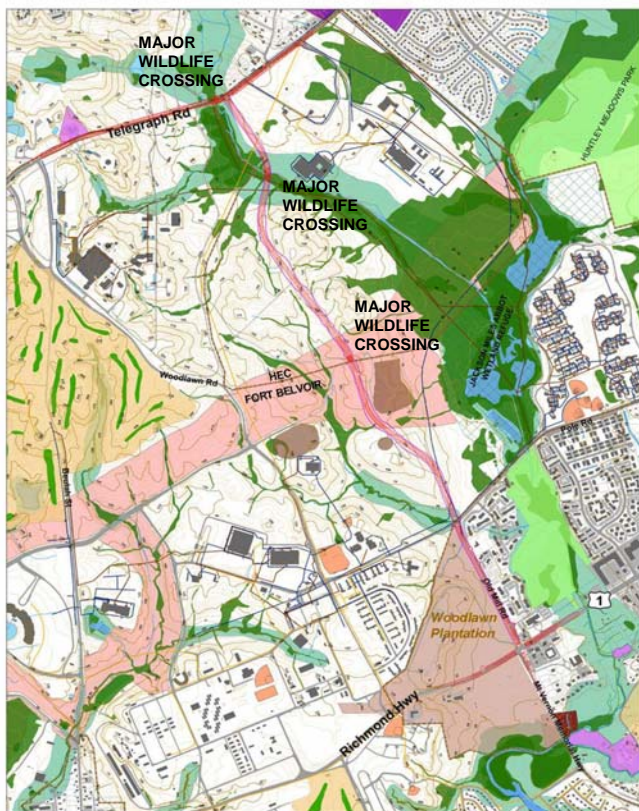


Figure S-4

Figure S-4 depicts many of the key resources in relation to the Preferred Alternative (known as Alternative 4CR). It is approximately 2 miles long, and assumes intersection improvements at each terminus. At U.S. Route 1, the Preferred Alternative aligns Mount Vernon Memorial Highway with Old Mill Road. At Telegraph Road, the connector road assumes a widened Telegraph Road to accommodate the intersection. This EA considers the environmental impacts of Telegraph Road between Beulah Street and HEC.

Potential impacts to wildlife habitat will be reduced by placing wildlife crossings within the forested area of Fort Belvoir and HEC. Three major wildlife crossings will be constructed. One major wildlife crossing would be located within Fort Belvoir's Forest and Wildlife Corridor. This wildlife crossing would be constructed as an underpass at the intersection of the Preferred Alternative and unimproved John J. Kingman Road. Each of the two-lane spans at this location would be about

100 feet long, 30 feet wide by 17 feet high, and located at a natural depression of the topography, which wildlife are thought to favor in their migration patterns. Additionally, at least two minor wildlife crossings, likely culverts, will be placed within the Forest and Wildlife Corridor to facilitate passage for small fauna to either side of the roadway. The Preferred Alternative provides two additional major wildlife crossings, both over Piney Run. Along Telegraph Road, the span length is approximately 90 feet; about 1,500 feet interior to HEC, the span length is approximately 175 feet.

To reduce fragmentation in the forested locations, the footprint of the roadway will be minimized to the maximum extent possible and the roadway has been aligned in close proximity to a grass-covered landfill that already exists in the corridor. Other measures for

habitat and wildlife mitigation include placing street lighting only at the intersections, and reforesting that portion of existing (closed) Woodlawn Road through another portion of the Forest and Wildlife Corridor. These measures will involve coordination with VDOT, FCDOT and Fort Belvoir environmental management staff. Deer reflectors, silent sirens, wildlife drift fencing to channel fauna to the constructed wildlife crossings and posting of deer-crossing signs are other measures which will mitigate the impact of the roadway through the forested areas.

Another example of minimizing impacts included shifting the alignment at Telegraph Road from the west side of Piney Run to the east side (towards HEC) to avoid impacting acidic seepage swamp and bottomland hardwood wetlands.

The Preferred Alternative is consistent with Fairfax County and VDOT plans. It avoids impacts to Huntley Meadows Park and the Jackson Miles Abbott Wetland Refuge. It avoids direct impacts to any known federally-listed threatened or endangered species. It avoids landfills, parks, and improves access and response times for emergency medical and fire services. The Preferred Alternative avoids taking any residences or businesses. As part of the efforts to minimize the impacts, some properties along Telegraph Road and Old Mill Road would be limited to right-in-right-out only access. The Preferred Alternative improves pedestrian and bicycle mobility in this part of the county by providing shared use paths; these allow access between Richmond Highway and Telegraph Road, and would enhance access to Woodlawn Plantation and connectivity to Mount Vernon.

As noted above, FHWA engaged in discussions with several groups and individuals regarding land required from the Woodlawn Plantation. The Preferred Alternative has minimized viewshed impacts to the property. FHWA will complete a Memorandum of Agreement (MOA) on the proposed impacts to cultural resources, notably the Woodlawn Plantation and related features of the Woodlawn Plantation Historic District and other resources. A keystone aspect of the Preferred Alternative is the transfer of a 2.5 acre parcel at the existing Woodlawn Gate from the U.S. Army to the owners of the Woodlawn Plantation. Details relating to the consultation process and the anticipated commitments are presented in Chapter 4, Section 4.3 Cultural Resources.

Table S-1 summarizes the impacts and mitigation measures proposed for the Preferred Alternative.

Table S-1: Preferred Alternative Key Resources Impacts and Mitigation

Resource	Impacts	Mitigation
Land Use, Plans, Visual Environment	<ul style="list-style-type: none"> ▪ Converts 2.6 acres of undeveloped land from Woodlawn Plantation ▪ Converts approximately 39 acres of undeveloped land on Fort Belvoir/ HEC to transportation use 	<ul style="list-style-type: none"> ▪ Provide landscaping and pavement treatments at U.S. Route 1/Old Mill/Mt. Vernon Memorial Highway intersection ▪ Revegetate side slopes ▪ Plant trees where allowed and shrub and small trees within clear zones and medians where appropriate ▪ No new access points to Fort Belvoir/HEC, except for one emergency use only gate for HEC ▪ See Cultural Resources
Natural Resources		
Geology, Soils, Groundwater	<ul style="list-style-type: none"> ▪ Clears and grades approximately 1.5 miles of undeveloped, rolling terrain 	<ul style="list-style-type: none"> ▪ Avoid steep slopes and erodible soils as much as possible ▪ Include low-impact design techniques for surface water runoff to improve groundwater recharge. ▪ Revegetate side slopes
Water resources and wetlands	<ul style="list-style-type: none"> ▪ Crosses less than 1.2 acres of wetlands, spanning nearly all of the wetlands ▪ Crosses 1,110 linear feet of streams within the Dogue Creek watershed 	<ul style="list-style-type: none"> ▪ Avoid placement of roadway or piers in wetlands or streams ▪ Span Piney Run at both proposed crossings ▪ Provide perpendicular bridge crossings to minimize encroachment to Resource Protection Areas (RPAs) ▪ Apply bio-retention facilities and rain gardens for stormwater management where possible ▪ Provide appropriate type and ratio of wetland mitigation, or purchase wetland credits, or provide payment to a wetland restoration trust fund. ▪ Avoid construction staging in wetlands, floodplains or RPAs
Natural Environmentally Sensitive Areas	<ul style="list-style-type: none"> ▪ Traverses 1,850 linear feet of the Forest and Wildlife Corridor on Fort Belvoir, about 7.1 acres ▪ Crosses 2,175 linear feet of designated Resource Protection Areas (RPAs), much is spanned 	<ul style="list-style-type: none"> ▪ Construct a major wildlife crossing within the Forest and Wildlife Corridor, with a 17' height ▪ Construct two minor wildlife crossings/culverts in the Corridor ▪ Remove pavement of two-lane existing (closed) Woodlawn Road through the Corridor, and reforest ▪ Erect no right-of-way fencing through the Corridor ▪ Provide wildlife drift fencing, if

Table S-1: Preferred Alternative Key Resources Impacts and Mitigation

Resource	Impacts	Mitigation
		appropriate, at the crossings <ul style="list-style-type: none"> ▪ Provide no street lighting through the Forest and Wildlife Corridor ▪ Span RPAs as much as possible ▪ Consider additional reductions in facility design (e.g., reduced lane widths) to reduce direct footprint ▪ Avoid construction staging in sensitive areas
Habitat and Threatened and Endangered Species	<ul style="list-style-type: none"> ▪ Avoids direct impact to any known federally-listed species ▪ Potentially impacts habitat of state-listed Wood Turtle ▪ Converts approximately 39 acres of Fort Belvoir and HEC property to transportation use ▪ Converts about 7.1 acres of the Fort Belvoir Forest and Wildlife Corridor to transportation use 	<ul style="list-style-type: none"> ▪ Construct three major wildlife crossings, one within the Forest and Wildlife Corridor ▪ Construct four minor wildlife crossings/culverts, two within the Forest Wildlife Corridor ▪ Span both potential crossings of Piney Run ▪ Use 'open' median to maximize daylight at stream crossings ▪ Remove pavement of two-lane existing (closed) Woodlawn Road through the Corridor, and reforest ▪ Erect no right-of-way fencing through the Corridor ▪ Provide wildlife drift fencing, if appropriate ▪ Provide no street lighting through the Forest and Wildlife Corridor, and reduce it through other forested locations to reduce nighttime impacts on wildlife ▪ Provide field observation during construction to relocate Wood Turtles to suitable habitat outside the project impact area ▪ Revegetate side slopes
Cultural Resources		
Historical	<ul style="list-style-type: none"> ▪ Requires approximately 2.5 acres of forested land from the National Historic Landmark parcel of Woodlawn Plantation ▪ Requires approximately 0.1 acres of land from Woodlawn Plantation Stables property ▪ Alters visual experience at the U.S. Route 1/Old Mill Road/Mount Vernon Memorial Highway intersection ▪ Relocates Woodlawn Plantation's driveway 	<ul style="list-style-type: none"> ▪ Transfer 2.5 acres within the Historic District to the National Trust for Historic Preservation (owners of Woodlawn Plantation) ▪ Provide pedestrian/bicycle facilities including the extension of the Potomac Heritage National Scenic Trail to Woodlawn Plantation ▪ Provide landscaping treatments and interpretive signage consistent with Woodlawn Plantation's rural, pastoral character ▪ Relocate entrance to Woodlawn Plantation

Table S-1: Preferred Alternative Key Resources Impacts and Mitigation

Resource	Impacts	Mitigation
		<ul style="list-style-type: none"> ▪ Satisfy terms of Memorandum of Agreement (MOA) with State Historic Preservation Officer (SHPO)
Archeological	<ul style="list-style-type: none"> ▪ One site (44FX1146) on Woodlawn Plantation property potentially impacted ▪ Two sites (44FX041 and 44FX1944) on Fort Belvoir potentially impacted 	<ul style="list-style-type: none"> ▪ Conduct additional archeological surveys ▪ Implement avoidance or removal consistent with MOA ▪ Apply appropriate procedures to other sites which may be identified
Physical Environment		
Hazardous Materials, Air Quality, Noise, Utilities	<ul style="list-style-type: none"> ▪ Traverses former Firing Ranges on Fort Belvoir/HEC ▪ No air quality exceedance ▪ Impacts 6 noise sensitive receptors along Telegraph Road 	<ul style="list-style-type: none"> ▪ Remediate ranges prior to construction ▪ Potential sound barrier along Telegraph Road
Socioeconomics		
Demographics, Environmental Justice, and Relocations	<ul style="list-style-type: none"> ▪ Requires minor taking along Telegraph Road ▪ Requires 2.5 acres from Woodlawn Plantation ▪ Alters access to certain businesses and residential developments to right-in-right-out ▪ Realigns Mount Vernon Memorial Highway 	<ul style="list-style-type: none"> ▪ Attempt further reduction in right-of-way or construction easement ▪ Maintain access during construction ▪ Avoid night-time construction activities near residential areas ▪ Use existing VDOT right-of-way for realigning Mt. Vernon Memorial Highway
Community Facilities and Services, Utilities, and Traffic	<ul style="list-style-type: none"> ▪ Relocates some utilities ▪ Certain intersections may experience lesser level-of-service 	<ul style="list-style-type: none"> ▪ Maintain access and services during construction ▪ Provides replacement access for lost access of Woodlawn Road; anticipate average daily traffic of approximately 20,000 ▪ Provide median breaks in Connector Road for emergency vehicle access ▪ Provide shared-use path along the alignment for enhanced pedestrian and bicycle mobility ▪ Consult further with VDOT and FCDOT for placement of turning lanes, further opportunities to reduce conflicting movements, and further optimization of signal timing

S.5 Other Federal Actions and Permits Required

Because the Preferred Alternative requires use of lands protected under Section 4(f), FHWA must make a finding that there is no prudent and feasible alternative to the use of such properties, and that the proposed action includes all possible planning to minimize harm to the properties resulting from that use. FHWA has prepared a Section 4(f) evaluation for both Fort Belvoir's Forest and Wildlife Corridor and the Woodlawn Plantation Historic District.

Various environmental authorizations will be required pursuant to Federal and state laws before construction proceeds. These include:

- Authorization by the USACE under Section 404 of the Clean Water Act for discharges of fill material into waters of the U.S., including wetlands.
- Authorization by the Virginia Department of Environmental Quality (DEQ) of a Virginia Water Protection Permit (9 VAC 25-210-10) pursuant to Sections 401 and 402 of the Clean Water Act for activities affecting jurisdictional wetlands, streams, and other waters.
- VDOT, through the Commonwealth Transportation Board, will be asked to facilitate and authorize the necessary transfer, closing, or easements related to the construction, maintenance and operation of the proposed Connector Road. VDOT will also be asked to facilitate the transfer of 2.5 acre parcel to the owners of Woodlawn Plantation.
- The U.S. Army Fort Belvoir Garrison (Fort Belvoir) and HEC will be required to facilitate and authorize easements or land transfers related to use of their property as part of the Preferred Alternative.
- In addition, Fort Belvoir will be required to close the existing Woodlawn Gate, in order to comply with the MOA exchanging that 2.5 acre parcel to the owners of Woodlawn Plantation. (Congressional legislation authorizing the transfer to VDOT has occurred.)
- Fort Belvoir will arrange for expeditious range clearing prior to construction of the Connector Road through the post.
- USACE and Fort Belvoir will be asked to expedite archeological permit for FHWA cultural resources consultant staff to perform necessary Section 106 survey work.
- Authorization under Virginia and Fairfax County Storm Water Management Criteria for water quality and quantity control, consistent with Fort Belvoir's MS-4 permit.
- Fairfax County and VDOT will be asked to determine the operation and maintenance mechanism for the shared-use paths to be constructed within the Woodlawn Plantation property.

1. PURPOSE AND NEED

The U.S. Department of Defense (DoD) eliminated public access to Beulah Street (VA Route 613) and Woodlawn Road (VA Route 618) within Fort Belvoir following events of September 11, 2001. These roads linked Richmond Highway (U.S. Route 1) and Telegraph Road (VA Route 611) in this area of Fairfax County, Virginia. Removal of the alternative access routes through this portion of Fairfax County substantially diminished the flexibility of traffic movement. The purpose of this project is to restore this link with a roadway on an alignment that does not threaten the security of Fort Belvoir.

Fort Belvoir is located in Fairfax County Virginia, approximately 12 miles south of Washington, D.C. See **Figure 1-1: Regional Project Location** and **Figure 1-2: Project Locale**. U.S. Route 1 is a principal arterial roadway and Telegraph Road is a minor arterial roadway.

As documented in a study conducted by the U.S. Army Corps of Engineers (USACE) in 2003 (*USACE Feasibility Study*), "The closing of the post to public access and through traffic...negatively affected U.S. Route 1 through the post, Fairfax County Parkway, and Telegraph Road..."¹.

The Eastern Federal Lands Highway Division (EFLHD) of the Federal Highway Administration (FHWA) and cooperating agencies have prepared this environmental assessment (EA) to comply with the National Environmental Policy Act² (NEPA).

Agencies cooperating in the preparation of this EA include the U.S. Department of the Army Defense Access Roads (DAR) Program, Fort Belvoir Garrison, USACE Humphreys Engineer Center, USACE Baltimore District, Virginia Department of Transportation (VDOT), and the Fairfax County Department of Transportation. The proposed project would be funded in part through the DAR program and possibly from other federal, state and local sources. Funding sources are not germane to the NEPA process.

1.1 Study Area

As part of the initial activities for this EA, FHWA sought guidance from key agency stakeholders, the general public and numerous other state and local agencies. In the interagency and public involvement meetings held for this EA, FHWA, in concert with agencies and following a February 2005 public meeting, confirmed its intention to narrow the NEPA study area. The focus would exclude Huntley Meadows Park to the northeast, in order to avoid significant wetland and parkland impacts. The alternative evaluation and refinement process is discussed in Chapter 2.

¹ U.S. Army Corps of Engineers (USACE), November 2003, *Preliminary Feasibility Study (Phase I) of Richmond Highway and Telegraph Road Connector, Fairfax County, VA*.

² See 40 CFR 1502.13.

The NEPA Study Area is generally bounded on the northwest by Telegraph Road, to the on the southwest by the Fairfax County Parkway, on the southeast by U.S. Route 1, and to the northeast by Huntley Meadows Park. This study area covers an approximate 3-mile diameter from a point generally centered on Fort Belvoir's North Post. See **Figure 1-3: Initial NEPA Study Area**. The study area lies predominantly within Fort Belvoir and HEC.

1.2 History of Fort Belvoir Access

Fort Belvoir has existed in various forms in southern Fairfax County since World War I. In 1918, Camp A.A. Humphreys, a temporary cantonment, was established on the site of the former Belvoir Manor. Congress had purchased the land in 1912, and transferred it to the War Department. The cantonment became the permanent installation Fort Humphreys which was renamed Fort Belvoir in 1935. Fort Belvoir has continually evolved in its function since World War II, providing administrative and basic operations support to a variety of military tenant organizations.

Fort Belvoir and the adjoining Humphreys Engineer Center (HEC) – a USACE facility— are located on approximately 8,400 acres. U.S. Route 1 traverses the Fort from east to west, dividing the Fort into the North Post and the South Post. The North Post is situated between Telegraph Road and U.S. Route 1; the South Post is situated between U.S. Route 1 and the Potomac River. Before 2001, numerous entrances (gates) permitted general accessibility both internal and external to Fort Belvoir. HEC comprises approximately 583 acres along the northeasternmost limits of the federal property; access to HEC is from Telegraph Road.

Several roads traverse the Post. When DoD closed public access through the Fort, it impacted Woodlawn Road, Beulah Street, Meeres Road and John J. Kingman Road on the North Post of Fort Belvoir. In addition to providing access to Fort Belvoir, these roads also provided public access through the Fort allowing connections between residential, commercial, and employment locations in southeast Fairfax County. Woodlawn Road and Beulah Streets are highways in the Virginia Department of Transportation's secondary road system, on easements from the U.S. Army.³

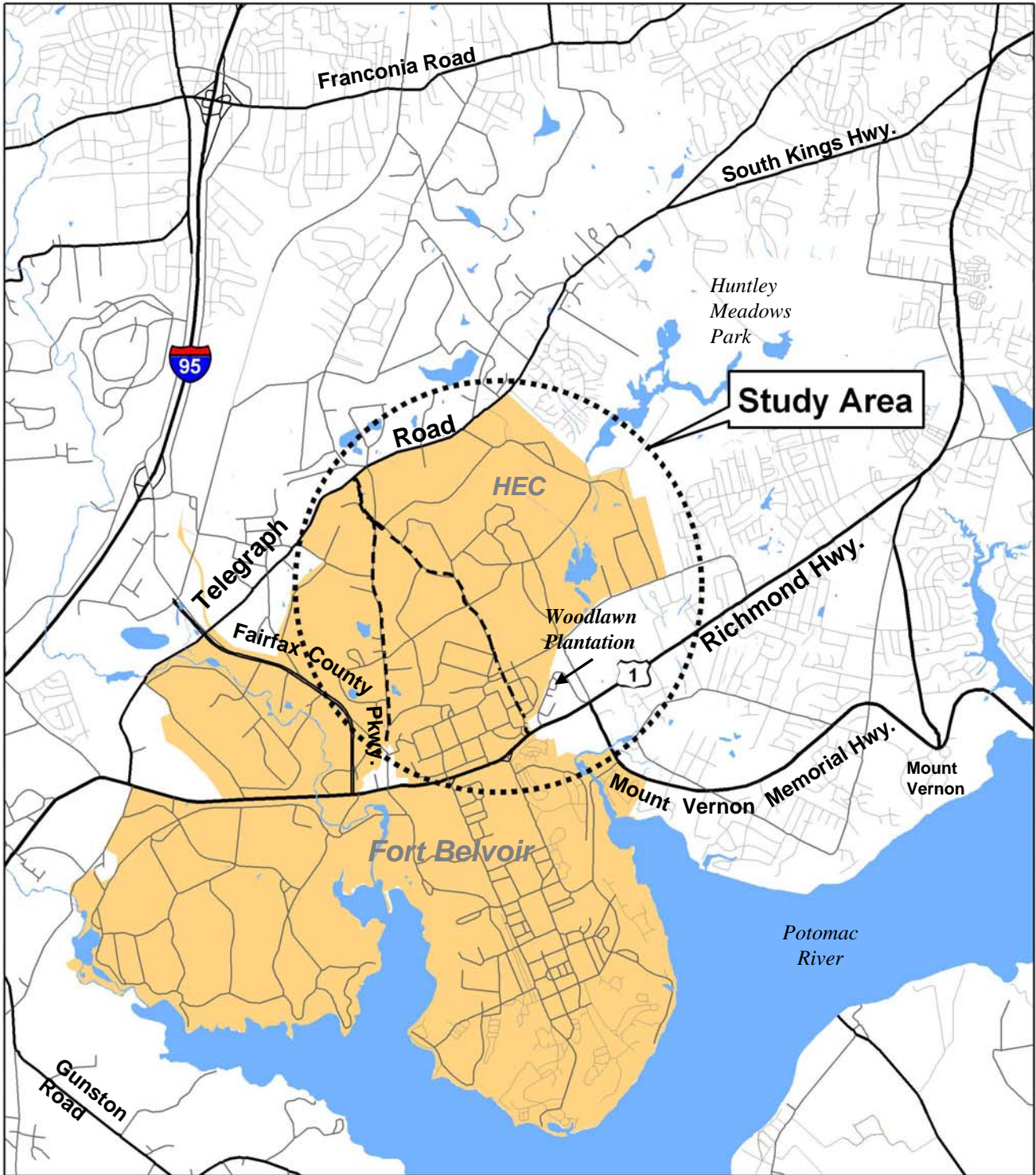
In 2002, the Beulah Street gate at Telegraph Road was re-opened to private vehicles displaying valid DoD decals. Re-opening that specific gate eliminated circuitous routing of authorized private automobiles destined for facilities located on Fort Belvoir; however, that action offers neither accessibility nor through access to the general public.

1.3 Study History

Congress passed legislation⁴ in 2002 authorizing the analysis of alternatives for the construction of a Connector Road between Telegraph Road and Richmond Highway (U.S. Route 1). In 2002, this legislation directed the Department of the Army to conduct a study to evaluate a connector road as an alternative to Beulah Street and Woodlawn Road. The act further noted that the study should consider an alternative extending Old Mill Road. Through this legislation, the *USACE Feasibility Study* identified and generally evaluated a number of routes to replace the access formerly provided by Woodlawn Road and Beulah Street. Chapter 2 reviews these alternatives.

³ The land is owned by the United States of America and is under the jurisdiction of the Department of the Army.

⁴ Public Law 107-314, the FY 2003 National Defense Authorization Act, Section 367, December 2, 2002.



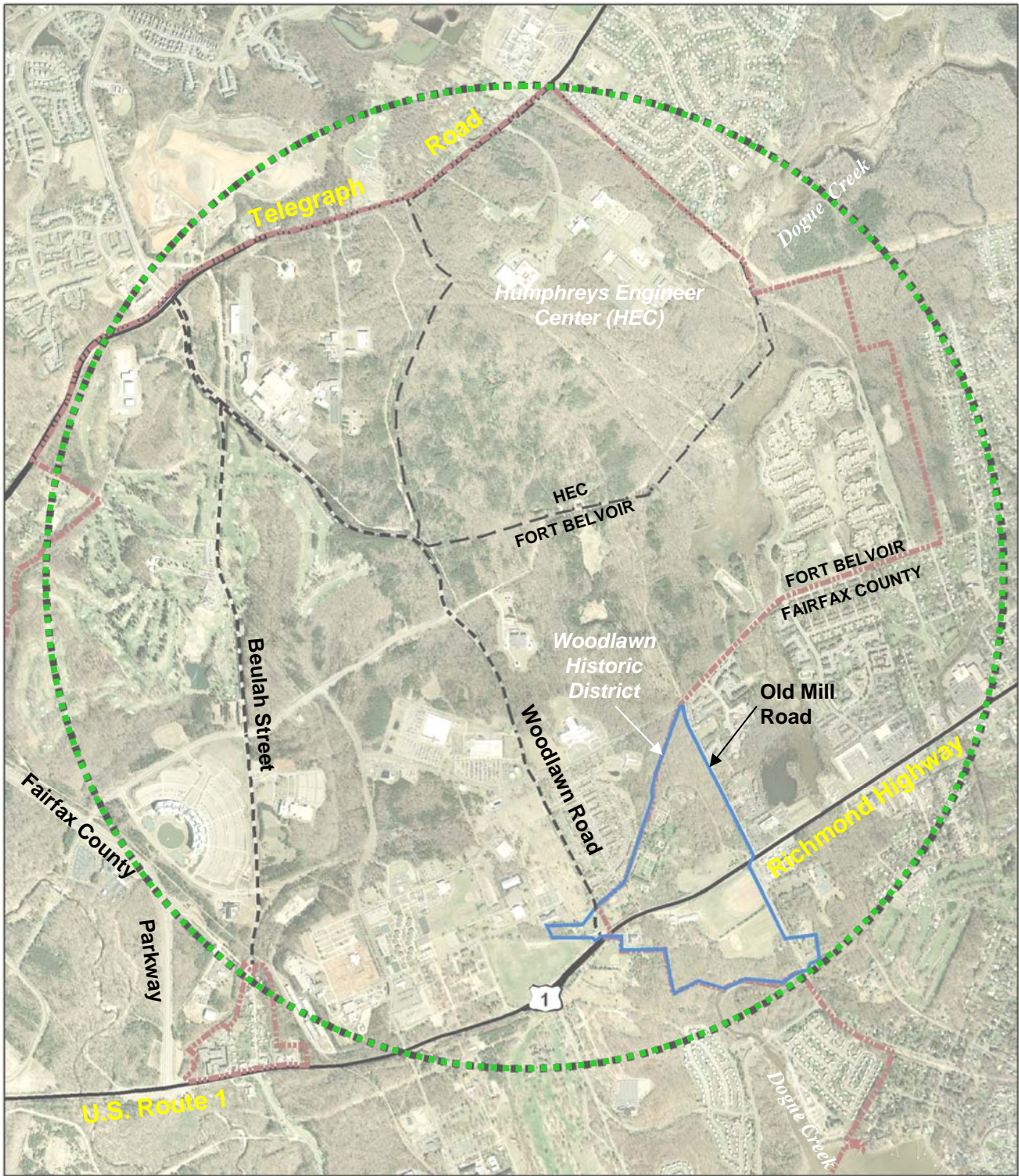
Legend

- Woodlawn Road/Beulah Street - Closed to public
- Fort Belvoir (Restricted Access)






Note: For graphic purposes, Fort Belvoir and HEC are shown combined

Project Locale

Figure 1-2



Legend

-  NEPA Study Area
-  Fort Belvoir Boundary
-  Woodlawn Road/Beulah Street - Closed to public
-  HEC Boundary
-  Woodlawn Historic District

NEPA Study Area

Figure 1-3

The *USACE Feasibility Study* involved a collaborative effort among the many interested agencies and the public. It involved numerous agency stakeholder meetings, opportunities for review by the public at two public meetings, and close coordination with the Army's Military District of Washington, Installation Management Agency – Northeast Region, Fort Belvoir Garrison, and HEC.

While the *USACE Feasibility Study* specifically did not recommend any alternatives due to the preliminary nature of the study, subsequently the Army identified a corridor called Alternative C, the extension of Old Mill Road, as its preferred alternative.

Following the *USACE Feasibility Study*, EFLHD embarked on this NEPA process, building on the findings, review and coordination processes.

1.4 Transportation Need and Deficiency

When national security interests caused the closure of unrestricted public access through Fort Belvoir, several alternative local roadway routings were eliminated. For example, at Woodlawn Road and U.S. Route 1, average daily traffic (ADT) in 2000 was 17,000; in 2003, it had dropped to 7,300.⁵ Approximately 10,000 vehicles were absorbed into the local highway system elsewhere. For peak hour conditions in 2002, morning use of Woodlawn Road at U.S. Route 1 declined from 995 to 295 vehicles in the same period. Evening peak hour changed from 1,150 movements onto or from Woodlawn Road to 665. Again, these vehicles have been diverted.

As noted, an immediate transportation deficiency was created with the removal of two state highways, Woodlawn Road and Beulah Street. This project would restore the connectivity between U.S. Route 1 and Telegraph Road for the general public.

1.5 Project Relationship to State, Regional, and Local Plans

In its FY00-01 Fairfax County Secondary Six Year Plan, the Commonwealth of Virginia had intended to widen Woodlawn Road (VA Route 618) between U.S. Route 1 and Telegraph Road (VA Route 611) from two to four lanes by 2009. VDOT widened Telegraph Road between the Fairfax County Parkway (VA Route 7900) and Beulah Street (VA Route 613) from two to four lanes in 2001. The improvements to Beulah Street at Telegraph Road offered improved direct access to and through the Fort via the Beulah Street gate.⁶

Since the closing of Woodlawn Road and Beulah Street, VDOT and Fairfax County have anticipated recovery of the lost public highway capacity. By agreement, VDOT will convert their responsibility for maintenance to the replacement facility. The *2005-2007 Virginia Transportation Six-Year Improvement Program* includes, by amendment, funding for the project study and some funding towards construction.

The proposed project is included in *Constrained Long-Range Transportation Plan (CLRP)* for the National Capital Region approved by the Metropolitan Washington Council of Governments (MWCOC). The MWCOC has completed an air quality conformity

⁵ From traffic firm Transcore, unpublished data 2000; and various Fort Belvoir studies for 2003.

⁶ The Northern Virginia component of the *FY 2006-2011 Transportation Improvement Program (TIP)* shows funding for widening Telegraph Rd from two- to four-lanes under two projects: Beulah Street to Hayfield Road (VA Route 635) and Hayfield Road to South Kings Highway.

determination for the CLRP.⁷ The study is included in the region's *2006-2011 Transportation Improvement Program (TIP)*.

The adopted *Fairfax County Comprehensive Plan* recommends the construction of a replacement Connector Roadway through the Fort Belvoir/HEC property along the approximate location of the unimproved Mulligan Road (roughly an extension of Old Mill Road) to Telegraph Road near Piney Run. The County is in process of updating the *Transportation Component* of its comprehensive plan. The draft includes a four-lane connector roadway between U.S. Route 1 and Telegraph Road, in lieu of the closed public access.

1.6 Project Purpose

The purpose for the project is to replace the once-public access provided by VA Route 618 (Woodlawn Road) and VA Route 613 (Beulah Street) between U.S. Route 1 and VA Route 611 (Telegraph Road). The need for the project stems from traffic congestion and delay, resulting in part from the road closures, due to national security concerns. The project purpose is to offer replacement connectivity compatible with force protection concerns. In this section of Fairfax County, the removal of those alternative access routes substantially diminished the flexibility of traffic movement. To the southwest of the general project study area, the Fairfax County Parkway offers a major thoroughfare. However, no other direct connection exists between U.S. Route 1 and Telegraph Road for over six miles between the Fairfax County Parkway in the southwest and the Kings Highway / Richmond Highway intersection to the northeast. Only limited circuitous routing between Telegraph Road and Route 1 exists through local communities in the area.

⁷ The Transportation Planning Board (TPB) adopted the air quality conformity analysis for the 2005 update to the CLRP and FY 2006-2011 TIP on October 19, 2005.

2. ALTERNATIVES

This chapter describes the alternatives considered by the Federal Highway Administration (FHWA) for this action. FHWA has evaluated a range of potential alternatives to replace public access between Richmond Highway (U.S. Route 1) and Telegraph Road (VA 611) and This evaluation is continual through the National Environmental Policy Act (NEPA) process.

2.1 Alternatives Development Process

Development and review of alternatives for a connector road between Richmond Highway and Telegraph Road was included in the 2003 study by the U.S. Army Corps of Engineers (*USACE Feasibility Study*). This *Environmental Assessment* (EA) builds on that previous evaluation. FHWA has also conducted an independent review of the USACE process, and alternatives, and has considered other alternatives. This section briefly reviews the process applied.

2.1.1 USACE Screening

In order to provide a replacement roadway for the closed Beulah Street and Woodlawn Road, the *2003 USACE Feasibility Study* developed numerous alternatives. That study narrowed those to seven, which in turn were evaluated in more detail. Those alternatives were labeled A through G. See **Figure 2-1**. Appendix G of the *Feasibility Study* detailed the criteria applied for that alternatives evaluation. The USACE engaged several agencies and the public during its study. At the completion of the *Feasibility Study*, the Army identified the corridor Alternative C, which extends Old Mill Road through Fort Belvoir and Humphreys Engineer Center (HEC) property, as its preferred alternative. Fairfax County Board of Supervisors endorsed Alternatives A, B or C, or a combination thereof.

2.1.2 NEPA Scoping

Shortly after the initiation of this EA study, FHWA conducted an agency scoping meeting in January 2005. Given the regulatory concern for protecting wetlands and Huntley Meadows Park, FHWA recommended eliminating the *Feasibility Study's* Alternatives E, F, and G from further consideration, because they all traversed portions of the park. Huntley Meadows Park is protected under the U.S. Department of Interior land transfer agreement as well as Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303); the latter binds FHWA from using any publicly owned park or wildlife refuge where a prudent and feasible alternative exists. FHWA also explained that relocating access several miles distant from the closed roadways does not serve the purpose and need for the project.

FHWA presented this recommendation at a Public Information Meeting in February 2005. Issues such as avoiding parks and wetlands, historic preservation, and avoiding residential impacts were among the key concerns voiced by agencies and the public.

2.1.3 FHWA Screening of USACE Alternatives

As part of the analysis under NEPA, FHWA conducted an independent review of the remaining alternatives and the factors used to evaluate them. Through geographic information system (GIS) data layers available from Fairfax County and Fort Belvoir, FHWA largely replicated the estimated quantities of impact by each alternative corridor. Additionally, FHWA assessed Alternatives A, B, C and D or some combination between them for relative impacts, achievement of the purpose and need, and appeal to all of the key stakeholders. Preliminary alternatives under consideration included:

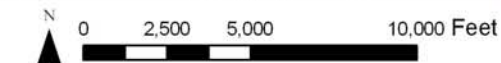
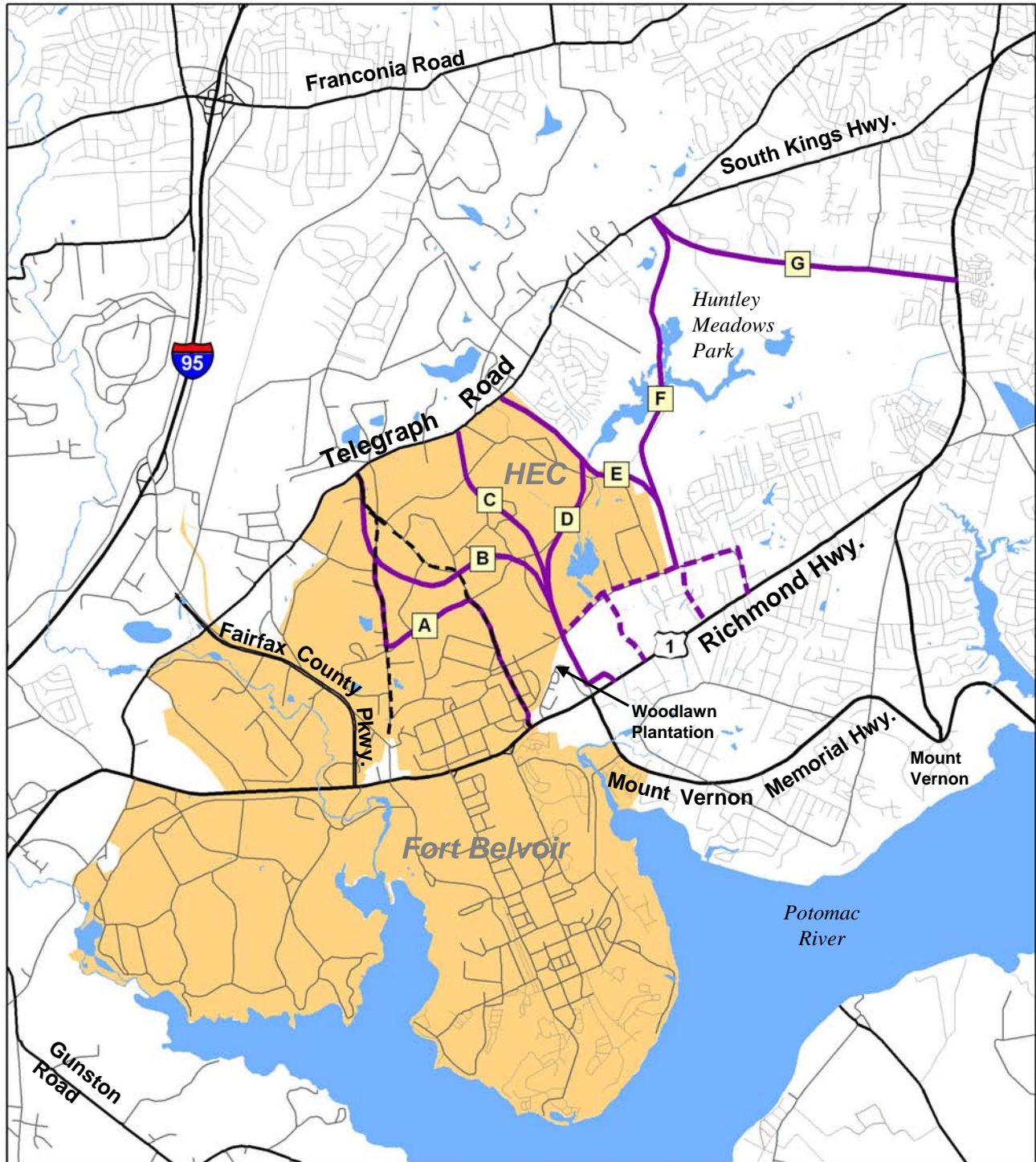
- *Alternative A* – Reopened Beulah Street and Woodlawn Road
- *Alternative B* – Relocated Beulah Street creating new location alignment through the Fort Belvoir golf course before aligning with extension of Old Mill Road
- *Alternative C* – New location alignment extending Old Mill Road generally along unpaved Mulligan Road and connecting to new location intersection of Telegraph Road
- *Alternative D* – New location alignment extending Old Mill Road generally along unpaved Mulligan Road before veering northward to connect along the northern boundary of HEC
- *Combination A/B* – Reopened Beulah Street then veered through two holes of the Fort Belvoir golf course, connecting with Alternative C alignment to Old Mill Road.

Both Alternative A and B, or a combination of A and B, have the transportation connectivity appeal of using Beulah Street at Telegraph Road as a terminus. (Prior to 2001, Fairfax County and VDOT had performed major improvements to this intersection.) However, reusing Post roadways is not an option favored by DoD for national security concerns.

The security concerns include distancing the public from military and other facilities, “hardening” transportation facilities within the garrison, and providing separate access to Department of Defense personnel. These alternatives would require construction of additional access points and additional (separated from public use) roadways for internal connectivity within the Fort.

Alternative D generally was co-located with a major overhead power transmission line. It would require land from a residential community, or involve significant impacts to wetlands on HEC, or both. It placed the connector road through a large portion of the Fort’s Forest and Wildlife Corridor and close to the Jackson Miles Abbot Wetland Refuge. (See Sections 3.2 and 4.2, Natural Environmentally Sensitive Areas.)

FHWA presented the general results of the study area constraints, traffic issues, and ongoing stakeholder discussions to the public at a second Public Information meeting in October 2005. FHWA reiterated the project purpose, citing that traffic projections verify the need for the connector road facility. FHWA explained that, as noted above, further review indicated that none of the Alternatives A, B, D, or combinations between them, or alternative connection points along either U.S. Route 1 or Telegraph Road offered a positive alternative to Alternative C. In several instances, the impacts to certain resources would be worse with the other alternatives. FHWA noted the on-going discussions with agency stakeholders and others suggesting the consensus to focus on variations of Alternative C. See **Figure 2-2**. The several constraints noted on the figure (security buffers, wetlands, parks, historic resources, streams, etc.) are identified and discussed in Chapters 3 and 4.



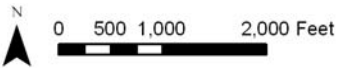
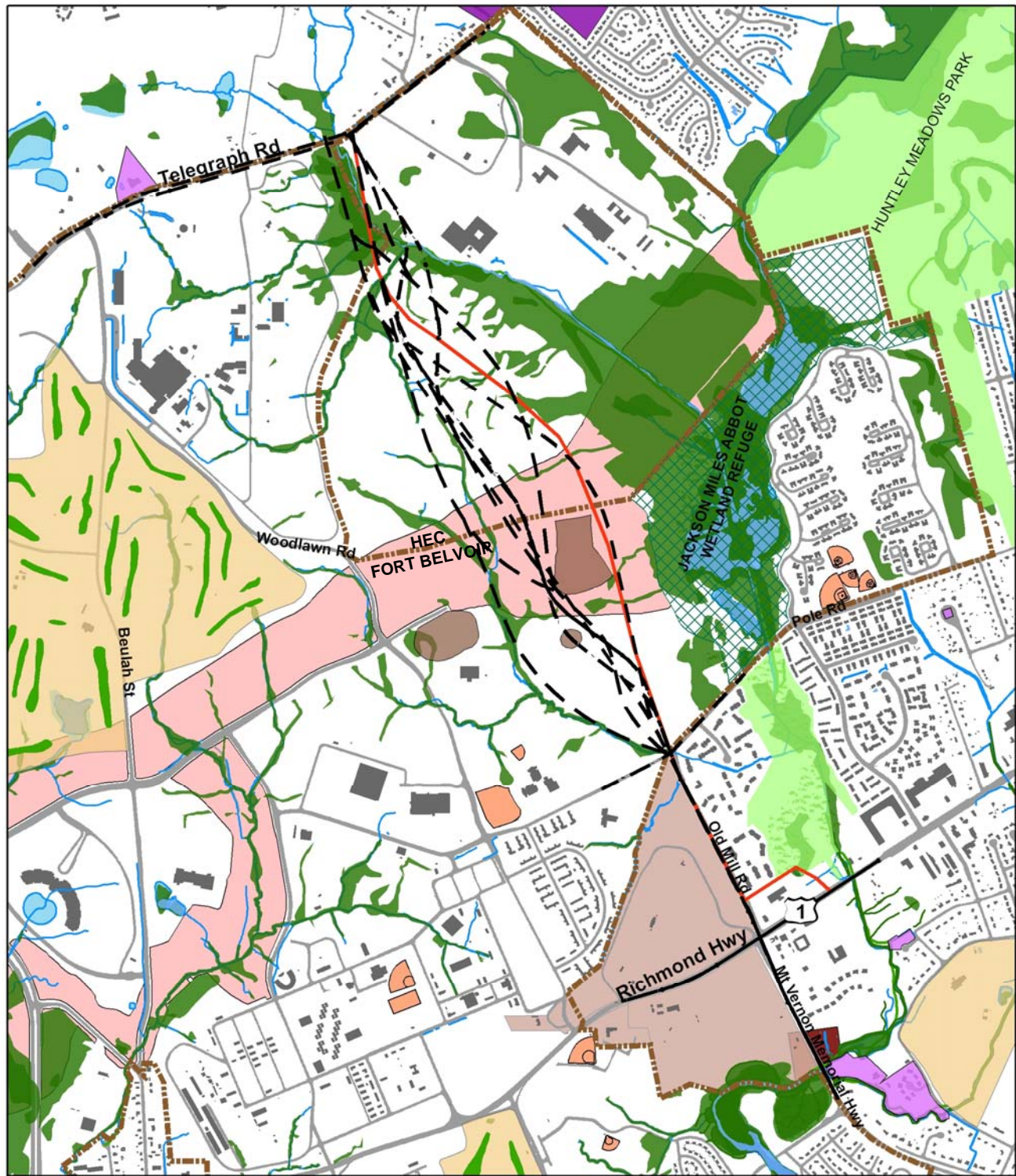
Legend

- Preliminary Feasibility Study Alternatives
- - - Preliminary Feasibility Study Subalternatives
- Woodlawn Road/Beulah Street - Closed to public
- Fort Belvoir (Restricted Access)

Note: For graphic purposes, Fort Belvoir and HEC are shown combined

USACE Feasibility Study Alternatives

Figure 2-1



Legend

- Variations of Alternative C Under Study
- Preliminary Feasibility Study Alternative C
- Woodlawn Historic District
- George Washington's Gristmill
- Jackson Miles Abbot Wetland Refuge
- Open Water
- Wetlands
- Forest and Wildlife Corridor
- Landfills
- Parks - Fairfax County Park Authority
- Fairfax County Schools
- Other County Property
- Golf Course
- Fort Belvoir Athletic Fields

Alternative C Variations

Figure 2-2

2.1.4 Facility Size

As mentioned in Chapter 1, the public had enjoyed the use of many roadways on Fort Belvoir prior to the events of September 11, 2001, including Woodlawn Road and Beulah Street. These two roads offered connections between U.S. Route 1 and Telegraph Road (VA 611). These two routes provided accessibility for local users and connected with Fort-maintained roads such as Meeres and Kingman Roads that in turn offered numerous routings.

Traffic forecasts indicate that a replacement facility would have volumes of approximately 20,300 in 2010 and 23,600 in 2030 at U.S. Route 1; at Telegraph Road, a connector road would have volumes of approximately 19,000 in 2010 and 21,200 in 2030.¹ Fairfax County policy dictates new location roadways with projected traffic volumes greater than 8,000 ADT be at least four-lane facilities. FHWA concurred with VDOT and Fairfax County to consider development of a four-lane arterial facility. Ancillary facilities such as sidewalks and on-road bicycle lanes also were initially considered. Details of intersection layouts would be dependent upon turning movement counts for future traffic conditions.

2.1.5 Early Concepts - Old Mill Road

With Alternatives B, C, and D or some variations thereto funneling to the vicinity of Old Mill Road, FHWA initiated discussions with the National Trust for Historic Preservation (Trust), owners of Woodlawn Plantation, a National Historic Landmark located along Old Mill Road at U.S. Route 1. These discussions involved review of potential options of widening Old Mill Road and use of land from Woodlawn Plantation to accommodate a connector road facility. FHWA is bound by law (see Section 3.3 Cultural Resources) to avoid impacts to significant cultural resources unless agreement can be reached to mitigate these impacts.

FHWA considered a number of preliminary options along Old Mill Road. Some required residential and commercial relocations; some required land from Woodlawn Plantation; some required a combination of both. Building upon both the *USACE Feasibility Study* and a 2001 VDOT study² of widening U.S. Route 1, FHWA considered ways to connect the replacement road with U.S. Route 1. Among the options considered were: 1) maintaining the current offset intersection, 2) routing Old Mill Road to a dog-leg near the IMP building, 3) providing one-way pairs with both the dog-leg and existing roadway and existing offset. Traffic analyses suggested that independent (greater separation between) intersections would render a better Level of Service (LOS) for each; however, much of the same traffic would use both intersections, rendering the combination a net decrease in traffic flow. VDOT and Fairfax County DOT supported alignment of Old Mill Road with Mount Vernon Memorial Highway.

FHWA reviewed these options with the Trust, and proceeded to develop concept options for possible relocation of the Woodlawn Plantation entrance drive, which currently sits opposite Mount Vernon Highway (VA Route 235). The Trust provided guidance, such as creating a "pastoral gateway", for landscape designers to develop concepts. Working with the Trust, FHWA developed ten concept options altogether, continuing to revise based on reviews by traffic and highway engineers, and the Trust needs. The Preferred Alternative, described below, incorporates the results of that coordination.

¹ Vanasse Hangen Brustlin, Inc. *Connector Road Study, Technical Memorandum*, for FHWA, January 2006.

² VDOT, *Environmental Assessment: U.S. Route 1 Section C*, 2001.

2.2 Other Transportation Alternatives Considered but Rejected

FHWA considered several alternatives to roadway construction; however, none satisfy the purpose and need of the project to provide a replacement roadway for the lost access of Beulah Street and Woodlawn Road through Fort Belvoir.

2.2.1 Transit

Regional (WMATA³) and local (Fairfax County Connector) entities provide bus service in the area. Bus service exists along U.S. Route 1 and Beulah Street and portions of Telegraph Road. Fairfax County continues to work with VDOT and Fort Belvoir in placing a transit center along the U.S. Route 1 corridor. Fairfax County and VDOT are also considering a rapid transit scenario (light rail or bus lane) along U.S. Route 1.

The closest Metrorail station is Franconia, the terminus of the Blue Line, about one-mile west of the intersection of Beulah Street and Franconia-Springfield Parkway. WMATA has conducted a preliminary study for extending the line; Fairfax County also plans to conduct studies to consider extending the line towards Fort Belvoir. Such an extension could offer additional opportunities to support the expected employment growth in the area.

Providing additional bus service or extending Metrorail does not return the public roadway accessibility removed due to the closure of the VDOT roadways through Fort Belvoir. In considering a bus-only connector, FHWA determined that the private automobile users would not regain accessibility, thus this option does not meet the project purpose and need.

2.2.2 Transportation System Management (TSM)

TSM constitutes a range of strategies and options that look to maximize the efficiency of the present transportation system. For roadway projects, TSM alternatives could include automated traffic signal timing to respond to changing traffic conditions, improved lane striping, or variable message signs or sophisticated radio transmissions. While some of these may be applicable and attractive to improving current infrastructure conditions, they would not provide the lost access and thus not meet the project purpose and need.

2.2.3 Transportation Demand Management (TDM)

TDM offers measures that reduce the demand on highway facilities. These measures are often coordinated with major employers in a region, whose employees can be a major generator of work related Single Occupancy Vehicle (SOV) trips. Potential TDM measures include carpooling/ridesharing, employee telecommute and flex-time, or subsidized mass transit. While some of these may be attractive from local and regional perspectives, they would not provide the lost access and thus not meet the project purpose and need.

2.3 Alternatives Carried Forward – No Build Alternate

Under the No Build Alternative, the FHWA would not construct the Connector Road. Former public users of the closed sections of Beulah Street and Woodlawn Road would continue to

³ Washington Metropolitan Area Transit Authority.

find other publicly available roadway routings between U.S. Route 1 and Telegraph Road. These routings are circuitous and distant.

As mentioned, the Army views reopening of Beulah Street or Woodlawn Road through the Post as a breach of their security requirements. The difficulty in reopening these roadways to public access is compounded by three issues: 1) the required “hardening” of the roadways, 2) the elimination of any unsecured access, and 3) the necessary internal circulation for DoD personnel that must be separated from public roadways.

The No Build alternative is not compatible with the project’s purpose and need, nor compatible with local transportation plans.

2.4 Alternatives Carried Forward – Build Alternate 4CR

The general location of the Preferred Alternate originates at a reconfigured Old Mill Road, adjacent to the Woodlawn Plantation property, and proceeds northward through Fort Belvoir and HEC land to a point on Telegraph Road east of Piney Run, approximately $\frac{3}{4}$ mile from Beulah Street. See **Figure 2-3**. The alignment has been named 4CR. It runs approximately $\frac{1}{2}$ mile along Old Mill Road and approximately 1.5 miles through Fort Belvoir and HEC. Intersection improvements occur both along U.S. Route 1 and Telegraph Road.

The Preferred Alternative includes realignment of Mount Vernon Memorial Highway to line up with the improved Old Mill Road at a common intersection, and additional turning lanes on U.S. Route 1. Approximately 1,000 feet of Mount Vernon Memorial Highway would be realigned northward towards the commercial properties. No new lanes would be added to Mount Vernon Memorial Highway.

The Preferred Alternative connects to a 2-lane section of Telegraph Road, but assumes Telegraph Road would be widened to 4-lanes. Preliminary engineering for the Preferred Alternative accommodates the necessary turn-lanes for the Connector Road intersection, and also shows how Telegraph Road would be extended to the 4-lane section from just north of Beulah Street as well as would taper to match the existing widened pavement south of the Hayfield High School.

Access to the Preferred Alternate will be at Telegraph Road, Pole Road, and along Old Mill Road. HEC will have a closed gated access for emergency use only near the John J. Kingman Road overpass. For natural resources impact mitigation, FHWA proposes that the Preferred Alternative not be fenced; similarly, FHWA proposes to limit street lighting in the forested portions of the corridor. The alignment generally follows along ridgelines within undeveloped areas, reducing clearing and drainage impacts or impacts to wildlife.

2.4.1 Typical Section

The Preferred Alternative is a 4-lane roadway. FHWA coordinated with VDOT and Fairfax County DOT in determining a proposed typical section. See **Figure 2-4**. VDOT standards for an arterial roadway offer the criteria for NEPA purposes. These include 12-foot travel lanes. In an attempt to reduce the amount of right-of-way required, FHWA proposes a 16-foot median, consistent with similar new facilities in Fairfax County. The speed limit anticipated for the Pole Road to Telegraph Road section is 45 miles per hour (mph), with a possible 35 mph posting for the Pole Road to U.S. Route 1 section. U.S. Route 1, Telegraph Road, and Mount Vernon Highway are currently posted at 45 mph. Pole and Old Mill Roads are

currently posted for 35 mph. During design, FHWA proposes to continue pursuing with VDOT and Fairfax County DOT, the recommendation for reducing the posted speed of the Connector from 45 mph to 35 mph (for the length of the roadway). FHWA will also continue to work with VDOT and Fairfax County to explore possibilities of reducing lane widths in an effort to further reduce the project's "footprint" and resulting impacts. Preliminary discussions between the agencies have been favorable towards a reduction of the roadway's footprint and design speed.

Details for median treatment such as landscaping, types of curb and gutter, and utility easements will be refined during the project design phase, should the project advance. The section of roadway between Pole Road and Telegraph Road could be more open and less "urban" looking than along Old Mill Road. Further consideration to reducing width of shoulders and other features will occur during design.

Early suggested typical sections included 4-foot on-road bicycle lanes, consistent with typical sections used by VDOT and Fairfax County, for example on Telegraph Road between Beulah Street and the Fairfax County Parkway. FHWA has reduced the typical section to eliminate the on-road bicycle lanes; however, a shared-use path would be provided along the length of the project. Options include placement immediately adjacent to the roadway or a more meandering facility, as envisioned on the Woodlawn Plantation property. Crosswalks at intersections are planned. Details for the path locations would be determined following additional coordination during design.

Along Old Mill Road (between U.S. Route 1 and Pole Road) the existing sidewalk on the north side of Old Mill Road would remain (subject to some reconstruction).

The total width for the roadway facility is expected to be approximately 97 feet.

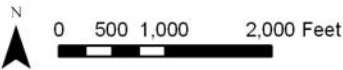
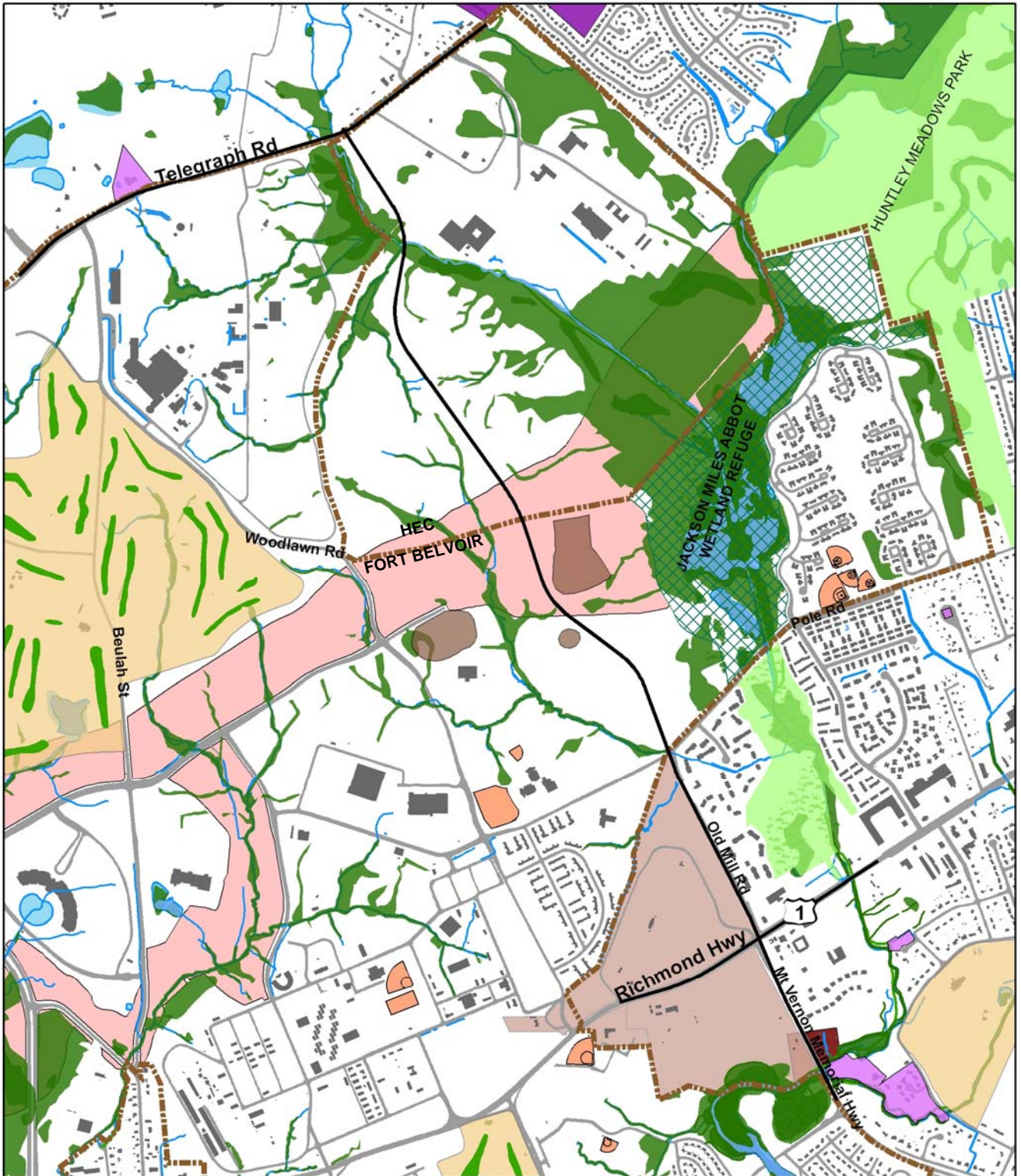
2.4.2 Termini Considerations

To create a connection that would be suitable to the transportation network, FHWA evaluated each terminus for alignment, traffic considerations and environmental impacts.

2.4.2.1 Southern Terminus – Richmond Highway/Old Mill Road/Mount Vernon Memorial Highway Intersection

The southern terminus presented several challenges, especially regarding the Woodlawn Plantation property. **Figure 2-5** illustrates the Preferred Alternative at U.S. Route 1, aligning Old Mill Road with Mount Vernon Memorial Highway. The figure superimposes the expected pavement surfaces and turning lanes for the proposed facility over the existing roadway pavement. (An aerial rendering appears in Chapter 4, Figure 4-1.)

The National Trust for Historic Preservation (Trust) owns one side of Old Mill Road. Woodlawn Plantation is the first property purchased by the Trust and is a National Historic Landmark. Multi-family housing and townhouses constitute the majority of the other side of Old Mill Road and beyond. At the U.S. Route 1 intersection, commercial use occurs on two quadrants not owned by the Trust. FHWA considered alternate configurations along Old Mill Road in order to reduce the amount of pavement and land required from the Trust; however, all would require residential or commercial buildings. FHWA evaluated options to align Mount Vernon Memorial Highway with Old Mill Road, and performed preliminary engineering to relocate Mount Vernon Memorial Highway within the VDOT right-of-way. In aligning the

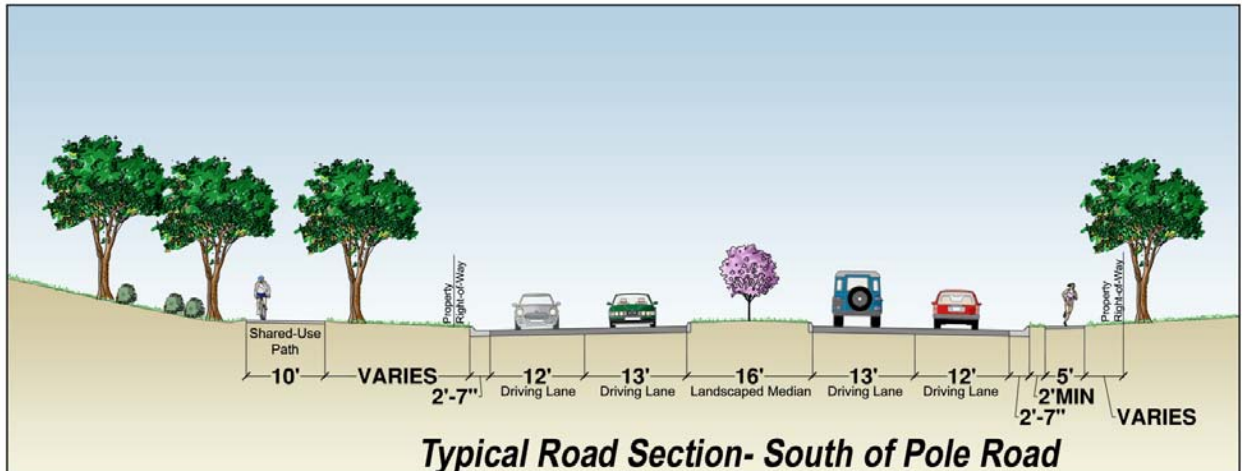
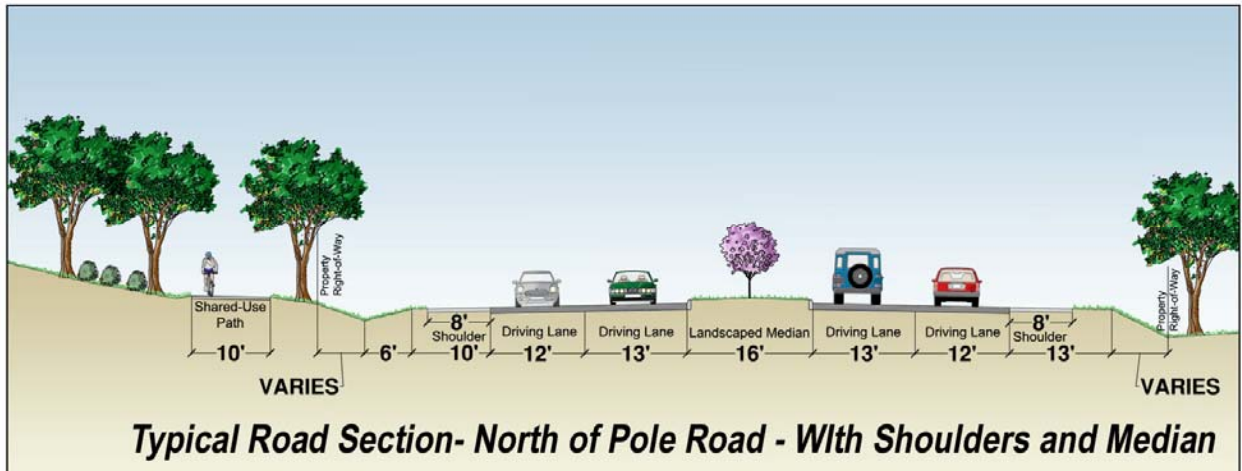
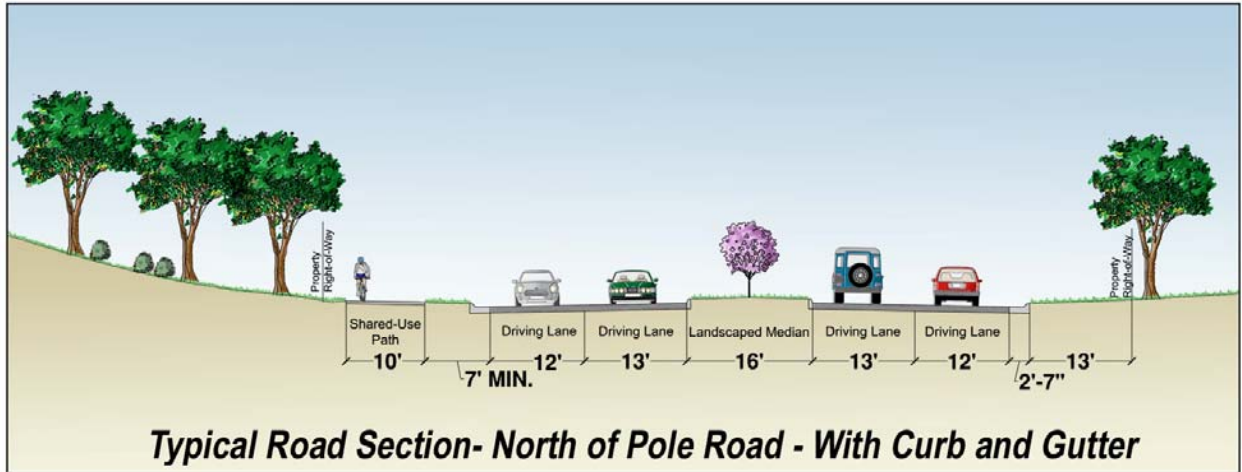


Legend

- Alternative 4CR Baseline
- Woodlawn Historic District
- George Washington's Gristmill
- Jackson Miles Abbot Wetland Refuge
- Open Water
- Wetlands
- Forest and Wildlife Corridor
- Landfills
- Parks - Fairfax County Park Authority
- Fairfax County Schools
- Other County Property
- Golf Course
- Fort Belvoir Athletic Fields

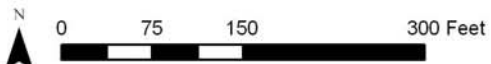
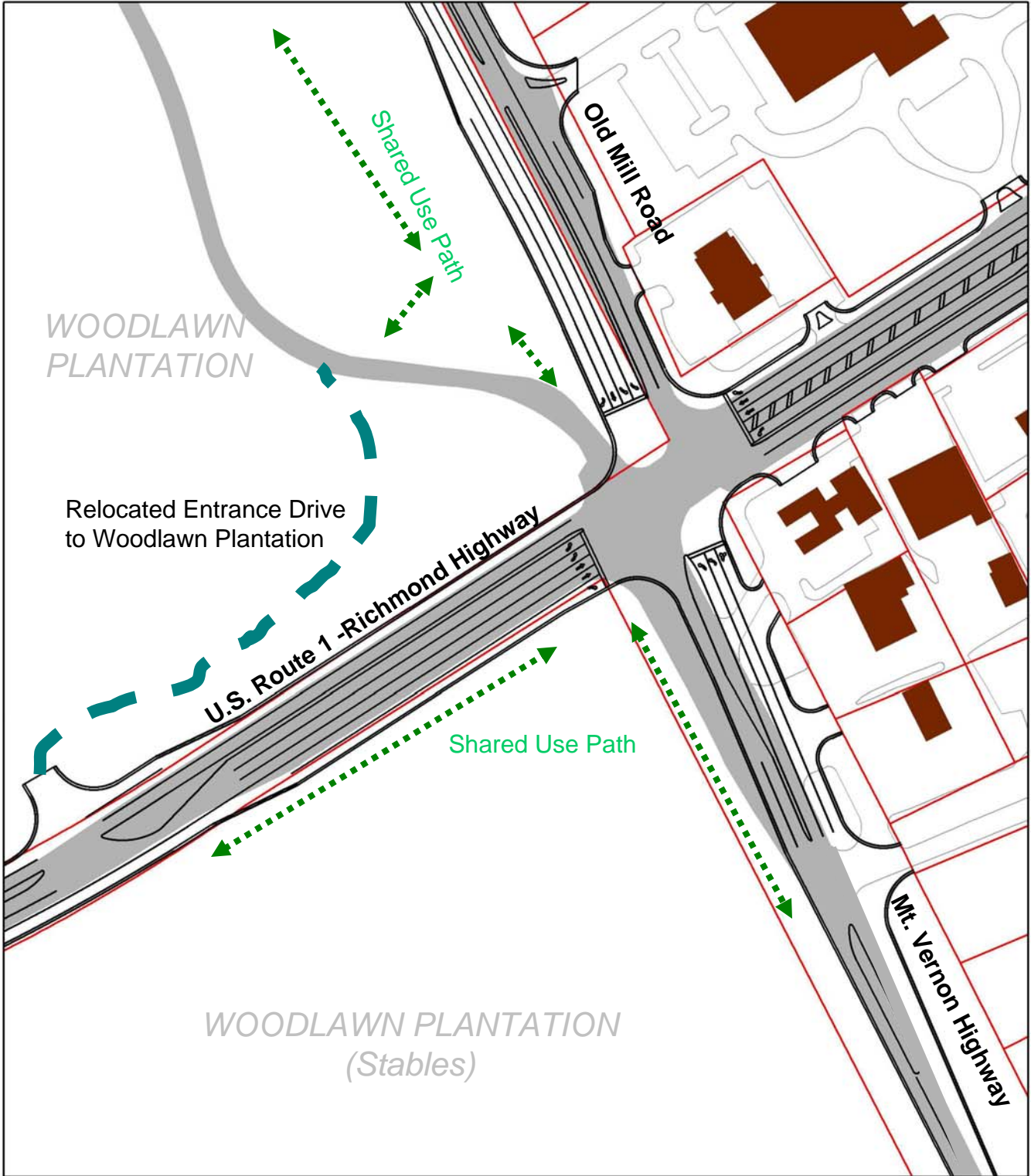
Alignment 4CR

Figure 2-3






Typical Sections

Figure 2-4



Legend

-  Alternative 4CR Pavement
-  Parcel Boundaries
-  Existing Roadway Pavement

Southern Terminus

Figure 2-5

roadways, FHWA proposes relocating the entrance to Woodlawn Plantation along U.S. Route 1. This relocated access offers a safer dedicated entrance to the historic property.

As part of the realignment, there are anticipated reciprocal transfers of property from the Trust to the Commonwealth of Virginia and from the U.S. Army to the Commonwealth of Virginia (for the purposes of transferring the property to the Trust). The parcel proposed to provide reciprocity for the Trust's land taken along Old Mill Road is a 2.5 acre parcel at the Woodlawn Gate.

2.4.2.2 Northern Terminus – Telegraph Road Intersection

Topography, national security interests, sight distances and wetlands considerations caused FHWA to locate the terminus approximately 150 feet northeast of Piney Run on Telegraph Road. See **Figure 2-6a**. Along Piney Run lies an expanse of wetlands, use of which likely would not be permitted under Section 404 of the Clean Water Act. Southwest of this wetland area is the DCEETA facility on Fort Belvoir, a special security area; northeast of the wetland area is a special security area on HEC.

Along Telegraph Road towards the HEC entrance, transportation constraints for locating the Connector Road include a recent subdivision access road and Old Telegraph Road. FHWA placed the Preferred Alternative terminus such that access could remain to the subdivision as well as provide sufficient weaving distance with Old Telegraph Road.

Telegraph Road is currently a two-lane facility between Beulah Street and Franconia Road. The FY07-12 VDOT Fairfax County Secondary Six Year Program funded the widening of Telegraph Road to four lanes between Hayfield Road and South Kings Highway by 2012. The segment between Beulah Street and Hayfield Road is partially funded for widening, with a balance of approximately \$12 million required beyond 2012. The typical section constructed between Fairfax County Parkway and Beulah Street represents the intended facility improvements of Telegraph Road.

Initially, FHWA highway and traffic engineers determined the length along Telegraph Road for the intersection to operate, and then tapered to the existing two-lane pavement. Future projects would then accomplish the remainder of the widening of Telegraph Road.

Upon review with key agency stakeholders and a Citizens Task Force, FHWA included two small segments of unimproved Telegraph Road as part of the NEPA documentation for the Preferred Alternative. Thus, the preliminary engineering for the Preferred Alternative shows an additional approximately 2,000 feet to the southwest and approximately 700 feet to the northeast along Telegraph Road, in order to tie-in to the 4-lane divided section near Beulah Street; and to the existing wider pavement towards Hayfield Road (approximately 200 feet beyond the HEC entrance but before the high school). **Figure 2-6b** illustrates the two ends of the Telegraph Road improvements. The dark line in the figure shows the existing pavement of Telegraph Road.

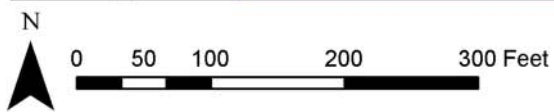
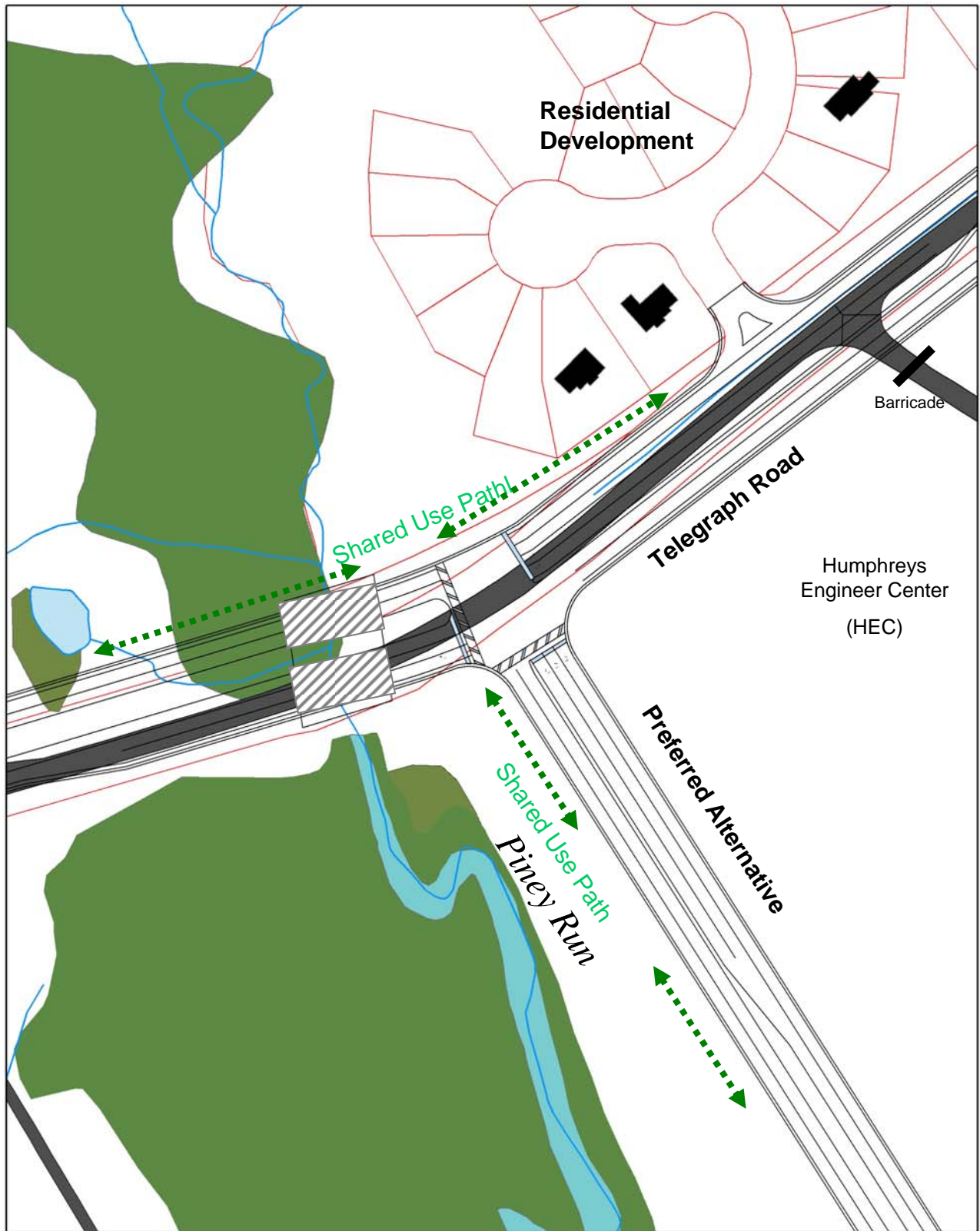
2.4.3 Costs

FHWA developed preliminary engineering cost estimates for the Preferred Alternative. Estimates include: earthwork, mobilization, drainage, pavement, erosion and sediment control, signals, utilities relocation, right-of-way, multi-purpose trail and maintenance of traffic. The total estimate (in 2008 dollars) is \$72 million for the ultimate 4-lane facility.

In the event funding availability does not allow construction of the full project at one time, costs for distinct portions are as follows (all in 2008 dollars):

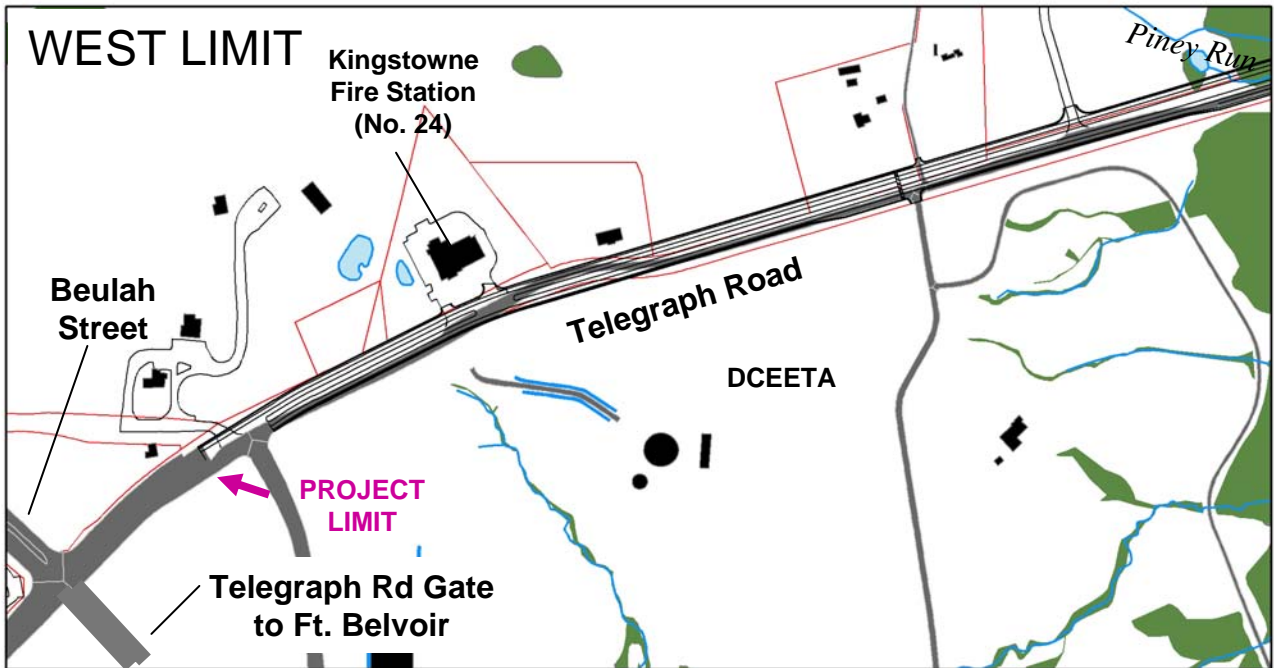
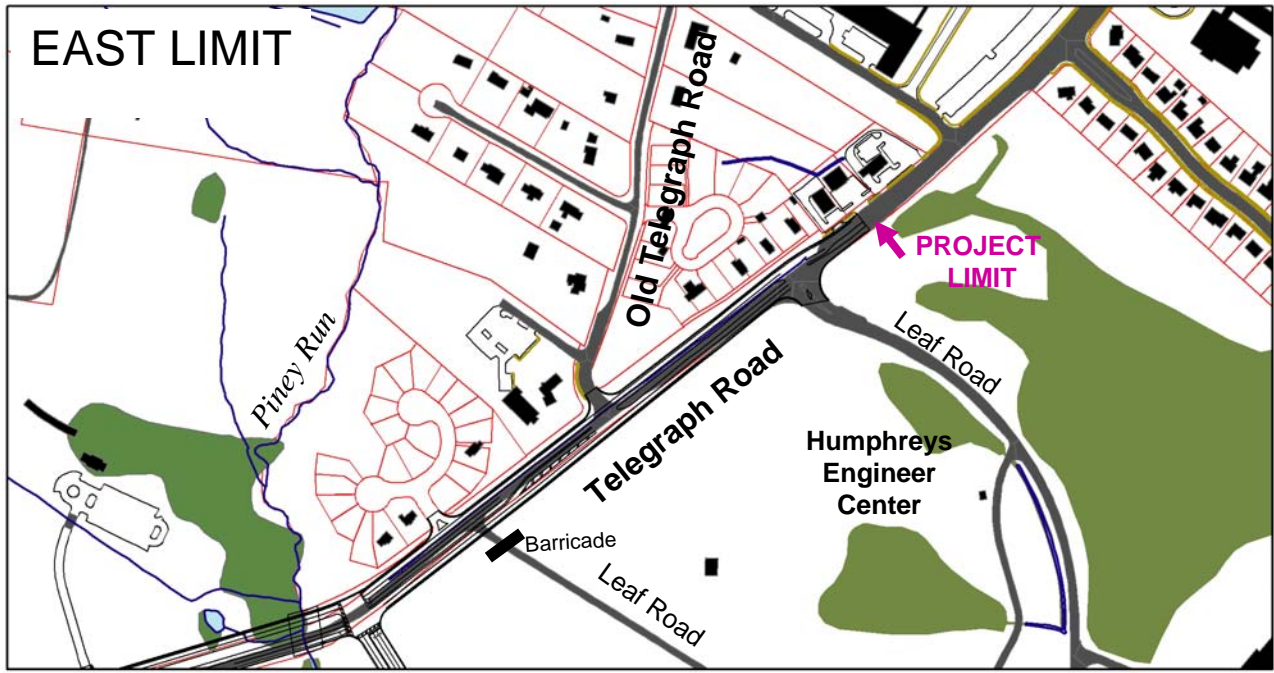
- Construct interim two-lane facility, with appropriate intersection improvements at Telegraph Road and U.S. Route 1 (including aligning Mount Vernon Memorial Highway and Old Mill Road): \$31 million.
- Convert from two-lane to four-lane facility, with appropriate intersection improvements at Telegraph Road and U.S. Route 1: \$18 million.
- Perform widening of Telegraph Road: \$23 million.

While potential sources of participation and timing for such authorizations are not germane to the NEPA process, FHWA can only proceed to construct portions with committed funding.



Northern Terminus

Figure 2-6a



Northern Terminus

Figure 2-6b

3.0 AFFECTED ENVIRONMENT

The Council on Environmental Quality (CEQ) regulations (40 CFR Part 1500) implementing the National Environmental Policy Act (NEPA) require documentation succinctly describing the environment of the area(s) to be affected by the alternatives under consideration, as well as a discussion of the impacts in proportion to their significance. The affected environment includes land use, socioeconomic conditions, community facilities and services, physical, natural and cultural resources, air quality, and ambient noise levels, among others.

The purpose of this chapter is to identify resources and aspects of the built and natural environments that may be affected by the proposed action. This chapter summarizes data collected during the course of the study relevant to the project study area and provides a basis for the impacts discussion presented in Chapter 4.

3.1 Land Use, Plans, Aesthetics and Coastal Zone Management

Land use influences traffic patterns. Transportation planners consider many aspects of regional and local needs, character, and growth expectations in developing location and design of proposed transportation facilities. Transportation facilities and the traffic on them can have positive or negative effects on business success, character of residential neighborhoods, and other aspects of the social and natural environment.

3.1.1 Existing Land Use

The majority of the study area is located inside of federal property, both Fort Belvoir and the adjacent Humphreys Engineer Center (HEC) within Fairfax County. (The regional setting and locale was shown in Figures 1-1 through 1-3.) The county is a fast-growing and congested metropolitan area of northern Virginia. Fairfax County covers 395 square miles, and the Connector Road study area covers approximately 7 square miles. The southeastern part of Fairfax County, where the project is located, is a mix of military, historical, commercial and residential land uses. There are also areas of undeveloped lands including wetlands and wildlife refuges, and open areas of golfing ranges or golf courses. See **Figure 3-1**.

3.1.1.1 Institutional Land Use - Fort Belvoir and HEC

About two-thirds of the study area is located within Fort Belvoir and HEC land. Fort Belvoir consists of 8,259-acres of the Main Post, and the separate 807-acre Engineer Proving Ground parcel located several miles to the northwest. The Main Post is divided by U.S. Route 1 into North Post and South Post. The study area is located within the North Post. In recent years, Fort Belvoir has functioned primarily as an administrative and logistic support center for the U.S. Army, and as host for 107 tenant organizations. Facilities with large footprints and parking requirements and the need for good regional transportation access characterize development over the past 15 years within the North Post.¹ The North Post accommodates troop and family housing, support facilities, and large tenant organizations

¹ Unpublished Draft Revision, U.S. Army Garrison Fort Belvoir, April 2005: *Real Property Master Plan – Long Range Component (LRC)*, 5-10

such as the Defense Communications-Electronics Evaluation and Test Activity (DCEETA). Several community activities are also contained within the North Post, such as the North Post Golf Course, the Fort Belvoir Elementary School, the commissary, the Post Exchange, two child development centers and several recreation facilities, including a golf course, for military personnel and their families.

Much of the North Post was farmland at the time of its initial acquisition by the Army during World War I. Like much of the Post, natural reforestation has occurred with second stage succession hardwood growth on those areas not specifically used for facilities.

In 1993, Fort Belvoir established a continuous, 742-acre Forest and Wildlife Corridor through Fort Belvoir lands. The Corridor is approximately 15 miles long with a minimum width of 250 meters and traverses the entire project study area. (See additional description later in this chapter.) Both Beulah Street and Woodlawn Road cross it.

The North Post also contains former munitions test ranges and various solid waste management units (SWMU) including landfills. One landfill² is located within the Forest and Wildlife Corridor, approximately ½ mile north of the intersection of Pole and Old Mill Roads.

HEC is a 538-acre Post located in the northeastern portion of the study area.. Its facilities are all located within an approximately 80-acre portion of its northern section. This area has been developed with four or five major buildings, roads and parking along with numerous smaller structures. Dense second-growth coniferous and deciduous forest covers the remainder of HEC.

3.1.1.2 Residential

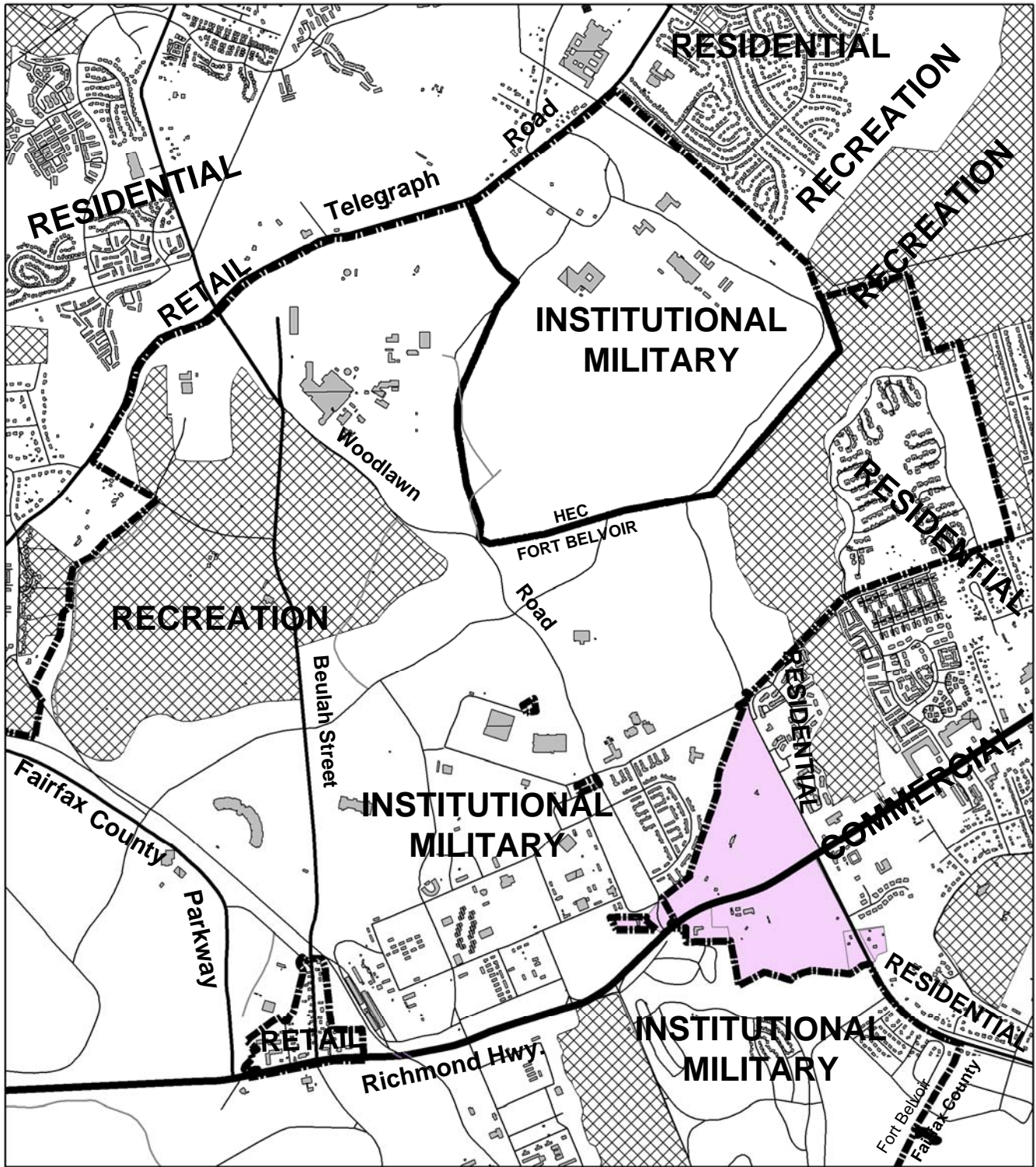
The North Post of Fort Belvoir contains a mix of land uses including on-Post military housing. The Lewis Heights housing complex, between Woodlawn and Meeres Roads, is presently under complete reconstruction; Woodlawn Village, a housing community of duplex and quadruplex units, lies north of Pole Road at the eastern edge of the Fort Belvoir boundaries.




In the study area outside Fort Belvoir, residential development is concentrated along U.S. Route 1, Telegraph Road, and Mount Vernon Memorial Highway. Medium density population, including townhouses and multi-family housing, characterize the area along Old Mill Road. Most of the homes off Telegraph Road and Mount Vernon Memorial Highway are single-family dwellings. Outside the federal installations, subdivisions in the study area include: Old Mill Gardens, Hayfield Farms, and Grist Mill Estates. Along U.S. Route 1 near the northeastern limit of the study area are two small trailer parks.

3.1.1.3 Commercial

Within the study area, commercial development exists along U.S. Route 1, north from the Old Mill Road/Mount Vernon Memorial Highway intersections. Southwest of the intersection of Telegraph Road and Beulah Street is another commercial center. The commercial developments are a mix of retail, office complexes, and fast food/chain restaurants. The character along U.S. Route 1 is more uncoordinated, strip-type retail uses, while development along Telegraph/Beulah is newer and generally more coherent in design. Northeast of HEC, a small cluster of commercial development exists on the side of Telegraph

² Fort Belvoir SWMU A07a.



-  Fort Belvoir/HEC Boundary
-  Recreational Use
-  Woodlawn Historic District

Existing Land Use

Figure 3-1

Road opposite Fort Belvoir. As mentioned, Fort Belvoir's North Post contains commercial activities including retail stores, a gas station, and a bank.

3.1.1.4 Open Space/Undeveloped Areas

Along U.S. Route 1, on Fort Belvoir property, the parade grounds offer a large expanse of undeveloped open space. In years past, these have been used for various local recreational events; with the advent of the 9/11 security measures, public use has been limited. Another area of open space is the Woodlawn Plantation property. This property straddles U.S. Route 1 between Woodlawn and Old Mill Roads. The property consists of pasture/open space, the historic plantation estate, and riding areas for the associated horse stables. On Telegraph Road near Piney Run, a golf driving range provides open space and recreational use to the public.

Both Fort Belvoir and HEC have large tracts of forested and undeveloped property. Fort Belvoir maintains a golf course in the northwest part of the study area. The North Post and HEC also contain portions of the 742-acre forest and wildlife corridor that crosses these federal lands diagonally connecting Huntley Meadows Park to Pohick Bay Regional Park to the Jackson Miles Abbot Wetland Refuge (JMAWR), bordering the study area to the northeast.

Several pockets of previously undeveloped land outside of the Post and HEC have been converted to "in-fill" residential development within the past decade. A landfill is located near the intersection of Beulah Street and Telegraph Road; portions of a former gravel operation have been converted to a golf driving range with other development planned.

3.1.1.5 Prime and Unique Farmland

The Farmland Protection Policy Act (PL 97-98; 7 U.S.C. 4201 et seq.) requires federal actions to minimize the unnecessary and irreversible conversion of farmland to nonagricultural uses. Some of the study area contains soils, which can be classified as prime farmland soils³; however, none of the study area is used, or planned to be used, or has been used for farming for over 50 years. As discussed in Chapter 1, institutional land uses (military) in various forms have occurred at the Fort Belvoir since World War I, precluding use as farm land.

3.1.2 Comprehensive and Master Plans

3.1.2.1 Fort Belvoir and HEC

Fort Belvoir was in process of updating its long-range plan for the North Post when the Base Realignment and Closure Commission (BRAC) announced its decision in May 2005 to relocate approximately 21,000 Washington-area Department of Defense (DoD) employees to Fort Belvoir by 2011. Future land uses at Fort Belvoir are expected to follow the Post's mission as an administrative, regional support, and housing post. The draft long range plan had called for near-term future growth to add approximately 3,000 new employees to the Post's 29,000 employees, with another 3,000 by 2025.⁴ In addition to BRAC's

³ U.S. Department of Agriculture, Natural Resources Conservation Service, Retrieved on July 19, 2005 at <http://soildatamart.nrcs.usda.gov/>

⁴ LRC, *Op. Cit.*, 1-3

recommendations, a hospital and a national army museum are planned by 2010.⁵ The road closures, and other public access restrictions and security measures necessitated by post-September 11, 2001, will continue into the foreseeable future.

The Post's 1993 land use plan prioritizes building on previously disturbed and infill sites and on preserving existing recreational facilities on the North Post. To address potential development the Post developed a constrained land use overlay; the forest and wildlife corridor running through the North Post is an example of such a constrained land use. Similarly, the Chesapeake Bay Resource Protection Areas (RPAs) on the Post are considered by Fort Belvoir to be environmentally sensitive and compatible only with very low or no development.

HEC's 1998 Master Plan identifies the 80-acre area near its northeastern boundary for its infrastructure, with the remaining acres as open space. A draft proposal from the mid-1990's to relocate the USACE headquarters from downtown Washington, D.C. to HEC continues to be under consideration. The site suggested would be within the current open-space designated area. HEC is currently evaluating its Master Plan components.

Fairfax County is in the National Capital Region, and thus both Fort Belvoir and HEC are required to have new development reviewed by the National Capital Planning Commission (NCPC). NCPC is the central planning agency for the federal government. It adopted a new *Comprehensive Plan for the National Capital: Federal Elements* on August 5, 2004, which establishes goals and planning policies for growth and development for federal agencies. One element of the NCPC plan, *Parks and Open Space*, lists a policy of conserving portions of military reservations that add significantly to the inventory of park, open space, and natural areas and should, to the extent possible, be used by the public for recreation.

3.1.2.2 Fairfax County

The study area straddles four of Fairfax County's Planning Districts: The Lower Potomac, Mount Vernon, Rose Hill and Springfield districts. Most of the study area is located within the Lower Potomac planning district, which includes Fort Belvoir and HEC. The opposite side of Telegraph Road to the Post, bounded by Beulah Street, is located within the Rose Hill planning district. The Springfield planning district is also located within the study area bounded by Telegraph Road and Beulah Street. The eastern part of the study area lies within the Mount Vernon Planning District, which includes the Woodlawn Plantation and Historic District, VA Route 235 (Mount Vernon Memorial Highway) and its intersection with U.S. Route 1.

The plans for future development in the Lower Potomac Planning district call for continued large institutional land use in area LP4 and low-density residential in the remaining area. Other recommendations in the Plan include the creation of a focal point of development, or "Town Center," in the Lorton-South Route 1 area. In addition, there are some areas of higher density residential development in the Lower Potomac Planning District, and the Plan recognizes the need to preserve stable residential areas through compatible infill development. The Laurel Hill Community Planning Sector recognizes a number of uses (largely parkland, but also residential, elderly care (with supporting uses), and public facility uses) in the area formally occupied by the D.C. Department of Corrections.

⁵ Ibid, 3-2

The County's 2003 Comprehensive Plan calls for the development of five *Community Business Centers* along the Richmond Highway corridor. These business centers are a land use category for which the county envisions a pedestrian-friendly mix of uses that promote economic stability.⁶ The County has designated the *Woodlawn Community Business Center* and adjacent suburban neighborhoods from the intersection of Mount Vernon Memorial Highway and U.S. Route 1 to commercial areas in the vicinity of Woodlawn Court.

Fairfax County is in the process of updating the *Transportation Component* of its Comprehensive Plan. The plan calls for widening of Telegraph Road to 4 lanes, between Beulah Street and Hayfield Road. (In fact, it calls for 4 lanes the entire distance to Franconia Road, where Telegraph Road already is 4 lanes.) The comprehensive plan also depicts aligning Old Mill Road with Mount Vernon Highway. The plan acknowledges the closure of Beulah Street and Woodlawn Roads and other former means of public access within and through Fort Belvoir and includes a new 4-lane connector facility between U.S. Route 1 and Telegraph Road, namely this project.

3.1.3 Zoning

Fairfax County has a zoning ordinance to manage development. The County has designated Fort Belvoir and the adjacent HEC property as Residential Conservation. To the north, east and south of the boundaries of the Post and HEC of Telegraph Road, the zoning is nearly all Residential. Land north of Telegraph Road between Beulah Street and the Hayfield subdivision, is largely zoned as Residential or Planned Development Housing, with small pockets of Commercial and Industrial. Zoning along U.S. Route 1 is largely Commercial, with Residential zoning extending along Mount Vernon Memorial Highway, except at the U.S. Route 1 intersection.

Additionally, Fairfax County has two overlay districts within the study area. One is an historic overlay district⁷, encompassing the Woodlawn Historic District (see Cultural Resources) and extending 1,000 feet in all directions beyond the various property limits. The historic overlay places specific conditions on development. The other overlay district is a natural resources overlay district, which is located north of Telegraph Road near Beulah Street. The county created Natural Resource Overlay districts for the sand and gravel industries (and their associated products) to allow such continued uses.⁸ Currently, the Hilltop landfill operates north of Telegraph Road within that zone.

3.1.4 Force Protection

As a military installation, Fort Belvoir enforces guidelines to reduce human casualties as well as damage to critical infrastructure around military structures and housing in the event of a terrorist attack. These guidelines are known as "Force Protection Standards". There are several structures within the Connector Road study area, both on Fort Belvoir and HEC, which require specific standoff distances and/or associated threat-protection reduction measures.

Fort Belvoir and HEC apply the DoD's *Unified Facilities Criteria 4-010-01; Antiterrorism Standards for Buildings*. The DoD criteria recommends minimum standoff distances of 45

⁶ Fairfax County, 2004d, pg. 3

⁷ From Fairfax County Zoning Ordinance, Article 7, Overlay and Commercial Revitalization District Regulations, Part 2, 7-200 Historic Overlay Districts.

⁸ *Ibid.*, Part 3, 7-300 Natural Resource Overlay District.

meters (148 feet) for new and existing buildings as a distance from public access roadways without a controlled perimeter. This standoff distance offers what DoD defines as a “low” level of protection. Other facilities, which require a higher level of protection and which have their separate controlled perimeter, seek a 400-meter standoff distance. HEC is currently re-evaluating force protection criteria for sensitive areas.

3.1.5 Visual Environment

The visual characteristics of a transportation facility can strongly influence viewer responses—both positive and negative. The visual environment can be affected for both views from a road (for drivers) and views to a road (surrounding residences and businesses, for example). Research has shown that people will consistently identify visual environments of both high and low quality. This section summarizes the existing visual environment within the study area.

3.1.5.1 Views to the Road

The most distinctive aesthetic and visual features in the study area are associated with the Woodlawn Historic District, with particular focus to Woodlawn Plantation in the southeastern portion of the study area. The Plantation residence, discussed later in this chapter, is a National Historic Landmark (NHL). The 1803 residence of George Washington’s step-granddaughter lies on top of a hill. The Plantation’s viewshed offers an unobstructed view for several miles to the east and southeast towards Mount Vernon and the Potomac River. The Pope-Leighey house is also located on the Woodlawn Plantation National Historic Landmark property approximately 375 feet south of Old Mill Road. Trees and vegetation mostly obscure views to the road from the Pope-Leighey house during the spring, summer and fall. The stables and pasture located across U.S. Route 1 from the residence contribute to the vista. Both parcels are listed on the National Register of Historic Places. Trees, vegetation and other landscaping obscure Richmond Highway and the Richmond Highway intersections with Old Mill Road and Mount Vernon Highway from the viewshed. As mentioned under zoning above, some of the study area lies within an historic overlay district which provides certain aesthetic guidelines, such as the use of landscaping for screening commercial activities.

Other viewsheds exist on Fort Belvoir property, at certain points along the Post’s golf course, but this area is restricted from public access.

3.1.5.2 Views from the Road

For drivers, there are four distinctive roadway corridors in the study area:

- Mount Vernon Memorial Highway (MVMH), Route 235, at the southeastern edge of the study area,
- Telegraph Road (VA 611) along the northwestern edge of the study area,
- U.S. Route 1 (Richmond Highway) along the south, and
- Fairfax County Parkway along the southwest.
- Old Mill Road (from Pole Road to U.S. Route 1)

(a) Mount Vernon Memorial Highway

The MVMH is a two lane roadway, except at occasional intersections where turning lanes are provided. It connects to the George Washington Memorial Parkway at Mount Vernon, about 8 miles to the east. The MVMH is a facility of the Commonwealth of Virginia and maintained

by VDOT. It has controlled access. Other than at the U.S. Route 1 intersection, it offers a pleasant drive along suburban residences and parks.

(b) Telegraph Road

Telegraph Road in the study area has three typical sections, one of which is reminiscent of a "country two-lane roadway." Motorists can observe hardwood forest along the DCEETA and HEC properties. Beyond HEC towards Hayfield Road, the pavement is wide enough to accommodate 4 travel lanes, and has the high school and elementary school on either side. From Beulah Street towards the Fairfax County Parkway, the typical section is a recently constructed 4-lane divided facility with grassed median and bike lanes.

(c) U.S. Route 1

U.S. Route 1 is an uncoordinated mix of office buildings, fast food restaurants, strip malls, gas stations and motels encroaching on the views of the Woodlawn Plantation's boundaries at Mount Vernon Memorial Highway and Old Mill Road. However, as U.S. Route 1 traverses the Woodlawn Plantation, the driver enjoys a vista of a horse pastures on the Woodlawn Stables property and a lawn/meadow on the Woodlawn Plantation NHL property.

Near Woodlawn Road, on opposite sides of U.S. Route 1, there is a church, cemetery, and Woodlawn Friends Meeting House. The meeting house is adjacent to the expansive parade grounds opposite Pence Gate. However, since the closure of Woodlawn Road to the public, the Army has erected a tent and other security features, which detract from the otherwise previously pleasant visual connection between the Woodlawn Plantation and the Woodlawn Friends Meeting property.

(d) Fairfax County Parkway

Fairfax County Parkway presents an edge of the study area, traveling from U.S. Route 1 to I-95 along a wide right-of-way. It is a recently constructed 4-lane divided controlled access facility, mostly with grade separations. A multi-purpose path skirts one side.

(e) Old Mill Road

Old Mill Road is presently a 2-lane undivided roadway from Pole Road to the intersection of U.S. Route 1. Views from the road include forested areas of Woodlawn Plantation on one side of the road, and a mix of multi-unit residential complexes on the other side (opposite to the Woodlawn Plantation NHL property). The Pope-Leighey House is not visible from Old Mill Road most times during the year. The approach to the intersection of Old Mill Road and U.S. Route 1 is typical of development in the area, an uncoordinated mix of commercial and retail uses.

3.1.6 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 (16 USC § 1451, et seq., as amended) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. The Commonwealth of Virginia developed a Coastal Zone Management Program (CZMP) in 1986. Section 307(c)(1) of the CZMA Reauthorization Amendment (CZMARA) stipulates that federal projects that affect land uses, water uses, or coastal resources of a state's coastal zone must be consistent to the

maximum extent practicable with the enforceable policies of that state's federally-approved coastal management plan.

The Virginia Department of Environmental Quality (DEQ) is the lead agency for administering the regulatory and advisory reviews. All of Fairfax County, and thus projects in the study area, is covered under Virginia's Coastal Resources Management Program (CRMP). As part of the NEPA process, the project will be submitted to the DEQ to determine the consistency of the project with CRMP goals. Areas where a project is evaluated for CRMP consistency by the DEQ include:

- Fisheries Management
- The State Tributyltin (TBT) Regulatory Program
- Subaqueous Lands Management
- Wetlands Management
- Dunes Management
- Non-Point Source Pollution Control
- Point Source Pollution Control
- Shoreline Sanitation
- Air Pollution Control

3.2 Natural Resources

The project is located in the Washington D.C. metropolitan area, which is recently and rapidly changing from undeveloped natural areas to developed land uses. Specifically, in this urbanized area, Fort Belvoir and HEC offer significant tracts of native vegetation with diversity and proximity to other large undisturbed tracts such as Pohick Bay Regional Park, Huntley Meadows Park and Mason Neck National Wildlife Refuge. To preserve its ecological significance, Fort Belvoir actively manages and conserves natural resources within its boundaries. External to the federal facilities, other natural features occur in the study area.

Fort Belvoir's *Integrated Natural Resources Management Plan* (INRMP) is also a useful reference if further information on the Post's natural resources is needed.

3.2.1 Physiography

Physiographic features include soils, groundwater, and topography, as well as an area's unique physical features. From this information, FHWA can determine suitability of soils for construction, slope stability, erosion potential and other factors.

The entire area east of Interstate 95 in the County lies within the Coastal Plain, including all of the study area. The study area lies along the Fall Zone, a physiographic delineation that separates the Coastal Plain Physiographic Province from the Piedmont Physiographic Province. The Coastal Plain Province is comprised of both unconsolidated and partially consolidated sediments and sedimentary rocks that regionally form an eastward thickening wedge. Sediments within the province are generally representative of multiple marine transgressive and regressive depositional sequences.

3.2.1.1 Topography

The study area primarily consists of rolling terrain. Surface features range from smooth uplands to bluffs and ravines; there are well-to-moderately drained uplands as well as poorly drained lowlands. Generally, the topography of the study area ranges from flat areas to areas defined by steep slopes containing a mixture of uplands and lowlands. Elevations in the study area range from about 25 feet above mean sea level (MSL) along Dogue Creek and Huntley Meadows Park, to about 230 feet MSL near Beulah Street and Telegraph Road. Richmond Highway at Mt. Vernon Highway is less than 30 feet MSL.

Severe slopes exist in the center and western portions of the study area. Slope percentages in these areas range from 10 to greater than 40 percent. Slopes in the eastern and southern portions of the study area are not as severe, at generally less than 10 percent. For the entire Fort Belvoir North Post, about 40 percent of the land consists of uplands and plateaus, 40 percent lowlands, with the remaining 20 percent as steep slopes.⁹ (See **Figure 3-2**, Steep Slopes and Poor Soils.)

3.2.1.2 Geology and Soils

The Coastal Plain is generally composed of soft, sedimentary rocks: unconsolidated sand, silt, and clay underlain by residual soil and weathered crystalline rocks. Most of the sediments in the study area, specifically identified at Fort Belvoir, belong to the Potomac Formation. Lens-shaped (lenticular) deposits of interbedded sand, silt, clay and gravel underlain by residual soil and weathered crystalline rocks characterize the Potomac Formation. Most notable of the Coastal Plain deposits are that these are unconsolidated sediments deposited during successive periods of building and receding shorelines.

Soils in the study area are largely two types: Dragston fine sandy loam and Lunt silt loam. Some of these are designated as Class 'A' soils. The problems associated with these soils include unstable slopes and land slippage, high shrink-swell clays, poor foundation support, and high water table conditions. Some of the soils are designated Marine Clay. Fairfax County has designated Marine Clays as a problem soil because of their high "shrink-swell" characteristics; with some areas identified as slippage-prone soils. The County comprehensive plan further advises that any development in areas with these conditions should apply the latest technologies for stabilizing marine clays from soil slippage. See Figure 3-2 for the locations of poor soil.

3.2.2 Water Resources

Water resources are essential to maintaining human health, fish and wildlife habitat, and vegetation. These resources can be affected by roadway projects because increased impervious surfaces can lead to changes in hydrology, degrade the surface waters that drain to streams and, thereby, affect natural habitats. These changes can also influence flooding effects and groundwater recharge.

Information on water resources in the study area was collected from a U.S. Geological Survey study for Fairfax County, and Ft. Belvoir's *Integrated Natural Resources Management Plan (INRMP)*. Surface and ground water resources in the study area are discussed below.

⁹ U.S. Army Garrison, Fort Belvoir, Virginia, *Environmental Assessment, Defense Communications-Electronics Evaluation and Testing Activity (DCEETA), Construction of Remote Delivery Facility and Perimeter Road Widening*, August 2005, p.3-6.

3.2.2.1 Groundwater

Three main groundwater aquifers underlay Fairfax County: Bacon's Castle Formation, and the Lower and Middle Potomac Formations. Groundwater in the Connector Road study area is primarily located within confined aquifers of the Lower Potomac Formation. The Lower Potomac Formation is characterized by a system of sandy aquifers separated by silt and clay¹⁰. Groundwater in this aquifer flows to the southeast. Recharge occurs by precipitation in the north and west of the study area, starting near the fall line with Piedmont physiographic province.

While the water from the aquifer is potable, neither the federal installations nor local residents in the study area use wells for drinking water. The Post continues to use about five wells for irrigation purposes (to service the golf course, for example). The County's 2003 Comprehensive Plan indicates that these aquifers are not a key source of drinking water for residents¹¹. The Fairfax County Water Authority supplies potable water to the area.

Water tables in the study area vary for a variety of reasons including localized soil characteristics, proximity to streams, precipitation and evapotranspiration. The Coastal Plain is characterized by a water table with typical depths of 10 to 35 feet.

3.2.2.2 Surface Water

Fairfax County contains fourteen watersheds groups and the study area contains parts of two of these groups; The Dogue Creek and Accotink Creek Watersheds (See **Figure 3-3**, Watersheds). The Accotink Creek Watershed is a distinct watershed, while Dogue Creek is part of the Lower Potomac Watershed Group which includes Dogue Creek, Little Hunting Creek, and Belle Haven watersheds. All watersheds in this region are part of the larger Potomac River Basin, which feed the Potomac River and ultimately to the Chesapeake Bay and Atlantic Ocean. The Potomac River Basin is a large watershed area of 14,670 square miles extending across four states (Virginia, West Virginia, Pennsylvania, and Maryland) and the District of Columbia.

(a) Dogue Creek Watershed

The Dogue Creek watershed is located in the eastern portion of the study area, roughly bisecting the study area at Woodlawn Road. The watershed contains fifteen sub-watersheds, including the Jackson Miles Abbott Wetland Refuge (JMAWR). Tributaries to Dogue Creek include Piney Run that crosses Telegraph Road in the northeastern part of the study area and travels southeasterly through the JMAWR, Dogue Creek park, and under U.S. Route 1.

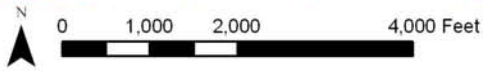
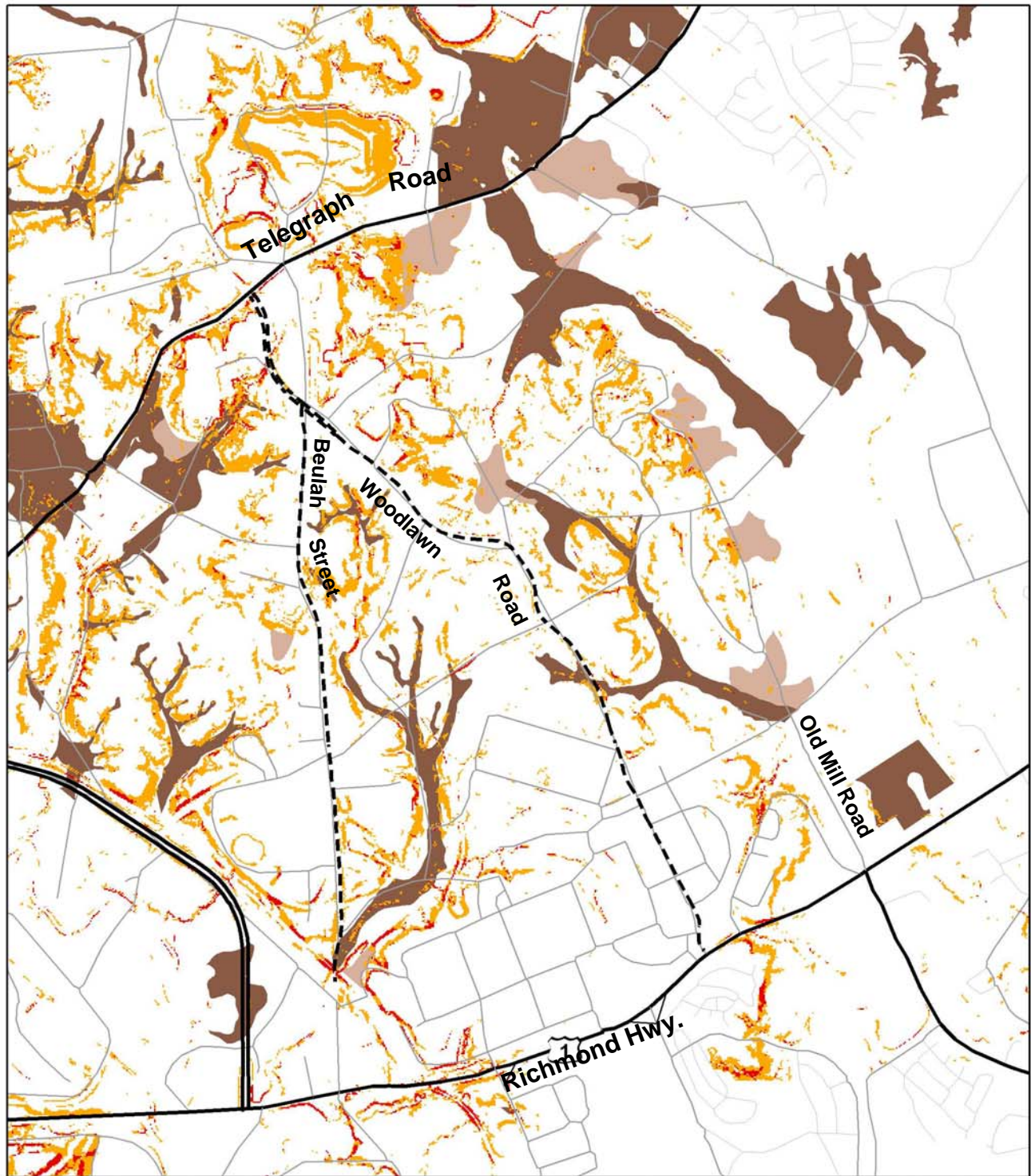
(b) Accotink Creek Watershed

The Accotink Creek watershed is located within the western part of the study area, roughly bisecting the study area along Woodlawn Road.

Additional information on the watersheds is included below in the Water Quality section.

¹⁰ USGS, *Fairfax County Stream Protection Baseline Study*, 1989, pg. 5

¹¹ Fairfax County Department of Planning and Zoning, Fairfax County, Virginia, *Fairfax County Comprehensive Plan, 2003 Edition, Chesapeake Bay Supplement, Policy Plan*, Adopted 11-15-2004, p. 41, Retrieved from: <http://www.fairfaxcounty.gov/dpz/comprehensiveplan/policyplan/chesapeakebay/waterfactors.pdf>. Note: Aquifer may provide potable water to jurisdictions outside of Fairfax County.

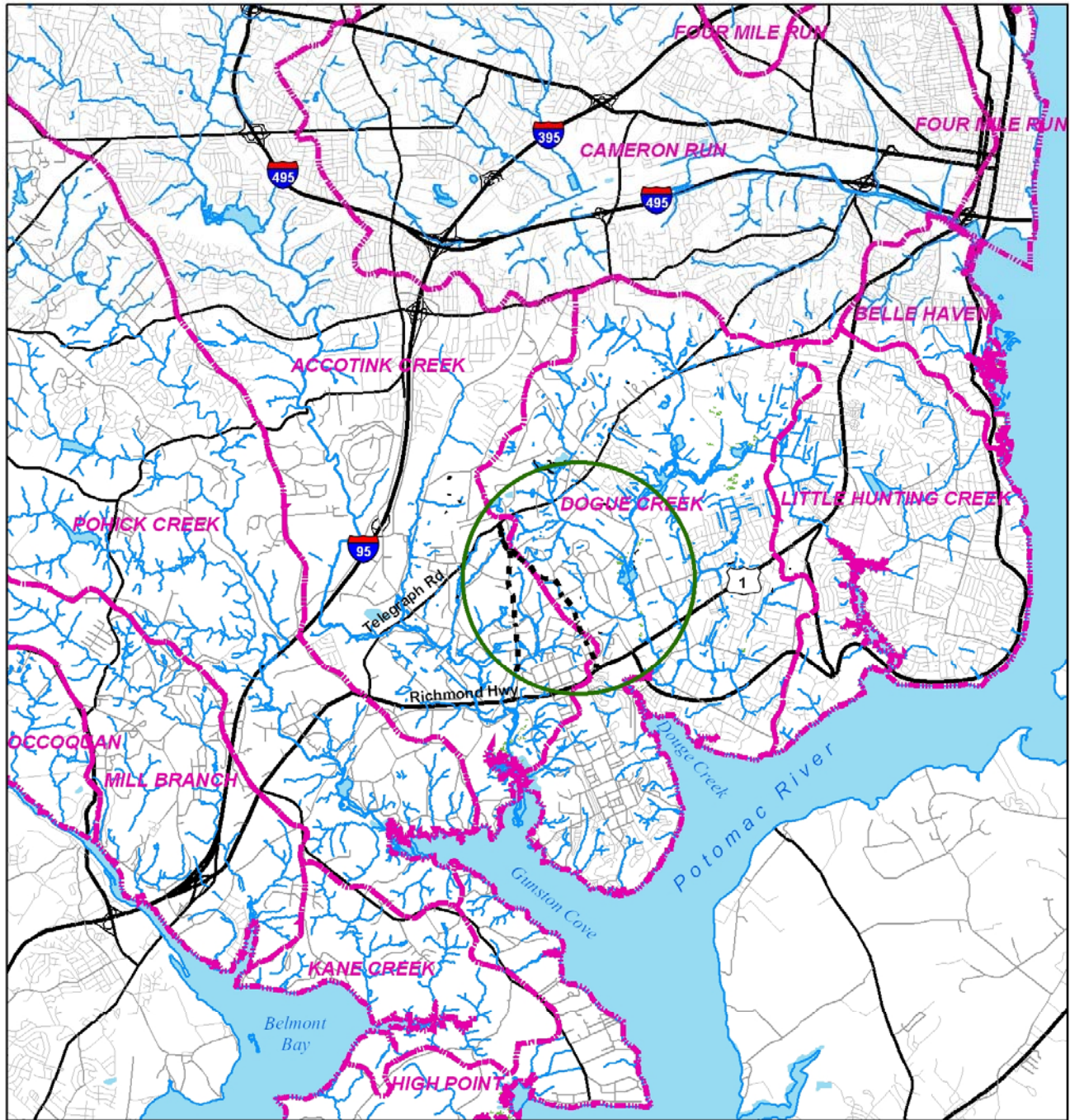


Legend

- Woodlawn Road/Beulah Street - Closed to public
- Marine fine sandy loam
- Class A Soils
- Step Slopes**
- 20% - 40%
- > 40%

Steep Slopes and Poor Soils

Figure 3-2



Legend

- Woodlawn Road/Beulah Street - Closed to public
- NEPA Study Area
- Watershed Areas

Watersheds

Figure 3-3

3.2.2.3 Water Quality

The U.S. Environmental Protection Agency (EPA) has water quality management regulations requiring states to list waters that do not meet state defined numeric and/or narrative water quality standards or criteria. The criteria used to evaluate impaired waters evaluate whether those waters either partially support or do not support one or more of five designated uses. (i.e. aquatic life, fish consumption, shellfish consumption, swimming, and drinking water.) The most current *Impaired Waters List* was developed by the Virginia Department of Environmental Quality (DEQ) with assistance from the Virginia Department of Conservation and Recreation (DCR).

Section 303(d) of the Clean Water Act and the EPA regulation 40 CFR Section 130.7(d) (1) promulgated in July, 1992, requires each state to submit a Total Maximum Daily Load (TMDL) Priority List to EPA in even numbered years. The *303(d) Impaired Waters List* is a compilation of those waters in the Commonwealth of Virginia that are designated water quality limited. These waters are defined as impaired. None of the waterbodies identified in the study area are included on Virginia's *2004 303(d) List of Impaired Waters*.

Fort Belvoir has also assessed stream conditions on the garrison.¹² Stream erosion and poor conditions exist, but the Post has implemented a program of a number of corrective measures. Additionally, Fort Belvoir conducted analyses¹³ of baseline conditions for all on-Post perennial streams in Spring 1998 and Spring 1999, including samples from Accotink Creek and Dogue Creek. Water samples were tested for nutrients, pesticides, metals, and total petroleum hydrocarbons. Sediments were not analyzed. The tests concluded that most EPA chronic aquatic life or human health criteria were not exceeded (except for iron, manganese, and aluminum). The levels for iron and manganese did not exceed levels that would be considered for toxicological effects. The levels measured for aluminum were reported to be typical of natural waters which frequently exceed criteria measures for aluminum.

Fairfax County also conducts water quality analysis for waterbodies within the county¹⁴. The analysis was conducted for individual watersheds and respective sub-watersheds. Sub-watersheds to the Dogue Creek watershed are located within the northeastern part of the study area. These sub-watersheds — on the main stem (above the north fork) of the creek and the “Barnyard Run” area of the river — are characterized as high quality streams by the County. Both sub-watersheds are in proximity to the JMAWR and are classified as *Watershed Management Areas*.

Part of Dogue Creek's watershed also crosses U.S. Route 1, before emptying into the Potomac River. This sub-watershed is characterized by stream degradation and is classified by the Fairfax County Department of Public Works and Environmental Services as a *Watershed Restoration Area Level II*. This classification is used for a sub-watershed where water quality conditions were determined to be poor. The management strategy for this

¹² U. S. Army Garrison Fort Belvoir, March 1, 1999, “*Watershed Delineation Project and Problem Site Descriptions... Volume II: Dogue Creek Watershed...*”

¹³ U.S. Army Garrison Fort Belvoir, Fort Belvoir, Virginia, Environmental and Natural Resources Division — Directorate of Installation Support, March 2001, *Fort Belvoir Integrated Natural Resources Management Plan, Chapter 7.0 Water Resources*, from: <http://www.belvoir.army.mil/bea.asp?id=inrmp>, pg. 7-26

¹⁴ Fairfax County Department of Public Works and Environmental Services, Fairfax County, VA, *Fairfax County Stream Protection Baseline Study*, January 2001, Retrieved from: http://www.fairfax.va.us/dpwes/environmental/SPS_pdf.htm, pg. 3-66

section of the creek involves the most comprehensive set of activities to improve watershed quality.

The Accotink Creek watershed is also classified as a *Watershed Restoration Area Level II* by Fairfax County within the study area. Water quality measures were classified as poor within the sub-watershed, requiring the most comprehensive activities to improve water quality¹⁵.

3.2.3 Floodplains

Executive Order 11988, Floodplain Management, defines the term floodplain as “the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.” Fairfax County defines *floodplains* as areas that “are periodically subject to inundation by water as a result of rainfall and/or snow melt events causing streams and rivers to spill over their banks. The 100-year floodplain is the area that would be expected to be flooded by the rainfall event that is expected to occur, on average, once every 100 years.”¹⁶ The Federal Emergency Management Agency (FEMA) regulates construction in floodplains to protect the constructed facility and to protect existing upstream and/or downstream facilities/properties from increased flooding. Floodplain Management, Executive Order 11988, issued 24 May 1977, directs all Federal agencies to avoid development in the 100-year floodplain, when possible.

FEMA flood insurance rate maps (FIRMs) indicate that the 100-year floodplain along Dogue Creek is located only in the easternmost edge of the study area. South and west of the Fairfax County Parkway is the Accotink Creek 100-year floodplain. **Figure 3-4** shows the 100-year floodplains as mapped by the County and Fort Belvoir. The figure also shows area wetlands.

3.2.4 Natural Environmentally Sensitive Areas

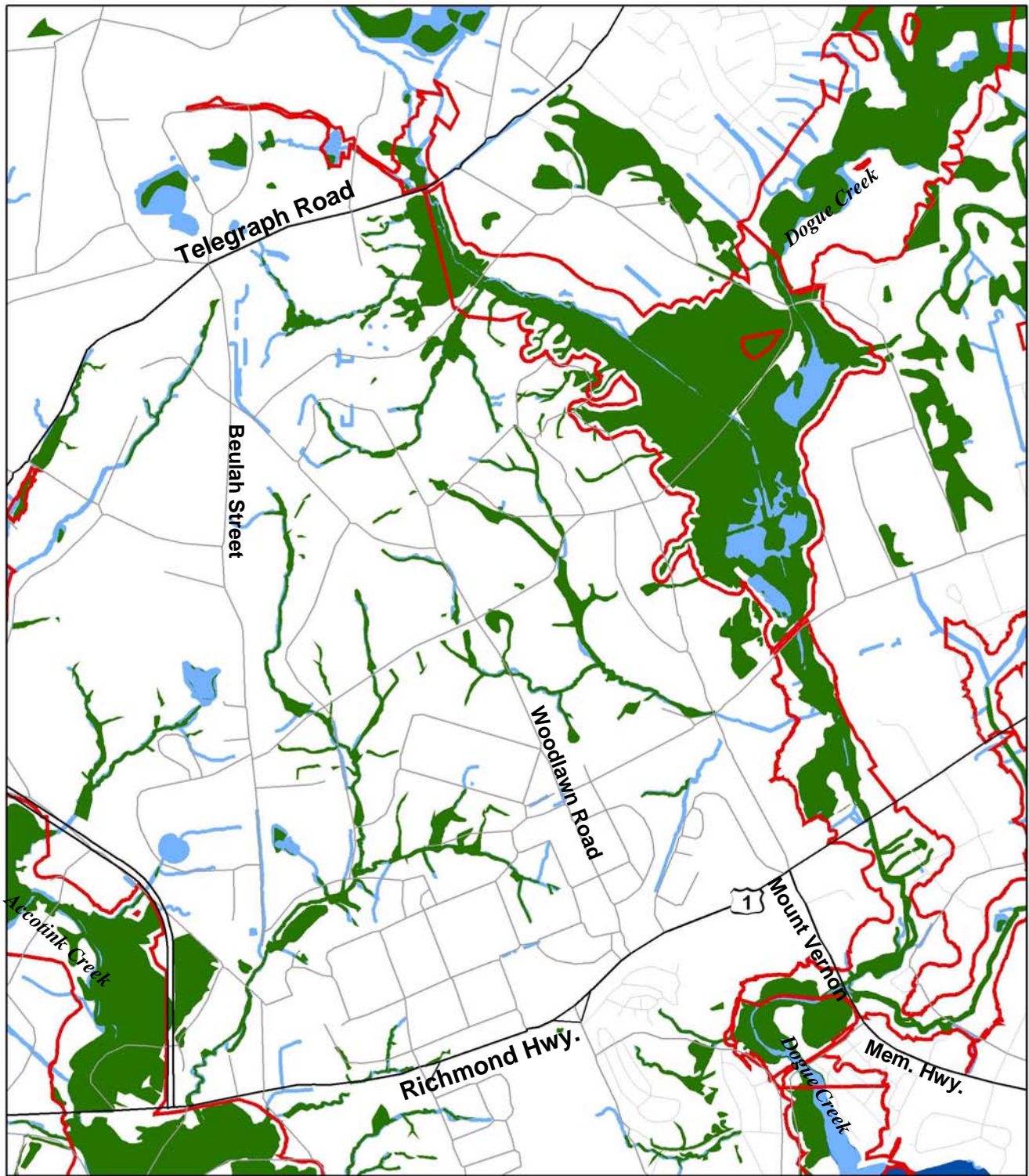
While this chapter presents information on numerous natural, physical and socio-economic resources, the study area contains some specific locales, which warrant particular mention due to their environmental sensitivity. Some of these naturally sensitive areas provide protection for native plant and animal communities, or provide unique opportunities for the public. Fort Belvoir’s *Integrated Natural Resources Management Plan* (INRMP) is also a useful reference if more information on the Post’s environmentally sensitive areas is needed. These areas are briefly described below, and illustrated in **Figure 3-5**.

3.2.4.1 Forest and Wildlife Corridor

The Fort Belvoir Forest and Wildlife Corridor was established in 1993 to offset the ecological impacts of habitat fragmentation caused by several major construction projects on Fort Belvoir. The Forest and Wildlife Corridor was a mitigation measure resulting from Fort Belvoir’s previous *1993 Long Range Component of the Real Property Master Plan* and *1988 Base Realignment/Closure (BRAC)*. An Environmental Impact Statement (EIS) was prepared in 1991 for the BRAC recommendations. That EIS proposed the Forest and Wildlife Corridor, originally envisioned as a “wildlife genetic or green” corridor recognized by both Fairfax County and the U.S. Fish and Wildlife Service for its importance in maintaining species

¹⁵ Ibid, pg. 3-74

¹⁶ Fairfax County Department of Planning and Zoning, *Fairfax County Comprehensive Plan, 2003 Edition, Chesapeake Bay Supplement, Adopted 11-15-2004*, p. 27



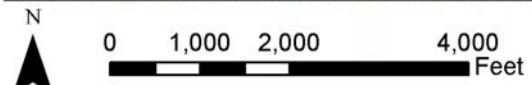
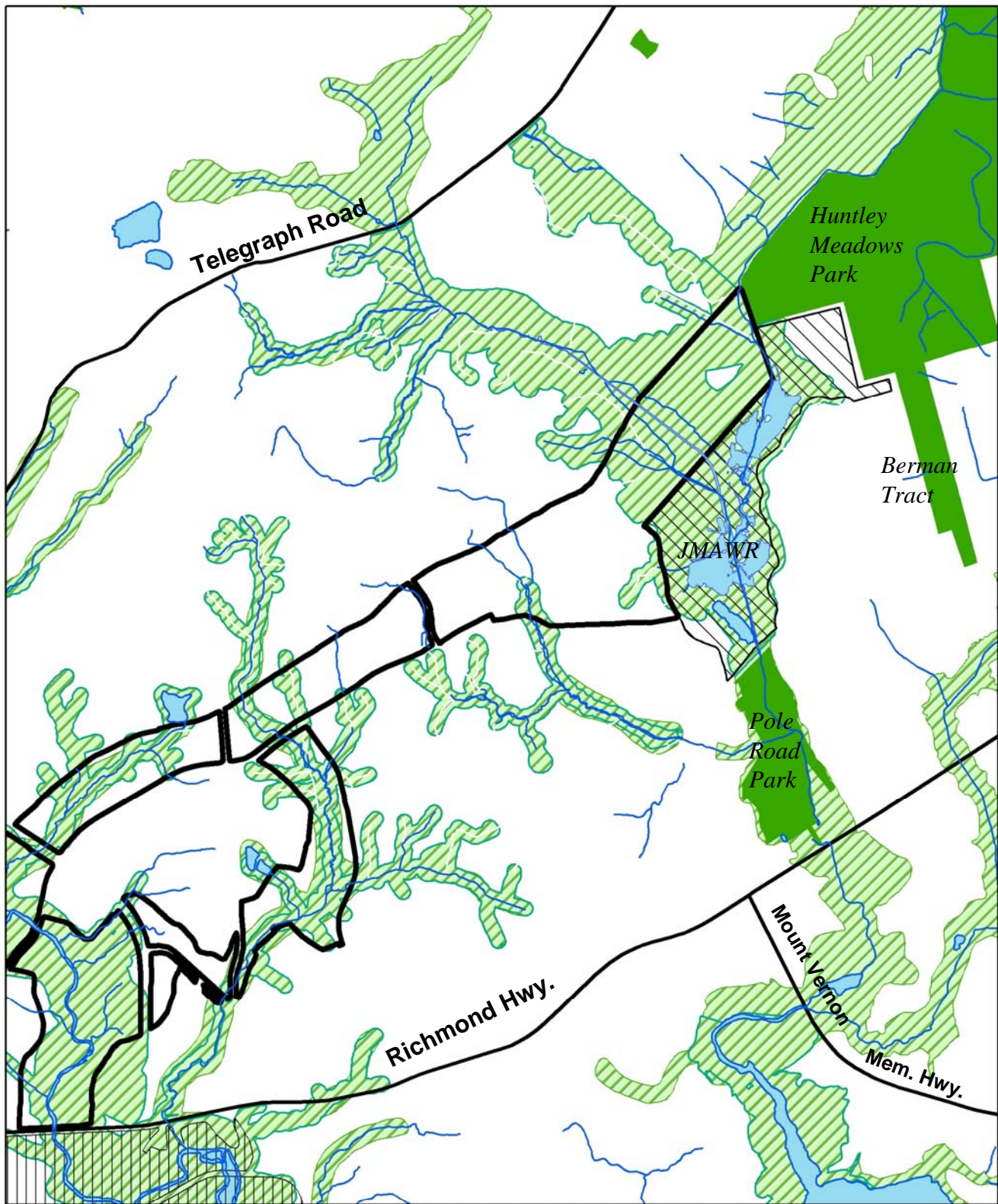
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



Legend

- 100 Year Floodplain Sources: Fairfax County and Fort Belvoir data
- Open Water
- Wetlands

Floodplains and Wetlands

Figure 3-4



- | | | |
|---|---|---|
|  Forest and Wildlife Corridor |  Waterbodies |  Perennial Streams |
|  Jackson Miles Abbott Wetland Refuge |  Parks-Fairfax County Park Authority | |
|  Accotink Bay Wildlife Refuge |  Resource Protection Areas | |

Natural Environmentally Sensitive Areas

FHWA Richmond Highway-Telegraph Road Connector Environmental Assessment

Figure 3-5

survival. The Corridor includes wetlands; riparian forest buffers; habitat for the state-listed wood turtle and several high priority breeding bird species listed with Partners in Flight (PIF); and waterways for passage of, and spawning habitats for anadromous fish. The corridor connects on- and off-post forested areas of wildlife habitat and allows animal movement between the larger forested areas, thus maintaining a diverse gene pool and helping ensure species survival.

The Corridor (i.e., the Forest and Wildlife Corridor) is comprised of a continuous band of forest and wetland habitats that cross the installation and connect with similar habitats in Huntley Meadows County Park (to the northeast) and on Mason Neck peninsula (e.g., Pohick Bay Regional Park, Gunston Hall Plantation, Mason Neck State Park and Mason Neck National Wildlife Refuge) (to the southwest). The corridor was identified in the early 1980's and has been documented by long-term biological studies. The corridor protects wildlife habitat and maintains a continuous area of natural forest habitat between JMAWR on the North Post and the Accotink Bay Wildlife Refuge (ABWR) on the South Post (southwest of the study area). The corridor is approximately 15 miles long with a minimum width of 250 meters. The Forest and Wildlife Corridor is not open to the public except for events that have been authorized by Fort Belvoir.

To help protect and manage the Corridor, the *Fort Belvoir Forest and Wildlife Corridor Management Plan* was developed in 1993. This Plan summarizes the history of the Corridor, documents its ecological function and importance, and prescribes management actions which include:

- Align roads to minimize the extent of encroachment on the corridor.
- Keep the cleared roadway as narrow as possible and minimize tree cutting.
- Keep utility right of way as narrow as possible
- Eliminate overhead utility and communication lines.
- Install appropriate animal crossings as part of each road construction project
- Accomplish aggressive erosion and sedimentation control during construction
- Include post-construction replantings to improve disturbed area recovery.

A new Real Property Master Plan (RPMP) was also developed in 1993. The RPMP designates the Forest and Wildlife Corridor as an environmental land use, and designates it as "severely constrained to development" The Environmental Assessment (EA) for the RPMP addresses implementation of the Corridor as a land use designation. The Finding of No Significant Impact (FONSI) for the RPMP EA (1993) states that Fort Belvoir will mitigate for the environmental impacts of projects developed under the RPMP by, among other things, following the requirements of the Forest and Wildlife Corridor Management Plan.

In 2001 Fort Belvoir developed an Integrated Natural Resources Management Plan (INRMP). The INRMP validates the corridor as a "Special Natural Area" under Department of Defense (DoD) Conservation Policy (DoD Instruction 4715.3. Among other actions, the INRMP calls for continuing "to prohibit land clearing and development within the corridor" (with the understanding that some clearing, such as utility line installation and maintenance and road

widening, will be unavoidable) and recommends expanding the limits of the designated Corridor.

If unavoidable activities such as road widening or construction are required in the Corridor area, mitigation measures are to be used that restore connectivity such as the use of oversized box culverts to serve as wildlife crossing structures.

3.2.4.2 Chesapeake Bay Preservation Areas

The Commonwealth of Virginia Chesapeake Bay Preservation Act of 1988 requires communities that are located along tidal portions of rivers that drain into the Chesapeake Bay to establish water quality protection measures. In response, Fairfax County enacted a Chesapeake Bay Ordinance that regulates the kinds of development that can occur in buffer areas along streams that drain to the Potomac River and eventually into Chesapeake Bay.

These buffer areas are known as Resource Protection Areas (RPAs). As established in accordance with Chapter 118 of The Fairfax County Code¹⁷, RPAs are defined as:

“A component of the Chesapeake Bay Preservation Area of the County comprised of lands adjacent to water bodies with perennial flow that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may result in significant degradation of the quality of state waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of sediments, nutrients, and potentially harmful or toxic substances from runoff entering the Bay and its tributaries, and minimize the adverse effects of human activities on state waters and aquatic resources.”

As illustrated in **Figure 3-5**, RPAs in the project study area extend largely along the stream banks of Dogue Creek, Piney Run, and Accotink Creek. This figure illustrates RPAs and streams that have been identified by both Fairfax County and Fort Belvoir. Although public transportation projects are exempt from the Fairfax County Chesapeake Bay Preservation Ordinance, VDOT attempts to avoid or minimize impacts to RPAs where possible.

As environmentally sensitive land corridors that lie along or near streams, rivers and other waterways, RPAs are important for many reasons. These include: water quality enhancement, stormwater and floodwater management, stream bank and shoreline stabilization, water temperature modification, wildlife habitat protection, and pollutant absorption.

Fairfax County's Environmental Quality Corridor (EQC) policy also provides guidance on water quality protection through the preservation of environmentally sensitive areas, such as RPA's. This policy is consistent with the County's Chesapeake Bay Preservation Ordinance, but it is not a regulation. The policy is primarily relevant to the county zoning process in the granting of special exceptions, special permits, and rezonings (as it relates to negotiations with developers for example). The EQC system seeks to protect and restore open space systems that link and preserve natural resource areas and provide passive recreation. The EQC policy recommends protection and restoration of environmentally sensitive lands,

¹⁷ Fairfax County, Virginia, *Code of the County of Fairfax, Virginia, Chapter 118, Chesapeake Bay Preservation Ordinance*, Accessed at:
<http://www.fairfaxcounty.gov/offsite/?pg=http://www.municode.com/resources/gateway.asp?pid=10051&sid=46>

including 100-year floodplains, steep slopes (gradient of 15 percent or greater) in stream valleys, minimum buffer areas, and upland habitats that augment the habitats and buffers provided by stream valleys.

3.2.4.3 Jackson Miles Abbott Wetland Refuge

The Jackson Miles Abbott Wetland Refuge (JMAWR) is a 146-acre wetland refuge established in 1988. JMAWR was designated a *Special Natural Area* by the Department of Defense (DoD) and Department of Army (DA) under DA Policy 13.1. Special Natural Areas are defined as areas on military installations such as refuges, scenic and/or wildlife areas where the DA focuses on conservation management. The Special Natural Area Policy is described as follows in the Fort Belvoir's INRMP:

“DA's natural resources management policy is contained within AR 200-3, Natural Resources Land, Forest and Wildlife Management. This regulation establishes the Army's requirements for managing and using land and water resources in accordance with the principles of ecosystem management, and institutes the Army's commitment to conserve, protect, and sustain biological diversity, and to restore degraded ecosystems. AR 200-3 acknowledges the need to set aside for conservation installation areas having significant natural resources, and the necessity of providing the public with opportunities to access these resources for education, scientific research and study, and recreation, consistent with ecosystem management goals. “

The Department of the Army established JMAWR to protect the wetlands along Dogue Creek and to provide public access to an important bird watching area. It is open 365 days a year to the public. JMAWR contains several amenities including a 0.6-mile hiking trail (a portion of which is handicapped accessible), three fishing piers (handicapped accessible) at the 1.5-acre manmade Mulligan Pond, a wildlife viewing area, parking, and an information kiosk at the Meeres Road entrance. Use surveys by Fort Belvoir indicate that major recreation activities in JMAWR include nature walking, dog walking, fishing, bird watching and wildlife observation.

JMAWR supports several state-listed rare animal species. JMAWR includes wetlands; riparian forest buffers; habitats for the state-listed wood turtle and state-listed rare plant species; and Partners in Flight (PIF) high-priority breeding sites. Its contiguous forest provides migratory corridors for wildlife. The northeastern boundary of JMAWR abuts Huntley Meadows Park.

3.2.4.4 Huntley Meadows Park

Huntley Meadows Park is located at the periphery of the study area, in the northeast corner abutting the HEC and the JMAWR, and extending northeasterly. The Federal Government donated land for Huntley Meadows Park to Fairfax County in 1975. It is the largest park¹⁸ in Fairfax County and contains 1,425 acres of diverse habitats including wetlands, meadows and mature forest. There are trails and a boardwalk, and an interpretive center. The land transfer agreement from the U.S. Department of Interior protects the park in perpetuity.

Two parcels belonging to the Fairfax County Park Authority (FCPA) or the Army provide additional habitat in the same sub-watersheds. One (the Berman-Gerber Tract) is a 28 acre

¹⁸ <http://www.fairfaxcounty.gov/parks/nature.htm>

parcel, transferred by the Fairfax County to federal ownership (Department of the Army) in 2003; it lies adjacent to Pole Road next to Fort Belvoir housing. The other (Pole Road Park) is a 49 acre tract providing a continued natural setting contiguous to JMAWR.

3.2.5 Wetlands

Wetlands serve many critical functions to the environment. They can help moderate stormwater flow, reduce flooding severity, and act as filters for substances such as dirt and oil. Wetlands also provide vital habitat for plant and animal species.

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and similar areas¹⁹. In most cases, three wetland parameters must be present in order for an area to be considered a wetland by U.S. Army Corps of Engineers (USACE) and VDEQ. These parameters include hydrophytic vegetation, hydric soil, and wetland hydrology.

In 1972, Congress passed the Federal Water Pollution Control Act Amendments, known as the Clean Water Act (CWA), to “restore and maintain the chemical, physical, and biological integrity” of the nation’s waters. (33 U.S.C. §1251 et. Seq.). Section 404 of the CWA gives the USACE authority to regulate the discharge of dredged or fill material in all waters of the U.S., including wetlands.

Executive Order 11990, “Protection of Wetlands” requires federal agencies to avoid and minimize harm to wetlands. This project must avoid wetlands unless there is “no practicable alternative.” If a federal project uses wetlands, it must undergo “all possible planning to minimize harm to wetlands.”

3.2.5.1 Study Area Wetland Features

The regional wetland patterns located within the study area are typical of the upper Coastal Plain and Piedmont physiographic provinces. Wetlands within these provinces are generally associated with drainage networks. See **Figure 3-4** for a map illustrating wetland features in the study area.

Virginia’s Department of Conservation and Recreation (VDNR) identifies portions of the study area as located within the Dogue Creek Wetlands Conservation Site²⁰. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Natural heritage resources of concern in this conservation site include a Coastal Plain/Piedmont Acidic Seepage Swamp and an animal species, the Wood turtle (*Clemmys insculpta*).

The Acidic Seepage Swamp is a unique type of wetland found along steep-sloped areas of the Potomac River and its tributaries. These wetlands are limited in their extent and confined to a northern and southeastern portion of the study area along Dogue Creek within the Jackson Miles Abbott Wetland Refuge. These wetlands are generally described as saturated deciduous or mixed forests of small headwaters stream bottoms and seeping toe-slopes with

¹⁹ USACE , 2003

²⁰ Munson, 2005

acidic, nutrient-poor soils.²¹ The vegetation in these seep areas is relatively dense, however plant diversity is relatively low. The tree canopy is comprised of common coastal plain bottomland hardwood species such as red maple, sweet gum, willow oak, green ash, pin oak, American elm, and silver maple. The shrub layer is dominated by *Viburnum* species such as black haw, with some ironwood, highbush blueberry, and red maple also present. The herbaceous layer is almost completely dominated by skunk cabbage, with lizard's tail and several species of sedges and arrow-leaf also occurring.

Other types of wetlands located in the study area include: palustrine forested (PFO), palustrine emergent (PEM), palustrine scrub/shrub (PSS) and palustrine open water (POW). The palustrine forested wetlands are primarily located along the floodplains of the creeks. They are classified as Coastal Plain/Piedmont Bottomland Hardwood Forest. The forest canopy includes red maple, sweet gum, willow oak, green ash, American sycamore, pin oak, American elm, silver maple, and box elder. Common understory saplings and shrubs include ironwood, red maple, American elm, sweet gum, black haw, and highbush blueberry. The herbaceous layer in the stream floodplains is diverse, with sparse areas under deep forest canopy near the creeks themselves, and dense areas in openings along utility lines. The sparse herbaceous layer immediately adjacent to the creeks commonly had poison ivy, Jack-in-the-pulpit, Virginia creeper, Japanese honeysuckle, *Microstegium*, May apple, and netted chain fern, with scattered other plants in low densities.

Within the study area, the palustrine emergent and palustrine scrub/shrub wetlands are concentrated in utility right-of-way openings. Here eastern burreed, soft rush, rice cutgrass, cattail, and many sedges dominate the vegetation, forming a dense layer. Also commonly observed in these areas are dewberry, jewelweed, panic grasses, and numerous fern species such as cinnamon fern, netted chain fern, and royal fern. Sweet gum is the most common invading woody plant in these linear canopy openings along the utility lines, and is one of the dominant plants in the palustrine scrub/shrub areas. Other common shrub dominants include green ash, black haw *Viburnum*, ironwood, highbush blueberry, and red maple. Functions of these types of wetlands, and wetlands in general, include sediment trapping, flood-flow and nutrient reduction, and wildlife habitat. PFOs are the predominant wetland type in the study area.

3.2.6 Vegetation and Wildlife Habitats

Wildlife presence within a densely populated suburban environment depends on the availability of suitable habitat. Habitat loss and fragmentation is a primary reason for species decline in urban and suburban environments. Human infringement on habitat can also influence the presence and abundance of wildlife in suburban environments.

Biological resources evaluated for the report include native or introduced plants and animals and their habitats. The resources discussed in this section include aquatic habitat, terrestrial habitat, plant and animal species, as well as the federal and state designated threatened and endangered species that may be present within the study area.

Information on biological resources was obtained in part from Fort Belvoir's *Integrated Natural Resources Management Plan* (INRMP), and was supplemented through HDR field surveys. Several habitats are presented in **Figure 3-6**, with many overlapping with designated features such as JMAWR.

²¹ Munson, 2005

3.2.6.1 Aquatic Habitat

Aquatic resources include fisheries and aquatic habitat located within the study area. The INRMP identifies 60 species of inland fishes collected at Fort Belvoir. These species may occur in the study area. Aquatic habitat in the study area includes the Dogue and Accotink Creek watersheds which are discussed in further detail in the water resources section. Fairfax County's 2001 *Stream Protection Strategy Baseline Study* analyzed aquatic habitat in both watersheds.

Within the Dogue Creek watershed portion of the study area, aquatic habitat quality varied by location. The sub-watershed in proximity to the JMAWR had a site condition rating of "good," while the habitat was rated as "fair." Aquatic habitat in the study area was ranked on ten criteria observed at each monitoring site. The study noted that sediment deposition in the streams of the watershed affect aquatic habitat quality. At the time, 15 individual fish species were observed in the watershed. Anadromous fish migrate up Dogue Creek only as far as U.S. Route 1, where a pipe restricts their further progression towards JMAWR or Huntley Meadows Park.

The County's Baseline Study rated the aquatic habitat quality as "poor" within the Accotink Creek watershed portion of the study area. Individual monitoring sites observed low numbers of fish species overall. The condition of stream banks was also observed to be poor with areas of erosion and sedimentation which have a negative effect on habitat.

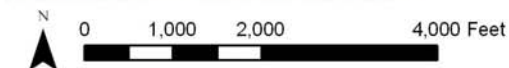
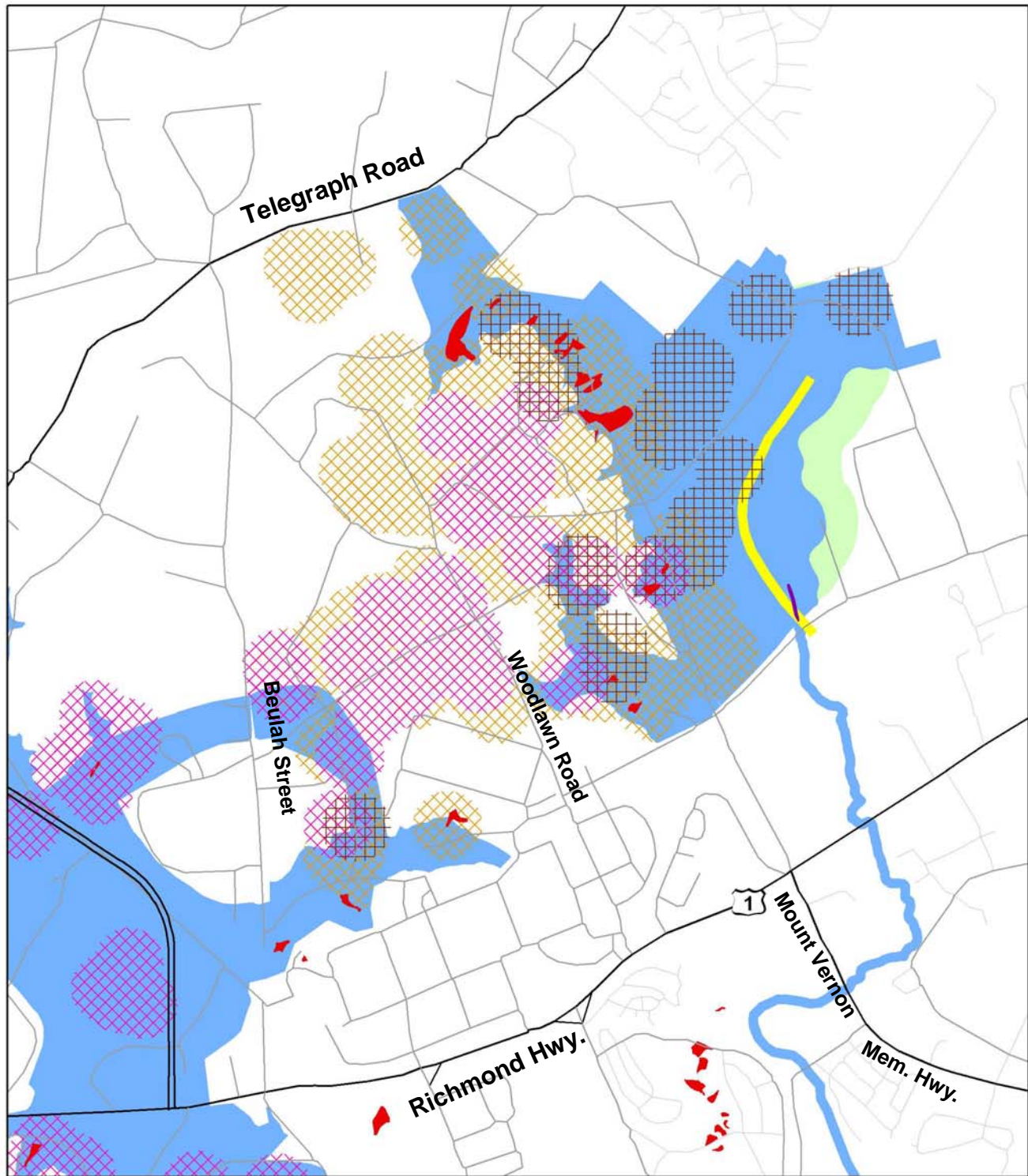
3.2.6.2 Terrestrial Habitat

The study area provides habitat for numerous wildlife species. These habitats include floodplain forest, mixed hardwood forests, pine forests, urban/open fields and wetlands. The floodplain, forest and wetland habitats were described previously. The terrestrial habitat is primarily upland habitat, and is comprised of three primary community types – mesic mixed hardwood forest, xeric pine forest, and low elevation dry mixed oak/heath forest.

The mesic mixed hardwood forests generally occur adjacent to the alluvial wetlands, and common canopy species observed here include tulip tree, willow oak, American beech, sweet gum, red oak, and black gum. Common understory species observed in this community included ironwood, red maple, pawpaw, American holly, and American beech. The herbaceous layer is variable in density, with some areas exhibiting nearly complete groundcover, while other areas exhibited almost no groundcover. Areas with dense groundcover are dominated by Japanese honeysuckle, poison ivy, ground pine, *Microstegium*, and Virginia creeper, while more sparsely covered areas are occupied by greenbrier, partridgeberry, spotted wintergreen, downy rattlesnake plantain, and lowbush blueberry. In areas where canopy openings allow more light to reach the forest floor and along the forest edges, large patches of wineberry and trumpet creeper occur.

The xeric pine forest is located on ridges and side slopes of rock outcrop areas. The canopy is dominated by Virginia pine, and the understory is typically sparse, with scattered ericaceous shrubs most commonly encountered. Where wind throw had downed trees and opened the forest floor to more sunlight, plants such as wineberry and blackberry are commonly observed, though not in patches as dense as those occurring in the mesic forest.

The low elevation dry mixed oak/heath forest is located on submesic to xeric infertile upland sites. This community is located on exposed ridgetops where a thin layer of nutrient poor soil



Legend

- Coastal Plain Piedmont Acidic Seepage Swamp
- Utterbackia imbecillis - Paper Pondshell Habitat
- Peregrine Falcon Migration Corridor
- Known and/or Potential Wood Turtle Habitat
- Fauna Special Species
- Gobbler Roost Buffers
- Breeding Birds 2003
- PIF Breeding Bird Habitat Buffers

General Habitat Areas

Figure 3-6

overlies the bedrock. Virginia pine and black oak are codominants in the canopy of this community. The understory is generally sparse, but commonly included black oak saplings, sassafras, black cherry, lowbush blueberry, huckleberry, and several other low-growing ericaceous shrub species. Occasional large patches of pink lady's slipper orchids can be observed growing on these ridgetop communities, but little other herbaceous cover exists in this community.

3.2.6.3 Wildlife

The diversity of habitats found on Fort Belvoir support many species of wildlife. Fort Belvoir's INRMP identifies 43 species of mammals as occurring or potentially occurring at Fort Belvoir. In addition, the INRMP identifies 263 species of birds, 33 species of reptiles and 27 species of amphibians. All of these species may occur in the study area either as permanent residents or as transient migrants.

Some of the wildlife occurring in the study area consists of species managed as game species by the Virginia Department of Game and Inland Fisheries (VDGIF) and/or the U. S. Fish and Wildlife Service (USFWS). These include the white-tailed deer, wild turkey, gray squirrel, bobwhite quail, and migratory waterfowl such as ducks and geese.

The majority of the wildlife species found in the study area are not game species, however. The large contiguous tracts of deciduous forests provide foraging and breeding habitat for many species of birds, especially neo-tropical migrants. The riparian wetlands of Dogue Creek and tidal wetlands of Accotink Bay provide important foraging and breeding habitat for a variety of resident and migratory waterfowl and shorebirds.

3.2.6.4 Threatened and Endangered Species

The diversity of habitats found at Fort Belvoir support some rare species, including some that are listed as threatened or endangered. Three sources were used to identify threatened and endangered species and species of concern that occur or potentially could occur within the study area:

- USFWS
- Virginia Department of Conservation and Recreation (VDCR), and;
- VDGIF

The VDGIF maintains a database of federal and state listed threatened and endangered species within Virginia. The VDCR Natural Heritage Program also rates species and communities with resource conservation rankings, and maintains a database of this information.

The Endangered Species Act of 1973 is jointly administered by the USFWS of the U.S. Department of Interior and the National Oceanographic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. Other threatened and endangered species are identified and protected by the Commonwealth through Article 6 (§[29.1-563](#) et seq.) of Chapter 5 of Title 29.1 of the Code of Virginia.

The Bald eagle (*Haliaeetus leucocephalus*) and the small whorled pogonia (*Isotria medeoloides*) are the only known federally-listed threatened species to occur within the study area. The Fort Belvoir INRMP states that the shoreline of Dogue Creek is used by the Bald

eagle for foraging and loafing habitats. The Accotink Bay Wildlife Refuge, located outside of the study area to the southwest, supports a majority of the Bald eagle habitat in the area. The Fort Belvoir *LRC*, reports that small whorled pogonia has been encountered or recorded on Fort Belvoir or in Fairfax County. A survey in 2005 by qualified specialists along the original corridor alignment failed to locate any within the corridor, however potential habitat was observed. (See Chapter 4 for more discussion.) A second survey was conducted in 2006 of potential habitat that had been identified previously, however this survey also failed to locate any specimens of the plant.

The VDGIF and VDCR list the bald eagle as state threatened and the small whorled pogonia as state endangered. The only other state-listed threatened or endangered species that are known or suspected to occur at Fort Belvoir are the wood turtle and the peregrine falcon (*Falco peregrinus*). The bald eagle is known to forage in the study area, but most of the documented bald eagle habitat is located off base in the Accotink Bay Wildlife Refuge. One single individual of small whorled pogonia has been located previously (summer 2005) on the EPG section of Fort Belvoir, but none have been found to date east of I-95. Wood turtle habitat is located along several of the creek drainages and in the adjacent floodplain forests and acidic seep swamps. No known peregrine falcon breeding habitat occurs on Fort Belvoir, however, peregrine falcons have been observed migrating through the area, and may use area tidal creeks and bays as foraging areas while hunting. See **Figure 3-6** for Wood Turtle Habitat.

Numerous other rare species of plants and animals are known or suspected to occur in the study area, but these are not listed as threatened or endangered at the federal or state level, and therefore do not require the same levels of protection. The USFWS identifies the Cerulean warbler (*Dendroica cerulean*) and Yellow lampmussell (*Lampsilis cariosa*) as federal species of concern known to occur in the study area. The Yellow lampmussell is also listed as a state species of concern. The yellow lampmussell is found in fast flowing medium-sized rivers and medium to large creeks. At least five bird species listed by the VDGIF as state species of concern are also known from the study area. These species are the Great egret (*Ardea alba egretta*), Yellow-crowned night-heron (*Nyctanassa violacea violacea*), Brown creeper (*Certhia americana*), Winter wren (*Troglodytes troglodytes*), and Purple finch (*Carpodacus purpureus*). The Great egret and Yellow-crowned night heron are wading birds which may be encountered around the area's tidal creeks, marshes, and shallow bays. The Cerulean warbler, Brown creeper and Winter wren are birds that may be found in interior forests, while the Purple finch is a bird that prefers the edges of humid coastal forests.

The Fort Belvoir *Long Range Component* (LRC) reports that Fort Belvoir is the only known location in the world of a groundwater-dwelling amphipod (a type of small water crustacean) known as the Northern Virginia well amphipod (*Stygobromus phreaticus*). This species is not currently listed as threatened or endangered at the state or federal level. Its status is listed by the DCR-NHP as globally rare (G1) and state rare (S1). Fort Belvoir staff report that the Northern Virginia well amphipod has been encountered in groundwater seeps along a steeply sloped area of the installation. This species may be listed in the future as threatened or endangered, but currently requires no legal protection.

3.3 Cultural Resources

Numerous cultural resources have been identified in the project study area. The study area contains a wide variety of cultural resource types, including prehistoric and historic-period archaeological sites and standing structures from the late eighteenth to the twentieth century. The National Register of Historic Places (NRHP)-eligible Woodlawn Historic District and the Woodlawn Plantation National Historic Landmark (NHL) are located in the southeast part of the study area. Prehistoric archaeological sites and historic period cultural resources associated with George Washington's settlement at nearby Mount Vernon have been documented near the study area.

Over the past 30 years, Fort Belvoir has sponsored cultural resources identification surveys and identified hundreds of historic structures and archaeological resources within the boundaries of Fort Belvoir. These resources range from single prehistoric archaeological sites to historic districts comprised of post-WWII military housing associated with the modern occupation of Fort Belvoir.

Federal agencies, in order to comply with Section 106 of the National Historic Preservation Act (NHPA) 36 CFR 800, as amended, must consider impacts of proposed projects on cultural resources that are listed or eligible for listing on the NRHP. In addition, Section 110(f) of the NHPA requires that federal agencies minimize impacts to National Historic Landmarks (NHL) and afford the Advisory Council on Historic Preservation an opportunity to comment on federally proposed projects affecting properties of NHL designation. See **Figure 3-7** for a map of historic and cultural resources in the study area, and **Figure 3-8** for a map of the Woodlawn Historic District.

3.3.1 Methodology

Qualified architectural historians reviewed records from the Virginia Department of Historic Resources (VDHR) Data Sharing System (DSS) for the study area. The locations of archaeological sites and historic structures were cross-referenced with archival materials on file at VDHR. Specific geographic information system (GIS) data layers from both Fairfax County and Fort Belvoir were also utilized for research. Records on file with Fairfax County were consulted with regard to the Woodlawn Historic Overlay District. Previous studies conducted by the Virginia Department of Transportation (VDOT) and its professional historian consultants were also reviewed.

3.3.2 Historic Resources

The VDHR shows twelve inventoried architectural properties in the study area. One NRHP-eligible historic district, the Woodlawn Historic District, is within the study area and consists of a NHL and individually NRHP eligible, ineligible, and unevaluated properties. In addition, other properties are within the study area, as described below, including two properties within the boundaries of Fort Belvoir. The notable resources on Fort Belvoir, namely those contributing to the Fort Belvoir Historic District, are located on the South Post outside of the study area.

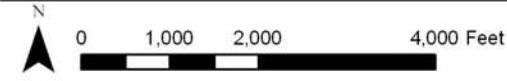
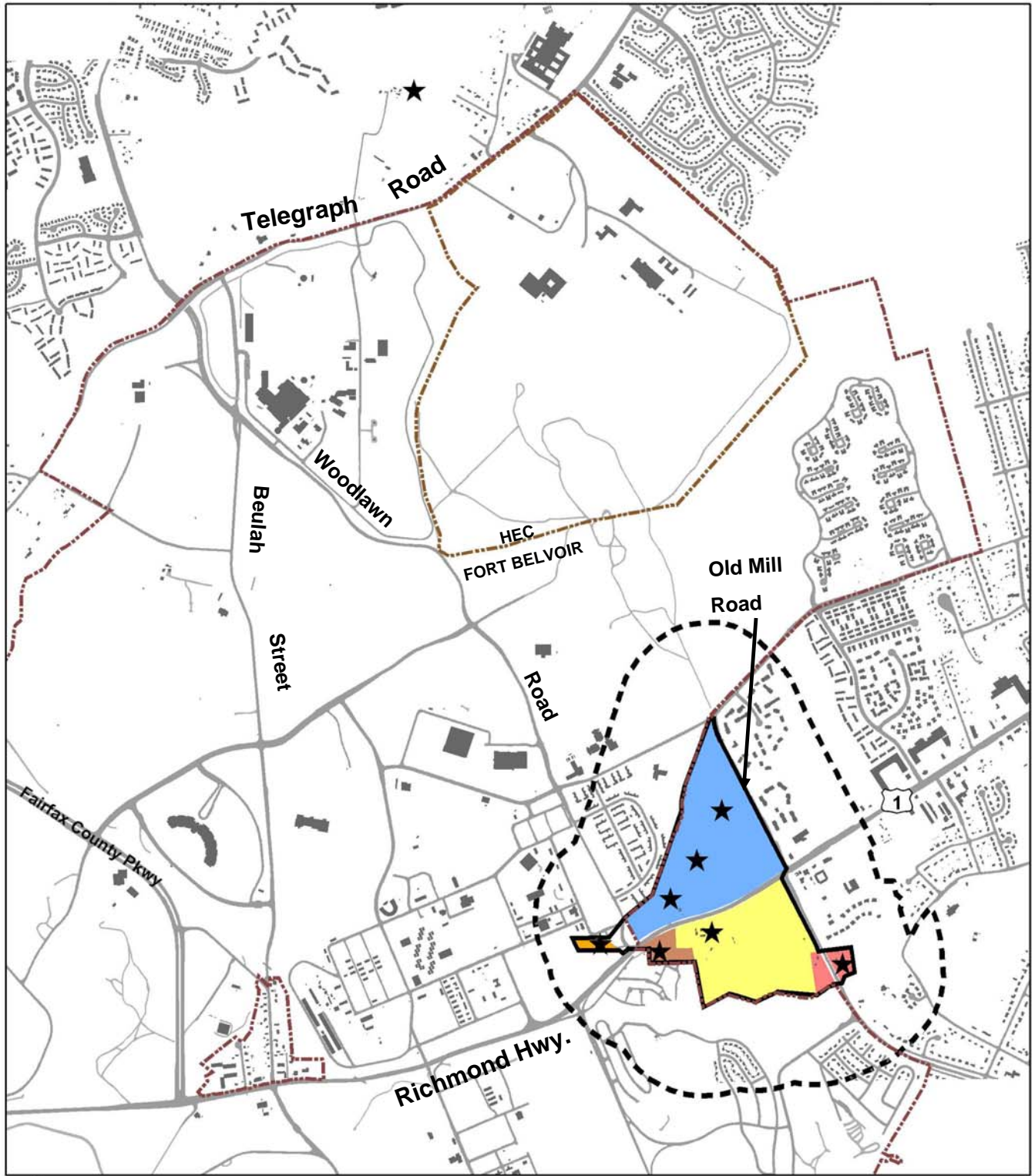
Several properties are associated with the Woodlawn Historic District and the immediate vicinity. The contiguous Woodlawn Historic District (029-5181) was determined eligible for listing in the NRHP in 2001. The District embraces a number of historic resources in the immediate vicinity, including:

1. *029-0056, Woodlawn Plantation* — This designation applies to the 1800s house, outbuildings, and landscaping associated with the Lewis family, relatives of George and Martha Washington. Since 1951, the National Trust for Historic Preservation has administered the 126-acre Woodlawn Plantation property, which includes two parcels, one on each side of U.S. Route 1. The property has multiple preservation-related designations, including listing in the NRHP in 1976. The parcel (opposite Woodlawn Stables) on U.S. Route 1 was designated as a NHL in 1998 and includes archaeological deposits designated as 44FX1146 (see below). The Woodlawn Stables parcel (off U.S. Route 1) is not part of the NHL designation. The entire NRHP-listed Woodlawn Plantation property, on both sides of U.S. Route 1, contributes to the Woodlawn Historic District.
2. *029-0058, Pope-Leighey House* — This designation applies to the single story home designed by Frank Lloyd Wright and moved to this location in 1964. It was individually listed in the NRHP in 1970 and while not itself a contributing property to the Woodlawn Historic District, it is situated within the woods of the Woodlawn Plantation and is entirely contained within the NHL property and historic district boundary.
3. *029-0062, Grand View House* — This designation applies to the single story dwelling constructed in the 1850s. It has not been individually evaluated for NRHP eligibility but is included within the boundaries of the NRHP-listed Woodlawn Plantation property (029-0056); in addition, it contributes to the Woodlawn NHL and the Woodlawn Historic District.
4. *029-0070, Woodlawn Baptist Church* — The early 1870s church burned and no longer exists; it was associated with a cemetery remaining on site, along with the modern church. The site has been recommended Not Eligible for individual listing in the NRHP, but is considered a contributing property to the Woodlawn Historic District.
5. *029-0172, Woodlawn Society of Friends Meeting House* — The Alexandria Monthly Meeting of the Religious Society of Friends at Woodlawn (Woodlawn Friends Meeting) Meeting House was constructed in the early 1850s and is associated with a horse stable and cemetery. It has been recommended Not Eligible for individual listing in the NRHP, but is considered a contributing property to the Woodlawn Historic District.²³
6. *029-0330, George Washington Grist Mill (State Historical Park)* — Listed on the NRHP in 2003, the property also contributes to the Woodlawn Historic District.

The district also includes a portion of Fort Belvoir between the Woodlawn Plantation NHL property and the Woodlawn Friends Meeting House. This parcel has not been individually inventoried in the DSS. Portions of the transportation routes within the contiguous District, namely U.S. Route 1 and Mount Vernon Memorial Highway, both operated and maintained by VDOT, are not contributing properties to the District.

In 1971 Fairfax County designated the Woodlawn Historic Overlay District around what is essentially the NRHP-eligible Woodlawn Historic District. The core of the overlay district includes the Woodlawn Plantation, the Pope-Leighey House, the Grand View House, the Woodlawn Friends Meeting House, and the George Washington Grist Mill; the Woodlawn Baptist Church property is not included in the core of the County overlay district but is within the district boundaries. As a feature typical of County overlay districts, an enveloping buffer

²³ The Woodlawn Friends Meeting are seeking re-evaluation of their property's eligibility status for listing in the NRHP as of May 30, 2006.

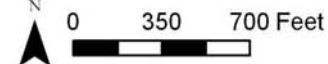
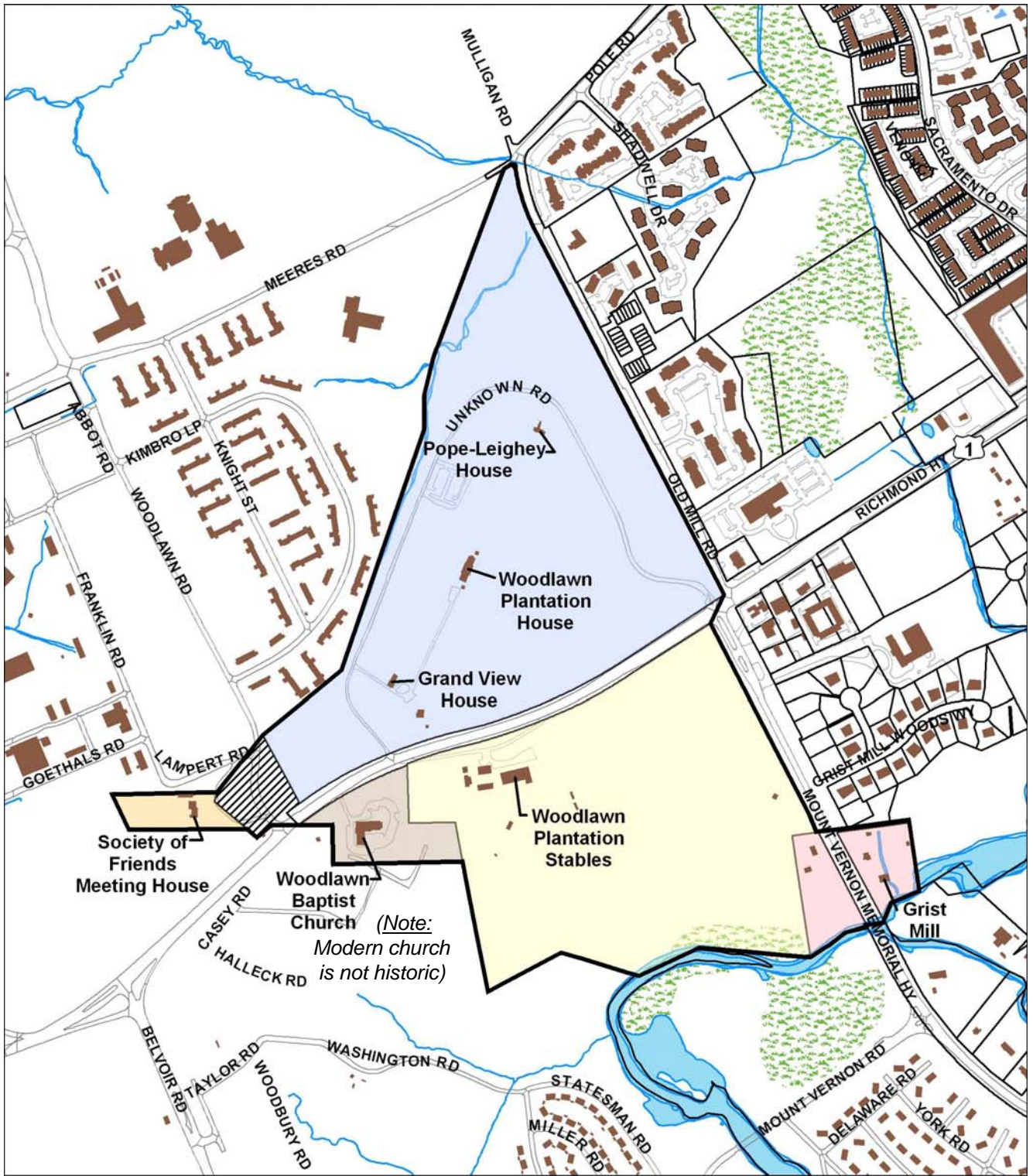


Legend

- Fort Belvoir/HEC Boundary
- Historic Sites
- Woodlawn Plantation House and Grounds (*National Historic Landmark)
- Woodlawn Plantation Stables and Grounds
- Woodlawn Baptist Church
- Society of Friends Meeting House
- George Washington's Grist Mill
- Woodlawn Historic Overlay District
- Woodlawn Historic District

Historic Resources

Figure 3-7



Legend

- Woodlawn Historic District
- Proposed Woodlawn Parcel Addition (Approximate)
- George Washington's Grist Mill
- Woodlawn Plantation House and Grounds (*National Historic Landmark)
- Woodlawn Plantation Stables and Grounds
- Woodlawn Baptist Church
- Society of Friends Meeting House

**Woodlawn
Historic District
Figure 3-8**

is included around the core properties of the district to provide development ordinances that protect the historic character of the core properties and their setting.

Five additional properties are within the NEPA study area and have no association with the Woodlawn Historic District or its contributing properties. One of these properties, U.S. Route 1 Bridge No. 1001 (029-0479), has been recommended Not Eligible for listing on the NRHP. Four of these properties have not been formally evaluated for NRHP eligibility, namely:

- 029-0269 – Single family residence (ca. 1930s) on Beulah Street.
- 029-0451 – Single family residence (ca. 1920s) on Telegraph Road.
- 029-0452 – Single family residence (ca. 1910s) on Telegraph Road.
- 029-5010 – Undefined bridge type associated with the operation of the Fort Belvoir Military Railroad.

3.3.3 Archaeological Resources

Review of the DSS records identified over 70 known archaeological sites in the overall study area, 24 that are potentially eligible for listing in the NRHP. These potentially eligible properties were identified both within and outside the boundaries of Fort Belvoir. Four of the sites contain exclusively prehistoric cultural materials from Archaic and Woodland contexts and eight are associated with the historic period. Nine sites contain archaeological materials from both prehistoric and historic period contexts. Cultural materials from historic sites represent late eighteenth century agricultural and industrial occupations to twentieth century domestic and military activities.

The 24 potentially eligible sites, for which no formal NRHP eligibility evaluations have been completed, are briefly described in the table below. Due to the sensitive nature of archaeological site location information and the protection of this information under the law, a location map is not included in the study. **Table 3-1** presents information on each site.

Table 3-1: Potentially Eligible NRHP Archeological Sites

Site Number	Comment
44FX0351	Historic period archaeological site associated with a 16-sided barn constructed by George Washington.
44FX0459	Multiple component site consisting of the Telegraph Road Cemetery (also known as Potter's Hill), historic-period archaeological deposits, and a limited prehistoric artifact assemblage. Historic deposits with good integrity appear to date from the first half of the nineteenth century. Prehistoric artifacts include two lithic flakes.
44FX0460	Historic period archaeological site comprised of a scatter of late 19th and 20th century domestic artifacts and brick and concrete structural remains.
44FX0461	Multiple component archaeological site consisting of a domestic agricultural occupation and military occupation. Trenches represent rifle pits associated with military activities on the reservation.
44FX0462	Historic period archaeological site comprised of a scatter of 19th and 20th century (and possible 18th century) domestic artifacts (namely ceramic wares) surrounding a stone and brick hearth.
44FX0463	Historic archaeological site comprising a surface scatter of ceramic fragments that may represent a nineteenth century domestic or agricultural occupation.
44FX0637	Prehistoric (probably Archaic period) archaeological site consisting of three lithic artifacts.
44FX0669	Historic archaeological site comprising an undefined brick-lined vertical shaft and

	associated brick fragments.
44FX0739	Multiple component site consisting of a historic cemetery and twentieth century agricultural debris. Prehistoric artifacts include two lithic flakes.
44FX1146	Historic period archaeological site associated with the eighteenth and nineteenth century occupation of the area now designated as Woodlawn Plantation (029-0056). This archaeological property is included in the NHL designation of Woodlawn.
44FX1211	Historic period site at the parcel on which rests the Woodlawn Society of Friends Meeting House. Grounds immediately around meeting house may require additional investigation.
44FX1212	Multiple component cultural resources site consisting of a cemetery and structure associated with the Woodlawn Baptist Church. Documented during HABS ²⁴ inventory and 1980s archaeological survey.
44FX1433	Historic archaeological site associated with twentieth century brick foundations.
44FX1589	Multiple component archaeological site consisting of prehistoric and nineteenth and twentieth century artifact assemblages.
44FX1815	Multiple component archaeological site consisting of a stone foundation, historic archaeological deposits, and a limited prehistoric lithic artifact assemblage. Historic deposits appear to date from the last quarter of the nineteenth century. Prehistoric artifacts include lithic flakes and other debitage.
44FX1904	A dense and diverse assemblage of prehistoric archaeological materials. In 2002, VDHR staff recommended this site potentially eligible.
44FX1905	Historic archaeological site probably associated with a twentieth century domestic occupation. A diverse artifact assemblage has been recovered from the site, and at least two surface features are visible. In 2002, VDHR staff recommended this site potentially eligible.
44FX1914	Prehistoric archaeological site comprised of lithic materials, including fire-cracked rock, cores and flakes.
44FX1941	Historic archaeological site probably associated with a twentieth century domestic occupation.
44FX1944	Prehistoric archaeological site comprised of lithic flaking debris.
44FX1945	Prehistoric Woodland archaeological site comprised of surface and subsurface lithic and ceramic materials.
44FX1946	Multiple component archaeological site consisting of a prehistoric lithic artifact assemblage and a historic-period artifact.
44FX1947	Historic archaeological site probably associated with a nineteenth to twentieth century agricultural occupation. Surface features include several poured concrete foundations, a possible septic tank, and historic landscaping elements.
44FX2262, George Washington's Gristmill	Multiple component archaeological site comprised of Middle Archaic prehistoric and late eighteenth to early nineteenth century artifact assemblages. Historic artifacts are associated with grain milling and associated domestic occupation of the site. It is unclear whether or not this archaeological component contributes to the Woodlawn Historic District which is listed on the NHRP.

3.4 Hazardous Substances

Hazardous materials can be encountered during the construction and operation of public projects. Examples of common hazardous materials include asbestos, lead-based paint, abandoned oil drums and certain organic compounds. Without proper handling, removal, and containment, these materials can pose dangers to human health and the environment.

²⁴ Historic American Building Survey (HABS). The HABS program documents architectural, engineering and industrial sites of historical significance. The National Park Service has overseen the program since 1933.

²⁶ U.S. Bureau of Census, 2000.

Identifying known and potential contamination prior to construction is important because it can substantially reduce the possibility of exposure to people and the environment. Regulated sites within the study area include demolition landfills, sanitary landfills and other regulated facilities.

Operational and demolition testing ranges have also been identified within the study area, on Fort Belvoir and HEC property. These areas were used as practice ranges in past years. Fort Belvoir is in the process of decommissioning the ranges in proximity to the project.

Hazardous waste sites are regulated by the Resource Conservation Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The project team used the services of Environmental Data Resources, Inc. (EDR) to conduct a search of available environmental records for the general study area in January 2005. The records search indicated one leaking underground storage tank (LUST), one underground storage tank (UST), and one leaking tank (LTANKS) site. In addition, 24 unmapped (orphan) sites were identified. Of the 24 orphan sites, two are identified as being located within Fort Belvoir, one in Woodlawn, six in Fairfax, and 15 in Alexandria.

3.5 Air Quality

Clean air is important to the health of the community and environment. Pollutants in the air can have negative effects on human health and cause harm to animals, plants, and materials. Emissions from cars, trucks, and buses are a major factor affecting air quality, particularly in urban areas.

Air quality in a region is measured using National Ambient Air Quality Standards (NAAQS) for different pollutants which are established by the EPA. Regions are designated as in "attainment" or "non-attainment" for different pollutants which are referred to as "criteria pollutants."

The Metropolitan Washington (MWCOG) region is designated as in attainment with National Ambient Air Quality Standards (NAAQS – see 40 CFR 50) for the criteria pollutants sulfur dioxide, (SO₂), nitrogen dioxide (NO₂), matter under ten microns in diameter (PM₁₀), and lead (Pb). See attainment status under 40 CFR 81. This study area also lies within a federally designated air quality attainment area for Carbon Monoxide (CO), in Fairfax County. The study area is within a federally designated air quality non-attainment area for Particulate Matter below 2.5 micrometers in diameter (PM_{2.5}) and is also in a moderate non-attainment area for ozone (O₃).

Measures to reduce ozone concentrations in the region are recommended in Virginia's *State Implementation Plan (SIP)* rather than at a project-specific level. The Connector Road project is included in the *2005 Update to the Financially Constrained Long-Range Transportation Plan for the National Capital Region* and the *FY 2006-2011 Transportation Improvement Program (TIP) for the Washington Metropolitan Region*. The project was also included in the analysis for the Air Quality Conformity Determination of the *2005 Long Range Plan*. Therefore, regional emissions of PM_{2.5} and ozone due to the project have previously been considered.

Federal conformity rules (40 CFR 93) and guidance have been established to help ensure that federal actions or approvals do not impede state or local agency plans to attain or maintain compliance with National Ambient Air Quality Standards (NAAQS). There are currently no EPA approved models or methodology available to analyze individual transportation projects (mobile source) for their potential to cause or contribute to PM_{2.5} and ozone concentrations.

3.6 Noise

Noise is sound that is perceived as unpleasant, unwanted, or disturbingly loud. Noise levels are a consideration in transportation projects because noise from construction activities and operation of a roadway can affect daily life. When a roadway is constructed or expanded to add vehicle capacity, noise levels generally increase, which can interfere with conversations, work and family activities, and sleep. Prolonged or heightened exposure to noise can also result in hearing loss.

In accordance with the Federal-Aid Highway Act of 1970, the Federal Highway Administration (FHWA) has established noise standards to protect public health and welfare. These standards include noise abatement criteria (NAC), which are noise levels that represent a balancing of desirable noise levels with achievable noise levels. NAC apply only to areas having regular human use and where lowered noise levels are desirable. In addition, NAC apply to the portion of the tract where the activity occurs. Noise standards established by the FHWA set a limit on traffic related noise levels, above which abatement must be considered. These noise limits are called the NAC and vary based on the types of activities at a particular site. **Table 3-2** below lists the FHWA NAC.

**Table 3-2: Federal Noise Abatement Criteria
Hourly A-Weighted Sound Level**

Activity Category	Hourly Noise Levels L _{eq} (h) dBA	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, play grounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	—	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR Part 772, FHWA.

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Noise can be stationary or transient, intermittent or continuous. Noise is measured in decibels (dB), with a weighting of sound wave frequencies to which the human ear is particularly sensitive (termed *A weighting*); denoted as dBA. Highway traffic noise is evaluated using an “equivalent noise level” (L_{eq}), which is a single-number representation of noise that varies over time (e.g. noise generated by a stream of differing vehicle types traveling at varying speeds). The L_{eq} contains the same amount of sound energy as the varying sound level over a specified period of time (e.g. one hour). The L_{eq} may be thought of as an average noise level.

Decibel units are logarithmic instead of linear. For instance, noise level changes of 2 to 3 dBA are barely perceptible to most people whereas a change of 5 dBA is readily perceived.

3.6.1 Traffic Noise

Traffic related noise impacts would occur when noise levels approach or exceed the NAC, or substantially exceed the existing noise levels. The Virginia Department of Transportation’s (VDOT) FHWA-approved *State Noise Abatement Policy* defines “approach” as a noise level that is 1 dBA less than the NAC and “substantial increase” is defined as 10 dBA or more. Noise abatement measures must be considered in areas where potential noise impacts are identified, though they are not mandatory. Noise abatement measures include noise barriers, alignments shifts, or truck restrictions. Noise abatement measures must be determined to be feasible and reasonable based on engineering, cost, and other considerations. In addition, citizen input regarding noise abatement measures must be obtained.

Typical sources of noise in the study area would generally include vehicle traffic, air traffic associated with airline approaches into Washington, D.C., urban noise, and industrial noise from a water treatment plant and steam facility south of the study area, among other sources. Specific noise sensitive areas (NSAs) in the study area include residences, historic properties, and churches, among others.

3.6.2 Noise Monitoring

Noise measurements were taken for this project to aid in identifying the existing noise environment within the project area. The locations where data was collected generally reflect:

- Sensitive receiver locations adjacent to the existing alignment. Noise levels were collected at these points to quantify current noise adjacent to the roadway.
- Locations where existing uses could be exposed to significant changes in noise levels for the proposed alternatives.

The validation exercise gives an indication of the accuracy of the model under the existing conditions and at the validation points. Vehicle mix and speed, additional ambient noises not included in the model (such as aircraft), etc. will vary depending upon the hour monitored vs. the hour modeled. When validating the TNM model it is common practice that if predicted and measured levels are within + or – 3 dBA of one another, this is an indication that the model is within the accepted level of accuracy. If the difference between the measured and predicted levels is greater than + or – 3 dBA, a careful examination of the field-measured and

predicted data would need to be undertaken to determine the reason(s) for this margin of error.

Adding a 2.5 dBA correction factor based on only a limited number of calibration locations (4) would not be statistically supported. Additionally, noise levels are predicted using the Peak Hourly Volume, adding another conservative factor of safety into the model.

Table 3-3 describes the locations and results of each of the monitoring sites.

Table 3-3: Peak-Hour Noise Monitoring Location Summary

Measurement Location	Description	Leq (dBA)
1	≈45 feet east of outside edge of nearest lane of Old Mill Road, near Oaks of Woodlawn Apartments.	56
2	≈30 feet east of outside edge of nearest lane of Old Mill Road, near Old Mill Gardens Condominiums.	58
3	≈33 feet east of outside edge of nearest lane of Old Mill Road, near Mount Vernon Church of Christ.	59
4	≈50 feet north of outside edge of nearest lane of Telegraph Road, near Hilltop Golf Club.	65
5	≈69 feet north of outside edge of nearest lane of Telegraph Road, in Arden Hills Subdivision.	66
6	Near intersection of Telegraph Road and Beulah Street, in Hilltop Field outfield.	65
7	In parking lot of Woodlawn Plantation/Pope Leighey House.	52
8	Near U.S. Route 1, on Woodlawn Baptist Church and Cemetery grounds.	61

3.6.3 Noise Sensitive Areas

Noise sensitive receptors are defined as any property (owner occupied, rented, or leased) where frequent exterior human use occurs and where a lowered noise level would be of benefit. Noise Sensitive Areas (NSAs) in the study area include residences, historic properties, sports activity fields, and churches, among others.

3.7 Infrastructure and Utilities

Public services and utilities can be affected by the planning and construction of transportation projects. Interruptions to these services can affect residents' and businesses work schedules, daily activities, emergency services, and other routine activities. It is therefore necessary to identify potential utility and other public services in the study which have the potential to be affected by the project.

The study area, as mentioned, is located in a highly developed area of metropolitan Washington, D.C. Major public roads, water, sewer, and stormwater facilities exist in many locations of the study area. Underground pipes for gas and various fiber optics cables also criss-cross the area. Fairfax County Water Authority provides potable water to the area.

Fairfax County provides sewer service to its citizens. Fort Belvoir operates and maintains its on-post sanitary sewer system, discharging to the Fairfax County system. The county's Noman M. Cole, Jr. Pollution Control Plant serves the Accotink, Pohick, Long Branch, Little Hunting and Dogue Creek drainage basins. This plant has a rating of 67 million gallons daily (MGD).

Washington Gas owns and operates natural gas distribution in the study area, including on Fort Belvoir and HEC. Electricity is provided by Dominion Virginia Power. There is a substation located near the eastern edge of HEC. There is a powerline corridor of large overhead powerlines along the boundary of HEC and the Hayfield subdivision.

3.8 Socioeconomics

3.8.1 Demographics

Fairfax County is the most populous County in the Commonwealth of Virginia. The population of the County in 2000 was 969,749 making up 14 percent of the population of Virginia.²⁶ The study area is primarily located within two county planning districts, the Mount Vernon and Lower Potomac Planning Districts. Fairfax County projects both to grow through 2025, to 106,000 persons and 100,300 persons, respectively.

Most of the study area lies within one census tract, 4219 (it includes Fort Belvoir and HEC). A map of census tracts in the general study area is presented in **Figure 3-9**. Census tracts primarily encompassed by the study area represent 26,419 persons.²⁷ Of the five census tracts evaluated in the study area, racial minorities²⁸ account for more than 25 percent of the population in four of them.²⁹ Fort Belvoir housing generally contains nearly 40 percent minority, compared to Fairfax County's nearly 22 percent. The reported Hispanic/Latino population comprises between 3.7 and 14.5 percent among the census tracts.

Populations age 65 and over are generally lower in the study area than Fairfax County. Only census tract 4212 has a higher percentage of seniors (13.2 percent) than County and Commonwealth averages (7.9 and 11.2 percent, respectively).

3.8.2 Income and Employment

The median household income in Fairfax County in 2003 was \$80,800, compared to \$52,776 statewide. For the census tracts in the study area, the median household income ranged from \$33,266 to \$98,259. Census tract 4219 has the lowest average household income of all the census tracts in the study area, while 4212 has the highest. The average household income at Fort Belvoir in 1999 was \$39,592, also lower than the County and state averages.

Census tract 4219 had the lowest median household income in the study area in 2000. Although the median average household income in tract 4219 is the lowest in the study area, it is not below the U.S. Department of Health and Human Services (HHS) poverty guidelines.

²⁷ The analysis excluded census tracts of the Accotink Village and any south of U.S. Route 1

²⁸ Includes identified in the Census as Black or African American, American Indian and Alaska Native, Asian, and Native Hawaiian and Other Pacific Islander

²⁹ Census tract #4212 total population of 2,053 has 12.3% racial minority.

Census tract 4219 has the highest percentage of individuals below the poverty level (8.1 percent), greater than both the state and County averages. Tract 4218 has the second highest poverty level rates at 5.8 percent, compared to 2.1 and 7.0 percent, respectively for the County and the Commonwealth.

The Virginia Employment Commission reported that in December 2004, Fairfax County had a total civilian labor force of 584,880 and employment in the county was 575,620, with an unemployment rate of 1.6 percent.³⁰

3.8.3 Housing Characteristics

Housing stock inside the project area includes multi-family, townhouse, and single family homes. In 2004 the Lower Potomac Planning District contained 6,891 housing units, of which 62% were single-family or townhouse units and the remainder were apartments. The median market value (2004) for single family houses in the Lower Potomac Planning District is \$381,813 and \$213,497 for townhouses. Fort Belvoir provides 2,070 multi-family and single family housing units for military personnel, as well as housing for 808 permanent enlisted personnel and 535 visiting personnel quarters. HEC has no housing units.

Nearby affordable housing, as designated by Fairfax County, in the project area is located at Old Mill Gardens on St. Gregory's Lane (48 units) near on Old Mill Road and Pole Road; and at Belvoir Plaza (45 units) on U.S. Route 1.

3.9 Community Facilities and Services

Access to recreational and community resources are a key contributor to the quality of life for a community. Identification of these facilities and services allows for evaluation of potential impacts in Chapter 4.

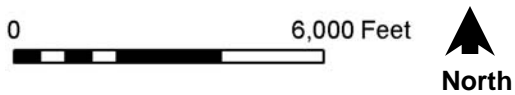
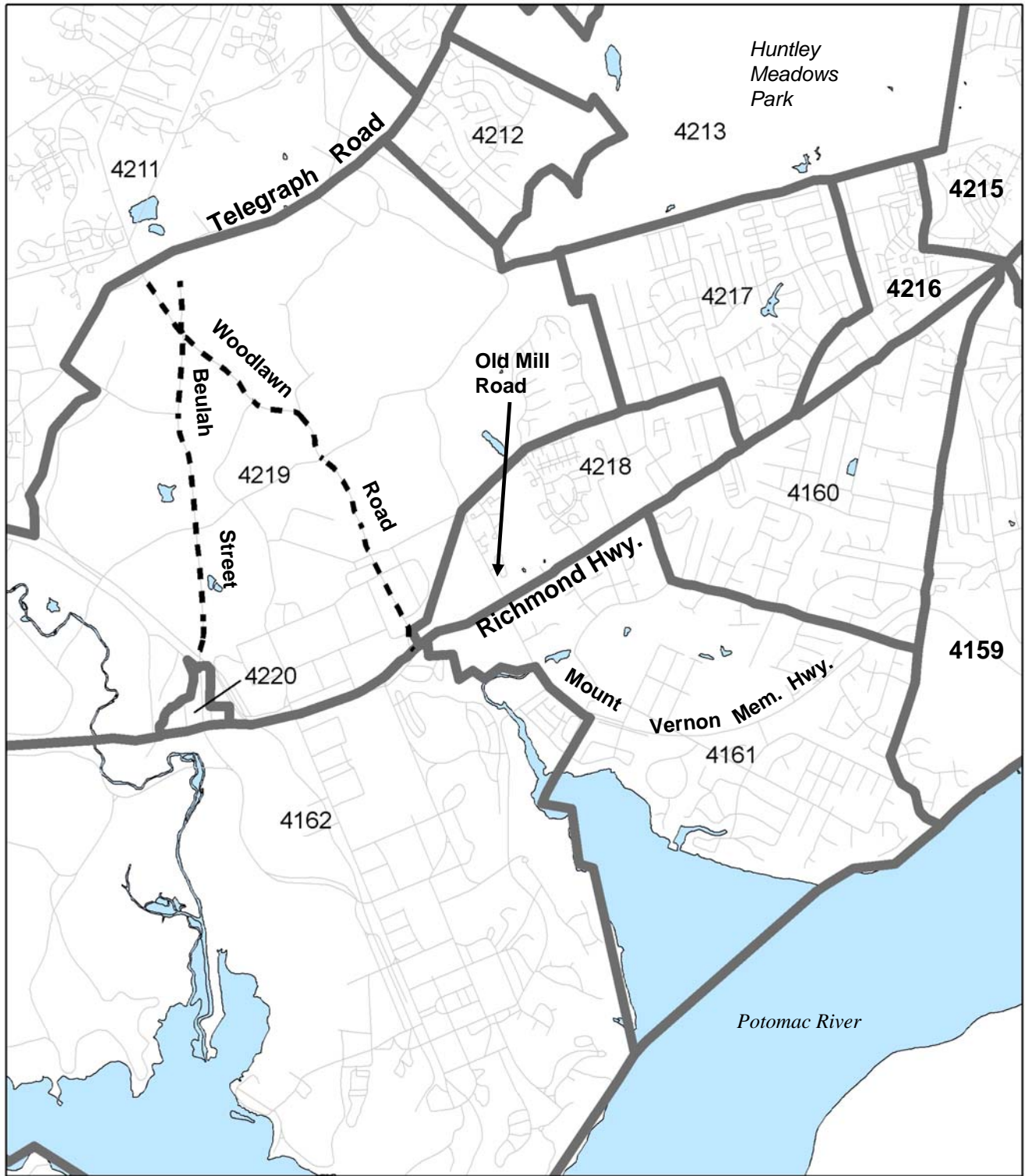
3.9.1 Facilities and Services

The study area is the location of a variety of community facilities and services including fire stations, public schools, cemeteries, churches, shopping centers and a post office.

Fairfax County fire stations closest to the study area include the Woodlawn Station (No. 37) on Lukens Lane, and the Kingstowne Station (No. 24) on Telegraph Road. Fort Belvoir operates several fire stations, including Fire Station No. 63 which is located in the study area on the North Post.

Public schools in closest proximity to the study area include Hayfield High School, Hayfield Middle School, and Hayfield Elementary School. These schools are clustered together at the northeast periphery of the study area on both sides of Telegraph Road. Combined, the Hayfield Schools cluster serves approximately 3,000 students, including approximately 600 students at the elementary school, 1,700 students at the high school, and 760 students at the middle school. The Fort Belvoir Elementary School is located on Meeres Road within Fort Belvoir, and serves approximately 1,300 students in kindergarten through 6th grade. Private schools in the study area include Agape Christian Academy off Mount Vernon Memorial Highway, which serves children pre-school through 6th grade.

³⁰ U.S. Army Garrison at Fort Belvoir, DCEETA EA, *op. cit.*, p. 3-40.



— Census Tract Boundaries

Study Area Census Tracts
Figure 3-9

There are numerous family and church cemeteries within the study area. These cemeteries are in close proximity to or within Fort Belvoir. The Triplett Family Cemetery is located on HEC. The Millan/Potter Family Cemetery is located within the boundaries of DCEETA on Fort Belvoir. Lacey's Hill Cemetery is also located within Fort Belvoir off Woodlawn Road on the North Post. Churches and church cemeteries within the study area include the Woodlawn United Methodist Church, Accotink United Methodist Church, Woodlawn Friends Meeting House and the Woodlawn Baptist Church. The Mount Vernon Church of Christ is located on Old Mill Road, in proximity to the intersection with U.S. Route 1.

Other public facilities in the southwest of the study area include several "strip" type shopping centers and the Engleside U.S. Post Office on U.S. Route 1.

Fort Belvoir provides on-Post community facilities that are not accessible to the general public, but are integral to the Army community. A community center on the North Post (on Gorgas Road) contains a post exchange, commissary, a Class IV (packaged beverage) store, convenience store, gas station, bank and the Main Post Chapel.

3.9.2 Parks and Recreation Facilities

Recreational facilities within the study area include two golf courses on Fort Belvoir (located on both the North and South Post) as well as athletic fields on the North Post. County owned public parks in the study area include Pole Road Park and the Berman-Gerber Tract (adjacent to Huntley Meadows Park) which serve environmental functions as wetlands and habitats, in addition to recreational uses. The Jackson Miles Abbott Wetland Refuge (JMAWR) offers fishing and nature trails to the public. The Grist Mill Park is associated with the Woodlawn Plantation Historic District. Both JMAWR and Huntley Meadows Park are discussed further in Section 3.2.3, Environmentally Sensitive Areas. A golf driving range is located on Telegraph Road.

3.10 Transportation and Traffic

3.10.1 Highway and Street Network

Commuter and longer distance non-commuter routes in this area of Fairfax County are along four main highways: Interstate 95, U.S. Route 1, Fairfax County Parkway (VA Route 7100) and Telegraph Road. Peak hour demands exceed capacity for much of the northern Virginia highway system, and this area of Fairfax County is no exception. See **Figure 3-10** for existing AM and PM peak-hour turning movement counts for several routes near the study area.³¹

Fort Belvoir, VDOT and others have conducted numerous studies and counts in the area. The references section lists sources of traffic data. For consistency, all of the major active studies have applied the transportation planning methodologies and models developed by Transcore, from its 2003 report for Fort Belvoir's Master Plan³².

³¹ The data is factored by 4.6 percent to account for changes in traffic volume from 2003 to 2005. The figure also notes key intersections relative to this report.

³² Fort Belvoir Comprehensive Master Plan Update, Technical Memorandum #1, Existing Transportation Conditions, Department of the Army, U.S. Army Garrison, Fort Belvoir, VA, prepared by Transcore, August 2003.

3.10.2 Traffic Analysis Methodology

Roadway networks include streets and their junctions, namely intersections or interchanges. An accepted measure to consider how well a road functions is to evaluate the Level of Service Analysis (LOS) of key signalized and unsignalized junctions. **Table 3-4** shows the criteria for LOS.

Table 3-4: Level-Of-Service Criteria for Intersections

Level of Service Designation	Signalized Intersection Criteria Average Total Delay (Seconds per Vehicle)	Unsignalized Intersection Criteria Average Total Delay (Seconds per Vehicle)
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80	35.1 to 50.0
F	> 80	> 50

Source: *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2000

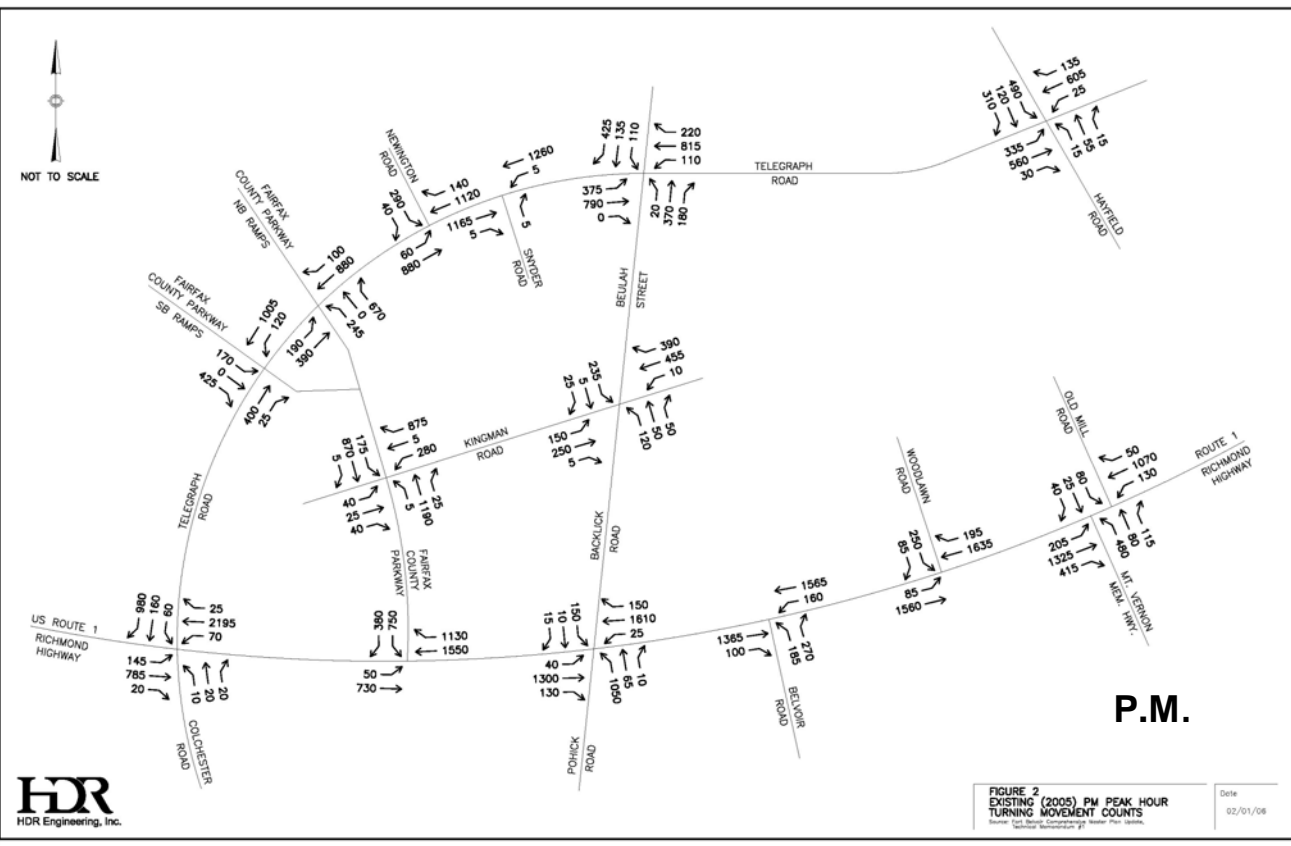
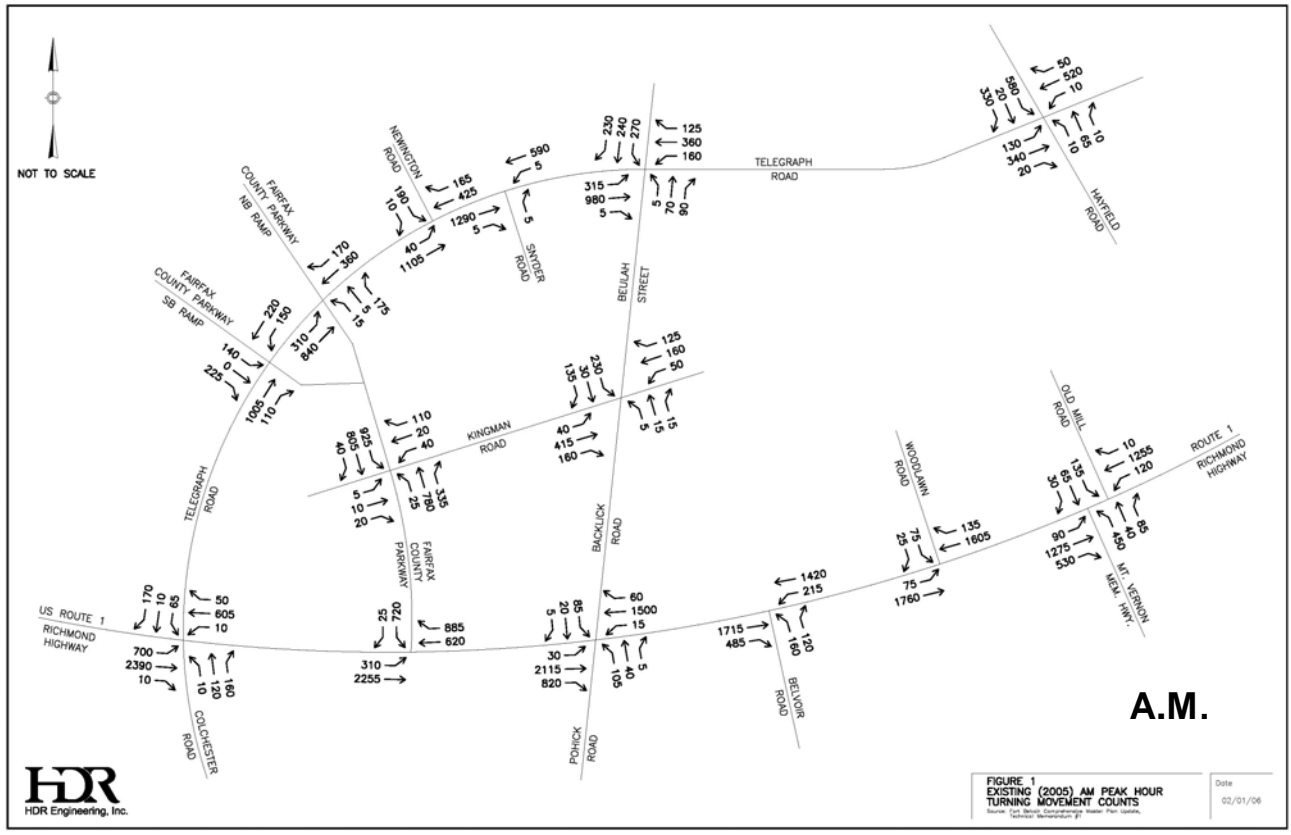
As illustrated by Table 5-1, a good LOS (“A” designation) consists of minimal delays, while a poor LOS (“F” designation) consists of extended delays. Delays can be correlated to the ratio between traffic volume and capacity. For example, if the volume of traffic approaching an intersection is greater than its capacity for that volume of traffic, the end result is a poor LOS. Conversely, if the volume of traffic approaching an intersection is much less than its capacity, the end result is a good LOS.³³

Traffic engineers identified 14 intersections which define the likely impacted area of the proposed Connector Road. As noted in the project Purpose and Need, motorists have no opportunity to travel between Telegraph Road and U.S. Route 1 except via the Fairfax County Parkway to the south or Kings Highway to the north. These routings can add up to five miles to current trips.

The intersections selected for analysis are generally within a triangle formed by Telegraph Road, U.S. Route 1 (Richmond Highway) and the proposed Connector Road. South and west of the study area, there are several decision points for motorists to seek options to travel between Telegraph Road and U.S. Route 1, and the analysis captures the possible changes. North and east there are no practicable alternatives until Kings Highway (which

³³ At signalized intersections, capacity is based on the amount of green time each approach receives. If the amount of green time is sufficient, then the capacity will process the volume of traffic and will result in a favorable LOS. If the amount of green time is insufficient, then the volume will begin to exceed the capacity and result in an unfavorable LOS.

At unsignalized intersections, capacity is based on acceptable gaps (i.e. an amount of time between vehicles) which provide enough time for each vehicle to commence its intended movement. Acceptable gaps are those gaps that are long enough to make the motorist comfortable with the intended movement.



**Existing (2005) Peak-Hour
Volumes**

Figure 3-10

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becomes Telegraph Road) and U.S. Route 1 meet approximately 5 miles from the study area, which is too far to expect a significant impact from a local connector road.

3.10.3 Existing Traffic Conditions

Using HCM methodologies, traffic engineers applied a software package called Synchro (Build 612) to evaluate the 14 intersections. Except for the intersection of Kingman and Beulah, HDR obtained existing signal timing and lane controls.³⁴ **Table 3-5** and **3-6** present the LOS results for signalized and un-signalized intersections. Delay is defined as the number of seconds of delay per vehicle.

Table 3-5: Existing Level of Service Results Signalized Intersection Analysis

SIGNALIZED INTERSECTION	AM		PM	
	DELAY	LOS	DELAY	LOS
Route 1 @ Telegraph Rd	35.0	D	78.7	E
Route 1 @ Fairfax County Pkwy	27.0	C	32.3	C
Route 1 @ Backlick Rd / Pohick Rd	23.7	C	91.2	F
Route 1 @ Belvoir Rd	18.8	B	13.0	B
Route 1 @ Woodlawn Rd	7.6	A	11.7	B
Route 1 @ Old Mill Rd / Mt Vernon Mem Hwy / Woodlawn Plantation	69.4	E	70.6	E
Fairfax County Pkwy @ Kingman Rd	25.7	C	59.0	E
Kingman Rd @ Beulah St	8.2	A	6.8	A
Telegraph Rd @ Fairfax County Pkwy SB Ramp	16.6	B	18.7	B
Telegraph Rd @ Fairfax County Pkwy NB Ramp	14.6	B	66.5	E
Telegraph Rd @ Newington Rd	7.7	A	15.5	B
Telegraph Rd @ Beulah St	33.5	C	32.5	C
Telegraph Rd @ Hayfield Rd	37.5	D	48.0	D

Table 3-6: Existing Level of Service Results Unsignalized Intersection Analysis

Unsignalized Intersection	AM		PM	
	DELAY	LOS	DELAY	LOS
Telegraph Rd @ Snyder Rd:				
WB Left	10.9	B	9.7	A
NB Right	11.2	B	10.5	B

³⁴ VDOT supplied HDR with geometric data and signal timings for each of the intersections, except for that of Kingman Road and Beulah Street. Contacts with the Fort Belvoir planning or consultant personnel did not yield information on that intersection. However, because this location does not impact the general public, HDR's applied assumptions for this on-Fort location should be suitable. HDR verified VDOT data using the 2002 Urban Areas Aerial Photographs published by the USGS and distributed by Terraserver-usa.com.

During the AM peak hour all intersections operate at LOS C or better except for two intersections: U.S. Route 1 at Telegraph Road (LOS D) and the slightly-offset Old Mill/Mt. Vernon Memorial Highway/Route 1 intersection (LOS E). During the PM peak hour five of the key intersections operate at or below LOS E.

3.10.4 Crash Information

Crash rates are higher on U.S. Route 1 and Telegraph Road than they are on the other roadways within the study area. These two roadways also have crash rates greater than the statewide average rates. The other roadways discussed within the study generally have rates lower than the state wide average rates.

3.11 Energy

Specific factors affecting energy use include the number and type of vehicles using a facility and their fuel consumption, total distance traveled, the number of stops and starts required on the facility, sudden acceleration/deceleration, congestion and grade steepness.

Changes in energy use, including fuel consumption, have occurred due to the closure of Woodlawn Road and Beulah Street. The closing of public access through Fort Belvoir have caused vehicles to deviate to more circuitous routes. Route deviations affect LOS and Vehicles Miles Traveled (VMT) by diverting traffic to other roads.

4. IMPACTS OF THE PROPOSED ACTION

This chapter summarizes the beneficial and adverse social, economic, and natural environmental effects of the alternatives under consideration for this project. The alternatives are the No-Build and Preferred (Build) Alternative, Alternative 4CR. The chapter was developed with guidance from FHWA Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*. Particular focus is given to cultural resources, natural resources, noise effects, and transportation. The No Build Alternative would be a continuance of existing conditions, and is assumed to have no impact in the study area except for increased traffic congestion.

The Preferred Alternative was evaluated for impacts by combining detailed Geographic Information System (GIS)¹ and field review data with preliminary engineering information. Applying design criteria noted in Chapter 2, engineers and scientists estimated impacts for the Preferred Alternative. For NEPA purposes, calculations for direct impacts extended to the estimated limits of cut and fill.²

This chapter is organized similar to Chapter 3. Sections 4.1 through 4.10 address the impacts on specific resources. Sections 4.11 through 4.17 address antiterrorism/force protection requirements, cumulative impacts, unavoidable adverse impacts, mitigation measures of impacts, the relationship between local short-term uses of the environment and the enhancement of long-term productivity, and irreversible and irretrievable commitments of resources.

4.1 Land Use, Plans, Right-of-Way, and the Visual Environment

4.1.1 Land Use

4.1.1.1 Existing Land Use

The majority of land under the Preferred Alternative is undeveloped and wooded. The portion of the Preferred Alternative on a new location, approximately 1.5 miles, is on Fort Belvoir and HEC property. The remainder of the build alternative ties-in to existing roadways at both termini; each of Old Mill Road and Telegraph Road would be widened. Of the federal property, most land impacted by the Preferred Alternative currently consists of second growth woods, criss-crossed by some utilities. Near the intersection of Mulligan and Kingman Roads, the Preferred Alternative would be adjacent to an approximately 500 X 1,500 foot-long grass-capped landfill (SWMU A-07a). The alignment was purposefully placed between that landfill and a smaller one (SWMU A-25) in order to avoid impacts to the Jackson Miles

¹ Fairfax County and Fort Belvoir supplied GIS data

² Acreage calculations and direct impacts for land use and natural resources impacts assumed the limit of cut-and-fill (LOC) for the main alignment (on new location). Right-of-way limits proportionately are less, estimated to extend approximately 13 feet beyond the outside edges of pavement except as noted; much of the side slope is assumed to be contained within construction easement.

Abbott Wetland Refuge (JMAWR). On Fort Belvoir and HEC properties the Preferred Alternative avoids traversing any existing internally fenced area, the entirety of Fort Belvoir and HEC property boundaries are considered as special security zones requiring authorized access.

The Preferred Alternative avoids splitting any residential community. It would widen Old Mill Road, taking land from the Woodlawn Plantation woods, and not from the medium-density housing on the residential side of the road (opposite Woodlawn Plantation). It would widen Telegraph Road along a section already designated by Fairfax County for widening, and for which most of the land has been dedicated. The Preferred Alternative is partially contained within the County's designated Woodlawn Historic Overlay District. No change to the land uses occurring along U.S. Route 1, Mount Vernon Memorial Highway, or Telegraph Road is expected under either the Build or No Build alternative

As a replacement roadway with no new access (other than potential emergency egress use by HEC), no increased or altered land use is expected.

4.1.1.2 Planned Land Use

The Preferred Alternative is consistent with Fairfax County's adopted 2003 *Comprehensive Plan*. That Comprehensive Plan recommended a 2-lane facility to be constructed in the general location of the Preferred Alternative, connecting Telegraph Road to Old Mill Road; however, Beulah Street and Woodlawn Road through the Post were not only shown as open to the general public but also shown to be widened to 4-lanes. Widening of Telegraph Road between Beulah Street and Hayfield Road is also included in the plan.

As noted in Chapter 3, the County is in the process of revising the *Transportation Component* of its Comprehensive Plan.³ Instead of a 2-lane route, it identifies a 4-lane facility extending from Old Mill Road to Telegraph Road. The Preferred Alternative is within the corridor identified in that proposed plan revision. The plan continues to identify widening of Telegraph Road in the study area to 4-lanes.

A corridor similar to the Preferred Alternative is contained in Fort Belvoir's draft *Long Range Component* of its Master Plan for the North Post.⁴ The Preferred Alternative is consistent with development plans for Fort Belvoir. As a result of the Base Realignment and Closure (BRAC) Commission findings and approved recommendations in 2005,⁵ Fort Belvoir is engaged in new master planning effort, which will reflect a 4-lane Connector Road generally along the alignment of the Preferred Alternative.

The Preferred Alternative is not inconsistent with use of HEC property. The Preferred Alternative passes through land that HEC defined as open space in their 1997 Master Plan.⁶ HEC is currently evaluating its Master Plan components.

³ The draft version is under public review; public meetings were conducted in the fall 2005; the County Council is expected to review and adopt the update in Summer 2006.

⁴ *Op. cit.*, unpublished draft, 2005. The Fort Belvoir draft proposed land use plan places housing to the west of the Connector Road and on the western portion of the HEC property; this is not consistent with HEC plans.

⁵ The Defense Base Closure and Realignment Act of 1990, as amended, provided for approval of the subsequent federal real property screening. Since Congress chose not to enact a joint resolution of disapproval, the BRAC recommendations became final on November 9, 2005.

⁶ While proposals to relocate the Headquarters of the U.S. Army Corps of Engineers (HQUSACE) from downtown Washington, D.C. to HEC had been made in prior years, the current policy is to maintain the headquarters function downtown. The Preferred Alignment would not preclude construction of a headquarters facility.

Neither the Preferred nor No Build alternative affects planned land use; however, the No Build is inconsistent with adopted plans for the area while the Preferred Alternative is consistent with them.

4.1.2 Right-of-Way and Relocation

FHWA is required to comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, for any right-of-way acquisition or relocation assistance. The majority of the Right-of-Way (ROW) for the Preferred Alternative is located on federal property, either Fort Belvoir or HEC. Approximately 16.5 and 17.4 acres from Fort Belvoir and HEC, respectively, will be required for the Preferred Alternative. For its property, the Army⁷ will arrange a formal land use agreement⁸ with the Virginia Department of Transportation (VDOT). Additionally, the Army will transfer approximately 2.5 acres of land as mitigation for a like amount anticipated to be taken from Woodlawn Plantation property (See Cultural Resources section for more description of this action).

Privately owned property would be required along Telegraph Road, Old Mill Road and U.S. Route 1 for the Preferred Alternative. No complete tax parcel would be required; strips from certain parcels along existing VDOT ROW likely would be needed under the Preferred Alternative. No new ROW is expected along Mt. Vernon Memorial Highway. Detailed acreage requirements would be determined following design and subsequent property surveys. **Table 4-1** provides a summary of likely ROW requirements for the Preferred Alternative.

Table 4-1: Estimated Right-of-Way Impacts^a

Type	Number of Properties Effected	Number of Buildings Removed	Total Area Taken (Acres)	
			No Build	Alt 4CR
Fort Belvoir ^{abc}	1	0	0	19.4
HEC ^{ac}	1	0	0	20.4
Woodlawn Plantation ^{abd}	1	0	0	2.6
Residential Properties	3 ^e	0	0	1.0
Business Properties	5 ^f	0	0	2.0
County Services	1	0	0	0.3
TOTAL	12	0	0	45.7

NOTES:

- ^a Per Fairfax County recorded property ownership data; excludes construction easements.
- ^b Excludes compensation acreage at Woodlawn Gate.
- ^c Federal lands for roadway may be in the form of a perpetual easement to VDOT rather than direct land transfer.
- ^d To be adjusted based on anticipated Memorandum of Agreement.
- ^e Two residential owners and one community association, along Telegraph Road
- ^f All business properties belong to the same owner, along Telegraph Road

⁷ The land is owned by the United States of America and is under the jurisdiction of the Department of the Army.
⁸ The mechanism of land transfer from Fort Belvoir or HEC is expected to be a perpetual easement rather than direct conveyance of ownership.

Some additional land would be required for construction easements, for example for creating side slopes. Relocation impacts are calculated based upon the anticipated direct impacts to buildings typically occupied by residents or business entities. Neither alternative requires residential structures or businesses. Minor changes in access to some properties may occur under the Preferred Alternative. As long as the minimum of right-in-right-out ingress and egress exists, the Commonwealth of Virginia requires no compensation consideration.

4.1.3 Visual Environment

Visual impact concerns include views from and to the project at the reconfigured intersection at the southern terminus, the northern terminus, and the 4-lane facility through the undeveloped Fort Belvoir/HEC property.

Title 23 of the U.S. Code, Section 109(h) and the U.S. Department of Transportation Order 5610.1C, Revised Attachment 2, require FHWA to consider the design quality in transportation projects, which involve public use areas, such as historic districts. Impacts to the visual environment by the Preferred Alternative were evaluated with several methods, including:

- Field review;
- Analysis of preliminary engineering horizontal and vertical alignments; and
- Landscaping opportunities for the southern terminus, developed from coordination efforts during the study.

4.1.3.1 Southern Terminus Area

The greatest visual change to the environment with the Preferred Alternative is that it would align the currently awkward and offset intersection of U.S. Route 1, Mount Vernon Memorial Highway (VA Route 635), Woodlawn Plantation entrance, and Old Mill Road. **Figure 4-1** presents the concept of the southern terminus. Mount Vernon Memorial Highway would generally align with the widened Old Mill Road rather than with the entrance to Woodlawn Plantation; the approach of Old Mill Road towards U.S. Route 1 would align with Mount Vernon Memorial Highway rather than a gas station. Regardless of the roadway widenings, an overall aesthetic benefit of the intersection alignment would be the noticeable reduction of signage and traffic signal clutter.

The Preferred Alternative would relocate the current entrance drive to Woodlawn Plantation, approximately 700' south along U.S. Route 1. (The existing colonial revival guardhouse would be removed to the new entrance.) The new entrance drive location offers a more visually unified connection between the manor side of the property and the stables side of the property. Rustic fencing already offers a unifying element for the Woodlawn Plantation property on both sides of U.S. Route 1; this type of fencing would be retained.

Mount Vernon Memorial Highway would remain largely visually unchanged with the Preferred Alternative. The approach to the intersection with U.S. Route 1 would be shifted towards the businesses opposite the Woodlawn stables property. This allows more green space along the Woodlawn Plantation stable property.

The Preferred Alternative includes construction of a proposed extension of the Potomac Heritage National Scenic Trail. This would be a shared-use pedestrian/bicycle facility, likely to be constructed along two sides of the perimeter of the Woodlawn stables property. Along



Southern Terminus Concept

Figure 4-1

Mount Vernon Memorial Highway, the trail would be placed on the “reclaimed” roadway area; along U.S. Route 1, it would be on easement on Woodlawn Plantation property. Initial landscape proposals place the trail inside of parallel rustic fencing. (Section 4.11 discusses the Potomac Heritage Trail in more detail.) For the shared use path proposed along the Old Mill Road side of the Woodlawn Plantation property, users would enjoy a meandering path in the woods; tree cutting would be minimized wherever possible.

Old Mill Road would convert from a 2-lane to a 4-lane facility with a median/center turn lane. The visual effect of a forested edge along the Woodlawn Plantation NHL side of the road would remain, but the Preferred Alternative would clear approximately 20 feet of woods for the new roadway. Because it is important to protect the vistas and rural image of and to the Woodlawn Plantation, additional plantings (concentrating on evergreens) would occur to ensure a natural visual screening effect. The sidewalk on the residential side of Old Mill Road would remain, as would the entrance driveways.

Vistas of U.S. Route 1 (as described in Chapter 3) to and from grand view at the manor house of Woodlawn Plantation as well as the Woodlawn stables would remain largely the same under the Preferred Alternative, except for the new driveway entrance to the plantation site. Natural elevations, trees and other vegetation would continue to obscure U.S. Route 1 from Woodlawn Plantation, so that the additional left turn lane and median would likely be unseen from the manor house.

Vistas from U.S. Route 1 approaching Woodlawn Road would be improved under the Preferred Alternative. Once the Army closes its entrance at Woodlawn gate, the large white security tent and military checkpoint between the Woodlawn Friends Meeting property and the Woodlawn Plantation will be removed and either VDOT or Fairfax County would maintain the roadway to Fort Belvoir’s property line. It is expected that the traffic signal would remain.

For the Preferred Alternative, where possible, natural vegetation would be placed in medians. Because this area is located in an historic district, special treatments of crosswalks, medians, and signs would occur; details will be considered during design. Continued coordination would occur prior to construction with the Fairfax County Architectural Review Board and Woodlawn Plantation. (See also Section 4.3, Cultural Resources.)

4.1.3.2 Northern Terminus Area

The section of Telegraph Road between Beulah Street and Hayfield Road is to be widened regardless of whether the Preferred Alternative is selected or constructed. This section of Telegraph Road would ultimately resemble the 4-lane section of Telegraph Road from Beulah Street to the Fairfax County Parkway, including a 16 foot grassed median. The Preferred Alternative assumes that typical section along Telegraph Road (by others), but adds turning lanes necessary for the intersection with the new connector road. The new intersection would contrast with what has been a 2-lane Telegraph Road. Ameliorating the visual impact of the Connector Road, however, are recent and planned development activities. For example, opposite Fort Belvoir, the developer of a recent housing development added an acceleration lane from the development entrance to Piney Run; on the Post side, the DCEETA is adding a lane (deceleration and acceleration) on Telegraph Road at a new entrance to its new remote delivery facility.⁹ Additionally on Telegraph Road,

⁹ See *Environmental Assessment and Finding of No Significant Effect* for the Remote Delivery Facility, October 2005.

the owner of the golf driving range south of Piney Run plans to add deceleration and acceleration lane at its entrance.

The preliminary engineering plans for Preferred Alternative included showing the widened Telegraph Road south and north of the new intersection. To the south, the road widening would extend to the current 4-lane section near Beulah Street. To the north, the road widening would extend to the already-widened pavement section beyond the entrance to HEC, approximately 900 feet north of the intersection of Old Telegraph Road.

Bicycle lanes may be included on the widened Telegraph Road, with pedestrian facilities accommodated either by sidewalk or shared-use paths, or both.

The Preferred Alternative could also alter the visual environment not only by the additional lanes, Connector Road intersection, and medians along Telegraph Road, but also by the possible introduction of a noise wall¹⁰. The affected subdivision currently has a 6-foot high wooden fence along its boundary with Telegraph Road. The noise wall would need to be 11 feet high by 300 feet long in order to ameliorate traffic noise. (See Noise, Section 4.6.) Decisions regarding a sound barrier would involve both resident and VDOT review later during the design phase. The noise impacts result from the planned widening of Telegraph Road.

4.1.3.3 Mainline Component

For the portion of the project interior to Fort Belvoir and HEC, the Preferred Alternative would provide drivers with a visual environment of undeveloped, largely forested land along a pleasantly curving 4-lane roadway. The roadway would not provide dramatic or uninterrupted vistas.

The Preferred Alternative offers an anticipated median treatment of grass and trees, and shrubs as permitted by VDOT sight-distance and clear zone requirements. Side slopes would be re-vegetated. For the shared use path proposed along the length of the Connector Road, bicyclists and pedestrians would enjoy the new connection between Pole Road and Telegraph Road, and the opportunity to connect to trails to the Jackson Miles Abbott Wetland Refuge, Woodlawn Plantation, the Grist Mill and other locations.

4.2 Natural Resources

4.2.1 Physiographic Impacts

The Preferred Alternative is not expected to affect the geological formations or geomorphology in the site's vicinity. The Preferred Alternative would not require deep excavation, but it would require grading of approximately 1.5 miles of undeveloped rolling terrain, as well as widening of existing roadway facilities. Grading at the edges of the roadway slopes would taper to match to existing contours.

¹⁰ Any mitigation measures for noise impacts, such as noise walls, will require further acoustic analysis and public outreach efforts. Virginia Department of Transportation, *Noise Walls - Frequently Asked Questions*, <http://www.virginiadot.org/projects/pr-faq-noise-walls.asp>

Through Fort Belvoir and HEC, the Preferred Alternative generally follows the contours of a ridgeline; this offers a more uniform profile, lessens the amount of cut and fill and the amount of runoff flowing over impervious surface.

The Preferred Alternative traverses areas with problem soils ("Class A Soils" as defined by Fairfax County). These soil conditions are most predominant in the northern section of the alignment. Fairfax County has specific requirements¹¹ for construction activities on such soils and subsoils, developed from experience with foundation support, slope stability, and permeability. A detailed geotechnical engineering report will be prepared during design. The geotechnical investigation will analyze the specific soil and subsurface conditions; engineers will then render recommendations. Examples of measures to be considered for design and construction within such soil groupings include: removal and replacement of the soil, mixing of additional substances (such as lime or bentonite), placement of geotextile fabrics, as well as following applicable erosion and sedimentation control practices.

4.2.2 Water Resources

The U.S. Army Corps of Engineers (USACE) regulates activities affecting waters of the United States (streams, wetlands and other generally defined aquatic habitats) and navigable waters pursuant to Section 404 of the Clean Water Act of 1977, as amended, and Section 10 of the Rivers and Harbors Act of 1899, respectively. There are no navigable waters in the study area subject to jurisdiction under Section 10 of the Rivers and Harbors Act.

The Virginia Department of Environmental Quality (DEQ) administers the Virginia Water Protection (VWP) permit program regulation (9 VAC 25-210-10), Section 401 of the Clean Water Act, and the State Water Control Law for activities affecting jurisdictional wetlands, streams, and other waters.

Subsurface and surface water resources are protected by the EPA pursuant to the federal Safe Drinking Water Act of 1974, as amended in 1986 and 1996 and include all public drinking water systems and reservoirs, lakes, aquifers, springs, groundwater, and wellhead protection areas, with especial emphasis on EPA-designated Sole Source Aquifers (SSAs). The Preferred Alternative crosses no designated SSAs.

The Wellhead Protection (WHP) Program protecting underground-based sources of drinking water was established in 1986 by the Safe Drinking Water Act amendments. The Preferred Alternative crosses no designated wellhead protection areas.

4.2.2.1 Stream Impacts

The Preferred Alternative has four stream crossings, all within the Dogue Creek watershed. In total 1,110 linear feet would be crossed by the Preferred Alternative, including 760 linear feet of Piney Run. The Preferred Alternative does not impact the Accotink Creek Watershed. Potential impacts to the streams may include changes in flow volume and velocity, water quality reduction from runoff, and reduced habitat quality due to piping or placing culverts. Because the Preferred Alternative generally follows the ridges and maintains a much higher elevation than the streams, expected impacts have been reduced. Proper erosion and sedimentation control measures would also be implemented to minimize the permanent

¹¹ See geotechnical guidelines in Fairfax County Public Facilities Manual (PFM, section 4-0301).

impacts to streams. Temporary impacts may also be incurred during construction from runoff and erosion and sedimentation.

Telegraph Road currently crosses over Piney Run, currently carried by culvert to the opposite side. This 2-lane crossing would be widened to approximately 6-lanes. Proposed preliminary design of the Preferred Alternative assumes the stream will be bridged at this location to carry the widened roadway. The improved hydraulic capacity should restore and enhance stream flow.¹² The Preferred Alternative crosses Piney Run approximately 1,500 feet east of Telegraph Road. Current design assumes a bridge at this location, as well.¹³ Placement of impediments such as retaining walls or bridge pilings in streams could cause impacts to stream flow; preliminary design for the Preferred Alternative avoids such placement. The alignment also crosses an unnamed tributary of Dogue Creek near Pole Road, and a small unnamed tributary of Dogue Creek near the current entrance to Woodlawn Plantation. The former would be placed in a box culvert, the latter would be piped.

Water quality impacts to the streams will be minimized by requiring Best Management Practices (BMPs) consistent with federal, state, and local regulations. Temporary impacts during construction will be minimized by requiring that all flow in the streams be maintained in accordance with VDOT design standards and applicable permit requirements. Impacts to streams from contaminants such as salting/sanding, road spills, and other road runoff could occur along the replacement roadway.

4.2.2.2 Stream Mitigation

The Preferred Alternative has been aligned to minimize the number of stream crossings. An additional stream impact minimization technique is to cross at a perpendicular angle in order to present the shortest distance across the water body. The alignment of the Preferred Alternative utilizes perpendicular crossings to the extent practicable. Another means of reducing impacts is to span the stream entirely, namely with a bridge. The Preferred Alternative will span Piney Run in two locations; no piers would be placed in the stream bed. During design, further evaluation of stream flows will be considered to avoid streambank and riparian impacts. An often-acceptable practice for smaller stream crossings is to place the stream in a culvert. A mitigation feature that would be employed for culverts is to countersink them. This technique would be used for small drainage ways along the Preferred Alternative. If multiple culverts are used at one location, providing a low-flow culvert is a mitigation measure to maintain natural stream flow, which provides for movement of aquatic life.

Coordination with Fairfax County and Fort Belvoir environmental personnel will occur during design to determine appropriate minimum and storm-flow conditions for crossings of Piney Run. Evidence of beavers upstream will also be factored into the qualitative analysis. Design of the bridges shall include measures to minimize scour of the stream bed and stream bank. To mitigate for water quality impacts, drainage pipes will be placed on the bridges to collect and filter the first one-half inch of rainfall.

¹² A preliminary hydrologic and hydraulic analysis indicates that a 8 feet wide by 6 feet high box culvert is needed if a bridge is not used.

¹³ A preliminary hydrologic and hydraulic analysis indicates the need for two 12 feet wide by 10 feet high box culverts if a bridge is not used.

4.2.2.3 Groundwater Impacts

The Preferred Alternative will increase impervious surface area by approximately 40 acres. This could impact groundwater by reducing infiltration of surface water through soils to the water table, and by increasing the pollution from runoff. FHWA will include design features which employ low-impact techniques for protecting groundwater.

4.2.2.4 Groundwater Mitigation

Potential impacts to groundwater can be minimized or avoided through proper design, and by including construction of appropriate stormwater management facilities to collect runoff and pretreat the runoff prior to release to the ground. FHWA will include design features which employ low-impact techniques for protecting groundwater.

4.2.2.5 Stormwater Impacts

Construction of the Preferred Alternative would increase impermeable surface area and surface water runoff. The potential impacts associated with this increased runoff are the same as indicated previously. The water quality of receiving surface waters could be degraded and groundwater could be contaminated.

BMPs will be part of the design to include controlling the velocity and volume of runoff in order to equal or improve the present conditions. For water quality control, bio-retention areas or rain gardens will be used to the extent possible. Generally, the maximum allowable contributing drainage area is limited to one acre for these types of BMPs, with runoff entering the basin as sheet flow (rather than via pipe or directional swales, for example). In locations where it is not feasible to place a bio-retention basin due to topographical or other constraints, a different BMP such as an extended dry detention pond, would be used. For curb and gutter sections, inlets would drain water from the roadway surface to a collector pipeline system. In turn this system would drain into stormwater management facilities, including bio-retention basins.

Further mitigation for stormwater impacts would be realized through the reclamation of the land now occupied by the closed portion of Woodlawn Road. The old roadway will have the pavement removed and will be reforested to partially restore permeable surface area within the project area. The restoration of this two-lane facility will partially offset the creation of new impervious surface created by the construction of the new four-lane facility.

4.2.2.6 Stormwater Mitigation

The project will be required to meet the Virginia and Fairfax County Storm Water Management Criteria for water quality and quantity control. The contractor must also comply with the terms of Fort Belvoir's MS-4 permit. To reduce the amount of storm water runoff generated by the roadway facility, the design would minimize natural area lost, reduce impervious surface, and use natural bioremediation techniques where possible, dependant on the availability of Right-of-Way. Specific criteria for stormwater management facilities will be decided in the design phase of the project. Alignment placement already has minimized the amount of non-roadway drainage by locating the Preferred Alternative along or close to a ridge line.

Initial calculations for stormwater estimated approximately 0.8 acres are needed for placement of bio-retention basins. An estimated additional 3 acres along the Preferred Alternative would be needed for maintenance access and safety separation from the travel lanes. (These areas are included in the impacts calculations for other resources.) FHWA will coordinate with Fairfax County and Fort Belvoir to seek additional ways to incorporate low impact development techniques for stormwater.

4.2.3 Floodplains

4.2.3.1 Floodplain Impacts

In accordance with Executive Order 11988, FHWA must avoid impacts to floodplains wherever possible. Impacts to floodplains can be assessed in terms of whether proposed development within the floodplain and/or floodways has the potential to obstruct flood flows. Impacts also can be from adversely increasing flood velocities or elevations, or significantly affecting the storage or flood control capacity of the floodplain, which would cause adverse flooding impacts on upstream, downstream or abutting properties, or to pose a hazard to human life, health, or property. The vast majority of the Preferred Alternative is located outside the floodplain. Approximately 4.3 acres of the 100-year floodplain are contained within the estimated limits of construction for the Preferred Alternative.¹⁴

4.2.3.2 Floodplain Mitigation

The Preferred Alternative would improve the floodplain conditions by improving the hydraulic capacity at Piney Run under Telegraph Road. For the crossing of Piney Run 1,500 feet east of Telegraph Road, the Preferred Alternative would provide suitable sizing to allow unimpeded flow. The floodplain impacts would be reduced and minimized by spanning these two crossings with bridges. VDOT requires that the design accommodate 50-year storms, and not increase the floodplain by more than 1 foot; Fairfax County guidelines permit no increase to the floodplain. Because the Preferred Alternative largely follows ridges and thus crosses streams and the floodplains at higher elevations, no increase to the floodplain is expected.

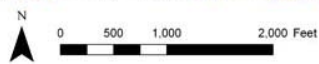
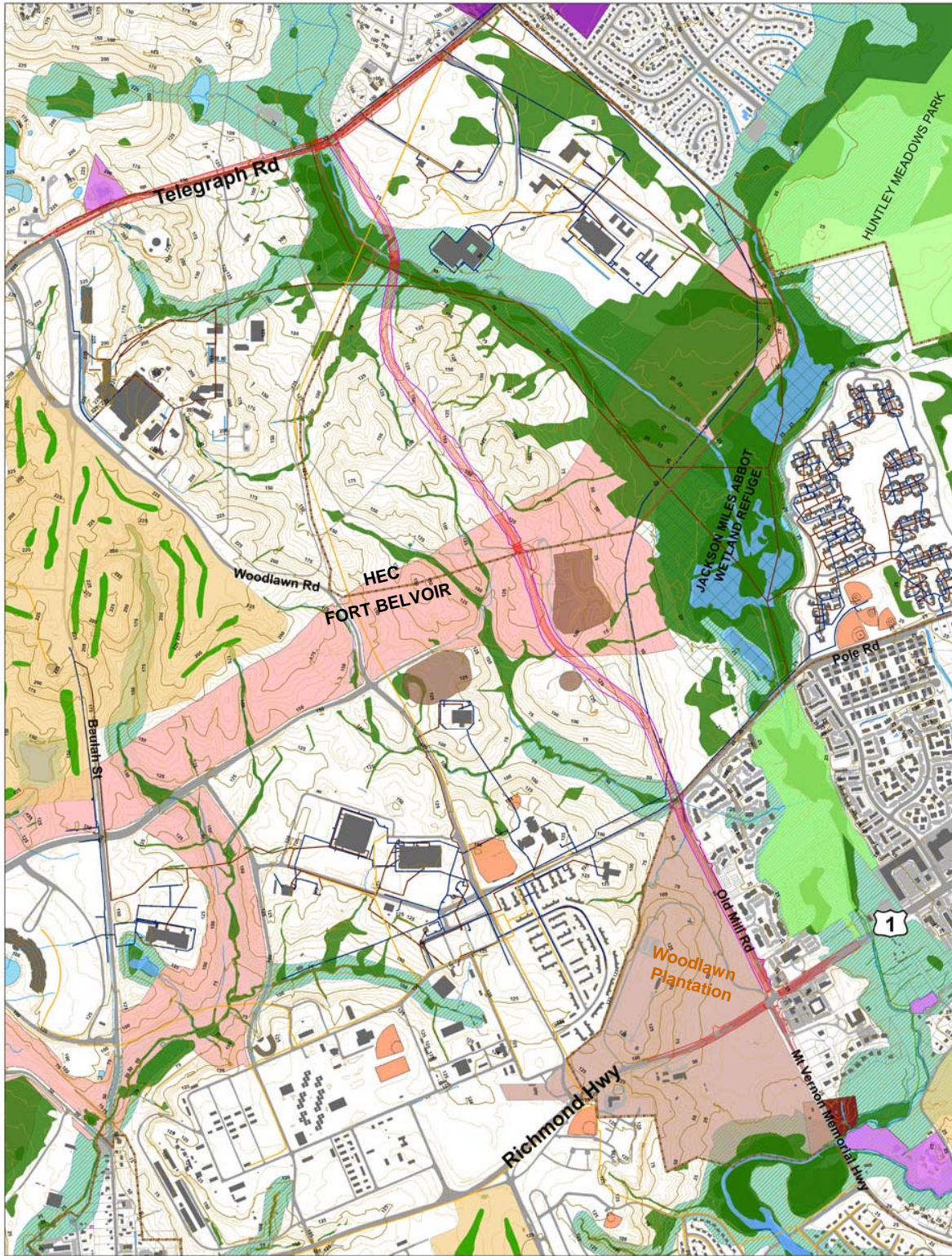
4.2.4 Natural Environmentally Sensitive Areas

4.2.4.1 Environmentally Sensitive Area Impacts

The Preferred Alternative will impact two of the four specific environmentally sensitive locales noted in Chapter 3. See **Figure 4-2**. It does not directly affect the Jackson Miles Abbott Wetland Refuge (JMAWR) or Huntley Meadows Park. This section explains the effects of the Preferred Alternative on the other key locales.

The Preferred Alternative will cross the Forest and Wildlife Corridor (Corridor) on Fort Belvoir. Because this designated corridor extends continuously through Fort Belvoir/HEC property, any new location roadway alignment connecting U.S. Route 1 with Telegraph Road would have to cross it. Several existing roadways already cross it. The Preferred Alternative crosses approximately 1,850 feet of the corridor, resulting in a total of approximately 7 acres affected. The primary impacts associated with placing a road crossing in the wildlife corridor

¹⁴ As designated by others. FEMA does not show this portion of Piney Run as within either 100- or 500-year floodplain, according to the Flood Insurance Rate Map, Fairfax County, Virginia, Panel 128 of 150, March 5, 1990.



- Legend**
- Alignment 4CR Pavement (3-15-06)
 - Alignment 4CR LOC (3-15-06)
 - Fort Belvoir/HEC Boundary
 - Woodlawn Historic District
 - George Washington's Gristmill
 - Landfills
 - Open Water
 - Wetlands
 - Resource Protection Area
 - Forest and Wildlife Corridor
 - Fairfax County Schools
 - Other County Property
 - Parks - Fairfax County Park Authority
 - Golf Course
 - Fort Belvoir Athletic Fields
 - Gas Main Line
 - Water Main Line
 - Wastewater Main Line

Environmental Constraints

Figure 4-2

is fragmentation of the forest and increased potential for wildlife-human conflicts. In accordance with Section 4(f) of the U.S. Department of Transportation Act of 1966, a separate Section 4(f) evaluation has been prepared and is presented elsewhere in this document.

The second natural environmentally sensitive area that will be impacted is the Resource Protection Area along Piney Run. RPAs have been established to act as buffers for water quality. As noted in Chapter 3, transportation projects are exempt from procedural requirements related to RPAs; nonetheless, FHWA anticipates following practices to minimize impacts, and control erosion and sedimentation. The Preferred Alternative crosses the RPA along Piney Run at one location along Telegraph Road and at a second location about 1,500 feet east of Telegraph Road.

4.2.4.2 Environmentally Sensitive Area Mitigation

To minimize impacts to wildlife, the alignment generally follows along ridgelines, allowing for continuation of natural ravines and streams, and reduces earthwork, cut and fill slopes as well as disturbance/removal of existing vegetation. Potential impacts to wildlife from vehicle collisions will be addressed by placing wildlife crossings within the Corridor. One major wildlife crossing would be constructed at the intersection of the Preferred Alternative and unimproved John J. Kingman Road through the Corridor.

The wildlife crossings within the Corridor would be located in areas with a natural depression of the topography, which wildlife are thought to favor in their migration patterns. At least one location would be suitable for a wildlife crossing for larger animals. The major wildlife underpass at Kingman Road would be suitable for passage of larger animals. Two other major wildlife crossings will occur, both over Piney Run at Telegraph Road and about 1,500 from Telegraph Road. Coupled with the Kingman Road major wildlife crossing, these underpasses should improve passage of wildlife. At Telegraph Road, Piney Run is currently in a culvert; the new bridge will enhance wildlife and riparian connectivity, facilitating better movement of wildlife to and from the post's Forest and Wildlife Corridor, and other forested and open spaces.

To reduce fragmentation in the forest corridor, the footprint of the roadway will be minimized to the maximum extent possible¹⁵. The Preferred Alternative has already been aligned in close proximity to a grass-covered landfill that already exists in the Corridor. No Right-of-Way fencing will be used in the wildlife corridor crossing areas to further reduce the fragmentation effect of the new road. Without fencing, the potential for deer-vehicle collisions is likely to increase. To help reduce this potential increase, wildlife drift fencing (to channel deer and other wildlife towards the wildlife crossings) and deer reflectors will be installed to discourage deer crossing in areas other than the constructed wildlife crossings. Additionally, deer crossing signs will be installed to alert motorists to the potential for deer-vehicle collisions.

Four additional minor wildlife crossings in the form of culverts will be installed at selected locations along the roadway alignment. Two of these additional crossings will be located within the designated Corridor and the other two will be located in the natural area located outside of the Corridor. During the roadway design phase, the utility of installing wildlife drift fencing for the minor wildlife crossings will be investigated.

¹⁵ Consistent with VDOT design standards.

Other measures for mitigation include installing street lighting only at the three intersections and along the residential portion of the alignment. In conjunction with Fort Belvoir's plans to close sections of Woodlawn Road within the Garrison, this project will remove the existing pavement of two-lane Woodlawn Road where it passes through the Corridor (or reduce its width to convert it to a trail) and re-vegetate the existing open areas along the to be removed roadway as well as those created by the pavement removal. This action will eliminate an existing transportation corridor currently passing through the Fort's designated Corridor.

In summary, the combined effect of the following listed mitigation actions will greatly reduce the impact of the proposed undertaking upon the Fort's designated Corridor:

- Eliminate/remove the existing two-lane Woodlawn Road through the Corridor.
- Re-vegetate the eliminated Woodlawn Road corridor through the Corridor.
- Replace the existing small drainage culvert conveying Piney Run under Telegraph Road and replace with a bridge structure that will also serve as a large animal/wildlife underpass.
- Provide a bridge structure as large animal/wildlife underpass on proposed connector road in the Corridor.
- Provide a bridge structure as stream and large animal/wildlife underpass on proposed connector road for its crossing of Piney Run.
- Re-vegetate cut and fill slopes, outside of clear zone, of the proposed connector road.
- Provide 4 additional minor wildlife crossing structures, 2 in the Corridor, 2 between the Corridor and Telegraph Road.
- Provide minimal drift fencing at proposed wildlife crossings.
- Provide "deer crossing" warning signs along the proposed connector road.
- Provide deer reflectors along the proposed connector road.
- Provide no lighting along the proposed connector road except at its three intersections and at the existing residential area.
- Facilitate discussion to reduce posted roadway speed below 45 MPH.

4.2.5 Wetlands

4.2.5.1 Wetlands Impacts

The Preferred Alternative will unavoidably cross approximately 1.15 acres of wetlands. The single largest wetland impact potentially occurs about 1,500 feet from Telegraph Road, where approximately 200 feet of wetlands adjacent to Piney Run would be spanned. Similarly, the crossing of Piney Run by Telegraph Road is largely wetlands. A third area of wetlands traversed by the Preferred Alternative is the northwest quadrant of the Pole Road intersection, along an unnamed tributary to Dogue Creek.

Along Telegraph Road, the Preferred Alternative would impact forested wetlands at the Piney Run crossing. Along U.S. Route 1 and Mount Vernon Memorial Highway, the Preferred Alternative will not impact wetlands.

The extent of the anticipated wetland impacts are summarized in **Table 4-2**. Wetland impacts due to dredging or filling must be authorized under Section 404 of the Clean Water Act by the USACE and under the Virginia Water Protection Act by DEQ.

Type	Impact	
	Square Feet	Acres
Palustrine forested (PFO)	35,078	0.81
Palustrine Unconsolidated Bottom	3,871	0.09
Palustrine emergent (PEM)	0	0.00
Palustrine scrub/shrub (PSS)	0	0.00
Palustrine open water (POW)	4,141	0.10
Unknown (likely PFO)	6,807	0.16
TOTAL	49,897	1.15

Numbers may not add due to rounding

4.2.5.2 Wetlands Mitigation

The Preferred Alternative generally stays on the crest or ridgeline, minimizing impacts to streams and wetlands. During development of the preliminary alternatives, and subsequent refinement of the Preferred Alternative, FHWA has undertaken specific measures to avoid and minimize wetland impacts. Of the early alternatives considered, the Preferred Alternative had the least wetland impact. Another example of minimizing wetland impacts included shifting the alignment at Telegraph Road from the west side of Piney Run to the east side to avoid acidic seepage swamp and bottomland hardwood wetlands. Similarly, the proposed perpendicular crossing and bridging of Piney Run at that location minimizes wetland impacts.

Further wetland impact minimization may be accomplished by use of steeper roadway side slopes or retaining walls at sensitive locations to reduce the footprint width. Stormwater management facilities will be placed outside of wetlands. Measures that meet the requirements of the Virginia Erosion and Sediment Control Handbook will be used during construction to minimize indirect impacts to wetlands. Further, equipment and material staging areas would be placed outside of wetlands. Unavoidable wetlands impacts will be mitigated according to the type and ratios specified in the permit, and may include actual onsite construction of wetlands, purchase of wetland credits from an approved mitigation bank, or payment into the wetland restoration trust fund.

4.2.6 Vegetation and Wildlife Habitats

4.2.6.1 Habitat Impacts

(a) Aquatic Habitat Impacts

The Preferred Alternative impacts approximately 1,110 linear feet of aquatic habitat due to stream crossings at Piney Run and two unnamed tributaries to Dogue Creek. The Preferred Alternative poses minor short-term and long-term impacts on vegetation and wildlife habitats in the study area; however, it would neither divert nor block any stream. Spanning streams is more beneficial to maintaining aquatic habitat than placing streams in culverts. Loss of habitat would result in fewer animals. The most important factor serving to minimize the impacts to both aquatic and terrestrial habitat is placing the alignment higher along the ridgeline than near the foot of the slopes, where more aquatic animals and fish live.

Other potential impacts to the aquatic habitat that may occur would be increased runoff from the roadway, resulting in potential increased pollutant loading.

(b) Terrestrial Habitat Impacts

The Preferred Alternative would bisect relatively undisturbed forested habitat used by migratory songbirds, which require large blocks of intact forest for nesting and foraging activities. Loss of this acreage will reduce the habitat available for use by resident and migratory species. The Preferred Alternative will impact about 8 acres of forested terrestrial habitat identified in the Partners-in-Flight program as breeding and foraging areas for a several PIF designated priority bird species. Additionally, approximately 11 acres of habitat identified as potential and/or uncertain wood turtle habitat would be impacted. The primary impacts will result from direct loss of a relatively small acreage of habitat, and from additional habitat fragmentation. Even though some habitat fragmentation will occur within the northern portion of Fort Belvoir/HEC, areas of woods on either side of the Preferred Alternative will remain in excess of 100 acres in size, so the loss of habitat is not expected to substantially impact the PIF priority bird species' ability to nest. Another potential impact that could result from construction of this new roadway is the introduction of invasive plant species in the disturbed footprint of the roadway shoulders.

(c) Wildlife Impacts

Impacts to wildlife will occur primarily through the loss of habitat. Some additional impacts will likely occur as a result of vehicle/wildlife conflicts.

4.2.6.2 Habitat Mitigation

(a) Aquatic Habitat Mitigation

Crossing a water resource at a perpendicular angle is one of the primary means of minimizing impacts of a roadway crossing. A perpendicular crossing is the shortest distance across the water body, thus the crossing type with the least impact on aquatic habitat. Spanning the crossing is another form of mitigation through minimization. Appropriate design efforts will be undertaken to minimize changes in stream patterns such as flow volume and velocity. This may be accomplished by sizing culverts to carry high flow volume without unnecessarily increasing velocity. Also, to facilitate passage of aquatic life, culverts can be countersunk or, if multiple culverts are used at one location, by providing a low-flow culvert. Another potential mitigation measure is to use culverts with natural bottoms. When combined with the realignment of the roadway closer to the top of the ridge line, potential impacts to aquatic resources will have been minimized to the maximum extent possible.

Impacts to aquatic habitats resulting from increased runoff of roadway pollutants will be minimized and mitigated by installation of appropriate BMPs along the roadway. Every effort will also be made to incorporate Low-Impact Development (LID) methods into the stormwater runoff treatment plans for this project. These methods, which mimic pre-development hydrology and stress infiltration of stormwater as opposed to direct runoff into stormwater facilities, can help minimize impacts on hydrology and water quality.

(b) Terrestrial Habitat Mitigation

Impacts to forest habitat are unavoidable. To reduce fragmentation in the forest corridor, the footprint of the roadway will be minimized to the maximum extent possible for VDOT standards and the roadway will be aligned in close proximity to a grass-covered landfill that already exists in the Wildlife corridor. Bridging of several areas along the alignment will allow for less interrupted connection between the Resource Protection Areas that are located on both sides of Telegraph Road, thus reducing impacts to terrestrial habitat. Impacts can also be offset through mitigation in the form of removal of pavement and reforestation of Woodlawn Road from Kingman Road to Beulah Street.

In accordance with Executive Order 13112, *Invasive Species*, every effort will be made to prevent and control the spread of invasive species during construction and subsequent operation of the proposed action. Example controls could include ensuring sterility of soil placed during grading for construction. New plantings and seeding of side slopes or landscaping will meet state and federal guidelines to avoid invasive species.

(c) Wildlife Mitigation

Impacts to wildlife not addressed through habitat mitigation measures detailed above are those that would be associated with direct vehicle/wildlife conflicts. Mitigation for these impacts will include the installation of wildlife crossings at specific locations along the roadway. At least three major wildlife crossings will be constructed under the Preferred Alternative: the crossing at Kingman Road and two bridges over Piney Run. At Kingman Road, the Preferred Alternative will span approximately 100 feet of natural topography at a height of about 17 feet, with an open median. It is expected that animals (including fish and amphibians) also would pass underneath the Preferred Alternative at its crossing of Piney Run about 1,500 feet south of Telegraph Road; this span would be approximately 175 feet long, also with an open median to offer daylight. Telegraph Road improvements would also bridge over Piney Run. While smaller fauna may use any of these major crossings, at least four additional minor wildlife crossings in the form of culverts will be installed at various locations along the roadway. The location for placement of these minor wildlife crossings will be determined during the preliminary road design phase of the project. At least two of these will be placed within Fort Belvoir's designated Forest and Wildlife Corridor.

Additionally, as noted previously, no Right-of-Way fencing will be used in the wildlife corridor crossing areas to further reduce the fragmentation effect of the new road. However, without fencing, the potential for deer-vehicle collisions could increase. To help reduce this potential increase, deer reflectors will be installed to discourage deer crossing in areas other than the constructed wildlife crossings. Signs alerting motorists to deer crossings will be installed in order to reduce the potential for deer-vehicle collisions. During design, further coordination between FHWA and Fort Belvoir environmental specialists will consider the utility of installation of wildlife drift fencing which could serve to channel wildlife towards the major and minor wildlife crossings.

4.2.7 Threatened and Endangered Species

4.2.7.1 Threatened and Endangered Species Impacts

(a) Federally Listed Species

The Preferred Alternative is not expected to impact federally-listed threatened or endangered species. The Bald eagle (*Haliaeetus leucocephalus*) may use the Dogue Creek shoreline south of the project. No nesting pairs are located near the Preferred Alternative.

The Preferred Alternative will not impact known locations of the Small Whorled Pogonia (*Isotria medeoloides*). In June 2005, qualified personnel found no plants along the southern section of the Preferred Alternative, nor along a northern variation of an earlier alignment. Qualified personnel conducted a subsequent evaluation for suitable habitat and determined that the Preferred Alternative crosses almost 9 acres of potential Small Whorled Pogonia habitat. However, no specimens of the plant were found in June 2006 within the limits of the Preferred Alternative.

The Preferred Alternative is not expected to impact the federally listed species of concern, the Cerulean warbler and the yellow lampmussell. Impacts to the Cerulean warbler would potentially result from forest fragmentation, and to the yellow lampmussell from stream degradation.

(b) State Listed Species

The Preferred Alternative traverses habitat potentially suitable for two state-listed species. The Preferred Alternative crosses potential wood turtle habitat along Piney Run and potential small whorled pogonia habitat. The potential habitat consists of mesic deciduous woodlands in and near clear creeks and would be impacted by roadway construction, including temporary access.

The Preferred Alternative is also not expected to impact the state-listed species of concern: the great egret, yellow-crowned night heron, brown creeper, winter wren, purple finch, and Northern Virginia well amphipod. The bird species would potentially be impacted by forest fragmentation, and the well amphipod would potentially be impacted by groundwater quality reduction.

4.2.7.2 Threatened and Endangered Species Mitigation

Before construction begins, qualified personnel will conduct a survey for wood turtle in potential habitat areas. Any individuals located will be moved to suitable habitat outside of the project area.

Effective erosion and sediment control and stormwater management would minimize the potential for adverse water quality impacts to the yellow lampmussel and the Northern Virginia well amphipod.

Wildlife crossings would be constructed under the Preferred Alternative to maintain the continuity of habitat and migration routes for various species. Where spanning of potential habitat's streams by bridging is not possible, using culverts with natural bottoms offers better opportunity for the amphibian and fish species utilization than a closed culvert.

Mitigation for potential impacts to the Cerulean warbler and the yellow lampmussell habitat would be accomplished by measures put into place as mitigation for other wildlife and water resource impacts associated with this project. Similarly, any potential impacts to the great egret, yellow-crowned night heron, brown creeper, winter wren, purple finch, and Northern Virginia well amphipod would be accomplished by the same measures.

4.3 Cultural Resources

The Preferred Alternative will directly impact historic, and potentially archaeological resources (historic properties) listed in or eligible for listing in the National Register of Historic Places (NRHP). 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 under 36 CFR 800, the implementing regulations for Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The criteria of adverse effect must be applied to evaluate whether a project impact would result in an adverse effect to historic properties. These criteria provide the basis for determining the project's potential effect on historic properties.

The proposed project impacts and adverse effects to standing structures and other historic properties are well-defined. However, because of current information gaps in the archaeological record and some degree of uncertainty about the boundaries of previously inventoried archaeological sites, the extent of impacts regarding archaeological properties are not yet specified. Therefore, the following sections consider future steps necessary to determine adverse effects to known, but poorly-defined, archaeological properties.

4.3.1.1 Determining Adverse Effects - Regulatory Framework

In order to comply with Section 106 of the NHPA, 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 order to identify historic properties that may be affected by the proposed undertaking, FHWA has defined the parameters of an Area of Potential Effects (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 proposed an APE for construction-related impacts of 150 feet on either side of the proposed centerline of the Preferred Alternative. In order to address possible visual and/or audible impacts to historic properties, such as the Woodlawn Historic District and Woodlawn Plantation, the APE includes a ¼ mile on either side of the proposed centerline of the Preferred Alternative.

According to 36 CFR 800.4, a federal agency must proceed to the assessment of adverse effects outlined by 36 CFR 800.5 if historic properties, identified in the APE, will be affected by an undertaking. Examples of adverse effects to historic properties include:

- Physical destruction of, alteration of, removal of, or damage to all or part of the property as well as changes of the character of the property's use or of physical features within the property's setting that contribute to its historical significance.
- Introduction of visual, atmospheric or audible elements that diminish the property's significant historic features.
- Neglect of a property causing its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.
- Transfer of ownership of a historic property to/from federal ownership, through transfer, lease, or sale.

The criteria of adverse effect state that "...adverse effects occur when an undertaking may directly or indirectly alter characteristics of a historic property...". In addition, alteration or destruction of an archaeological site is considered to be an adverse effect, whether or not recovery of archaeological data from the site is proposed (36 CFR 800.5).

4.3.1.2 Consulting Parties

In accordance with the requirements of Section 106, the federal agency consults with appropriate parties. FHWA coordinated with the State Historic Preservation Officer (SHPO) in developing a roster of agencies, organizations and individuals who might be part of the consulting parties process.¹⁶ The Consulting Parties work with the federal agency and SHPO towards development of mitigation measures to resolve adverse effects. As culmination of the process, FHWA executes a formal Memorandum of Agreement (MOA) with the SHPO and the Advisory Council on Historic Preservation (ACHP). FHWA may invite other parties to be signatories. It is expected that the U.S. Department of the Army (USACE and Fort Belvoir) and the National Trust for Historic Preservation (NTHP) will be signatories for the Section 106 MOA on this project. As agencies and the public review this EA, but prior to FHWA rendering a decision, an MOA will be executed detailing measures to which FHWA and other agency stakeholders (including the Department of Defense) will be bound.

4.3.1.3 National Historic Landmark Status

The designation of the Woodlawn Plantation NHL requires that FHWA follow the requirements of 36 CFR 800.10, which outlines agency responsibilities for protecting NHL's. This requires the agency, "to the maximum extent possible, undertake planning and actions to minimize harm to the National Historic Landmark that may be directly and adversely affected by the undertaking." In addition, the agency must request the participation of the ACHP as well as the U.S. Secretary of the Interior in any consultation where there may be an adverse effect on a NHL. In a letter dated March 22, 2006, FHWA invited the ACHP to participate in the consultation process. In addition, FHWA invited the regional National Park Service (NPS) (a designated representative of the Secretary of the Interior in NHL matters) to comment on the proposed project and Woodlawn Plantation NHL in a letter dated March 17, 2006.

¹⁶ Consulting parties for the Connector Road project: Department of the Army, National Trust for Historic Preservation, Virginia Department of Transportation, Fairfax County Architectural Review Board, Fairfax County Department of Transportation, Woodlawn Friends Meeting, Fairfax County History Commission, Fairfax County Office of Planning, Virginia Department of Historic Resources, Historic Mount Vernon, the Gum Springs Historical Society, and Martha Catlin.

Some of the affected properties (adversely affected as defined by 36 CFR 800) are also considered under Section 4(f) of the U.S. Department of Transportation Act and are presented in the accompanying Section 4(f) statement elsewhere in this document.

4.3.1.4 Impacts to Historic Properties

Table 4-3 lists the cultural resources identified within the APE, or which may be identified and/or relocated during additional Phase I archaeological resources surveys¹⁷. The potential impacts to these resources also appear in the table.

Table 4-3: Summary of Cultural Resources within the project APE

Resource	NRHP/NHL Status (individually)	Additional Status	Project Impact	Adverse Effect/Comment	Suggested Mitigation
Woodlawn Plantation National Historic Landmark	NHL-listed		Taking of property along Old Mill Road and the Woodlawn Plantation NHL side of U.S. Route 1	Yes MOA will address	<ul style="list-style-type: none"> • Transfer of property at the southern terminus of Woodlawn Road to the Trust • Misc. improvements to NHL property along U.S. Route 1 and Old Mill Road
Woodlawn Historic District	NRHP-eligible		Taking of property along Old Mill Road and both sides of U.S. Route 1	Yes MOA will address	Misc. improvements through District along U.S. Route 1 and Old Mill Road (Table 4-4)
Woodlawn Plantation	NRHP-listed	Contributes to Woodlawn Historic District	Taking of property along Old Mill Road and both sides of U.S. Route 1	Yes MOA will address	<ul style="list-style-type: none"> • Transfer of property at the southern terminus of Woodlawn Road to the Trust • Misc. improvements to property along U.S. Route 1 and Old Mill Road (Table 4-4)
Pope-Leighey House	NRHP-listed	Is contained within Woodlawn Historic District	Edge of pavement approximately 40' closer along Old Mill Road	Yes - Visual adverse effects MOA will address as part of Historic District Property	Misc. improvements to NHL property along and Old Mill Road
Grand View House	NRHP	Contributes to Woodlawn Historic District	None	No (see District discussion)	
Woodlawn	NRHP-not eligible	Contributes	None	No	

¹⁷ Archeological surveys expected will include anticipated property takings along Old Mill Road, and improvement areas on Woodlawn Plantation along U.S. Route 1, or along Telegraph Road.

Table 4-3: Summary of Cultural Resources within the project APE

Resource	NRHP/NHL Status (individually)	Additional Status	Project Impact	Adverse Effect/Comment	Suggested Mitigation
Baptist Church property and cemetery		to Woodlawn Historic District		Property not individually eligible (see District discussion)	
Woodlawn Friends Meeting House	NRHP-not eligible ¹⁸	Contributes to Woodlawn Historic District	None	No Property not individually eligible (see District discussion)	Potential adverse effect due to elimination of federal ownership would be negated with covenant to apply Section 106
George Washington Grist Mill	NRHP-listed	Contributes to Woodlawn Historic District	None	No	
44FX0461	NRHP-potentially eligible		Taking of property along Old Mill Road	Unknown Relocation survey and evaluation needed	If adverse effect, avoidance or data recovery
44FX1146	NRHP-potentially eligible		Taking of property through Fort Belvoir	Unknown Relocation survey and evaluation needed	If adverse effect, avoidance or data recovery
44FX1944	NRHP-potentially eligible		Taking of property through Fort Belvoir	Unknown/Relocation survey and evaluation needed	If adverse effect, avoidance or data recovery
Unknown archaeological resources within APE on Woodlawn Plantation	Unknown		Taking of property along Old Mill Road and improvements to plantation property on Woodlawn Plantation NHL side of U.S. Route 1	Unknown Phase I survey and evaluation needed	If adverse effect, avoidance or data recovery
Unknown archaeological resources within APE along Telegraph Road	Unknown		Taking of property along residential/commercial side of Telegraph Road	Unknown Phase I survey and evaluation needed	If adverse effect, avoidance or data recovery

¹⁸ The Woodlawn Friends Meeting are seeking re-evaluation of their property's eligibility status for listing in the NRHP, as of May 30, 2006.

Three parcels of land associated with Woodlawn Plantation would be impacted by the proposed project. The largest taking is due to expansion of Old Mill Road along the northern boundary of Woodlawn Plantation. The taking of land along Old Mill Road only consists of approximately 2.24 acres. The site's property along Old Mill Road is second growth forest. Accommodating turn lanes along U.S. Route 1 also requires takings on both sides of U.S. Route 1. Approximately 0.27 acres would be taken from the Woodlawn Plantation NHL side of U.S. Route 1, and 0.13 acres of land would be acquired from the Woodlawn Stables side of U.S. Route 1. The total amount of right-of-way required from the Trust is approximately 2.64 acres. Placement of shared-use paths are expected to be through easement.

The project will also move the existing Woodlawn Plantation main entrance. Currently, the primary entrance is located at the intersection of U.S. Route 1 and Old Mill Road; the Preferred Alternative proposes to move the entrance to a new access point approximately 700 feet south on U.S. Route 1.

A beneficial impact will occur with the removal of military security activity from a non-contributing but contiguous parcel presently owned by Fort Belvoir near its Woodlawn Gate. The Army¹⁹ will transfer this parcel, approximately 2.5 acres, as part of this project to the Commonwealth of Virginia, which in turn will transfer this to the Trust, owners of Woodlawn Plantation.

4.3.1.5 Assessment of Adverse Effects

The proposed project impacts represent an adverse affect to the Woodlawn Plantation National Historic Landmark, the Woodlawn Historic District, and Woodlawn Plantation property. While these resources have all been considered for this project, the Woodlawn Historic District has a prominent place because it encompasses the other two as well as other properties in the APE (see **Table 4-3**). While the transfer of 2.5 acres from the Army to the Commonwealth (as authorized by statute) has the potential to have an "adverse effect" if it altered the characteristics of the historic property; the Agency intends to negotiate between the Army and the SHPO conditions for the transfer that will prevent any alteration of the historic characteristics of the historic property, and, in addition, will result in the improvement of the entrance to the property, thereby enhancing the historic property and serving as mitigation for the Project.

Development around U.S. Route 1 and Old Mill Road has introduced modern intrusions within the Woodlawn Historic District boundaries. These intrusions include strip commercial, residential, and utility usage that detract from the integrity of the historic setting of the Woodlawn Historic District. Because of these previous impacts to the setting, only physical impacts on other individual properties has been considered in this analysis. Cumulative and Indirect impacts to cultural resources are discussed in Section 4.13. As noted in the table, for example, the project will have no effect on the individually-listed Grist Mill.

The proposed project may represent an adverse effect to three previously identified archaeological sites and an as yet unknown number of archaeological sites in areas not previously surveyed within the APE. None of the other properties identified within the APE would be adversely affected by the proposed project.

¹⁹ The land is owned by the United States of America and is under the jurisdiction of the Department of the Army.

4.3.1.6 Mitigation

(a) Standing Structures Mitigation

FHWA will continue to work with the Consulting Parties to determine project effects and develop consensus for measures to avoid or minimize impacts on significant cultural resources. FHWA will sponsor measures to mitigate these impacts through documentation or other forms of data recovery. These measures will be detailed in the MOA.

FHWA has focused the initial consultation effort on the development of mitigation measures to enhance the relationship between the historic and modern features within the boundaries of the Woodlawn Historic District. The acquisition of land from Woodlawn Plantation property along Old Mill Road and U.S. Route 1, would be ameliorated by replacement land and certain design features. The Consulting Parties have considered several of these measures. The Preferred Alternative would provide an overall improvement to the physical setting of the Woodlawn Historic District. A comparative summary of several anticipated measures appears in **Table 4-4**.

The consultation effort includes, as previously described, a transfer of 2.5 acres of property from Fort Belvoir to VDOT and in turn to the Trust, owners of Woodlawn Plantation. Conditions of this transfer will be negotiated by the Army and the SHPO in order to ensure legally enforceable conditions for maintaining protection of the NHL and adjoining properties under the NHPA. The parcel for transfer is contained within the Woodlawn Historic District at the intersection of Woodlawn Road and U.S. Route 1. A transfer to the Trust would allow for a reestablishment of the historic, physical connection between the Woodlawn Plantation property and the Woodlawn Friends Meeting House. The current military presence, including the security checkpoint at the Woodlawn Gate, would be removed, once a new security gate is constructed. This transfer would enhance the setting among these contributing elements of the Woodlawn Historic District. In addition, the Trust has indicated that it would agree to maintain NHPA protection on the parcel through covenants and in the context of the MOA.

Table 4-4: Preferred Alternative Summary of Changes to Woodlawn Plantation

Advantages	Disadvantages
<i>Intersection and Driveway</i>	
<ul style="list-style-type: none"> ▪ Improves safety and efficiency of Woodlawn driveway operations by separation from Mt. Vernon/Old Mill Road ▪ Maintains or enhances access to Woodlawn driveway from U.S. Route 1, particularly for northbound visitors ▪ Provides pedestrian access to the Woodlawn Plantation main house driveway ▪ Improves visibility of pedestrian use at the Mt. Vernon Memorial Highway/U.S. Route 1 intersection ▪ Includes striping and other treatments at the crosswalks, both at Old Mill Road and at the relocated entrance ▪ Allows opportunity for enhanced treatment of utilities at intersection, dependant on cost and complexity (e.g. burying cables) 	<ul style="list-style-type: none"> ▪ Removes existing driveway (constructed in the 1930's) ▪ Removes alignment of Woodlawn Driveway and Mount Vernon Memorial Highway ▪ Temporary disorientation of visitors accustomed to current location of entrance drive ▪ Short-term vegetation loss, while new plantings achieve growth

<ul style="list-style-type: none"> ▪ Incorporates landscaping to reflect the historic, pastoral character of Woodlawn Plantation ▪ Provides staged construction to minimize disruption to estate operations 	
Trail Connections	
<ul style="list-style-type: none"> ▪ Provides “meandering” shared use path adjacent to Old Mill Road, connecting to Pole Road and Telegraph Road trails ▪ Extends the Potomac Heritage National Scenic Trail (PHNST) along Woodlawn Plantation property on both Mt. Vernon Highway and U.S. Route 1, tying to the stable drive ▪ Allows trail users to experience pastoral and agrarian character of the estate ▪ Provides connection between trail and other pedestrian facilities on Old Mill Road, consistent with the County’s Trail Plan ▪ Facilitates access to the Plantation for pedestrians, bicyclists, and persons with disabilities from around the region and visitors from other nearby historic properties ▪ Links the Plantation with a federally designated trail system that extends from Pennsylvania to Virginia ▪ Reconnects Woodlawn to Mount Vernon, and Washington, D.C. by the PHNST ▪ Proposed trails and crosswalks would reconnect Woodlawn Plantation properties on both sides of U.S. Route 1 ▪ Trails would be maintained by a designated agency ▪ Allows staged construction minimize disruption to estate operations 	<ul style="list-style-type: none"> ▪ Temporary disruptions due to construction of trails ▪ Minor clearing of trees for the path
Land Transfer	
<ul style="list-style-type: none"> ▪ Provides transfer of 2.5 acres of land at the southern terminus of Woodlawn Road, by the U.S. Department of the Army ▪ Reconnects Woodlawn Plantation with Woodlawn Friends Meeting House ▪ Eliminates military presence and security activities at this current entrance to Fort Belvoir ▪ Creates opportunity for Woodlawn Plantation to relocate its maintenance entrance road from U.S. Route 1 	<ul style="list-style-type: none"> ▪ Takes 2.24 acres of undeveloped forest land from Woodlawn Plantation along Old Mill Road ▪ Takes 0.4 acres of undeveloped pastoral land from Woodlawn Plantation along both sides of U.S. Route 1 ▪ Maintenance of Woodlawn Road (at the Woodlawn Gate) would shift from Fort Belvoir and federal maintenance to another entity.
Signage	
<ul style="list-style-type: none"> ▪ Plans for and installs interpretative signs along trail and pedestrian facilities, e.g. locations east before and at the Mount Vernon Estate. Signs would guide trail users to the Plantation, and educate users on history of the Plantation 	

<ul style="list-style-type: none"> ▪ Reduces clutter of highway signage at the existing offset intersection of U.S. Route 1/Old Mill Road/MVMH 	
Construction Phasing	
<ul style="list-style-type: none"> ▪ Minimizes intrusion on existing entrance by constructing new entrance first 	<ul style="list-style-type: none"> ▪ Construction activity could temporarily reduce patronage.

Notwithstanding the conversion of approximately 2.6 acres of Woodlawn property to roadway use, the proposed project will enhance Woodlawn Plantation and the Woodlawn Historic District by creating a setting that improves the visitor experience. **Figure 4-1** illustrates a preliminary rendering of Alternative 4CR, including trails and other pedestrian enhancements. The current entrance to Woodlawn Plantation (constructed in the 1930s) is offset from Mount Vernon Memorial Highway, is difficult to reach from Old Mill Road, and presents safety concerns for vehicles entering or leaving the plantation property. The Preferred Alternative proposes to move the public vehicular entrance to Woodlawn farther south to facilitate safer ingress/egress of the property.

Additionally, the project would provide for an extension of the Potomac Heritage National Scenic Trail. The proposed installation of shared-use pedestrian/bicycle facilities along U.S. Route 1 and at the intersection with Old Mill Road and Mount Vernon Memorial Highway would enhance the visitor experience. New interpretive signage would be installed in these areas and elsewhere leading trail users to Woodlawn Plantation, and providing trail user with relevant historical information about the historic sites. These improvements would provide a more meaningful balance between the historic features of Woodlawn and modern development in the area.

(b) Archaeology Mitigation

In addition to the measures outlined above for the Woodlawn Historic District the proposed project requires mitigation measures for potential impacts to archaeological sites on the Woodlawn Plantation NHL along Old Mill Road or U.S. Route 1, along the margins of Telegraph Road, and within Fort Belvoir.

Currently there is one previously recorded archaeological site on Woodlawn Plantation. Site 44FX1146 is likely within the boundary of the proposed taking along Old Mill Road (the exact location of the site is unclear at this time) and may be eligible for listing on the NRHP. In order to relocate Site 44FX1146 and understand the nature of any currently unknown archaeological sites in other portions of the taking, FHWA will conduct an archaeological resources survey within the area of the entire taking. Preliminary determinations of NRHP eligibility of archaeological properties may be possible at the time of the survey of the entire parcel subject to acquisition. If not, FHWA would conduct formal evaluations. For those sites recommended by FHWA to be eligible for listing, FHWA would determine adverse effects and implement avoidance or mitigation measures (agreed upon by the consulting parties) per the terms of the MOA. Areas of land taken along Telegraph Road would be treated in a similar manner.

Currently two archaeological resources on Fort Belvoir may be impacted by the proposed project. These resources, Sites 44FX0461 and 44FX1944, are considered potentially eligible for listing on the NRHP at this time. VDHR has concluded that the vicinity of the proposed alignment has been previously surveyed for archaeological resources. However, there exists

ambiguous location data for the above noted potentially eligible sites. FHWA will conduct a Phase I archaeological survey in the vicinity of these resources to locate them in relation to the proposed project APE. Preliminary determinations of NRHP eligibility of archaeological properties may be possible at the time of the survey. If not, FHWA would conduct formal evaluations. For those sites recommended by FHWA to be eligible for listing, FHWA would determine adverse effects and implement avoidance or mitigation measures (agreed upon by the consulting parties) per the terms of the MOA.

4.4 Hazardous Materials

The Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulate hazardous waste sites under federal laws. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERLCA), also known as Superfund, was created to provide the authority and a source of funding for cleaning up hazardous substances released into the environment.

Impacts to hazardous material sites were analyzed using GIS and solid waste management unit (SWMU) data provided by Fort Belvoir, as well as field surveys conducted in November 2005. As described in Chapter 3, numerous databases which compile information on hazardous materials were also reviewed for the location of other hazardous materials sites. Two of the previously mentioned landfill sites (SWMU A-07a and SWMU A-25) are in proximity of Preferred Alternative; however, these sites were avoided in the design of the Preferred Alternative's alignment.

The alignment traverses former field training and demolition training ranges on the Post. These ranges are no longer so used, and are in the process of being decommissioned and cleared. The characterization and clean-up of the ranges and disposal areas that lay within the footprint of the Preferred Alternative offers no additional impact under NEPA. Prior to the construction phase, appropriate measures would be taken to identify and remove unexploded and spent ordnance and demolition materials. Similarly, if other hazardous materials are encountered during construction, appropriate measures would be taken to prevent adverse affects to the environment and construction workers.

4.5 Air Quality

The Metropolitan Washington Council of Governments (MWCOG) includes the proposed project in the 2005 air quality conformity determination for the region.²⁰ For pollutants of regional concern (Ozone and PM_{2.5}), the impacts due to the project have already been analyzed by the COG in its most recent conformity determination. For those pollutants, the impact will be the same regardless of final design of the roadway, and thus no additional regional analysis has been performed. The Preferred Alternative also lies within a federally designated air quality attainment area for Carbon Monoxide (CO); however, a hot spot analysis was conducted for the project because it met the Annual Average Daily Traffic (AADT) threshold. Based on that analysis, it was concluded that the project will have no substantial adverse impact on air quality as a result of CO emissions.

²⁰ The Air Quality Conformity Determination is based on the 2005 Constrained Long Range Plan and the FY 2006-2011 Transportation Improvement Program (TIP), MWCOG.

In the March 10, 2006 Federal Register publication relating to PM_{2.5} hot-spot requirements in project-level conformity determinations, the EPA notes that PM_{2.5} is both a regional and a localized air quality concern in certain circumstances. Secondary formation from PM_{2.5} precursors (such as NO_x and SO₂) is a critical component to the regional PM_{2.5} air quality problem and it is anticipated that EPA standards relating to low sulfur diesel fuels (effective in 2006) and heavy-duty engines (effective in 2007) will lower the contribution of secondary PM_{2.5} emissions on a regional basis. Local emissions due to diesel vehicles would not be greatly reduced due to these standards as the Preferred Alternative does not involve a substantial number of diesel vehicles. However, because the Preferred Alternative does not involve a significant number of diesel vehicles, it is expected that local emissions due to the project will not have a substantial impact on local PM_{2.5} levels.²¹

Mobile source air toxics (MSATs) have been assessed qualitatively in accordance with recent FHWA guidance²². Results indicate that in the design year, the Preferred Alternative offers reduced MSAT emissions in the general area of the project, relative to the no build alternative, due to the reduced vehicle miles traveled (VMT) associated with more direct routing, and due to EPA's MSAT reduction programs. On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

The air quality analysis conducted by the project team therefore concluded the Preferred Alternative will have no substantial adverse impact on air quality. The Preferred Alternative will result in the reduction of Vehicle Miles Travelled (VMT's) on the regions roadway as well, which could also benefit air quality over current conditions (vehicles using more circuitous routes).

4.6 Noise

FHWA noise guidelines call for comparing existing conditions to future build conditions in order to assess traffic noise impacts. A noise technical analysis²³ evaluated the predicted noise resulting from the Preferred Alternative. The noise analysis evaluated three scenarios: current year (2005), design year (2030) No Build, and design year (2030) Build condition. The build condition analyzed impacts as a result of the Preferred Alternative. The No Build alternative assumes the Connector Road will not be constructed, and provides a baseline from which to measure the performance, costs, and impacts of the Build alternative.

4.6.1 Noise Sensitive Areas

Federal noise abatement criteria (NAC) were explained in Chapter 3. A noise impact assessment was performed for noise sensitive sites near the Preferred Alternative. VDOT practice predicts noise at apartment buildings and condominiums for both first and second

²¹ Federal Highway Administration Eastern Federal Lands Highway Division, *Richmond Highway-Telegraph Connector, Air Analysis Technical Report*, Prepared by HDR Engineering, Inc., March 2006.

²² Federal Highway Administration (FHWA) 2006. "Interim Guidance on Air Toxic Analysis in NEPA Documents," Memorandum by Cynthia J. Burbank, Associate Administrator for Planning, Environment and Realty, February 3, 2006.

²³ Federal Highway Administration Eastern Federal Lands Highway Division, *Richmond Highway-Telegraph Connector, Noise Analysis Technical Report*, Prepared by HDR Engineering, Inc., March 2006.

floor units. **Figure 4-3** shows the general location of the noise sensitive receptors (NSR) along the project corridor.

4.6.2 Noise Impacts

Of the seventy-three (73) individual noise sensitive receptors found to exist along the project corridor, six were found to approach or exceed the FHWA NAC under the build alternative. The change in relative noise levels for the design year (2030), defined as any noise level increase or decrease directly attributable to the build alternative, varies from 0 to 9 dBA greater than the noise levels modeled for the existing year (2005) alternative. There are no substantial increase impacts predicted. In the existing case, none of the noise sensitive receptors approaches the FHWA NAC.

The FHWA Traffic Noise Model (TNM) predicted a number of residences along Telegraph Road (NSR 67 through 72) to have noise levels above 66 dBA, the VDOT exterior noise abatement level for residences. This level is above the NAC.

TNM predicted noise levels at Woodlawn Plantation (Receptor 25) to be 49 dBA. Monitoring data that was taken at this receptor in the field indicated an existing noise level of 52 dBA. The low modeled noise level from TNM at Woodlawn Plantation is a result of the distance from the modeled traffic on U.S. Route 1 and Old Mill Road. This indicates the traffic from these roadways does not contribute significantly to the noise environment at Woodlawn Plantation. The monitored noise level of 52 dBA at this location is a result of some airplane noise, birds chirping loudly, and roadway noise in the background. For NEPA purposes, it will be assumed that both the no-build and build noise levels at Woodlawn Plantation will be equivalent to the monitored noise level of 52 dBA.

Along Mount Vernon Memorial Highway, an additional analysis²⁴ was conducted for noise levels at Grist Mill Estates, a single-family residential development near the Grist Mill. A total of eight (8) NSR's were identified at this development for analysis. None approach or exceed the FHWA NAC. All eight are predicted to experience increases of 0 dBA to 3 dBA over existing conditions.

Four of the six receptors along Telegraph Road which exceed VDOT criteria would also be impacted by the widening of Telegraph Road, regardless of the construction of the Preferred Alternative.

4.6.3 Noise Mitigation

By definition, a noise impact must approach or exceed the NAC criteria, or result in an increase greater than 10 dBA. For Category B, residential, predicted noise levels must be greater than or equal to 67 dBA (or 66 dBA for VDOT).

Noise abatement measures typically considered when noise impacts are predicted to occur include: alteration of vertical alignments, management of traffic, construction of sound barriers, and acoustical insulation of public use and non-profit facilities. There are no known future developments in the project corridor that qualify for sound barrier consideration.

²⁴ Federal Highway Administration, Eastern Federal Lands Highway Division, *Richmond Highway-Telegraph Road Connector Environmental Assessment, Grist Mill Estates Noise Investigation Memorandum*, February 9, 2006

4.6.3.1 Alignment Modification and Traffic Management

This noise abatement measure can be incorporated into a project to reduce traffic noise impacts where the receivers are typically on one side of the project or where the elevation is relatively constant. Since sound intensity decreases with distance, shifting the centerline away from the receivers may reduce noise levels. Due to the presence of receivers and other constraints on both sides of the new alignment, substantial shifting of the alignment horizontally is not feasible or reasonable. However, during design, both minor additional shifts and reductions in typical sections near the NSRs will be explored further.

Traffic management measures that limit the motor vehicle types, travel speed, traffic volume, and/or time of operation are sometimes used as noise abatement measures. The build alternative will have a 35-45 mph posted speed along the Connector Road. Speeds would have to be lowered a considerable amount before any significant noise reduction would be noticed. Any reduction in speed would affect the roadway's ability to accommodate anticipated traffic volumes and reduce the capacity of the proposed facility. Therefore, this option is not recommended for mitigation.

Limiting truck volumes or their time of operation along the Connector Road would likely have little to no effect on the predicted noise levels due to the low (0-1%) percentage of heavy trucks predicted to use the Connector Road. Additionally, shifting the trucks would probably mean a shift of the noise problem to other routes. Therefore this option is not recommended for noise mitigation purposes.

4.6.3.2 Noise Attenuation Devices (Sound Walls)

The construction of sound barriers has been considered at all impacted locations within the project corridor. Sound barriers reduce noise levels by blocking the sound path between a roadway and noise sensitive area. A sound barrier evaluation was performed for this project to determine whether reasonable and feasible barriers²⁵ could be constructed at the noise sensitive sites predicted to approach or exceed the NAC as a result of the build alternative.

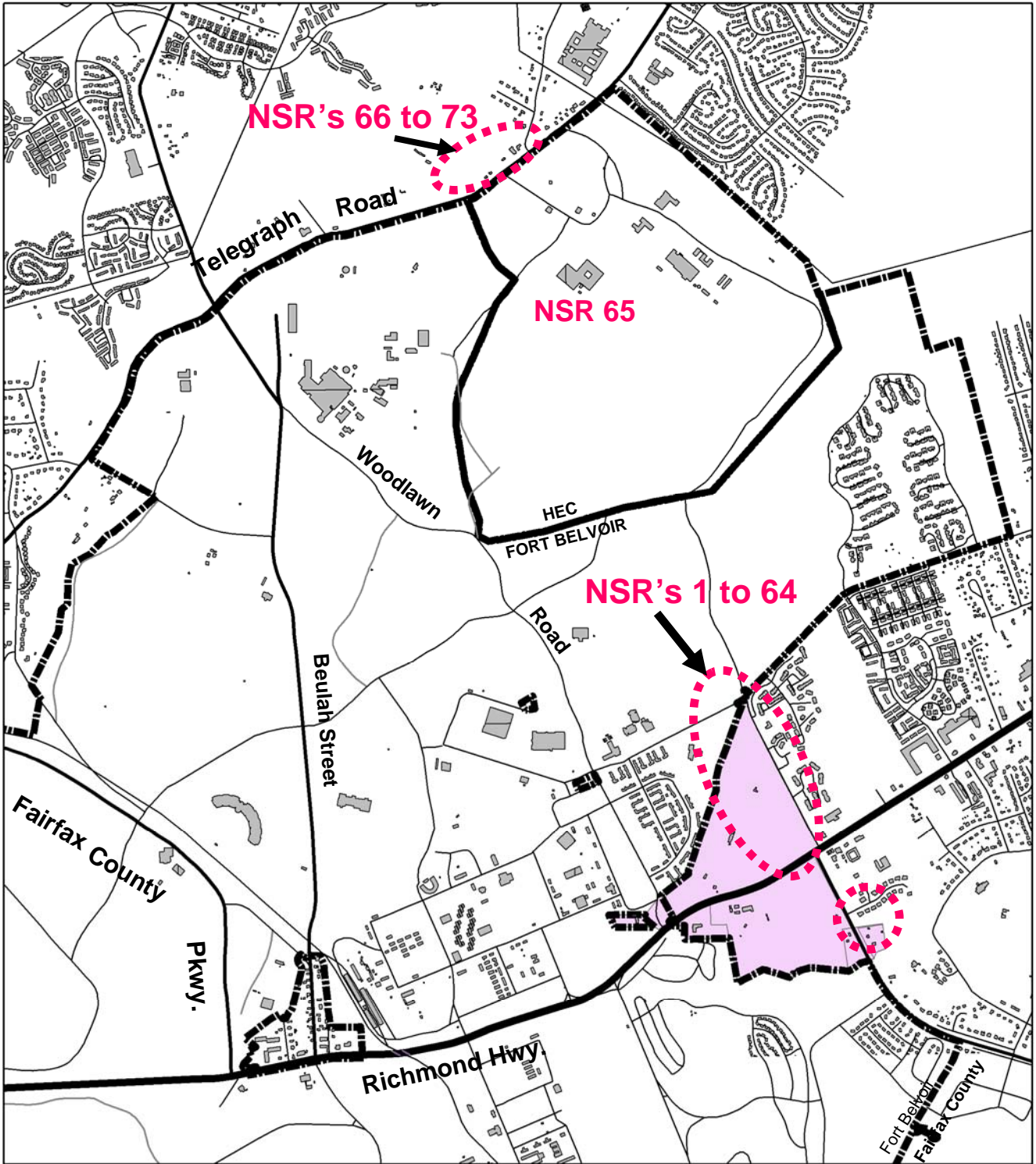
Currently VDOT considers a barrier feasible if it can be constructed to provide a minimum noise level reduction (insertion loss) of 5 dBA at the sites predicted to approach or exceed the FHWA Noise Abatement Criteria for the build alternative. In addition, VDOT considers a barrier to be cost reasonable if the cost per benefited receptor is no more than \$30,000.



The two locations along Telegraph Road where NSRs would be impacted were evaluated for effectiveness of sound barriers. One proposed barrier shields NSRs 67-69. Analysis showed this barrier would provide greater than 5 dBA benefit to 2 of 3 receptors, however, this barrier is not cost-effective. The cost per benefited receptor exceeded the VDOT limit.

Another barrier was evaluated to shield impacted NSRs 70-73. Analysis showed this barrier provides greater than 5 dBA benefit to all 3 impacted receptors. This barrier is estimated to be within the VDOT guidelines per benefited-receptor.²⁶ No decision can be made to

²⁵ "Feasibility" primarily addresses engineering considerations (physical constraints affecting barrier construction, ability to provide a substantial noise reduction given certain access, drainage, safety or maintenance requirements, etc.). "Reasonableness" addresses the use of common sense and good judgment when considering noise abatement. Factors such as noise abatement benefits, cost of abatement, visual impacts, absolute noise levels, change in predicted noise levels, and adjacent development are all important.

²⁶ The estimated cost for the barrier is under \$54,000.



-  Fort Belvoir/HEC Boundary
-  Woodlawn Historic District

Noise Sensitive Receptors

Figure 4-3

construct a noise attenuation device until more design is completed, followed by detailed evaluation, and input from the impacted property owners. FHWA anticipates following VDOT procedures for noise walls. These include reviewing feasible sound barriers with the joint VDOT/FHWA Noise Abatement Committee, which in turn would render a recommendation to the VDOT Chief Engineer.

4.7 Infrastructure and Utilities Impacts

No long-term impacts to utilities or existing infrastructure are expected from the Preferred Alternative. Construction of the Preferred Alternative could result in short-term disconnections and reconnections of buried and aboveground infrastructure items, such as phone, fiber-optics, electrical lines and storm water, wastewater and potable water supply lines. Any utilities associated with the Preferred Alternative would be placed within its ROW.

Among the utilities, Washington Gas mainline running southwest to northeast across Fort Belvoir would be crossed by the Preferred Alternative near the Telegraph Road intersection. Appropriate measures would be taken to maintain gas service during construction, as the gas line would be relocated as necessary.

A Fairfax County water line runs roughly parallel to the Preferred Alternative's alignment for about 1000 feet, in proximity to the proposed intersection with Pole Road. Another water main runs along the residential side of Telegraph Road (opposite Fort Belvoir); the project would relocate this 50-year old pipe. Appropriate measures would be taken to maintain water service during construction. Similarly, relocation and maintenance of service would be accomplished for electrical or telephone or other utilities crossed by the Preferred Alternative.

4.8 Socioeconomic Impacts

The Preferred Alternative displaces no residents or businesses. Widening Old Mill Road and Telegraph Road could produce visual and noise impacts to existing residences. These impacts are discussed in detail in Section 4.1.3 and 4.6.

Socioeconomic characteristics of census tracts where the Preferred Alternative would be located were evaluated. Particular attention focused on identification of possible impacts to low-income and minority populations. This emphasis is due to Executive Order 12898 requiring federal agencies to incorporate consideration of environmental justice into the NEPA evaluation process. Socioeconomic characteristics for census tracts in the study area are discussed in Section 3.8.

Census Tracts 4219 and 4218 have higher low-income and minority populations than county and state-wide averages. These two census tracts bound the Preferred Alternative towards the southern terminus and within Fort Belvoir. Census Tract 4211, where the proposed northern terminus at Telegraph Road is located, has lower levels of low-income populations than county and statewide averages. A review of assessed property values for new homes adjacent to Telegraph Road, however, indicate low-income populations do likely not own them. Existing census information, field review of the Preferred Alternative, and review of assessed property values for townhouses along Old Mill Road, indicate that the Preferred Alternative would adversely and disproportionately affect no minority and low-income populations. The affordable housing apartment complex near Old Mill and Pole Roads would be no more impacted than others along Old Mill Road.

As an additional outreach measure, affected property owners (within Census Tract 4218) along Old Mill Road were sent an advance brochure that described the project, provided a status update, and also served as invitation to a public meeting held for the project in October 2005. Should additional public involvement identify disproportionate impacts to potential Environmental Justice populations, FHWA will consider measures to avoid or minimize any such impacts.

The Preferred Alternative affects access to businesses at the intersection of U.S. Route 1/Mount Vernon Memorial Highway/Old Mill Road. It creates right-in/right-out only conditions for two locations along Old Mill Road. Although some user convenience to local businesses and commercial sites is lost, right-in/right-out only movements would improve safety and traffic flow efficiency.²⁷ However, it should be noted that the right-in/right-out restriction is only introduced as result of the project.

4.9 Community Facilities and Services Impacts

Facilities and services evaluated include schools, churches, cemeteries, emergency, and on-Post services for the army community, as described in Chapter 3. The Preferred Alternative does not adversely impact community facilities. No community facilities or services would be displaced or relocated as a result of the Preferred Alternative. There would be no division of neighborhoods, nor separation of neighborhoods from schools, shopping, churches, parks or other community facilities by the Preferred Alternative. Access to schools would continue similar to existing conditions. A left-turn lane similar to the present one, would allow access to the private school adjacent to the Grist Mill estates. The church on Old Mill Road would experience an increase in noise levels, but it would still remain under the NAC.

The Preferred Alternative could enhance response times for emergency response vehicles. Emergency responders would no longer have to utilize circuitous routes to access neighborhoods at the edges of the study area. For example, two Fairfax County fire stations located on Telegraph Road and Lukens Lane, would benefit from improved access under the Preferred Alternative. Occasional median breaks are included to allow emergency vehicles to turn around.

The Preferred Alternative would not adversely affect man-made recreational facilities. It will enhance bicycle access in the area (See Section 4.11.) It bisects two hunting areas on Fort Belvoir/HEC (W-4 and R-3). Hunters must be permitted, and maintain a distance of at least 100 yards from a road or residence.

Access between Fort Belvoir and HEC property would be via an underpass, near the unimproved section of John J. Kingman Road. Hunters, as well as maintenance vehicles and wildlife, could use the grade-separation planned.

4.10 Traffic

Understanding how existing traffic and transportation conditions will change over time is important in the evaluation of transportation project impacts. The Preferred Alternative would play a minor role in the regional highway network. Under either the Build or No Build

²⁷ Virginia Department of Transportation (VDOT) does not require all-direction access; namely, right-in-right-out is all which is legally required, regardless of past usage.

alternative, this area of Fairfax County will experience increased traffic as a result of more accelerated growth of the regional economy and associated changes in employment and population. FHWA has assessed the data for both the Preferred and the No Build Alternative for 2010 and 2030 conditions, to provide a comparison of traffic conditions within the study area.

An examination of the surrounding roadway network in conjunction with likely impact areas led to the selection of fifteen signalized and unsignalized intersections in the study area for analysis. **Figure 4-4** illustrates forecasted Average Daily Traffic (ADT) volumes both within and in proximity to the study area .

4.10.1 Methodology

Assumptions regarding future improvements to the other roadways in the study area were based on the MWCOG *Constrained Long Range Plan* (CLRP). The CLRP is financially constrained and thus includes only those projects that can be funded by revenues that can be reasonably expected to be available. In addition to the Connector Road, two important improvements projected by the year 2015 are the widening of U.S. Route 1 and Telegraph Road (from Beulah Street to South Kings Highway). The traffic projections for the future years assumed these, and other, improvements.

Daily and peak hour AM and PM forecasts for key roadways and intersections in the study area were generated for 2010 No-Build, 2010 Build, 2030 No-Build and 2030 Build.²⁸ From these forecasts, Level of Service (LOS) for key intersections was calculated.²⁹

Table 4-5 and **Table 4-6** show the results of the LOS analysis for the Build and No-Build scenarios. The tables indicate the overall LOS for the intersection as well as the average vehicle delay (in seconds). In some cases, the LOS may not change dramatically, but the differences in expected amount of time each vehicle is delayed may offer a more telling result.

²⁸ Federal Highway Administration, Eastern Federal Lands Highway Division, *Connector Road Study*, prepared by Vanasse Hangen Brustlin, Inc., January 2006.

²⁹ Federal Highway Administration, Eastern Federal Lands Highway Division, prepared by HDR Inc., *Technical Memorandum Future Traffic Conditions for the Richmond Highway (U.S. Route 1) and Telegraph Road Connector Environmental Assessment*, prepared by HDR Engineering, Inc., February 10, 2006

Table 4-5: Signalized Intersection Analysis Results

SIGNALIZED INTERSECTION	2010 NO-BUILD		2010 BUILD		2030 NO-BUILD		2030 BUILD	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
AM PEAK HOUR								
U.S. Route 1 @ Telegraph Rd	45.5	D	43.3	D	89.9	F	98.0	F
U.S. Route 1 @ Fairfax County Pkwy	46.9	D	36.9	D	36.9	D	30.5	C
U.S. Route 1 @ Backlick Rd / Pohick Rd	27.0	C	24.2	C	23.8	C	20.7	C
U.S. Route 1 @ Belvoir Rd	32.3	C	34.8	C	35.2	D	62.1	E
U.S. Route 1 @ Woodlawn Rd	15.6	B	16.4	B	15.1	B	14.8	B
U.S. Route 1@Old Mill Rd / Mt Vernon Mem Hwy / Woodlawn Plantation	136.7	F	-	-	141.9	F	-	-
U.S. Route 1 @ Connector Road	-	-	50.7	E	-	-	42.5	E
Fairfax County Pkwy @ Kingman Rd	48.3	D	48.0	D	57.0	E	44.1	D
Kingman Rd @ Beulah St	30.2	C	18.2	B	30.2	C	32.0	C
Telegraph Rd @ Fairfax County Pkwy SB Ramp	17.5	B	17.1	B	19.6	B	23.2	C
Telegraph Rd @ Fairfax County Pkwy NB Ramp	11.3	B	10.8	B	13.1	B	17.7	B
Telegraph Rd @ Newington Rd	10.9	B	10.7	B	16.0	B	14.1	B
Telegraph Rd @ Beulah St	36.4	D	35.2	D	49.0	D	42.7	D
Telegraph Rd @ Connector Rd	-	-	12.5	B	-	-	15.2	B
Telegraph Rd @ Hayfield Rd	54.2	D	59.2	E	63.6	E	70.0	F
PM PEAK HOUR								
U.S. Route 1 @ Telegraph Rd	37.3	D	43.4	D	50.4	D	67.9	E
U.S. Route 1 @ Fairfax County Pkwy	82.9	F	119.7	F	136.4	F	109.0	F
U.S. Route 1 @ Backlick Rd / Pohick Rd	166.8	F	136.9	F	223.5	F	205.0	F
U.S. Route 1 @ Belvoir Rd	86.7	F	78.3	E	159.1	F	157.5	F
U.S. Route 1 @ Woodlawn Rd	34.9	C	40.1	D	63.1	E	61.4	E
U.S. Route 1@Old Mill Rd / Mt Vernon Mem Hwy / Woodlawn Plantation	190.8	F	-	-	225.4	F	-	-
U.S. Route 1 @ Connector Road	-	-	63.5	E	-	-	103.3	F
Fairfax County Pkwy @ Kingman Rd	175.2	F	155.6	F	226.8	F	178.9	F
Kingman Rd @ Beulah St	73.4	E	105.2	F	73.4	E	61.6	E
Telegraph Rd @ Fairfax County Pkwy SB Ramp	20.9	C	16.7	B	23.7	C	21.0	C
Telegraph Rd @ Fairfax County Pkwy NB Ramp	70.3	E	38.3	D	114.6	F	48.0	D
Telegraph Rd @ Newington Rd	21.0	C	20.2	C	36.9	D	31.6	C
Telegraph Rd @ Beulah St	40.5	D	37.5	D	63.9	E	58.7	E
Telegraph Rd @ Connector Rd	-	-	68.0	E	-	-	46.8	D
Telegraph Rd @ Hayfield Rd	59.5	E	65.0	E	65.3	E	81.5	F

Note: Delay is reported as the average delay per vehicles in seconds. Shaded cells indicate intersections where LOS changes between the No-Build and Build Alternatives.

Table 4-6: Unsignalized Intersection Analysis Results

UNSIGNALIZED INTERSECTION	2010 NO-BUILD		2010 BUILD		2030 NO-BUILD		2030 BUILD	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
AM PEAK HOUR								
Telegraph Rd @ Snyder Rd								
WB Left	15.2	C	15.1	C	24.4	C	24.6	C
NB Right	12.6	B	12.8	B	14.3	B	13.8	B
PM PEAK HOUR								
Telegraph Rd @ Snyder Rd								
WB Left	17.3	C	14.7	B	31.7	D	26.3	D
NB Right	14.1	B	13.5	B	18.6	C	17.7	C

4.10.2 Traffic Impacts

Both VDOT and Fairfax County generally strive for new construction projects to provide at least a LOS C for the design year. Because this connector is a replacement facility in an already congested area, that general rule is not applicable. The Preferred Alternative does not render a better LOS for every intersection compared to the No Build. However, many intersections obtain improvements in terms of the amount of delay. For example, the 2030 morning peak hour average vehicle delay at the existing Old Mill Road/Mt. Vernon Memorial Highway/Route 1 intersection is projected to be 141.9 seconds compared to 42.5 seconds under the build scenario.

The impact of the Preferred Alternative (Connector Road) on the traffic volumes of other roadways in the study area is, in general, not substantial. Due to reassignment of the traffic when the connector would be built, a few roadways in the study area would be expected to see an increase in traffic as a result of the build alternative while several roadways would be expected to see a decrease in traffic.

The future traffic analysis forecasted Year 2010 and 2030 daily volumes on the Preferred Alternative (near Telegraph Road) as 19,000 and 21,200 vehicles per day, respectively. Near U.S. Route 1, the forecasted Year 2010 and 2030 daily volumes are 20,300 and 23,600 vehicles per day, respectively.

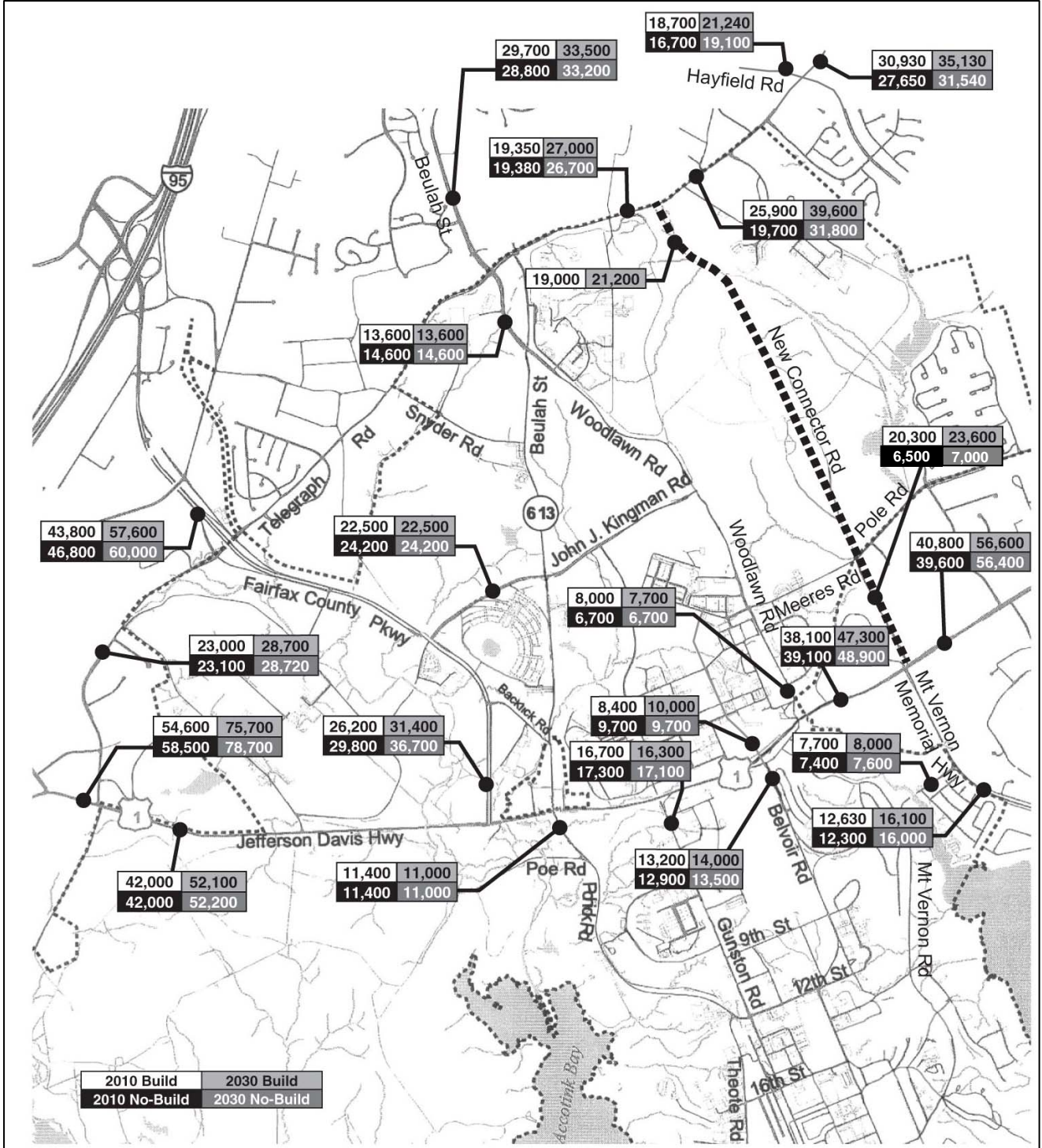
The analysis found that approximately 35 percent of the traffic on the Preferred Alternative would begin or end their trips on Fort Belvoir. The remaining 65 percent would be external traffic. At the intersection of the Connector Road and Telegraph Road, approximately 80 percent of the Connector Road traffic originates from or is destined to points further east and north via Telegraph Road and Hayfield Road. The remaining 20 percent originates from or is destined to points further to the west and north via Telegraph Road and Beulah Street.

Near the southern terminus, approximately 40 percent of the traffic originates from or is destined to points further northward via U.S. Route 1. Approximately 50 percent originates from or is destined to points further west and south via U.S. Route 1 while approximately 10 percent originates from or is destined to points further east and via the Mount Vernon Memorial Highway.

That the Connector Road may attract over 20,000 trips per day without dramatically impacting volumes on other roadways is indicative of a congested transportation network. In many cases, traffic from the Connector Road will simply “displace” the pre-Connector Road traffic on other roadways. That is, the Connector Road will distribute traffic from these roadways to other roadways which in turn will distribute traffic to other roadways throughout the region. The result is that the traffic-related impacts of the Connector Road become diluted. Along the Connector Road there are limited opportunities for new development or the potential for new trip generators.

4.10.3 Traffic Mitigation

The traffic analysis performed for the No Build and the Build Alternatives assumed optimized signal timing based upon projected turning movements. For the Build condition, traffic engineers identified locations and desired lengths for turning lanes and intersection configurations. Working with VDOT and Fairfax County DOT, preliminary design engineers in many cases



2010 Build	2030 Build
2010 No-Build	2030 No-Build

Future ADT Volumes

Figure 4-4

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accommodated these lengths and turning movements along the Preferred Alternative. During detailed design, FHWA will consult further with VDOT and Fairfax County DOT for placement of turning lanes, further opportunities to reduce conflicting movements, and further optimization of signal timing.

As noted under 4.1.2 Right of Way, 4.8 Socioeconomics, some properties along the Preferred Alternative and Telegraph Road would be limited to right-in-right-out access. The restrictions would be necessary for safety, clear sight distance, and operational efficiency of the facility.

4.11 Considerations for Pedestrians and Bicyclists

Transportation facilities and choices for pedestrians and bicyclists in the study area would be expanded and enhanced with the Preferred Alternative. The proposed typical section includes a shared-use path and/or sidewalk.

Along Old Mill Road under the Preferred Alternative, both a sidewalk and a shared use trail are proposed. The sidewalk on the residential side of the road would remain (some reconstruction may be necessary). On the Woodlawn Plantation side, a shared use path would be constructed. This trail would meander within Woodlawn Plantation property and tie-in to the Woodlawn Plantation driveway as well as to the crosswalks at the U.S. Route 1 intersection at Old Mill Road.

Along the Fort Belvoir/HEC portion of the Preferred Alternative, a shared use path is proposed. Due to the lack of intersections and driveways on this portion of the facility, an off-road path is suitable for both casual and commuter bicyclists.

Along the Telegraph Road improvements, a shared-use path and/or sidewalk are also proposed. The four-lane divided section of Telegraph Road between Beulah Street and Fairfax County Parkway enjoys a sidewalk on one side, a multi-use trail on the other side, and 4' bike lanes on each outside travel lane. To minimize right-of-way between Beulah Street and Old Telegraph or Hayfield Roads, alternative widths and features may be more appropriate; the Preferred Alternative places a shared use path along the non-federal side of Telegraph Road.

The Preferred Alternative offers the opportunity to connect the Potomac Heritage National Scenic Trail (PHNST) across Woodlawn Plantation to the Grist Mill and also towards Fort Belvoir and further south along U.S. Route 1. The National Park Service (NPS) has had plans to extend the PHNST across the Woodlawn Plantation. The PHNST is a federally designated system of trails that extends from Pennsylvania to Virginia. In this region, the PHNST follows the length of George Washington Memorial Parkway from Mount Vernon to Washington, D.C. NPS plans to connect Mount Vernon to the Grist Mill. As part of the Preferred Alternative, FHWA would construct a shared use path along the portion of Mt. Vernon Memorial Highway to be realigned as part of this project, and U.S. Route 1 on VDOT ROW and/or Woodlawn Plantation property.³⁰ The path anticipated as part of the Connector Road would be located on the Woodlawn Stables side of Mt. Vernon Memorial Highway and U.S. Route 1, and would also extend to the Woodlawn stable's driveway. Details for the specific location of the PHNST will be coordinated among the NPS, Fairfax County, and Woodlawn Plantation.

³⁰ Details for maintenance of the PHNST will be developed during the next phase of the project. An easement to either Fairfax County or regional park authority would allow for maintenance of the trail.

Overall access for pedestrians and bicyclists would be improved by aligning the intersection at U.S. Route 1/Old Mill Road/Mount Vernon Highway. Pedestrian crosswalks will be installed at that intersection and at Telegraph Road.

4.12 Antiterrorism and Force Protection Requirements

The Preferred Alternative must comply with DoD minimum Antiterrorism and Force Protection (AT/FP) requirements, particularly the minimum standoff distance of 45 meters (148 feet) between new or occupied buildings and roadways. Standoff distances for the Preferred Alternative were determined using GIS data for building locations provided by Fort Belvoir and HEC. The Preferred Alternative maintains a distance of about 400 meters (1300 feet) to the closest DCEETA structure. The closest building at the HEC is approximately 120 meters (400 feet). Details for addressing other security issues will be addressed during design.

4.13 Indirect and Cumulative Impacts

The FHWA and other Federal agencies' responsibility to address and consider direct, indirect, and cumulative impacts in the NEPA process was established in the Council of Environmental (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR §§1500-1508). The definitions are:

Direct effects are caused by the action and occur at the same time and place. (40 CFR § 1508.8)

Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR § 1508.8)

Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR § 1508.7)

In 1992, FHWA developed guidance for assessing indirect and cumulative impacts. FHWA has subsequently continued to refine its analysis process for these effects. The CEQ developed a handbook for addressing cumulative effects in NEPA documents; additionally, EPA has developed guidance to assist EPA reviewers in their review of NEPA documents.

This section focuses on the indirect and cumulative impacts of the connector road and future transportation projects through the study area.

4.13.1 Indirect Impacts

Indirect impacts from highway projects are often related to induced land development that can result from the construction of a highway. As a project whose purpose is to provide replacement access between a major arterial (U.S. Route 1) and minor arterial (Telegraph Road), it is not expected that the Preferred Alternative would induce major long-term growth inside or outside of

the study area. The most substantial indirect impact foreseen is that the project could provide a catalyst for widening Telegraph Road 1 to 5 years sooner than anticipated. This improvement is already planned in the MWCOG's 2006-2011 *Transportation Improvement Program* for completion by 2010, and would not occur simply as a result of the Preferred Alternative. In itself, the Connector Road would serve as a minor arterial, connecting arterials. Except for an emergency access gate for HEC, no roadway connection to the Preferred Alternative occurs except at the termini.

About one-third of the corridor is located within the Woodlawn Historic District. The National Trust for Historic Preservation, owner of Woodlawn Plantation, is committed to preserving the pastoral landscape on its property and a National Historic Landmark, and not commercial or residential development. About two-thirds of the corridor crosses undeveloped land on Fort Belvoir and HEC property. The Department of the Army (DA) and USACE dictate land use policy on these undeveloped lands, not private developers or landowners.

Another key constraint to development within Fort Belvoir and HEC would be force protection measures which are required for new facility construction on military property. These facilities would likely require 400 meter security buffers and controlled access points, which increase operational costs. As has been mentioned, the Headquarters of the U.S. Army Corps of Engineers has been proposed for relocation to HEC (in proximity to the Preferred Alternative). The relocation of USACE headquarters is incidental to this project.

Fairfax County predicts³¹ that the planning districts in the study area will grow at faster rates than other districts in the county. The county anticipates accelerated growth as the demand for affordable housing grows, and the shift of employment centers further out into the growing suburban areas of the county. The Preferred Alternative would not be a causative factor in these growth and land use trends occurring in the county, as its function in the regional highway system would be limited.

4.13.2 Cumulative Impacts

Cumulative impacts often relate to the long-term effects on natural resources resulting from development. This section analyzes past, present and future activities that have a potential to impact the environment. The extent of cumulative impacts can vary by resource. An analysis of cumulative impacts can therefore sometimes extend beyond the limits of the study area. For example, evaluating cumulative impacts from all development in the contiguous 15-mile Forest and Wildlife Corridor, even outside the study area, is appropriate. Alternatively, the wood turtle's habitat is more limited within the study area, and proposed development on U.S. Route 1 may have less impact on this resource.

4.13.2.1 Past Pattern of Settlement and Development

Lands now within Fairfax County have been inhabited for more than 12,000 years beginning with Native American populations. European settlement began in the 1650's. By the 18th century Fairfax County had grown to a population of over 12,000 people. Fairfax County was greatly impacted by the Civil War because of its strategic location, although no major battles were fought there. After the Civil War, the County returned to a rural, agricultural economy which sustained residents into the early twentieth century. Proximity to Washington, D.C. allowed the

³¹ Fairfax County, Virginia Department of Transportation, *Fairfax County Transportation Plan Update – "Fairfax Futures" Preliminary Recommendations*, November 1-10, 2005, Powerpoint Presentation.

County to grow through this time necessitating road and rail facilities for the transport of agricultural goods (especially dairy products). The establishment of Fort Belvoir (then Fort Humphreys) also occurred in the early twentieth century during and immediately after World War I. Following World War II, Fairfax County began its suburbanization and traditional farming activities began to disappear. The population grew from the 1940's to the 1950's, from 40,900 to 98,500 residents. By the mid-1960's, Fairfax County had 454,300 residents. By 2004, the population of Fairfax County is estimated to have grown to slightly over 1,000,000 people.

4.13.2.2 Present Conditions

Several projects in the immediate vicinity of the corridor have a reasonable expectation to be constructed in the next year or two. The first project is the DCEETA Remote Delivery Facility (RDF), a military facility to be located south of the Preferred Alternative. This facility will serve approximately 100 vehicle trips per day via new access on Telegraph Road. No new vehicle trips into DCEETA are expected, rather existing traffic will access the Remote Delivery Facility from a different location. The second project is a planned retirement community (residential development) to be constructed near the proposed Telegraph Road intersection. Although the retirement community would be adjacent to the Resource Protection Area (Dogue Creek and tributaries-including Piney Run) none of the RPA lands would be developed. Other development proposed along Telegraph include a miniature golf-course south of the Preferred Alternative on Telegraph Road, and the expansion of a veterinary hospital north and opposite of the HEC entrance.

Huntley Meadows Park is one of the last remaining large wetland areas in the County, as well as the County's largest park, with a high priority for conservation by the County. Another sensitive wetland area is the Jackson Miles Abbott Wetland Refuge, on Fort Belvoir property. These resources contribute in large measure to the water quality in the Dogue Creek Watershed. Unlike Accotink Creek, Dogue Creek and its tributaries are not listed on the Commonwealth of Virginia's 2002 303(d) List of Impaired Waters. The Preferred Alternative would not require taking of any of these lands, nor would any other private or public projects propose taking of these lands in the short-term. To minimize the impacts of development, Fairfax County has also implemented a variety of measures, such as the establishment of Resource Protection Areas and Stormwater Management regulations to improve water quality in the region.

Forest and wildlife habitat has the potential to be cumulatively impacted by the Preferred Alternative and other near-term development in the study area. The Preferred Alternative would disturb about 7 acres of land from the designated Forest and Wildlife Corridor within Fort Belvoir. Two Solid Waste Management Units (SWMU), located in the Forest and Wildlife Corridor near the Preferred Alternative, have been capped and are grass-covered. South of the project area, the Forest and Wildlife Corridor has been recently degraded by removal of adjacent forest for placement of the Fairfax County Parkway, expansion of Telegraph Road, expansion of U.S. Route 1 and several housing developments. No other development has been proposed which has the potential to cumulatively impact the Forest and Wildlife corridor in the short-term at this time.

Potential threatened and endangered species habitat has been identified within the study area. Approximately 10 acres of potential and uncertain Wood Turtle habitat would be disturbed by the Preferred Alternative. As these sensitive habitats lie within Resource Protection Areas, and on federal property (HEC and Fort Belvoir) they are not likely to see other types of development or encroachment in the short-term.

To a lesser extent, other resources considered in this Environmental Assessment could be cumulatively impacted by the project with other development. In the short-term, the construction of the Preferred Alternative has minor socioeconomic impacts as no new opportunities for commercial and residential development would be created.

4.13.2.3 Future Plans

Projects discussed in this section are expected to occur in the longer term, five or more years away.

(a) Base Realignment and Closure Commission (BRAC)

The Base Realignment and Closure Commission (BRAC) is charged with recommending changes to military operations throughout the country. The 2005 BRAC recommendations are in the process of being implemented. By the year 2011, Fort Belvoir will expand, by accepting:

- Medical care functions from the Walter Reed Army Medical Center
- Army and DoD organizations presently in leased space in the National Capital Region
- Logistics functions from Naval Support Activity, Mechanicsburg, PA and Wright-Patterson Air Force Base
- Elements of PEO Enterprise Information Systems from Fort Monmouth, N.J.
- National Geospatial Agency units from leased locations in the NCR and Bethesda, MD

This consolidation of activities on Fort Belvoir would bring an additional 21,125 jobs to the Post. It is presently unclear exactly where new facilities would be located to accommodate all the jobs expected to shift to Fort Belvoir. The added traffic from BRAC recommendations has not been included in the future conditions for either the Build or No Build forecasts.

(b) National Museum of the U.S. Army

In 2001, the Secretary of the Army announced plans to open the National Museum of the U.S. Army with Fort Belvoir as the chosen location. The museum is expected to open between 2009 and 2011. The museum will encompass approximately 48 acres of Fort land. The initial location for the museum was in proximity to Pence Gate on the South Post. That location is on hold pending the recommendations made in Fort Belvoir's Master Plan update (expected to be released in later 2006). The museum is being funded through private donations, and being developed in a partnership between the Department of the Army and the Army Heritage Foundation. The construction costs for the museum are estimated to be 200 million dollars. An estimated one million annual visitors are expected to the museum. The added traffic from the Museum has been included in the future conditions for both the Build and No Build forecasts.

(c) Other Fort Belvoir Projects

Fort Belvoir plans to close Woodlawn Gate in the next few years as a force protection measure, providing additional standoff distances for the Lewis Heights Military Housing development. The gate closing may be accelerated by the transfer of land to the National Trust for Historic Preservation. A replacement gate would be expected.

As part of its North Post and South Post planning efforts, Fort Belvoir has proposed several projects, which individually may not introduce severe adverse impacts, but taken together, and

combined with the BRAC activities, could contribute to a change in the environmental character of the Post. These projects include:

- Woodlawn Road Road Reforestation
- Soldier Support Center
- Navy Seabee Complex
- Upgrade of Physical Fitness Center
- Religious Education Center adjacent to North Post Chapel
- US Army Intelligence & Security Command
- Residential Communities Initiative (RCI)
- DeWitt Army Hospital Replacement (proposed relocation depending on BRAC decision (Subchapter 3.9.1))

(d) Planned Transportation Improvements in the Study Area

Fairfax County outlines several long range transportation planning goals in the County's 2003 Comprehensive Plan.

In the Lower Potomac Planning District (primarily from the west to Fort Belvoir Boundary):

- Widen U.S. Route 1 to 6 lanes from Prince William County to Virginia Route 235 North.
- Providing paved, pull-off bus loading areas
- Developing centrally controlled, coordinated signalization along U.S. Route 1
- Using reversible lanes along portions of U.S. Route 1 to handle peak hour traffic volume.

In the Mount Vernon Planning District, high priority recommendations along U.S. Route 1 (from the north to Woodlawn Plantation boundary) include:

- Widening U.S. Route 1 from 6 lanes to 8 lanes from VA Route 235 North to the Capital Beltway. The newly constructed outer lane would be used by buses and right-turning vehicles exclusively during the peak periods. Encouraging long distance commuter traffic (outside of Fairfax County) to use the Interstate highways rather than U.S. Route 1 as a commuting route
- Expanding the capacity of U.S. Route 1 to 6 lanes through the Woodlawn historic district.

MWCOG's 2004 Update to the *Financially Constrained Long Range Transportation Plan* and 2005-2010 Transportation Improvement Program either recommends or programs funding for several transportation improvements in the short and medium term within the study area, including:

- Widening U.S. Route 1 through the historic district to 6 lanes (programmed by 2015).
- Widening Telegraph Road to 4 lanes, from Beulah Street to South Kings Highway (programmed by 2015).
- Installing signal pre-emption for buses along U.S. Route 1 from Mount Vernon Highway/Old Mill Road to Fort Hunt Road.
- Improving bus stops and associated facilities along the U.S. Route 1 corridor from Gunston Road to Huntington Avenue. This is a short term improvement (programmed for 2006).

(e) Fairfax County Transportation Plan Update

Fairfax County is currently updating their Transportation Plan recommending several major new transportation projects within the general U.S. Route 1 corridor. These projects could include the development of Bus Rapid Transit (BRT) or Light Rail Transit (LRT) service along U.S. Route 1 and the extension of Metrorail service to Fort Belvoir. The added capacity from these mass transit improvements were not included in the future conditions for either the Build and No Build forecast.

4.13.2.4 Cumulative Impacts Assessment

Likely the largest development in this area of Fairfax County would be the relocation of 21,125 military-related jobs from other parts of the region and U.S. While the impact of the BRAC project could be substantial, the Preferred Alternative would play a limited role in cumulatively impacting resources along with BRAC. Development proposals related to BRAC are rapidly evolving and subject to change.

Fort Belvoir identifies approximately 723 acres of developable land between the Forest and Wildlife Corridor and Telegraph Road (*NOTE: this includes some HEC land*). Fort Belvoir also identifies approximately 500 acres of developable land between the Forest and Wildlife Corridor and the Pole Road intersection with Meeres Road. If the Army were to develop in locations near the Preferred Alternative in the future (outside of the HEC boundaries), Fort Belvoir's *Long Range Component* recommends residential land use in this area. Any future military facility or housing must maintain force protection standards which affects where these facilities can be located. The operational costs of maintaining controlled access to facilities or housing must also be considered. The National Museum of the U.S. Army is expected to be located on the South Post, and would not cumulatively impact environmentally sensitive resources in the study area.

Cumulative impacts to water quality would be minimized by stormwater Best Management Practices (BMP's) that will be employed in the construction and design of any transportation facility, as required by the Department of Defense for all military facilities, and as required by Fairfax County and Virginia Storm Water Management Criteria for water quality and quantity control. The construction of the Preferred Alternative would employ a variety of stormwater management techniques as described in Section 4.2.5.2. The *Virginia Stormwater Management Handbook* provides guidance for implementing BMP's both during and after the construction. Relevant regulation on stormwater management is discussed in Section 4.2.2.

Other transportation projects also have the potential to cumulatively impact environmental and cultural resources in the study area. This is particularly the case in evaluating the long-term cumulative impacts of the widening U.S. Route 1 from 4 lanes to 6 lanes, and the widening Telegraph Road from 2 lanes to 4 lanes. These two projects represent major highway improvements for this area of Fairfax County in the long-term. A concern related to the U.S. Route 1 widening project is the encroachment on Woodlawn Plantation. Should that project advance it could increase cumulative effects on the Woodlawn Plantation and the Woodlawn Historic District. The current Preferred Alternative plans to enhance pedestrian access to the Woodlawn Plantation property while preserving its pastoral character. Other projects, listed previously, are not expected to cumulatively impact Woodlawn Plantation or other historic resources in the study area.

The widening of U.S. Route 1 to 6 lanes is planned by 2015 in the latest MWCOG *Constrained Long Range Regional Transportation Plan*. VDOT has indicated that funding has not been

secured for the widening in the short-term, and that the project is envisioned to include a transit component. VDOT conducted a NEPA study in 2003, but did not complete the process. Based on citizen concerns with the proposed 8-lane section in the northern segment, the U.S. Route 1 Corridor Steering Committee deferred the selection of a preferred alternative until a comprehensive transit study examining transit in the median area could be performed.

By congressional authority, as noted, the Army is preparing to transfer approximately 2.5 acres of land to the Commonwealth of Virginia. The SHPO will be involved in the covenant anticipated to be placed on the land, in order to ensure its long-term protection under the NHPA. This land in turn would pass to the owners of Woodlawn Plantation as a mitigation measure for the Connector Road. The parcel reconnects Woodlawn Plantation with the Woodlawn Friends Meeting House on Woodlawn Road. This is approximately the same amount of land being taken from Woodlawn Plantation for conversion to transportation use. Trail and pedestrian/bicycle facilities are planned which would ultimately reconnect Woodlawn Plantation to the historic Mount Vernon Estate, and further to Washington, D.C. along the Potomac Heritage National Scenic Trail. These pedestrian/bicycle facilities improve access to Woodlawn Plantation. There are presently no pedestrian or bicycle facilities which serve the Plantation grounds directly.

The widening of U.S. Route 1 and Telegraph Road would likely result in minor cumulative impacts to water resources in the long-term. It is assumed extensive measures would be taken to manage and treat stormwater runoff for any newly constructed transportation facilities. The Forest and Wildlife Corridor and threatened and endangered species habitat appear to not be impacted by either the U.S. Route 1 or Telegraph Road widening projects. Both projects are expected to closely follow alignments of the existing highways.

As mentioned, this area of Fairfax County is forecasted to see accelerated population growth, job growth and economic development in the coming years. The factors involved in this growth and development eclipse the Connector Road project, and the Connector Road would not aggravate these trends (and their environmental impacts).

4.14 Construction Impacts

The Contractor will be required to comply with all terms of all permits associated with this project. For example, the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act must permit all wetland impacts. The Virginia Department of Environmental Quality (VDEQ) would permit stream crossings. Discharges of storm water from construction activities are authorized pursuant to the Virginia Pollutant Discharge Elimination System (VPDES) and the Virginia State Water Control Law. Discharge of stormwater from construction activities to waters within the Commonwealth of Virginia requires authorization from the State Water Control Board. The Contractor must comply with the special and general conditions of those permits, as well as all applicable state, local and federal laws, ordinances, and regulations.

Working with the natural resources personnel from Fort Belvoir, VDOT and VDEQ, appropriate locations for construction laydown and staging areas will be identified during design. There will be no forest clearing for staging, nor staging within Resource Protection Areas (RPA's). Efforts to minimize their size, natural environmental impacts, and residential or traffic impacts will be a priority; none will be located in wetlands. Appropriate Stormwater Management (SWM) and other controls during use will minimize direct impacts; appropriate restoration to pre-construction

conditions is expected, where the location was not otherwise used for the roadway or associated facility (such as SWM facility).

The project construction period is expected to last almost two years. Should there be a phased implementation, similar disruption and construction impacts could occur, but with several years in between.

4.14.1 Land Use and Access

Temporary disruption of access to certain properties may occur during construction. Any disruption would be minimized as much as possible through development of maintenance-of-traffic plans. Where possible, construction of new entrance(s) would be completed and placed in operation before old entrance(s) are impacted. Temporary detours or lane-shifts may occur along existing roadways of Old Mill Road, Route 1, Mount Vernon Memorial Highway, Pole Road and Telegraph Road.

4.14.2 Wildlife and Habitat

Direct, short-term impacts during construction would include loss of vegetation and resulting displacement of larger animal species, such as deer and fox. Smaller mammals, reptiles and amphibians may be displaced during construction. Field surveys within known potential habitat areas for state-listed animal species would be conducted prior to construction. Any listed species would be relocated according to the Virginia Department of Game and Inland Fisheries (VDGIF). An increase sediment-laden runoff could have direct, short-term impact on aquatic biota. Measures to prevent and control runoff are described below.

4.14.3 Soil Erosion/Storm Water Controls

Short-term water quality and stormwater impacts may occur from grading activities and erosion during construction. The contractor will employ best management practices (BMPs) to control erosion and sedimentation during construction to minimize impacts on water quality.

FHWA would ensure that the contractor implement and maintain strict erosion and sedimentation procedures in accordance with the Virginia Department of Conservation and Recreation (DCR), Division of Soil and Water Conservation (DSWC) 1992 Virginia Erosion and Sediment Control Manual (VDCR, 1992) and the Public Facilities Manual of the County of Fairfax (Fairfax County, 2001). These measures would be summarized in an E&S Control Plan that would be approved by VDOT, Fort Belvoir, and Fairfax County and included in the Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharges of Storm Water from Construction Activities application.

Construction activities will be monitored to ensure that erosion and storm water management practices are adequate in preventing sediment and pollution migration into nearby surface waters. Problem soil issues would be addressed in the design phase of the project, with a complete geotechnical analysis. BMPs for certain soil types could include staging construction to minimize the amount of earth exposed at any one time. Construction methods may include use of berms, dikes, mulch, netting, bio-retention features and other forms of stormwater management controls.

4.14.4 Resource Protection Areas, Stream Crossings, and Wetlands

Short-term water quality and erosion impacts may occur during construction. For the crossing of RPA and streambeds, the following measures could be taken by the contractor, as appropriate:

- Apply BMPs to minimize impact on the RPA and associated wetlands.
- Stabilize affected slopes.
- Minimize vegetation removal.
- Minimize the trench width for buried utility banks.
- Expedite construction within the RPA.
- Use silt fences and other erosion control measures to delineate the RPA buffer prior to site work to prevent accidental intrusion of the buffer.
- Enhance the riparian buffer through replanting following disturbance.
- Avoid unnecessary disturbances to vegetation and soils outside of the proposed grading limits.

4.14.5 Hazardous Materials

Portions of the Preferred Alternative traverse former military training ranges that have the potential for unspent ordnance and demolitions materials. The U.S. Army will take measures to detect, neutralize and remove these prior to construction. Additionally, construction of the project would result in a short-term increase in the use of hazardous materials and generation of hazardous wastes from the operation of construction equipment. During construction there would be a small potential for soil contamination from motor oils, hydraulic oils, and gasoline and diesel fuels as a result of construction vehicle repair, maintenance and fueling. Placement and use of any fuel tanks will be performed in accordance with Virginia Department of Environmental Conservation (DEC) requirements.

4.14.6 Air Quality

Construction impacts on air quality include dust created by disturbance of earth and exhaust emissions from construction equipment. The Virginia Department of Environmental Quality (VDEQ) regulations will be enforced in order to minimize these impacts.

Fugitive particle emissions would be minimized during construction through use of standard control measures outlined in Virginia Standards for Fugitive Dust Emissions (9 V AC 5-50-90) and Fort Belvoir's Title V operating permit (NVRO70550). The contractor will:

- Where possible, spray water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of and;
- Apply water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which may create airborne dust;
- Use adequate containment methods during sandblasting or other similar operations;
- Cover open equipment for conveying or transporting material likely to create objectionable air pollution when in motion; and
- Remove promptly spilled or tracked dirt or other materials from paved streets and dried sediments resulting from soil erosion.

4.14.7 Noise

Land uses that will be sensitive to traffic noise will also be sensitive to construction noise. A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, VDOT has developed and FHWA has approved a specification that establishes construction noise limits. This specification can be found in VDOT's January 2002 Road and Bridge Specifications, Section 107.14(b.3), "Noise". The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

4.15 Relationship between Local Short-term Use of the Environment and the Enhancement of Long-Term Productivity

Implementation of the Proposed Action Alternative would result in long-term benefits for the mobility of residents in the surrounding area who must now use more circuitous routes instead of Woodlawn Road and Beulah Street, with minor long-term impacts on the environment.

4.16 Irreversible and Irretrievable Commitments of Resources

The construction of the Connector Road would not expend unusual amounts of man-hours, fuel, and materials associated with design and construction, in relation to other projects of similar size. The project would consume non-renewable resources (oil, gasoline) as well as the labor costs to design and build the roadway facility.

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DHR ID # 029-0330, George Washington Grist Mill, March 19, 2003; and
DHR ID # 029-5181, Woodlawn Historic District, December 20, 2001.

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7.0 LIST OF AGENCIES, ORGANIZATION AND PERSONS TO WHOM COPIES OF THE DOCUMENT HAVE BEEN SENT

The Federal Highway Administration (FHWA) requirement for distribution of Environmental Assessments is limited to public inspection at the FHWA headquarters and Division Office. However, in addition to the notice of availability, it is the practice of FHWA to distribute a copy of the document (either hardcopy or CD) with the notice to Federal, State and local government agencies likely to have an interest in the undertaking. Furthermore, FHWA intends to make this document available on the internet at the Eastern Federal Lands Highway Division project website.

7.1 Federal Agencies and Officials

Advisory Council on Historic Preservation
Federal Highway Administration, Virginia Division Administrator
National Capitol Planning Commission
National Park Service
 National Capitol Area
 National Historic Landmarks Program
Natural Resources Conservation Service
 Southeast Regional Office
 Virginia State Conservationist
U.S. Army
 Military District of Washington
 Garrison Fort Belvoir
U.S. Army Corps of Engineers
 Headquarters
 Baltimore District
 Capitol Area Office, Baltimore District
 Humphreys Engineer Support Center
U.S. Department of Defense
 Defense Access Road Program
U.S. Department of Housing and Urban Development, Virginia State Office
U.S. Department of Interior
 Office of Environmental Compliance
 Fish and Wildlife Service
U.S. Environmental Protection Agency, Virginia Field Office
U.S. House of Representatives
 Hon. James Moran
 Hon. Tom Davis
U.S. Senate
 Hon. John Warner
 Hon. George Allen

7.2 Virginia Agencies

Virginia Council of Indians
Virginia Department of Conservation and Recreation
 Division of Soil and Water Conservation
 Division of Planning and Recreation
Virginia Department of Mines, Minerals and Energy
Virginia Department of Environmental Quality
 Air Program Coordination
 Environmental Impact Review Coordinator
 Virginia Natural Heritage Program
 Water Program Coordination
Virginia Department of Forestry
Virginia Department of Games and Inland Fisheries
Virginia Department of Rail and Public Transportation
Virginia Railway Express
Virginia Department of Transportation
 Central Office
 Northern Virginia District Office
Virginia Outdoors Federation

7.3 Regional Agencies

Metropolitan Washington Council of Governments, Transportation Planning Board
Northern Virginia Regional District Commission
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Northern Virginia Transportation Authority

7.4 Fairfax County Agencies & Officials

Fairfax County Board of Supervisors
 Supervisor Gerry Hyland
 Supervisor Dana Kauffman
Fairfax County
 County Executive
 Department of Planning and Zoning
 Department of Transportation
 Department of Public Works and Environmental Services
 Fire and Rescue Department
Fairfax County Park Authority
Fairfax County Architectural Review Board
Fairfax County History Commission

7.5 Other Parties

Citizens' Task Force members
Section 106 Consulting Parties (other than above)
National Trust for Historic Preservation
Headquarters
Woodlawn Plantation
Gum Springs Historical Society
Gunston Hall
Historic Mount Vernon
Pohick Church
Quaker Friends Meeting House
Woodlawn Baptist Church

7.6 Locations for Public Availability of the Environmental Assessment

Federal Highway Administration, Eastern Federal Lands Highway Division,
21400 Ridgetop Circle, Sterling, VA 20166

Fort Belvoir, Public Affairs Office,
9820 Flagler Road, Suite 201, Fort Belvoir, VA 22060

Kingstowne Library,
6500 Landsdowne Centre, Alexandria, VA 22315

Lee District Supervisor Dana Kauffman's Office,
6121 Franconia Road, Alexandria, VA 22310

Mount Vernon District Supervisor Gerald Hyland's Office,
Mount Vernon Governmental Center, 2511 Parkers Lane, Alexandria, VA 22306

Sherwood Regional Library,
2501 Sherwood Hall Lane, Alexandria, VA 22306

Internet:
http://www.efl.fhwa.dot.gov/planning/active_projects_rhtrc.htm

8. COORDINATION

8.1 Agency Coordination

Building upon the earlier U.S. Army Corps of Engineers (COE) Feasibility Study, agency coordination for this Environmental Assessment (EA) began with an initial stakeholder meeting in November 2004. The purpose of the initial meeting was to introduce the Federal Highway Administration - Eastern Federal Lands Highway Division (FHWA) team to key stakeholders regarding the subject project, to review the past efforts and available data, and to discuss project schedule and study approach. The key agency stakeholders working with FHWA on this action are:

- Fairfax County Department of Transportation
- U.S. Army Garrison Fort Belvoir, Directorate of Public Works (DPW)
- U.S. Army Surface Deployment and Distribution Command, Defense Access Road Program
- U.S. Army Corps of Engineers (USACE), Baltimore District
- U.S. Army Corps of Engineers, Humphreys Engineer Center
- Virginia Department of Transportation (VDOT)

FHWA conducted an agency scoping meeting on January 24, 2005. Formal notice of the meeting was distributed January 10, 2005. The purpose of this meeting was to present the project to Federal, state and local agencies. FHWA presented the project and study approach for preparation of the NEPA documentation and schedule, as well as reviewed the past work efforts including discussions of previous alternatives and available data.

Numerous other meetings have been held between the project team and key agency stakeholders on many issues during the study process. These issues range from traffic analysis and forecasts, typical sections, alignment and intersection configurations to historic resources mitigation opportunities, cost estimates, and pedestrian/trail locations.

8.2 Public Involvement

Public involvement has been important to this project. Earlier during the USACE study phase, two public meetings had been conducted, on June 23, 2003 and November 17, 2003. For this EA phase, FHWA conducted an initial public informational meeting on February 17, 2005. That meeting presented the project purpose and need, described the NEPA and Section 106 processes, and initial alternatives. FHWA conducted a second public information meeting on October 25, 2005. That meeting outlined the study progress, the refinement of the alternatives, and the progress on numerous issues. Both meetings allowed an exchange of information and comments. For each public meeting, advance notices appeared in local newspapers. Additionally, written comments were received and considered. A public meeting will be conducted on this EA.

FHWA initiated a website for the project activities in January, 2005, and has updated it with displays, handouts, and presentations from each public information meeting. The internet address is:

http://www.efl.fhwa.dot.gov/planning/active_projects_rhtrc.htm

County Supervisors Gerald Hyland and Dana Kauffman created a Citizens Task Force for the project, after the first public meeting in February 2005. The Task Force consists of eight residents from the two planning districts. The Task Force met with Project Team representatives on June 1, 2005; August 31, 2005; January 26, 2006 and May 12, 2006. Briefings included project activities including options for the U.S. Route 1/Old Mill Road/Mount Vernon Memorial Highway intersection, traffic studies, and other coordination efforts. The Task Force recommended conducting the October 2005 public meeting and developing the newsletter preceding it. The Task Force offered comments on the content of an initial draft of this Environmental Assessment.

8.3 Section 106 Coordination

In compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), described under 3.3 and 4.3. *Cultural Resources*, FHWA initiated a Consulting Parties process regarding potential impacts to cultural resources. FHWA conducted meetings on September 12, 2005 and March 30, 2006 as part of the process. Consulting parties include:

- Virginia Department of Historic Resources, State Historic Preservation Officer (SHPO)
- Fairfax County Architectural Review Board
- Fairfax County Dept. of Planning & Zoning
- Fairfax County History Commission
- Fairfax County Dept. of Transportation
- Gum Springs Historical Society
- Gunston Hall Plantation
- Historic Mount Vernon
- National Trust for Historic Preservation (Trust)
- Woodlawn Friends Meeting
- VDOT
- U.S. Army Garrison – Fort Belvoir
- Defense Access Road Program

Informal coordination to assist the cultural resources evaluation process also occurred. The project team held numerous meetings with the Trust to discuss potential impacts to the Woodlawn Plantation, a National Historic Landmark (NHL), protected also under Section 110 of the NHPA. Formal consultation was also undertaken with the U.S. Department of Interior's National Park Service regarding the NHL property.

Table 8-1 lists a summary of several meetings related to cultural resources.

Table 8-1: Cultural Resources Coordination Meetings

DATE	ATTENDEES/CONTENT
5/13/05	FHWA and its consultants met with the Trust, owners of Woodlawn Plantation, Supervisor Hyland, and Fairfax County DOT. The meeting provided an overview of the project, alternatives under consideration, and general options for the Old Mill Road/U.S. Route 1/Mount Vernon Memorial Highway intersection. The Trust agreed to continue discussions. The meeting was held at Woodlawn Plantation.
6/21/05	Fairfax County Supervisor Gerald Hyland organized this meeting to discuss issues surrounding the connector road. The Army offered to transfer 2.5 acres of land adjacent to the Friends Meeting House, from the Army to the Trust. Invited attendees included Major General Jackman, of the Military District of Washington, the Trust, FHWA, COE, Fort Belvoir, Fairfax County DOT, and VDOT. The meeting was held at the Pope-Leighey House.
7/13/05	FHWA met with the Trust to discuss five preliminary concept options for the intersection of Old Mill Road, and Richmond Highway (U.S. Route 1), and Mt. Vernon Highway. The intersection is expected to be a terminus of the Connector Road. The meeting was held at HDR offices in Alexandria, VA.
8/9/05	FHWA met with the Trust to discuss four additional concept options developed for the intersection of Old Mill Road/U.S. Route 1/Mt. Vernon Highway and Woodlawn Plantation entrance. The options were based on feedback received at the 7/13/05 meeting, reflecting the historic, pastoral character of Woodlawn Plantation, as well as possible trail options on Woodlawn Plantation property. The meeting was held at HDR.
9/12/05	FHWA convened this first Section 106 Consultation Meeting. Consulting parties who may be signatories to the Memorandum of Agreement to a Memorandum of Agreement (MOA) were invited to the meeting. The meeting provided the consulting parties with a project overview, a summary of the connector road alternatives selection process, a description of the proposed land transfer to the Trust, the Memorandum of Agreement (MOA) for the project, and the status of the widening of U.S. Route 1 through the Historic District. The study team also presented the intersection design options that had been developed by FHWA in consultation with the Trust. The meeting was held at Woodlawn Plantation.
10/7/05	FHWA convened a multi-agency trail coordination meeting for the project. The Trust and Historic Mount Vernon (operators of Washington's Grist Mill, under contract with VDCR) were invited participants, which also included VDOT, Fairfax County and National Park Service staff. Discussion centered on options for linking the Potomac Heritage National Scenic Trail (PHNST) to Woodlawn Plantation, and options along/onto Fort Belvoir. The meeting was held at HDR.
1/5/06	FHWA met with the Trust to discuss potential project impacts and minimization along their property abutting Old Mill Road and Mount Vernon Highway. Details regarding entrance drive relocation, multi-purpose trail placement, and land transfer were among the topics. The meeting was held at the HDR.
3/20/06	FHWA and DoD met with the Trust to review preliminary engineering lane configuration changes at the Old Mill Road/ Mount Vernon Highway intersection, median and crosswalk locations, trail coordination, and construction phasing. The meeting was held at HDR.
3/30/06	FHWA convened the second Consulting Parties for the Richmond Highway (US Route 1) – Telegraph Road (Route 611) Connector Project. FHWA presented a summary of activities completed since the September meeting, including the alignment refinement process resulting in corridor 4CR. Discussion involved levels of details of mitigation for a proposed Memorandum of Agreement. The meeting was held at Sherwood Regional Library.

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**Section 4(f) Evaluation/Section 106 Coordination
WOODLAWN HISTORIC DISTRICT
FAIRFAX COUNTY, VA**

I. PROPOSED ACTION

a. Description of Action: Construct a 4-lane roadway that connects Telegraph Road and Richmond Highway (U.S. Route 1) in Fairfax County, Virginia. See discussion in Chapter 2 of the Environmental Assessment (EA) for more detail.

b. Purpose and Need: Provide replacement access between Telegraph Road and Richmond Highway (U.S. Route 1) as a result of the closing of Woodlawn Road and Beulah Street through Fort Belvoir, Virginia after the 9/11 terror attacks. For reference, Chapter 1 of the Environmental Assessment provides more detail on the purpose and need for the project.

c. Applicability of Section 4(f): Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 USC 303) requires that no land of an historic resource that is listed in, or eligible for listing in, the National Register of Historic Places (NRHP) be used for federal-aid highways unless there is no feasible and prudent alternative. Specific alternatives to avoid such lands must be considered, and measures to minimize harm must be included in the project. The proposed action would physically encroach upon the Woodlawn Historic District, specifically property owned by the National Trust for Historic Preservation (“Trust”). The proposed roadway would align Old Mill Road and Mount Vernon Memorial Highway at the U.S. Route 1 intersection. The proposed action would relocate the entrance driveway to Woodlawn Plantation.

It is anticipated that the proposed project would have an adverse effect on the Woodlawn Historic District because of the physical encroachment and other alterations to the local landscape. Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) specifically addresses adverse impacts to significant resources (16 U.S.C. 470(f)). FHWA has performed consultation related to Section 106 and must execute a Memorandum of Agreement (MOA) with the State Historic Preservation Officer, among others, prior to making a selection on an alternative and possibly advancing the project to design and construction. (See Chapter 4, Section 4.3 Cultural Resources of the EA for more detail related to Section 106 compliance.)

II. SECTION 4(f) PROPERTY

a. Description of the Woodlawn Historic District: The Woodlawn Historic District is in the general location of the intersection of U.S. Route 1, Mount Vernon Memorial Highway, and Old Mill Road in Fairfax County, Virginia. **Figure 1** provides an overview of the Woodlawn Historic District and contributing sites.

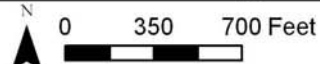
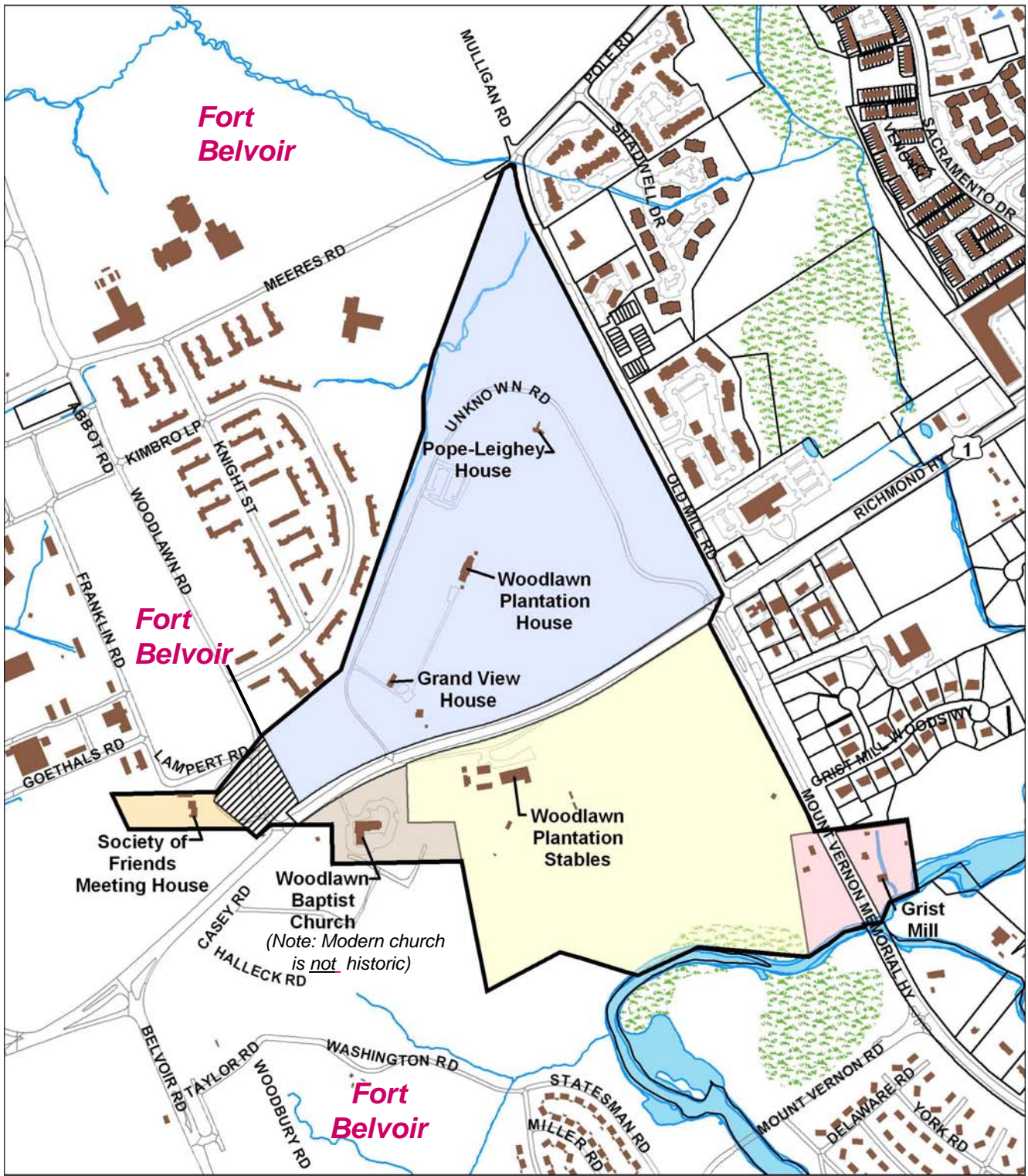
Several recognized structures are associated with the Woodlawn Historic District and the immediate vicinity. The contiguous district, Virginia Department of Historic Resources (DHR)# 029-5181, was determined eligible for listing in the NRHP in 2001. The Woodlawn Historic District embraces a number of historic resources in the immediate vicinity. **Table 1** summarizes the resources.

Table 1: Summary of Contributing Sites to the Woodlawn Historic District

Resource	NRHP/NHL Status (individually)	Additional Status	VDHR Identifier	Fairfax County Parcel ID	Address
Woodlawn Plantation National Historic Landmark	NHL-listed		029-0056	109-2-01-0003 and 109-2-01-0004	9000 Richmond Highway Alexandria, VA
Woodlawn Historic District	NRHP-eligible		029-5181	various	various
Woodlawn Plantation	NRHP-listed	Contributes to Woodlawn Historic District	029-0070 (stables)	109-2-01-0003 109-2-01-0004 109-2-01-0002	9000 Richmond Highway 8907 Richmond Highway
Pope-Leighey House	NRHP-listed	Contained in the Woodlawn Historic District	029-0058	109-2-01-0004	9000 Richmond Highway, Alexandria
Grand View House	NRHP	Contributes to Woodlawn Historic District	029-0062	109-2-01-0004	9000 Richmond Highway, Alexandria
Woodlawn Baptist Church property and cemetery	NRHP-not eligible	Contributes to Woodlawn Historic District	029-0070	109-2-01-0001	9001 Richmond Highway, Alexandria, VA
Woodlawn Friends Meeting House	NRHP-not eligible *	Contributes to Woodlawn Historic District	029-0172	109-2-01-0038	8990 Richmond Highway, Alexandria, VA
George Washington Grist Mill	NRHP-listed	Contributes to Woodlawn Historic District	029-0330	109-2-01-0028	5514 Mount Vernon Memorial Hwy., Mount Vernon

* As of May 30, 2006, the Woodlawn Friends Meeting are seeking re-evaluation of their property's eligibility status for listing in the NRHP.

1. Woodlawn Plantation (DHR# 029-0056) — This designation applies to the 1800s house, outbuildings, and landscaping associated with the Lewis family, relatives of George and Martha Washington. Since 1951, the Trust has administered the 126-acre Woodlawn Plantation property, which includes two parcels, one on each side of U.S. Route 1. The land was transferred to the Trust by deed in 1957. The property has multiple preservation-related designations, including listing in the NRHP in 1976. The parcel north of U.S. Route 1 was designated as a NHL in 1998. The parcel on the opposite side of U.S. Route 1 from the manor house (DHR# 029-0070), is listed in the NRHP but is not



Legend

- Woodlawn Historic District
- Proposed Woodlawn Parcel Addition (Approximate)
- George Washington's Grist Mill
- Woodlawn Plantation House and Grounds (*National Historic Landmark)
- Woodlawn Plantation Stables and Grounds
- Woodlawn Baptist Church
- Society of Friends Meeting House

part of the NHL designation. This contributing property contains the pasture and stables and is 56 acres in size. The entire NRHP-listed Woodlawn Plantation property, on both sides of U.S. Route 1, contributes to the Woodlawn Historic District.

2. Pope-Leighey House (DHR# 029-0058) — This designation applies to the single story home designed by Frank Lloyd Wright and moved onto Woodlawn Plantation property in 1964. It was individually listed in the NRHP in 1970. While not itself a contributing property to the Woodlawn Historic District, the Pope-Leighey House sits within the woods of the Woodlawn Plantation and is wholly contained within the NHL property and historic district boundary.
3. Grand View House (DHR# 029-0062) — This designation applies to the single story dwelling constructed in the 1850s. It has not been individually evaluated for NRHP eligibility but is included within the boundaries of the NRHP-listed Woodlawn Plantation property (029-0056); in addition, it contributes to the Woodlawn NHL and the Woodlawn Historic District.
4. Woodlawn Baptist Church (DHR# 029-0070) — The early 1870s church burned and no longer exists; it was associated with a cemetery remaining on site, along with the modern church. The site has been recommended Not Eligible for individual listing in the NRHP, but is considered a contributing property to the Woodlawn Historic District.
5. Woodlawn Friends Meeting House (DHR# 029-0172) — The Meeting House was constructed in the early 1850s and is associated with a horse stable and cemetery. Located adjacent to Fort Belvoir's Woodlawn Gate off U.S. Route 1 at 8990 Woodlawn Road. Previous evaluation by DHR has recommended the site Not Eligible for individual listing in the NRHP, but considered a contributing property to the Woodlawn Historic District. (As of May 30, 2006, the Woodlawn Friends are asking for a re-evaluation of that determination.)
6. George Washington Grist Mill (State Historical Park) (DHR# 029-0330) — Listed on the NRHP in 2003, the property also contributes to the Woodlawn Historic District. The Grist Mill is located about 0.3 miles from the existing intersection with U.S. Route 1 at 5514 Mount Vernon Memorial Highway. The property is approximately 7 acres in size.

The Woodlawn Historic District also includes a portion of Fort Belvoir between the western edge of Woodlawn Plantation (the NHL property) and the eastern edge of the Woodlawn Society of Friends Meeting House. This parcel has not been individually inventoried in the DSS. Portions of the transportation routes within the contiguous District, namely U.S. Route 1 and Mount Vernon Memorial Highway, both operated and maintained by VDOT, are not contributing properties to the District.

b. Features and Functions¹

1. **Figure 2** shows the relationship of the project to the Woodlawn Historic District.
2. The boundaries of the district encompass approximately 140.53 acres.

¹ Description of features and functions is largely taken from the *Environmental Assessment Route 1 Improvements Project C* completed by the Virginia Department of Transportation (VDOT) in 2003.

3. Woodlawn Plantation is owned by the National Trust for Historic Preservation. The Woodlawn Friends Meeting House is owned by the Alexandria Monthly Meeting of the Religious Society of Friends at Woodlawn (Woodlawn Friends Meeting). George Washington's Grist Mill is owned by the Commonwealth of Virginia (Mount Vernon has assumed some administrative and operating functions.) The property between the Woodlawn Plantation and the Woodlawn Friends Meeting House is currently owned by the U.S. Army² but is to be transferred to the Virginia Department of Transportation and then to the Trust. This transfer is not considered a Section 4(f) use.
4. The following activities take place on 4(f) property: At Woodlawn Plantation, there are tours, seasonal exhibits, school programs, picnics, needlework exhibitions, teas, children's workshops, haunted history tours, Christmas at Woodlawn, and private events. The research library is available to scholars by appointment and includes particular strengths in Colonial and Federal decorative arts, slavery, and Virginia history and genealogy. Woodlawn Plantation's stables are leased to a private operator for equestrian activities. The Friends Meeting House hosts a monthly religious meeting. On the Fort Belvoir land within the District, Woodlawn Road serves as an entrance gate to the Fort, with a security checkpoint. George Washington's Gristmill is a state park open to the public.
5. Existing facilities at Woodlawn Plantation include the mansion, a museum shop, a parking lot, picnic grounds, gardens, stables, outbuildings and the Pope-Leighey House. Facilities at the Woodlawn Friends Meeting House include the meeting house, a shed, and a cemetery. Facilities at George Washington's Gristmill include the reconstructed mill, a picnic area, and a parking lot. There are no facilities on the Fort Belvoir lands within the district, other than Woodlawn Road and the security checkpoint. There are no planned additional facilities at this time.
6. The Woodlawn Plantation property on the Woodlawn Plantation NHL side of U.S. Route 1 is accessed by a main entrance off Richmond Highway, which is presently opposite of the Mount Vernon Memorial Highway approach to the intersection. The Friends Meeting House is accessed from a driveway off of Fort Belvoir's Woodlawn Gate, the former Woodlawn Road. George Washington's Gristmill is accessed by a parking lot directly off Mount Vernon Memorial Highway.
7. The district has unusual characteristics: The northern portion of the Woodlawn Plantation is a designated National Historic Landmark. As such, it is subject to special statutory requirements in Section 110(f) of the National Historic Preservation Act. Under these requirements, federal agencies must, "to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking." Further, under regulations 36 CFR 800.10(c), "The agency official shall notify the Secretary [of Interior] of any consultation involving a National Historic Landmark and invite the Secretary to participate in the consultation where there may be an adverse effect." FHWA notified the Department of Interior of consultation involving Woodlawn Plantation and invited them to participate in the consultation to resolve the adverse effects by a letter dated March 17, 2006 to William Bolger, National Park Service.

² The land on Fort Belvoir is owned by the United States of America and is under the jurisdiction of the Department of the Army.

NOTE: Acreage along Old Mill Road was calculated from existing edge of pavement to 2' beyond proposed curb.

2.24 A

97,774 SF (2.24 AC)
Along Old Mill Road

Woodlawn

NOTE: Acreages do not include temporary construction easements. No ROW is proposed for trails, which would remain as Trust property.

0.27 A

11,545 SF (0.27 AC)
Along US 1

0.13 A

5,869 SF (0.13 AC)
Along US 1 (forable property)

From HDR 4CR, 4-11-06

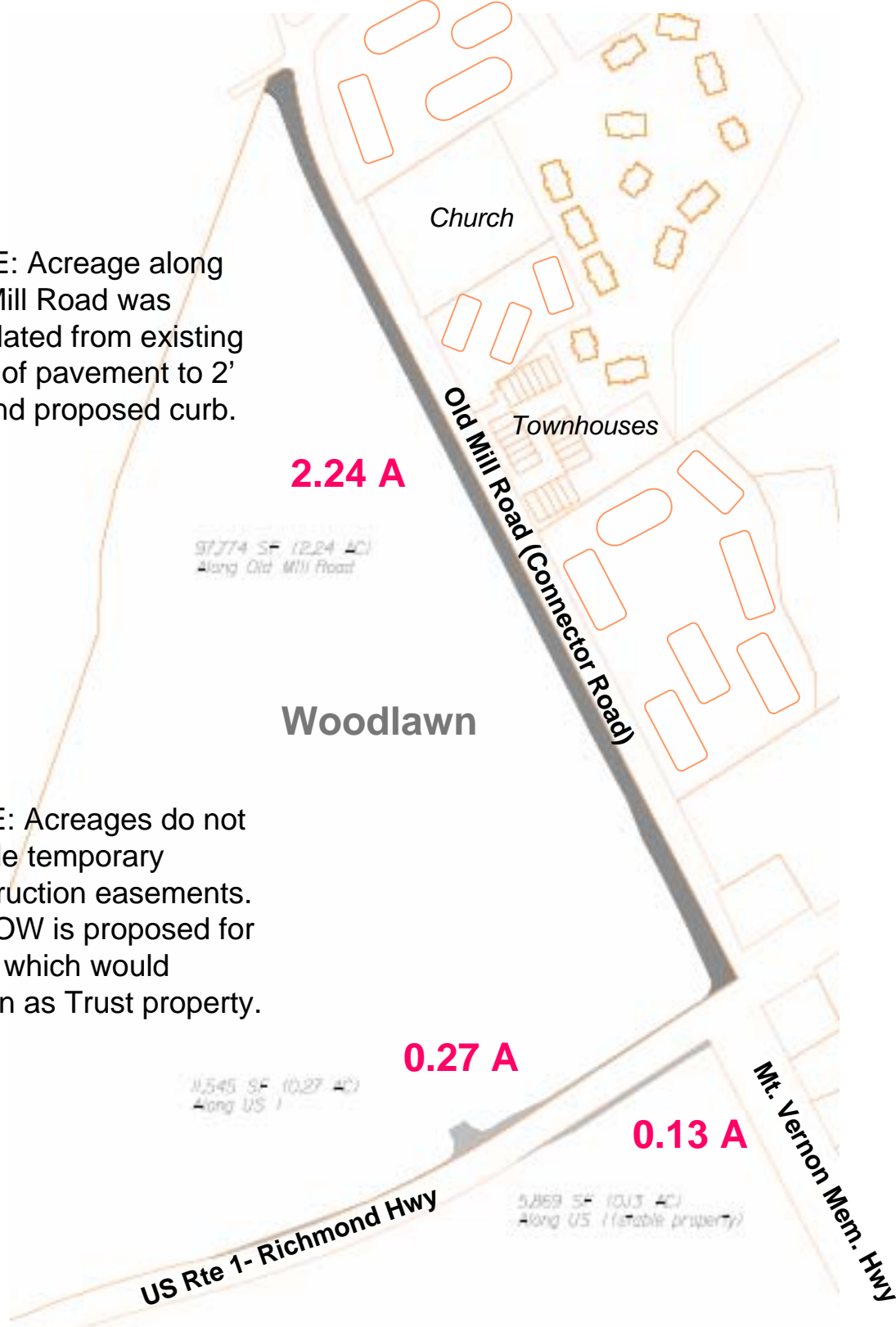
 New Pavement

 Garden Apartment Complex

**FHWA Richmond Highway-Telegraph Road Connector
Fairfax County, VA - Section 4(f) Woodlawn**

**Additional ROW From
Woodlawn Plantation
Property**

Figure 2



III. IMPACTS TO SECTION 4(f) PROPERTY

a. **Use:** For the alignment under consideration, approximately 2.64 acres would be used from property belonging to the Trust. These lands are associated with the NHL, Woodlawn Plantation and the overall Woodlawn Historic District. Nearly all the taking (2.5 acres) would be from the Woodlawn Plantation NHL site (DHR# 029-0056), with approximately 0.13 acres from the parcel on the opposite side of U.S. Route 1 (DHR# 029-0070). **Figure 2** illustrates the proposed taking of the property. The no-build alternative would not require the taking of any land.

b. **Other Impacts:** Aside from the physical encroachment on the Woodlawn Historic District property, the project would affect access to Woodlawn Plantation. The build alternative would relocate the main entrance to Woodlawn Plantation approximately 700 feet south of the existing entrance on U.S. Route 1. Currently, the main entrance from U.S. Route 1 to Woodlawn Plantation is directly opposite Mount Vernon Memorial Highway. Old Mill Road is currently offset from that intersection; however, the same traffic signal controls movements into Woodlawn's driveway and Old Mill Road, as well as turns onto U.S. Route 1. To enhance the safety of the intersection, and the flow of traffic, the intersection would be reconstructed to align Old Mill Road and Mount Vernon Memorial Highway. FHWA has engaged in discussions with the Trust since the initiation of the project, to review and seek input for possible solutions involving redesign of the intersection. The build alternative introduces new pedestrian facilities to accommodate visitors to Woodlawn Plantation, and other users of the Potomac Heritage National Scenic Trail (PHNST).

The project would impact the visual environment within the Historic District, particularly at a corner of the historic district: the intersection of U.S. Route 1, Old Mill Road and Mount Vernon Memorial Highway. Along Old Mill Road, 2.24 acres of undeveloped forested land would be taken for the construction of additional through and turning lanes. Among several mitigation measures, the Trust has proposed the planting of additional vegetation to minimize the visual impacts of Old Mill Road's widening. **Figure 3** illustrates changes to the visual environment as a result of the build alternative. The new intersection will offer a more cohesive design than the current "5-leg" intersection. The intersection will also incorporate pedestrian amenities and the extension of the PHNST along the perimeter of the Woodlawn Plantation property south of U.S. Route 1.

Other effects on the District under the build alternative would be minimal. There would be no change in noise levels at Woodlawn Plantation for the 2030 design year build alternative compared to the 2030 design year no-build alternative. Changes in noise levels would not reach an impact threshold. The preferred alternative was also included in the Metropolitan Washington (MWCOG) region's latest air quality conformity analysis, and was determined to be in conformity with the State Implementation Plan for Air Quality. *Temporary construction easements beyond the permanent right-of-way limits would be necessary under the build alternative. However, these easements would not disturb any existing or planned structures or facilities.*

IV. ALTERNATIVES

a. Alternatives that use 4(f) property: The Preferred Alternative is described in detail in Chapter 2 of the Environmental Assessment. As previously stated, the Preferred Alternative will serve as a replacement connector road providing access between U.S. Route 1 and Telegraph Road. The centerline of Old Mill Road would be shifted slightly south to allow for the alignment with Mount Vernon Memorial Highway, which would be shifted slightly north. Land from the Woodlawn Plantation NHL would be used to accommodate 1 right, 1 through, and 2 left turning lanes (which requires 2.24 acres) on Old Mill Road. Additionally, minor amounts of land would be taken from Woodlawn Plantation on both the north and south sides of U.S. Route 1 to accommodate turning lanes at the intersection.

b. Avoidance Alternatives:

(i) The No Build Alternative avoids use of the Woodlawn Plantation property, but would not meet the purpose and need for the project.

(ii) Reopening the closed roadways of Beulah Street and Woodlawn Road to the traveling public would not be practical or feasible due to the Department of Defense security requirements for Fort Belvoir.

(iii) Some other early alternatives involved alignments as far north and traversing Huntley Meadows Park, another significant Section 4(f) resource.

(iv) Several of the alternatives which FHWA has eliminated from further consideration, also involved similar use of the Woodlawn Plantation property along Old Mill Road.

(v) Avoidance of the Woodlawn Plantation property along Old Mill Road could only be achieved by placing all the roadway improvements to the north of Old Mill Road; this shift would involve the taking of approximately 11 townhouses, 4 garden apartment buildings, a church and a commercial enterprise, and the associated displacement and relocation of the residents, which is determined not to be prudent.

(vi) Another option FHWA briefly considered specifically to avoid the Woodlawn Plantation property avoided Old Mill Road entirely, by veering the alignment immediately adjacent to but not on the Woodlawn Plantation's northwestern boundary (Fort Belvoir-side) before connecting to U.S. Route 1. However, this alignment was inconsistent with Fort Belvoir facility plans. In addition, discussions with the Trust resisted development of this option because of its greater visual and constructive use of the Woodlawn property.

Based on the above determinations, the FHWA has focused on measures to reduce and mitigate the direct impacts from the Preferred Alternative 4CR.

V. MEASURES TO MINIMIZE HARM

a. Minimize Encroachment: The amount of encroachment into the district would be the minimum necessary to accommodate the proposed widening and alignment of Old Mill Road, consistent with sound engineering principles and safety. A meandering shared-use



FHWA Richmond Highway-Telegraph Road Connector
 Fairfax County, VA - Section 4(f) Woodlawn

Southern Terminus Concept
 Figure 3

path will be constructed on Woodlawn Plantation from the intersection with U.S. Route 1 to Pole Road. This eliminates the necessity for sidewalks along both sides of Old Mill Road and reduces right-of-way needed for the Preferred Alternative. Additionally, the extension of the Potomac Heritage National Scenic Trail would occur on the Woodlawn Plantation's east of U.S. Route 1. The typical section of the trail extension would follow National Park Service and AASHTO guidance (10 feet + 4 feet). Both pedestrian facilities are considered mitigation by the Trust however, and they would be constructed on easements granted by the Trust to the public agency maintaining the trails. Details regarding the locations of the shared use paths will be developed during design and in coordination with the Trust and National Park Service.

- b. Access:** The main entrance to the Woodlawn Plantation NHL would be relocated approximately 700 feet south of the existing entrance on U.S. Route 1 as a result of the Preferred Alternative. The entrance would be redesigned to enable safe ingress and egress to the site, to make the entrance more attractive to the public and at the same maintain the agrarian character of Woodlawn Plantation. There is a secondary maintenance and staff entrance to Woodlawn Plantation which would not be relocated as part of the project. The entrance to the Woodlawn stables property on the south side of U.S. Route 1, would not be relocated, although ingress and egress may be restricted to right-in and right-out access only in order to accommodate a left-turn into the new manor main entrance. The relocated main entrance, and associated landscaping features and pedestrian facilities, have been developed in consultation with Woodlawn Plantation, representatives from the Trust and other consulting parties.
- c. Mitigation:** The maintenance of Woodlawn Plantation's historic, rural, agrarian character as well as improved pedestrian facilities, and the Plantation's historic connection with Mount Vernon were emphasized by the Trust as design features which should be enhanced. **Figure 3** illustrates some the landscaping and pedestrian facilities concepts which were developed in coordination with the Trust.

Additionally, for the loss of approximately 2.6 acres from the Woodlawn Plantation property, the Army has agreed to transfer the parcel of land (2.5 acres in size) along Woodlawn Road adjacent to the Friends Meeting House. This land is located within the historic district, and would provide a connection to two contributing elements of the Woodlawn Historic District. The Army has been authorized by statute to transfer the parcel; it is intended that a covenant shall be placed on the parcel protecting it in perpetuity under terms of the NHPA.

- d. Maintenance of Traffic:** Traffic flow would be maintained during construction so that access to properties both within and adjacent to the District would not be interrupted.
- e. Turn lanes and traffic control:** The project would provide medians, turn lanes and traffic signals at the intersection of U.S. Route 1, Old Mill Road and Mount Vernon Memorial Highway; and at the relocated Main entrance to Woodlawn Plantation.
- f. Erosion and Sediment Control:** Temporary and permanent erosion and sediment controls would be installed during construction to minimize any detrimental effects of project-generated sediment on District land. The practices recommended in the *1992 Virginia Erosion and Sediment Control Handbook* will be used for this project.

- g. Landscaping:** Landscaping is a key component of the mitigation measures for this project. Landscaping options were developed in coordination with the Trust and other consulting parties, as mentioned the intent of the landscaping will be to reinforce the rural, agrarian character of Woodlawn Plantation.
- h. Additional coordination:** Additional coordination has been held with the National Trust for Historic Preservation, Fairfax County Department of Transportation, Virginia Department of Transportation (VDOT), Fort Belvoir, and the Department of the Army Defense Access Roads Program. Through the Section 106 process, FHWA ensures that consulting parties provide input on proposed mitigation measures, refine design details and agree to execute a Memorandum of Agreement (MOA) or Programmatic Agreement (PA) pursuant to 36 CFR 800.6.

VI. COORDINATION

a. Correspondence directly related to Woodlawn Plantation/Woodlawn Historic District

State Historic Preservation Officer - Virginia Department of Historic Resources (DHR)	
1/10/05	Letter from Jack Van Dop, FHWA, to Kathleen Kirkpatrick, Director, State Historic Preservation Office, DHR and multiple other state, federal and local agencies announcing project initiation and scoping meeting on 1/24/05.
7/1/05	Letter from Jack Van Dop, FHWA, to Kathleen Kirkpatrick, Director, State Historic Preservation Office, DHR, to initiate formal consultation for compliance with Section 106 of the National Historic Preservation Act (36 CFR 800.8 (c)(1)(ii)).
7/14/05	Letter from Marc Holma, DHR, to Jack Van Dop, FHWA, agreeing to participate in the Section 106 process in recognition of historic properties identified within the study area.
9/6/05	Letter from Margaret Ballard, HDR, to Marc Holma, DHR, and multiple Consulting Parties requesting initiation of the Section 106 Consulting Parties process, and inviting participation to a meeting 9/6/05.
9/16/05	Letter from Marc Holma, DHR, to Jack Van Dop, FHWA, in response to the 9/12/05 Section 106 Consulting Parties meeting outlining next steps in the Section 106 process.
3/10/06	Letter from Jack Van Dop to Marc Holma, DHR, in response to Marc Holma's 9/16/05 letter requesting to outline the scoping for the proposed connector road; possible utilization of Old Mill Road to connect U.S. Route 1 and Telegraph Road; status of historical structure and archeological identification surveys; status of consulting party requests made at the 9/12/05 meeting; and request to convene another consulting parties meeting.
4/13/06	Letter from Jack Van Dop to Marc Holma, DHR transmitting April 11, 2006 Cultural Resources Report to DHR.

U.S. Department of Interior (DOI)	
3/17/06	Letter from Jack Van Dop, FHWA, to Mr. William Bolger, National Park Service, inviting him to participate in the National Historic Landmark consultation process for Woodlawn Plantation.

Advisory Council on Historic Preservation (ACHP)	
9/1/05	Telephone call from Jack Van Dop, FHWA, to Carol Legard, Advisory Council on Historic Preservation, inviting ACHP to participate in the Section 106 process and upcoming meeting.
3/17/06	Email from Margaret Ballard, HDR, to Carol Legard, ACHP, inviting ACHP to attend the 3/30/06 Section 106 Consulting Parties meeting.
3/22/06	Letter from Jack Van Dop, FHWA, to Don Klima, Advisory Council on Historic Preservation, inviting ACHP to participate in the Section 106 process.

Virginia Council on Indians	
3/27/06	Letter from Jack Van Dop, FHWA to Ms. Deanna Beacham, Virginia Council on Indians, inviting her to comment and participate in the consultation process for this project.

b. Consulting Parties

Invited parties for Section 106 consultation include:

- Virginia Department of Historic Resources, State Historic Preservation Officer (SHPO)
- Fairfax County Architectural Review Board
- Fairfax County Dept. of Planning & Zoning
- Fairfax County History Commission
- Fairfax County Dept. of Transportation
- Gum Springs Historical Society
- Gunston Hall Plantation
- Historic Mount Vernon
- National Trust for Historic Preservation (Trust)
- Alexandria Quaker Friends Meeting House
- Virginia Department of Transportation
- U.S. Army Garrison – Fort Belvoir
- Defense Access Road Program

c. Meetings Directly Related to Woodlawn Plantation

FHWA coordinated with Section 106 Consulting Parties, both individually and collectively at several meetings, listed below.

Date	Content/Attendees
5/13/05	FHWA met with the Trust, owners of Woodlawn Plantation, Supervisor Hyland, and Fairfax County DOT. The meeting provided an overview of the project, alternatives under consideration, and general options for the intersection. The Trust agreed to continue discussions. The meeting was held at Woodlawn Plantation.

6/21/05	Fairfax County Supervisor Gerald Hyland organized a meeting among the Trust, U.S. Army, FHWA and others to discuss issues regarding the connector road. At the meeting, Major General Jackman of the Military District of Washington asked if the Trust would consider accepting a transfer of land associated with the Woodlawn Gate to the Trust (approximately two acres) in exchange for the land required for the Connector Road project. The meeting was held at the Pope-Leighey House on Woodlawn Plantation.
7/13/05	FHWA met with the Trust to discuss five preliminary concept options for U.S. Route 1/Old Mill Road/Mount Vernon Memorial Highway. With many alignments funneling to Old Mill Road, the intersection is likely a terminus of the Connector Road. The meeting was held at HDR offices in Alexandria, VA.
8/9/05	FHWA met with the Trust to discuss four additional concept options developed for the intersection and Woodlawn Plantation entrance. The options were based on feedback received at the 7/13/05 meeting, reflecting the historic, pastoral character of Woodlawn Plantation, as well as possible trail options on Woodlawn Plantation property. The meeting was held at HDR.
9/12/05	FHWA convened this first Section 106 Consultation Meeting. Consulting Parties were invited to the meeting. See list below. The meeting provided the consulting parties with a project overview, a summary of the connector road alternatives selection process, a description of the proposed land transfer to the Trust, possible items for inclusion in an MOA for the project, and the status of the proposed expansion of U.S. Route 1 through the Historic District. The study team also presented the intersection design options that had been developed by FHWA in consultation with the Trust. The meeting was held at Woodlawn Plantation.
10/7/05	FHWA convened a multi-agency trail coordination meeting for the project. The Trust and Historic Mount Vernon (operators of Washington's Grist Mill, under contract with VDCR) participated, as did VDOT, Fairfax County, Fort Belvoir, and National Park Service staff. Discussion centered on options for linking the Potomac Heritage National Scenic Trail (PHNST) to Woodlawn Plantation, and options along/onto Fort Belvoir. The meeting was held at HDR.
1/5/06	FHWA met with the Trust to discuss potential project impacts and minimization along their property abutting Old Mill Road and Mount Vernon Highway. Details regarding entrance drive relocation, multi-purpose trail placement, and land transfer were among the topics. The meeting was held at the HDR offices in Alexandria.
3/20/06	FHWA and DoD met with the Trust to review preliminary engineering lane configuration revisions at U.S. Route 1/Old Mill Road/Mount Vernon Memorial Highway intersection, median and crosswalk locations, trail coordination, and construction phasing. The meeting was held at HDR.
3/30/06	FHWA convened the second Consulting Parties meeting. FHWA presented a summary of activities completed since the September meeting, including the alignment refinement process resulting in corridor 4CR. Discussion involved levels of details of mitigation for a proposed MOA. The meeting was held at Sherwood Regional Library.

d. Other Public Participation efforts relative to Woodlawn Plantation/Woodlawn Historic District: NEPA, Section 106 and Section 4(f)

Date	Session/Content
2/17/05	Public Information Meeting. The first public meeting provided an opportunity to present to the public the project's purpose and need; description; overview of the National Environmental Policy Act (NEPA) & National Historic Preservation Act processes; work completed to date for the project; and the project schedule. FHWA solicited public input. Comments received included concerns on impacts to Woodlawn Plantation and other sites in the district, and preferences for the connector road alternatives that were considered for the project. The meeting was held at the Mount Vernon High School.
6/1/05	Citizens Task Force Meeting. County Supervisors Gerry Hyland and Dana Kauffman created a Citizen's Task Force for the project after the first public meeting in February 2005. The Task Force consists of eight residents from the two affected planning districts. FHWA briefed them on project activities including options for the U.S. Route 1/Old Mill Road/Mount Vernon Memorial Highway intersection, traffic studies, and other coordination efforts. This meeting was held at Supervisor Hyland's Office in the Mount Vernon Government Center
8/31/05	Citizens Task Force Meeting. FHWA reviewed the concept options as had been developed and discussed with the Trust for U.S. Route 1/Old Mill Road/Mount Vernon Highway intersection,. The meeting was held at Supervisor Hyland's Office in the Mount Vernon Government Center
10/24/05	Public Information Meeting. At this second meeting, FHWA presented a summary of the preliminary engineering and environmental activities, with recommendation to focus attention to the Alternative C corridor. FHWA displayed the graphic showing the general aligning of Old Mill Road with Mount Vernon Memorial Highway, as had been discussed with the Trust. Held at the South County Government Center in Alexandria
1/26/06	Citizens Task Force Meeting. FHWA discussed the numerous coordination meetings held, including with the NPS, Fort Belvoir and the Trust, and presented the rationale for the Alternative 4CR. Held at Supervisor Hyland's Office in the Mount Vernon Government Center
5/15/06	Citizens Task Force Meeting. FHWA received comments on preliminary draft Environmental Assessment. Held at Supervisor Hyland's Office in the Mount Vernon Government Center

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Section 4(f) Evaluation FORT BELVOIR FOREST AND WILDLIFE CORRIDOR FAIRFAX COUNTY, VA

I. PROPOSED ACTION

a. Description of Action: Provide a four-lane replacement roadway between Richmond Highway (U.S. Route 1) and Telegraph Road (VA Route 611) in Fairfax County, Virginia. See discussion in Chapters 1 and 2 of the Environmental Assessment (EA) for more detail.

b. Purpose and Need: Provide replacement access between Telegraph Road and Richmond Highway (U.S. Route 1) as a result of the closing of Woodlawn Road and Beulah Street through Fort Belvoir, Virginia after the 9/11 terror attacks. See Chapter 1 of the EA.

c. Applicability of Section 4(f): Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 USC 303) requires that no land from a publicly owned public park, recreation area, or wildlife or waterfowl refuge, be used for federal-aid highways unless there is no feasible and prudent alternative. Specific alternatives to avoid such lands must be considered, and measures to minimize harm must be included in the project. The proposed project would encroach upon the Forest and Wildlife Corridor, located on U.S. Army land at Fort Belvoir. For the purposes of this analysis, the Federal Highway Administration (FHWA) considers the Forest and Wildlife Corridor (hereinafter “Corridor”) a Section 4(f) resource.

II. SECTION 4(f) PROPERTY

a. Description of the Forest and Wildlife Corridor: The Corridor¹ was established by Fort Belvoir in 1993 as a mitigation commitment to offset the ecological impacts of habitat fragmentation caused by several major construction projects on Fort Belvoir. The Corridor is approximately 15 miles long with a minimum width of 250 meters. The Corridor protects a wildlife habitat and migratory corridor, while also maintaining a continuous area of natural forest habitat between Jackson Miles Abbott Wetland Refuge (JMAWR) and the Accotink Bay Wildlife Refuge (ABWR). The Corridor is not open to the public except as authorized by Fort Belvoir. **Figure 1** illustrates the Corridor boundaries.

The Corridor includes a wide range of wetlands, riparian forest buffers, habitat for the state-listed wood turtle and several high priority breeding species listed with the Partners in Flight (PIF) program, and waterways for passage of, and spawning habitats for anadromous fish. The Corridor connects with off-post forested areas of wildlife habitat, notably the Huntley Meadows Park (a 1,425 acre natural area), and allows animal movement between the larger forested areas, thus maintaining a diverse gene pool and helping ensure species survival.

Fort Belvoir has designated the Corridor as a Special Management Area (along with ABWR and JMAWR) recognizing the existence and importance of these sensitive natural resource

¹ See Chapter 3 of Environmental Assessment and Fort Belvoir’s Integrated Natural Resources Management Plan for a more detailed description of the Forest and Wildlife Corridor, and its development.

areas on-Post; and using the land designations to protect those areas from impact by development and mission activities. Over time, the boundaries of these areas have expanded. As noted in the Fort's *Integrated Natural Resources Management Plan*, the primary goal for the Fort in managing these significant natural areas is conservation. These areas are 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.

b. Features and Functions:

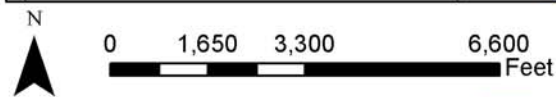
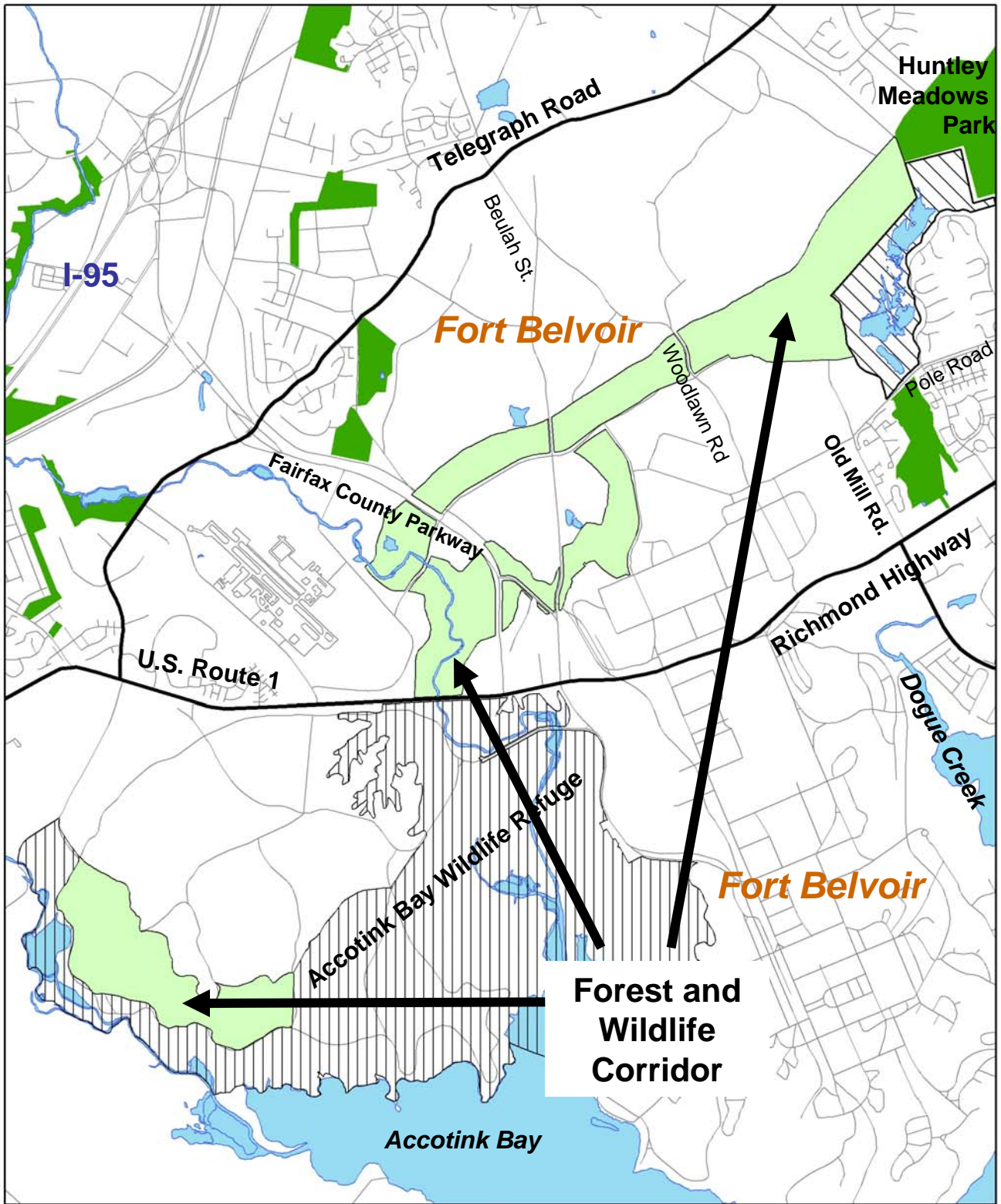
1. **Figure 2** shows the relationship of the Preferred Alternative to the Corridor.
2. The boundaries of the Corridor encompass approximately 742 acres.
3. The land that makes up the Corridor is located within the boundaries of Fort Belvoir and the Humphreys Engineer Center (HEC). The U.S. Army owns the land².
4. Institutional military, residential and transportation land uses occur primarily at the boundaries of the Corridor. The Corridor is largely undeveloped and forested. Bow hunting for deer only is allowed within the Corridor, by permit.
5. The Corridor serves important habitat functions within the study area including: habitat for the state-listed, threatened wood turtle and habitat for the Partners in Flight (PIF) priority bird species.
6. Both the Fairfax County Parkway and U.S. Route 1 traverse the Corridor.
7. Wildlife crossings have been constructed for both Fairfax County Parkway and U.S. Route 1. The wildlife crossings allow the Corridor to maintain a continuous link between the JMAWR and Huntley Meadows Park and the ABWR on the Potomac River.
8. Both Beulah Street and Woodlawn Road traverse the Corridor on the North Post of the Fort Belvoir. (These streets are closed to the general public.)
9. John J. Kingman Road serves as a southern boundary for the Corridor on much of the North Post; east of Woodlawn Road, it is largely unpaved and contained within the Corridor on the HEC.
10. Certain facilities of the post are located within the Corridor, including utilities, and a solid waste management unit (landfill).
11. The Preferred Alternative would be located approximately 1,500 feet west of the JMAWR.
12. The Preferred Alternative purposely avoids JMAWR, keeping the existing Mulligan Road landfill as a buffer between them.

III. IMPACTS TO SECTION 4(f) PROPERTY

Use: For the alignment under consideration by FHWA, approximately 7 acres would be contained within the Corridor as a permanent use easement. The Preferred Alternative would cross where the width of the corridor is approximately 1,850 feet. The Preferred Alternative is a four-lane facility with median.

Other Impacts: Aside from the physical encroachment on the Corridor, the project would remove some terrestrial habitat, and could potentially alter migratory patterns within the Corridor, particularly for the larger mammal species that occur on the Fort.

² The land is owned by the United States of America and is under the jurisdiction of the Department of the Army.



Source: INCRMP, Fort Belvoir, 2001

- | | |
|-------------------------------------|-------------------------------------|
| Forest and Wildlife Corridor | Waterbodies |
| Jackson Miles Abbott Wetland Refuge | Parks-Fairfax County Park Authority |
| Accotink Bay Wildlife Refuge | Resource Protection Areas |

**Section 4(f)
Forest & Wildlife Corridor
Forest & Wildlife Corridor
Figure 1**

Preferred Alternative (4CR)



- Open Water
- Wetlands
- Resource Protection Area
- Forest and Wildlife Corridor
- Solid Waste Management Unit (Landfill)

Forest and Wildlife Corridor

**Section 4(f)
Forest & Wildlife Corridor**

**Preferred Alternative
Figure 2**

IV. ALTERNATIVES

- a. **Alternatives that use 4(f) property:** Any replacement connector road providing access between U.S. Route 1 and Telegraph Road on Fort Belvoir property requires use of the Corridor. The Preferred Alternative would be constructed to the standard as specified by the Virginia Department of Transportation (VDOT). **Figure 3** illustrates the typical section for the proposed connector road. The typical section could be either curb and gutter or an open outside shoulder. The Preferred Alternative includes a shared use path.
- b. **Avoidance Alternatives:** The No Build Alternative avoids use of the Corridor, but would not meet the purpose and need for the project. All other preliminary alternatives (which FHWA has eliminated from further consideration) would have a Section 4(f) impact, either to this Corridor or to the Huntley Meadows Park. This is because the Corridor lies between the two roadways and there is no physical means to avoid traversing the Corridor.

V. MEASURES TO MINIMIZE HARM

- a. **Minimize Encroachment:** The amount of encroachment into the Corridor would be the minimum necessary to accommodate the proposed alignment of the Connector Road, consistent with sound engineering principles and safety allowed by the Virginia Department of Transportation (VDOT). FHWA has worked with Fort Belvoir and other key agency stakeholders to reduce the amount of impact to the Corridor by the Connector Road alignment. Earlier variations of Alternative C, placed the alignment closer to the Jackson Miles Abbot Wetland Refuge; those would have resulted in greater width of crossing the Corridor than the current location. By locating the Preferred Alternative close to and west of a large solid waste management unit (now unused and grassed capped), the open area of the former land fill can provide a transition to the transportation facility. FHWA made additional revisions by placing the alignment generally along the ridgeline rather than in stream valleys; this in turn reduces impacts to the wildlife.
- b. **Access:** The impacted area lies entirely within the garrison of Fort Belvoir, and no existing or planned facilities have been identified in proximity to the Connector Road Alignment. An emergency access for the HEC from unimproved Kingman Road will be provided. No other access is anticipated.
- c. **Mitigation:** FHWA commits to further attempts during design to further reduce the footprint of the roadway through the Corridor. To facilitate wildlife migratory patterns, a major wildlife crossing would be constructed within the Corridor, with a span of about 100 feet, width of 30 feet and a height of 17 feet. The crossing would be located with a natural depression of the topography, which wildlife are thought to favor in their migration patterns. **Figure 4** provides a detailed location of the proposed major wildlife crossing. The surface for the wildlife crossing will be determined in the design phase, as it may also serve as a crossing for permitted (recreational) hunting activities.

In conjunction with Fort Belvoir's plans to close sections of Woodlawn Road within the Garrison, this project will remove the existing pavement of two-lane Woodlawn Road where it passes through the Corridor (or reduce its width to convert it to a trail) and

revegetate the existing open areas along the to be removed roadway as well as those created by the pavement removal. This action will eliminate an existing transportation corridor currently passing through the Fort's designated Corridor.

Several methods will be employed to mitigate impacts to water quality (and resultant impacts to habitat) from the Connector Road. The project is required to meet both Virginia and Fairfax County Stormwater Management Criteria for water quality and quantity control. A curb and gutter system is expected to be used, with curb opening drop inlets, and a storm water sewer system with cross drains. Bio-retention areas or rain gardens will be employed where possible. These would be more "habitat friendly" than large stormwater management ponds. Extended dry detention ponds may also be employed where other best management practices are not feasible.

Other mitigation includes reduced lighting and no right-of-way fencing of the project through the Corridor. While street lighting at the key intersections would be expected, FHWA would coordinate with VDOT and Fort Belvoir during design to minimize effects of lighting within the Corridor.

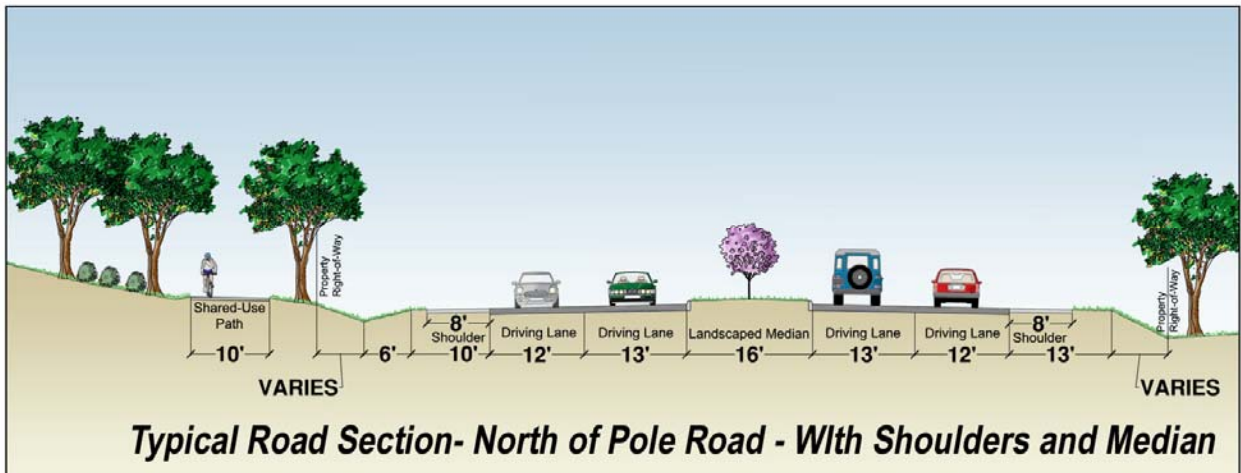
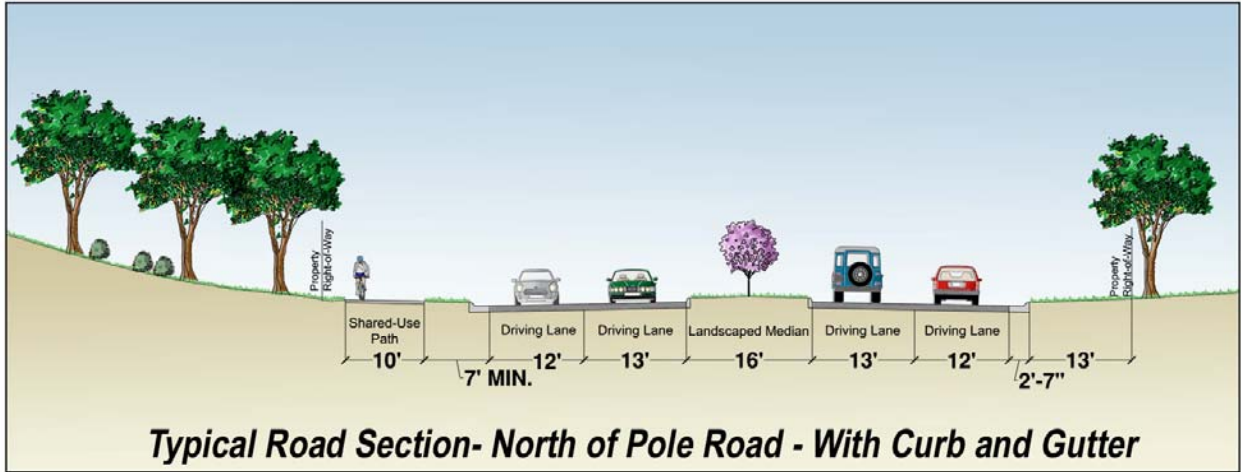
In summary, the combined effect of the following listed mitigation actions will greatly reduce the impact of the proposed undertaking upon the Fort's designated Corridor:

- Eliminate/remove the existing Woodlawn Road corridor through the Corridor
- Revegetate the eliminated Woodlawn Road corridor through the Corridor
- Replace the existing small drainage culvert conveying Piney Run under Telegraph Road and replace with a bridge structure
- Provide a bridge structure as wildlife crossing on proposed connector road in Corridor
- Provide a bridge structure as stream and wildlife crossing on proposed connector road for its crossing of Piney Run
- Revegetate cut and fill slopes, outside of clear zone, of the proposed connector road
- Provide 4 additional minor wildlife crossing structures, 2 in the Corridor, 2 between the Corridor and Telegraph Road.
- Provide minimal drift fencing at proposed wildlife crossings
- Provide "deer crossing" warning signs along the proposed connector road
- Provide deer reflectors along the proposed connector road
- Provide no lighting along the proposed connector road except at its three intersections and at the existing residential area
- Facilitate discussion to reduce posted roadway speed below 45MPH

d. Maintenance of Traffic: The Connector Road is a new roadway facility and maintenance of traffic is not an issue that would have to be addressed for this 4(f) resource.

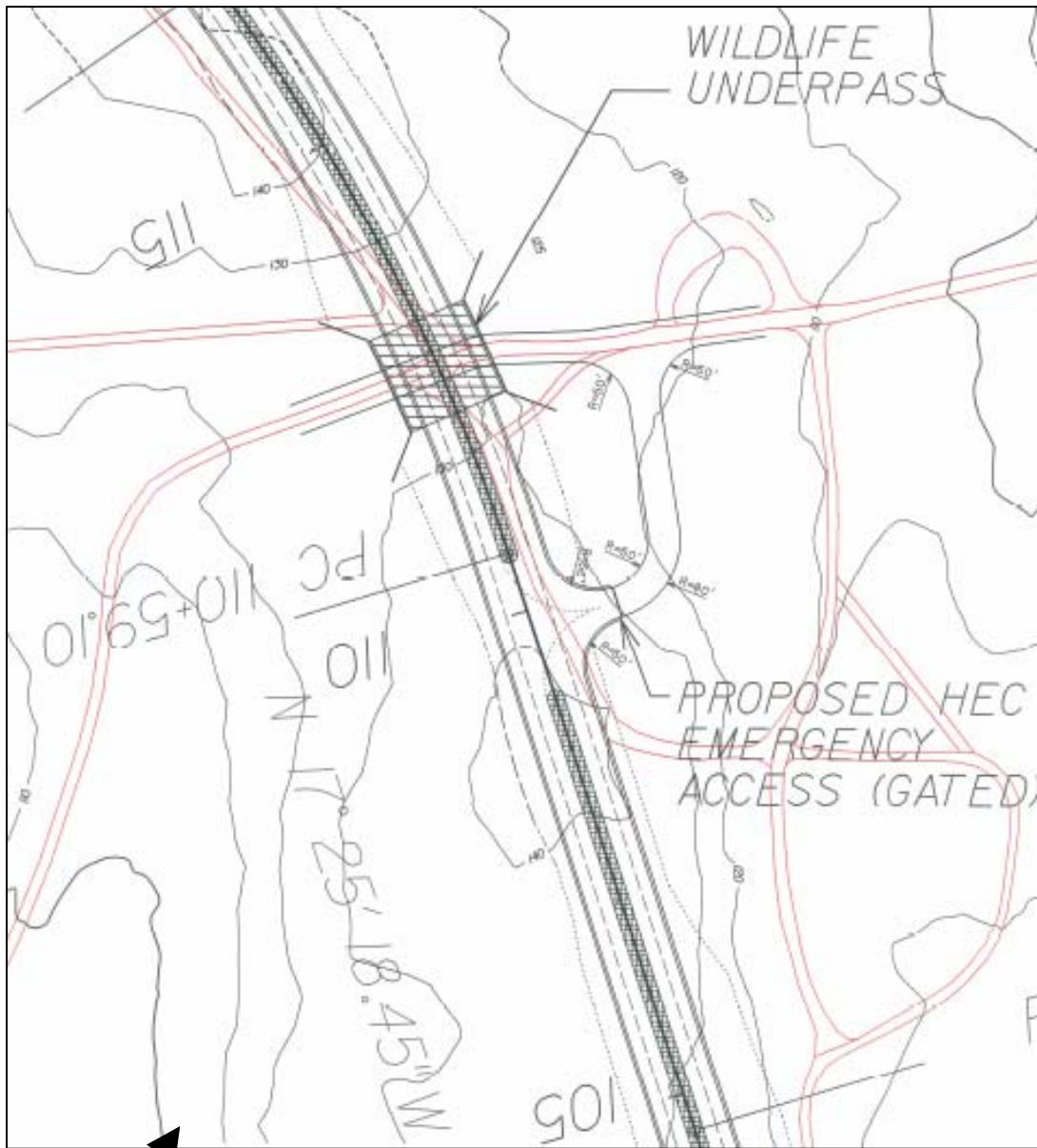
e. Erosion and Sediment Control: Temporary and permanent erosion and sediment controls would be installed during construction to minimize any detrimental effects of project-generated sediment within the Corridor. The practices recommended in the *1992 Virginia Erosion and Sediment Control Handbook* will be used for this project.

f. Landscaping: Landscaping along the Connector Road will be consistent with guidance provided by Virginia Department of Conservation and Recreation (DCR) in the *1999*



Section 4(f)
Forest & Wildlife Corridor

**Typical Section
Figure 3**



Inset



Section 4(f)
Forest & Wildlife Corridor

**Major Wildlife Crossing
Figure 4**

*FHWA Richmond Highway-Telegraph Road Connector
Section 4(f)*

Virginia Stormwater Management Handbook. The handbook describes many plant species which are suitable given consideration to viability and long-term maintenance by VDOT. The typical section anticipates a vegetated median through the Fort.

- g. Additional coordination:** Additional coordination has been held with Fort Belvoir Directorate of Installation Support – Environmental and Natural Resources Division to address and minimize adverse affects and potential mitigation for the Corridor. Coordination will continue throughout the design process of the Preferred Alternative.
- h. Unusual characteristics:** The Connector Road would roughly parallel a large landfill, known as Mulligan Road Landfill. This solid waste management unit (SWMU) has been capped with a grassy cover. The alignment purposely avoids the SWMU, and places the SWMU closest to the JMAWR. This area of the Corridor is also near the intersection of several unimproved roads including a section of John J. Kingman Highway and Mulligan Road.

VI. COORDINATION

1/24/06	Agency Scoping Meeting. FHWA presented the project and study approach for preparation of the NEPA documentation and schedule, as well as reviewed the past work efforts including discussions of previous alternatives and available data. The Forest and Wildlife Corridor and other resources were noted.
2/17/06	First Public Information Meeting. FHWA presented the project purpose and need, described the NEPA and Section 106 processes, and initial alternatives. Public comment was received; concerns were expressed for natural and cultural resources and providing such things as pedestrian and bicycling amenities.
5/2/05	FHWA met with Fort Belvoir following meetings with VDOT and Fairfax County regarding traffic issues and citizen input from the February 17, 2005 Public Information meeting. General discussions about the status of the Fort's Master Plan update in light of the pending announcement by Base Realignment and Closure Commission. (The Fort's draft Master Plan update continued to show the general alignment of the COE Corridor C.)
10/13/05	FHWA met with Fort Belvoir, HEC, and DCEETA personnel to discuss constraints and suggested revisions to the modified Connector Road alignment through Fort Belvoir. Discussion and evaluation of the proposed connector was aided by a GIS session projected to the group. GIS overlays showed the proposed alignment and Limits of Construction (LOC) with geographic layers of natural and other constraints on-base (including wetlands, water bodies, SWMU's, Security Buffers and building footprints).
10/24/05	Second Public Information Meeting. FHWA explained rationale for possible variations for the Alternative C corridor to be carried into preliminary engineering.
12/14/05	FHWA project team held a second working meeting with Fort Belvoir, HEC, and DCEETA personnel to discuss any other suggested revisions to two modified Connector Road alignments through Fort Belvoir (the revisions are titled 3CR and 4CR). Discussion and evaluation of the proposed connector was aided by a GIS session projected to the group. GIS overlays of a revised alignment and Limits of Construction (LOC) with geographic layers of natural and other constraints on-base (including wetlands, water bodies, SWMU's, Security Buffers, archeological resources, topography, habitats of concern, and building footprints).

1/12/06	FHWA project team held a working meeting with Fort Belvoir, DCEETA, VDOT and Fairfax County DOT personnel to discuss potential right-of-way along Telegraph Road for transportation improvements.
2/28/06	FHWA met with Fort Belvoir DPW and major utility companies to review the locations of key utilities and the timing and coordination required regarding possible relocation of utilities.
3/24/06	FHWA project team met with Fort Belvoir staff to discuss latest revisions to the proposed Connector Road alignment through Fort Belvoir and review environmental concerns. There was also brief discussion on issues related to the Woodlawn Road land transfer (from the Army-VDOT to the National Trust for Historic Preservation).
4/7/06	FHWA project team met with Fort Belvoir staff to review construction impacts and longer term mitigation opportunities.
5/2/06	FHWA met with Fort Belvoir staff to discuss potential mitigation actions, including additional wildlife crossings, median widths and inclusion of low impact storm water management concepts.
6/26/06	FHWA met with Fort Belvoir staff to discuss additional mitigation actions, including pavement removal and reforestation of existing two-lane Woodlawn Road through the Corridor.