

Richmond Highway Bus Rapid Transit Project

DOCUMENTED CATEGORICAL EXCLUSION

for

Fairfax County Department of Transportation



**Federal Transit
Administration**

JANUARY 2022

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LIST OF ABBREVIATIONS AND ACRONYMS

ACS	American Community Survey
APE	Area of Potential Effects
BMP	Best Management Practice
BRT	Bus Rapid Transit
CAG	Community Advisory Group
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLRP	Constrained Long-Range Transportation Plan
CNE	Common Noise Environments
CO	Carbon Monoxide
CWA	Clean Water Act
dB(A)	A-weighted, equivalent sound level in decibels
DHR	Virginia Department of Historic Resources
DPZ	Department of Planning and Zoning
DRPT	Department of Rail and Public Transportation
EJ	Environmental Justice
EO	Executive Order
EV	Electric Vehicle
FAQ	Frequently Asked Questions
FCDOT	Fairfax County Department of Transportation
FCPS	Fairfax County Public Schools
FEMA	Federal Emergency Management Agency
FFRMS	Federal Flood Risk Management Standard
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System

HHS	Health and Human Services
HUD	Housing and Urban Development
ICE	Indirect and Cumulative Effects
LEP	Limited English Proficiency
LOD	Limits of Disturbance
L RTP	Long-Range Transportation Plan
MSA	Metropolitan Statistical Area
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NC RTPB	National Capital Region Transportation Planning Board
NCS	Neighborhood and Community Services
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
O ₃	Ozone
PCB	Polychlorinated Biphenyl
PECs	Potential Environmental Conditions
REX	Richmond Highway Express
ROW	Right-of-Way
RPA	Resource Protection Area
T&E	Threatened and Endangered
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TOYR	Time of Year Restriction
TSP	Transit Signal Priority
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation

USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VAC	Virginia Administrative Code
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHCD	Virginia Department of Housing and Community Development
VDOT	Virginia Department of Transportation
VDRPT	Virginia Department of Rail and Public Transportation
VDWR	Virginia Department of Wildlife Resources
WIP	Watershed Improvement Plan
WMATA	Washington Metropolitan Area Transit Authority
WOUS	Waters of the United States

1 INTRODUCTION

The Fairfax County Department of Transportation (FCDOT), in coordination with the Federal Transit Administration (FTA) as the lead federal agency, has prepared a documented Categorical Exclusion (CE) in accordance with FTA's regulations on implementing the National Environmental Policy Act (NEPA) (23 CFR §771.118). This CE evaluates construction of a bus rapid transit (BRT) system along VA 241 / North Kings Highway and US 1 / Richmond Highway from the Washington Metropolitan Area Transit Authority (WMATA) Metrorail station at Huntington in the north to US Army Garrison Fort Belvoir in the south. The project would include the construction of new BRT-dedicated median lanes, nine BRT stations, roadway widening, streetscape improvements, and construction of sidewalks and bicycle facilities.

1.1 GENERAL PROJECT OVERVIEW

The proposed Richmond Highway BRT Project (project) would extend 7.4 miles south from the Huntington Metrorail Station to US Army Garrison Fort Belvoir. The first 0.7 miles of the project would run along VA 241 / North Kings Highway from the Huntington Metrorail Station to Richmond Highway. Once on Richmond Highway, the project would extend 6.7 miles south to Belvoir Road (**Figure 1-1**). The project would be constructed in two sections, with Section 1 preceding the construction and opening of Section 2.

Richmond Highway in Fairfax County is part of US 1 and is a major north-south route. Locally, Richmond Highway acts as a north-south connector in the Washington, DC suburbs of Fairfax County. The surrounding land uses are a mixture of well-established auto-centric residential and commercial developments.

1.2 PROJECT HISTORY AND COMPREHENSIVE PLAN AMENDMENT

The Virginia Department of Rail and Public Transportation (DRPT) conducted a multimodal alternatives analysis for an approximately 16-mile segment of US 1 from the Huntington Metrorail Station to Woodbridge in Prince William County in 2013 and 2014 (DRPT, 2015). This study followed an earlier 2011 study, directed by the Virginia General Assembly, which requested that DRPT review and evaluate all previous studies and determine the feasibility of transit improvements along a 27-mile segment of the US 1 corridor. The DRPT Multimodal Alternatives Analysis was undertaken in coordination with Fairfax County, Prince William County, the Virginia Department of Transportation (VDOT), and the Office of Intermodal Planning and Investment. The purpose of the Multimodal Alternatives Analysis was to provide improved transit, bicycle and pedestrian, and vehicular conditions and facilities along the US1 corridor to support long-term growth and economic development. The DRPT Multimodal Alternatives Analysis developed and evaluated a range of multimodal solutions to address the transportation needs of the corridor, ultimately recommending that a BRT system be constructed in the short term, with a three-mile extension of the Metrorail Yellow Line to Hybla Valley constructed in the long term (the proposed BRT does not preclude a future Metro extension, which would be reviewed separately under NEPA if it advances). The fifteen members of the project's Executive Steering Committee, as well as the Fairfax County Board of Supervisors, adopted a resolution in support of the study's final recommendations. The final report was completed January 2015.

Figure 1-1: Richmond Highway BRT Project



The approach to implementing the recommendations from the DRPT study (including land use and roadway changes) is called Embark Richmond Highway. The Fairfax Board of County Supervisors adopted a Comprehensive Plan Amendment on March 20, 2018 that recommended implementing a BRT system and widening and improving Richmond Highway. The BRT system and the highway improvements are separate projects that have independent utility from one another pursuant to 23 CFR 771.111(f)(2).

The VDOT Richmond Highway Corridor Improvements project consists of improvements to three miles of Richmond Highway between Sherwood Hall Lane and Jeff Todd Way (see **Figure 1-1**). The project includes:

- Widening Richmond Highway from four to six lanes
- Adding separate two-way cycle tracks and sidewalks on both sides of the road
- Reserving median width to accommodate Fairfax County's future dedicated bus-only lanes
- Intersection improvements
- Replacing the bridges over several creeks

A Finding of No Significant Impact was issued by FHWA in October 2020 and the project is currently in the design phase. Construction is anticipated to begin as early as 2025. More detailed information on the VDOT Richmond Highway Corridor Improvements project, including links to the design plans and environmental documents, can be found on the VDOT project website.

2 PURPOSE AND NEED

The purpose and need of the project builds upon the planning efforts of the 2018 Multimodal Alternatives Analysis, which arrived at the recommendation for a BRT system. The purpose of the project is to provide higher quality bus transit service along Richmond Highway from the Huntington Metrorail Station to US Army Garrison Fort Belvoir. The project would provide improved transit reliability, speed, choice, user experience, and community connectivity.

The transportation needs for the project include:

- Improved transit service. Transit ridership on Richmond Highway is high compared to other corridors within Fairfax County, but existing transit service is slow due to traffic congestion and closely-spaced stops.
- Increased roadway capacity for transit. Transit on Richmond Highway currently operates in mixed traffic. Due to the lack of dedicated right-of-way (ROW), bus service is unreliable, particularly during peak travel periods.
- Better connections to transit for pedestrians and bicycle riders. Richmond Highway is the principal transportation facility in the corridor and offers the only direct transit connections for regional trips, but existing bicycle and pedestrian facilities along the roadway are not continuous and are largely unbuffered from heavy highway traffic. Improved bicycle and pedestrian facilities would provide safer connections to transit facilities for local users.

The needs identified for this project were originally investigated in the DRPT Multimodal Alternatives Analysis. Specifically, the DRPT study included attractive and competitive transit service to support a transit dependent population and safe and accessible pedestrian and bicycle access as needs. Since the time of that study, the needs have been further refined and are reflected in the elements above.

2.1 IMPROVED TRANSIT SERVICE

2.1.1 Travel Demand

As noted above, the existing transit service on Richmond Highway is slow due to traffic congestion and closely-spaced stops. These operating conditions make scheduled trip times unreliable, reducing transit utility for all riders and making transit a less attractive option for choice riders (people who choose to use public transportation despite having access to another mode of travel). Adding high-quality transit would provide additional choices and an improved level of service for the existing and future traveling public in the corridor.

Fairfax County has a large transit-dependent population. According to the 2015-2019 American Community Survey (ACS) 5-year estimates, there are over 2,600 households that do not own a car in Census block groups within a half-mile of the study corridor. Over 8,600 people in the work force that live in the Census block groups within a half-mile of the study corridor use public transportation.

2.1.2 Improved Transit Travel Time

The average speeds for bus transit in the corridor are considerably lower than the average speeds for general-purpose travel, resulting in substantially longer travel times for buses. **Table 2-1** shows the difference between drive travel times and transit travel times to and from several stations along the corridor. In the examples in the table below, transit travel times range from five to 15 minutes longer than drive travel times.

Table 2-1: Drive Versus Transit Travel Times

Origin	Destination	Distance	Drive Travel Time	Transit Travel Time
Fort Belvoir Community Hospital	Huntington Metrorail Station	8.8 miles	20 minutes	35 minutes
Fort Belvoir Community Hospital	Mt. Vernon Shopping Center (Hybla Valley)	5.7 miles	15 minutes	25 minutes
Mt. Vernon Shopping Center (Hybla Valley)	Huntington Metrorail Station	5.2 miles	15 minutes	20 minutes

Source: *Route 1 Multimodal Alternatives Analysis Appendix A*, DRPT, June 2014

2.2 Increased Roadway Capacity for Transit

Bus transit on Richmond Highway currently operates in mixed-traffic lanes. Traffic congestion makes transit an unattractive option and makes scheduled trip times unreliable. Traffic conditions in the corridor are anticipated to deteriorate in the future due to projected increases in demand as population and employment increase in the corridor.

2.3 Better Connections to Transit for Pedestrians and Bicycle Riders

Richmond Highway is the principal transportation facility in the corridor. Existing bicycle and pedestrian facilities along the roadway are not continuous and are largely unbuffered from heavy highway traffic. Improved bicycle and pedestrian facilities are needed to provide safer connections to transit facilities for local users, particularly for the large, transit-dependent population who live and work in the study area and who rely on bicycling, walking, and transit to meet the needs of daily life.

The corridor has a high rate of pedestrian and bicycle crashes and fatalities. Large, commercial-use parcels are common in the corridor, resulting in very widely-spaced pedestrian crosswalks on Richmond Highway. Additionally, sidewalks along the corridor are often deficient. The sidewalk facilities that exist are largely unbuffered from the heavy traffic on the corridor. Accommodations to pedestrian destinations such as bus stops are often missing or substandard per the Americans with Disabilities Act.

3 THE PROPOSED ACTION

3.1 OVERVIEW

The project includes the construction of new BRT-dedicated median lanes, nine BRT stations, streetscape and intersection improvements, and improvements to and construction of sidewalks and bicycle facilities.

The proposed BRT system would operate in dedicated lanes for 6.7 miles along Richmond Highway and in mixed traffic for the 0.7-mile segment on North Kings Highway.

The width of the BRT-dedicated facility would range from 32 feet (for two lanes) to 58 feet (for two lanes and station platforms). The stations for the BRT service would be located approximately one mile apart. Transit signal priority is being considered at key intersections.

Because the width of the dedicated facility varies, and because some portions of the project corridor already contain a median of sufficient width for median-running BRT and additional improvements and some do not, the need for roadway widening along the corridor to accommodate the proposed BRT and other improvements varies.

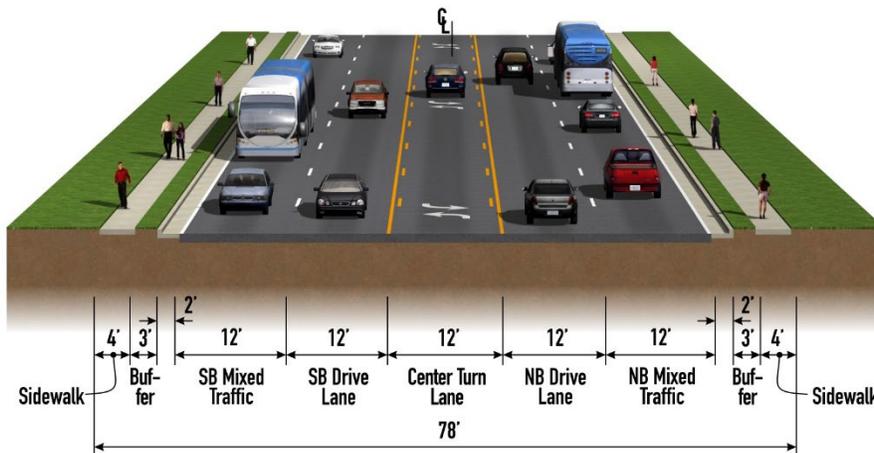
3.2 TYPICAL SECTIONS

The following describes the four different cross sections (typical sections) that would be used in the project corridor. These vary based on the width of the existing median and the adjacent land uses. The proposed BRT stations are referenced by the closest cross street(s) or landmark and the proposed names of the stations are included in parentheses.

3.2.1 North Kings Highway - Huntington Metro Station to Richmond Highway

Beginning at the Huntington Metrorail Station, the BRT would operate in mixed-traffic along North Kings Highway to Shields Avenue and Richmond Highway (**Figure 3-1**). This segment would be approximately 0.7 miles long. The roadway, bicycle, and pedestrian facilities would not be changed from what exists today. There would be one BRT station in this section, and it would be located at Huntington Metrorail Station (Huntington Metro BRT Station). Improvements in this section would be limited to signage, pavement markings, and reconfiguration of the existing bus stops at the Huntington Metrorail Station.

Figure 3-1: Typical Section – North Kings Highway from Huntington Metrorail to Richmond Highway



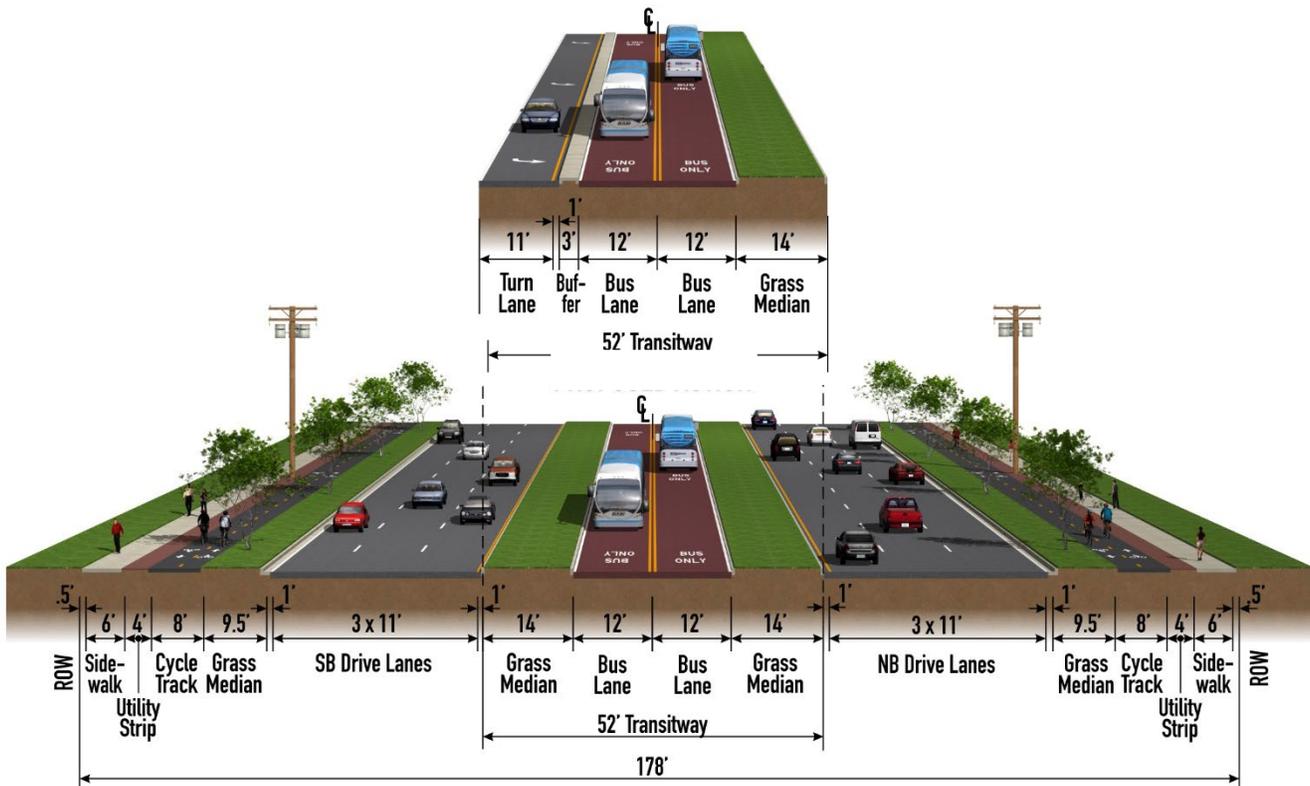
3.2.2 Richmond Highway - Shields Avenue to Sherwood Hall Lane

From the intersection of Richmond Highway and Shields Avenue, the BRT would continue south on Richmond Highway to Sherwood Hall Lane. Richmond Highway is currently a six-lane roadway. As part of the project, Richmond Highway would be widened and reconstructed to accommodate dedicated transit lanes for the BRT within the road median. Wider sidewalks, a separated cycle track, and landscaped buffers would also be constructed along both sides of the roadway for the length of this segment to Sherwood Hall Lane (**Figure 3-2**).

The median in which the transitway would be constructed would be widened to 52 feet in most locations. The two bus lanes would be 12 feet wide, with two 14-foot grass medians on the outside of the median-running BRT lanes. These 14-foot grass medians would provide the space needed for left-turn lanes and stations. At all signalized intersections a left-turn lane would be provided in place of the grass median, with a minimum three-foot buffer between the turn lane and the bus lane. At intersections with BRT stations, the median would be widened to a minimum of 58 feet and both 9.5-foot grass medians between the general-purpose lanes and the cycle tracks would be reduced to allow for a buffer of at least five feet between the turn lane and the bus lane. There would be five BRT stations in this section:

- Near the intersection of Richmond Highway and North Kings Highway (Penn Daw Station)
- Beacon Hill Road (Beacon Hill Road Station)
- Lockheed Boulevard and Dart Dive (Lockheed Boulevard Station)
- Boswell Avenue and Fordson Road (Hybla Valley Station)
- Sherwood Hall Lane (Gum Springs Station).

Figure 3-2: Typical Section – Richmond Highway from Shields Avenue to Sherwood Hall Lane

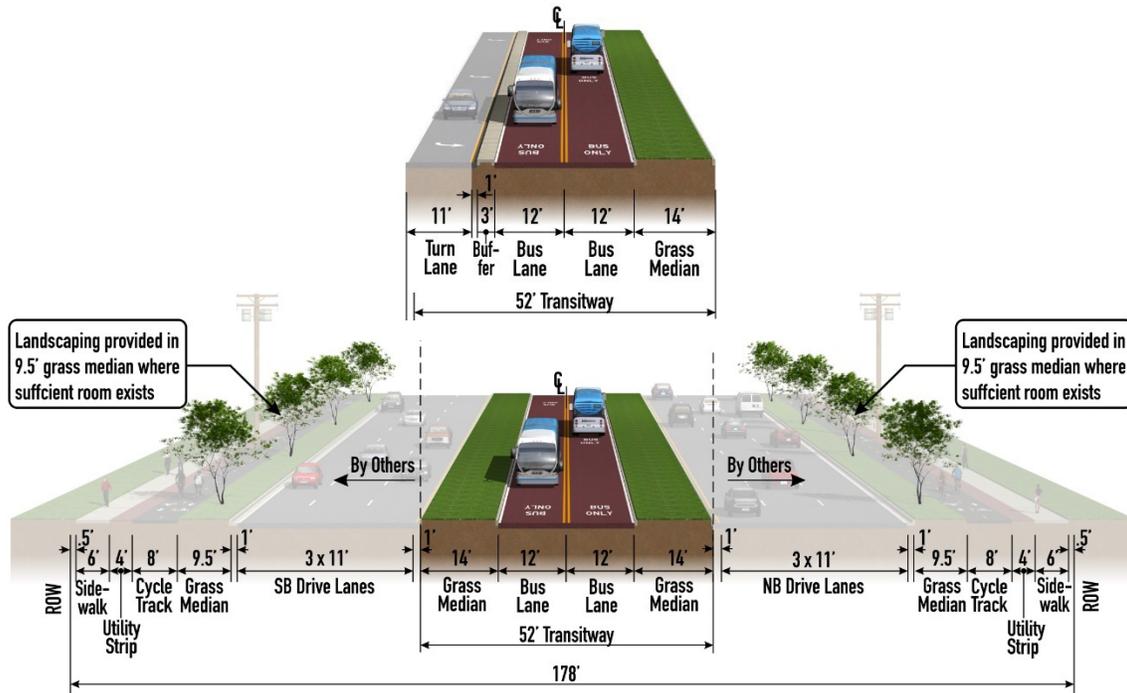


3.2.3 Richmond Highway - Sherwood Hall Lane to Jeff Todd Way

From Sherwood Hall Lane south to the intersection of Jeff Todd Way/Mount Vernon Memorial Highway, Richmond Highway will be reconstructed as part of the VDOT Richmond Highway Corridor Improvements Project (VDOT project) described in **Section 1.2**. The VDOT project will construct the new median and reserve it for use by the project.

The project would include the construction of BRT-dedicated lanes in the reserved median built by the VDOT project. The reserved median is 52 feet wide in most locations. The two bus lanes would each be 12 feet wide, and two 14-foot grass medians would be built on the outside of the bus lanes, as shown in **Figure 3-3**. At signalized intersections where a left-turn lane is needed for the general traffic lanes, VDOT will provide a turning lane in place of the grass median, with a 3-foot buffer, at minimum, between the turn lane and the bus lane. At intersections with BRT stations, the median would be widened to 58 feet and the 9.5-foot grass medians between the general traffic lanes and the cycle tracks would be reduced to allow for a five-foot buffer between the turn lane and the bus lane. There would be two BRT stations in this portion of the corridor, and they would be located at Mohawk Lane (South County Center Station) and Cooper Road (Woodlawn Station). Where sufficient room exists, the project would provide landscaping in the grass buffer between the general travel lanes and the cycle track in station areas.

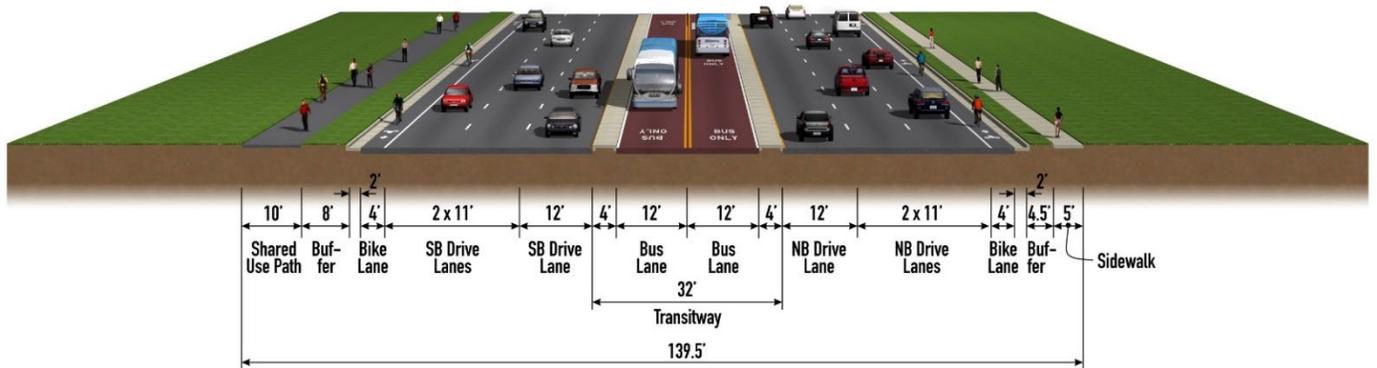
Figure 3-3: Typical Section – Richmond Highway from Sherwood Hall Lane to Jeff Todd Way



3.2.4 Richmond Highway - Jeff Todd Way to Fort Belvoir

From Jeff Todd Way/Mount Vernon Memorial Highway to the project’s terminus at Belvoir Road, new BRT-dedicated lanes would be constructed within the existing Richmond Highway median. This median was constructed as part of the Federal Highway Administration Eastern Federal Lands Highway Division US Route 1 Fort Belvoir road widening improvements and was planned to accommodate BRT. The median transitway would be 32 feet wide, with two 12-foot travel lanes, and two four-foot buffers between the dedicated bus lanes and the general traffic lanes (Figure 3-4).

Figure 3-4: Typical Section – Richmond Highway from Jeff Todd Way to Fort Belvoir



3.3 STATIONS

The project includes the following nine stations:

- Huntington Metro
- Lockheed Boulevard
- South County Center
- Penn Daw
- Hybla Valley
- Woodlawn
- Beacon Hill Road
- Gum Springs
- Fort Belvoir

The station locations (**Figure 1-1**) would provide pedestrian connections to Metrorail (at Huntington), Fairfax County Connector, and the WMATA Richmond Highway Express (REX) bus routes.

The station platforms would be located on the outside (right side) of the bus lanes. The platform dimensions could vary depending on ridership and site conditions but would be between ten and 14 feet wide and 140 feet long. The platforms would be long enough to accommodate two buses. The platforms would allow for near-level boarding and canopies and windscreens would be provided to protect transit riders from inclement weather. The stations would include seating for patrons and elements such as real-time passenger service information, lighting, route signage, tactile warning strips, and trash receptacles. **Figure 3-5** shows a rendering of a station. This rendering is conceptual and is subject to change as the design progresses.

Figure 3-5: Conceptual Rendering of Richmond Highway BRT Station



Electric vehicle (EV) charging infrastructure is not anticipated to be necessary at stations. As a result, EV charging infrastructure has not been incorporated into station design at this time.

3.4 OPERATIONS AND MAINTENANCE FACILITY

The project would use WMATA's existing Cinder Bed Road Operations and Maintenance Facility, which opened December 30, 2018. The facility is located approximately four miles from the south end of the BRT corridor at 7901 Cinder Bed Road in Lorton. It has the capacity to service and store the 21 buses proposed for the project. The facility is owned by WMATA and its use would require that FCDOT enter into an agreement with WMATA. It is assumed that the facility would accommodate EV technology within its existing footprint if necessary to accommodate an EV fleet.

3.5 OPERATIONS

The project would operate seven days a week. Headways (the time between buses) would vary from six to 20 minutes depending on the time of day and day of the week. **Table 3-1** shows the proposed operating plan from the *Route 1 Multimodal Alternatives Analysis* for that study’s forecast year of 2035. The current study has a forecast year of 2040. As the project progresses this proposed service plan will be assessed for updating for 2040, and the proposed service plan may be modified.

Table 3-1: BRT Service Plan*

Day	Period	Headway
Weekday	AM Peak - 5:00 am to 9:30 am	6 minutes
	Midday - 9:30 am to 3:30 pm	12 minutes
	PM Peak - 3:30 pm to 7:00 pm	6 minutes
	Evening - 7:00 pm to 12:00 am (3:00 am Friday)	12 minutes
Saturday	7:00 am to 3:00 am	20 minutes
Sunday	7:00 am to 12:00 am	20 minutes

*Proposed plan as of current design and subject to change

3.6 VEHICLES

The project would use 60-foot articulated buses. Twenty-one buses would be acquired in order to operate peak period service with six-minute headways and to maintain a spare ratio of 20 percent. It is anticipated that the BRT would require 12 revenue vehicles and three spares for base service between Huntington and Fort Belvoir, with five additional vehicles and one spare to account for additional peak service between Huntington and Hybla Valley.

In July 2021, the Fairfax County Board of Supervisors adopted an updated Operational Energy Strategy and set a new greenhouse gas emissions reduction goal through the Carbon Neutral Counties Declaration (Fairfax County, 2021). The County pledged to meet certain targets as part of its declaration, including to end the purchase of diesel buses after FY2024 unless approved by the Board of Supervisors. As a result, the BRT service may operate a mixed diesel, hybrid, and electric fleet.

3.7 BICYCLE AND PEDESTRIAN FACILITIES

The ultimate configuration of Richmond Highway would include sidewalks for pedestrians and either a separated two-way cycle track or on-street bicycle lanes. In some segments of the project corridor these facilities have been constructed already or will be constructed as part of the VDOT Richmond Highway Corridor Improvements Project.

4 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

The following section discusses existing conditions within the corridor as well as environmental consequences of the project. Existing conditions were assessed for an 8.6-mile study corridor that extended from the WMATA Huntington Metrorail Station south to the intersection of Richmond Highway and Fairfax County Parkway. Environmental consequences were assessed for the project’s Limits of Disturbance (LOD), which extend 7.4 miles south from the Huntington Metrorail Station and end at the intersection of Richmond Highway and Belvoir Road. The LOD accounts for both permanent impacts associated with operation of the project and temporary impacts associated with construction-related

activities. Direct impacts include only those expected from the project and not impacts resulting from the VDOT Richmond Highway Corridor Improvements Project, which were evaluated as part of a separate project that was determined to have independent utility pursuant to 23 CFR 771.111(f)(2). A Finding of No Significant Impact was issued for the VDOT Richmond Highway Corridor Improvements Environmental Assessment on October 19, 2020.

Table 4-1 provides an overview of environmental consequences for all resources impacted. Resources that will not be affected and are not discussed in this document include parks and recreational areas, aquifers and water supply, anadromous fish use areas, Resource Protection Areas (RPAs), topography and soils, and submerged aquatic vegetation.

4.1 RIGHT-OF-WAY, LAND USE, AND ZONING

4.1.1 Right-of-Way

Existing Conditions

The existing ROW within the study area includes North Kings Highway from the WMATA Huntington Metrorail Station to Richmond Highway and Richmond Highway from North Kings Highway to Fort Belvoir. North Kings Highway in the study area is generally a 75-foot wide four-lane roadway with turn lanes. Richmond Highway in the study area is generally a 90- to 150-foot wide four-to six lane median-divided roadway with turn lanes and service roads.

Environmental Consequences

Approximately 63 acres of ROW would be acquired for the project. Temporary construction easements are used to undertake activities necessary to construct the project, including transporting, stockpiling, and storing construction materials, equipment, and vehicles. Temporary construction easements also provide egress for vehicles and pedestrians. Temporary construction easements only exist during construction and the land would be returned to the previous land use upon completion of the project. Additional information on ROW can be found in the *Richmond Highway Bus Rapid Transit Project Socioeconomics, Land Use, and Right-of-Way Technical Report* (FCDOT, 2021d).

4.1.2 Land Use

Existing Conditions

Land use surrounding Richmond Highway is typical of residential and commercial development in Northern Virginia and the Washington, DC metropolitan region. Transportation projects have the potential to impact land use and zoning through the conversion of land to transportation purposes by ROW acquisition.

A half-mile area surrounding the project study corridor, which extends from the Huntington Metrorail Station south to Fairfax County Parkway, was analyzed for existing land uses. Current land use in over half (52 percent) of the area within the half-mile buffer is designated as residential land use (**Table 4-2**). Twenty-one percent of the study area land use is designated as institutional of which a majority is US Army Base Fort Belvoir.

Table 4-1: Summary of Environmental Consequences

ENVIRONMENTAL RESOURCE	POTENTIAL ENVIRONMENTAL CONSEQUENCES OF THE PROJECT
Right-of-Way (ROW) Section 4.1.1	Approximately 63 acres of new ROW would be required for the project.
Land Use and Zoning Section 4.1.2	Approximately 63 non-transportation land use acres may be converted to transportation use. This would include commercial land (33 acres), residential land (10 acres), industrial land (1 acre), institutional land (11 acres), open land (8 acres), and utilities (<0.2 acre).
Social Impacts, Community Facilities, and Community Cohesion Section 4.2	The project anticipates the permanent acquisition of 18 residences; the ultimate number of displacements could decrease as the project continues through design. One community facility, Gateway International Christian Church, would be displaced, and portions of ROW would be acquired from parcels belonging to six additional community facilities (two schools, three places of worship, and one church/school).
Environmental Justice (EJ) Section 4.3	No disproportionately high and adverse effects would occur to minority and low-income populations.
Economics Section 4.5	Forty-two commercial properties would be displaced. The project provides economic benefits, such as better job accessibility and reduced travel times, for employees, residents, and customers and clients of the businesses in the corridor.
Historic Architectural Resources Section 4.6.1	Nine historic properties were identified within the historic architectural APE for the project. The project would have no effect to two historic resources: the Fort Belvoir Military Railroad Historic District and Camp A.A. Humphreys Pump Station and Filter Building. The project would have no adverse effect to seven historic resources: Woodlawn Plantation, Woodlawn Cultural Landscape Historic District, Mount Vernon High School, St. Louis Catholic Church and School, A&A Rentals/Fire Station, Fair Haven Historic District, and the Gum Springs Historic District.
Archaeological Resources Section 4.6.2	There would be no effect to archaeological resources in the corridor. The Phase I archaeological survey did not identify any new archaeological sites and no further work is recommended.
Section 4(f) Section 4.7	The project would have a <i>de minimis</i> Section 4(f) use at Woodlawn Plantation and Woodlawn Cultural Landscape Historic District of approximately 1.1 acres, including approximately 0.6 acres of temporary impacts. The project would result in a temporary impact of approximately 0.2 acres for A&A Rentals and approximately 0.1 acres for Fair Haven Historic District, which would qualify for a temporary occupancy exception under Section 4(f).
Visual Impacts Section 4.8	Overall visual effect of the project is anticipated to be neutral. The project is contextually compatible with its surroundings and viewer sensitivity in the study corridor is low to moderate.

ENVIRONMENTAL RESOURCE	POTENTIAL ENVIRONMENTAL CONSEQUENCES OF THE PROJECT
Air Quality Section 4.9	The project would not cause or contribute to a violation of the Carbon Monoxide (CO) National Ambient Air Quality Standards (NAAQS) within the study area. The project would meet all applicable air quality requirements of the Clean Air Act and federal and state transportation conformity regulations.
Hazardous Materials Section 4.10	The Hazardous Materials findings for this project are consistent with routine findings along a transportation corridor. 53 properties within a half-mile of the study corridor centerline have been identified as a high or moderate priority for additional investigation work.
Noise and Vibration Section 4.11	Noise impacts are predicted at 19 of the 69 Common Noise Environments (CNEs) within the study area, which include 168 receptors that represent 165 residential homes and three recreational sites. A single potential noise barrier system for the project was determined to be both feasible and reasonable at CNE 21. No vibration impacts are anticipated.
Wetlands Section 4.13.1	Approximately 0.02 acre of wetland would be impacted by the project.
Streams and Water Quality Section 4.13.1	Approximately 216 linear feet of stream would be impacted, roughly 14 of which would be impaired waters.
Floodplains Section 4.13.2	Approximately 0.2 acre of floodplains would be impacted.
Wildlife and Wildlife Habitat Section 4.13.5	Approximately 1.2 acre of forested land would be impacted.
Threatened, Endangered, and Special Status Species Section 4.13.6	There is unlikely to be sufficient suitable habitat to support threatened and endangered species. Therefore, there is unlikely to be an impact to threatened or endangered species.
Indirect and Cumulative Effects Section 4.14	Indirect impacts could occur from induced growth within the vicinity of the BRT stations, which is consistent with planned growth for the corridor. The incremental cumulative effect of the project would be relatively minor and largely beneficial for communities and residents.

Table 4-2: Land Use in the Study Corridor – Existing Acreage and Impact of the Project

Land Use	Number of Acres Current	Percent of Study Corridor	Acres Converted to Transportation Use by the Project
Commercial	445	9.0%	33
Residential	2,570	52.0%	10
Industrial	17	<0.1%	1
Institutional	1,049	21.2%	11
Open Land	517	10.5%	8
Recreation	272	5.5%	0
Utilities	62	1.3%	<1
Public	7	<0.1%	0
Total	4,938	100%	63

Environmental Consequences

A total of 63 land use acres may be converted to transportation use, which is consistent with the 2017 *Fairfax County Comprehensive Plan*, which contains recommendations for improving the Richmond Highway corridor including improvements to transportation and public facilities. The Plan recommends evaluating the median of Richmond Highway for development of a rail or bus rapid transit system. Furthermore, the Comprehensive Plan Amendment adopted on March 20, 2018 recommended implementing a BRT system. As such, the project would not change the overall existing land use patterns and would be consistent with local land use planning and zoning. No zoning changes or exceptions are anticipated. Additional detail on land use can be found in the *Richmond Highway Bus Rapid Transit Project Socioeconomics, Land Use, and Right-of-Way Technical Report* (FCDOT, 2021d).

4.1.3 Minimization and Commitments

All ROW acquisitions, including easements, would be performed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) (Uniform Act) and the FTA Awards Management Circular 5010.1E to ensure the fair and equitable treatment of persons displaced as a result of federal and federally-assisted programs. Anticipated land use conversions are consistent with local plans and policies.

4.2 SOCIAL IMPACTS, COMMUNITY FACILITIES, AND COMMUNITY COHESION

4.2.1 Population and Housing

Existing Conditions

The number of people and housing units of Virginia, Fairfax County, and the 55 US Census block groups that comprise the study corridor are provided in **Table 4-3**. The study corridor block groups are those block groups that contain land within the half-mile buffer around the study area corridor. Based on the 2015-2019 American Community Survey (ACS) 5-year estimates, these block groups had a population of 101,973 residents, which accounted for approximately nine percent of Fairfax County’s total population of approximately 1,146,000 persons. According to the Metropolitan Washington Council of Governments Round 9.1 Cooperative Forecasting (2017), by 2045, the population and the number of households in the study corridor are expected to grow by 48 percent and 54 percent, respectively.

Table 4-3: Population and Housing

Geographic Area	Total Population	Number of Housing Units
Virginia	8,454,463	3,514,032
Fairfax County	1,145,862	413,885
Study Block Groups Total	101,973	36,316

Within the study corridor block groups there are 36,316 housing units, accounting for approximately nine percent of Fairfax County’s total housing units. According to the 2015-2019 ACS 5-year estimates, the average household size for the study corridor block groups is three. Housing characteristics data is provided in **Table 4-4**. Of the total 36,316 housing units within the study corridor block groups, 34,281 units (94 percent) are occupied. Approximately 55 percent are owner-occupied, while the remaining 45 percent are renter occupied.

Table 4-4: Housing Characteristics

Geographic Area	Occupied Housing Units	Vacant Housing Units	Owner Occupied Housing Units	Renter Occupied Housing Units	Total Units (Occupied + Vacant)
Virginia	3,151,045	362,987	2,087,711	1,063,334	3,514,032
Fairfax County	396,501	17,384	269,528	126,973	413,885
Study Corridor Block Groups Total	34,281	2,035	18,795	15,486	36,316

Environmental Consequences

The project would involve total acquisition of an anticipated 18 housing units, which accounts for less than one percent of housing in the study area. Based on the average of three persons per household within study Census block groups, approximately 54 persons may be displaced.

The 2017 *Fairfax County Comprehensive Plan* recommends future residential land development through infill, redevelopment, and revitalization in areas targeted for growth. The Plan was amended in 2017 with Embark Richmond Highway (Plan Amendment 2015-IV-MV1), calling for more mixed-use development, especially residential, within a half-mile of nine proposed BRT stations. As such, the proposed project would be consistent with the County’s Comprehensive Plan for growth and housing in the study area. Additional information on population and housing can be found in the *Richmond Highway Bus Rapid Transit Project Socioeconomics, Land Use, and Right-of-Way Technical Report* (FCDOT, 2021d).

4.2.2 Community Facilities

Existing Conditions

The project would be constructed in an urbanized area containing community facilities, parks, and recreation centers. There are 83 community facilities identified within a half-mile of the study corridor.

Environmental Consequences

One place of worship (Gateway International Christian Church) would potentially be displaced. Portions of ROW and/or easements would be acquired from parcels belonging to six additional community facilities

(two schools, three places of worship, and one church/school), with acquisitions consisting of slivers of land along the edge of the parcel (and which would not preclude access to these facilities).

The project would retain connections to community facilities along the study corridor by providing continuous sidewalk and bicycle facilities along with signalized crosswalks; these types of features are currently discontinuous within the corridor. The construction and operation of the dedicated BRT lanes and stations along the existing Richmond Highway alignment would provide enhanced transit service with faster and more reliable travel time than existing bus service in the corridor, with increased multimodal access to the corridor's community facilities. As a result, the project would improve access to adjacent communities and community facilities by improving safety and enhancing pedestrian and bicycle facilities along the corridor.

During construction, temporary impacts to community facilities could include temporary road closures, changes to travel patterns, temporary reductions in parking, and traffic detours during construction. Access to community facilities would be maintained throughout construction. Additional information on community facilities can be found in the *Richmond Highway Bus Rapid Transit Project Socioeconomics, Land Use, and Right-of-Way Technical Report* (FCDOT, 2021d).

4.2.3 Community Cohesion

Community cohesion is a loosely defined concept of community identity typically based on shared ethnicity; coherent design features in a community's layout and aesthetics; and spatial cohesion gained by accessibility to neighbors, community facilities, goods, and services. The impacts of transportation projects on community cohesion "may be beneficial or adverse, and may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group, generating new development, changing property values, or separating residents from community facilities" (FHWA, 1987).

Existing Conditions

Richmond Highway has been in existence for decades with gradual suburban and urban growth on both sides of the highway over time. The corridor adjacent to Richmond Highway is largely commercial with most residential communities further away from the highway. The Richmond Highway corridor is an important center of development and economic activity and contains several large facilities serving the County and region, along with many locally oriented facilities and services. Community facilities found in the study corridor consist primarily of parks and outdoor recreation areas, places of worship, community centers, schools, and emergency services.

Environmental Consequences

Based on planning-level engineering, the project would require permanent acquisition of 42 business parcels and 18 residences. The properties anticipated to be permanently acquired are adjacent to Richmond Highway on the edge of their respective neighborhoods, Greater Belle Haven and Groveton. The project could result in beneficial effects to community cohesion in the study area with the potential to improve connectivity between neighborhoods, community facilities, and services due to improved continuous bicycle and pedestrian facilities. The project, once built, would not isolate communities along Richmond Highway in the study limits in a way that could adversely impact community cohesion.

Temporary construction impacts that could adversely impact community cohesion may include construction noise, dust, temporary lost parking and temporary detours to properties adjacent to the LOD. Additional detail on community cohesion can be found in the *Richmond Highway Bus Rapid Transit Project Socioeconomics, Land Use, and Right-of-Way Technical Report* (FCDOT, 2021d).

4.2.4 Minimization and Commitments

The total number of potential displacements could be reduced in later design phases as a finer level of understanding of property impacts is understood. Given the number of unoccupied housing units in the study area block groups, there appears to be adequate available housing in the study area to accommodate relocated residents.

The proposed project would be consistent with the County's Comprehensive Plan for growth and housing in the study area.

A number of public comments were received at the September 2019 public information meeting regarding project impacts to the St. Louis Catholic Church and School property and specifically to a structure called Walsh Hall. These impacts would have occurred due to grading issues. A follow-up meeting was held at the St. Louis Catholic Church and School in October 2019 to further discuss the potential impacts and listen to the community. FCDOT evaluated the project at the property and determined that it would be cost effective to use a retaining wall at this location, which would eliminate impacts to the Walsh Hall structure. The design reflected in this CE includes a retaining wall at this location.

Potential temporary construction impacts would be minimized through the implementation of mitigation measures such as scheduling construction to avoid loud noise at sensitive times, dust control measures, advance notice of road closures, and clear signing of detour routes.

4.3 ENVIRONMENTAL JUSTICE

4.3.1 Regulatory Context

Executive Order (EO) 12898 (February 11, 1994) *Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations* directs federal agencies to identify and address disproportionately high and adverse human health and environmental impacts of its programs, policies, and activities on EJ populations. The USDOT Order 5610.2[a] sets forth the DOT policies for implementing EJ principles in all DOT programs, policies, and activities (77 FR 27534, May 10, 2012). FTA's EJ Circular 4703.1 provides detailed guidance to applicants for FTA funding on addressing EJ.

Per FTA EJ Circular 4703.1, the guiding EJ principles of USDOT and FTA are to:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects on minority populations and low-income populations;
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The Council on Environmental Quality (CEQ) has issued additional guidance for federal agencies for consideration of EJ in the NEPA process (CEQ, 1997).

The following sections provide definitions of minority and low-income populations.

4.3.2 Minority Populations Definition

A minority person is defined by USDOT Order 5610.2(a) and FTA's EJ Circular as American Indian and Native Alaskan, Asian, Black or African American, Hispanic or Latino (regardless of race), and Native Hawaiian or other Pacific Islander.

A minority population is defined by USDOT Order 5610.2(a) and FTA's EJ Circular as any readily identifiable group or groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed or transient persons who would be affected by a DOT or FTA program, policy or activity. The CEQ further states that a minority population should be identified where either (a) the minority population of the affected area exceeds 50 percent of total population or (b) the minority population percentage in the affected area is "meaningfully greater" than the minority population percentage in the general population or other appropriate unit of geographical analysis (CEQ, 1997). Fairfax County defines minority populations for their transit programs as Census block groups with minority resident percentages above the county-wide minority percent (FCDOT, 2020a). To be consistent with these programs, 49 percent minority residents and greater was the "meaningfully greater" threshold used in the analysis of Census race and ethnicity data. Minority data was pulled from the ACS 2015-2019 dataset at the block group level for block groups within 0.5 miles of Richmond Highway within the study limits. Fairfax County Neighborhood and Community Services was contacted to assist in the identification of minority populations. Other potential minority populations in the study area were identified using supplementary data and public comments received on the project, as described below.

4.3.3 Low-Income Populations Definition

Low-income persons are defined by USDOT Order 5610.2(a) and FTA's EJ Circular as persons whose median household income is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines. A low-income population is any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed U.S. DOT/FTA program, policy, or activity (per USDOT Order 5610.2(a)/FTA EJ Circular/CEQ EJ Guidance).

In areas with higher costs of living, the HHS poverty guidelines based on national averages are less reflective of local income and poverty conditions. The FTA EJ Circular provides flexibility in methods to identify low-income populations as long as the selected method is at least inclusive of households earning at or less than 150 percent of the Health and Human Services poverty guidelines. As described below, a more conservative analysis methodology for determining low-income populations was used for this project.

The method used for analysis is similar to that used by FCDOT to identify low-income populations used in the FCDOT 2020 Title VI Plan (FCDOT, 2020a) that also includes compliance with EO 12898. The analysis used the median household income for the US Census Washington-Arlington-Alexandria DC-VA-MD Metropolitan Statistical Area (MSA) that includes Fairfax County. Low-income households were defined

as those where the median household income was less than 50 percent of the MSA median household income for the area, adjusted for family size using the Department of Housing and Urban Development (HUD) Fair Market Rents to determine low-income limits. Using this method, the low-income threshold for this analysis is they 54,600 per family of three, the average family size in the study block groups. Median household income data was pulled from the ACS 2015-2019 dataset at the block group level for block groups within 0.5 miles of Richmond Highway within the study limits.

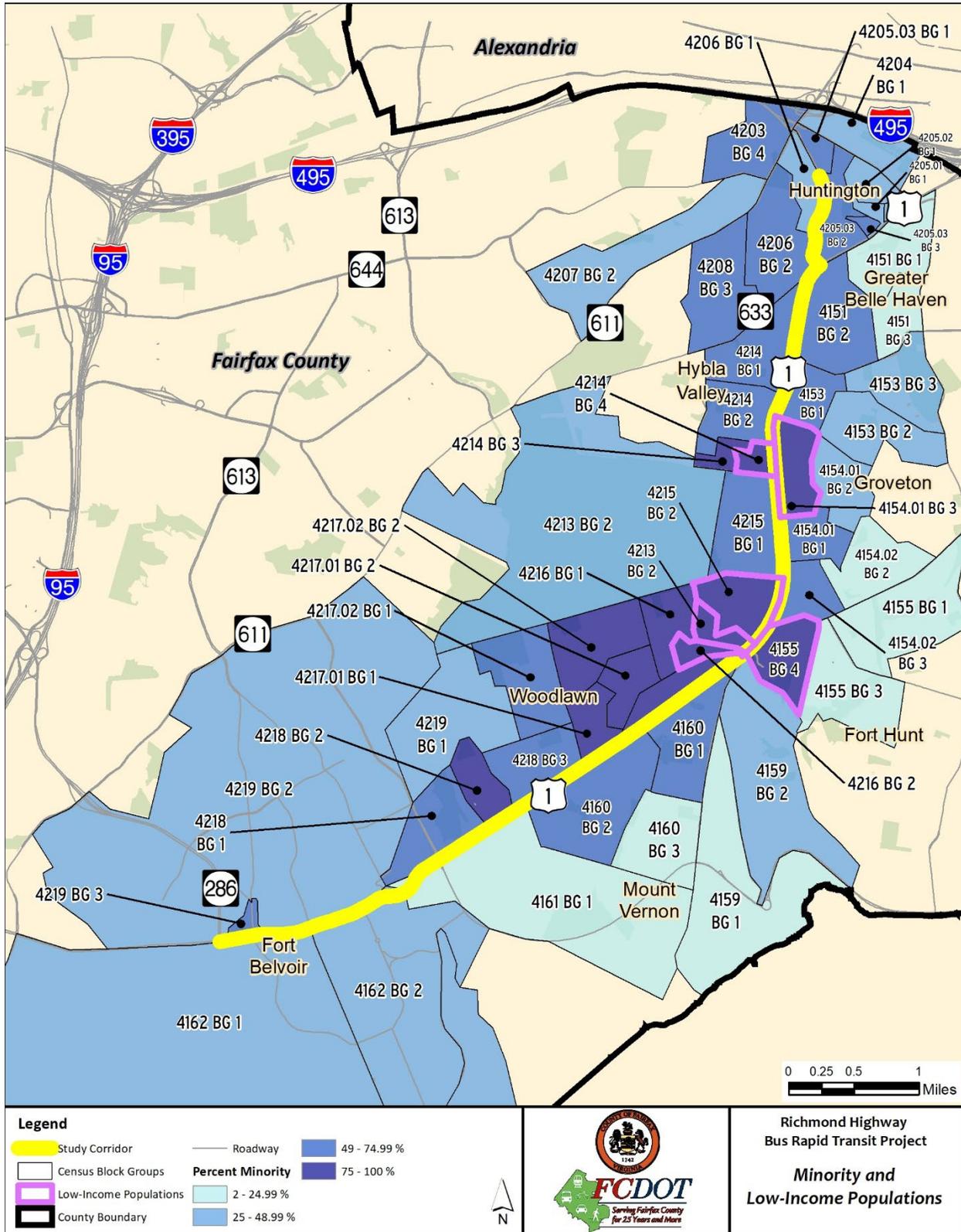
4.3.4 Identification of Minority and Low-Income Populations

Identification of minority populations in the study area is based in part on US Census Bureau's ACS 2015 to 2019 five-year race and ethnicity data at the Census block level. The analysis reviewed the 55 Census block groups that are entirely or partially within one-half mile of Richmond Highway in the study area. Using the definitions described above, 33 Census block groups had minority percentages greater than that of Fairfax County as a whole and are therefore considered minority populations. **Figure 4-1** shows the Census block groups analyzed and the proportion of minorities living in a given study block group. Minority residents live predominantly in block groups adjacent to Richmond Highway through the study area, with the heaviest concentrations in the Mount Vernon, Woodlawn, and Groveton neighborhoods. Census Tract 4151 block group 1 in the Greater Belle Haven neighborhood had the fewest minority residents at 2 percent, whereas Census Tract 4214 block group 3 in Groveton had the most at 99 percent. See the *Richmond Highway Bus Rapid Transit Socioeconomic, Land Use and Right-of-Way Technical Report* (FCDOT, 2021d) for detailed information.

Other potential minority populations in the study area were identified using supplementary data and public comments received on the project. For example, the Gum Springs Historic District is a thriving, historically African-American community in the central portion of the study area and is identified in this analysis as a minority population.

The low-income population identification is based in part on ACS 2015-2019 median household income using the same block groups as described above for minority populations. ACS 2015-2019 data indicate the average household size in the study block groups is a family of three. Median household income for the study block groups ranged from the lowest of \$19,235 in Census Tract 4155 block group 4 in the Fort Hunt neighborhood to the highest in Census Tract 4159 block group 1 in the Mount Vernon neighborhood at \$235,972. Based on the methodology described above, the low-income threshold for this analysis is \$54,600 per family of three using the Very Low Income limits established by the MFR. Six study block groups had median household incomes less than \$54,600 and are therefore considered low-income populations. The census-based low-income populations were clustered in the Hybla Valley, Groveton, Woodlawn, and Fort Hunt neighborhoods (**Figure 4-1**). Low-income populations were also identified based on other community characteristics such as low-income housing identified by Fairfax County Community Services. Six low-income assisted affordable housing complexes (Spring Garden Apartments, Stony Brook Apartments, Creekside Village, Audubon Estate, and Harmony Place Modular Homes) are located in Census block groups designated low-income. Oaks of Woodlawn is an additional low-income assistance housing development at 8799 Old Colony Way that is also considered a low-income population.

Figure 4-1: Minority and Low-Income Populations in the Study Area



Fairfax County Schools data on race and ethnicity and number of students enrolled in the school lunch program provides additional insight on potential EJ populations at the local level. Based on 2019 to 2020 data, all ten public schools in the study area serve primarily minority students (varying between 63 percent to 95 percent of the student body), and 50 percent or more students participate in the free/reduced cost meals program at eight schools in the study area (Fairfax County Public Schools, 2021). See the *Richmond Highway Bus Rapid Transit Socioeconomic, Land Use and Right-of-Way Technical Report* for detailed information (FCDOT, 2021d).

4.3.5 Identification of Adverse Effects

The USDOT Order 5610.2[a] defines adverse effects as including but not limited to:

- Bodily impairment, infirmity, illness or death;
- Air, noise, and water pollution or soil contamination;
- Destruction or disruption of man-made or natural resources;
- Destruction or diminution of aesthetic values;
- Destruction or disruption of community cohesion or a community's economic vitality;
- Destruction or disruption of the availability of public and private facilities and services;
- Vibration;
- Adverse Employment effects;
- Displacement of persons or businesses, farms or nonprofit organizations;
- Increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broad community; and
- The denial or, reduction in, or significant delay in the receipt of, benefits of, DOT policies, programs or activities.

The FTA EJ Circular defines an adverse effect as “the totality of significant individual and cumulative human health or environmental effects to human health, the natural and social environment, community function, etc.” This section (**Section 4.3.5**) presents the types of adverse effects potentially occurring from implementing the project and the subsequent section, **Section 4.3.6**, presents the specific impacts to EJ populations.

Based on the resource analyses in this CE, the project would not have adverse effects to air quality, water quality, soil, historic or cultural resources, or hazardous materials that would impact human environment or health. Therefore, no potential for disproportionately high and adverse impacts on EJ populations for these resource areas would occur. See the *Richmond Highway Bus Rapid Transit Socioeconomic, Land Use and Right-of-Way Technical Report* (FCDOT, 2021d) for detailed information.

Noise and Vibration: Preliminary noise analysis indicates noise impacts that exceed the federal Noise Abatement Criteria (NAC) are predicted at 19 of the 69 Common Noise Environments (CNE) within the study area, which include 168 receptors that represent 165 residential homes and three recreational sites. A single potential noise barrier system was determined to be both feasible and reasonable at CNE 21 in the Groveton neighborhood. If final noise analysis with detailed design determines a noise barrier is still warranted at CNE 21, the owners and renters of those receptor units that would benefit from the proposed noise mitigation may vote on whether or not a wall should be constructed by completing and

returning the citizen survey. At least 50 percent or more of those benefited by the proposed barrier wall must be in favor of the proposed mitigation for it to be constructed (VDOT, 2019).

Construction noise would be limited by adhering to VDOT specifications requiring that construction not exceed established noise limits. Using the FTA's Vibration Screening Process, the project improvements would consist of the addition of rubber-tire bus vehicles. The surface of the additional bus lanes and stations for this project would be asphalt; therefore, irregular surfaces would not be present. Due to these conditions, operational vibration impacts would not occur. Ground borne vibrations from construction equipment would be limited by specifications and restrictions placed on the construction contractor to limit vibration. Pile driving is not anticipated at this time.

Man-made and Natural Resources: Destruction of or disruption to man-made and natural resources would occur from demolition of pavement and clearing for construction of the new facilities that would predominantly occur in the Richmond Highway median. For natural resources, minimal impacts would occur due to building along an existing transportation corridor, with limited wetland, stream, and floodplain impacts as described in **Table 4-1**. Best Management Practices (BMPs) would be implemented to minimize impacts to stream crossings and maintain habitat connectivity wherever possible. Impacts to wetlands and streams, including in-stream construction, would be minimized and mitigated as described in **Section 4.13**. Roughly 1.2 acre of forest habitat would be impacted, with most of the proposed project area dominated by an urban setting.

Visual Resources: A visual resources study was conducted in the study area determined that the overall visual effect was neutral. Impact minimization measures will include landscaping to enhance the aesthetics of topography, structure, and lighting design along the corridor. Affected communities will be consulted to develop minimization measures appropriate for that community.

Displacements, Community Cohesion and Economic Vitality: The project could displace residents and businesses through the total acquisition of 18 residences and one community facility parcel (**Figure 4-2**), and up to 42 business parcels (**Figures 4-3 and 4-4**). Currently, FCDOT is refining design that would further reduce the total acquisitions and estimates that this effort could avoid at minimum another three residential relocations. Most of the project would be constructed primarily within the existing ROW and existing access to side streets would be maintained. Therefore, the proposed project would not be a new barrier or separate or isolate neighborhoods or communities along the study corridor that could adversely impact community cohesion. The project would not bisect neighborhoods and communities as the alignment is along the existing Richmond Highway.

Temporary construction impacts that could impact community cohesion may include construction noise, dust, temporary lost parking and temporary detours to users of Richmond Highway through the project construction zone and to properties adjacent to the LOD. These potential temporary impacts would be minimized through the implementation of mitigation measures such as scheduling construction to avoid loudest noise at sensitive times, dust control measures, advance notice of road closures, and clear signing of detour routes, alleviating adverse effects to community cohesion.

Figure 4-2: Residential and Community Facility Relocations

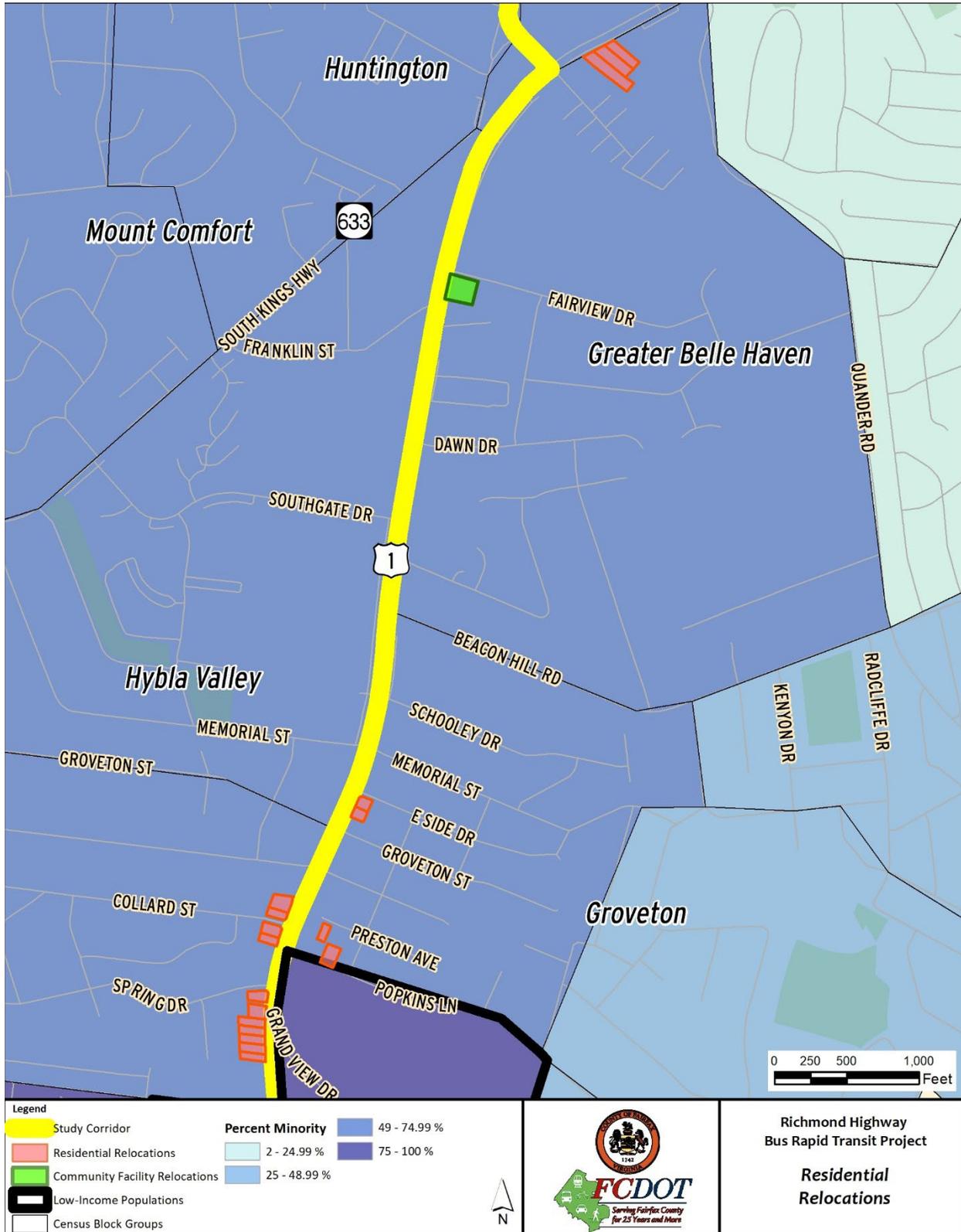


Figure 4-3: Commercial Relocations (North)

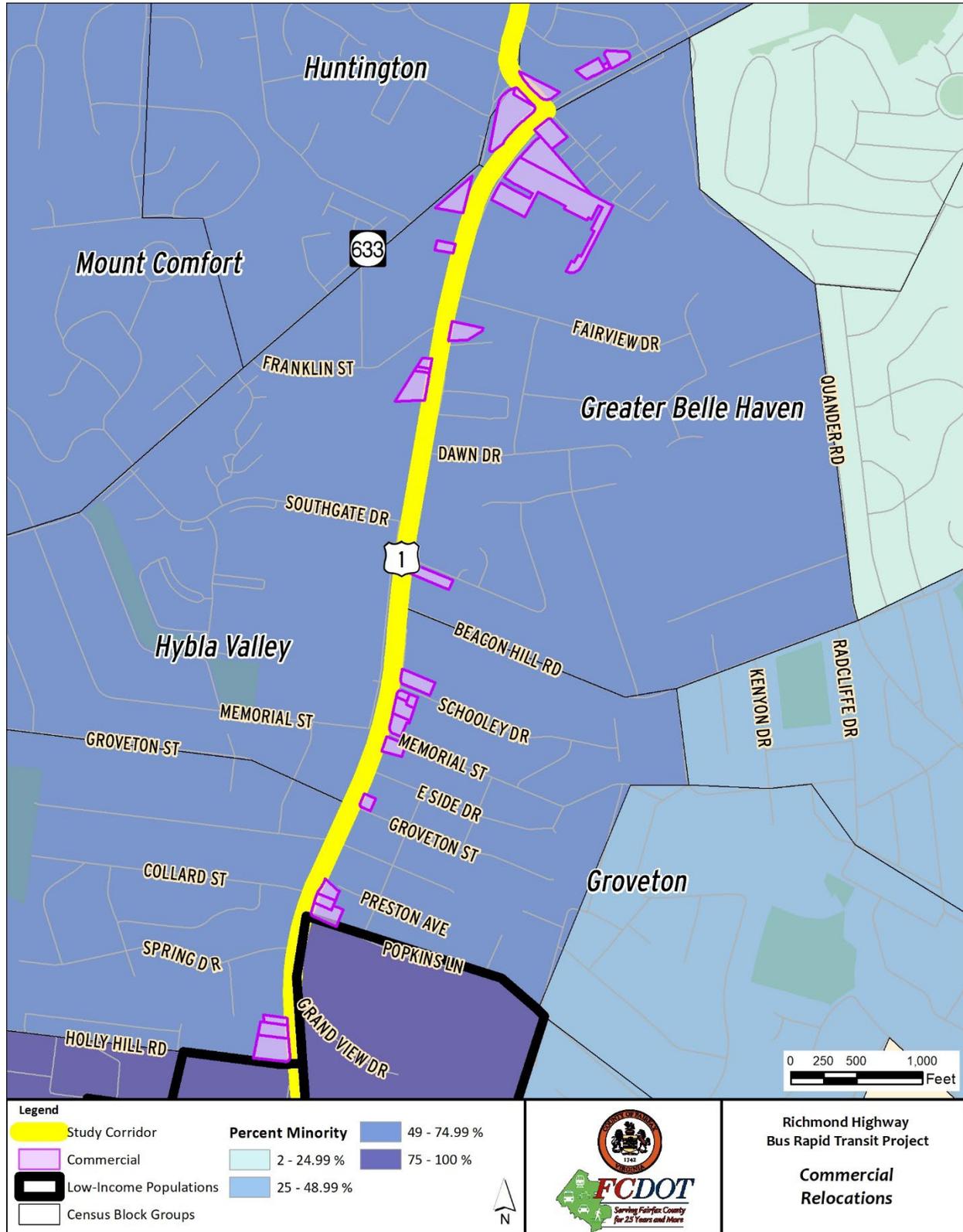
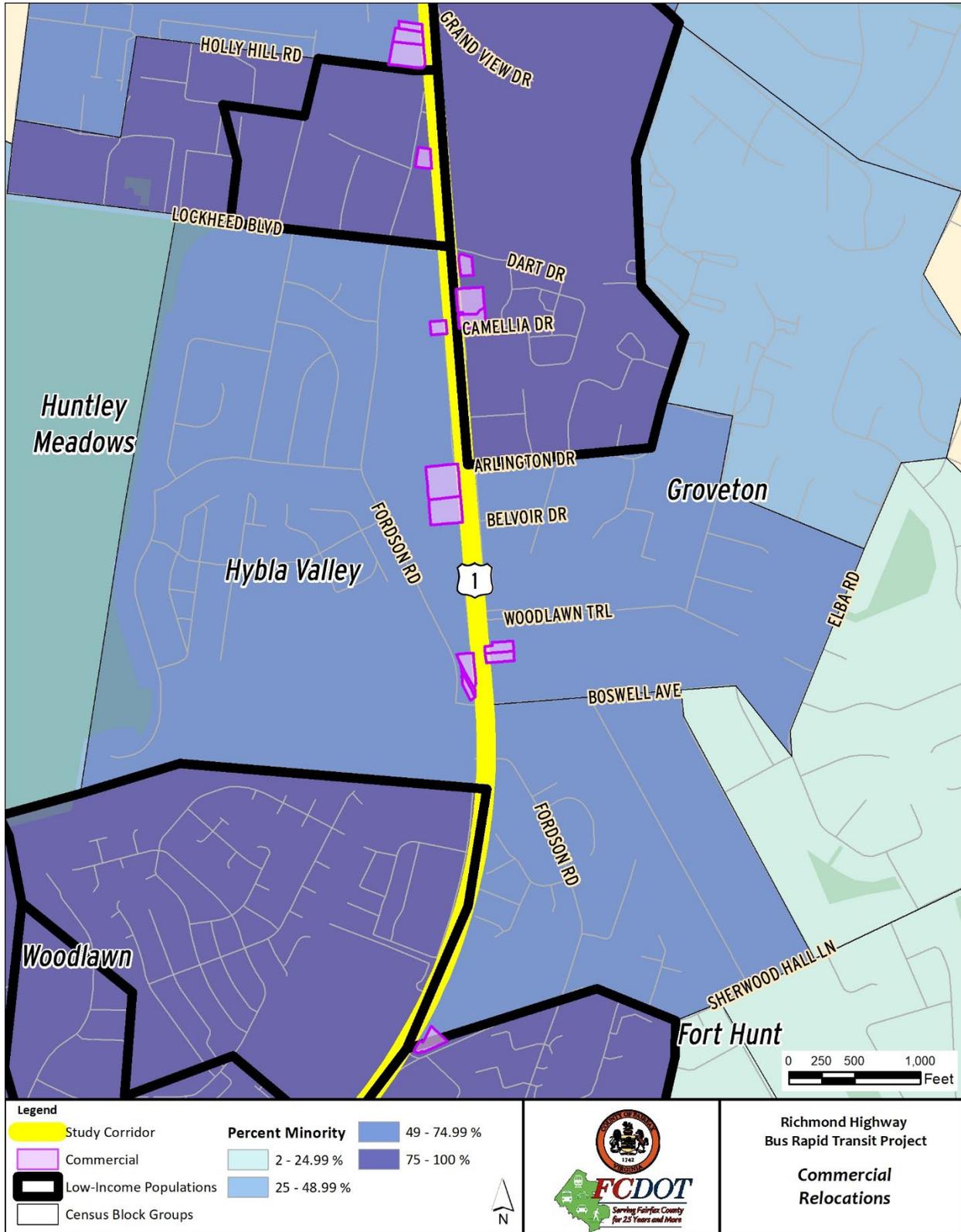


Figure 4-4: Commercial Relocations (South)



Property acquisitions and displacements are not expected to substantially affect economic conditions in the study area. As noted previously, the project would require total acquisition of 42 business parcels (**Figures 4-3** and **4-4**). Total acquisition of commercial properties could be reduced in the later, detailed design phase of the project. Relocation of the largest employers in the study area would not occur. Adverse construction-related impacts to businesses directly adjacent to construction could occur, but would be temporary, and cease when the project would be completed. Potential impacts include temporary detours, road closures, and loss of parking for businesses during construction. A construction mitigation plan will be prepared in the later project stages to specify communications and construction means and methods to reduce inconveniences of construction to businesses, such as noise, dust, construction traffic, and preservation of access to local streets, driveways, and parking.

Ongoing coordination with area businesses, particularly those located adjacent to proposed improvements or detour routes, would occur to prevent or minimize short-term disruption.

Community Facilities: The Gateway International Christian Church at 6401 Richmond Highway in the Greater Belle Haven neighborhood would be acquired in its entirety (**Figure 4-3**), and limited ROW would be acquired from an additional six community facilities. The partial ROW community facility parcels would retain access and function during construction and operations and would not be adversely impacted.

Traffic: Increased traffic congestion from operation of the project is not anticipated. The proposed project would provide dedicated transit lanes for BRT for most of its length, rather than operating in mixed vehicular traffic, expected to improve transit service in the study area. The project would also improve bicycle and pedestrian facilities offering different modes of transportation than vehicular travel. Currently, much of the corridor lacks adequate pedestrian facilities or exhibits sub-standard sidewalk conditions. The proposed project may temporarily increase traffic congestion in the study area during construction. This would be due to temporary lane closures and detours that would cease when the project would be completed. However, these effects would be minimized by using the same measures described above for potential impacts to businesses.

4.3.6 Disproportionately High and Adverse Effects

The USDOT EJ Order defines a disproportionately high and adverse effect as an impact that would be predominantly borne by a minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-EJ population. In making determinations regarding disproportionately high and adverse effects on minority and low-income populations, mitigation and enhancements measures that will be implemented and all offsetting benefits to the affected minority and low-income populations may be taken into account, as well as the design, comparative impacts and the relevant number of similar existing system elements in non-minority and non-low-income areas. If there is no potential for adverse effects, then impacts cannot be disproportionately high and adverse.

The USDOT EJ Order further states that disproportionately high and adverse effects to EJ populations will only be carried out if further mitigation or alternatives to reduce or avoid the disproportionately high and adverse effects are not “practicable.” In determining if further mitigation measures or alternatives are “practicable,” the social, economic, and environmental effects of avoiding or mitigating the adverse effects will be taken into account.

Most of the proposed project effects described above would occur throughout the project area and affect both EJ and non-EJ populations. This includes the effects described for air quality; natural resources; historic and cultural resources; hazardous resources; visual resources; neighborhood connectivity; and temporary, short-term construction impacts that would be reduced by mitigation and minimization measures as described above. Potential effects to these resources would either not be adverse or would be minimized and would be experienced by both EJ and non-EJ populations along the corridor. These impacts would not be predominantly borne by EJ populations nor would they be appreciably more severe to EJ populations than non-EJ populations. Mitigation, minimization, and best management practices identified for these resource areas would be applied equally on the alignment for these resources. Therefore, no potential for disproportionately high and adverse effects would occur to EJ populations from potential effects to air quality, natural resources, historic and cultural resources, hazardous materials, visual resources, neighborhood connectivity, and temporary construction impacts. The project improvements would be made primarily in the median and ROW of Richmond Highway and not in residential areas.

Preliminary noise analysis indicates noise impacts that exceed the NAC are predicted at 19 of the 69 CNE within the Study Area. Operational noise impacts adjacent to the construction zone and directly along Richmond Highway in the Study Area would occur in both EJ population areas and non-EJ areas in the Study Area. See the *Richmond Highway Bus Rapid Transit Project Noise and Vibration Technical Report* (FCDOT, 2021c) for more detailed information and mapping. Only one area (Common Noise Environment, or CNE, 21) would benefit from a noise barrier that is warranted, feasible, and reasonable. CNE 21 is within Census tract 4154.02 block group 3 defined by the analysis as an EJ population located in the Fort Hunt neighborhood. Consideration for noise mitigation would be provided when warranted and determined to be feasible and reasonable. Receptors benefited by a warranted noise barrier at CNE 21 would vote to determine whether at least 50 percent approve a noise barrier or not. Since the noise impact at the CNE 21 barrier location could be mitigated and it is up to the affected receptors to select the mitigation, the potential adverse noise impact is considered mitigated and no potential for disproportionately high and adverse noise impacts to EJ populations would occur.

Project benefits include improved access to transit and other transportation modes such as bicycle and pedestrian facilities, improved quality of transit services, improved travel times and reliability of bus service in the study area, improved connectivity among adjacent communities from new bicycle and pedestrian facilities, improved transit access to community facilities, improved access to jobs, and construction crew spending at local businesses during construction. The project would be expected to have long-term beneficial impacts by enhancing regional connectivity, improving mobility options, and improvements to regional air quality.

As the majority of the project study area includes EJ populations, the effects of the project may be predominately borne by those populations. Benefits of the project would be realized by people living in EJ block groups adjacent to the improvements and in the non-EJ areas of the project. Study Census block groups indicate that two percent of homeowners and six percent of renters do not own vehicles. Approximately 16 percent of workers 16 years of age and older living in the study block groups use public transportation (excluding taxicabs). Not all of these workers would live in the EJ areas of the study area, but those that do would benefit from the improved transit proposed by the project. Eight of the nine proposed stations would be located within the median of Richmond Highway running adjacent to EJ

population areas in the study limits. Because minority and low-income populations reside in areas adjacent to Richmond Highway within the study area, most of the impacts, both beneficial and adverse, would be borne by these populations. However, most of the project benefits would also be borne by EJ populations living adjacent to Richmond Highway in the study area. If the project alignment were shifted, impacts to other EJ populations along the corridor would be anticipated and the benefits of the project would not be realized if the project were not built.

The project includes a total of 255 acquisitions, including some partial and full acquisitions, within the three-mile corridor of the study area north of Sherwood Hall Lane. This corridor includes both EJ and non-EJ populations. One additional acquisition occurs in the southern section of the project corridor. FCDOT has avoided or minimized property impacts along the Richmond Highway corridor in a number of ways. Measures for avoiding and minimizing ROW impacts include installing retaining walls to reduce the cut and fill necessary for grading; reducing the median or amenity panel buffers to avoid acquisitions; revising the roadway cross slope to limit grading impacts to properties; removing bus pull-offs; removing dedicated right turn lanes and combining them with through lanes; and thoughtfully implementing stormwater facilities. These tools were considered during preliminary design and were utilized where appropriate. Specific measures that have been taken include:

- Adding retaining walls at Groveton Baptist Church, St. Louis Catholic Church and School, and Gum Springs Shopping Center.
- Reducing the BRT median or the amenity panel buffers at Groveton Baptist Church, A&A Rentals, and in the Penn Daw area.
- Revising the roadway cross slope at Kings Village, Collard Street and Popkins Lane, and in the Penn Daw area.
- Removing dedicated right turn lanes and combining them with through lanes throughout the corridor, including locations such as Clayborne Avenue, Fordson Road (east), Dawn Drive, and Sherwood Hall Lane (west).
- Removing bus pull-offs at Collard Street and Sherwood Hall Lane.
- Utilizing properties already anticipated to be full acquisitions or relocations for stormwater management in order to avoid additional full acquisitions. Nineteen properties already slated for full acquisition due to design requirements will be used for eight stormwater facilities.
- Installing underground stormwater facilities to supplement aboveground facilities. Without the underground component, the aboveground facilities would require greater capacity and would necessitate more right-of-way.

However, despite avoidance and continue minimization measures, right-of-way acquisitions are required for the project to be implemented in order to maintain roadway capacity for existing users and for future travel demand models. The design of the project also includes sufficient width to maintain a consistent, six-lane cross section as stated in the Locally Preferred Alternative (LPA) Recommendation from the DRPT in the 2015 Route 1 Multimodal Alternatives Analysis (DRPT, 2015). This is important for meeting existing and future roadway capacity needs and not degrading existing level of service so that the roadway continues to provide the same benefits to the community for transportation to home, work, and recreation. The LPA also includes implementation of sidewalks and bicycle paths that are currently sub-standard or non-existent throughout the project corridor.

One community facility, the Gateway International Christian Church, would be displaced in Census tract 4151 block group 2, which is 49 percent minority. The ability to avoid property impacts is limited because EJ populations exist along both sides of the Highway through most of the project study area; avoiding impacts on one side of Richmond Highway could result in impact to minority and low-income populations on the opposite side of Richmond Highway. For example, shifting the alignment or stormwater management facility away from Census tract 4214 block group 2, which is roughly 60 percent minority (where there are 14 residences and commercial parcels that would be acquired), could force displacements in Census tract 4154.01 BG 3, which is roughly 87 percent minority and is also identified as low-income.

Residential total parcel acquisition displacements would occur in the Hybla Valley, Greater Belle Haven, and the Groveton communities (**Figure 4-2**). Affected residences are single family. Assuming an average of three persons per household, approximately 54 persons would be impacted by relocations, which represents 0.05% percent of the 101,973 people in the study area. FCDOT would work with impacted residences with the goal of relocating affected parties within their existing neighborhood, depending on their stated preferences. Should any residences be unoccupied, it is assumed that fewer residents would be displaced. Acquisitions through these neighborhoods are partly unavoidable because of roadway widening activities in the 1970s that resulted in inadequate clear zones which have created unsafe pedestrian, roadway, and living conditions for some residences. FCDOT has explored constructing sidewalks in these communities because of the unsafe pedestrian conditions created from the widening projects in the 1970s; however, because of the short setback distances that remain, implementation of sidewalk improvements is not possible without further ROW acquisitions and displacements. The 18 residences that would be acquired are along the edge of the respective communities and do not represent a significant percentage of homes in these neighborhoods. No schools or major community recreation centers would be acquired in these neighborhoods or the project. The acquisitions would not bisect the respective communities and would not result in adverse effects to community cohesion. To-date, FCDOT has conducted extensive public outreach for affected property owners and following the completion of NEPA at the request of affected property owners, FCDOT will conduct weekly ROW meetings with affected property owners (see Section 5.2.2 for discussion of outreach efforts to-date). EJ populations in these neighborhoods would be served by the future Beacon Hill Station and would experience additional beneficial effects including greater regional connectivity, improved mobility options, improved regional air quality, and improved pedestrian and bicycle facilities.

FTA's EJ Circular requires that determinations of disproportionately high and adverse effects take into consideration "mitigation and enhancements measures that will be taken and all offsetting benefits to the affected minority and low-income populations."

The residential relocation activities are anticipated to take several years and residential acquisition impacts in the Groveton, Greater Belle Haven, and Hybla Valley will be mitigated through continued coordination and the measures included in Section 4.3.8. While impacts could be appreciably more severe to EJ communities than non-EJ communities, this burden would be offset by the project providing long-term benefits in terms of enhanced mobility, safe sidewalks and bike facilities, and improved connectivity that would accrue equally to all residents in the project study area. These neighborhoods would also be served by the Beacon Hill station and over the long term, EJ populations surrounding the Beacon Hill station would enjoy improved transit accessibility and the above stated benefits of the project. The

adverse effects of the project on EJ populations would not be considered disproportionately high and adverse, because the effects would not be suffered primarily by environmental justice communities after the consideration of mitigation measures and consideration of the benefits from the project, which would accrue equally to all populations in the study area. Several residential parcels were adversely impacted by widening projects in the 1970s which resulted in substandard and unsafe clear zones adjacent to their properties. Any efforts to construct clear zones or to install safe sidewalks to current standards would require total acquisition of these parcels. Not building the project and entirely avoiding adverse effects associated with acquisition would result a continuation of substandard conditions on several residences and the benefits not accruing to the EJ and non-EJ populations in the project area. After the consideration of all avoidance, minimization, and mitigation measures and a balancing of off-setting benefits of the project, no disproportionately high and adverse effects are expected to occur on minority and low-income populations. Sections 4.3.7 and 4.3.8. details outreach efforts specific to EJ populations and the mitigation measures related to property acquisitions.

4.3.7 Outreach Efforts to Environmental Justice populations

To promote inclusive public participation, the Public Outreach Plan for the Richmond Highway BRT Project included strategies to engage minority and low-income populations. General strategies included, but were not limited to:

- Meeting at times and locations that are convenient and accessible for these communities;
- Varying meeting sizes and formats to provide a variety of comfort levels;
- Offering shuttle transportation to community meetings through Fairfax County Neighborhood and Community Services (NCS);
- Creating outreach materials that are inclusive and welcoming to minority, low-income, and other underrepresented populations;
- Coordinating with existing community-based organizations that reach out specifically to members of affected communities (e.g., coordinating with NCS to share information at their monthly meetings);
- Considering radio, television, or newspaper ads on stations and in publications that minority populations and low-income populations;
- Reaching out through trusted community leaders, schools, and churches;
- Attending community-based events; and
- Displaying Title VI public notices. FCDOT has Title VI notices on the County's website. These notices are also brought to meetings and other events to ensure that the community has access to information.

Potential residential and community facility total parcel acquisitions have been presented to the public on roll plots presented at numerous public information meetings and targeted meetings with EJ communities; mitigation measures were also presented at that time. In addition, ROW virtual meetings have been held online where residential total acquisitions were identified along with proposed mitigation; recordings of the meetings are posted on the project website. No comments were received concerning minority and low-income populations potentially affected by ROW acquisition.

4.3.8 Minimization and Commitments

ROW impacts may be further reduced during more advanced design phases when more detailed information is available.

Every effort will be made to expeditiously acquire real property and/or interests in real property for the project by negotiation. As soon as feasible, the agency shall notify the owner in writing of the agency's interest in acquiring the real property and the basic protections provided to the owner by law and regulation. The owner shall be provided an opportunity to accompany the appraiser during the appraiser's inspection of the property to be acquired (Section 24.102 of 49 CFR).

All displaced persons (residential, commercial, and personal property) will be provided with advisory assistance as required in Section 24.205(c) of 49 CFR.

All displaced persons will be provided with all appropriate and required relocation notices as defined in Section 24.203 of 49 CFR.

All displaced residential persons will be offered with at least one (preferably three) decent, safe, and sanitary, comparable replacement dwelling(s) pursuant to the requirements of Section 24.204 of 49 CFR.

All displaced persons will be provided with reasonable assistance necessary to complete and file any required claim for payment as required by Section 24.207 of 49 CFR. Further, expeditious payments for relocation claims shall be made and, dependent on demonstrable need, advance payments will be made in order to avoid or reduce hardships.

No relocation payments will be made to any displaced person without first obtaining certification that the person is either a citizen or national of the United States, or an alien who is lawfully present in the United States pursuant to Section 24.208 of 49 CFR.

Any person who feels that the Agency has failed to properly consider the person's application for assistance will be provided with the opportunity to appeal such determination pursuant to the requirements of Section 24.10 of 49 CFR.

Last Resort Housing benefits will be made available to all persons for whom comparable replacement housing is not available within their financial means pursuant to the requirements of Section 24.404 of 49 CFR.

Outreach to the residents of Gum Springs, identified here as an EJ community, has resulted in modifications to the project design. Gum Springs residents voiced concern regarding a station design that showed reduced access at Fordson Road. The community was presented with options for station configurations at that location in a meeting in June 2019. Based on the feedback received during the meeting, the project team incorporated the community's preferred design, in which northbound and southbound BRT platforms are split across two intersections at Fordson Road and Boswell Avenue.

4.4 LIMITED ENGLISH POPULATIONS

Per the FTA EJ Circular, limited English proficiency (LEP) persons include people who do not speak English as their primary language and have a limited ability to speak, read, write, or understand English. In accordance with FTA Title VI Circular and USDOT's policy, FTA shall address the needs of LEP persons in

the study are in compliance with Title VI. The following describes the strategies used to identify and engage LEP persons in the study area.

The Census Bureau has data on speaking English proficiency and languages spoken at home available from the ACS 2015-2019 at the Census Tract level. Twenty-five Census Tracts are within 0.5 miles of Richmond Highway through the study area. Approximately 40 percent (37,684) of the population within the study Census Tracts speaks English “less than very well” and two percent do not speak English at all. Study Census Tract data for languages spoken at home indicates that the languages having at least 1,000 speakers are Spanish or Spanish Creole, other Indo-European, other unspecified, other Asian, Arabic, and French, Haitian and Cajun. Of the non-English languages spoken at home, Spanish is the most common with 25,971 speakers living in the study Census Tracts. In addition to the measures for outreach to EJ populations discussed in **Section 4.3.7**, Fairfax County and FTA included the following strategies in their outreach to LEP persons for the proposed project:

- Providing translation at large community meetings (Spanish by default and offering other languages by request or by expected interest and/or presence of a large number of LEP community members);
- Creating multi-lingual outreach materials that are inclusive and welcoming to LEP persons;
- Considering radio, television, or newspaper ads on stations and in publications that target LEP persons;
- Displaying Title VI public notices (FCDOT has Title VI notices a on the County’s website in 11 languages. These notices are also brought to meetings and other events to ensure that the LEP community has access to information in the language with which they are most comfortable.)

4.5 ECONOMICS

Existing Conditions

The Richmond Highway corridor has nearly four million square feet of retail development with over one million square feet of office space and nine hotels with a total of more than 1,000 rooms. In addition, Fort Belvoir and its contractors occupy 8,700 acres with over 10 million square feet of office space on-post.

The study corridor is a major employment area, home to many government, academic, and private industry research facilities and offices. As shown in **Table 4-5**, several large businesses with over 1,000 employees are located along the study corridor. Many of the businesses along the study corridor are related to military and healthcare professions.

Table 4-5: Major Employers in the Study Corridor

Employer	Number of Employees
Department of Defense (Fort Belvoir)	30,000 +
Defense Contract Audit Agency	4,600+
Defense Logistics Agencies	20,000+
Fairfax County Public Schools	1,000+
Inova Mount Vernon Hospital	1,000+

Environmental Consequences

Based on preliminary engineering, 42 commercial properties would be displaced. The commercial

displacements include fast food establishments, gas stations and automotive-related service providers, banks, plazas and shopping centers, small shops (including a veterinary hospital, a laundromat, a motel, psychic readings, self storage, and paint shops) and vacant properties. The commercial properties with total acquisitions account for approximately 0.12 percent of total businesses in Fairfax County based on 2018 Census County Business Patterns data. All activities related to acquisitions and displacements would be conducted in conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, which mandates that relocation services and payments be available to eligible businesses and nonprofit organizations displaced by a federal agency or with federal financial assistance. The potentially displaced businesses do not include the five major employers listed in **Table 4-5**. Property acquisitions and displacements are not expected to substantially affect economic conditions in the study area as no large employers will be displaced and a small proportion of businesses will be impacted.

The improvement of the bus service on Richmond Highway provided by the project would result in economic benefits, such as better job accessibility and reduced travel times, for employees, residents, and customers and clients of the businesses in the corridor. Access will be improved due to the addition of the new stops that the BRT will offer along the corridor. Additionally, access will be improved with new sidewalks, bike facilities, and signalized crosswalks.

Temporary detours or road closures and loss of parking for businesses during construction would occur.

4.5.1 Minimization and Mitigation

As the project advances, efforts will be made to minimize impacts from ROW.

A construction mitigation plan will be prepared in the later project stages to specify communications and construction means and methods to reduce inconveniences of construction to businesses, such as noise, dust, visual blight, construction traffic, and preservation of access to local streets, driveways, and parking. Ongoing coordination with area businesses, particularly those located adjacent to proposed improvements or detour routes, would occur to prevent or minimize short-term disruptions.

4.6 HISTORIC AND CULTURAL RESOURCES - SECTION 106

4.6.1 Historic Architectural Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that federal agencies consider the effects of federally-funded projects on historic properties. FTA initiated Section 106 consultation with the Virginia Department of Historic Resources (DHR) and invited additional potential consulting parties in October 2018; DHR responded via letter in November 2018, concurring with the project's Area of Potential Effects (APE). A reconnaissance-level historic architectural survey was undertaken to identify historic properties (properties listed or considered eligible for listing in the National Register of Historic Places [NRHP]) that could potentially be affected by the undertaking.

In the resulting report, the Historic Architectural Survey, a total of 271 architectural resources, 135 previously identified and 136 newly identified, were found to be located within the historic architectural APE. A total of seven historic properties were identified within the historic architectural APE for the project: Woodlawn Plantation (029-0056), Mount Vernon High School (029-0230), Woodlawn Cultural Landscape Historic District (029-5181), Fort Belvoir Military Railroad Historic District (029-5724), Camp

A.A. Humphreys Pump Station and Filter Building (029-0096), St. Louis Catholic Church and School (029-5149), and A&A Rentals (029-6432).

The Historic Architectural Survey was submitted to DHR in April 2019 along with digital copies of the report and the Virginia Cultural Resource Information System forms and associated site plans and archival photographs. Four Consulting Parties submitted a response and DHR provided a letter dated June 3, 2019 containing comments.

Following a Consulting Party meeting on September 4, 2019 (see section 4.6.3), FCDOT submitted an addendum to the historic architectural identification to DHR and the Consulting Parties on November 7, 2019. The addendum strove to address comments from DHR and the Consulting Parties and provided additional historic context for two post-World War II residential neighborhoods, Fair Haven (DHR No. 029-6348) and Jefferson Manor (DHR No. 029-6349), and the segment of Richmond Highway / U.S. Route 1 (DHR No. 029-5708) located within the project APE. Additionally, Gum Springs (DHR No. 029-6581) was delineated as a newly identified resource. Through this review, Fair Haven was recommended NRHP-eligible. Two Consulting Parties submitted comments and DHR provided a letter containing additional comments dated December 9, 2019. DHR requested that FCDOT provide more information about Jefferson Manor and address Consulting Party comments, especially in regard to the Gum Springs Community. In this letter, DHR also concurred with FTA's determination that Fair Haven (DHR No. 029-6348) is potentially eligible for Virginia Landmarks Register/NRHP listing.

A second addendum to the historic architectural identifications was submitted to DHR and the Consulting Parties on April 7, 2020. This second addendum was developed to address additional comments related to Jefferson Manor and to incorporate project design changes that occurred at several intersections and necessitated an expanded APE. With this second addendum FCDOT also submitted documentation related to Section 106 coordination, including responses to Consulting Party comments developed during the Section 106 Process. A second Consulting Party meeting was held on April 16, 2020. Four Consulting Parties submitted comments in response to the second addendum. In a letter dated May 8, 2020, DHR concurred with FTA's determination that Jefferson Manor is not eligible for VLR/NRHP listing and maintained the position that Gum Springs be treated as eligible for the purposes of the Project. The eligibility opinion regarding Gum Springs does not constitute a formal finding of eligibility. On August 13, 2020, FTA provided a consolidated finding letter to DHR and the Consulting Parties, which summarized all previous identification of historic properties, and noted FTA's treatment of Gum Springs as an NRHP-eligible historic district for the purposes of the undertaking. Included with the letter was a memorandum describing Gum Springs' historic significance and a Comment Summary Matrix responding to Consulting Party comments received regarding the second addendum report dated April 7, 2020. Three Consulting Parties provided comments in response to the August 13, 2020 FTA letter. DHR responded in an email concurring with FTA's findings.

Following DHR concurrence on identification, the project team undertook an effects assessment. The purpose of the effects assessment was to evaluate the potential direct and indirect effects to historic properties that may result from the undertaking. The project would require roughly 6.2 acres of permanent and temporary construction easements from non-contributing properties in the Gum Springs Historic district, approximately 1.1 acres of permanent and temporary construction easements at Woodlawn Plantation and Woodlawn Cultural Landscape Historic District (**Figure 4-5**), and approximately

0.2 acres of temporary construction impacts at A&A Rentals. The effects assessment determined that the proposed undertaking would have no adverse effect on Woodlawn Plantation (029-0056), Woodlawn Cultural Landscape Historic District (029-5181), Mount Vernon High School (029-0230), St. Louis Catholic Church and School (029-5149), Fair Haven (029-6348), A&A Rentals / Fire Station (029-6432) or Gum Springs Historic District (029-6581).

Figure 4-5: Location of Woodlawn Plantation (DHR No. 029-0056/029-5181-0001) NRHP/VLR and NHL Boundaries and Woodlawn Cultural Landscape (DHR No. 029-5181) NRHP/VLR Boundary



Further, the undertaking would have no effect to the Fort Belvoir Military Railroad Historic District (029-5724) or the Camp A.A. Humphreys Pump Station and Filter Building (029-0096).

FTA provided the effects assessment to DHR and the consulting parties on January 15, 2021 and DHR concurred with the Effects Assessment on February 17, 2021 on the premise that two conditions be met:

1. The designs for the Hybla Valley, South County Center, Gum Springs, and any other BRT stations that are within the established visual APE and within the viewshed of identified historic properties, be provided to DHR prior to finalization and construction; and
2. The noise wall design and location(s) that are within the established visual APE and within the viewshed of identified historic properties be provided to DHR prior to finalization and construction.

In addition to the DHR letter, FTA and FCDOT also received comments from three consulting parties during the comment period, including a formal objection from the National Trust for Historic Preservation (NTHP). FTA continued consultation directly with NTHP to resolve their objection through a meeting on March 10, 2021, and letter dated June 25, 2021. The letter detailed commitments FCDOT is making to avoid and minimize impacts to the Woodlawn Plantation property and the Woodlawn Cultural Landscape Historic District. NTHP responded in a letter dated October 1, 2021, resolving the objection.

Additional detail on historic architecture can be found in the *Richmond Highway Bus Rapid Transit Project Historic Architectural Survey* (FCDOT, 2019b), the *Addendum to the Richmond Highway Bus Rapid Transit Project Historic Architectural Survey* (FCDOT, 2019c), the *Second Addendum to the Richmond Highway Bus Rapid Transit Project Historic Architectural Survey* and the *Historic Architectural Effects Determination Technical Report* (FCDOT, 2021a). Additional coordination documentation is included in **Appendix C**.

4.6.2 Archaeological Resources

An Archaeological Assessment was undertaken to identify historic properties that could potentially be affected by the undertaking and was submitted to DHR and the Consulting Parties in April 2019. (An update to the Archaeological Assessment, which expanded the survey area by less than one acre in Survey Area G, was submitted in November 2019.) The Archaeological Assessment consisted of an evaluation of a Field Review Area measuring approximately 560 acres. Of that number, approximately 270 acres of the Field Review Area were previously subjected to archaeological testing and no additional field investigations are required.

Twenty previously recorded archaeological sites are located within the Field Review Area. Four of those sites were unevaluated for the NRHP. One site was unevaluated but has since been documented as destroyed. No additional testing will be required at that site. Additional testing is required to evaluate the remaining three unevaluated sites for the NRHP. Evaluation and possible mitigation are required for an additional site, which has been recommended as eligible by its original excavators.

Of the acreage not previously subjected to archaeological testing, a total of nine survey areas (about ten acres) were identified as retaining a moderate to high archaeological potential for intact prehistoric or historic resources despite the twentieth-century development along Richmond Highway and were recommended for Phase I archaeological survey.

A Phase I archaeological survey was undertaken in January 2020. Testing revealed the majority of the survey areas contained disturbed soils related to residential, commercial, and roadway development along Richmond Highway despite being identified in the assessment report as potentially containing intact soils. Historic artifacts were recovered from two of the nine survey areas, and no precontact or historic artifacts were recovered from the seven remaining survey areas. The Phase I archaeological survey for the project did not identify any new archaeological sites and no further work is recommended within the limits of the Phase I archaeology survey. Should the LOD change to include previously identified sites, additional work may be necessary. DHR concurred with the results of the Phase I Archaeology Survey on May 8, 2020. DHR correspondence is included in **Appendix C**.

Additional detail on archaeology can be found in the *Richmond Highway Bus Rapid Transit Project Archaeological Assessment Technical Report* (FCDOT, 2019a) and the *Richmond Highway Bus Rapid Transit Project Phase I Archaeology Survey* (FCDOT, 2020b).

4.6.3 Section 106 Public Involvement

Eighteen potential Consulting Parties were invited to participate in the Section 106 process in a letter dated October 4, 2018. The list of invited Consulting Parties is included in the invitation letter in **Appendix C**. Of the 18 invited Consulting Parties, the following five accepted the invitation: the Archaeology and Collections Branch of the Fairfax County Park Authority, the Delaware Nation, Department of the Army (Fort Belvoir), the Fairfax County Department of Planning and Zoning, and NTHP. The Alexandria Monthly Meeting of the Religious Society of Friends, though not invited, requested that FTA keep them apprised of potential effects to their property, the Woodlawn Quaker Meetinghouse, should they choose to participate as a Consulting Party in the future. The Alexandria Monthly Meeting of the Religious Society of Friends was included on all correspondence subsequent to the receipt of the November 2018 email. The Fairfax County Historical Society, which was invited to be a Consulting Party in 2018 but did not respond, sent a letter accepting the invitation in May 2020. The Fairfax County Historical Society was included on all Section 106 correspondence subsequent to receipt of the letter.

FCDOT held a first Consulting Party meeting September 4, 2019. The Consulting Party meeting addressed the Section 106 Process, an overview of the project, archaeology work to date, architectural history work to date, and what would be entailed in an effects assessment. The group then participated in open discussion.

A second Consulting Party meeting was held on April 16, 2020. This meeting addressed the analysis contained in the second addendum (Jefferson Manor and the updated APE), and Consulting Parties had significant conversation around the topic of the eligibility of Gum Springs. The Consulting Parties requested an extended review period ending May 21, 2020. DHR responded to the second addendum in a letter dated May 8, 2020, concurring with the findings on Jefferson Manor and requesting that FTA move forward by treating Gum Springs as a NRHP-eligible historic district for the purposes of this project.

Additional information regarding Section 106 public involvement efforts were undertaken at the events listed in **Table 4-6**.

Table 4-6: Section 106 Public Involvement

Date	Meeting Location / Topics Addressed
April 17-18, 2018	Public meeting / Project Overview and NEPA Process Including Cultural Resources
January 23, 2019	Public meeting / Project Overview and NEPA Process Including Cultural Resources
June 25, 2019	Hybla Valley/Gum Springs - Project Overview and NEPA Process Including Cultural Resources
July 24, 2019	Beacon Hill/Lockheed - Project Overview and NEPA Process Including Cultural Resources
July 31, 2019	Woodlawn/Fort Belvoir - Project Overview and NEPA Process Including Cultural Resources
August 7, 2019	Huntington/Penn Daw - Project Overview and NEPA Process Including Cultural Resources
August 14, 2019	South County Center - Project Overview and NEPA Process Including Cultural Resources
August 18, 2019	Spanish Language Meeting - Project Overview and NEPA Process Including Cultural Resources
September 13, 2019	Fairfax County Architectural Review Board Briefing
September 17, 2019	Public Meeting / Project Overview and NEPA Process Including Cultural Resources
October 8, 2019	Gum Springs Community Center – Project Overview and NEPA Process Including Cultural Resources; Solicited Interest from Community Members Willing to Participate in Ethnographic Research

In advance of the public meeting held on September 17, 2019, all public outreach notices contained the following statement:

In compliance with the NHPA (Section 106 and 36 CFR, Part 800), information concerning the potential effects of the proposed project on properties listed in or eligible for listing in the NRHP will be provided in the project’s environmental documentation and will be available for comment at this meeting.

4.6.4 Commitments

As stated above, DHR concurred with the Effects Assessment on February 17, 2021 on the premise that two conditions be met: the designs for the Hybla Valley, South County Center, Gum Springs, and any other BRT stations that are within the established visual APE and within the viewshed of identified historic properties, be provided to DHR prior to finalization and construction; and the noise wall design and location(s) that are within the established visual APE and within the viewshed of identified historic properties be provided to DHR prior to finalization and construction.

Two commitments specifically related to the Woodlawn Plantation property are also included here: that no stormwater management infrastructure will be installed on the Woodlawn Plantation property or the Woodlawn Cultural Landscape Historic District and that FCDOT will continue to seek ways to minimize permanent impacts to Woodlawn during detailed design and as part of the ROW acquisition process.

These commitments can also be found in the Project Commitments table (**Table 4-10**), found in **Section 4.15**.

4.7 SECTION 4(F) RESOURCES

4.7.1 Section 4(f) Regulatory Context

Section 4(f) of the USDOT Act of 1966 as amended (49 USC 303(c)) stipulates that the USDOT, including the FTA, cannot approve the use of land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or public or private historic site unless the following conditions apply:

- FTA determines that there is no feasible and prudent avoidance alternative to the use of land from the property, and the action includes all possible planning to minimize harm to the property resulting from such use (23 CFR §774.3(a)); or
- FTA determines that the use of the Section 4(f) properties, including any measures to minimize harm committed to by the applicant, will have a *de minimis* impact on the property (23 CFR §774.3(b)).

A use of Section 4(f) Property occurs when:

- Land is permanently incorporated into a transportation facility;
- There is a temporary occupancy of land that is adverse in terms of the Section 4(f) statute's preservationist purposes (23 CFR §774.13(d)); or
- There is a constructive use of a Section 4(f) property (23 CFR §774.15).

Permanent incorporation of land into a transportation project occurs as purchased ROW or the acquisition of sufficient property interests. Temporary occupancy of Section 4(f) land includes right-of-entry, project construction, a temporary easement, or other short-term arrangement.

A temporary occupancy will not constitute a Section 4(f) use when all of the following conditions listed in 23 CFR §774.13(d) are satisfied: duration must be temporary; scope of the work must be minor; no anticipated permanent adverse physical impacts nor any interference with the protected activities, features, or attributes of the property would occur on either a temporary or permanent basis; the land being used must be fully restored; and there must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the previously listed conditions.

A *de minimis* impact under 23 CFR §774.3(b) for historic sites means that no historic properties are affected by the project or that the project will have "no adverse effect" on the property in question, pursuant to 36 CFR §800, the implementing regulations of the NHPA of 1966. For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f).

4.7.2 Existing Conditions and Section 4(f) Use

Within the study corridor nine historic properties and three parks qualify as Section 4(f) properties. The nine historic properties were identified in the Section 106 APE: Woodlawn Plantation (029-0056), Mount Vernon High School (029-0230), Woodlawn Cultural Landscape Historic District (029-5181), Fort Belvoir Military Railroad Historic District (029-5724), Camp A.A. Humphreys Pump Station and Filter Building (029-0096), St. Louis Catholic Church and School (029-5149), A&A Rentals (029-6432), Fair Haven (DHR No. 029-6348), and Gum Springs Historic District (DHR No. 029-6581). The three parks are Little Hunting Creek Park, Vernon Heights Park, and Pole Road Park.

Table 4-7 lists the applicability of Section 4(f) to the nine historic and three park Section 4(f) properties.

The project would have no Section 4(f) use of the Little Hunting Creek, Vernon Heights, or Pole Road parks Section 4(f) properties. The LOD would completely avoid these parks with no impact to the property boundaries, function, or access. There would be no constructive use of these properties because the project would not substantially impair the protected features of the parks, which are used for recreational purposes and are surrounded by residential and commercial development. The project would not restrict access to the parks or their features, nor would changes in noise result in impairment to the properties' use.

The project would have no incorporation of land and therefore no Section 4(f) use of Fair Haven Historic District, St. Louis Catholic Church and School, Mount Vernon High School, Fort Belvoir Military Railroad Historic District, or Camp A.A. Humphreys Pump Station and Filter Building. The project terminus is north of Fort Belvoir Military Railroad Historic District and the Camp A.A. Humphreys Pump Station and Filter Building. At the Fair Haven Historic District, St. Louis Catholic Church and School, and Mount Vernon High School, the project would be constructed within the existing roadway ROW and would not require physical impact to these properties.

For the Gum Springs Historic District, permanent ROW acquisition and easements would be required from non-contributing properties in the district; however, there would be no temporary or permanent incorporation of any contributing elements. Therefore, there would be no Section 4(f) use of this property.

Table 4-7: Section 4(f) Properties and Potential Impacts

NAME	ID NUMBER	SECTION 4(f) USE
Fair Haven Historic District	029-6348	No Use; Temporary Occupancy Exception
Gum Springs Historic District	029-6581	No Use
A&A Rentals / Fire Station	029-6432	No Use; Temporary Occupancy Exception
St. Louis Catholic Church and School	029-5149	No use
Little Hunting Creek Park	N/A	No Use
Vernon Heights Park	N/A	No Use
Mount Vernon High School	029-0230	No Use
Pole Road Park	N/A	No Use
Woodlawn Plantation	029-0056/029-5181-0001/44FX1146	<i>De Minimis</i> (NRHP-listed property) No Use (NHL property)
Woodlawn Cultural Landscape Historic District	029-5181	<i>De Minimis</i>
Fort Belvoir Military Railroad Historic District	029-5724	No Use
Camp A.A. Humphreys Pump Station and Filter Building	029-0096	No Use

4.7.3 Temporary Occupancy Exception

The project would require a temporary construction easement of approximately 0.2 acres from the historic A&A Rentals property (DHR No. 029-6432) to reconstruct the existing driveway apron along Richmond Highway and allow for minor regrading. The reconstructed driveway apron would continue to provide access to the service bays and would not change the use of the property. The historic-age concrete wall located to the north of the driveway would remain in place. Reconstruction of the existing parking

lot pavement along the Franklin Street edge of the property may also be necessary. No other work is anticipated within the boundary of the property. This temporary construction easement is located in portions of the property that are paved with concrete and asphalt. Work proposed within the easement would not diminish the historic integrity of the property and would not result in an adverse effect per 36 CFR Part 800.5 and DHR's concurrence.

The project would require a temporary construction easement of approximately 0.1 acres from the Fair Haven Historic District (DHR No. 029-6348) for grading purposes. No other work is anticipated within the boundary of this historic property. This temporary construction easement is located within the roadway of Bellevue Avenue and in the front yards of two parcels. Work within the easement would not diminish the historic integrity of the district or result in an adverse effect per 36 CFR Part 800.5 and DHR's concurrence.

DHR concurred with the no adverse effect determination at the historic A&A Rentals property and the Fair Haven Historic District on February 17, 2021. Therefore, the temporary occupancy at historic A&A Rentals property and Fair Haven Historic District meets the criteria at 23 CFR 774.13(d)(1-4) and does not constitute a use under Section 4(f).

4.7.4 Description of *de minimis* Impacts

There would be incorporation of land from Woodlawn Plantation (DHR No. 029-0056) and Woodlawn Cultural Landscape Historic District (DHR No. 029-5181). The Historic Architectural Effects Assessment, which DHR concurred with on February 17, 2021, concluded that the project would have no adverse effect to these properties. FTA informed DHR of its intention to make a finding of *de minimis* Section 4(f) use of the Woodlawn Plantation and Woodlawn Cultural Landscape Historic District pursuant to Section 4(f) regulations at 23 CFR §774.3(b).

The project would require the permanent incorporation of roughly 0.5 acres and temporary construction easements of approximately 0.6 acres from Woodlawn Plantation and Woodlawn Cultural Landscape Historic District (**Figure 4-5**). The portion of the properties that would be acquired, or on which an easement would be located, has been modified by previous roadway and utility improvements. The incorporation and easement would not result in adverse effects to the historic properties or to any contributing elements of the historic properties, nor would it change the character of the properties' use or physical features that contribute to their significance. For these reasons, the Historic Architectural Effects Assessment concluded that the project would have no adverse effect to these properties.

DHR concurred with the finding of no adverse effect on February 17, 2021. Therefore, FTA has determined that the impact would be *de minimis* pursuant to Section 4(f). FTA informed DHR of its intention to make a finding of *de minimis* Section 4(f) use of the Woodlawn Plantation and Woodlawn Cultural Landscape Historic District pursuant to Section 4(f) regulations at 23 CFR §774.3(b).

Since FTA has determined the impact to Woodlawn Plantation and Woodlawn Cultural Landscape Historic District to be *de minimis* pursuant to Section 4(f), an evaluation of feasible and prudent avoidance alternatives and all possible planning to minimize harm is not necessary. Per 23 CFR 774.17, avoidance, minimization, mitigation, or enhancement measures have been included as part of a *de minimis* determination.

4.7.5 Commitments

Project commitments related to Section 4(f) resources are focused on A&A Rentals and the Woodlawn Plantation and Woodlawn Cultural Landscape Historic District. First, the land used at A&A Rentals (for the purpose of reconstructing the existing driveway apron and allowing for minor regrading) will be fully restored to a condition as least as good as that which existed prior to the project per temporary occupancy requirements. Second, no stormwater management infrastructure will be installed on the Woodlawn Plantation property or the Woodlawn Cultural Landscape Historic District; either existing infrastructure will be utilized or stormwater requirements will be managed within the existing VDOT ROW. These commitments can also be found in the Project Commitments table (**Table 4-10**), found in **Section 4.15**.

4.8 VISUAL IMPACTS

4.8.1 Methodology

The visual impacts of the project were assessed per a modified version of the Federal Highway Administration's (FHWA's) *Visual Impact Assessment for Highway Projects* (2015). Visual analyses are subjective; visual character terms are therefore descriptive and non-evaluative, meaning that they are based on defined attributes which are neither positive nor negative by themselves. Changes in visual character cannot be described as having positive or negative attributes until compared with viewer responses to the change.

4.8.2 Existing Conditions

The visual environment of the study corridor roadway is dominated by transportation elements. The land uses in the study corridor are predominantly commercial, industrial, government/military, and residential with little potential for scenic views from or toward Richmond Highway. These uses are readily visible from the roadway, sidewalks, and abutting properties. No cohesive streetscaping is present in the Richmond Highway study corridor. The existing visual quality of the study corridor is low due to its aging auto-centric character, principally comprised of commercial land uses.

The visual components of the project include bus stations, platforms, shelters, buses, signage, sidewalks, bike paths, and pavement markings. The most visible aspects of the project would be the stations and the dedicated BRT lanes. The proposed design would be based on the context of the local community to minimize impacts to views of prominent features along the study corridor. The stations would have more architectural design than typical bus stops and could be a positive addition to the visual quality of the areas where they would be located.

The visual impact of the project was determined by assessing the change in visual resources due to implementation of the project and predicting viewer response to that change. Visual impacts from a project arise when changes in visual context occur and elicit a non-neutral response from a viewer. The response can be positive or negative.

For the purposes of the visual analysis, the study area was divided into four Landscape Units, reflecting a consistency of viewshed or setting in each unit. Landscape Unit I extends along Kings Highway from the Huntington Metro Station to Richmond Highway; Landscape Unit II extends along Richmond Highway from Shields Avenue to Napper Road; Landscape Unit III extends along Richmond Highway from Napper Road to Jeff Todd Way; and Landscape Unit IV extends along Richmond Highway from Jeff Todd Way to Fairfax

County Parkway. Each unit was evaluated for the following characteristics: visual change, contextual compatibility, and viewer sensitivity. Contextual compatibility describes the compatibility of the project’s components with existing elements or character of the study corridor and is characterized as “compatible” or “incompatible.” Viewer sensitivity describes the level of response to the project’s components based on the frequency and duration of exposure that viewers face, and is characterized as “low,” “moderate,” or “high.” The overall value of impact describes the degree of impact by Landscape Unit and is characterized as “beneficial,” “adverse,” or “neutral.”

4.8.3 Description of Visual Impacts

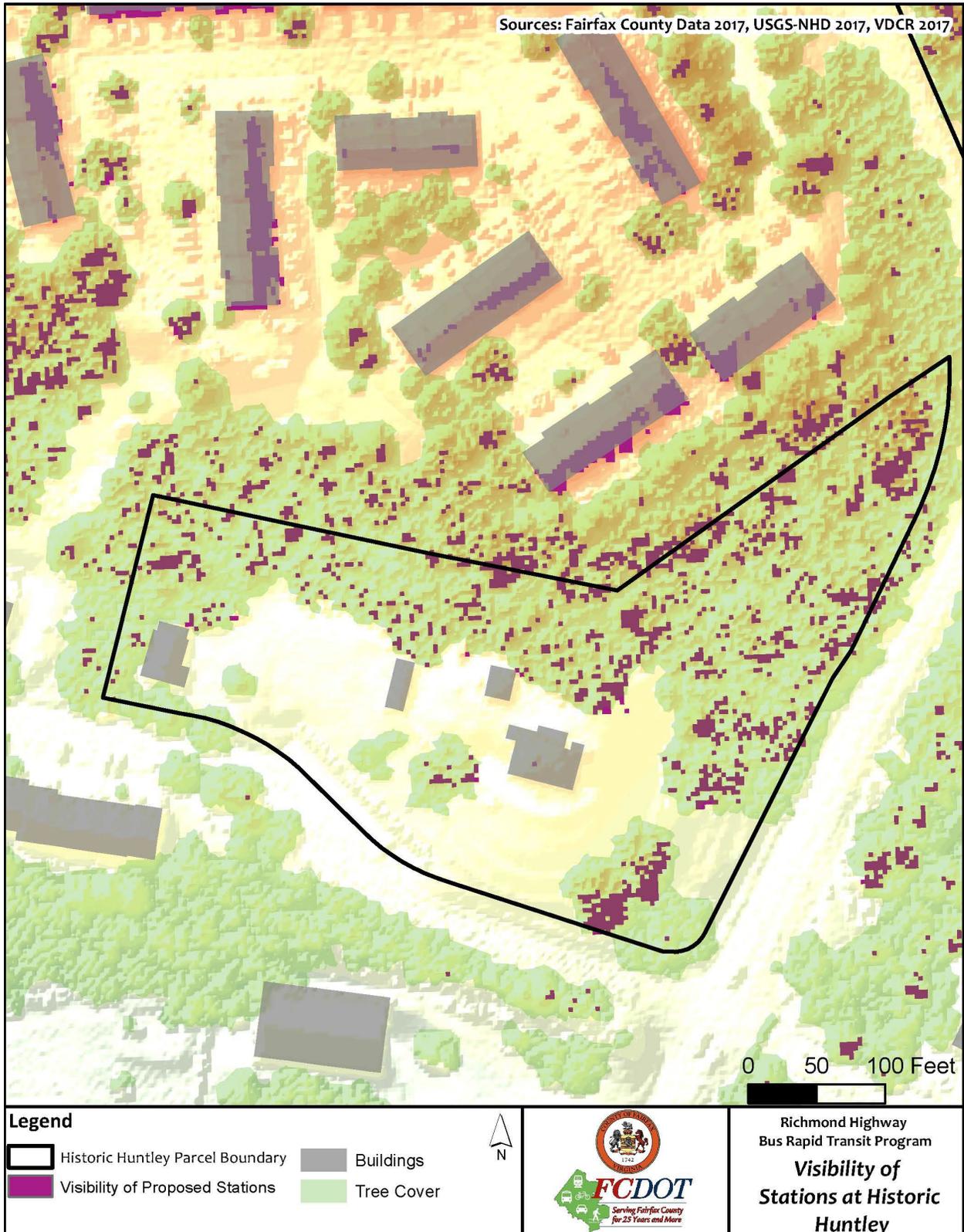
Throughout the study corridor, the project would add elements to the viewshed that are compatible with the existing roadway and surrounding land uses along Richmond Highway. Changes to the visual landscape include signage, pavement markings, roadway widening, and construction of BRT stations and pedestrian and bicycle improvements. These changes are described by Landscape Unit in **Table 4-8** below. Moderate viewer sensitivity to visual change was due in part to the possibility of stations blocking the view from adjacent properties and the level of exposure to user groups in the area. **Table 4-8** summarizes the characteristics of visual impact and provides an overall value of impact by Landscape Unit.

Table 4-8: Summary of Impacts to Visual Resources

	Landscape Unit I	Landscape Unit II	Landscape Unit III	Landscape Unit IV
Project Components / Visual Change	Improvements would be limited to signage, pavement markings, and construction of one BRT station at the Huntington Metro Station.	Roadway would be widened and reconstructed to accommodate median-running BRT and pedestrian and bicycle improvements. Five BRT stations would be constructed.	New BRT-dedicated lanes would be constructed in the median (being built as part of the VDOT project). Two BRT stations would be constructed.	New BRT-dedicated lanes would be constructed within the existing median. One BRT station would be constructed.
Contextual Compatibility	Compatible	Compatible	Compatible	Compatible
Viewer Sensitivity	Low	Low to Moderate	Low	Low
Overall Visual Effect	Neutral	Neutral	Neutral	Neutral

After receiving public comment regarding the visibility of the BRT stations from Historic Huntley, a GIS visibility assessment tool was employed to examine the viewshed. For the assessment, stations were assumed to be a maximum of 20 feet in height. The resulting analysis, which showed the locations from which the stations would be visible as purple dots, indicated that the stations may be visible from the rooftop vantage point of one Historic Huntley structure and no stations would be visible within open areas on Park Authority property (**Figure 4-6**).

Figure 4-6: Visibility of Stations at Historic Huntley



4.8.4 Minimization and Commitments

Several elements of the project would serve to minimize potential negative impacts of the project to visual quality and could potentially improve visual quality of the corridor. These measures would include landscaping to enhance the aesthetics of topography, structure, and lighting design along the corridor. The project team could proactively engage with affected communities to identify specific approaches that would best address concerns of highly sensitive viewers (such as residential communities). Visual quality impacts to visually sensitive areas including parks and historic sites would be similarly treated. Lighting for the BRT stations would be selected to minimize light pollution to surrounding residential communities. Stations would be designed to be compatible with the character of the surrounding land uses and would feature materials, colors, lighting, landscaping, and pedestrian facilities designed to minimize negative visual impacts on the surrounding streetscape. Specific mitigation measures would be determined and implemented if the project is advanced for design and construction.

Temporary visual impacts, such as visibility of construction materials and other equipment, would occur during construction, but would be relatively short-term. Short-term aesthetic or visual impacts from construction on the surrounding communities along the study corridor would include introduction of construction equipment, trucks, silt fencing, security fencing, construction markings, flagging tape, and walls surrounding proposed construction staging and laydown areas, and fugitive dust.

4.9 AIR QUALITY

An air quality study was conducted to identify existing conditions and model a future condition from which to determine impacts.

4.9.1 Existing air quality conditions

The United States Environmental Protection Agency (USEPA) Green Book lists the jurisdictions within which the project is located as being in attainment for all the National Ambient Air Quality Standards (NAAQS) except Ozone (O₃). The Virginia Department of Environmental Quality (VDEQ) has stated that this project is located within a Marginal 8-hour Ozone Nonattainment area, and a volatile organic compounds and nitrogen oxides Emissions Control Area.

The USEPA and VDEQ maintain a network of monitoring stations that sample ambient air pollutant concentrations. The carbon monoxide (CO) monitors for the project area did not exceed the NAAQS in 2019. The O₃ monitors exceeded the NAAQS in 2019.

The 2019 data shows the 0.070 parts per million standard was exceeded on one day at the South 18th and Hayes Street monitor and two days at the Lee Park, Telegraph Road monitor. Ozone is a regional pollutant; therefore, a conforming transportation plan and program (as discussed in the next section) confirm that mobile source emissions budgets established for the region for purposes of meeting the ozone NAAQS will not be exceeded by the project.

VDEQ issues an annual report summarizing air quality monitoring data for the previous year and updating long-term trend data for certain criteria pollutants including O₃. Ambient air quality trends over the previous decade for O₃ are generally downward, reflecting the benefit of emission reduction measures or programs implemented for both mobile sources (e.g., more stringent emission and fuel quality standards) and stationary sources (industry, etc.).

4.9.2 Project listing in MWCOG Constrained Long-Range Transportation Plan (CLRP) and TIP

The project is currently included in the National Capital Region Transportation Planning Board's (NCRTPB) Visualize 2045 Long-Range Transportation Plan (LRTP) as Constrained Element Identification 3496, and Fiscal Year 2021-2024 Transportation Improvement Program (TIP) (TIP ID 6680). These programs and plans account for regional emissions and not local effects. The major emissions concerned in construction are CO and PM, neither of which are required for analysis as the project location is not in an area subject to project-level conformity requirements for CO or PM. The Visualize 2045 Air Quality Conformity Analysis documents the air quality conformity analysis of the financially constrained element of the Visualize 2045 LRTP and FY2021-2024 TIP. The project is found in the Air Quality Conformity Analysis as Conformity Input Table identification number 808. The LRTP was approved on October 17, 2018 and the TIP and Air Quality Conformity Analysis were approved on March 18, 2020.

4.9.3 Project assessment

Project assessments are conducted to determine the appropriate level of analysis for a given project to meet all applicable regulatory requirements. An analysis of CO and Mobile Source Air Toxics was performed under the purview of NEPA using a worst-case modeling approach. The results demonstrate that, using very conservative assumptions, the Opening Year and Design Year for the project would not cause or contribute to a violation of the CO NAAQS within the Study Area, and thereby satisfy Clean Air Act requirements pertaining to CO.

4.9.4 Air quality impacts

The project was assessed for potential air quality impacts and compliance with applicable air quality regulations and requirements. The assessment indicated that the project would meet all applicable air quality requirements and federal and state transportation conformity regulations. As such, the project will not cause or contribute to a new violation, increase the frequency or severity of any violation, nor delay timely attainment of the NAAQS established by the USEPA.

4.10 HAZARDOUS MATERIALS

4.10.1 Methodology

A hazardous materials evaluation (Phase I Environmental Site Assessment) was undertaken to evaluate potential contamination issues associated with sites within and adjacent to the project corridor. The evaluation included a review of readily-accessible records concerning properties within one quarter mile on either side of the centerline of the study area corridor and a reconnaissance of sites identified with potential environmental conditions (PECs). The federal and state environmental databases reviewed for PECs within the study area included an Environmental Data Resources, Inc. Corridor Report of publicly-listed facilities of environmental significance, Environmental Assessments for four projects within the corridor, historical records including Sanborn maps and aerial photographs, and publicly-available soil and flooding information. Following the database, document, and physical setting sources review, a site reconnaissance was undertaken to verify current site conditions and identify PECs in the field. Verifying PECs in the field requires the identification of Underground Storage Tanks (USTs), Aboveground Storage Tanks (ASTs), 55-gallon drums, dumping piles, transformers, fuel dispensers, liquid pooling, and stressed vegetation. Only external visual observations of properties were made.

Based on the available information, sites of concern were ranked from low to high priority using the following prioritization criteria:

Low Priority:

- Site has no history of contamination or spills; and
- VDEQ cases are closed with good information on cleanup; and
- Site is down or cross gradient and greater than 250 feet but less than 500 feet from the alignment; or
- Site is a low quantity generator; or
- Site has single heating oil or less than 550-gallon historical or operable Underground Storage Tank installed after 1980 with no history of release; or
- Site has undergone significant redevelopment as a non-petroleum/hazardous waste handling site.

Moderate Priority:

- Site has history of contamination, dumping and/or spills; and
- VDEQ cases are closed with insufficient information regarding resolution; and
- Site is >500 feet up gradient of the alignment; or
- Site is down or cross gradient and greater than 100 feet but less than 250 feet from the alignment; or
- Site is only listed as historical dry cleaner or gasoline/auto station; or
- Site is a large quantity generator; or
- Site has multiple historical or operable USTs; or
- Hazardous waste disposal or storage onsite; or
- Violation notices.

High Priority:

- Site has history of contamination, dumping and/or spills; and
- VDEQ cases are open; and
- Site is less than 500-feet up gradient of the alignment; or
- Site is down or cross gradient and less than 100-feet from the alignment; or
- Site has multiple historical or operable USTs; or
- Voluntary Remediation Program (VRP) or Superfund site.

Sites were not included if they were more than a quarter mile from the alignment, if they had no history of contamination or spills, or if they were down or cross-gradient and greater than 500 feet from the proposed alignment.

4.10.2 Existing Conditions

Fifty-three properties in the project corridor were identified with 'high' or 'moderate' contaminant risks. These sites represent a risk for potential contaminant mobilization associated with sites of concern or PECs within the proposed project LOD. Due to the risks associated with these sites, a review of additional contaminant or hazard information or additional sampling investigations to determine the extents of impact based on the design and excavation extents are recommended. If contaminant impacts are

anticipated within the construction zone, additional characterization or remediation prior to mobilization is recommended. The 71 parcels with ‘low’ contaminant risks are not anticipated to involve potential mobilization associated with identified contaminant.

Based on the hazardous materials evaluation, soil samples were collected from select geotechnical boring locations at proposed BRT station locations across the corridor (Phase II Environmental Site Assessment). Soil samples were collected between zero and ten feet below ground surface during the geotechnical boring investigation that screened areas within the footprint of proposed BRT stations within the project corridor. Although the screening investigation did not identify contaminants of concern within the footprint of selected bus station locations, localized areas of contamination (‘hot spots’) may still be present within the final construction LOD.

4.10.3 Minimization and Commitments

As a precaution to minimize potential risks to human health and the environment, the following actions will be undertaken prior to project construction:

- Creation of an impacted materials handling plan for the delineation of potential contaminants in the event that suspect impacted material is identified during construction activities. The plan should include measures for defining an Area of Concern, Personal Protective Equipment, safety requirements for workers, and soil handling and disposal requirements should gross contamination be identified during construction activities.
- Screening of excavated materials within the Area of Concern with a photoionization detector or multi-gas meter, calibrated for potential contaminants of concern in the area as identified in the Hazardous Materials Technical report. If high volatile concentration levels or other indications of impact are identified, collect soil samples for laboratory analysis.
- Review of any analytical results by an environmental professional to evaluate potential changes to the health and safety, material handling, and off-site disposal requirements.

Due to the number of potential sites of concern identified along the study area, the selected contractor will also prepare and implement health and safety plans compliant with Occupational Safety and Health Administration 1910.120, *Hazardous Waste Operations and Emergency Response* for onsite workers. Fairfax County will include special provisions in the bid documents for the management of contaminated media should it be encountered during construction. These provisions should require the immediate notification of project personnel if such conditions are identified to ensure the appropriate safe handling, management, reporting, and disposal of impacted material.

4.11 NOISE AND VIBRATION

Noise and vibration studies were undertaken to quantify existing conditions and model a future condition from which to determine impacts. Additional detail on noise and vibration analysis and associated methodology can be found in the *Richmond Highway Bus Rapid Transit Project Noise and Vibration Technical Report* (FCDOT, 2021c).

4.11.1 Noise and Vibration Analysis Methodology

While the project is intended primarily to provide improved transit services, the dominant noise source in the project corridor during both daytime and nighttime hours is highway traffic noise, making transit noise

minimal by comparison. Therefore, per Section 4.1 of the FTA's *Transit Noise and Vibration Assessment Manual* (Report No. 0123, September 2018), FHWA NAC were used to assess potential noise impacts. Since the project involves the addition of rubber-tire transit vehicles, a vibration analysis was conducted using the FTA vibration screening procedure.

The noise analysis portion of this study was conducted in accordance with the FHWA and VDOT noise assessment regulations and guidelines. The FHWA regulations for assessment and mitigation of highway traffic noise in the planning and design of federally-aided highway projects are contained in Title 23 of the United States Code of Federal Regulations §772 (23 CFR 772). These regulations state that a "Type I" traffic noise analysis is required if through travel lanes or interchange ramps are added.

A preliminary noise evaluation was performed for the NEPA stage of the project; however, a more detailed review will be completed during final design. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable during the preliminary stage may meet the established criteria and be recommended for construction in final design.

4.11.2 Noise Analysis

The study area includes mostly residential land use and developments, as well as some exterior commercial land uses. All noise-sensitive receptors in the study area fall under Categories B, C, D, or E. Category B land uses consist of single-family, duplex, multi-story, and townhomes with exterior uses. Category C land uses consist of residential, church, and school recreational areas, as well as park land. Several Category D land uses, which are interior in nature, were identified, and include schools and places of worship. Category E land uses consist of hotel external use, which includes patios and swimming pools, as well as a fast-food exterior dining area.

To assess the degree of impact of highway traffic noise on human activity, the FHWA established NAC for different categories of land use. The NAC are given in terms of the hourly, A-weighted, equivalent sound level in decibels (dB(A)).

Traffic noise impacts occur if the predicted traffic noise levels approach or exceed FHWA-established NAC or if the predicted traffic noise levels are substantially higher than the existing noise levels (defined as 10 dB(A) by VDOT). To characterize existing and future noise levels at all noise-sensitive land uses in the Study Area, noise prediction receivers (known as "receptors") were added to measurement sites in the Traffic Noise Model. There are 1,742 receptors in the study area.

Receptors are grouped into CNEs with similar sources of noise and similar land uses within them.

Noise impacts in the 2040 Build Condition are predicted at 19 of the 69 CNEs within the 500-foot study limit. Within these 19 CNEs there are 168 receptors representing 165 residential homes and three recreational sites, which are predicted to experience noise levels that approach or exceed the NAC under the Design Year (2040) Build condition. If design year noise levels "approach or exceed" the NAC, then the activity is impacted, and a series of abatement measures must be considered.

Build noise levels in the 69 CNEs are almost entirely one to three dB(A) greater than existing levels. This highest predicted increase was 6 dB(A) in one CNE, but the predicted level was 51 dB(A). None of the CNEs

were predicted to experience a substantial increase in noise, defined as more than 10 dB(A).

Five institutional sites were assessed for Category D land use, and interior noise levels were predicted for each. No Category D impacts are predicted for the entire project area. No impacts to Category E outdoor areas are predicted.

Feasible and reasonable mitigation

VDOT guidelines recommend a variety of mitigation measures that should be considered in response to transportation-related noise impacts. For this project, noise barriers are the only feasible mitigation option for impacted receptors.

Noise barrier analyses are warranted for all CNEs with noise impacts. All studied noise barriers are assumed to be physically feasible and were evaluated at various lengths and panel heights to determine if they met acoustic feasibility, design goals, and reasonableness criteria. Acoustical feasibility is defined by VDOT as providing at least a five dB(A) highway traffic noise reduction at impacted receptors. Engineering feasibility is the determination that it is possible to design and construct the noise abatement measure and maintain access to adjacent properties and general access to adjacent properties. The reasonableness criteria require that the barriers meet the following three conditions:

- Cost effectiveness value,
- Noise reduction design goal, and
- The viewpoints of the benefited receptors.

To determine cost-effectiveness VDOT has established an approved cost based on a maximum square footage of abatement per benefited receptor, a value of 1,600 square feet per benefited receptor. The noise reduction design goal is a seven dB(A) reduction in noise. For noise barriers determined to be feasible and reasonable, the affected public that would benefit by the proposed mitigation would be given an opportunity to decide whether they were in favor of construction of the noise barrier.

Noise barrier analyses are warranted only for CNEs with predicted noise impacts under the Future Design Year (2040) Build condition. One potential noise barrier associated with this project was determined to be feasible and reasonable at CNE 21 (located on Richmond Highway between Belford Drive and Fordson Road). The additional potential barriers identified in the technical report will be finalized by the VDOT Richmond Highway Corridor Improvements Project. All barriers have been assessed under the FHWA methodology and are subject to the VDOT noise wall process. The VDOT noise wall process ensures that, for noise barriers determined to be feasible and reasonable, the affected property owners and renters that will be benefited by the proposed mitigation will be given an opportunity to decide whether they are in favor of construction of the noise barrier. Before final decisions and approvals can be made to construct a noise barrier, a final design noise analysis will be performed. For barriers that are determined to be feasible and reasonable, input from the owners and renters of those receptor units that will be benefited by the proposed mitigation may vote by completing and returning a citizen survey that they receive in the mail. Of the votes tallied, 50 percent or more must be in favor of a proposed noise barrier for that barrier to be considered further. Upon completion of the citizen survey, the VDOT Noise Abatement staff make recommendations to the Chief Engineer for approval. Approved barriers are then incorporated into the road project plans (VDOT, 2019).

4.11.3 Vibration Analysis

Ground-borne vibration can be a serious concern for nearby neighbors of a transit route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. However, in contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment. Construction impacts for the project are discussed in the section below.

Transit vibration impacts are assessed based on land use categories and sensitivity to vibration. Using the FTA's Vibration Screening Process, the project improvement would consist of the addition of rubber-tire bus vehicles. The surface of the additional bus lanes and stations for this project would be asphalt; therefore, irregular surfaces would not be present. Due to these conditions, vibration impacts would not be likely, and therefore no further analysis is required. The project is predicted to result in no impact from ground-borne vibration.

4.11.4 Construction Noise and Vibration

Land uses that are sensitive to traffic noise would also be sensitive to construction noise. The degree of construction noise impacts generated during the construction of the Project would vary, as the noise impacts are directly related to the types and number of equipment used and the proximity to the noise-sensitive land uses. Construction activities would be typical of roadway construction including grading, utility relocation, paving, construction of the stations, operating heavy earth-moving equipment and possibly pile-driving. Construction noise impacts would be temporary and would cease upon completion of construction.

The operation of construction equipment also causes ground vibrations that spread through the surrounding ground. While these vibrations tend to diminish over distance, depending upon the type of construction equipment, and duration of the activity, nearby sensitive receptors could be affected. Human annoyance is also dependent upon the extent, distance and duration of the vibration generating activities. Construction-related vibration rarely causes structural damage to normal building structures. However, some building damage can occur when construction-related activities are near older, more fragile historic buildings. As a result, construction-related vibration impact criteria give special consideration to these fragile buildings. Construction activities that typically generate the most severe vibration include blasting and impact pile driving. However, neither blasting nor pile driving is currently planned for BRT construction. Therefore, no prolonged annoyance nor damage from construction vibration is expected, and no quantitative assessment is necessary at this time.

4.11.5 Minimization and Commitments

If determined to be feasible and reasonable in the final design noise analysis and if agreed upon by a majority of the affected property owners and renters through a voting process (as described in **Section 4.11.2**), one noise wall would be constructed per the VDOT noise wall process.

FCDOT will develop construction phase noise and vibration minimization measures. FCDOT will consider conducting construction activities during the daytime as reasonably feasible; designating construction

vehicle routes to minimize disturbance to residents; locating stationary equipment away from residential areas to the extent reasonably feasible; employing noise control technologies to limit excessive noise when working near residences; and adequately notifying the public of construction operations and schedules.

Construction noise would be limited by adhering to VDOT specifications requiring that construction not exceed established noise limits. The specifications are as follows:

- The Contractor's operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels.
- The County may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 PM and 6 AM. If other hours are established by local ordinance, the local ordinance shall govern.
- Equipment shall in no way be altered so that resulting noise levels are greater than those produced by the original equipment.
- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

4.12 SAFETY AND SECURITY

Safety and security considerations as related to design and operation of the project are important to incorporate during the planning stage. Stations for the project would be designed using Crime Prevention Through Environmental Design principles to deter offender decisions that precede criminal acts. For example, all lighting for the platforms would be pedestrian-scaled to assist in facial recognition, and general street lighting would not be considered sufficient to meet this need even if it meets baseline lighting criteria levels.

In regard to pedestrian and bicycle facilities, Richmond Highway currently has low connectivity for these modes between the larger road network and points of interest. Large, commercial-use parcels are common in the corridor, resulting in very widely-spaced pedestrian crosswalks on Richmond Highway. The project would design crosswalks that would minimize conflicts between transit vehicles, automobiles, bicycles, and pedestrians. The project would install pedestrian and bicycle controls at signalized intersections like countdown signals and audible pedestrian pushbuttons. Crosswalks and bicycle lanes would be designated with signing and pavement markings.

4.13 NATURAL RESOURCES

Natural resource investigations were undertaken to determine existing conditions and determine potential impacts to resources.

The study area is highly urbanized, and any remaining natural areas are largely confined to major stream corridors and small forested areas between commercial and residential developments. Additional detail on natural resources in the corridor can be found in the *Richmond Highway Bus Rapid Transit Project Natural Resources Technical Report* (FCDOT, 2021b).

4.13.1 Water Quality and Waters of the US (WOTUS)

Water Quality

In compliance with Sections 303(d), 305(b), and 314 of the Federal Water Pollution Control Act (i.e., 1972 Clean Water Act (CWA) amended in 1977) and the Safe Drinking Water Act, VDEQ has developed a prioritized list of waterbodies that currently do not meet State water quality standards. Virginia's Water Quality Standards (9 Virginia Administrative Code (VAC) 25.260) define the water quality needed to support aquatic life, recreation, fish consumption, shellfishing, and public water supply by establishing numeric physical and chemical criteria. If a waterbody fails to meet the Water Quality Standards these waters are considered to be impaired and placed on the 303(d) list.

Existing Conditions

Using VDEQ water datasets, there are three Section 303(d) impaired perennial streams within the study area, as designated under Section 303(d) of the CWA: Little Hunting Creek (impaired for fish consumption), Dogue Creek (impaired for recreation), and Paul Springs Branch (impaired for aquatic life and recreation). Potential impacts to these streams were calculated by performing Geographic Information System (GIS) overlays of the LOD and the identified resources.

Environmental Consequences

The project would impact approximately four linear feet of Dogue Creek and ten linear feet of Little Hunting Creek. The impacts would be aerial in nature from bridge crossings. Stormwater management as part of the project design, implemented in accordance with county and state regulations, would minimize impacts to streams near and downstream of the project. Regulations and BMPs for stormwater management include utilizing the Virginia Runoff Reduction Method, the Virginia Stormwater Management Program, the Stormwater Nonpoint Nutrient Offset legislation, requirements of the Virginia General Permit, and requirements associated with the Chesapeake Bay Watershed Improvement Plan for the entirety of the project, and Fairfax County Article 4 of the Stormwater Management Ordinance and Chapter 6 of the Public Facilities Manual for the portion of the project south of Jeff Todd Way and north of Sherwood Hall Lane. The proposed BMPs provide a number of stormwater facilities to meet water quality and quantity requirements aimed at reducing scour and degradation of local streams and waterways delineated within the regulations. The proposed facilities may include bioretention facilities, wet ponds, and underground storage facilities. The large-scale facilities would be located adjacent to the roadway on public property or on parcels acquired for the project. The swales would be located in medians and buffer spaces along the roadway. The facilities would collect stormwater either via curb cuts or an inlet/pipe system, and include pre-treatment, storage, water quality filtering mechanisms, and infiltration where possible. All facilities would have underdrains and membranes to prevent unwanted water intrusion into the roadway and structures. The large facilities could potentially be enhanced with public amenities.

Ultimately, stormwater management for the project would improve water quality and reduce water quantity resulting from the project area. Phosphorus and other nutrient loads would be reduced by an anticipated 20 percent, and peak flows would be reduced to near pristine conditions. Additionally, the project would provide stormwater storage for more than 1.5 million gallons of stormwater, preventing degradation of and erosion in local streams.

Streams

The Richmond Highway corridor intersects six streams within the Middle Potomac-Anacostia-Occoquan watershed. The streams, from south to north, include: two tributaries to Accotink Creek (Mason Run and an unnamed tributary), Dogue Creek and North Fork Dogue Creek, and Little Hunting Creek (which it crosses twice) and its tributary, Paul Springs Branch. These streams ultimately drain into the Potomac River, a tidally influenced system.

Approximately 216 linear feet of stream impacts would occur during activities such as excavation, fill, and creation of construction access due to culvert extensions.

Wetlands

A field delineation of wetlands within the project study area identified approximately 1.6 acre of wetlands. Less than one-tenth of an acre of wetland impacts would occur during activities such as excavation, fill, and creation of construction access due to filling slopes at culvert extensions.

Permitting

The project should qualify for a USACE Nationwide 14 permit, a VDEQ 401 certification, a Virginia Marine Resources Commission subaqueous bed permit, and a VDEQ stormwater permit.

4.13.2 Floodplains

Several federal directives regulate construction in floodplains to ensure that consideration is given to avoidance and mitigation of adverse effects to floodplains. These federal directives include the National Flood Insurance Act of 1968, EO 11988, and the USDOT Order 5650.2 entitled, *Floodplain Management and Protection*. The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP), which is administered by the Federal Emergency Management Agency (FEMA). To reduce the risk of flood loss and to minimize the impact of floods on human safety, while preserving the natural beneficial values of floodplains, EO 11988, *Floodplain Management*, requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with construction within and modification of floodplains. The order also requires agencies to avoid direct and indirect support of floodplain development wherever there is a practical alternative. USDOT Order 5650.2 guides the implementation of EO 11988 and requires the detailed consideration of impacts to floodplains, as well as avoidance and minimization.

In Virginia, the Virginia Department of Conservation and Recreation is responsible for coordination of all state floodplain programs. Development within floodplains is also regulated by local flood insurance programs administered by localities under the NFIP. As delineated in Section 104-1-8 of the Fairfax County Code of Ordinances, the current Virginia Erosion and Sediment Control Handbook and the Public Facilities Manual will be employed to ensure Erosion and Sediment control standards are met.

Existing Conditions

Approximately 15 acres of FEMA-mapped 100-year floodplains exist within the study area. The 100-year floodplain includes those areas that statistically have a one percent chance of being flooded in any given

year. The 100-year floodplains occurring with the study area are associated with Accotink Creek, Dogue Creek, North Fork Dogue Creek, and Little Hunting Creek.

Environmental Consequences

The project would encroach upon approximately 0.2 acre of regulated floodplains, mostly from the perpendicular crossing of floodplains. Perpendicular crossings would result in less floodplain fill, maximizing floodwater conveyance and storage compared to longitudinal encroachments. The actual encroachment may be different based upon the total extent of fill required for construction and the use of bridges at the major water crossings. The project is not expected to increase flood elevations, the probability of flooding, or the potential for property loss and hazard to life.

The project is consistent with local land use plans and is not projected to either encourage or accelerate growth or changes in land use within floodplains. Therefore, the project would not encourage, induce, allow, serve, support, or otherwise facilitate incompatible base floodplain development.

Virginia Coastal Zone Management Program

The study area is located within Virginia's coastal zone, and the project would disturb land within Virginia's coastal zone. The project would be designed to be in compliance with the applicable Enforceable Regulatory Programs that comprise Virginia's Coastal Zone Management Program. Should it be determined during the permit process that the project requires an individual permit, a Coastal Zone Management Consistency Certification will be pursued.

4.13.3 Vegetation – Invasive Species

The Virginia Department of Conservation and Recreation Division of Natural Heritage, in association with the Virginia Native Plant Society, has identified and listed approximately 90 invasive plant species that are known to threaten Virginia's natural populations. The list is divided into three regions: Coastal Plain, Piedmont, and Mountains. This list also classifies each species by level of invasiveness, including High, Medium, and Occasional. Highly invasive species generally disrupt ecosystem processes and cause major alterations in plant community and overall structure. They can easily establish themselves in undisturbed habitats and colonize disturbed areas rapidly under the appropriate conditions. While plants with medium and low invasiveness can become management problems, they tend to have less adverse effects on natural systems and are more easily managed.

Existing Conditions

The Richmond Highway corridor is located within the Coastal Plain region. The highly invasive plant species identified at the WOUS field investigation data points include lesser celandine (*Ficaria verna*), multiflora rose (*Rosa multiflora*), Japanese stiltgrass (*Microstegium vimineum*), and Japanese honeysuckle (*Lonicera japonica*).

Environmental Consequences

The project has the potential to introduce invasive species. While most of the area within the LOD is previously disturbed by a myriad of development activities, the disturbance of natural areas as well as the

removal and transfer of fill from borrow sites within the LOD or offsite locations could spread invasive species.

4.13.4 Wildlife and Habitat

Existing Conditions

The project would primarily be within existing transportation ROW, which consists of poor-quality habitat and habitat fragmentation from existing urban development. As such, the project area is not anticipated to support terrestrial threatened or endangered species.

Environmental Consequences

Potential impacts from the project would not exacerbate existing conditions through the removal of vegetation. However, it would impact approximately 1.2 acre of forested land. These actions would likely cause animal migration away from the disturbance and a temporary reduction in habitat usage by mostly common edge-dwelling species. Due to poor quality and fragmentation from urban development, habitat located within the LOD is not anticipated to support terrestrial threatened or endangered species.

4.13.5 Threatened and Endangered Species

Federal and state agencies regulate and manage activities associated with terrestrial wildlife and their habitats on conserved lands and through the enforcement of laws related to hunting and fishing. The USFWS has statutory authority and responsibility for enforcing the Migratory Bird Treaty Act. The USFWS and VDWR act as consulting agencies under the US Fish and Wildlife Coordination Act. Their role in these procedures is to determine likely effects or impacts on special status and protected species and habitats, and to recommend appropriate measures to avoid, reduce, or compensate for those impacts (Virginia Department of Wildlife Resources (VDWR), 2016a).

The VDWR is currently evaluating the establishment of new regulations to define their role and authority for migratory birds in Virginia. These new regulations will be considered during the permitting phase of the project.

Existing Conditions

Table 4-9 presents the species identified by USFWS and VDWR that are currently listed as threatened or endangered that are known to occur in the vicinity of the study area along with each species’ listed status.

Table 4-9: Threatened and Endangered Species Mapped Within the Vicinity of the Study Area

Species	Status
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Federally and State Threatened
Tri-colored Bat (<i>Perimyotis subflavus</i>)	State Endangered
Wood Turtle (<i>Glyptemys insculpta</i>)	State Threatened
Peregrine Falcon (<i>Falco peregrinus</i>)	State Threatened

For the Northern Long-eared bat (NELB), the nearest confirmed hibernacula occur approximately 92 miles to the west of the study area, in Rockingham County, and the nearest recorded roosts are located approximately 151 miles to the south in the City of Chesapeake (VDWR, 2021b).

For the Tri-colored Bat, there are no confirmed hibernacula located within the vicinity of the study area (VDWR, 2021c).

For the Wood Turtle, observations have previously occurred along Accotink Creek and Dogue Creek (VDWR, 2021a).

For the Peregrine Falcon, no resident occurrences are known for Fairfax County (VDWR, 2021a).

Environmental Consequences

Northern Long-eared Bat (NLEB) and Tri-colored Bat

Approximately 1.2 acre of low-quality forested habitat within highly developed areas was identified within the LOD. These highly developed areas and the existing roadway infrastructure limit the probability of travel corridors for NLEBs and tri-colored bats in the LOD. These areas are all unlikely to be utilized as roosts by NLEB, or the tri-colored bat, as roosts would not be expected in close proximity to the existing transportation corridor. In addition, as stated earlier, according to the VDWR Northern Long-Eared Bat Winter Habitat and Roost Trees Application (VDWR, 2021b), no confirmed NLEB maternity roost trees or hibernacula are located within five miles of the study area and no tri-colored bat hibernaculum have been confirmed within five miles of the study area with use of the Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application (VDWR, 2021c). Therefore, harm to roosting NLEB from tree removal would be unlikely in these areas. The tri-colored bat could roost in trees/foliage, yet the VDWR has stated that they have not tracked and are not aware of any tri-colored bat roost trees in Virginia (VDWR, 2016). As such, harm to roosting tri-colored bat due to tree removal in the LOD is unlikely.

A field survey for tri-colored bat roost sites could support CWA permitting of the project. If no roosts are identified with the survey, then VDWR may not institute a Time of Year Restriction (TOYR) for tree clearing activities in regard to the tri-colored bat. If a survey is not conducted, the VDWR may institute a TOYR extending from April 1 through October 31 for tree removal activities within suitable forested habitat. Use of these TOYR would offset potential direct impacts, would mitigate indirect effects outside of the area of direct impact, and should result in a “not likely to adversely affect” determination from the resource agencies.

The project is consistent with activities analyzed in the USFWS *Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat* on the Final 4(d) Rule. The project may affect the NLEB; however, any take that may occur as a result of the project is not prohibited under the ESA Section 4(d) rule adopted for the species at 50 CFR §17.40(o). Please refer to the *Richmond Highway Bus Rapid Transit Project Natural Resources Technical Report* (FCDOT, 2021b) for more information.

Peregrine Falcon

No resident occurrences of peregrine falcons are known for Fairfax County (VDWR, 2021a). Peregrine falcons are known to inhabit bridges within coastal Virginia; however, these bridges do not occur within the study area. Therefore, no mitigation or avoidance measures are proposed for this species.

Wood Turtle

The section of Dogue Creek located within the LOD which is considered a T&E Water contains low quality habitat for the wood turtle given its proximity to the existing road edge. Because of this low quality, there are no anticipated impacts to the wood turtle.

4.13.6 Minimization and Commitments

Stormwater management as part of the project design, implemented in accordance with county and state regulations, would minimize impacts to streams near and downstream of the project.

Mitigation measures for water quality would be discussed during the permit procurement process.

Impacts to streams and wetlands would be minimized to the greatest extent practicable. If during the Water Quality permitting phase, the USACE or VDEQ determines compensatory mitigation is required, the County will evaluate onsite compensation opportunities. If no onsite opportunities are available, the County will secure competitive bids from approved stream or wetland banks to purchase credits. If no credits are available, a trust fund payment will be secured. This would be undertaken in accordance with the 2008 *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule*. Mitigation measures would be discussed during the permit procurement process.

Efforts to minimize floodplain encroachment would be considered during advanced design to avoid or minimize impacts on natural and beneficial floodplain values.

In accordance with EO 13112, *Invasive Species*, the spread of invasive species under the project would be minimized by requiring prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law. Specific seed mixes that are free of noxious or invasive species may be required for environmentally sensitive areas and would be determined during the design and permitting process. Because much of the construction under the project would be along existing disturbed corridors, the addition of invasive animal species is expected to be minimal.

If implemented, a TOYR for tree clearing activities for the tri-colored bat would offset potential direct impacts, would mitigate indirect effects outside of the area of direct impact, and should result in a “not likely to adversely affect” determination from the resource agencies.

4.14 INDIRECT AND CUMULATIVE EFFECTS

4.14.1 Definitions and Methodology

Indirect effects are those that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Cumulative effects are the incremental effects of the action when considered in the context of other past, present, and reasonably foreseeable actions. Cumulative effects consider the compounding impacts of actions taking place over a period of time.

The following study areas were considered for the Indirect and Cumulative Effects (ICE) analysis:

Induced Growth ICE Study Area: one-half mile around each proposed transit station.

Socioeconomic Resources ICE Study Area: includes the Census block groups within or partially within one-half mile of the study corridor.

Natural Resources ICE Study Area: includes the subwatersheds encompassing the project's direct impact area, subwatersheds near and downstream of the project corridor, and Huntley Meadows Park.

Historic Resources ICE Study Areas: the Historic Resources ICE Study Area for Historic Architecture is the same as the APE for Historic Architecture, and the Historic Resources ICE Study Area for Archaeology overlaps with the Archaeological Field Review Area.

4.14.2 Indirect Effects

Indirect Effects were analyzed as encroachment effects and induced growth effects. Encroachment effects consider the alteration of the behavior and functioning of the resources caused by the project's encroachment on the environment. Induced growth effects are those that might influence development adjacent to the project.

Socioeconomic Resources

Since most of the project would be constructed within the existing Richmond Highway ROW, the project would not separate or isolate any communities or community facilities along the study corridor. Community impacts would occur only along the edges of existing communities abutting the existing highway facility; no residential areas would be bisected and no new barriers to local movement through communities would result.

Beneficial effects on transit access to community facilities would result from the project's enhanced transit service. The project could also improve access to adjacent communities and community facilities by reducing congestion, improving safety, and enhancing pedestrian and bicycle facilities along the study corridor.

Increased transit access could lead to greater demand for land use development, or induced growth, particularly in the vicinity of the proposed BRT stations. The regional strategy for directing growth is based on an Activity Centers concept, advanced by the Region Forward Coalition and member organizations, including the Metropolitan Washington Council of Governments (MWCOG). Activity Centers are focal areas for population density and employment and are part of a combined land use and transportation strategy for directing strategic growth and investment across the region. The Activity Centers in the project area vicinity include Huntington/Penn Daw, Beacon/Groveton, Hybla Valley / Gum Springs, and Fort Belvoir. The Fairfax County Comprehensive Plan uses a similar Community Business Centers concept. County policies anticipate growth to concentrate in these areas, thereby increasing the density of housing and employment activity on the corridor and necessitating additional travel capacity to support and enable growth. Therefore, the proposed BRT improvements would be consistent with future growth planned for the corridor.

Future growth along the corridor supported by the proposed improvements could have effects on community character and land use of neighborhoods, particularly those in close proximity to the proposed stations. It is anticipated that this growth would be guided through local and regional comprehensive planning processes that incorporate public input and consideration of existing communities and

businesses. Some adverse effects, such as changing character of neighborhoods, could result from new growth. The project would support long-term economic growth, potentially resulting in increased business and service providers and increased employment the area. Growth and development in the area, supported by increased transit accessibility, could also improve access to services, with greater population and demand leading to more community facilities to provide services to more people.

Planned growth in the area could be beneficial to low-income populations as new, accessible employment opportunities could emerge and potentially transit-dependent populations would be provided with greater mobility via the proposed BRT transit service. Development of new housing stock could potentially provide new housing options to low-income and minority populations. Planned growth could also be adverse to low-income populations along the corridor if property values increase from greater demand. The overall impact to low-income populations from changes in land use and property development cannot be reasonably predicted based on available information and would likely depend largely on market forces and policies implemented by local zoning and development authorities. Given the potential benefits to low-income populations from mobility provided by the proposed new BRT service, many of whom are transit-dependent, it is not anticipated that reasonably foreseeable, disproportionately high and adverse indirect effects would occur to minority and/or low-income populations residing along Richmond Highway in the study area.

Historic Resources

All effects to archaeological and historic architectural properties, including indirect effects, have been considered under Section 106 of the NHPA as described in both the *Archaeological Assessment Technical Report* (Fairfax County, 2019) and the *Historic Architectural Survey Technical Report* (Fairfax County, 2019) and related materials prepared for the Richmond Highway BRT Project.

Potentially easier access to historic properties along the Richmond Highway corridor from the addition of the BRT stations could foster increased visitation to historic properties. This would be beneficial if access to historic properties is controlled, as increasing historic tourism provides incentives and means for preservation. While not anticipated, uncontrolled increased visitation may result in overuse to the point of adversely affecting integrity. Major historic property attractions developed for public interpretation in the Historic Resources ICE Study Area include the Woodlawn Plantation and Pope-Leighey House. Access to the Woodlawn Plantation and Pope-Leighey House is controlled.

During construction, access to historic properties could be temporarily impacted by road closures and detours, and loss of parking, potentially affecting visitation. These construction effects would be short term.

New construction or rehabilitation associated with induced growth has the potential to adversely affect historic archaeological and architectural properties through demolition, excavation, and vibration effects; changing the design, materials, or workmanship of a property; or altering the setting, feeling, and association of historic properties. Development projects funded, permitted, or on lands controlled by federal and state agencies must comply with Section 106 of the NHPA and the Virginia Antiquities Act and Burial Law, respectively, and therefore must consider the impacts of their undertakings on historic properties.

Natural Resources

The project would directly impact less than one tenth of an acre, or 216 linear feet of streams; approximately 0.1 acres of wetlands; and one acre of forested land.

The project would widen an existing roadway in a highly urbanized area; incrementally increasing the width of the roadway would not exacerbate existing habitat fragmentation from urban development in the study area. Habitat fragmentation can reduce the functioning of natural areas by isolating patches of habitat, preventing wildlife movement and causing edge effects and indirect loss of ecosystem function. Potential for indirect impacts to wildlife could occur due to the removal of vegetation for construction, which could serve as habitat for mostly common edge-dwelling species. Due to poor quality and existing fragmentation from urban development, habitat located within the LOD is not anticipated to support terrestrial threatened or endangered species. Long-term indirect effects to wildlife could include the introduction of invasive species and loss of vegetation serving as a food source.

Direct effects to wetlands, streams, and floodplains may indirectly change hydrologic flow dynamics through adjacent natural communities up or downstream, which sometimes alters these dynamics at the ecosystem level such that the ability of the system to maintain itself is altered. Some of the potential indirect effects that may occur because of changes to natural processes in the wetlands of the Natural Resources ICE Study Area include changes to floodwater storage capacity and retention times, vegetative community composition and structure, nutrient cycling, and aquatic life movement. These indirect effects can alter wetland functions such as habitat, plant community, and carbon cycling.

The indirect impacts of the project to hydrology associated with any given stream, wetland, floodplain or open water crossing would be limited, as the project is confined to adding a median-running transitway to an existing corridor and the accompanying roadway widening, improvements, and stormwater management associated with this action.

The increased impervious surface from the project could indirectly increase the amount and velocity of runoff, amplifying the severity of flooding and erosion. Runoff would also pick up more sediment from disturbed soils and contaminants that could be deposited downstream, reducing water quality and impairing both human and wildlife uses. Runoff from roadways could contain heavy metals, salt, and associated materials, organic compounds, and nutrients. When runoff enters waters that are already impaired, the impacts are cumulative and can result in accelerated changes in the microbenthic community structure and composition, which in turn can affect the fish and amphibian populations that rely on them as a food source, as well as the birds and aquatic mammals that prey on the fish and amphibians. The effects can result in changes in community structure at a local level but may also extend further to include changes in ecosystem structure and function in the absence of proper mitigation.

Development associated with induced growth in the Induced Growth ICE Study Area could impact wetlands, streams, and floodplain areas, or further fragment habitat. The growth strategies identified in regional and local comprehensive planning documents aim to concentrate land use growth into activity centers supported by transit infrastructure (described above under Socioeconomic Resources). This could help to direct growth into planned, already urbanized areas, potentially diverting unplanned growth or urban sprawl away from rural areas with more remaining natural resources. The specific impacts and extent of any future growth cannot be reasonably predicted and is largely dependent on market forces and policies implemented by zoning and development authorities. Should future induced growth and development in the vicinity of the project's BRT stations impact regulated waters, wetlands, streams, or

floodplains, that individual development could be subject to review, approval, and/or permits from local, state, or federal agencies before any impacts would occur. Re-development of already-developed areas could be required to replace outdated stormwater control and drainage systems and replace impervious surfaces with more permeable surfaces, lessening impacts to water quality that may otherwise occur.

4.14.3 Cumulative Effects

Cumulative effects consist of the direct and indirect effects of the Richmond Highway BRT in combination with the impacts of past, present, and reasonably foreseeable actions. Past, present, and reasonably foreseeable actions have already affected or have the potential to affect land use and socioeconomic, natural, or historic resources, as does the Richmond Highway BRT. Cumulatively, past, present, and reasonably foreseeable actions have had an adverse impact on natural and historic resources, and both adverse and beneficial impacts on socioeconomic resources.

Transportation and development projects have contributed to the pattern of growth within the Cumulative Effects study area. Several notable actions along the Project corridor are planned or have been recently completed. The VDOT Richmond Highway Route 1 Corridor Improvements Project, which received a FONSI in October 2020, is currently in design and will be widening roughly three miles of Richmond Highway between Route 235 (Mount Vernon Highway at Jeff Todd Way) and Sherwood Hall Lane from four lanes to six lanes. Construction on the VDOT project is anticipated to begin as early as 2025 and will be completed within three to four years. Construction on the VDOT Richmond Highway Route 1 Corridor Improvements Project would be coordinated with construction on the Richmond Highway BRT Project. Another project in the corridor, the Richmond Highway Widening Project, completed in 2017, extends through Fort Belvoir along Richmond Highway from Telegraph Road north to Jeff Todd Way. These transportation actions have contributed to and will contribute to cumulative effects on resources affected by the Richmond Highway BRT. These and other actions are identified in the MWCOG's *Financially Constrained Long-Range Transportation Plan (CLRP) for the National Capital Region* (NCRTPB, 2016a), MWCOG Fiscal Year 2019-2024 TIP (NCRTPB, 2018a), Commonwealth of Virginia State TIP (2017), VDOT's Six-Year Improvement Program (2018b), MWCOG's *National Capital Region Freight Plan* (NCRTP, 2016b), and Fairfax County's Capital Improvement Program (2018).

Socioeconomic

Actions of the past and current projects have changed land uses along the corridor from rural to developed commercial and residential land uses. As Richmond Highway became more formalized as a major north-south roadway in the area, the land around it became further developed and built out. Economic development in the form of new businesses and jobs came to the region, and communities formed along the corridor. Community facilities were added to serve the people who lived there. Land use intensification in the region has contributed to increased benefits to society from expanding communities with burgeoning employment and increased standards of living but has also contributed to a steady decline in natural and historic resource conditions in the respective study areas.

Past and present actions have had some adverse impacts to community cohesion. These actions include the incremental widening of Richmond Highway and the associated greater distance between communities on either side of the highway. Prior transportation projects have had impacts to residences and businesses adjacent to the highway such as relocations.

The Richmond Highway BRT would have both beneficial and adverse impacts to local businesses and jobs. While the project would necessitate some business and commercial relocations, improved transit and induced growth around BRT stations could attract new businesses and job opportunities. Local plans, as described earlier in this document, have already proposed redevelopment or infill development in the corridor, which is consistent with future growth and development anticipated with the Induced Growth ICE Study Area.

Past actions established the development patterns and existing land uses, which in turn have created a need for greater transit access to support the existing and future planned land uses. The project may cumulatively impact some of the same communities adjacent to the highway that have been affected by other projects, particularly other actions to widen Richmond Highway. Overall, the incremental effect of the project would be of a lower magnitude compared to the numerous prior actions that have shaped socioeconomic conditions in the corridor.

Natural Resources

The Richmond Highway BRT would have a small, incremental contribution to cumulative effects on natural resources in the corridor. Past and present growth and development has resulted in a largely built-out commercial corridor, resulting in the loss of natural ecosystems and rural land uses. Past actions that took place as the corridor urbanized occurred without the benefit of modern stormwater management techniques or water quality regulations. Past actions also resulted in the loss and fragmentation of much of the terrestrial wildlife habitat that previously existed in the ICE Study Area. Impairment to wildlife habitat occurred prior to the enactment of a number of major environmental regulations. Since that time, environmental regulations, natural resource planning, and restoration efforts have reduced adverse natural resource impacts from what would otherwise have continued to occur. Present and reasonably foreseeable actions would include protections to wetlands, floodplains, water quality, and rare, threatened, and endangered species afforded protection by federal, state, and local regulations. Additionally, local comprehensive planning includes natural resource management plans that aim to preserve remaining high-value wildlife habitat and water quality by directing growth to specific areas and densities, with the goal of sustaining natural resources for the future.

The Richmond Highway BRT would make improvements on an existing roadway in a highly urbanized area that has been previously disturbed. Direct effects would include impacts to wetlands, streams, and floodplains due to the placement of fill, as well as direct loss of wildlife habitat due to vegetation clearing and earth-moving. Indirect effects to these resources would include changes in water quality, increased runoff, changes in hydrologic regime, changes in light regime, introduction of invasive species, alteration of drainage patterns, potential changes in flood flow elevations, animal-vehicle collisions, noise, and potential for oil spills. These direct and indirect effects would be minimized by implementing BMPs and compensatory mitigation.

Construction and post-construction of the Richmond Highway BRT would potentially contribute to minor, localized increases in pollutants and nutrients causing impairment to waterways. Drainage design for the new proposed bridges would be developed in later design phases and would be in conformance with current stormwater regulations in order to minimize effects to natural resources and water quality. Since construction of the Richmond Highway BRT would upgrade and replace current stormwater management

systems, implementation of the Richmond Highway BRT would improve roadway runoff water quality from current conditions.

Because much of the Natural Resources ICE Study Area is developed, wildlife habitat and corridors are highly fragmented. Habitat is most intact within the parks in the study area, including Huntley Meadows Park, which is outside of the project's area of direct effects.

4.14.4 Overall Impact

Because the project would result in improvements along an existing developed transportation corridor, detrimental indirect effects to communities in the vicinity are not anticipated. Neighborhoods would not be bisected, and impacts would occur along the edges of developed areas where they abut against the highway. The project could lead to increased demand for new development, infill and intensified land uses, particularly in close proximity to the proposed BRT stations. This is consistent with the planned regional strategy of concentrating growth into activity centers, promoting densified urban development supported by public transit infrastructure. The project would not exacerbate existing habitat fragmentation but could have detrimental effects on downstream water quality. Such impacts would be accounted for in the Section 404 permitting process. Potential indirect effects to historic resources would be both beneficial (related to greater access) and potentially detrimental (from increased development in the vicinity).

Past and present actions have shaped the current state of land use and socioeconomic, natural, and historic resources within the respective ICE study areas; these actions have been both beneficial and adverse. Future actions would be both beneficial and adverse to socioeconomic resources and land use, and primarily adverse to natural and historic resources. Impacted residential areas directly adjacent to the highway may have, in some instances, been impacted by prior actions resulting in a cumulative effect. The overall magnitude of the project would be relatively small compared to the numerous other past, present, and reasonably foreseeable actions in the study areas. Previous and current actions have established patterns of land use and development that have generated the need for new transit service along the corridor. Thus, the incremental effect of the project, considered in light of the numerous other actions, would be relatively minor and largely beneficial for communities and residents. The relatively small direct impacts to natural resources would be an adverse cumulative addition to prior actions, but comparatively small in magnitude, and in areas that are already urbanized. Additionally, adherence to current and future regulatory requirements and planning practices would minimize the adverse cumulative effects of the project, and other present and future projects on natural and historic resources in the study area.

4.15 PROJECT COMMITMENTS

Table 4-10 captures the minimization measures and commitments of the project. FCDOT is responsible for actions in the table.

Table 4-10: Project Commitments

ENVIRONMENTAL RESOURCE	COMMITMENTS	TIMING
Operations and Maintenance Facility Section 3.4	FCDOT will enter into an agreement with WMATA to use WMATA’s existing Cinder Bed Road Operations and Maintenance Facility.	2024
Right-of-Way, Land Use, and Zoning Section 4.1	All ROW acquisitions will be performed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and the FTA Awards Management Circular 5010.1E to ensure the fair and equitable treatment of persons displaced as a result of federal and federally assisted programs. Refer to Section 4.3.8 for more detail about the Uniform Act.	Prior to construction
Community Facilities, and Community Cohesion Section 4.2	<ul style="list-style-type: none"> • Access to community facilities will be maintained throughout construction. • A construction mitigation plan will be prepared at later project stages to specify communications and construction means and methods to reduce inconveniences of construction. Impacts from construction will be minimized through mitigation measures such as scheduling construction to avoid loudest noise at sensitive times, dust control measures, advance notice of road closures, and clear signing of detour routes. • The retaining wall at the St. Louis Catholic Church and School will be implemented per 30 percent design plans. 	<ul style="list-style-type: none"> • During construction • Prior to construction • During construction
Minority and Low-Income Populations (Environmental Justice Populations) Section 4.3	<ul style="list-style-type: none"> • FCDOT will mitigate displacements in accordance with the Uniform Act and FTA’s Awards Management Circular 5010.1E requiring that affected owners be justly compensated, including relocation benefits where eligible. Refer to Section 4.3.8 for more detail. • Equity in services will be provided by the project in accordance with Title VI of the 1964 Civil Rights Act and the USDOT EJ Order and the FTA EJ Circular. • The station design at Gum Springs, which splits the northbound and southbound BRT platforms at that location across the intersections of Fordson Road and Boswell Avenue, will be carried into final design and the existing access at Fordson Road will be maintained. 	<ul style="list-style-type: none"> • During ROW acquisition • Service and Fare Equity Analysis to be completed six months prior to the beginning of revenue operations • During construction
Historic Architectural Resources Section 4.6.1	<ul style="list-style-type: none"> • No stormwater management infrastructure will be installed on the Woodlawn Plantation property or the Woodlawn Cultural Landscape Historic District; either existing infrastructure will be utilized or stormwater requirements will be managed within the existing VDOT ROW. • FCDOT will continue to seek ways to minimize permanent impacts to Woodlawn during detailed design and as part of the ROW acquisition process. • The designs for the Hybla Valley, South County Center, Gum Springs, and any other BRT stations that are within the established visual APE and within the viewshed of identified historic properties will be provided to DHR prior to finalization and construction. 	<ul style="list-style-type: none"> • During Construction • During Design • Prior to finalization and construction

ENVIRONMENTAL RESOURCE	COMMITMENTS	TIMING
	<ul style="list-style-type: none"> The noise wall design and location(s) that are within the established visual APE and within the viewshed of identified historic properties will be provided to DHR prior to finalization and construction. 	<ul style="list-style-type: none"> Prior to finalization and construction
Archaeological Resources Section 4.6.2	In the event that previously unidentified archaeological resources or human remains are discovered during project construction, FCDOT shall halt construction at that location, notify FTA and other appropriate agencies, and reinitiate Section 106 consultation as necessary before resuming construction activities.	During construction
Section 4(f) Resources Section 4.7	<ul style="list-style-type: none"> The land used at A&A Rentals (for the purpose of reconstructing the existing driveway apron and allowing for minor regrading) will be fully restored to a condition as least as good as that which existed prior to the project per temporary occupancy requirements. No stormwater management infrastructure will be installed on the Woodlawn Plantation property or the Woodlawn Cultural Landscape Historic District; either existing infrastructure will be utilized or stormwater requirements will be managed within the existing VDOT ROW. 	<ul style="list-style-type: none"> During construction/following construction During construction
Visual Impacts Section 4.8	There will be coordination with the public and stakeholders regarding station design via the project website and at public meetings. Public meetings focused on soliciting input regarding community-specific elements for the station design are anticipated to begin November 2021.	Prior to construction
Hazardous Materials Section 4.10	<ul style="list-style-type: none"> An impacted materials handling plan will be created for the delineation of potential contaminants in the event that suspect impacted material is identified during construction activities. Screening of excavated materials within the Area of Concern will be conducted with a photoionization detector or multi-gas meter calibrated for potential contaminants of concern in the area as identified in the Hazardous Materials Technical report. Review of analytical results will be undertaken by an environmental professional to evaluate potential changes to the health and safety, material handling, and off-site disposal requirements. Health and safety plans will be prepared and implemented in compliance with Occupational Safety and Health Administration 1910.120, Hazardous Waste Operations and Emergency Response for onsite workers. 	<ul style="list-style-type: none"> Prior to construction During construction During construction Prior to construction
Noise and Vibration Section 4.11	A final design noise analysis will be completed to confirm that the noise barrier at CNE 21 on Richmond Highway between Belford Drive and Fordson Road is feasible and reasonable. It will also finalize the length, height, and specific location of the proposed barrier. Following the final	<ul style="list-style-type: none"> Prior to construction

ENVIRONMENTAL RESOURCE	COMMITMENTS	TIMING
	<p>noise wall design, FCDOT will conduct surveys to determine if the owners and renters of the receptor units that would be benefited by the barrier would be in favor of the installation.</p> <ul style="list-style-type: none"> • Construction phase noise and vibration minimization measures will be developed. • Construction activities may be conducted during the daytime as reasonably feasible. • Construction vehicle routes will be designated to minimize disturbance to residents. • Stationary equipment will be located away from residential areas to the extent reasonably feasible. • Noise control technologies will be employed to limit excessive noise when working near residences. • The public will be notified of construction operations and schedules. • VDOT/Fairfax County specifications requiring that construction not exceed established noise limits will be adhered to. • Ground borne vibrations from construction equipment and activities such as pile driving will meet specifications and restrictions. 	<ul style="list-style-type: none"> • Prior to construction • During construction • Prior to construction • During construction
<p>Safety and Security Section 4.12</p>	<p>Stations for the project will be designed using Crime Prevention Through Environmental Design principles to deter offender decisions that precede criminal acts.</p> <p>The project will install pedestrian and bicycle controls at signalized intersections like countdown signals and audible pedestrian pushbuttons. Crosswalks and bicycle lanes will be designated with signing and pavement markings.</p>	<p>During design</p> <p>During construction</p>
<p>Water Quality and Waters of the US Section 4.13.1</p>	<p>Stormwater management will be implemented in accordance with county and state regulations</p> <p>Impacts to streams and wetlands will be minimized to the greatest extent practicable. Compensatory mitigation will be undertaken in accordance with the 2008 <i>Compensatory Mitigation for Losses of Aquatic Resources; Final Rule</i> and mitigation measures will be further discussed during the permit procurement process.</p> <p>Practices to reduce impacts to adjacent terrestrial habitats will be evaluated and will include implementation and maintenance of strict erosion and sediment control measures and stormwater management BMPs.</p>	<p>Prior to construction</p> <p>Determined prior to construction (during permit procurement)</p> <p>Determined prior to construction</p>

ENVIRONMENTAL RESOURCE	COMMITMENTS	TIMING
	The project will likely qualify for a USACE Nationwide 14 permit, a VDEQ 401 certification, a VMRC subaqueous bed permit, and a VDEQ stormwater permit. Permits will be applied for and compliance will be documented as necessary.	Prior to construction
Vegetation-Invasive Species Section 4.13.3	In accordance with EO 13112, <i>Invasive Species</i> , the spread of invasive species under the project will be minimized by requiring prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law. Specific seed mixes that are free of noxious or invasive species may be required for environmentally sensitive areas and would be determined during the design and permitting process. Because much of the construction under the project will be along existing disturbed corridors, the addition of invasive animal species is expected to be minimal.	During construction
Wildlife and Wildlife Habitat Section 4.13.4	<p>To reduce potential impacts to adjacent terrestrial habitats, construction practices will avoid the removal of existing vegetation to the greatest extent practicable and will include the implementation and maintenance of strict erosion and sediment control measures and stormwater management BMPs to reduce potential impacts to adjacent habitats.</p> <p>At the request of Fort Belvoir, cutting and removal of vegetation will be avoided on Fort Belvoir property from April 1 to July 15, with the understanding that if cutting and removal occurs during this time frame, a survey for birds and active bird nests is recommended.</p>	<p>Determined prior to construction; implemented during construction</p> <p>During construction</p>
Threatened and Endangered Species Section 4.13.5	Surveys and time-of-year restrictions for tri-colored bats will be determined during the permit acquisition process.	Prior to construction

5 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

5.1 AGENCY COORDINATION AND SCOPING

Agency scoping involves gathering existing information regarding a project, which includes input received during the agency contact phase of the project and information gleaned from reviewing local and regional planning documents.

In late March 2018, FCDOT sent letters to over 50 representatives of local, state, and federal agencies. The letters provided a broad overview of the limits of the project and information about the study. Letter recipients were asked to include information regarding possible future development and the potential for ICE. Representatives from 16 agencies provided responses. A summary and compilation of the correspondence can be found in **Appendix B**.

5.2 PUBLIC INVOLVEMENT

The goal of the BRT Project's Public and Stakeholder Outreach Plan was to employ a range of strategies to obtain a broad base of active participation in the design and implementation of BRT for the project corridor. An active and inclusive public engagement process that provides the public with a clear understanding of the project and the opportunity to participate in the planning process was intended to build community and stakeholder support for the project. The Outreach Plan defined five goals for the outreach process:

- Strategically engage all stakeholders in early and ongoing dialogue to ensure that the project meets the needs of corridor residents, future riders, and county residents in general.
- Anticipate and respond to community concerns.
- Encourage diverse participation.
- Continually educate about all aspects of this project.
- Build on and respond directly to the other outreach efforts that have recently occurred and are occurring in the corridor.

5.2.1 Overview of Strategies

The public involvement process for this project sought to draw in a diversity of people that are representative of the residents and users of the corridor. Specific public involvement strategies include:

- Establishing a Community Advisory Group (CAG) as part of the project governance structure to help guide the project and provide input on community outreach efforts.
- Holding small focus groups and/or briefings with diverse sets of stakeholders who have interests in and knowledge of specific topics in the study area.
- Conducting educational and interactive public meetings at key points in the process.
- Reaching out to community members through venues and pop-up events other than public meetings (e.g., festivals, schools, etc.)
- Providing frequently updated information to a broad audience through digital and other media:
 - Maintaining a project website that provides opportunities for two-way input and communications; and

- Developing and distributing emails, social media announcements, newsletters, and printed materials (flyers, etc.) to educate the public and provide project updates.
- Utilizing existing community networks to disseminate project information and public meeting notices.
- Using clear, concise, acronym-/jargon-free language as much as possible.
- Regularly monitoring the outreach/involvement strategies throughout the project and determining whether any modifications should be made as the project progresses.

Throughout the project, the project team maintained a webpage on the County website. The webpage included an informational video, meeting notices and materials, news updates, project background, frequently asked questions (FAQs), project newsletters, and an interactive Story Map with information about the project. Additionally, FCDOT launched a transportation-specific Facebook page, which is used (with the Connector page) to share project information. FCDOT posts meeting notices on social media, including Facebook and Twitter. The team posted a Channel 16 story and the BRT marketing video on FCDOT's YouTube page. The marketing video, available in English, Spanish, and Korean, has become one of the most-watched videos on the FCDOT page.

Project announcements including public meeting notifications were provided on the project webpage, through social media, via Fairfax Alerts, with digital and printed flyers and mailings, and through a project newsletter.

5.2.2 Public Outreach Events and Public Input Opportunities

Three sets of public meetings have been held in person and five more were held virtually due to public health concerns regarding COVID-19.

The first set of public meetings were held on April 17, 2018 at the West Potomac High School and April 18, 2018 at Mount Vernon High School in Alexandria, VA. Approximately 28 people attended the meeting at West Potomac High School, and 36 attended the meeting at Mount Vernon High School. Comments were received during the Question-and-Answer portion of the meetings, as well as via comment sheets completed by participants.

A second in-person public meeting was held on January 23, 2019, at the Mount Vernon High School in Alexandria, VA. Approximately 54 people attended the meeting. Comments were received during the Question-and-Answer portion of the meeting, as well as via comment sheets completed by participants.

The in-person third public meeting was held on September 17, 2019 in the gymnasium of Bryant High School in Alexandria, VA. Approximately 250 people attended the meeting. Comments were received during the Question-and-Answer portion of the meeting as well as via comment sheets completed by participants. Problematic audio equipment presented a problem during the presentation and Question and Answer session.

Table 5-1 provides dates and topics for the virtual meetings. For all virtual meetings, the first date listed was conducted in English and the second date listed was conducted in Spanish. All virtual meetings consisted of a presentation and a Question-and-Answer session.

Table 5-1: Virtual Meetings and Topics

Date	Topic
October 20 and 22, 2020	Right-of-Way Acquisition
November 4 and 7, 2020	Station Design
December 8 and 9, 2020	Corridor Year-End Update
January 27 and 28, 2021	BRT Branding
June 30, 2021	Station Design and Right-of-Way Acquisition
October 25, 2021	Right-of-Way

Additional virtual meetings are being planned for the first quarter of 2022 upon completion of the NEPA process.

Six “mini meetings” were conducted in Summer 2019 including a meeting held on August 18, 2019 for questions, answers, and discussion about the project in Spanish. These meetings were targeted to specific station areas, but all members of the public were welcome to attend. The dates and locations of all meetings are listed in **Table 5-2**.

Table 5-2: Summer 2019 Mini Meeting Locations

Station Area	Date	Location
Hybla Valley / Gum Springs	June 25, 2019	Supervisor Storck Community Room 2511 Parkers Lane
Beacon Hill / Lockheed	July 24, 2019	Bryant Alternative High School 2709 Popkins Lane
Woodlawn / Fort Belvoir	July 31, 2019	UC-Sacramento Neighborhood Center 8792 Sacramento Drive
Huntington / Penn Daw	August 7, 2019	Mount Eagle Elementary 6116 N Kings Highway
South County Center	August 14, 2019	South County Government Center 8350 Richmond Highway
General Discussion in Spanish	August 18, 2019	Good Shepherd Church 8710 Mount Vernon Highway

More than thirty pop-up events and briefings took place between April 2018 and March 2021 and included:

1. Richmond Highway Widening meeting, April 4, 2018
2. Celebrate Fairfax!, Fairfax County Government Center, June 8-10, 2018
3. Gum Springs Community Day, Martin Luther King, Jr. Community Park, June 16, 2018
4. McCutcheon/Mount Vernon Farmers Market, Sherwood Regional Library, June 20, 2018
5. Sacramento Community Day, 8792-E Sacramento Dr. Alexandria, VA 22309, June 23, 2018
6. Mt Vernon Pyramid Back-To-School Fair, Mt. Vernon High School, August 14, 2018
7. Huntington Farmers Market, August 23, 2018
8. Ventures in Community Monthly Meeting, September 5, 2018
9. Fairfax County Architectural Review Board Briefing, September 13, 2018
10. Richmond Highway Widening meeting, October 29, 2018
11. Mt Vernon CAC/Police meeting, November 13, 2018

12. Bethlehem Church, December 4, 2018
13. Town Hall meeting with Del. Tran, December 14, 2018
14. Lee District Open House, January 12, 2019
15. Richmond Highway Widening meeting, March 26, 2019
16. Mt. Vernon Town Hall, February 2, 2019
17. Area Association Steering Committee, March 4, 2019
18. Gum Springs Day (Juneteenth – Taste of Gum Springs), June 15, 2019
19. Gum Springs Community Meeting, June 25, 2019
20. Back-to-School Resource Fair – Mt. Vernon High School, August 14, 2019
21. Sherwood Hall Library – Farmers’ Market, September 4, 2019
22. VIC meeting, September 4, 2019
23. Mt. Vernon High School Back-To-School night, September 5, 2019
24. Community Briefing, Gum Springs Community Center, October 8, 2019
25. Community Briefing, Saint Louis Church, October 24, 2019
26. Hybla Valley Farms Civic Association Meeting, Mt Vernon Supervisors Office, December 2, 2019
27. Groveton Home Owners Association Meeting, Groveton Elementary School, March 2, 2020
28. Lee District Town Hall, - virtual, via CrowdCast, July 1, 2020
29. Mount Vernon Council of Civic Associations – virtual, July 6, 2020
30. Mount Vernon HS PTA- virtual, via Teams, February 2, 2021
31. Neighborhood Ambassadors Meeting, February 9, 2021, virtual via Zoom
32. Gum Springs Advisory Board, February 16, 2021, virtual via Phone
33. Sequoyah Food Distribution, February 23, 2021
34. Sequoyah Food Distribution, February 25, 2021

Additional events and meetings will be held prior to project completion.

In addition to the events and meetings described above, the project team also conducted a survey requesting community input on the BRT brand and station design. Feedback from the communities along Richmond Highway received by July 9, 2021 influenced the look and feel of the future stations and the branding for the system. Additional public involvement in the development of station-specific design will be undertaken in ‘community charm’ meetings planned for November 2021.

Public input gathered over the course of the project has been captured in four ways. Responses to frequently asked questions from the public were posted to the FAQ webpage, which was routinely updated. Input from the public was also captured in and responded to in the project newsletters and acknowledged at subsequent public meetings. All public meetings have included question-and-answer sessions where attendees are invited to ask questions of the project team. Additionally, for specific questions and comments, the public has been encouraged to send emails to the project email address.

Meetings held with the Gum Springs community were previously referenced in the Environmental Justice section of this document. Outreach to and meetings with the Gum Springs community occurred on June

16, 2018 (pop-up event); June 15, 2019 (pop-up event); June 25, 2019 (mini meeting); October 8, 2019 (community briefing); and February 16, 2021 (advisory board meeting).

5.2.3 Community Advisory Group

The CAG was developed to help guide the project and provide input on community outreach efforts. The CAG consisted of a diverse group of business and residential leaders from the corridor, including representatives from organizations with various areas of knowledge and interest. Members were recommended by Mount Vernon District Supervisor Dan Storck and Board of Supervisors Chairman Jeffrey McKay. The CAG has met ten times: March 1, 2018; December 13, 2018; May 16, 2019; August 22, 2019; December 9, 2019; February 13, 2020; July 30, 2020; January 2021; April 8, 2021, and October 21, 2021. Additional CAG meetings are anticipated prior to project completion.

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