Route 1
Multimodal Alternatives Analysis

APPENDIX G

Environmental Report and NEPA Recommendation

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Route 1

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1.0 Introduction

Note: *The findings in this document are preliminary. Documentation of potential project impacts is "preliminary" and intended for use by the project team. As the project advances, this document will serve as an aid for the responsible agencies as they oversee environmental documentation and other planning and design activities.*

The Virginia Department of Rail and Public Transportation (DRPT) is undertaking a Multimodal Alternatives Analysis in coordination with Fairfax County, Prince William County, the Virginia Department of Transportation (VDOT), and the Office of Intermodal Planning and Investment (OIPI). The purpose of the project is to provide improved performance for transit, bicycle and pedestrian, and vehicular conditions and facilities along the Route 1 corridor that support long-term growth and economic development.

Corridor needs include improved traffic flow; more frequent and more reliable transit "trunk" service; and transportation capacity that will accommodate planned development in the corridor. Multimodal alternatives have been conceived to address these critical needs.

The purpose of this technical memorandum is to provide a preliminary inventory of environmental resources within the study corridor, and review potential impacts that may result from the construction and implementation of the various alternatives under evaluation. This inventory of resources and potential impacts informs the evaluation of alternatives and assists in framing the appropriate level of environmental documentation associated with each alternative. Categories for discussion in this document were chosen based on the specific features of this corridor and the list of considerations that are typically included in a NEPA document.

The National Environmental Policy Act (NEPA) of 1969 requires that federal agencies assess the potential impacts of their actions on the human and natural environment. In addition to NEPA, various state and local regulations and policies require proposed activities to obtain a variety of permits and approvals. This memorandum will help inform the lead agencies who ultimately determine the appropriate level of NEPA documentation for the recommended alternative.

1.1 Federal Environmental Documentation Requirements

In order to advance the proposed transit improvements using federal funds, the appropriate level of federal environmental review must be undertaken. Under NEPA, there are three possible classes of action that determine the documentation required. Class I actions are those which are likely to significantly affect the environment, and require preparation of an Environmental Impact Statement (EIS). Class II actions are those which do not individually or cumulatively have significant environmental impacts. For these actions, a Categorical Exclusion (CE) would be issued. Projects qualifying for CEs can either be listed in regulations, in either 23 CFR 771.117 (for FHWA projects) or 23 CFR771.118 (for FTA projects) or agreed to by the federal agency. VDOT and FHWA maintain a list of additional highway

projects beyond those listed in regulation that also qualify for a CE. Class III actions are those where the significance of the environmental impact is not clear. These actions require the preparation of an Environmental Assessment (EA), which can result either in a Finding of No Significant Impact (FONSI), or in an identification of potentially significant impacts, in which case an EIS is required.

Given the phased nature of the project, documentation may proceed in a number of ways. The discussion of NEPA class of action will be tied to the anticipated phasing of corridor projects. The project team will discuss the findings of the environmental scan with appropriate federal agency staff who will ultimately determine the appropriate level of documentation for the recommended alternative and implementation phasing approach.

1.2 Study Area Overview

Between I-495/Capital Beltway and Fort Belvoir, the northern section of Route 1 within Fairfax County is frequently referred to as Richmond Highway and is comprised mostly of low-density shopping centers, apartment complexes and office buildings.

Most of the corridor from Beacon Hill through Hybla Valley and Gum Springs is a continuous commercial strip, including several large retailers and the renovated Mount Vernon Plaza. Development is more limited toward Mount Zephyr/South County, which primarily consists of a small shopping center anchored by the South County Government Center. Further south, the Woodlawn area serves as an access point for the historic Mount Vernon site and supports low-density commercial development, along with motels and multi-family and affordable housing.

South of the Woodlawn area and beginning at Mulligan Road and Mount Vernon Highway, the corridor includes views of Woodlawn Plantation and Stables as well as additional strip developments.[1] Beyond Woodlawn Road are two entrances to Fort Belvoir. Industrial sites occur beyond Fort Belvoir on the way to Lorton, where there are both multi-family and single family housing, as well as commercial development. Fort Belvoir is the single largest land use within the corridor. The southern terminus of the project corridor is Woodbridge, across the Occoquan River in Prince William County. This section of Woodbridge is comprised of commercial development with large parking areas and is being master planned for mixed-use development to complement the nearby Virginia Railway Express (VRE) station.

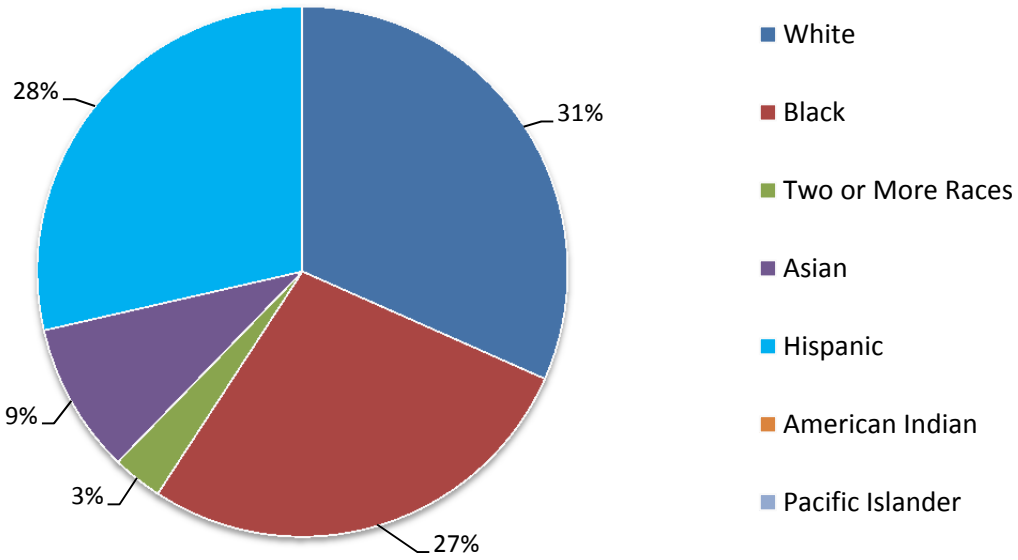
1.2.1 Demographics

According to the 2010 US Census, the population within ½ mile of the 15-mile study corridor of Route 1 is 72,823. Minorities (black, Asian-American, American Indian and Alaska Native, Pacific Islander, and other races) comprise 69 percent of the study area population. **Figure 1-1** shows the racial distribution of the population.

[1] This segment of the corridor, between Mulligan Road and Telegraph Road, is scheduled for widening to six-lanes by VDOT, beginning in 2014.

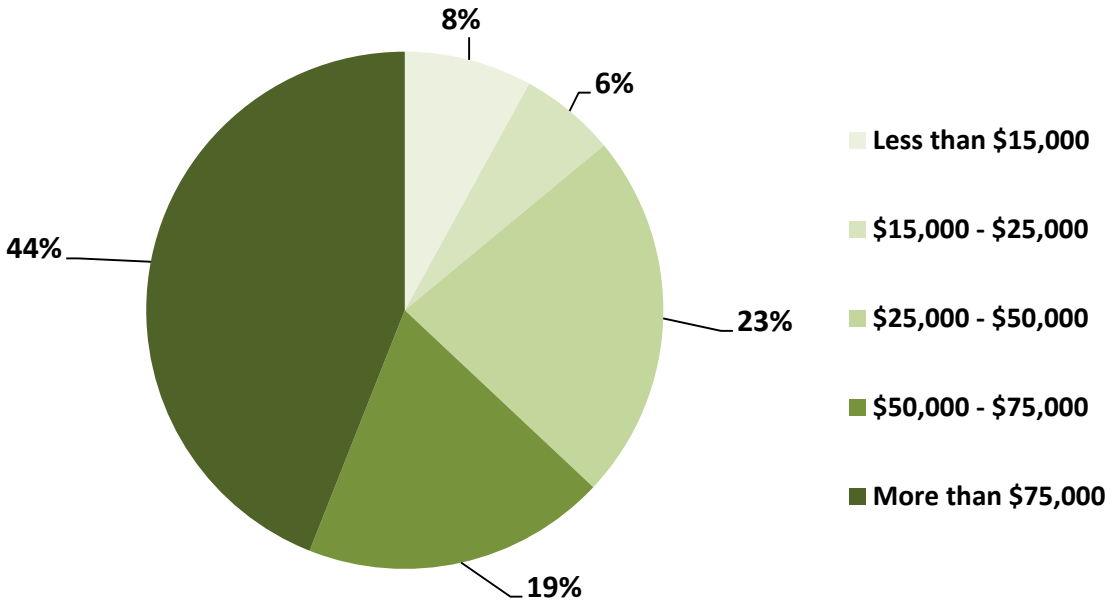
The American Community Survey (ACS) 2008 – 2012 identified 25,099 households within the study area. The median household income of the study area is $86,598. About 10 percent of the study area is considered low-income. **Figure 1-2** provides a graphic representation of the households by household income within the study area.

Figure 1-1: Study Area Distribution of Population by Race/Ethnicity (2010)



Source: U.S. Census Bureau. Census 2010.

Figure 1-2: Study Area Distribution of Households by Annual Household Income



1.2.2 Existing Transit Service

Several transit operators provide service along the Route 1 Corridor:

- **Fairfax County Connector (FCC):** operates standard local service and limited-stop service around the corridor, as well as circulator services to Fort Belvoir.

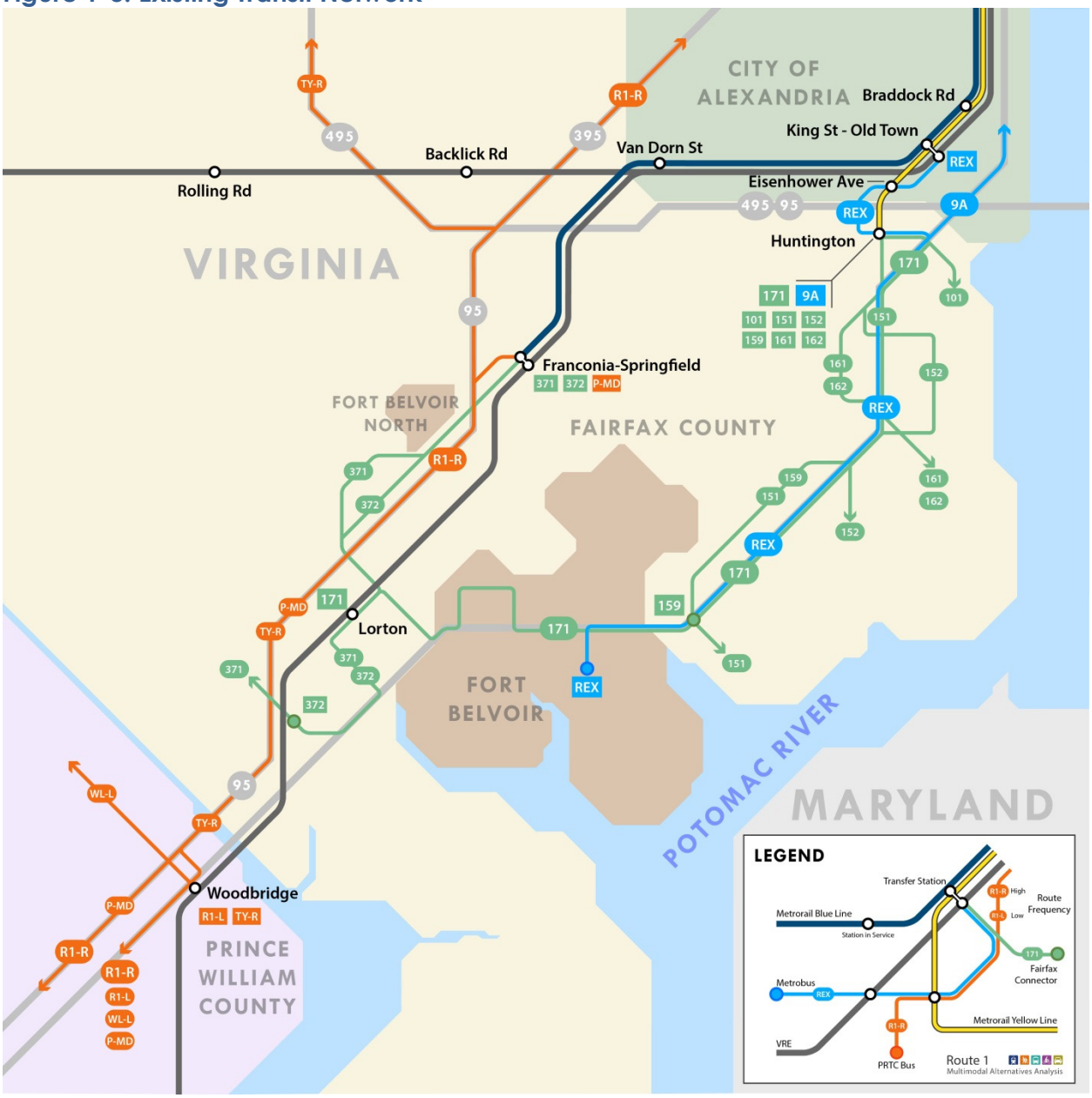
- **Potomac and Rappahannock Transportation Commission (PRTC):** operates local service (OmniLink), shuttle service (MetroDirect), and commuter service (OmniRide), in the Woodbridge portion of the Route 1 corridor.

- **Washington Metropolitan Area Transit Authority (WMATA):** operates the Richmond Highway Express Services (REX) as a limited-stop express bus service between Fort Belvoir and the Huntington and King Street Metrorail Stations. REX service operates in regular traffic along Richmond Highway, but vehicles feature signal optimization technology that adds time to green traffic signals when buses are approaching intersections. REX vehicles also features unique branding scheme on buses and has separate bus stop flags to differentiate it from other transit services.

In addition to bus transit service, the Virginia Railway Express (VRE) provides commuter rail services parallel to the southern portion of the Route 1 corridor. The VRE Fredericksburg Line operates service from Fredericksburg to Union Station in Washington, DC. VRE has stations in the Route 1 Corridor at Woodbridge and west of Route 1 at Lorton. **Figure 1-3** shows the existing transit network.

Ridership varies between bus routes along the Route 1 corridor. Routes with the greatest frequency tend to have the highest ridership. The three routes with the highest ridership are: WMATA's REX service with 3,519 daily boardings; FCC's Route 171 with 3,238 daily boardings; and FCC's Route 151 with 1,232 daily boardings.

Figure 1-3: Existing Transit Network



1.3 Purpose and Need of the Project

The need for the project stems from existing and expected transportation problems along the corridor related to limited transit service, poor bicycle and pedestrian facilities, and high traffic volumes. These deficiencies limit accessibility and are not supportive of the desired economic development growth along the corridor.

The existing carrying capacity of the corridor is constrained. People traveling by automobile experience congestion and delays; people traveling by transit experience infrequent service as well as delays because of traffic congestion. Integrated multimodal improvements are needed to support the

anticipated high levels of employment and residential growth. County Comprehensive Plans envision this growth in the form of focused, pedestrian- and transit-oriented development. Without transportation capacity improvements that encourage pedestrian and transit travel, it is unlikely that the projected growth can be accommodated within the corridor, and the associated economic opportunity of additional jobs and residents will be limited.

Attractive multimodal options are needed to help serve the high transit-dependent population who rely on bicycling, walking and/or transit to meet the needs of daily life. According to the American Community Survey (2008-2012), within ½-mile of the study corridor, there are over 2,000 households that do not own a car.

Of the existing transit riders, nearly three-quarters of existing transit riders have no access to an automobile as a travel alternative. Over half of corridor transit riders have household incomes of less than $30,000. Preserving community and affordability over the long term requires improved transit and other transportation options to meet the needs of this population.

The project identified four specific areas of need for a major multimodal investment in the corridor: Transit, Pedestrian and Bicycle, Vehicular, and Land Use/Economic Development. **Table 1-1** summarizes the problems and need by area.

Table 1-1: Problems and Needs Summary

Multimodal Area	Problems and Needs	
Transit	• Transit travel time is not competitive with auto • Peak and off-peak transit service is infrequent • Dwell time at stops and peak period congestion delays transit	*Attractive and competitive transit service to support transit dependent population*
Pedestrian/ Bicycle	• Facilities for non-auto travel are limited, substandard, and unable to compete with the attractiveness of single occupancy vehicle travel • Pedestrian crossings of Route 1 are infrequent, wide, and not near existing transit stops • Bicycle access is difficult with few alternative paths.	*Safe and accessible pedestrian and bicycle access*
Vehicular	• Users experience significant congestion along Route 1 during peak periods • Travel times are highly variable and unpredictable	*Appropriate level of vehicle accommodation*
Land Use/Economic Development	• Current development patterns fail to optimize development potential at designated activity centers • Existing street connectivity is poor at commercial nodes	*Support and accommodate more robust land development to support anticipated population and employment growth*

1.4 Alternatives

This section describes the four refined multimodal alternatives under evaluation. The four refined alternatives assume the same vehicular lane and bicycle/pedestrian facility configuration, but the transit mode and operating assumptions vary. The refined multimodal alternatives assume a consistent, six-lane vehicular lane configuration and a 10-foot multi-use path along the majority of the corridor. The four refined alternatives are referred to by the transit component and include:

1. Alternative 1 - Bus Rapid Transit – Curb Running
2. Alternative 2 - Bus Rapid Transit – Median Running
3. Alternative 3 - Light Rail Transit – Median Running
4. Alternative 4 - Metrorail/Bus Rapid Transit Hybrid – Yellow line extension to Hybla Valley with supporting Bus Rapid Transit – Median Running to Woodbridge

1.4.1 Alternative 1: Bus Rapid Transit – Curb Running

This alternative assumes Bus Rapid Transit (BRT) service in dedicated outside lanes in the north portion of the corridor (8.4 miles) to Fort Belvoir. From Fort Belvoir south to Woodbridge, BRT service would be configured in mixed traffic with special treatments at key locations including transit signal priority (TSP) and queue jump lanes (6.7 miles). **Figure 1-4** shows the alignment and station locations.

Alternative 1 has a typical section of 154 feet along the mainline with 172 feet at the intersections and stations in Fairfax County. In Prince William County, Alternative 1 has a typical section of 126 feet along the mainline with 134 feet at the intersections and stations. **Figure 1-5** and **Figure 1-6** show the typical sections.

Figure 1-4: Alternative 1: BRT – Curb Running

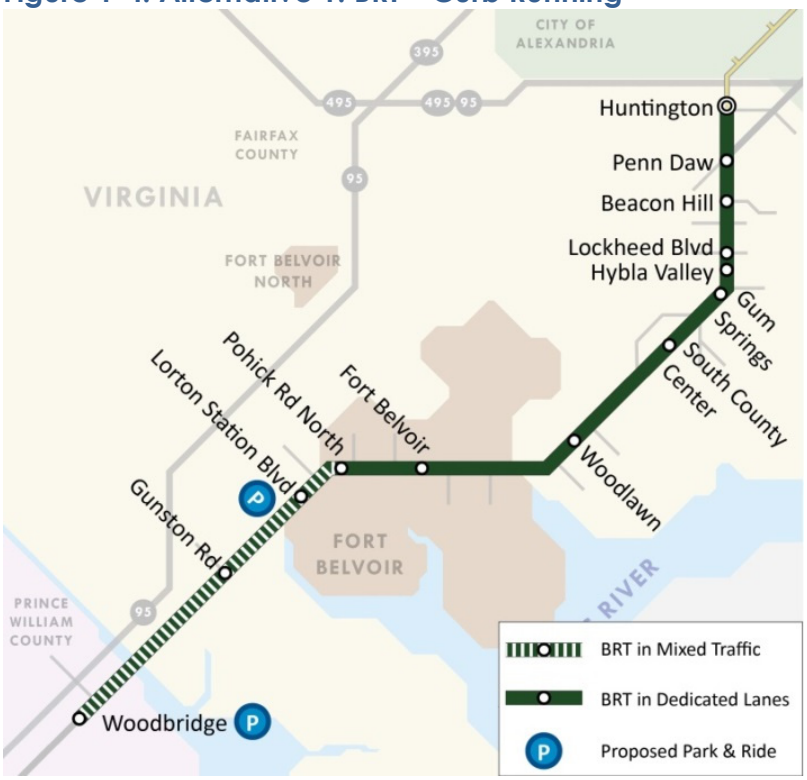


Figure 1-5: Alternative 1: BRT – Curb Running, Typical Section (Huntington to Fort Belvoir)

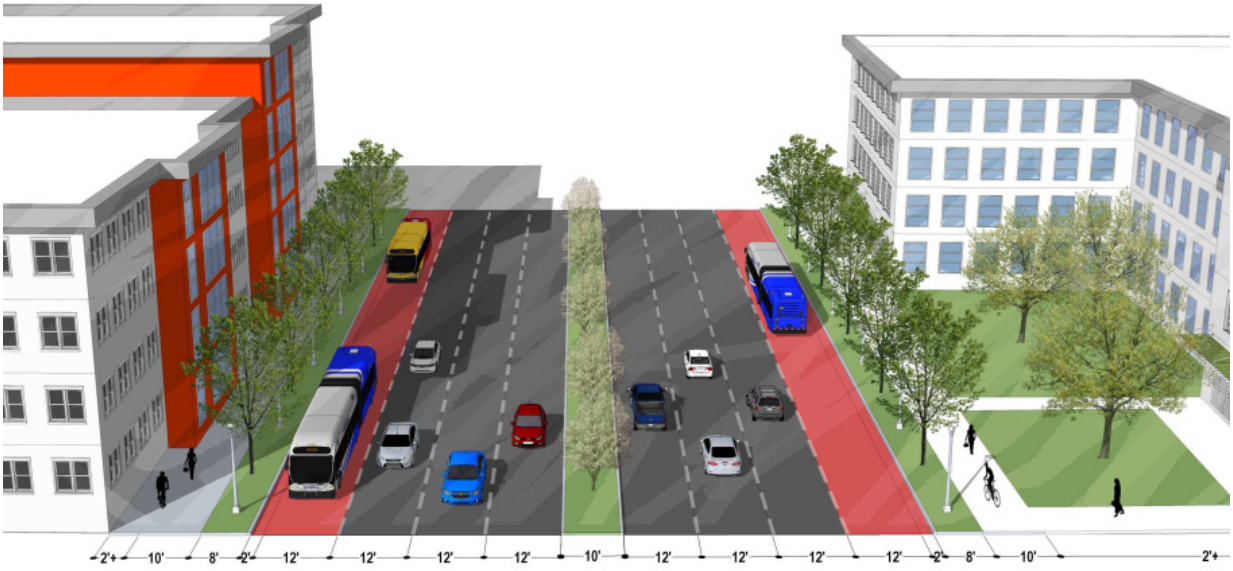
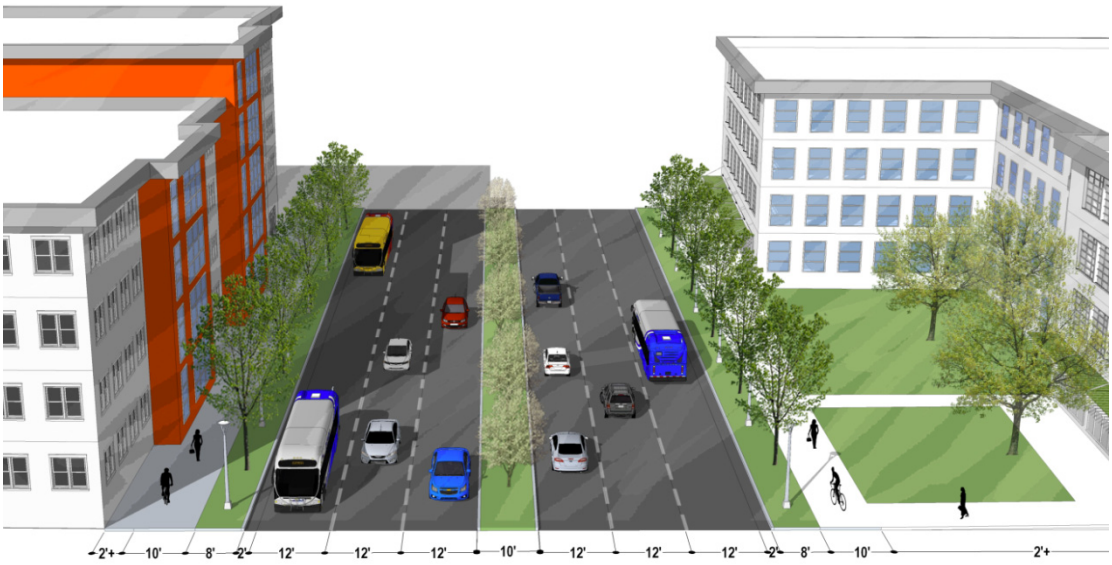


Figure 1-6: Alternative 2: BRT – Curb, Typical Section (Pohick Road to Woodbridge VRE)



1.4.2 Alternative 2: Bus Rapid Transit – Median Running

This alternative assumes BRT operates in the median in dedicated lanes in Fairfax County (14.2 miles), and transitions to mixed traffic in Prince William County (0.67 miles). Across the Occoquan River Bridge and within Prince William County, BRT service would be configured in mixed traffic with special treatments at key locations including transit signal priority (TSP) and queue jump lanes. **Figure 1-7** shows the station locations.

Alternative 2 has a typical section of 150 feet along the mainline with 156 feet at the intersections and stations in Fairfax County. In Prince William County, Alternative 2 has a typical section of 126 feet along the mainline with 134 feet at the intersections and stations. **Figure 1-8** shows the typical section in Fairfax County. Refer to **Figure 1-6** for the typical section in Prince William County.

Figure 1-7: Alternative 2: BRT – Median

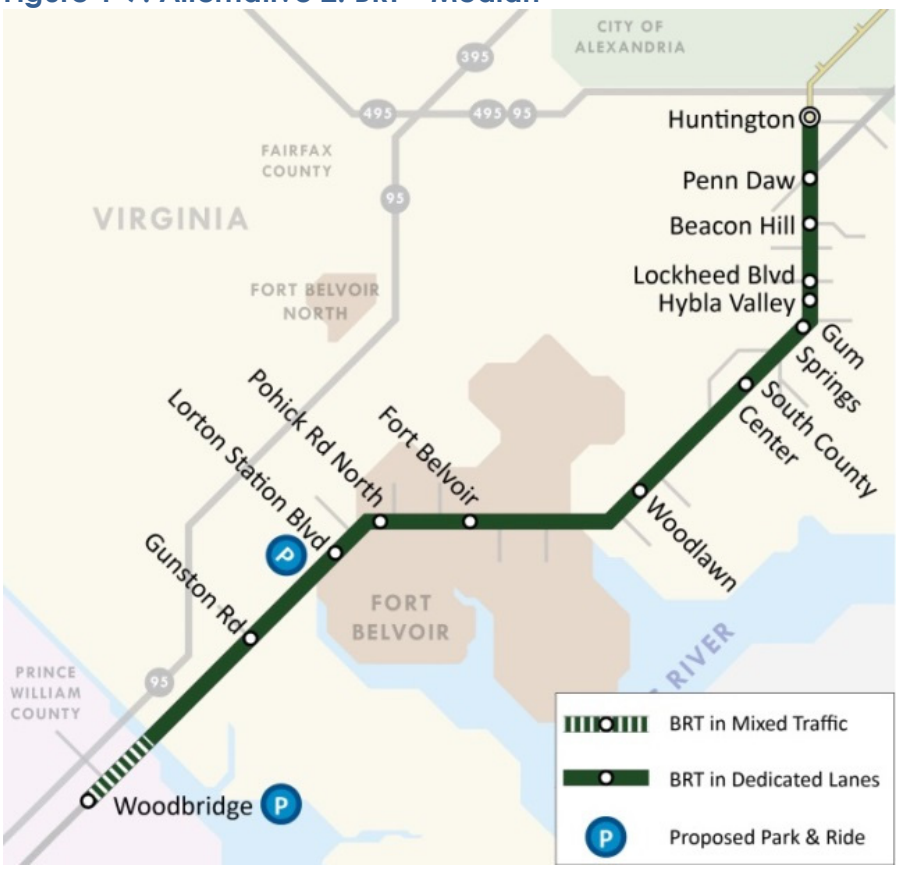
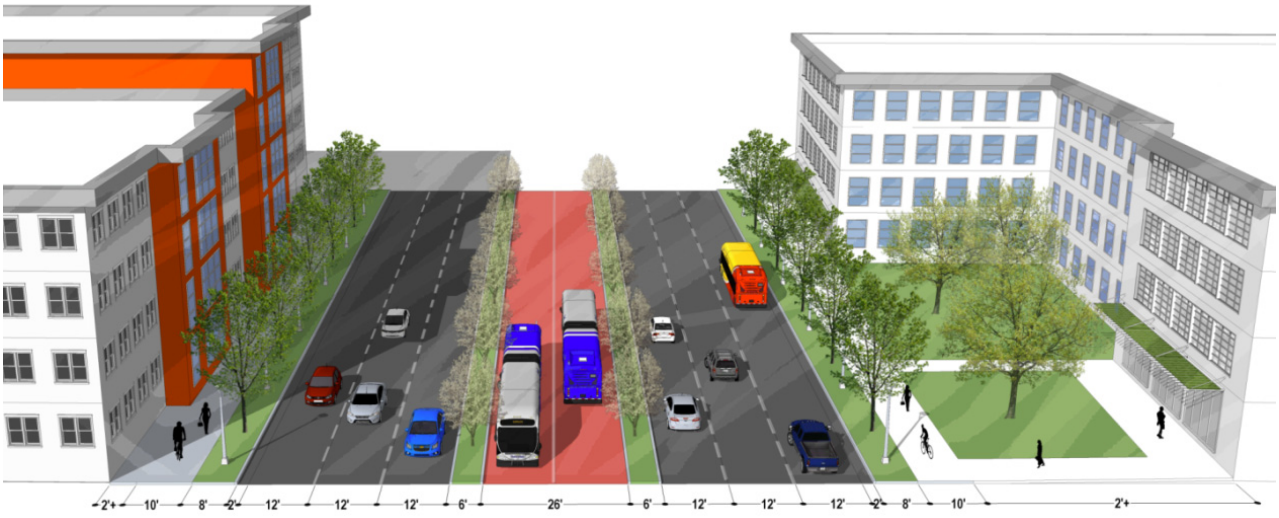


Figure 1-8: Alternative 2: BRT – Median, Typical Section (Fairfax County)



1.4.3 Alternative 3: Light Rail Transit

This alternative assumes Light Rail Transit (LRT) service in a dedicated median transitway for the majority of the corridor. In Prince William County, and along the southern portions of the corridor in Fairfax County, LRT service would be configured in a dedicated transitway parallel to Route 1 but outside the Route 1 right-of-way. **Figure 1-9** shows the station locations.

Alternative 3 has a typical section of 154 feet along the mainline with 172 feet at the intersections and stations in Fairfax County. In Prince William County, Alternative 3 has a typical section of 126 feet along the mainline with 134 feet at the intersections and stations. **Figure 1-10** shows a typical section.

Figure 1-9: Alternative 3: LRT

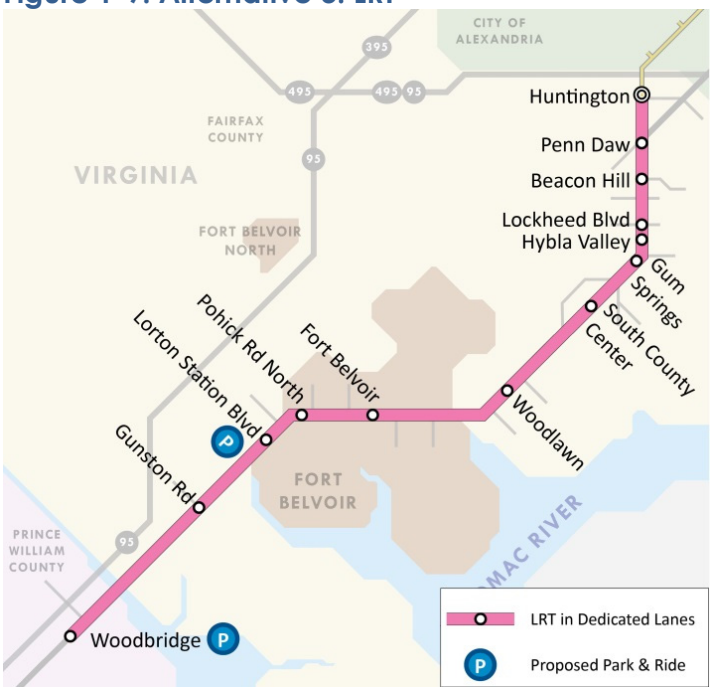
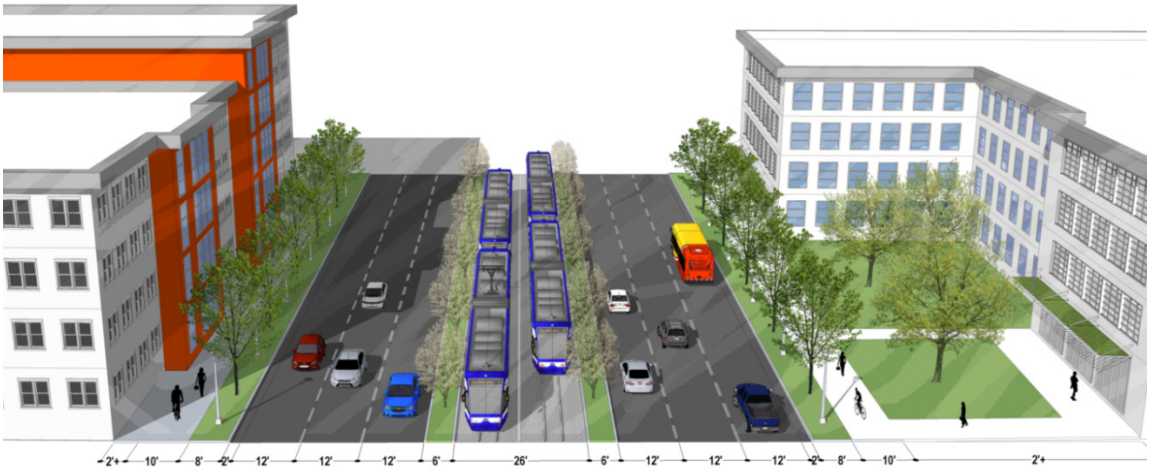


Figure 1-10: Alternative 3: LRT – Median, Typical Section

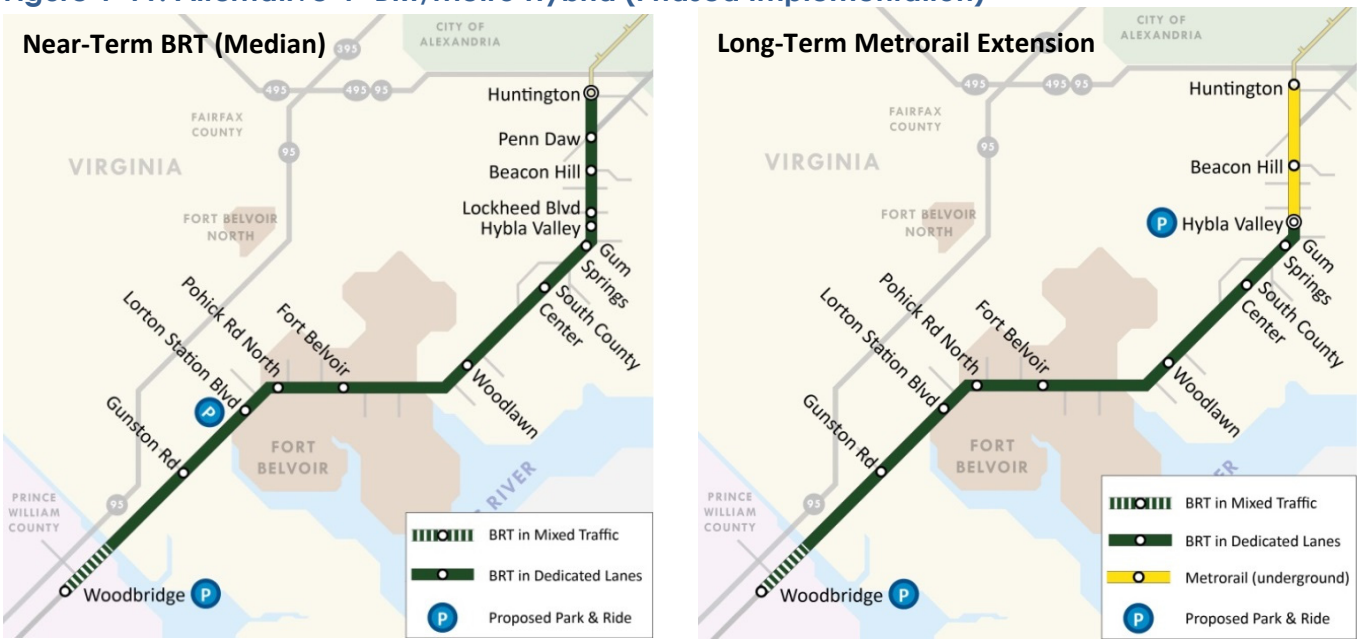


1.4.4 Alternative 4: Metrorail/BRT Hybrid

This alternative assumes BRT operates in the median in dedicated lanes in Fairfax County (14.2 miles), and transitions to mixed traffic in Prince William County (0.67 miles). Across the Occoquan River Bridge and within Prince William County, BRT service would be configured in mixed traffic with special treatments at key locations including transit signal priority (TSP) and queue jump lanes. **Figure 1-11** shows the station locations.

In the long-term, this alternative assumes a Yellow Line Metrorail Extension underground to Hybla Valley (3.1 miles).

Figure 1-11: Alternative 4- BRT/Metro Hybrid (Phased Implementation)



Alternative 4 BRT elements are the same as Alternative 2: a typical section of 154 feet along the mainline with 172 feet at the intersections and stations. The underground Metrorail alignment between Huntington and Hybla Valley has a cross-section width of approximately 60 feet. In Prince William County, Alternative 4 (BRT in mixed traffic) has a typical section of 126 feet along the mainline with 134 feet at the intersections and stations. Error! Reference source not found. **Figure 1-12** show a typical section for Metrorail and BRT. Refer to **Figure 1-6** for the typical section in Prince William County.

Figure 1-12: Alternative 4: Metrorail/BRT Hybrid – Median, Typical Section (Hybla Valley to Route 1 Bridge)

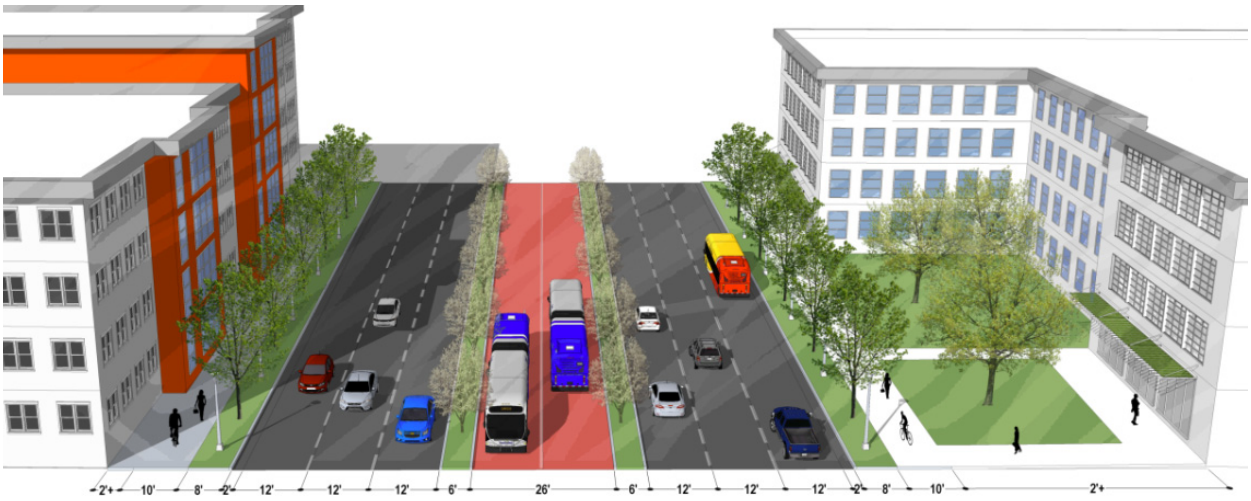
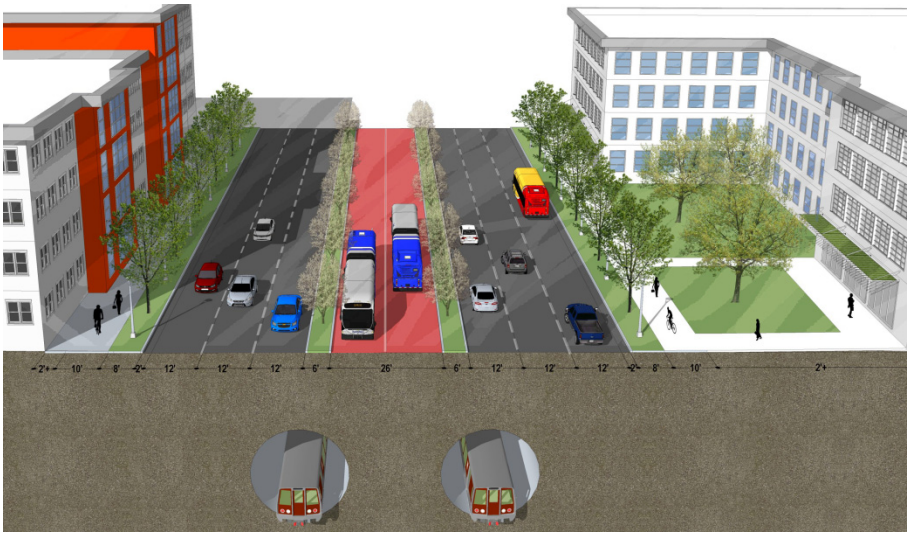


Figure 1-13: Alternative 4: Metrorail/BRT Hybrid – Underground, Typical Section (Yellow Line Extension)



2.0 Methodology

The environmental scan was conducted using available Geographic Information System (GIS) data provided by Fairfax County, Prince William County, and the Virginia Department of Transportation (VDOT), as well as web-based inventory tools for each resource area.

2.1 Study Area Definition

The environmental scan considered all resources that lie within the project study area. The study area is defined as a ½-mile buffer from the Route 1 centerline from the Huntington Metrorail station to the Woodbridge VRE station (See **Figure 2-1**).

Figure 2-1: Study Area

2.2 Ongoing Corridor Projects

Two major roadway projects along the corridor have been evaluated under separate environmental studies. These projects are listed below and shown in **Figure 2-2**. Both projects widen Route 1 to six general purpose travel lanes, propose a 10-foot shared use path, and 6-foot sidewalk on either side of Route 1. The Route 1 Improvements at Fort Belvoir also reserves median space for future transit. The potential impacts within the footprints of these two projects are not included in this assessment.

Figure 2-2: Recent Projects with Environmental Clearances

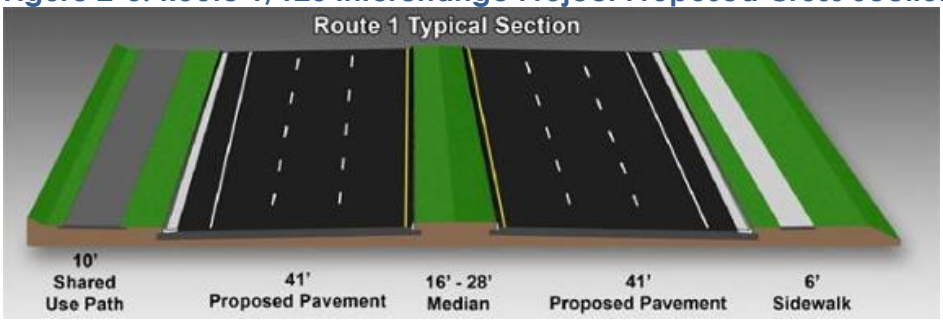
2.2.1 Route 1 (Jefferson Davis Highway) and Route 123 (Gordon Boulevard) Interchange Project

The Federal Highway Administration (FHWA) and VDOT completed an EA for the Route 1/123 Interchange Project in Prince William County, Virginia.[2] Within this project's study area, the project proposes widening Route 1 to six general purpose lanes, a 10-foot shared-use path, and a 6-foot sidewalk on both Routes 1 and Route 123. **Figure 2-3** shows the typical cross section.

The EA was completed in 1999 and a FONSI was issued by FHWA on January 3, 2004. In 2008, FHWA and VDOT initiated a reevaluation of the EA, and the reevaluation and FONSI (with Section 4(f) de minimis Evaluation) was made available to the public in 2011. Phase 1 construction is anticipated to begin 2015 and Phase 2 in 2016, pending funding.

Alternatives 1, 2, and 4 assume that the BRT operates in mixed traffic within Prince William County and therefore does not propose any additional right-of-way. Alternative 3 follows a different alignment and potential impacts are documented accordingly.

Figure 2-3: Route 1/123 Interchange Project Proposed Cross Section



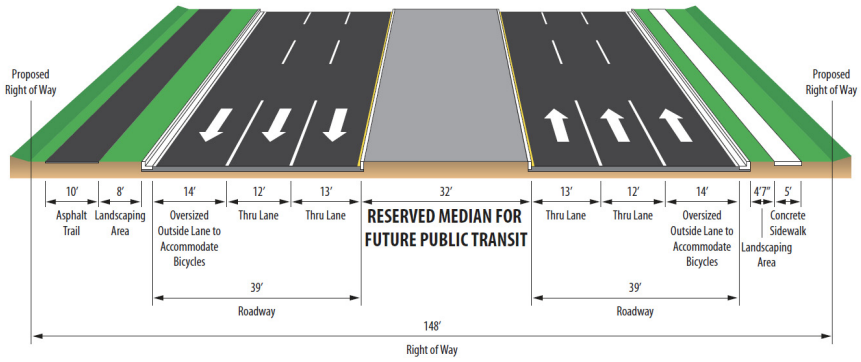
Source: VDOT, 2012.

2.2.2 Route 1 Improvements at Fort Belvoir

FHWA prepared an EA for the project, extending between Telegraph Road and Mount Vernon Memorial Highway in Fairfax County. The EA was prepared in coordination with Fairfax County, VDOT, Department of the Army, and FHWA. The purpose of the project is to address traffic capacity deficiencies on Route 1 within the study limits by widening Route 1 from four travel lanes to six travel lanes. The project is constructing a 32-foot median to accommodate future transit as well as a 10-foot shared use path on one side and a 6-foot sidewalk on the other side of Route 1. The project received its FONSI in 2012. **Figure 2-4** shows the typical cross section.

[2] http://www.virginiadot.org/projects/northernvirginia/route_1-123_interchange.asp

Figure 2-4: Proposed Typical Cross Section



Source: VDOT, 2014.

2.3 Impact Footprints

During the planning and impact assessment for this Alternatives Analysis, mapping activities were conducted using available GIS data from state and local agencies. Using this GIS data, as well as conceptual designs and typical sections for each alternative, assumptions were made regarding locations of existing right of way limits and proposed configuration of potential improvements for the project.

The resulting "footprints" for each alternative were used to identify potential impacts for features or resources that would be directly affected by the project components. As described above, the broader ½-mile study area was used to identify other features and resources that would be less directly affected by the project alternatives.

Assumptions include the following:

- The existing VDOT right of way boundary was estimated using the edge of parcel boundaries within the corridor (using County GIS parcel data).
- A centerline of the existing roadway was created by digitizing the centerlines of the corridor shown on GIS based aerials.
- The project study area was identified by placing the proposed typical sections for each alternative along the mapped centerline, therefore splitting the impacts halfway between the east and west sides of the corridor. The next phase of work would assess corridor segments where widening could be done on one side only to minimize property impacts.
- Modifications to building and site access from Route 1 were not considered. It is assumed at this stage that any existing access points would be maintained. However, in reality, changes to access would likely be required in order to facilitate efficient movements along the corridor, in particular for the BRT alternative options, which could result in additional right of way impacts.
- Locations of existing utilities were not identified; however, it is assumed that adjustments and relocations will be necessary as part of any future improvements to this corridor.

- The capacity of existing facilities, including the bus loop at Huntington Metro Station, was not considered. Enlargement or repurposing of existing facilities to support the capacity requirements of the alternatives will need to be studied in the future.

Table 2-1 summarizes the footprint assumptions.

Table 2-1: Footprints Limits

		Alternative 1	Alternative 2	Alternative 3	Alternative 4
		BRT 1 - Curb	*BRT 2 - Median*	*LRT*	*Metrorail - BRT Hybrid*
		Footprint Width			
Northern Terminus (Huntington Metro Station)		Utilize existing bus loop	Utilize existing bus loop	58' (LRT Station)	BRT utilizes existing bus loop; Metrorail extension of Yellow Line
Northern Terminus to Richmond Hwy		104'	104'	104'	104'
Richmond Hwy to Hybla Valley Station	Mid-block	150'	154'	154'	154'
	Intersection/ Station	156' (200' nearside/300' farside of intersection)	172' (350' to either side of intersection)	172' (350' to either side of intersection)	172' (350' to either side of intersection)
Hybla Valley Station to Mount Vernon Hwy	Mid-block	150'	154'	154'	154'
	Intersection/ Station	156' (200' nearside/300' farside of intersection)	172' (350' on either side of intersection)	172' (350' on either side of intersection)	172' (350' on either side of intersection)
Mount Vernon Hwy (South) to Pohick Road		148’ Under construction	148’ Under construction	148’ Under construction	148’ Under construction
Pohick Road to Prince William County Line	Mid-block	126'	154'	154'	154'
	Intersection/ Station	134' (200' nearside/300' farside)	172' (350' on either side of intersection)	172' (350' on either side of intersection)	172' (350' on either side of intersection)
Prince William County Line to Southern Terminus		Within proposed ROW	Within proposed ROW	38' (West of Rt 1)	Within proposed ROW
Southern Terminus		Utilize existing bus loop	Utilize existing bus loop	LRT Station West of Rt 1	Utilize existing bus loop

3.0 Environmental Scan Findings

This scan covers several topic areas typically documented in a NEPA document. Other topics are documented elsewhere in the AA or are not specifically defined at this stage. The sections below summarize findings for each area of the environmental scan. Four key areas emerged as the most relevant resource areas; these are anticipated to have potentially significant impacts and have the greatest influence on the determination of NEPA Class of Action and would be points of emphasis in subsequent NEPA documentation:

- Environmental Justice
- Historic and cultural resources
- Water resources
- Property/ ROW impacts

Environmental Justice: Minority populations and low-income populations are present along the corridor. Community analysis and impact assessment conducted during the NEPA phase will identify minority and low income populations, identify any disproportionately high and adverse effects to Environmental Justice (EJ) populations, minimize or avoid those effects, and ensure a concerted effort is made to include EJ populations in public outreach efforts. Additionally, benefits from improved mobility and accessibility due to the project will be documented.

Historic and cultural resources: Historic properties are present along the corridor, particularly near Fort Belvoir. Although the potential direct impacts are addressed in the 2012 Improvements at Fort Belvoir Environmental Assessment and FONSI, close agency coordination will be required to ensure all potential effects are documented.

Water Resources: Two major creeks and one major waterbody are present along the corridor: Pohick Creek, Accotink Creek, and the Occoquan River. Floodplains, Resource Protection Area (RPA), and wetlands have been identified near these environmentally sensitive areas. These areas will need to be closely studied in the NEPA phase.

Property/ ROW impacts: All alternatives would require additional right-of-way and may lead to direct impacts on existing properties and buildings. Preliminary analysis was conducted using available GIS data; however, right-of-way and boundary surveys are needed to more accurately assess potential impacts in the subsequent NEPA and design phases. Alternative 1 has the least property impacts, while Alternatives 2, 3, and 4 have the most.

3.1 Socioeconomics/Environmental Justice

3.1.1 Regulatory Considerations

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in matters relating to human health or the environment." In general, to give due consideration to the goal and intent of Executive Order 12898, proposed federally funded transportation projects must provide equitable distribution of benefits and avoid inequitable distribution of negative impacts.

FTA and FHWA released guidance on EJ analysis in 2012:

- FTA Environmental Justice Circular 4703.1 (July 2012)
- FHWA Order 6640.23A (June 2012)

The guidance defines an adverse effect as the totality of significant individual or cumulative human health or environmental effects to human health, the natural and social environment, community function, etc. It also includes the denial, reduction, or delay in receiving benefits, which should be addressed like any other impact. A "disproportionately high and adverse effect" includes taking into consideration "mitigation and enhancements measures that will be taken and all offsetting benefits to the affected minority and low-income populations… as well as the design, comparative impacts, and the relevant number of similar existing system elements in nonminority and non-low-income areas."

The order identifies minority communities as "Black, Hispanic, Asian, American Indian and Alaskan Native, Native Hawaiian or other Pacific Islander."

FTA and FHWA define low-income as a person whose median household income is at or below the Department of Health and Human Services poverty guidelines. For the purposes of this analysis, the FY2010 AMI income limits for a "Low Income" family of four of $64,400 was used as the AMI definition for low income in this analysis.[3]

[3] In regions where the 80 percent of AMI exceeds the U.S. median income, the low-income limit is capped by the United States median income, except in cases where 85 percent of the area's annual 2 bedroom fair market rent is greater than 35 percent of the United States median income. In FY2010 the Washington, DC FMR region low income limit was capped by the United States median income.
Source: http://www.huduser.org/portal/datasets/il/il2010/2010summary.odn?inputname=METRO47900M47900*Washington-Arlington-Alexandria%2C+DC-VA-MD+HUD+Metro+FMR+Area&selection_type=hmfa&year=2010.

3.1.2 Study Area Conditions

Minority populations

Figure 3-1 shows the year 2010 percentages of minority population within the study area (see **Figure 2-1**) based on US Census Bureau data. Minority groups make up 69 percent of the population in the study area, which is higher than the percentage of minorities in Fairfax County (45 percent) and Prince William County (52 percent). Within the study area there are 52 block groups with a higher proportion of minority residents than Fairfax County or Prince William County. **Table 3-1** summarizes the minority and low income populations for the study area, Fairfax County, and Prince William County. There are 44 block groups where 50 percent or more of the population of a Census block group is minority.

Table 3-1: Minority Populations

	Study Area		Fairfax County		Prince William County	
	Population	% of total population	Population	% of total population	Population	% of total population
Total Population	72,823		1,081,726		402,002	
Minority Population	22,898	69%	491,104	45%	206,346	51%

Source: U.S. Census Bureau. Census 2010.

Low-income populations

The FY2010 AMI income limits for a "Low Income" family of four of $64,400 was used as the AMI definition for low income in this analysis.[4] Within the study area, 22 block groups have median household incomes below the $64,400 income limit for the Washington DC region.

Figure 3-2 shows the year 2012 percentages of low-income population in areas within the study area based on US Census Bureau data. The two largest concentrations of low-income population are on the west side of Route 1 near Beacon Hill and around Hybla Valley. There are no census tracts where 50 percent or more of the population is low-income. Four census tracts have low-income populations greater than 10 percent of the County.

3.1.3 Findings

In consideration of the existing communities and their populations within the study area, many of which are considered to be low-income and minority, Title VI and Environmental Justice concerns will be a factor in the future NEPA process. Community analysis and impact assessment should identify whether

[4] In regions where the 80 percent of AMI exceeds the U.S. median income, the low-income limit is capped by the United States median income, except in cases where 85 percent of the area's annual 2 bedroom fair market rent is greater than 35 percent of the United States median income. In FY2010 the Washington, DC FMR region low income limit was capped by the United States median income.
Source: http://www.huduser.org/portal/datasets/il/il2010/2010summary.odn?inputname=METRO47900M47900*Washington-Arlington-Alexandria%2C+DC-VA-MD+HUD+Metro+FMR+Area&selection_type=hmfa&year=2010.

disproportionately high and adverse effects to EJ populations are anticipated and avoid and/or mitigate those effects.

Because all of the alternatives follow the same alignment and have similar service characteristics, Title VI and Environmental Justice concerns are important for all alternatives during subsequent phases of work.

During subsequent planning, NEPA and design phases, the project should engage these populations at all stages of project development. A public engagement plan that responds to community needs should be developed and the proposed project will need to evaluate any adverse effects and benefits to these populations. Subsequent study will identify and address reasonably foreseeable adverse social, economic, and environmental effects on minority populations and low-income populations. These effects can include construction impacts, indirect effects, cumulative effects, and post-construction/operations impacts. It is anticipated that communities within the study area would benefit from all alternatives under consideration due to improved mobility, transit reliability and access within the study area. It is anticipated that all alternatives would result in travel time savings, which would support livability in the corridor. Over time, property values could increase as the corridor gains in attractiveness. This in turn would have a positive secondary effect on the local tax base; however, an adverse secondary effect of redevelopment may be the potential loss of some affordable housing for low-income residents currently residing along the corridor. In anticipation of this potential effect, the counties can develop tools to adjust, enforce, and increase availability of affordable housing to ensure that the current residents of the corridor can remain in the corridor and share in the benefits offered by the project.

Figure 3-1: Minority Populations

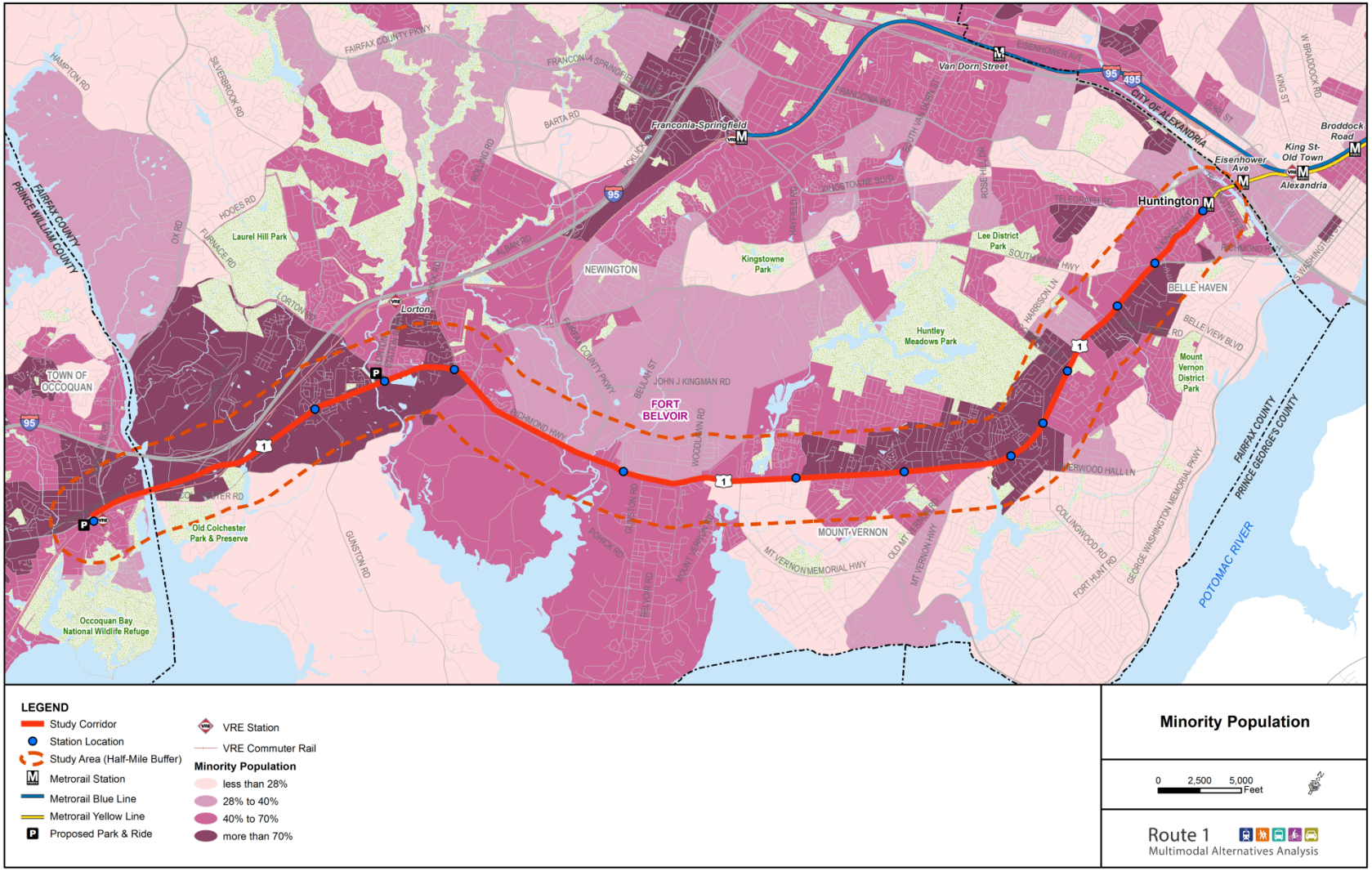
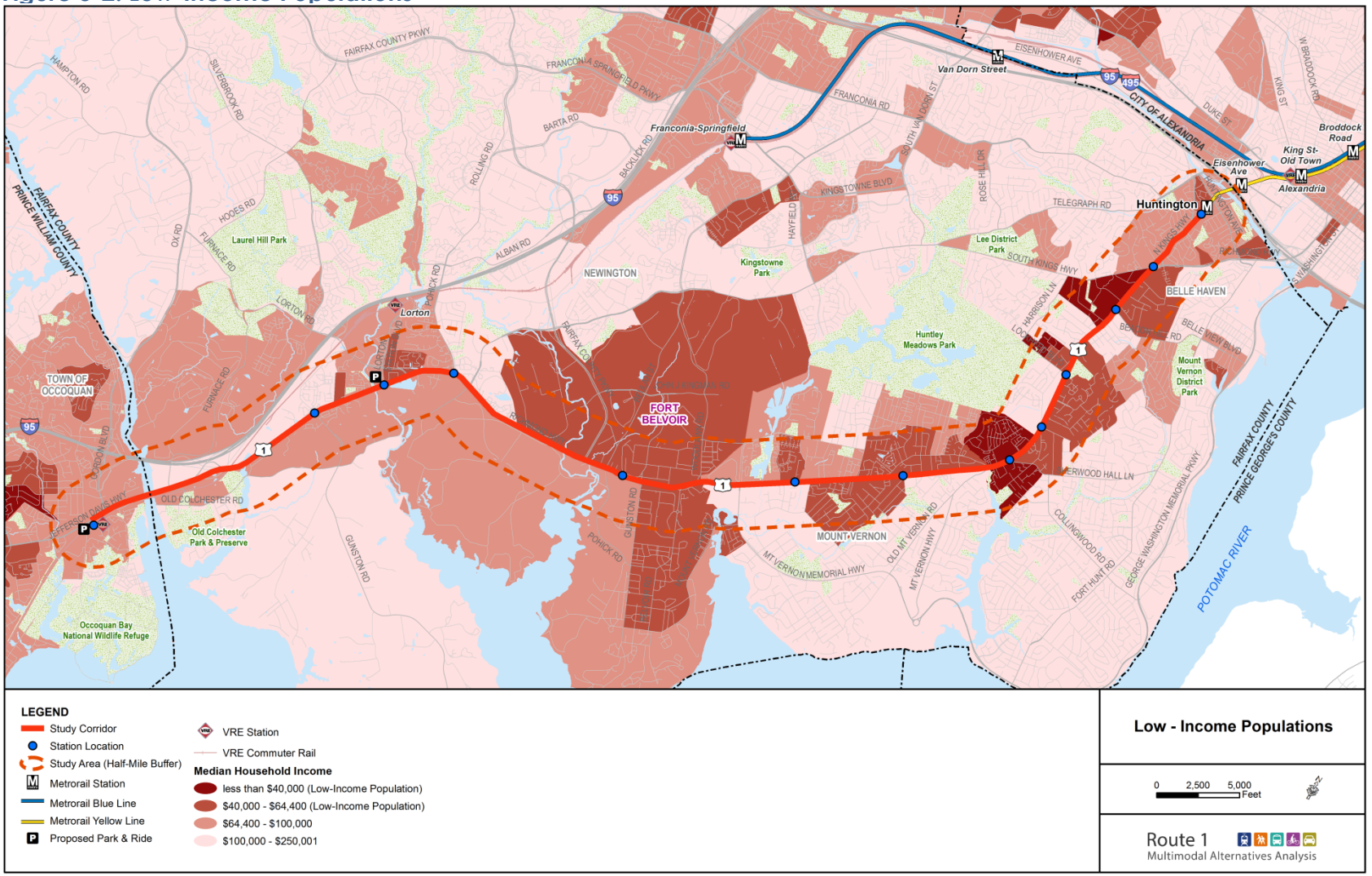


Figure 3-2: Low-Income Populations



3.2 Property Acquisition and Potential Displacements (Potential Right of Way Impacts)

3.2.1 Regulatory Considerations

Federal and state laws require that property owners be paid fair market value for their land and improvements, and that they be assisted in finding replacement business sites or dwellings. Displacements result from right-of-way (ROW) acquisitions that require the use of a property occupied by a residence or business. Under the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, federal agencies are required to meet certain standards for the fair and equitable treatment of persons displaced by federally supported actions. Relocation assistance will follow the guidelines set forth in Title 49, Part 24 of the Code of Federal Regulations (49 CFR Part 24).

A GIS analysis assessed the footprints of proposed facilities within the corridor and their relationship to existing public ROW and land parcels. The analysis then identified the portions of land parcels where permanent ROW acquisition would be needed to accommodate project facilities.

3.2.2 Findings

Based on the assumptions stated in Section 2.3 and the data contained in **Table 3-2**, there are anticipated to be a number of parcels impacted by either partial acquisitions or total acquisitions. Table 3-2 does not distinguish between partial and total acquisitions at this stage of the project.

Table 3-2: Potential ROW Impacts

Potential Impacts		Alt 1: BRT Curb	Alt 2: BRT Median	Alt 3: LRT	Alt 4: Hybrid
Total Number of Buildings Impacted		17	29	29	29
Fairfax County	**Number of Parcels Impacted**	299	347	349	347
	Total Area of Parcels Impacted	25.94 Acres	35.70 Acres	36.32 Acres	35.70 Acres
Prince William County	**Number of Parcels Impacted**	0	0	11	0
	Total Area of Parcels Impacted	0	0	2.53 Acres	0

The **Appendix** provides detailed mapping of potential impacts associated with each alternative. Note: The findings in this document are preliminary and the potential direct impacts, particularly property impacts associated with the alternatives under evaluation are draft and for internal use only. The analysis was performed using GIS and is not based on survey data.

3.3 Neighborhoods and Community Facilities

3.3.1 Study Area Conditions

A major impetus for the development of improved transportation service in the corridor has been to support the future residential and commercial development over the next 10 to 20 years. Station stops have been sited to provide access to current and future development and within designated activity centers. People residing and working along the corridor would benefit from improved transit service and access to employment and retail centers.

3.3.2 Findings

Community facilities in the study area include schools, libraries, churches, and religious institutions, post offices, and emergency services. Because all of the alternatives follow the same alignment and have similar service characteristics, likely impacts on neighborhoods and community facilities are comparable for all alternatives. More detailed analysis of potential impacts to these facilities will be conducted during the NEPA and design phases. **Table 3-3** lists and **Figure 3-3** shows major community facilities within the study area.

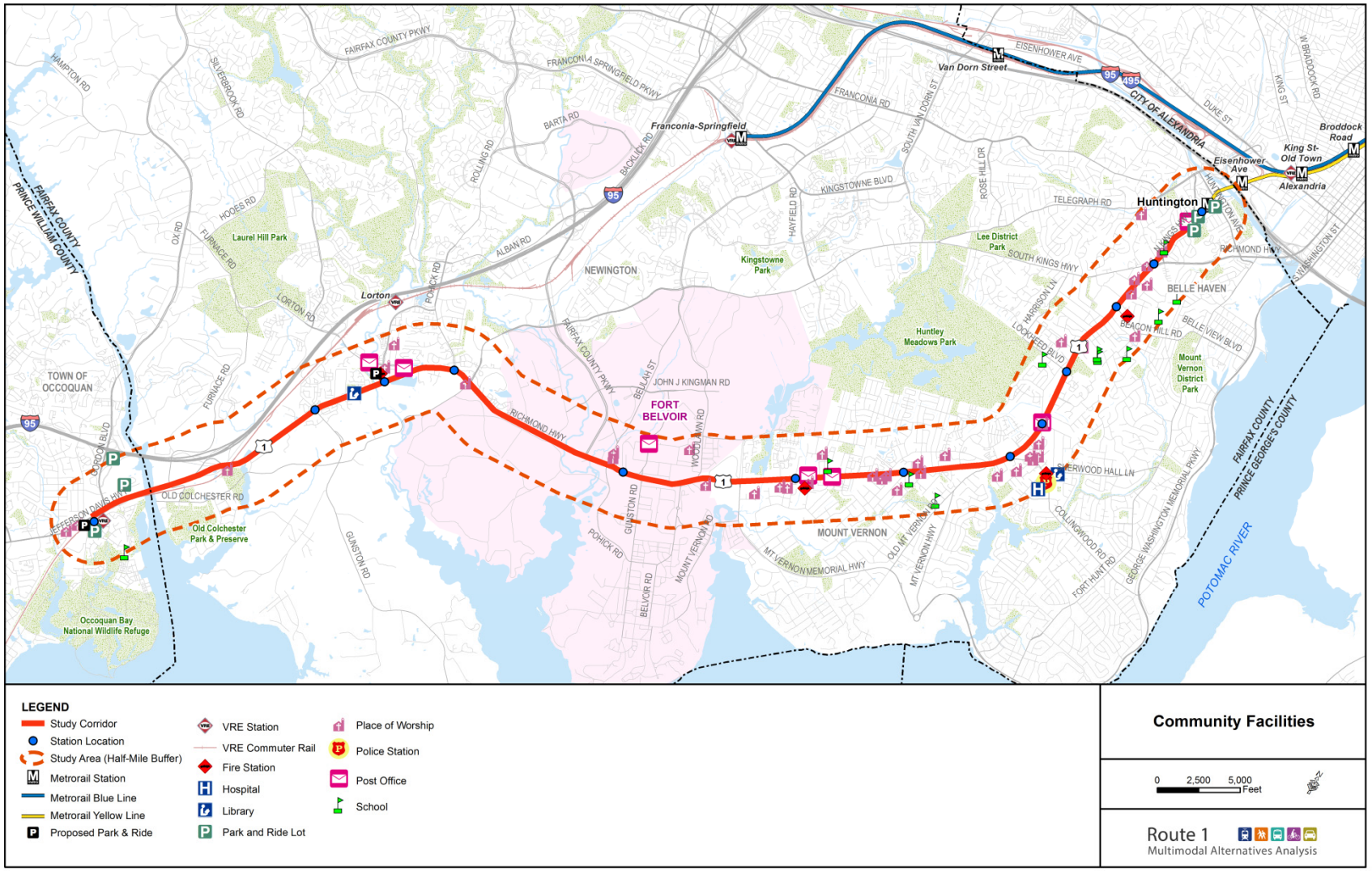
Table 3-3: Community Resources

Facility Type	Name	
Library	Sherwood Regional Library Lorton Library	
Police Stations	Fairfax County Police Department Mount Vernon District Station	
Fire Stations	Mount Vernon Penn Draw	Woodlawn Lorton
Post Offices	US Post Office (5) Jefferson Manor PO	
Schools	Woodlawn Elem. Hybla Valley Elem. Bryant Alternative High Achievement, Integrity and Maturity Lyles-Crouch Elem. Islamic Saudi Academy	Bucknell Elem. West Potomac High Quander Road School Riverside Elem. Mount Eagle Elem.
Places of Worship	Bethlehem Church Emmanuel Church Engleside Church Pohick Church Wesley Church Woodlawn Church Woodlawn Church Saint Louis Catholic Church	Seventh Day Adventist Church Gateway International Mt Vernon Iglesia Del Nazareno Greater Shiloh Baptist Church Fair Oaks Baptist Church Harvest Assembly Baptist Church Spirit of Faith Rising Hope United Methodist Church

Facility Type	Name	
	Calvary Presbyterian Church	Favor House Ministries
	Groveton Baptist Church	Evangelical Church Apostles
	Bethany Lutheran Church	Spirit of Faith Ministries
	Roberts Memorial United Methodist Church	Washington Community Church
	Beulah Baptist Church	Alexandria Miracle International
	All Saints Chapel	Chúa Hoa Nghiêm
	Occoquan Church (historical)	New Hope Church
	Accotink United Methodist Church	Hope Aglow Empowerment Center*
	Alfred Street Baptist Church	Boku Bethlehem
	Bethel World Outreach Church	First AME Church
	Bethlehem Baptist Church	Ship of Zion Baptist Church
	Christian Science Reading Room	in Christ
	First Baptist Church of Lorton	Mount Calvary Baptist Church
	Unity Christian Fellowship*	Jesus is Lord Ministries Church of God in Christ
Hospitals	Inova Mount Vernon Hospital	
Govern-ment Centers	South County Center	
Park & Ride Lots	VRE Woodbridge*	
	WMATA Huntington (2 lots)	
	Oxbridge Center*	
	King's Highway	
	Route 123 & I-95*	

*Facilities in Prince William County.

Figure 3-3: Community Facilities



3.4 Parklands

3.4.1 Regulatory Considerations

Section 4(f) of the U.S. Department of Transportation Act of 1966, protects public parks and recreational lands, wildlife habitat, and historic sites of national, state, or local significance. Section 4(f) precludes transportation projects from using these lands and requires that all prudent and feasible alternatives to the use of these lands be investigated. For unavoidable impacts, all planning to minimize harm and appropriate mitigation is required. In addition, Section 6(f) of the U.S. Land and Water Conservation Fund Act preserves, develops, and assures the quality and quantity of outdoor recreation resources and requires that certain conditions be met before conversion of these resources can occur.

3.4.2 Study Area Conditions

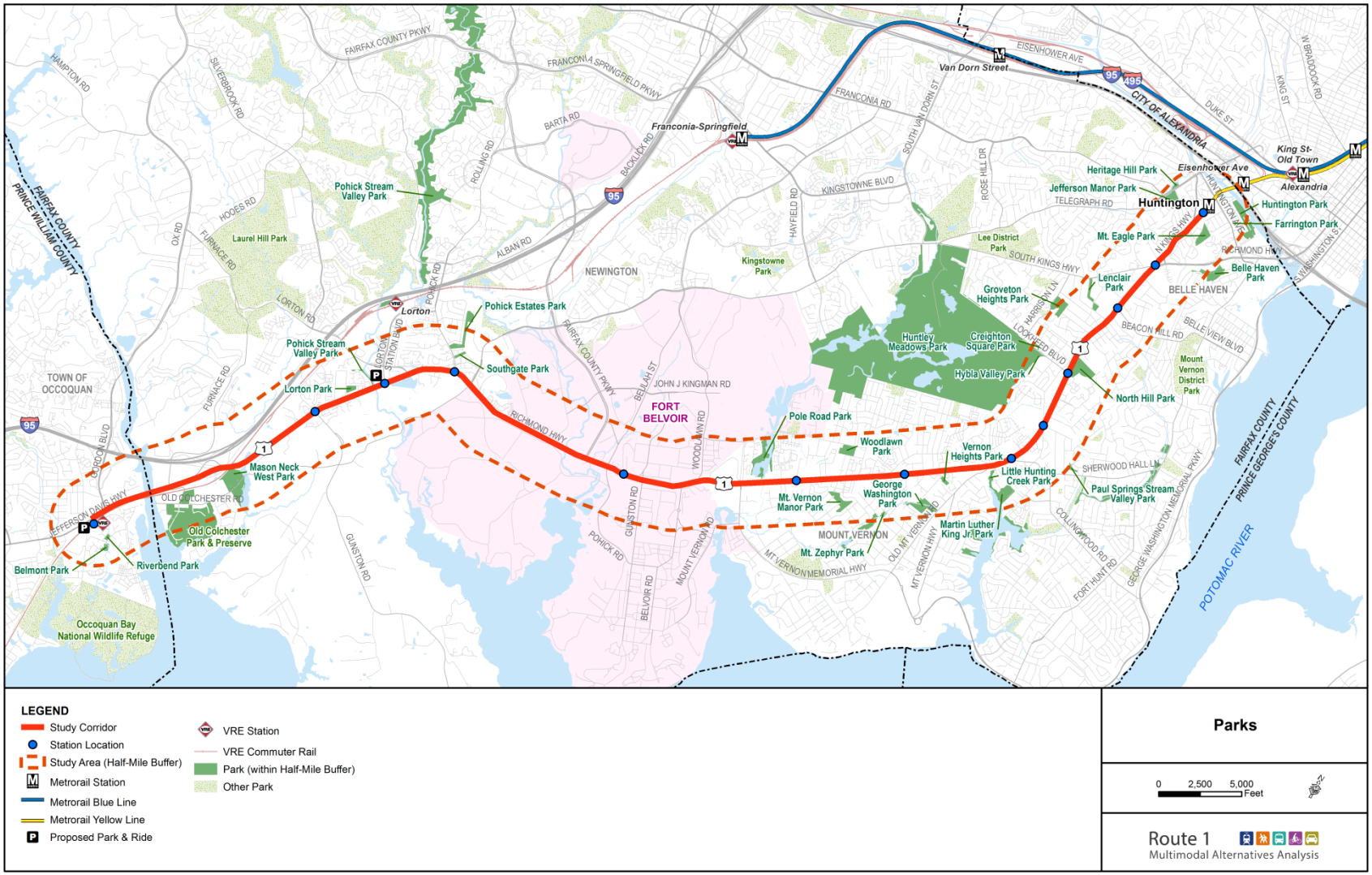
Within the study area, 29 publicly owned parks lie within Fairfax County and two publicly owned parks are located in Prince William County. The parks within the study area are listed below in **Table 3-4** and shown in **Figure 3-4**. According to the National Park Service (NPS) Land & Water Conservation Fund database, no parks within the study area are 6(f) funded parks.[5]

Table 3-4: Parks within Study Area

Fairfax County		Prince William County
Mount Zephyr Park	Walt Whitman School Site	Riverbend Park
Huntley Meadows Park	North Hill Park	Belmont Park
Pohick Stream Valley Park	Paul Springs Stream Valley Park	
Pole Road Park	Old Colchester Park & Preserve	
Dogue Creek Stream Valley Park	Southgate Park	
Hollin Meadows Park	Vernon Heights Park	
Farrington Park	Martin Luther King Jr. Park	
Lorton South Park	Lenclair Park	
Mount Vernon Manor Park	Fort Willard Historic Site	
George Washington Park	Pohick Estates Park	
Mount Eagle Park	Woodlawn Park	
Belle Haven Park	Creighton Square Park	
Huntington Park	Mason Neck West Park	
Little Hunting Creek Park	Hybla Valley Park	
Groveton Heights Park	North Hill Park	

[5] http://waso-lwcf.ncrc.nps.gov/public/index.cfm

Figure 3-4: Parks (Publicly Owned)



3.4.3 Findings

Two parks (Lorton South Park and North Hill Park) are directly adjacent to the alignment and could be directly impacted by the alternatives.

Because all of the alternatives follow the same alignment and have similar service characteristics, likely impacts on parklands are comparable for all alternatives. More in-depth analysis will be required to determine potential proximity effects such as noise and visual impacts. Future project planning and design of station stops and other facilities should be carried out to avoid or minimize the potential impacts on these parks and recreational resources. Coordination should occur with the affected federal, state, and local agencies to avoid impacts to the extent possible on identified resources within the study areas.

3.5 Historic and Cultural Resources

3.5.1 Regulatory Considerations

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their actions on historic properties. Historic properties are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior." NEPA also requires federal agencies to coordinate and plan their actions so as to preserve significant historic, cultural, and natural resources. In Virginia, the Department of Historic Resources (VDHR) provides assistance to Federal agencies and associated interested parties and project stakeholders in carrying out Section 106 and its associated implementing regulations found at 36 CFR Part 800.

3.5.2 Study Area Conditions

According to a search of VDHR's V-CRIS database, nine previously recorded properties within the study area are listed in the National Register of Historic Places. Error! Reference source not found. lists the properties.

Table 3-5: NRHP-listed Properties within Study Area

Property Name	Quadrant	NRHP Listing Date	DHR#
Pohick Church	Belvoir	10-16-1969	029-0046
Fairfax Arms	Belvoir	05-21-1979	029-0043
Woodlawn Plantation*	Belvoir	02-26-1970	029-0056
Pope-Leighey House	Belvoir	12-18-1970	029-0058
Camp A.A. Humphreys Pump Station and Filter Building	Belvoir	06-19-1996	029-0096
Woodlawn Society of Friends Meeting House	Belvoir	05-21-2009	029-0172
George Washington Grist Mill	Belvoir	08-08-2003	029-0330
George Washington's Distillery and Grist Mill	Belvoir	11-04-2009	029-0330
Hollin Hills Historic District	Mount Vernon	09-30-2013	029-5471

Source: VDHR V-CRIS database, updated June 16, 2014

*Property is also a listed National Historic Landmark (NHL), may require additional coordination during NEPA phase

Figure 3-5 shows all 170 architectural sites that are either eligible (12 sites), not evaluated (58 sites), or not eligible (109 sites) for listing in the NRHP. Table 3-6 lists the eligible architectural sites. The nine places listed in the National Register of Historic Places are labeled. The 58 sites that have not been evaluated by VDHR would likely need to be evaluated during the NEPA phase of the project.

Table 3-6: Eligible Architectural Sites

Property Name	Quadrant	DHR#
9 Hole Golf Course (South Post), #1432, Ft. Belvoir	Fort Belvoir	029-5423
Railroad Bridge #1433, Route 1, Ft. Belvoir	Fort Belvoir	029-5424
Hollin Hills Historic District	Alexandria/Mount Vernon	029-5471
U.S. Post Office (Alexandria Post Office, 200 S. Washington St)	Alexandria	100-0063
Gunston Hall Apartments, 901-915 S Washington Street	Alexandria	100-0121-1006
Mount Vernon High School	Mount Vernon	029-0230
Fort Belvoir/Jones Point Storage Building, Rte 100	Alexandria	100-0167
Old Colchester Road (Ft. Belvoir)	Fort Belvoir	029-0953
Railroad Bridge #2298, Rt 617 (Cinder Bed Rd), Ft. Belvoir	Fort Belvoir	029-5010
Woodlawn Historic District	Fort Belvoir	029-5181
Hunting Terrace Apartments, 1205 S Washington	Alexandria	100-5019
Freedmen's Cemetery (Contraband Cemetery)	Alexandria	100-0121-1085

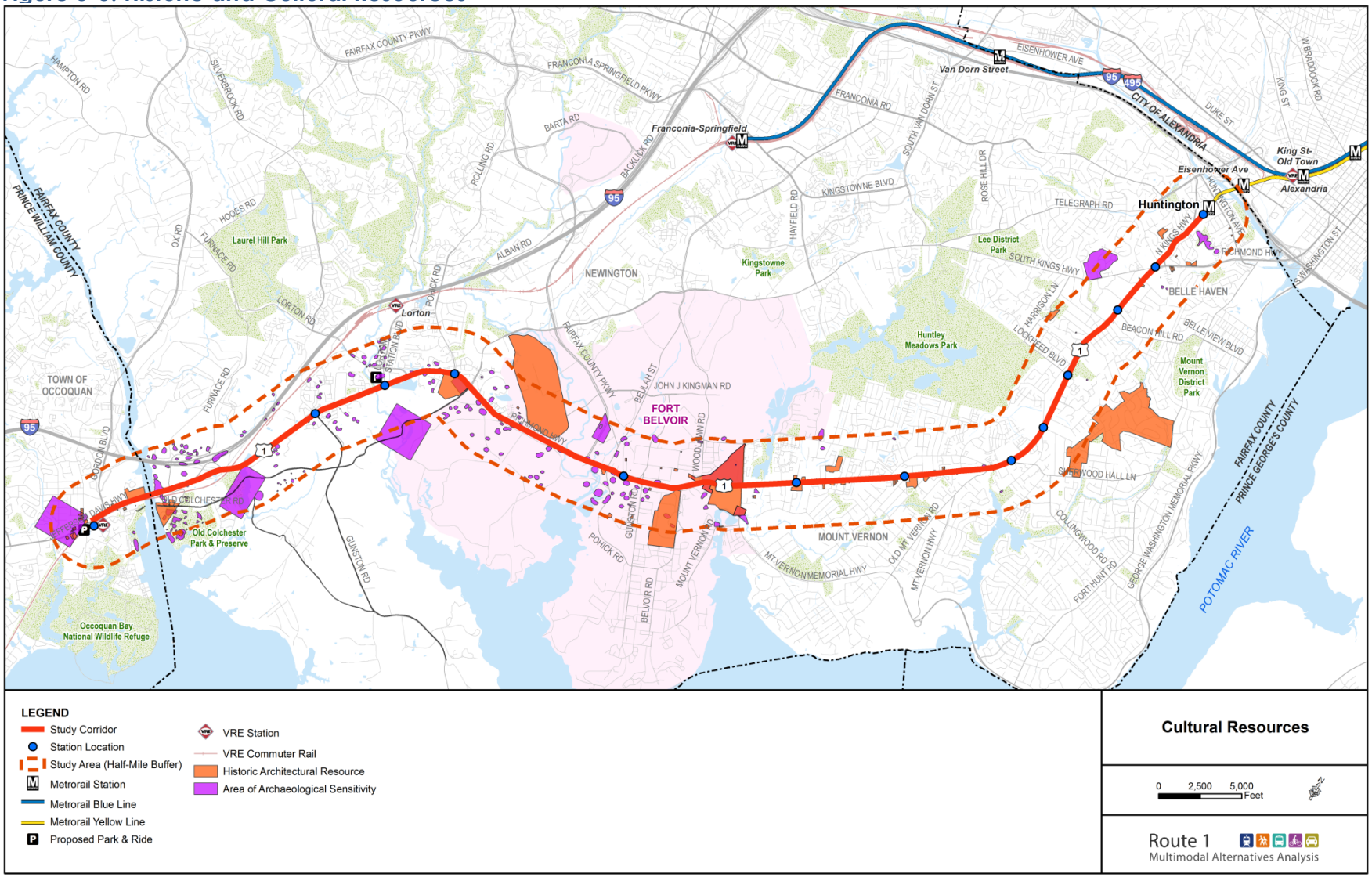
Figure 3-5 also shows the archeological sensitive areas. Within the study area, three sites are listed as NRHP eligible, nine sites have potential for eligibility, 204 sites are not evaluated, and 47 are not eligible.

3.5.3 Findings

Eight of the nine architectural properties listed in the NRHP lie within the study area boundary of the Route 1 Improvements Project at Fort Belvoir. Only one eligible architectural resource (Hollins Hill Historic district) lies within the study area and outside of Fort Belvoir. It is unlikely that this resource would be affected by any of the proposed alternatives.

Because all of the alternatives follow the same alignment and have similar service characteristics, likely impacts on cultural resources are comparable for all alternatives. Further investigation and coordination with VDHR as part of environmental review will be necessary to comply with Section 106 of the National Historic Preservation Act. Archeologically sensitive sites fall within the study area. These sites will need to be further reevaluated and sensitive areas could be subject to testing.

Figure 3-5: Historic and Cultural Resources



3.6 Air Quality

3.6.1 Regulatory Considerations

The Clean Air Act (CAA) of 1990 (with major revisions in 1977 and 1990), is the basis for most federal air pollution control programs. The Environmental Protection Agency (EPA) regulates air quality nationally, while the Virginia Department of Environmental Quality (VDEQ) is responsible for statewide air quality monitoring and development and implementation of programs to ensure Virginia meets national air quality standards.

The CAA establishes National Ambient Air Quality Standards (NAAQS) for ground level ozone, carbon monoxide, particulate matter, lead, sulfur dioxide and nitrogen dioxide. Areas where the NAAQS are not met, known as nonattainment areas, are classified by the CAA depending on the area's measured levels of criteria pollutant compared to the federal standard.

3.6.2 Study Area Conditions and Findings

The Route 1 corridor is located in Fairfax County and Prince William County, which are located in an EPA-designated non-attainment area for the one-hour ozone standard and marginal nonattainment for the eight-hour ozone standard for ozone. The overall effect on corridor-level and regional air quality created by any alternative will largely depend on the following factors: The ability of the service to attract more people to use transit and reduce automobile-related emissions; any difference in the type and amount of vehicular emissions between the baseline compressed natural gas (CNG) fueled bus system and the new transit system and propulsion method; the impact on traffic; and emissions from construction activities, e.g. equipment, trucks, and fugitive dust emissions.

Alternative 4 would provide the greatest benefit to air quality because of reduced automobile-related emissions. Alternative 4 would require excavation and tunneling to support the Metrorail alignment, which has the potential for greater temporary impacts on air quality as compared with the other Alternatives.

As the project progresses, air quality issues will be addressed in greater detail through emissions modeling, microscale analysis and confirmation of the project's inclusion in the regional Transportation Improvement Plan (TIP). Future analysis would include a demonstration of project air quality conformity with Virginia's State Implementation Plan (SIP).

3.7 Noise and Vibration

3.7.1 Regulatory Considerations

The following are four sources of criteria for detailed evaluation of noise impacts and related mitigation measures:

- The Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment Guidance Manual (DOT-95-16, April 1995).
- The Federal Highway Administration's (FHWA) Highway Traffic Noise: Analysis and Abatement Guidance (23 CFR 772, July 2010).
- Virginia Department of Transportation's State Noise Abatement Policy.
- Local jurisdiction noise ordinances.

3.7.2 Study Area Conditions

Existing sources that would contribute to the ambient background noise and vibration levels include motor vehicles, buses, trucks, and other ongoing construction activities along the corridor. It is anticipated that both the construction and ongoing operation of the selected transit system will contribute to ambient noise levels.

3.7.3 Findings

It is expected that the noise generated by any of the alternatives would not significantly increase the current level of ambient noise from the roadway traffic. However, further analysis would be needed to identify the locations of noise sensitive areas and determine if the project would result in potential impacts on noise sensitive receptors in those areas.

Noise levels from construction activities related to proposed transit improvements along the study corridor, although temporary, could create a nuisance at nearby locations. Alternative 4 would require tunneling to support the Metrorail alignment, which would likely produce greater temporary impacts than the other alternatives. Best management practices would be employed to minimize temporary effects.

3.8 Water Resources

3.8.1 Regulatory Considerations

The federal and state laws and regulations that protect the quality of water resources are listed below:

- The Clean Water Act (CWA) sets water quality standards for all bodies of surface water, including wetlands. Section 404(b)(1) of CWA requires the selection of the practicable alternative that causes the least harm to the "aquatic environment" which consists of wetlands and other jurisdictional waters of the U.S., so long as the alternative does not have other significant adverse environmental consequences.
- U.S. DOT Order 5660.1A requires the protection, preservation, and enhancement of the nation's wetlands during the planning, construction, and operation of transportation facilities and projects.
- The Coastal Zone Management Act of 1972 and related amendments require that federal actions that are likely to affect any coastal zone resources complete a federal consistency determination.
- U.S. DOT Order 5650.2 requires transportation facilities and projects to give proper consideration to the avoidance and mitigation of adverse floodplain impacts.
- The Chesapeake Bay Preservation Act requires tidewater local governments (including Fairfax County) to designate and protect water resources affecting the Chesapeake Bay. Local governments were required to implement an ordinance to regulate and minimize development-related impacts on the Bay through the designation of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). RPAs were designated along all perennial streams in the County. RPAs include the land area within 100 feet of a perennial stream bank or edge of wetlands adjacent to the perennial stream. RPA areas are protected under state law and local ordinances. In general, no development, land disturbance or vegetation removal is allowed in an RPA. Development is permitted within RMAs but must adhere to criteria established in the county's Comprehensive Plan.
- Within the Commonwealth, the VDEQ has primary responsibility for day-to-day administration of federal and state laws and regulations affecting surface and groundwater resources.

3.8.2 Study Area Conditions

Coastal Zone

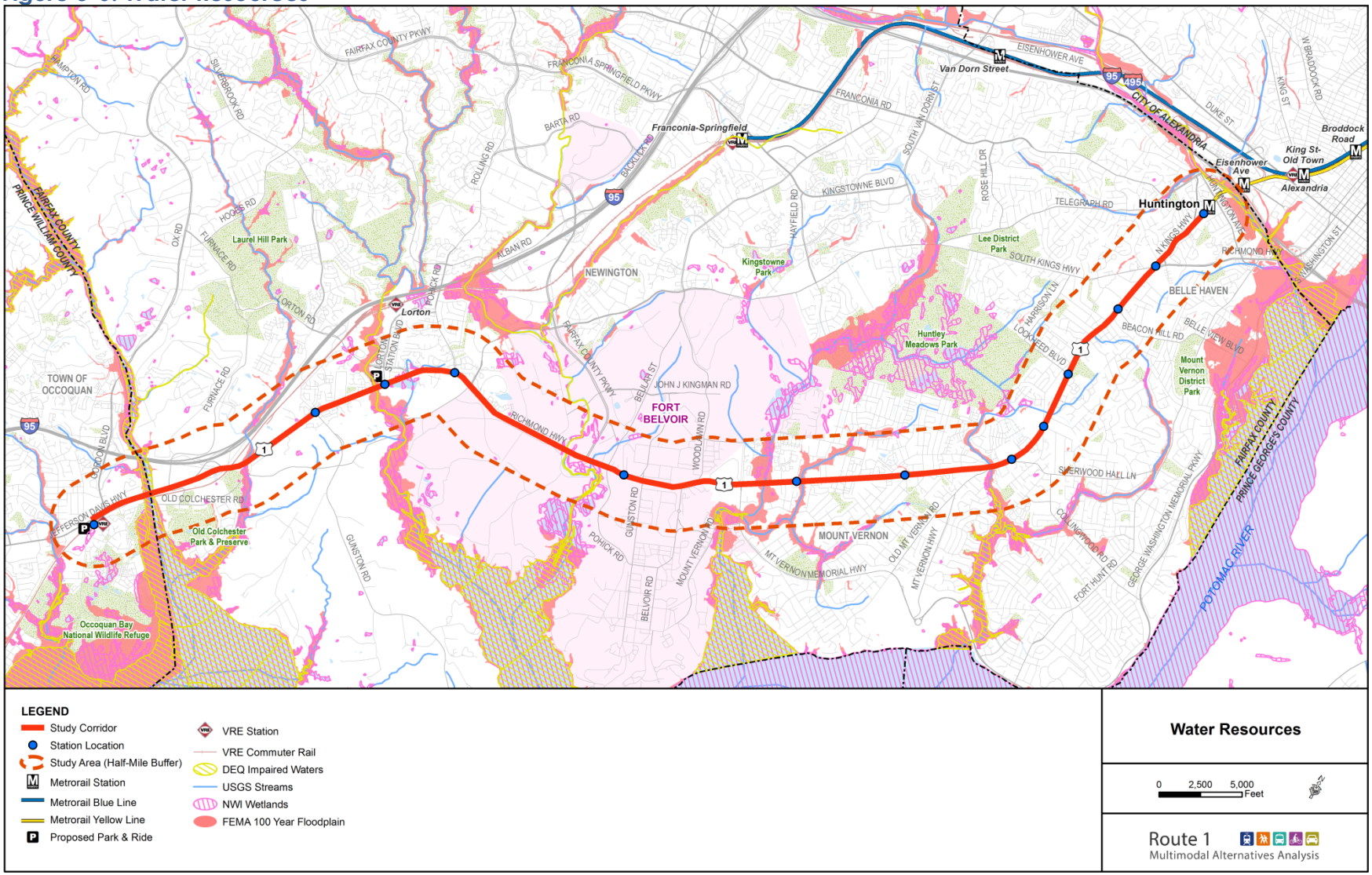
The study area is within Fairfax County and Prince William County, which are located within Virginia's Coastal Zone.

Floodplain

The corridor crosses the Occoquan River and several large named creeks and a number of small streams and drainages. GIS analysis noted streams, potential floodplain, and wetland vegetation that are within the study area.

Figure 3-6 displays water resources, floodplains, wetlands, and RPAs within the study area.

Figure 3-6: Water Resources



Stormwater management controls the flow of stormwater runoff by sending it through the storm drainage system before discharging it to lakes and streams. This reduces the amount of pollution carried by stormwater runoff that reaches local waterways and the Chesapeake Bay and helps prevents flooding.

Virginia requires Prince William and Fairfax County, as well as VDOT, to develop watershed management plans as a part of the state's permits for Municipal Separate Storm Sewer System (MS4). The project corridor runs through several watershed management areas: Belle Haven, Little Hunting Creek, Dogue Creek, Accotink Creek, Pohick Creek, and Mill Branch in Fairfax County and Occoquan River in Prince William County. As the project will be contributing more impervious surface, specifically through road-widening, the proposed project would need to be accounted for in the watershed management plans in the study area. **Table 3-7** lists the estimated contribution of impervious surface to the study area associated with each alternative.

3.8.3 Findings

All four alternatives could potentially have direct impacts on streams, wetlands, and stormwater management policies. Wetlands have been mapped near Pohick Creek (Lorton), Massey Creek, and Occoquan River in Prince William County. Alternative 3 is the only alternative that would require additional right-of-way near Occoquan River, and therefore has the greatest potential to impact wetlands and other habitat areas. For Alternatives 1, 2, and 4, potential impacts from widening the existing bridge over the Occoquan River will need to be studied. **Table 3-7** lists the potential impacts associated with each alternative. Potential impacts were calculated using available GIS data.

Temporary indirect impacts to these resources could result from construction-related activities. During construction, proposed improvements will be required to comply with applicable federal, state, and local standards. All necessary permits will be assessed during the NEPA phase and acquired prior to construction. Because the project is located within the Coastal Zone, a federal consistency determination will be required.

Table 3-7: Potential Impacts to Water Resources

	Alt 1: BRT Curb	Alt 2: BRT Median	Alt 3: LRT	Alt 4: Hybrid
Floodplains	7.5 acres	8.4 acres	8.4 acres	8.4 acres
Impaired Waters	0.06 acres	0.07 acres	0.6 acres	0.07 acres
Wetlands	0.09 acres	0.2 acres	0.66 acres	0.2 acres
Streams	1,104 feet	1,260 feet	1,299 feet	1,260 feet
Stormwater Management (Impervious Surface added from Road Widening)	7.29 acres	25.11 acres	24.76 acres	25.11 acres

3.9 Protected Species and Critical Habitats

3.9.1 Regulatory Considerations

Section 7 of the Endangered Species Act of 1973 regulates federally-listed threatened and endangered species and designated critical habitats. The National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) identify, manage and protect those species in danger of extinction. USFWS also maintains a list of candidate species that do not have threatened or endangered status but are of special concern.

Virginia protects threatened or endangered plants and insects under its Endangered Plant and Insect Species Act of 1979. The Act provides for the listing and protection of species through the Virginia Department of Agriculture and Consumer Services (VDACS) with help from the Division of Natural Heritage (DNH) of Virginia Department of Conservation and Recreation (VDCR). The DNH of VDCR also protects rare plant and animal species and natural heritage areas throughout the Commonwealth. Non-endangered wildlife is protected under federal law by the Migratory Bird Treaty Act of 1918, last amended in 1986, which provides protection for native migratory game and non-game birds. The Virginia Department of Game and Inland Fisheries (VDGIF) regulates non-endangered wildlife at the state level.

3.9.2 Study Area Conditions

According to the USFWS on-line database, four threatened or endangered species were identified within the study area. The four species within the study area are listed in

Table 3-8. Threatened and Endangered Species habitat, as well as Anandromous Fish Use areas, is shown in **Figure 3-7**.

Table 3-8: Threatened or Endangered Species

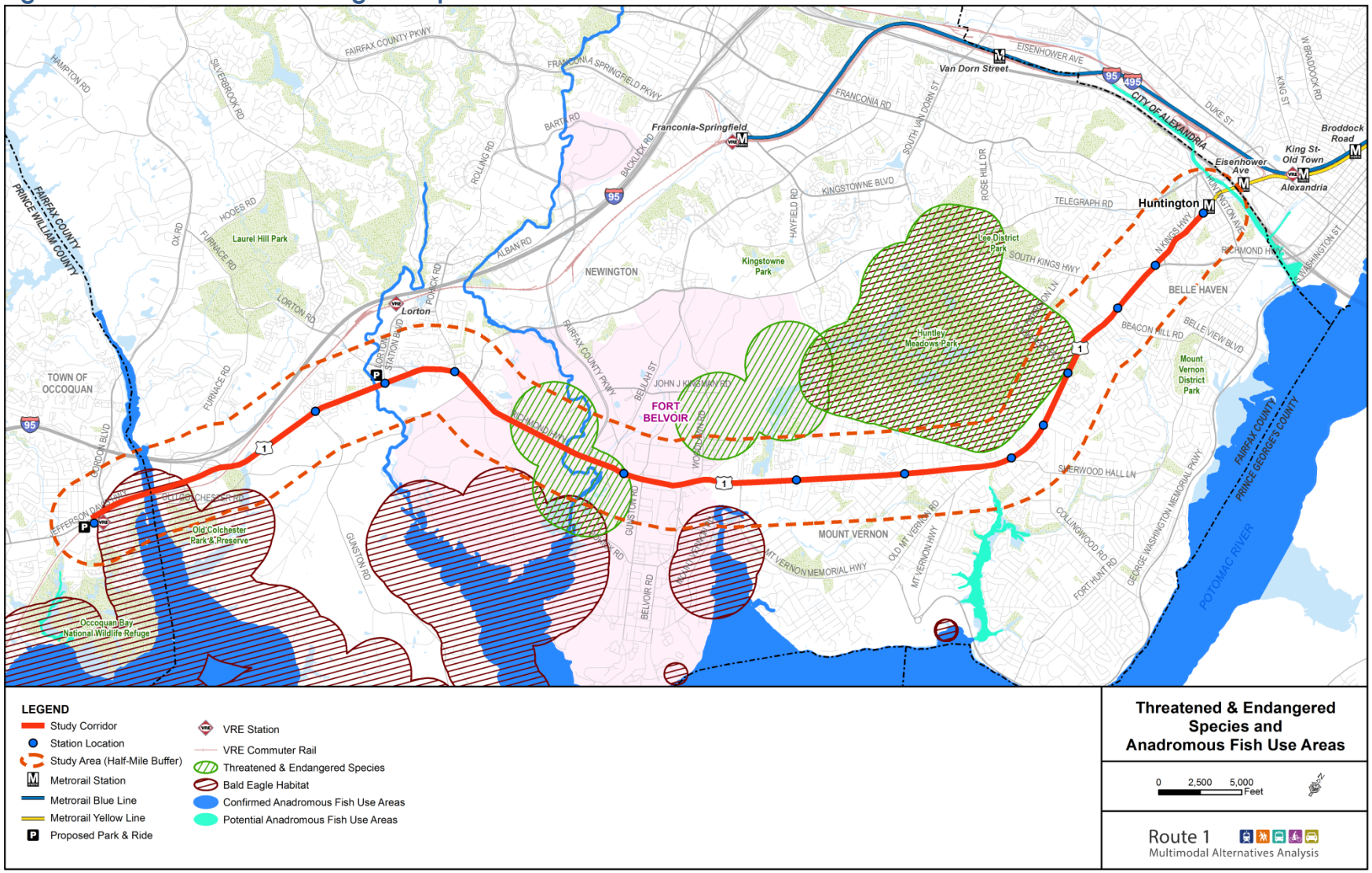
Common Name	Genus	Species	Status	Notes
Dwarf wedgemussel (Clam)	*Alasmidonta*	*heterodon*	Federal Endangered	
Bald Eagle	Haliaeetus	leucocephalus	Federal Species of Concern	The College of William & Mary Center for Conversation Biology does not report any bald eagle nests immediately within the study area, but the southernmost portion of the project is within a Bald Eagle concentration area.
Wood Turtle	*Glyptemys*	*insculpta*	State Threatened	
Peregrine Falcon	*Falco*	*peregrinus*	State Threatened	
Harperella (Flowering plants)	*Ptilimnium*	*nodosum*	Federal Endangered	

Sources: USFWS IpAC . Accessed 2014 http://ecos.fws.gov/ipac/wizard/trustResourceList!prepare.action; VDCR database, 2014.

3.9.3 Findings

Because all of the alternatives follow the same alignment and have similar service characteristics, likely impacts on protected species and critical habitats are comparable for all alternatives. During the NEPA phase, more detailed analysis will be required to understand if any of these resources could be affected by any of the alternatives. To identify whether any other species inhabit the study area, coordination with USFWS agency and field investigations may be required.

Figure 3-7: Threatened & Endangered Species and Anandromous Fish Use Areas



3.10 Potentially Contaminated Sites

3.10.1 Study Area Conditions

According to an inventory search using Virginia Department of Environmental Quality (DEQ) and EPA databases, the following potentially contaminated sites were present in the study area and are shown in **Figure 3-8**.

- 6 DEQ Petroleum Release Sites
- 3 EPA Toxic Release Inventory Sites
- 1 Landfill
- 1 EPA RCRA Site

3.10.2 Findings

Only two of the previously documented sites are adjacent to the alignment. A gas station near Grovetown could be directly potentially impacted by the Alternatives. Alternative 3 could also directly impact a site (Vulcan materials, crushed stone supplier) in Prince William County. No field work was conducted, and a Phase I Environmental Site Assessment is recommended during the NEPA phase to further research these sites and any other potentially contaminated areas along the corridor.

3.11 Construction Impacts

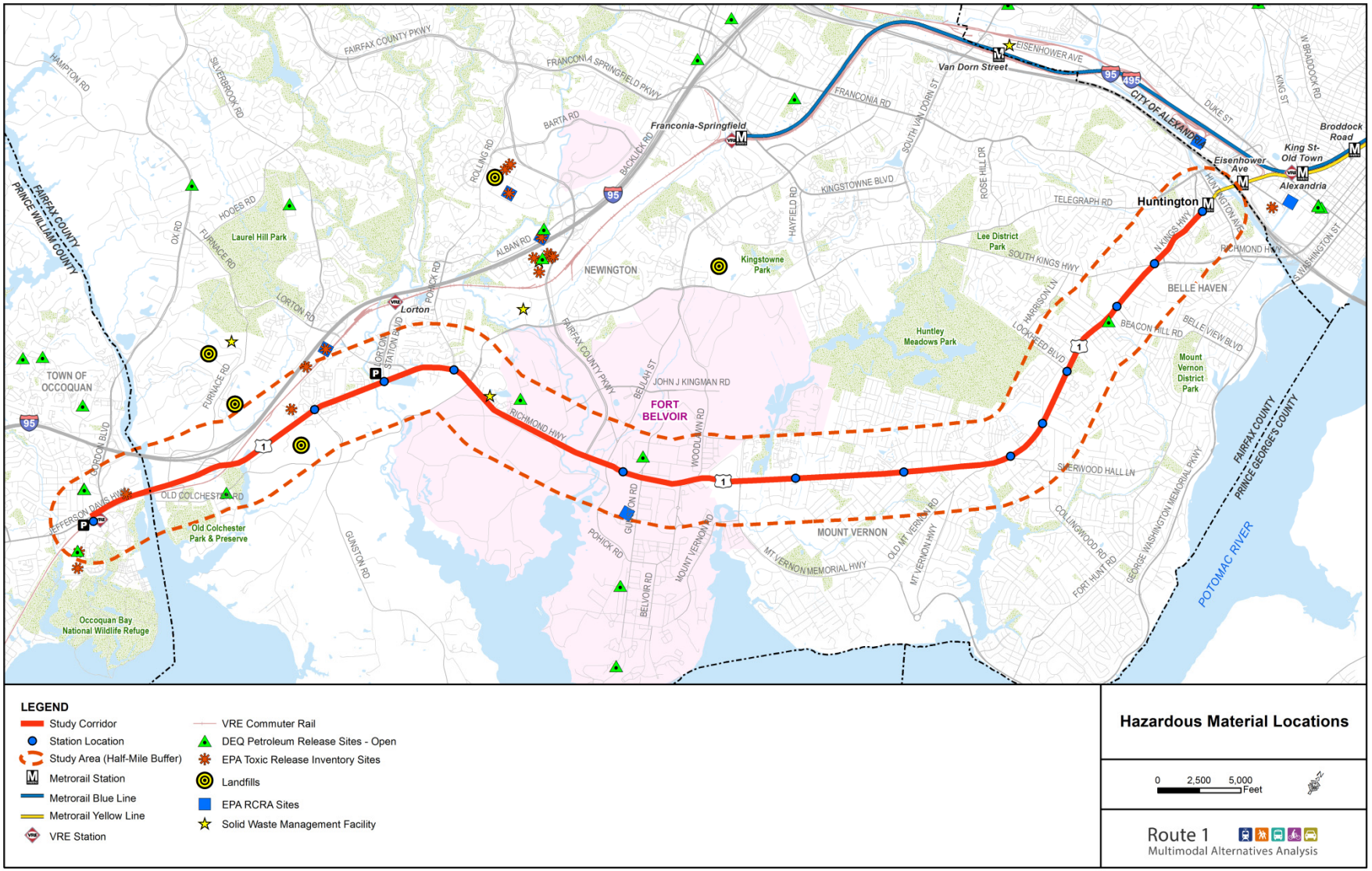
Project construction impacts are defined as those impacts that are localized, temporary and short-term, occurring only during the construction period. These impacts generally are limited to the immediate construction area and would occur primarily in the form of traffic changes along with physical changes to land use from earth moving and vegetation removal by means of construction equipment. Throughout construction, impacts are controlled by the use of specifically defined and/or regulated construction practices.

3.11.1 Findings

Construction activities may result in impacts to air quality, noise, soils, water quality, wetlands, streams, wildlife and their habitat, and transportation conditions. In particular, traffic impacts could include lane closures, diversion of traffic, and removal of shoulders, potentially affecting traffic safety and flow. Effects of construction impacts could be mitigated by following applicable state and local procedures as well as industry standards for each of the various resources. For traffic impacts, implementation of traffic maintenance plans will be likely be required which would include signage and detour information. In preparation for construction, the contractor would coordinate with applicable authorities, including VDOT, to ensure that effects related to construction on the roadways are addressed and minimized. This could include developing traffic maintenance plans and mitigation of potential construction impacts. During the potential construction of Alternative 4 – Metrorail portions, there could also be concerns of

noise and vibration impacts during the tunnel construction that would need to be addressed during the NEPA phase and public involvement activities.

Figure 3-8: Potentially Contaminated or Hazardous Materials Locations



4.0 Discussion of Likely NEPA Class of Action

The purpose of this environmental scan is to help identify some of the potential environmental constraints and effects associated with the alternatives for refinement and implementation. This information is valuable in providing background to the lead federal agency/agencies to identify the appropriate NEPA class of action should federal funding be identified for the project.

At the end of this current study, a recommendation of a preferred transit alternative and program of projects for multimodal improvements will be made. The identification of a recommended preferred alternative will be made based on the alternative's ability to meet the stated purpose and need of the proposed action based on detailed technical evaluation and stakeholder input. This preferred alternative will advance for further evaluation and study, and advanced into local and regional transportation plans by the project sponsor.

For federally funded projects, the requirements of NEPA must be met. NEPA defines three (3) classes of action: Categorical Exclusion (CE), Environmental Assessment (EA) and Environmental Impact Statement (EIS). **Table 4-1** defines these classes of action.

Table 4-1: NEPA Classes of Action

	Environmental Impact Statement	Environmental Assessment	Categorical Exclusion
Applicability	• Significant impacts are anticipated • Complex projects that have a high likelihood of legal challenge or public controversy	• Project type is not listed as a CE in (CE list) • Significance of impacts is uncertain • EAs may be elevated to EIS when significant impacts are identified during the study	• Listed as a CE in regulations • Projects with no significant impacts • Often primarily within existing right-of-way
Requirements	• Evaluates a range of alternatives (including a No Build) • Notice of Intent (published in the Federal Register) • Formal Scoping process • Public hearings required • Decision documented in a Record of Decision (ROD)	• May evaluate a preferred alternative or range of alternatives (including a No Build) • Public information meetings and hearings are not always required • Decision documented in a Finding of No Significant Impact if no significant impacts are identified. If significant impacts are identified, preparation of an EIS may be required.	• May be completed through a CE Checklist identified by lead agency or if more information is needed, a Documented CE may be prepared. • Public involvement requirements not as stringent as with EA/EIS • Decision is a signed CE
General time frames*	• Typically 18 months to 3 years for Draft EIS and another 1 to 2 years for a Final EIS/ROD(depending on the complexity of the project)	• Typically 6 to 18 months	• Typically 2 to 6 months

*Timeframes provided are for general discussion purposes; timeframes vary by project

The following section discusses the potential classes of action associated with each alternative.

4.1 Potential Class of Action Discussion

Generally, the three key drivers that help determine the potential for significant impacts, and therefore the level of NEPA documentation, are:

- Context and intensity of the impacts to key resources,
- Scale (size and cost) of the anticipated project, and
- Potential areas for and magnitude of public discussion/controversy.

During the Alternatives Analysis process, all of the alternatives were found to have similar footprints, and consequently similar impacts. However, the alternatives vary in scale - ranging from adding BRT service largely within existing right of way to the inclusion of new underground heavy rail service or surface running light rail service. A consideration for each alternative is also the likely construction effects. Each alternative would have some degree of construction effects that contribute to the complexity of the project and vary by alternative. **Table 4-2** highlights the factors associated with each alternative that will likely influence the class of action.

Table 4-2: Factors that Influence Class of Action

	Alt 1- BRT Curb	Alt 2- BRT Median	Alt 3- LRT	Alt 4- Hybrid
Context and intensity of the impacts to key resources	May have the greatest limitations to existing access points to businesses entering/exiting Route 1	Higher amount of right of way impacts	Greatest amount of right of way impact	For BRT project, higher amount of right of way impacts
Scale (size and capital cost)	Least estimated project cost ($832M)	Lower estimated project cost ($1.01B)	Higher estimated project cost ($1.56B)	Greatest estimated project cost ($2.46B)
Potential areas for and magnitude of public discussion/controversy	Generally lower controversy and concern; potential right-of-way impacts most likely issue	Generally lower controversy and concern; potential right-of-way impacts most likely issue	Raises greater controversy and concern; high overall project cost and potential right-of-way impacts most likely issue	Potential for greater controversy and concern; high overall project cost, tunneling and vibration most likely issue
Likely Class of Action	Environmental Assessment	Environmental Assessment	Environmental Impact Statement	Environmental Impact Statement

Alternatives 1 and 2 propose BRT service, either operating along the curb or within the median area within Fairfax County and within mixed traffic in Prince William County. The proposed footprints would not vary greatly and the scale and magnitude of the implementation of either of these alternatives may

not be considered significant, and therefore an Environmental Assessment would likely be required for either Alternative 1 or 2.

Alternative 3 would include the LRT option operating in the median area to southern Fairfax County, where it would operate in a parallel dedicated transitway across the Occoquan River and in Prince William County. This alternative would likely require a larger amount of new right of way, property acquisitions, and relocations beyond that anticipated for the other proposed alternatives. Additionally, the scale of the project is typically considered more substantial and often more significant, therefore an EIS would likely be required if this alternative were to be carried forward.

Alternative 4 would include a Metrorail running underground in the northern part of the corridor with BRT operating in the median and in mixed traffic in the south. The addition of heavy rail systems underground may give the appearance of minimum physical impacts and right of way acquisitions, but the scale of the project is often considered large enough to warrant a full analysis of alternative approaches for underground running transit. Should this alternative be carried forward, it is anticipated that an Environmental Assessment would be required for the BRT portion/phases and that an EIS would be required for the Metrorail portion/phase.

4.2 Next Steps

As funding is underway and uncommitted at this time for design and construction of the proposed transit alternatives at this time, it is the current goal of DRPT, VDOT, Fairfax County, and Prince William County to identify a potential footprint for potential future alternatives, thereby preserving the corridor for future implementation of transit improvements. Identification of this potential footprint would not preclude the appropriate analysis of all reasonable alternatives in the NEPA process. With the redevelopment that is currently ongoing throughout the project corridor, it is anticipated that the future land uses will continue to change compared with what is present today.

Since the potential for significant impacts under future conditions cannot be determined with certainty, an EA could be suggested as the first step for the NEPA process for any of the alternatives currently under consideration. Once additional agency coordination and scoping activities are initiated, it may become clear to the lead federal agency/agencies that significant impacts are anticipated. The NEPA process could then easily transition from an EA to an EIS if needed to ensure the proper level of analysis and documentation is completed for the project.

As part of subsequent discussions with the lead federal agency/agencies, a phased approach to NEPA could be considered for the project corridor (see Section 5.0, below).

After a recommended alternative is identified, the project team will refine information on the proposed project including a project description, a summary of prior planning work on the project, the project's general purpose and need, a map of the alignment and proposed station locations, its potential effects on the environment and human health, and other project features.

5.0 Addendum: Phasing and Implementation Approach

5.1 Draft Multimodal Recommendation and Phasing Implementation Plan

Since the Environmental Scan was first developed, the project team has recommended a preferred alternative and phasing implementation plan. This plan was presented and discussed with the Technical Advisory Committee, the Executive Steering Committee, the Community Involvement Committee, and at the Public Meeting in fall 2014. The recommendation and phasing plan is as follows:

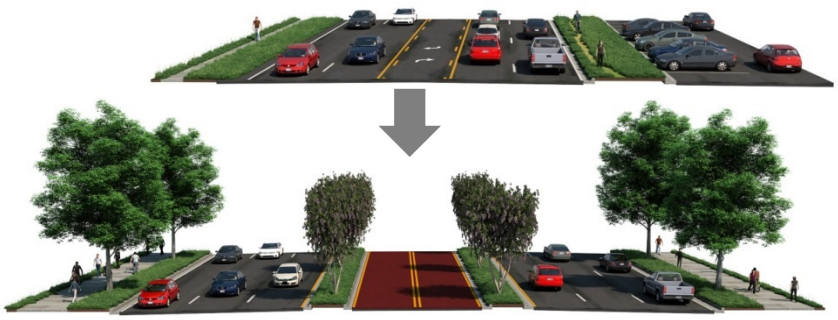
Recommendation:

- **Transit:**
  - Median running **Bus Rapid Transit (BRT)** in the **near-term** would provide a cost effective transportation solution to support economic development plans.

  - **Metrorail extension** to Hybla Valley in the **long-term** has potential to provide a higher level of local and regional mobility and support long-term corridor development, contingent upon increased future land use density.

- **Bicycle/Pedestrian:** Construct a continuous pathway for pedestrians and bicyclists along the 15-mile corridor; the configuration will vary depending upon urban design, right-of-way availability, and other local considerations.

- **Roadway Widening**: Widen roadway from four lanes to six lanes to create a consistent, six-lane cross section along the corridor. This involves widening two segments along Route 1: (i) Napper Road to Mount Vernon Memorial Highway; and (ii) Lorton Road to Annapolis Way.



Bus Rapid Transit would be implemented in three phases, and the Metrorail extension would be completed in the fourth and final phase. **Figure 5-1** shows the construction phasing implementation plan and **Figure 5-2** provides a preliminary implementation timeline for each phase. The *Evaluation of Alternatives Report (Fall 2014)* provides more detailed information on the costs and key considerations that informed the phasing plan.

Figure 5-1: Phasing Plan

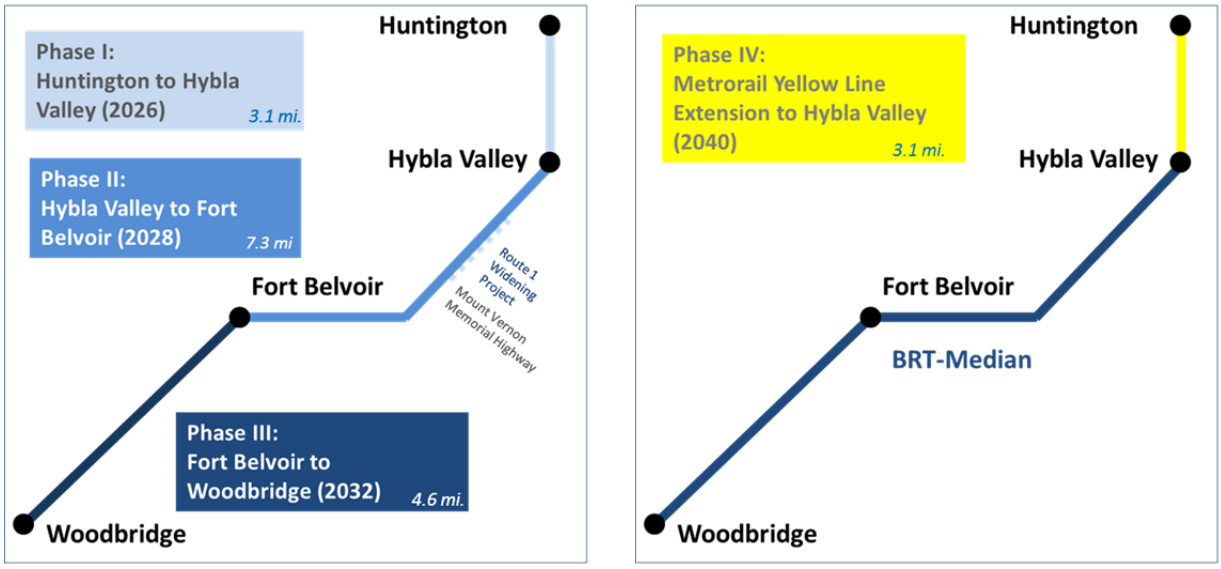
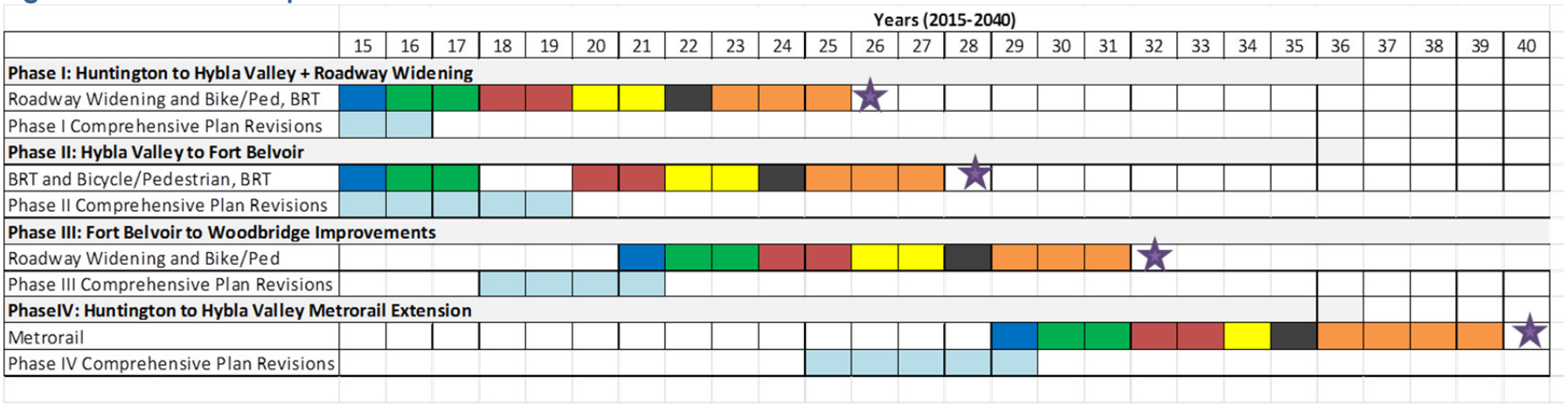


Figure 5-2: Potential Implementation Timelines



Note: Timelines assume a funding stream to support projects implementation.
*Contingent upon increased future land use density.

Legend: General Project Development Sequence

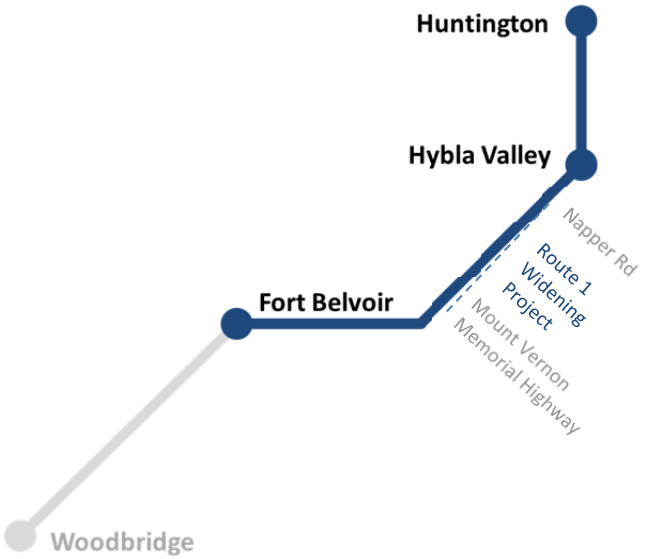
Comprehensive Plan	Planning	Scoping/ NEPA PE	Final Design	Right of Way	Utilities Relocation	Construction	Operation

5.2 NEPA Considerations and Likely Class of Action Determination

Based on the environmental scan findings and precedent projects, the project team recommends conducting environmental documentation for Phases I and II, concurrently. Although the construction of Phase I and II of the BRT project may be completed in two phases (as shown in Figure 5-1), the project team recommends completing environmental documentation for the 10-mile corridor segment between Huntington and Fort Belvoir. Preliminary analysis suggests that this BRT segment may be competitive for federal funding under the FTA Capital Investment Program (Section 5309) New Starts/Small Starts program.

The NEPA Class of Action for the multimodal improvements from Huntington to Fort Belvoir would likely be an Environmental Assessment given the findings of the Environmental Scan and preliminary conversations with agency partners. Given the multimodal nature of the improvements and range of assumed funding sources, it is likely that both FHWA and FTA would have oversight roles during the NEPA process.

Figure 5-3: Phase I of NEPA Documentation

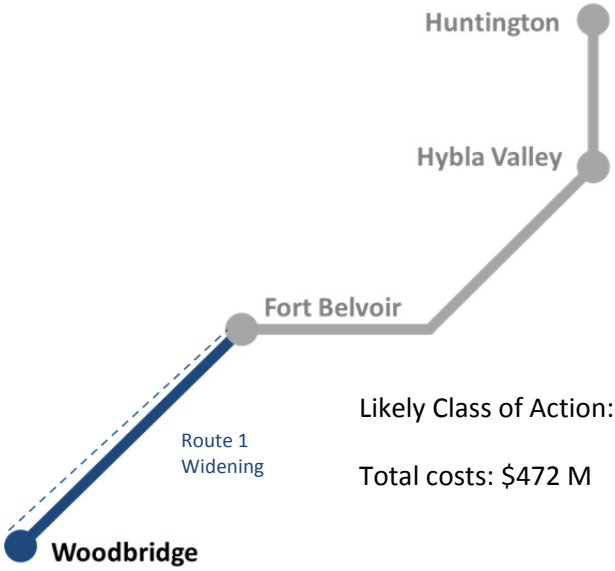


Likely Class of Action: Environmental Assessment

Total costs: $530M

Implementation of multi-modal improvements between Fort Belvoir and Woodbridge (see **Figure 5-4**) would likely be an Environmental Assessment as well. Preliminary analysis suggests that this segment is less competitive for federal funding under the FTA Capital Investment Program (Section 5309) New Starts/Small Starts program.

Figure 5-4: Phase II of NEPA Documentation

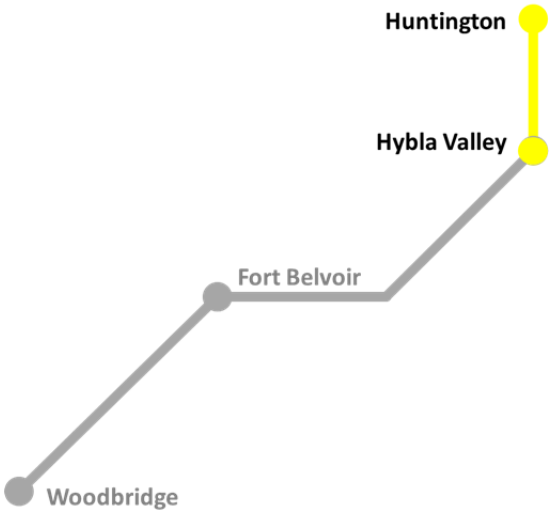


Likely Class of Action: Environmental Assessment

Total costs: $472 M

A Metrorail extension to Hybla Valley in 2040 would likely require an Environmental Impact Statement, given the scale of the project and likely impacts. Figure 5-5 shows the proposed Metrorail extension.

Figure 5-5: Phase III of NEPA Documentation



Likely Class of Action: Environmental Impact Statement

Total costs: $1.46 B