3.0 ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes the environmental resources present in the Potomac Yard Metrorail Station study area and the potential environmental impacts, both beneficial and adverse, that could be expected to occur with the No Build Alternative and with construction and operation of the three Build Alternatives or B-CSX Design Option.

3.1.1 Resources Evaluated

The following resources are discussed in the subsequent sections:

- Transportation
- Land Acquisitions and Displacements
- Land Use and Zoning
- Consistency with Local Plans
- Neighborhoods, Demographics, and Community Resources
- Environmental Justice
- Visual Resources
- Cultural Resources
- Parklands
- Air Quality
- Noise and Vibration
- Water Quality
- Waters of the United States (Wetlands)
- Floodplains
- Navigable Waterways and Coastal Zones
- Wild and Scenic Rivers
- Ecosystems and Endangered Species
- Sustainability
- Contaminated Materials
- Safety and Security
- Utilities
- Secondary and Cumulative Effects
- Construction Impacts

In general, the project study area comprises the Potomac Yard area in northern Alexandria and southern Arlington County, bound by the George Washington Memorial Parkway (GWMP) to the east, Slaters Lane to the south, U.S. Route 1 to the west, and the Airport Access Road to the north. When the study area differs for the analysis of a specific resource, the specific study area is described in the appropriate resource section and referred to as the analysis area. For example, the study area for topics such as water resources is generally the limit of disturbance for the proposed improvements. For other resources, the study area differs from the limit of disturbance.

Resource areas were evaluated to identify the impacts of project alternatives in the opening year 2016 and in the horizon year 2040. An “effect” can be beneficial or adverse. If an adverse effect is identified, whether temporary or permanent, then the project considers methods to avoid or mitigate these impacts. These avoidance or mitigation measures are described at the conclusion of each resource section.

The discussion of each environmental resource includes the following:

- **Resource title and introductory paragraph** – Description of the resource and any applicable regulations and guidance;
- **Methodology** – Description of the data sources and methodology employed to evaluate the potential impacts, including a definition of the resource area;
- **Affected environment** – Description of the affected environment (existing or opening year conditions);
- **Environmental consequences** – Key findings describing the potential impacts; and
- **Mitigation** – Potential mitigation strategies.

A list of data sources can be found in the References section, located in **Appendix C**. Detailed technical memoranda have been prepared for resource areas where appropriate and are included in Volume II.

3.1.2 Impacts Summary

Table 3-1 on the following pages provides a summary of key impacts by alternative for all resource areas. The impacts listed are permanent impacts from the project alternatives, with the exception of the “Construction Impacts” category at the end of the table. Detailed descriptions of the environmental resources and impacts are included in **Sections 3.2 through 3.24** following the summary table.

Table 3-1: Summary of Impacts[1]

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Transportation					
Traffic	Increase in average delay at one intersection by 2040	Increase in average delay at one intersection by 2040	Increase in average delay at one intersection by 2040	Increase in average delay at one intersection by 2040	Increase in average delay at one intersection by 2040
Metrorail Operations	None	• Additional train midday off-peak (2016 and 2040) • Direct Metrorail access	• Additional train midday off-peak (2016 and 2040) • Direct Metrorail access	• Additional train midday off-peak (2016 and 2040) Direct Metrorail access	• Additional train midday off-peak (2016 and 2040) • Direct Metrorail access
Surface Transit	None	None	None	None	None
Pedestrian and Bicycle Accommodations	Improved bicycle/pedestrian access between Potomac Yard and Potomac Greens	Improved bicycle/pedestrian access between Potomac Yard and Potomac Greens	Improved bicycle/pedestrian access between Potomac Yard and Potomac Greens	Improved bicycle/pedestrian access between Potomac Yard and Potomac Greens	Improved bicycle/pedestrian access between Potomac Yard and Potomac Greens
Parking and Access Facilities	None	Potential impact for on-street parking where there are no parking restrictions	Potential impact for on-street parking where there are no parking restrictions	Potential impact for on-street parking where there are no parking restrictions	Potential impact for on-street parking where there are no parking restrictions
Airport Facilities and Operations	None	Improves transit access to airport from Potomac Yard	Improves transit access to airport from Potomac Yard	Improves transit access to airport from Potomac Yard	Improves transit access to airport from Potomac Yard
Land Acquisitions and Displacements					
GWMP Land Acquisition	None	None	0.16 acre	None	1.43 acres
City of Alexandria Land Acquisition	None	1.16 acres	3.30 acres	4.44 acres	5.55 acres
Private Land Acquisition (Includes CSXT right of way)	None	0.11 acre	0.51 acre	9.92 acres	3.06 acres
Total Land Acquisition	None	1.27 acres	3.97 acres	14.36 acres	10.04 acres
Displacements	None	None	None	1 (Movie Theater)	1(Movie Theater)
Impacts to Greens Scenic Area Easement	None	None	1.71 acres	None	None
Land Use, Zoning and Local Plans					
Land Use	None	Station entrance facilities occupy existing public open space	Station, entrance facilities, and realigned track occupy existing public open space	• Station, entrance facilities, and realigned track occupy portion of existing commercial development and existing public open space	• Station and elevated track occupy portion of existing commercial development • Realigned track would affect planned street network

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Land Use (Cont'd)				• Realigned track would affect planned street network	• Elevated track structures occupy existing and planned open space
Zoning	Permits 3.700 million square feet of development in North Potomac Yard (CDD #19)	• Permits 9.250 million square feet of development in Potomac Yard including 3.700 million square feet in North Potomac Yard (CDD #19) • Occupies open space and requires amendments to CDD #10 and CDD #19	• Permits 13.075 million square feet of development in Potomac Yard including 7.525 million square feet in North Potomac Yard (CDD #19) • Station height exceeds HD1 Height District limit, would require design modifications	• Permits 9.250 million square feet of development in Potomac Yard including 3.700 million square feet in North Potomac Yard (CDD #19) • Occupies open space and requires amendments to CDD #10 and CDD #19	• Permits 9.250 million square feet of development in Potomac Yard including 3.700 million square feet in North Potomac Yard (CDD #19) • Occupies open space and requires amendments to CDD #10 and CDD #19
Consistency with Local Plans	• Not consistent with City of Alexandria plans and regional transportation plans, as it does not include a Metrorail station at Potomac Yard • Not inconsistent with GWMP plans	• Not consistent with station location in North Potomac Yard Small Area Plan • Consistent with regional transportation plans • Not inconsistent with GWMP plans	• Consistent with City of Alexandria plans • Consistent with regional transportation plans • Not inconsistent with GWMP plans	• Not consistent with City of Alexandria plans • Consistent with regional transportation plans • Not inconsistent with GWMP plans	• Not consistent with City of Alexandria plans • Consistent with regional transportation plans • Not inconsistent with GWMP plans
Neighborhoods and Environmental Justice					
Neighborhoods, Demographics, and Community Resources	None	• Improved mobility with access to Metrorail • Increased economic activity due to Metrorail access • Visual impacts to views from Potomac Yard and Potomac Greens	• Improved mobility with access to Metrorail • Increased economic activity due to Metrorail access • Visual impacts to views from Potomac Yard and Potomac Greens	• Improved mobility with access to Metrorail • Increased economic activity due to Metrorail access • Visual impacts to views from Potomac Yard and Potomac Greens	• Improved mobility with access to Metrorail • Increased economic activity due to Metrorail access • Visual impacts to views from Potomac Yard Potomac Greens

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Neighborhoods and Environmental Justice (Cont'd)					
Environmental Justice	None	Benefit to communities from greater access to transit	Benefit to communities from greater access to transit	Benefit to communities from greater access to transit	Benefit to communities from greater access to transit
Visual Resources					
Short-term (2016) Impacts to Visual Resources *(Build Alternatives compared to the No Build Alternative)*	No changes to existing views with the exception of the viewshed within Potomac Yard which would improve by 2016 from Moderately Low to Moderate with continued redevelopment of the area.	• Visual impacts to GWMP reduce visual quality for **two** viewsheds: - One from High to Moderately High - One from Moderately High to Moderate • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality for **three** viewsheds: - Two from Moderate to Moderately Low - One from Moderate to Low	• Visual impacts to GWMP reduce visual quality for **three** viewsheds and the Continuous Corridor: - One from Very High to Moderate - Two from High to Moderately High - Continuous Corridor from Very High to High • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality for **two** viewsheds: - Two from Moderate to Moderately Low	• Visual impacts to GWMP reduce visual quality for **three** viewsheds and the Continuous Corridor: - Two from Very High to Moderately High - One from Very High to High - Continuous Corridor from Very High to High	• Visual impacts to the GWMP reduce visual quality for **three** viewsheds and the Continuous Corridor by 2016: - Two from Very High to Low - One from High to Moderately High - Continuous Corridor from Very High to High • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality by 2040 for **three** viewsheds: - Two from Moderate to Very Low - One from Moderate to Moderately Low

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Visual Resources (Cont'd)					
Long-term (2040) Impacts to Visual Resources *(Build Alternatives compared to the No Build Alternative)*	Anticipated changes to existing views from GWMP and Potomac Yard/Potomac Greens by 2040 due to North Potomac Yard development	• Visual impacts to GWMP reduce visual quality for **one** viewshed from Moderate to Moderately Low. • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality for **two** viewsheds: - One from Moderately Low to Very Low - One from Moderate to Moderately Low	• Visual impacts to the GWMP reduce visual quality for **one** viewshed from Very High to Moderately High. • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality for **two** viewsheds: - One from Moderately Low to Low - One from Moderate to Moderately Low	• Visual impacts to the GWMP reduce visual quality for **three** viewsheds and the Continuous Corridor: - Two from Very High to Moderately High - One from Very High to High - Continuous Corridor from Very High to High • Visual impacts to view from Potomac Yard due to pedestrian bridges	• Visual impacts to the GWMP reduce visual quality for **two** viewsheds and the Continuous Corridor: - Two from Very High to Moderate - Continuous Corridor from High to Moderately High • Visual impacts to Potomac Yard/ Potomac Greens reduce visual quality for **two** viewsheds: - One from Moderately Low to Very Low - One from Moderate to Very Low
Cultural Resources *(Section 106 process described in introductory paragraphs of Section 3.9 Cultural Resources)*					
Adverse Effects on GWMP/MVMH (FTA preliminary determination)	No	Yes	Yes	Yes	Yes
Construction area on MVMH and GWMP Land (requires permit from NPS)	None	Option 1 0.30 acre Option 2 None	Option 1 0.78 acre Option 2 0.55 acre	None	2.40 acres
Permanent Transfer of each MVMH and GWMP Land	None	None	0.16 acre	None	1.43 acres
Visual Impacts	None	Temporary and permanent impacts diminish GWMP/MVMH landscape architecture	Temporary and permanent impacts diminish GWMP/MVMH landscape architecture	Temporary and permanent impacts diminish GWMP/MVMH landscape architecture	Temporary and permanent impacts diminish GWMP/MVMH landscape architecture
Number of Trees removed in areas of original GWMP/MVMH Design	None	Option 1 5 to 10 trees Option 2 None	Option 1 15 to 20 trees Option 2 10 to 15 trees	None	70 to 75 trees

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Acres of Trees removed on GWMP/MVMH Land	None	Option 1 0.30 acre Option 2 None	Option 1 0.93 acre Option 2 0.71 acre	None	3.54 acres
Acres of Trees removed on Greens Scenic Area Easement Land	None	Option 1 0.18 acre Option 2 0.09 acre	Option 1 1.51 acres Option 2 1.51 acres	None	None
Archaeological Sites Affected	None Known	Option 1 2 sites Option 2 None known	Option 1 2 sites Option 2 None known	None known	1 site
Parklands					
Impacts to Parks	None	• City of Alexandria: 1.16 acres (Metrorail Reservation area excluded from impacts) • Federal (NPS): none	• City of Alexandria: 3.01 acres • Federal (NPS): 0.16 acre	• City of Alexandria: 3.86 acres • Federal (NPS): none	• City of Alexandria: 5.38 acres • Federal (NPS): 1.43 acres
Air Quality					
Impacts to Air Quality	None	None	None	None	None
Noise & Vibration					
Exceed FTA Noise Criteria	None	None	None	None	7 sites
Exceed WMATA Noise Criteria	7 sites	7 sites	7 sites	7 sites	3 sites
Station Noise (announcements and door chimes)	Yes (announcements from train)	Yes (in close proximity to residences)	Yes	Yes	Yes
Exceed FTA Vibration Criteria	None	6 sites	None	None	7 sites
Exceed WMATA Vibration Criteria	None	1 site	None	None	None
Water Resources					
Increase in Impervious Surface	None	1.82 acres	2.24 acres	Decrease of 0.02 acre	9.24 acres
U.S. Army Corps of Engineers Regulated Wetlands	None	0.02 acre	1.22 acres	None	0.52 acre
NPS Regulated Wetlands	None	0.02 acre	1.28 acres	None	0.50 acre

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Water Resources (Cont'd)					
100-year Floodplain Impacts	None	None	GWMP Land 0.05 acre GSAE Land 1.26 acres Other Land 0.17 acre Total Land 1.48 acres	None	GWMP Land 0.77 acre GSAE Land 0 acres Other Land 0.13 acre Total Land 0.90 acre
500-year Floodplain Impacts (excludes 100-yr floodplain)	None	0.41 acre	0.95 acre	None	0.41 acre
Water Resources (Cont'd)					
Resource Protection Areas *(GSAE=Greens Scenic Area easement administered by NPS)*	None	GWMP Land 0 acres GSAE Land 0 acres Other Land 0.41 acre Total Land 0.41 acre	GWMP Land 0.10 acre GSAE Land 1.71 acres Other Land 1.54 acres Total Land 3.36 acres	GWMP Land 0 acres GSAE Land 0 acres Other Land 1.12 acres Total Land 1.12 acres	GWMP Land 1.12 acres GSAE Land 0 acres Other Land 0.95 acre Total Land 2.07 acres
Ecosystems and Endangered Species					
Protected Species	None	None	None	None	None
Ecologically Sensitive Areas	None	None	None	None	None
Natural Habitat Impacts	None	0.03 acre	2.58 acres	0.18 acre	1.76 acres
Sustainability					
Sustainability Policy Impacts	None	None	None	None	None
Hazardous and Contaminated Materials					
Hazardous and Contaminated Materials Impacts	None	None	None	None	None
Safety and Security					
Safety and Security Impacts	None	None	None	None	None
Utilities					
Utilities Impacts	None	Impacts to stormwater and water utilities	Impacts to stormwater and water utilities	Impacts to stormwater, water, sanitary, petroleum pipeline, and Metrorail related utilities	Impacts to stormwater, water, sanitary, petroleum pipeline, and Metrorail related utilities

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Secondary and Cumulative Effects					
Secondary	Additional traffic and visual effects from new development	Additional traffic and visual effects from new development	Additional traffic and visual effects from new development	Additional traffic and visual effects from new development	Additional traffic and visual effects from new development
Cumulative	Additional traffic and visual effects from new development	Cumulative traffic, visual, and floodplain effects from present and future development	Cumulative traffic, visual, and floodplain effects from present and future development	Cumulative traffic, visual, and floodplain effects from present and future development	Cumulative traffic, visual, and floodplain effects from present and future development
Construction Impacts (*permanent impacts for each resource listed above*)					
Metrorail Operations	None	Affects Metrorail operations including weekend and evening off-peak shutdowns	Affects Metrorail operations including weekend and evening off-peak shutdowns	Affects Metrorail operations including weekend and evening off-peak shutdowns	Affects Metrorail operations including weekend and evening off-peak shutdowns
CSXT ROW and Operations	None	Pre-planned outages on CSXT track	Pre-planned outages on CSXT track	• Extensive pre-planned outages on CSXT track • Requires completion of CSXT ROW before construction of WMATA alignment	Pre-planned outages on CSXT track
Public Roadways and Private Driveways	None	• Lane closures, use of flagmen, sidewalk closures, wear and tear due to construction activities <u>Option 1</u> • Construction access from GWMP, Potomac Greens Drive, and Potomac Avenue during approved times <u>Option 2</u> • Construction access from Potomac Greens Drive, Potomac Avenue during approved times	• Lane closures, use of flagmen, sidewalk closures, wear and tear due to construction activities <u>Option 1</u> • Construction access from GWMP, Potomac Greens Drive, and Potomac Avenue during approved times <u>Option 2</u> • Construction access from Potomac Greens Drive and Potomac Avenue during approved times	• Lane closures, use of flagmen, sidewalk closures, wear and tear due to construction activities • Construction access from Potomac Greens Drive, Potomac Avenue during approved times	• Lane closures, use of flagmen, sidewalk closures, wear and tear due to construction activities • Construction access from GWMP, Potomac Greens Drive, Potomac Avenue during approved times

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Construction Impacts (Cont'd) (*permanent impacts for each resource listed above*)					
Greens Scenic Area Easement Impacts	None	Option 1 0.25 acre Option 2 0.13 acre	Option 1 3.09 acres Option 2 3.09 acres	None	0.02 acre
Visual Resources *(Acreages reported are for acres of treed area and associated vegetation removed)*	No trees on GWMP or Greens Scenic Area easement removed	• Removal of 0.30 acre of trees on GWMP/MVMH Land for Option 1 • Removal of trees on Greens Scenic Area easement: Option 1 0.18 acre Option 2 0.09 acre • Visible construction equipment and materials	• Removal of trees on GWMP/MVMH Land: Option 1 0.77 acre Option 2 0.55 acre • Removal of trees on Greens Scenic Area easement: Option 1 0.83 acre Option 2 0.83 acre • Visible construction equipment and materials	• No trees on GWMP or Greens Scenic Area easement removed • Visible construction equipment and materials	• Removal of 2.40 acres of trees on GWMP/MVMH Land • No removal of trees on Greens Scenic Area easement • Visible construction equipment and materials
Cultural Resources	None	Option 1 Affects MVMH/ GWMP and two archaeological sites Option 2 None	Option 1 Affects MVMH/ GWMP and two archaeological sites Option 2 Affects MVMH/ GWMP	None	Affects MVMH/ GWMP and one archaeological site
Parklands	None	Option 1 • City of Alexandria: 5.49 acres • Federal (NPS): 0.30 acre; access along 1.7 miles of GWMP roadway Option 2 • City of Alexandria: 4.80 acres (Metrorail Reservation area excluded from impacts) • Federal (NPS): none	Option 1 • City of Alexandria: 5.48 acres • Federal (NPS): 0.78 acre; access along 1.7 miles of GWMP roadway Option 2 • City of Alexandria: 5.48 acres • Federal (NPS): 0.55 acre	• City of Alexandria: 0.97 acre • Federal (NPS): none	• City of Alexandria: 5.53 acres • Federal (NPS): 2.40 acres; access along 1.7 miles of GWMP roadway

Resource	Impacts				
	No Build Alternative	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Construction Impacts (Cont'd) (*permanent impacts for each resource listed above*)					
Air Quality	None	Direct emissions from construction equipment, increased emissions from motor vehicles, and fugitive dust emissions	Direct emissions from construction equipment, increased emissions from motor vehicles, and fugitive dust emissions	Direct emissions from construction equipment, increased emissions from motor vehicles, and fugitive dust emissions	Direct emissions from construction equipment, increased emissions from motor vehicles, and fugitive dust emissions
Noise and Vibration	None	Affects only the closest residences and commercial properties in the vicinity of station	Affects only the closest residences and commercial properties in the vicinity of station and new track	Affects only the closest residences and commercial properties in the vicinity of station and new track	Affects only the closest residences and commercial properties in the vicinity of station and new track
U.S. Army Corps of Engineers Regulated Wetlands	None	Option 1 0.30 acre Option 2 0.01 acre	Option 1 3.61 acres Option 2 3.54 acres	None	0.41 acre
NPS Regulated Wetlands	None	Option 1 0.35 acre Option 2 0.01 acre	Option 1 3.68 acres Option 2 3.57 acres	None	0.48 acre
100-year Floodplain Impacts	None	Option 1 0.53 acre Option 2 None	Option 1 3.86 acres Option 2 3.63 acres	None	1.22 acres
Resource Protection Areas	None	Option 1 1.75 acres Option 2 0.49 acre	Option 1 5.50 acres Option 2 5.27 acres	0.58 acre	2.40 acres
Hazardous and Contaminated Materials	None	Potential to encounter contaminated materials	Potential to encounter contaminated materials	Potential to encounter contaminated materials	Potential to encounter contaminated materials

[1] The Cultural Resources section addresses the requirements of Section 106 of the National Historic Preservation Act of 1966. The other sections in the table address the requirements of the National Environmental Policy Act (NEPA).

3.2 Transportation

This section assesses the impacts of the alternatives on the transportation network serving the study area. Transportation elements include roadways, heavy rail transit (Metrorail), freight rail, passenger rail, commuter rail, surface transit (bus rapid transit and local bus services), pedestrian and bicycle facilities, parking, and airports. The analysis is described in more detail in the *Transportation Technical Memorandum* in Volume II.

3.2.1 Methodology

3.2.1.1 Roadway, Surface Transit, Pedestrian, Bicycle, and Parking Facilities and Services

Existing and planned opening year (2016) and horizon year (2040) transportation facilities and services were identified and documented based on field reviews, current transportation plans, small area plans, and base mapping and data provided by the City of Alexandria and Arlington County. Potential impacts of the three Build Alternatives and B-CSX Design Option were assessed by examining potential conflicts between the locations of proposed project facilities and existing/planned facilities and services in the base transportation network.

3.2.1.2 Traffic Conditions

The anticipated traffic impacts of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option were evaluated by assessing the performance of 20 key intersections in the study area, using both regional and local land use and traffic projections. For the existing conditions and future No Build and Build conditions in 2016 and 2040, the intersections were modeled using VISSIM, a traffic micro-simulation model. The background increase in the study area traffic volume was estimated using projected regional traffic growth from the Metropolitan Washington Council of Governments (MWCOG) regional travel model and land use and population forecasts. Projected trips generated by approved developments in Potomac Yard were estimated based on the City of Alexandria's approved development plans and City of Alexandria estimates for the development volumes expected to be built by 2016 and 2040. Additional future development that may occur if a Metrorail station is constructed at Potomac Yard was excluded from the analysis; traffic that may be generated by potential induced development occurring as a result of a new Metrorail station is discussed in **Section 3.23 Secondary and Cumulative Effects**.

Intersection performance is typically measured by the average time a vehicle is stopped (delayed) at an intersection. This quantified delay is referred to as Level of Service (LOS). Levels of Service are designated "A" through "F" from best to worst. The City of Alexandria and Arlington County have a standard of LOS "D" or better at signalized intersections. For the purpose of this analysis, a traffic impact is defined as a change in overall intersection LOS either by two grade levels (for example, from LOS B to LOS D) or any change from LOS D or above (acceptable) to LOS E or LOS F (poor or failing).

3.2.1.3 Metrorail Operations

Assessment of potential impacts to rail operations was conducted in two steps. In the first step, new Metrorail train run and travel time estimates were developed. In the second step, possible impacts to operating requirements were identified, including the number of train sets needed on the line, additional miles, and hours of service.

3.2.1.4 Potomac Yard Metrorail Station Ridership

Travel demand forecasting for the proposed Metrorail station for the three Build Alternatives was conducted using the MWCOG regional travel demand model and employed the current Washington Metropolitan Area Transit Authority (WMATA) transit post-processor application (Version 2.3, 2012), which was developed to support the WMATA Regional Transit System Plan. Future land use was based on the regionally adopted land use forecasts (MWCOG's Round 8.0 Cooperative Land Use) and approved baseline development volumes and planned distribution of development density for the City of Alexandria portion of Potomac Yard, excluding the additional approved development that would be allowed after construction of a Potomac Yard Metrorail Station. For B-CSX Design Option, the station ridership assumed the same results as Build Alternative D due to the similar development volume and station locations. Additional station ridership that may be generated by potential induced development occurring as a result of a new Metrorail station is discussed in **Section 3.23 Secondary and Cumulative Effects**.

3.2.2 Affected Environment

Figure 3-1 shows key facilities in the opening year transportation network, which are described below.

3.2.2.1 Existing and Opening Year Base Transportation Network

The study area is served by two regionally important roadways, U.S. Route 1 and the GWMP, and by regional and local mass transit services. The Metrorail Blue and Yellow Lines pass through the study area and can be accessed outside of the study area at the Braddock Road, Crystal City, and Ronald Reagan Washington National Airport Metrorail Stations.

The City of Alexandria and Arlington County opened the Crystal City/Potomac Yard (CCPY) Transitway (also known as Metroway) in August 2014. Metroway is a premium bus service that serves riders between the Braddock Road and Crystal City Metrorail Stations and operates in bus-only lanes for the most congested portions of the route. The second phase of the project, which will provide dedicated bus-only lanes along route segments within Arlington County and extend the route to the Pentagon City Metrorail Station, is currently under construction. WMATA (Metrobus) and Alexandria Transit (DASH) operate bus services in the study area, providing connections to Crystal City, Pentagon City, the Pentagon, Old Town Alexandria, the west end of Alexandria, adjacent neighborhoods, and to the Braddock Road and Crystal City Metrorail stations.

The CSX Transportation (CSXT) freight and intercity passenger rail corridor passes through the study area and has a current volume of approximately 97 trains per day, including freight, Amtrak, and Virginia Railway Express (VRE) services along three tracks. The closest stations are located outside of the study area, at King Street (Amtrak and VRE service) and Crystal City (VRE service).

In addition to sidewalks and on-street bike lanes and bike routes, the study area has three multi-use trails that accommodate pedestrians and bicyclists: Potomac Yard U.S. Route 1 temporary multi-use path, Potomac Avenue multi-use trail, and Four Mile Run Trail. The Mount Vernon Trail, a regional trail is located east of the study area. **Figure 3-2** shows existing and planned bike and pedestrian facilities in the study area.

The Ronald Reagan Washington National Airport is located northeast of the study area and accessed via arterial roadways and the Metrorail Blue and Yellow Lines.

Planned changes to the existing network by the Opening Year 2016 include construction of the internal street and sidewalk network within Potomac Yard, and new DASH circulator services (Route AT15). See **Figure 3-3** for Opening Year 2016 bus service. See **Figure 3-2** bike and pedestrian facilities including the completion of the multi-use trail from Potomac Yard to the Braddock Road Metrorail Station.

3.2.2.2 2040 Base Transportation Network

By the horizon year of 2040, the North Potomac Yard street network will be completed. The CCPY Transitway alignment through Potomac Yard will shift north of East Glebe Road, using the new street network to make the connection between U.S. Route 1 and Potomac Avenue, and DASH will introduce an additional cross-town circulator (Route AT14) from Potomac Yard to the Landmark area (see **Figure 3-4**). The Metrorail Silver Line is expected to be open to Dulles Airport and Loudoun County. To accommodate future Metrorail demand, WMATA plans to run eight-car trains on all lines during the peak periods. Off-peak service will still utilize six-car trains. The completed Potomac Yard street network will include additional pedestrian and bicycle accommodations, consisting of sidewalks and on-street bike routes and lanes throughout the new grid of smaller pedestrian-scaled street blocks.

The CSXT rail corridor is expected to expand track capacity from three tracks to four tracks through the Potomac Yard area (known as the “Long Bridge Corridor”). The *VRE System Plan 2040 Study* identifies the expansion as critical to obtain higher volumes of rail traffic and more reliable operations in the future, as two tracks could be dedicated for passenger trains and two tracks for freight trains. The Long Bridge Corridor track expansion is anticipated to be completed between 2021-2030 within the existing CSXT right-of-way. The Long Bridge Corridor is also being assessed as part of the improvements and needs identified under a comprehensive study of the Long Bridge between the District of Columbia and Virginia by the District Department of Transportation (DDOT) in cooperation with the Federal Railroad Administration (FRA). The final report of the *Long Bridge Study* is currently being reviewed by FRA.

Figure 3-1: Opening Year 2016 Key Transportation Facilities

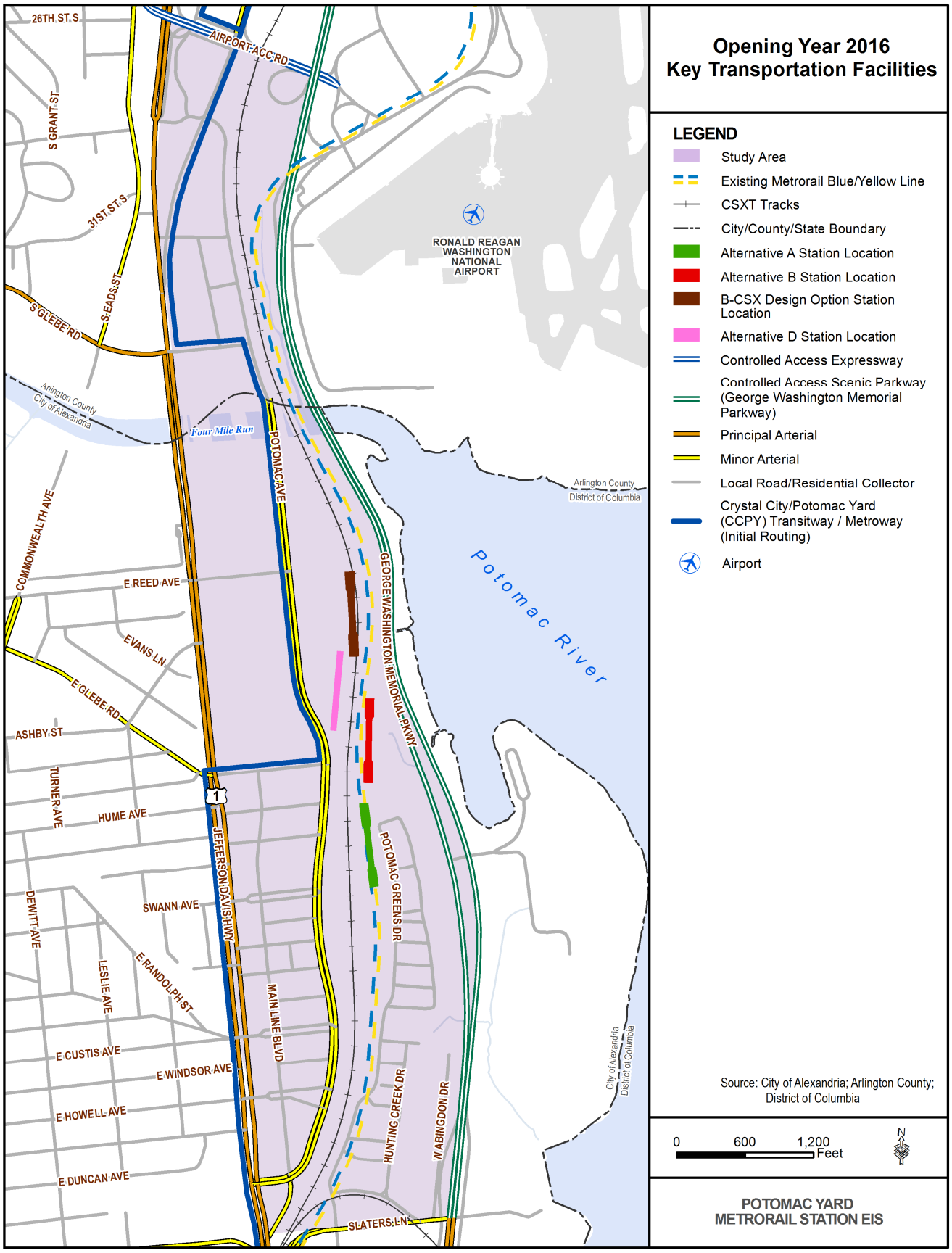


Figure 3-2: Bike and Pedestrian Facilities

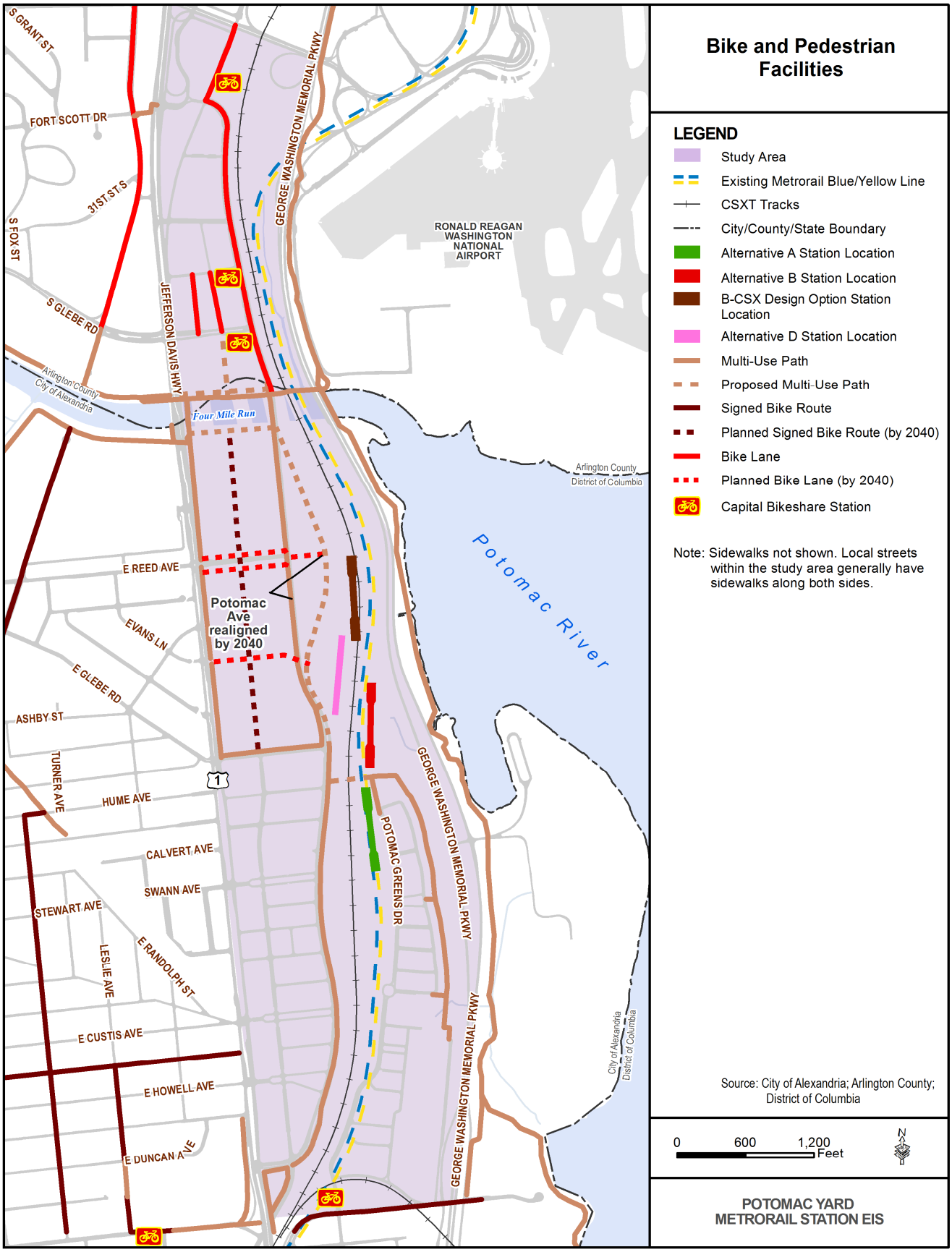


Figure 3-3: Opening Year 2016 Bus Services

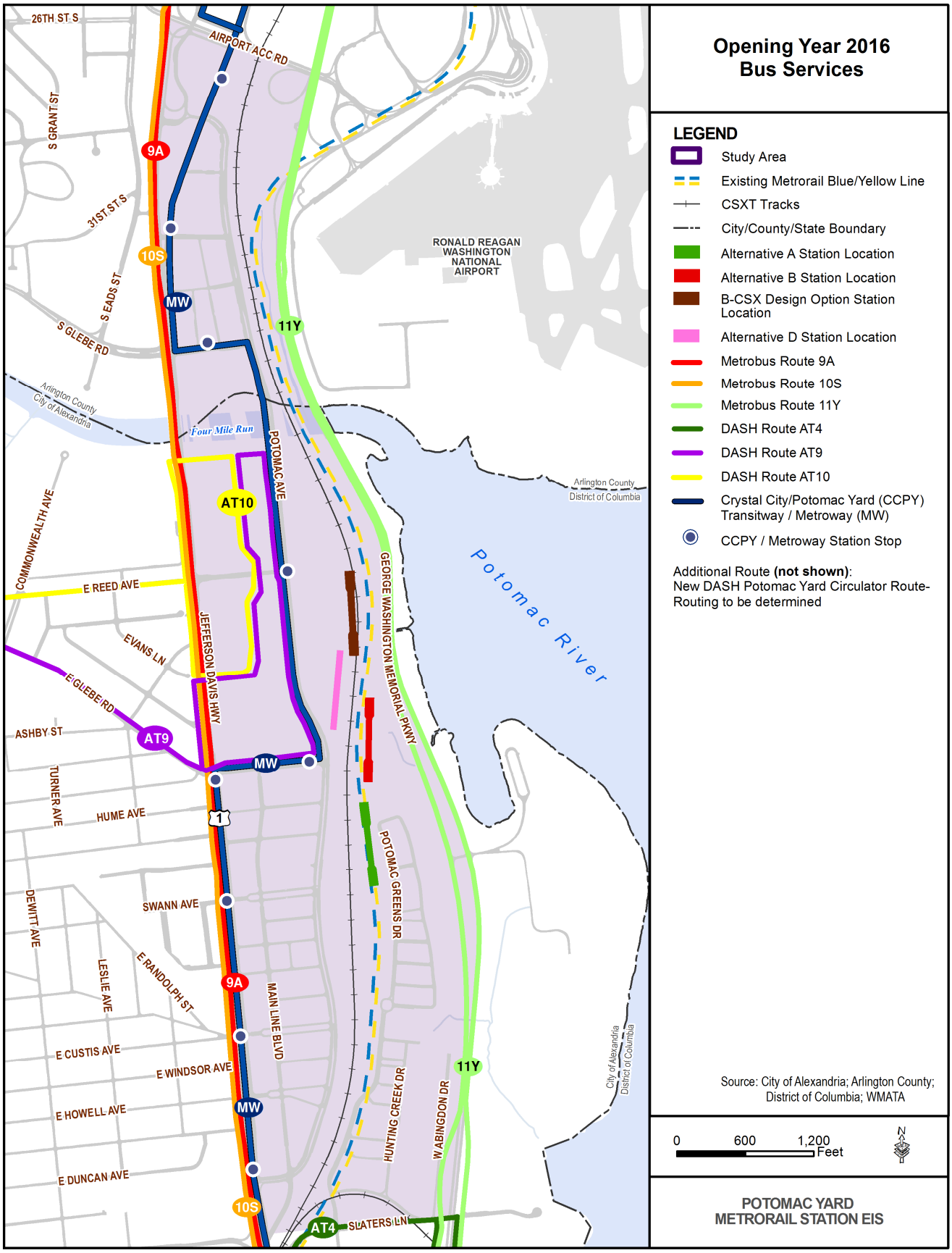
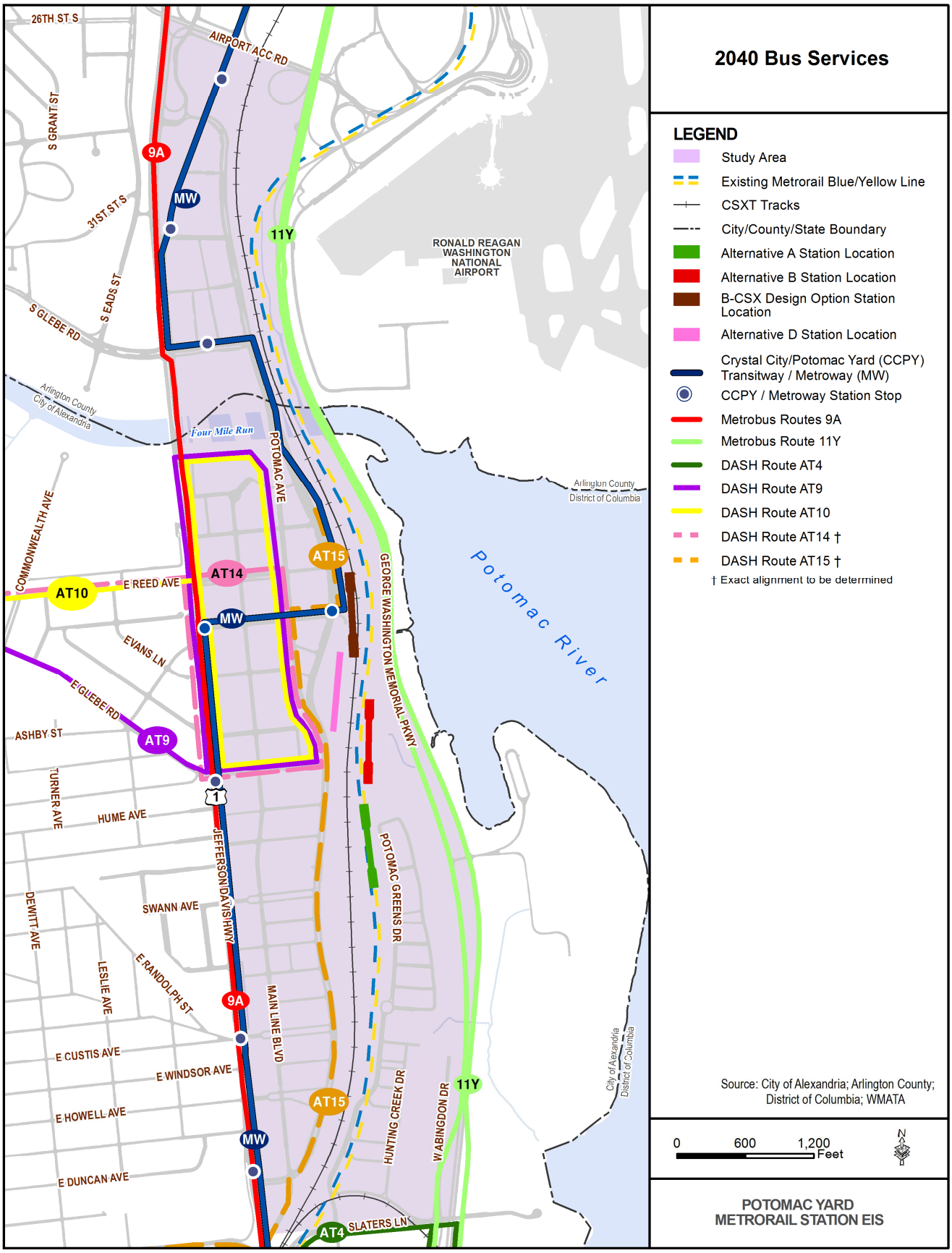


Figure 3-4: 2040 Bus Services



3.2.3 Environmental Consequences

3.2.3.1 No Build Alternative

Roadways and Traffic

Under the No Build Alternative, opening year 2016 traffic conditions are expected to be similar to existing conditions. By 2040, most intersections are estimated to experience slight increases in average vehicular delay due to general regional traffic growth. However, the intersection of U.S. Route 1 at East Glebe Road is projected to operate poorly at LOS E during the AM and PM peak hours for the No Build Condition, a downgrade in service from LOS C in 2016.

Rail Operations

No change to planned rail operations described in **Section 3.2.2 Affected Environment** would occur under the No Build Alternative.

Surface Transit

No change to planned bus services described in **Section 3.2.2 Affected Environment** would occur under the No Build Alternative.

Pedestrian and Bicycle Accommodations

The pedestrian and bicycle network for the No Build Alternative would be comparable to the planned base conditions in 2016 (see **Figure 3-2**). Connectivity within Potomac Yard will be substantially enhanced by the construction of the grid network of streets and sidewalks in North Potomac Yard.

The No Build Alternative includes a pedestrian and bicycle bridge over the CSXT and Metrorail tracks, which would improve local connectivity, shortening the average trip between the Potomac Greens/Old Town Greens neighborhood and Potomac Yard from the current distance of 1.6 miles to 0.4 mile, enabling shorter access to the planned amenities in Potomac Yard. The addition of the pedestrian and bicycle bridge would enhance access to the Mount Vernon Trail from Potomac Yard by creating a shorter connection through the Potomac Greens neighborhood to the Slaters Lane access point to the Trail via the Potomac Greens Park trail and West Abingdon Drive. Access to the trail across the GWMP would remain limited to existing connections via Slaters Lane and the Four Mile Run Trail.

Parking Facilities

No effect to existing or planned parking is expected as a result of the No Build Alternative. The redevelopment of North Potomac Yard will locate off-street parking in structures and on-street parking will be provided as paid hourly metered parking.

Airport

No effect to airport facilities and operations is expected as a result of the No Build Alternative.

3.2.3.2 Build Alternatives

Roadways and Traffic

The proposed Potomac Yard Metrorail Station is planned as an urban station without Park & Ride facilities and off-street Kiss & Ride facilities, and the three Build Alternatives and B-CSX Design Option are expected to generate low levels of vehicular trips similar to other urban stations, with most users accessing the station by walking, bicycle, or bus. The three Build Alternatives and B-CSX Design Option would have no effect on overall intersection LOS in the study area when compared with the No Build condition.

Rail Operations

With each of the three Build Alternatives and B-CSX Design Option, adding a Potomac Yard Metrorail Station would result in approximately one additional minute in run time between National Airport and Braddock Road Metrorail stations. Approximately half of this additional run time would consist of station dwell time at the new Potomac Yard station and the remainder would be additional running time decelerating into and accelerating out of the new station. In the off-peak, the three Build Alternatives and B-CSX Design Option would require one additional train in service to accommodate the increased cycle time needed on the Yellow Line from Huntington to Fort Totten. The Blue Line service plan has sufficient layover time at the end of the line and could accommodate the additional cycle time without requiring an additional train. The slight changes to run time and

distance for the three Build Alternatives and B-CSX Design Option compared to the No Build Alternative would lead to minimal changes in revenue miles and hours.

No change would occur under the three Build Alternatives or B-CSX Design Option from changes anticipated to freight, passenger and commuter rail services. The additional fourth CSXT track anticipated in the Potomac Yard area could be accommodated for under any of the three Build Alternatives or B-CSX Design Option and would not result in any operational impacts to freight, passenger and commuter rail services.

Station Ridership

Table 3-2 lists the estimated opening year 2016 and 2040 ridership at the proposed Potomac Yard Metrorail Station for the three Build Alternatives and B-CSX Design Option. In 2016, ridership for the Build Alternatives and B-CSX Design Option would be similar. In 2040, Build Alternative B would have the highest ridership of the alternatives as a result of its location closest to the high-density development planned in North Potomac Yard. Build Alternative A is further away from the high-density development planned in North Potomac Yard compared to Build Alternative B, and accordingly would have lower 2040 ridership. The realigned tracks of B-CSX Design Option and Build Alternative D, would occupy areas of North Potomac Yard planned for development, reducing the amount of future high-density development in proximity to the station locations and resulting in lower 2040 ridership compared to Build Alternative B.

Table 3-2: Forecast Potomac Yard Metrorail Station Ridership

Ridership Forecast Year	Average Weekday Boardings				
	No Build	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
Opening Year 2016	0	3,600	3,600	3,600	3,600
Horizon Year 2040	0	10,000	11,300	10,000	10,000

Source: MWCOG regional travel demand model with WMATA transit post-processor application (Version 2.3, 2012); MWCOG Round 8.0 Cooperative Land Use Forecasts; and City of Alexandria baseline approved development volumes for Potomac Yard (9.250 million square feet total) assumed for all alternatives.

Potential ridership increases due to development that would be anticipated to occur in Potomac Yard as a result of the three Build Alternatives and B-CSX Design Option is discussed in **Section 3.23 Secondary and Cumulative Effects**.

Surface Transit

No additional bus service or route modifications are planned as part of any of the three Build Alternatives or B-CSX Design Option. The three Build Alternatives and B-CSX Design Option would be located within walking distance of the CCPY Transitway and local bus routes (see **Figure 3-1** and **Figure 3-2**). Some users of the Potomac Yard Metrorail Station would board the CCPY Transitway or DASH routes to access the station, resulting in locally increased bus ridership over the No Build Alternative.

Pedestrian and Bicycle Accommodations

The Build Alternative station entrances would be connected to the planned sidewalk, bicycle route, and multi-use trail network in North and South Potomac Yard (see **Figure 3-3**). The three Build Alternatives and B-CSX Design Option facilities and infrastructure would not obstruct any existing or planned pedestrian or bicycle facilities. The new pedestrian and bicycle bridge across the CSXT and Metrorail tracks would be provided as part of Build Alternatives A and B, and would enhance local pedestrian and bicycle connectivity similar to the No Build Alternative. For Build Alternative D, the pedestrian and bicycle bridge would be built simultaneously with the project. For B-CSX Design Option, the pedestrian and bicycle bridge would be built independently of the project.

Parking Facilities

The three Build Alternatives and B-CSX Design Option are planned as urban stations, primarily accessed via foot, bicycle, or bus/streetcar. Therefore, no additional parking for Metrorail patrons would be provided. However, some Metrorail passengers may attempt to drive and park in adjoining neighborhoods, including Potomac Greens, the developing neighborhoods of South Potomac Yard, and the surface parking lots surrounding the Potomac Yard Shopping Center. Use of neighborhood parking facilities by station passengers could result in less parking availability for residents and patrons of commercial uses in Potomac Yard. The

introduction and enforcement of parking restrictions, including time limits and residential permitting, would largely avoid and minimize the potential impacts of Metrorail patrons attempting to park along public streets in adjoining neighborhoods.

Airport

Based on initial coordination with the Metropolitan Washington Airports Authority (MWAA), which included its review of proposed station locations and preliminary height information, the three Build Alternatives and B-CSX Design Option would comply with applicable height restrictions and would not affect airport facilities or operations. As the station alternatives are directly under the flight path of Runway 4, specific elements of the proposed facilities (such as station lighting) would need to be evaluated during the design phase.

A new Metrorail station at Potomac Yard would enhance airport access from the station area by providing a direct transit connection to the airport via the Metrorail Blue and Yellow Lines.

3.2.4 Mitigation

The three Build Alternatives and B-CSX Design Option would have no adverse effect on any transportation resource, so no mitigation is proposed.

3.3 Land Acquisitions and Displacements

This section identifies potential property or right-of-way acquisitions and displacements of residences or businesses associated with the project.

The following Federal and local guidance and policies are applicable to the resource:

- Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as Amended.
- 49 CFR, Part 24.
- FTA Circular 5010.1D, Chapter IV, Section 2.
- 54 U.S.C. 102901.

3.3.1 Methodology

Property ownership was analyzed using publicly available records, including property boundary, zoning, and title information for each parcel in the study area. Property boundaries were mapped based on 2012 property survey data.

Potential property needs of the three Build Alternatives and B-CSX Design Option, which could include fee simple ownership or right-of-way easements depending on the type of facility, were determined by assuming a minimum 20-foot setback from proposed permanent facilities and structures. In some areas the potential property needs extend beyond 20 feet to accommodate slope areas where the permanent limits of disturbance accommodate potential earthwork and grading, and in other areas the 20-foot property setback extends beyond the limits of disturbance. Property already owned by WMATA or within existing WMATA right-of-way was excluded from property acquisition needs. For proposed aerial structures, the underlying property was assumed to be needed for the project, except for structures above the CSXT tracks, in which case the proposed structures are outside of the vertical and horizontal clearance and CSXT right-of-way would not be impacted.

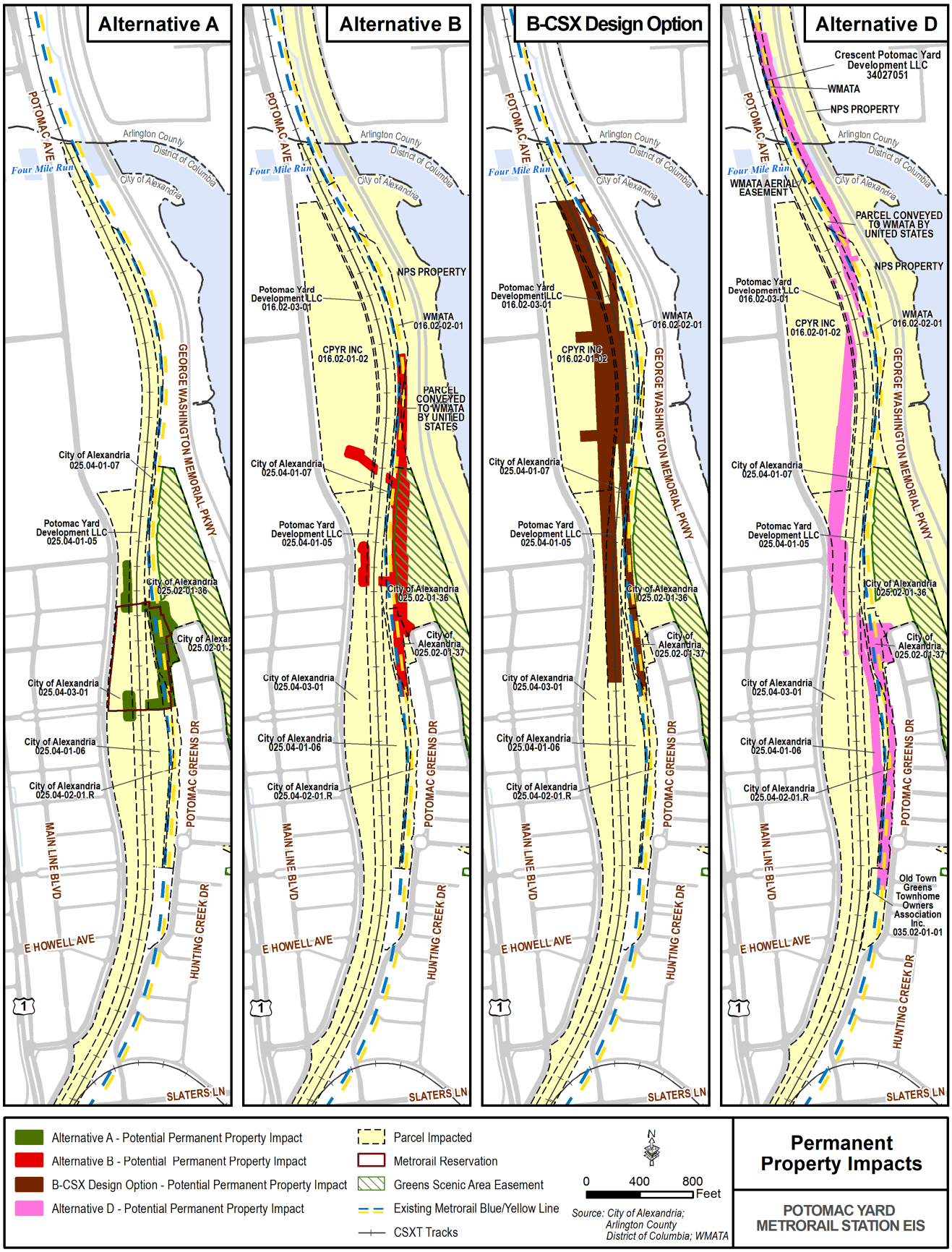
Temporary construction easements were not included in the land acquisition analysis, but are discussed in **Section 3.24 Construction Impacts**.

3.3.2 Affected Environment

3.3.2.1 Key Landowners

Property ownership within the study area consists of a mix of public and private owners. **Figure 3-5** shows current property ownership in the study area. Key landowners include the following:

Figure 3-5: Permanent Property Impacts of Build Alternatives



WMATA

WMATA owns two parcels to the north and south of Four Mile Run along the existing Metrorail alignment. To the south of these parcels, WMATA does not own the parcels underlying its right-of-way. The City of Alexandria owns the underlying parcels along the Metrorail tracks from Potomac Greens Park south to the area around the track portal, which is owned by the Old Town Greens Townhome Owners Association; WMATA has been granted easements across these parcels, which allow it to operate and maintain the Metrorail line.

The City of Alexandria

The City of Alexandria owns parcels at the northern end of the Potomac Greens neighborhood, including the Potomac Greens Park, parcels between the residences located along Potomac Greens Drive and the existing Metrorail alignment, the land between Potomac Greens neighborhood and the GWMP (part of Potomac Greens Park), and the land between the WMATA and CSXT rights-of-way. A large portion of the land north and east of Potomac Greens is owned by the City of Alexandria and is covered by the Greens Scenic Area easement owned by the United States and administered by NPS. The City of Alexandria owns local streets within Potomac Yard and Potomac Greens (with the exception of private alleyways owned by the neighborhood homeowners association) as public rights-of-way.

The United States of America (National Park Service)

The United States owns and NPS administers the GWMP, which forms the eastern edge of the study area along its entire length, including areas west of the roadway eastward to the Potomac River. In addition, NPS administers the Greens Scenic Area easement and various access easements in the area (see Key Easements, Other Title Instruments and Title Provisions below).

Private Landowners

Private Landowners own the parcels within the study area that are west of the CSXT railroad tracks and the parcel underlying the CSXT right-of-way.

CSXT is not listed as a landowner, as it operates within a permanent service easement but does not own the underlying land.

3.3.2.2 Key Easements, Other Title Instruments and Title Provisions

Key easements, other title instruments, and title provisions that apply to parcels within the study area might affect the ability to construct, operate, or maintain a Metrorail station at any of the alternative locations. (This section does not include discussion of utility easements, which are discussed in **Section 3.23 Utilities**.) Key easements and other title instruments within the study area comprise the following:

WMATA Right-of-Way

WMATA holds easements for portions of its Metrorail right-of-way on parcels owned by other entities.

CSXT Right-of-Way

The CSXT railroad operates within the parcel owned by Potomac Yard Development, LLC. CSXT holds a permanent railroad easement. A condition of the railroad easement is the right of the Potomac Yard landowner to construct up to three future bridge crossings over the CSXT tracks within Potomac Yard.

Greens Scenic Area Easement

In 2000, a perpetual scenic easement was acquired by the United States Department of the Interior (NPS) as part of the agreement between Commonwealth Atlantic Properties (the owner of Potomac Yard at the time) and NPS allowing for the development of Potomac Greens and portions of Potomac Yard. The purpose of the easement, as stated in the title documents, is to conserve and preserve the natural vegetation, topography, habitat, and other natural features within what was termed the “Greens Scenic Area.” The scenic easement prohibits most improvements, clearing, tree removal, and grading, except for uses such as light passive recreation and underground utilities, for which any improvements require prior written approval of the United States. Thus, permanent improvements and temporary construction activities associated with the Build Alternatives would be prohibited within the scenic easement. **Section 3.3.3 Environmental Consequences** describes the mechanism for use of the area by the project.

The area covered by the easement is located to the north and east of the Potomac Greens neighborhood, between the neighborhood and the GWMP, on land that is now owned by the City of Alexandria. See **Appendix**

G for additional background information, terms and conditions, and the title instruments related to the Greens Scenic Area easement.

Metrorail Reservation

The Metrorail Reservation was identified as the possible location of a Metrorail station (in the general location of Build Alternative A) in early planning documents for the redevelopment of Potomac Yard. Title provisions relating to the Metrorail Reservation apply to the deeds of a number of parcels located between the residential neighborhoods of Old Town Greens and Potomac Greens and the CSXT right-of-way, as well as one parcel located west of the CSXT right-of-way. These parcels are owned either by the City of Alexandria, the Old Town Greens Townhome Owners Association, the Potomac Greens Homeowners Association, or by Potomac Yard Development, LLC. The parcels are covered by easements and covenants, which anticipate construction of a Metrorail station. A sign informing the public of the planned future Metrorail station has been posted within Potomac Greens Park at the Metrorail Reservation site since the neighborhood was developed, and information was included in all title documents for parcels within the Potomac Greens neighborhood denoting the future Metrorail station location.

Access, Utility and Construction Easements, and Public Rights-of-Way

The study area also has numerous access, utility and construction easements, and public street rights-of-way typical of an urban area. See **Section 3.22 Utilities** and **Section 3.2 Transportation** for more information.

3.3.2.3 Anticipated Changes in Property Ownership

Under agreements with the City of Alexandria, private developers of North and South Potomac Yard are required to dedicate parcels of land to the City for use as public parks. These parcels include the northern portion of Potomac Yard Park as well as several small parks within the Potomac Yard development (see **Section 3.10 Parklands**), some of which the City of Alexandria anticipates will be dedicated in fee simple to City ownership by the year 2016. For the Potomac Yard Park property in North Potomac Yard, the dedication to the City is anticipated to include provisions that permit facilities and uses related to the proposed future Metrorail station, similar to the dedication of the southern portion of Potomac Yard Park to the City in December 2013.

3.3.3 Environmental Consequences

3.3.3.1 No Build Alternative

The No Build Alternative would not result in land acquisition or displacements related to the project.

3.3.3.2 Build Alternatives

Property Impacts

Figure 3-5 shows potential land acquisition needs for the three Build Alternatives and B-CSX Design Option, and **Table 3-3** lists the acreages of potential land acquisition needs by affected parcel owner. The three Build Alternatives and B-CSX Design Option would require additional property for station facilities or right-of-way for realigned track. B-CSX Design Option would also require additional property for the realigned CSXT tracks. Within the potential property impact areas, property needs of the three Build Alternatives and B-CSX Design Option could involve fee simple ownership or easements for track right-of-way or facility access, depending on the type of facility and operational needs. Additional temporary construction easements would be needed for each of the three Build Alternatives or B-CSX Design Option; temporary property impacts are described in **Section 3.24 Construction Impacts**.

As the project facilities would be owned and operated by WMATA, existing WMATA right-of-way and land parcels are excluded from the estimated land acquisition areas. For Build Alternative A, the Metrorail Reservation easement was excluded from potential land or easement acquisition needs. Build Alternatives B and D and B-CSX Design Option have realigned track within a portion of the Metrorail Reservation but not station facilities, so the Metrorail Reservation area was not excluded from the land acquisition needs for these alternatives.

If an alternative requires a land exchange with NPS or impacts an easement owned by NPS, NPS will need to approve the land exchange before the alternative can be implemented. NPS does not have general authority to dispose of real property without the acquisition of property in exchange, so any NPS land transfer or easement modification would be subject to an equal value exchange of lands or interests in land under 54 U.S.C. 102901. Appropriate NEPA compliance would be required for the land exchange. Once all requirements are satisfied, a

final exchange agreement would be drafted and executed by both parties before closing and conveyance of the land.

For historic resources, the transfer, lease, or sale of a Federally owned property without adequate provisions to ensure long-term preservation of the property's historic significance is regarded as an adverse effect under Section 106 of the National Historic Preservation Act (16 U.S.C. 470), as amended, and its associated implementing regulations in 36 CFR Part 800 (see **Section 3.9 Cultural Resources**).

Table 3-3: Potential Permanent Land or Right-of-Way Acquisition

Property Impacted by Type of Parcel Owner	No Build	Build Alternative A[1] (acres)	Build Alternative B (acres)	B-CSX Design Option (acres)	Build Alternative D (acres)
City of Alexandria[2]	0	1.16	3.30	4.44	5.55
NPS[3]	0	0.00	0.16	0.00	1.43
Private Landowner	0	0.11	0.51	9.92[(4)]	3.06
Total[5]	0	1.27	3.97	14.36	10.04

Note: only the portions of parcels required for each alternative are included in the listed acreage.
[1]Alternative A property requirement excludes the area within the Metrorail Reservation.
[2]Some City of Alexandria parcels include area within the Greens Scenic Area easement held by NPS.
[3]NPS property impact acreage includes only NPS parcels and does not include the Greens Scenic Area easement held by NPS on City of Alexandria property.
[4]Impacts to the CSXT right-of-way easement by B-CSX Design Option are included within private landowner property impacts.
[5]Individual acreages may not equal total acreage due to rounding.

Greens Scenic Area Easement

The Greens Scenic Area easement would be permanently impacted by Build Alternative B (see **Table 3-4**). The construction staging and access areas for the three Build Alternatives would impact the easement to varying degrees (see **Section 3.24 Construction Impacts**). For Build Alternatives A and D the proposed construction staging areas could likely be modified at later design phases to avoid the scenic easement. Since Build Alternative B impacts an easement administered by NPS, the easement modification would be subject to an equal value exchange in property or interest in property as required by Federal law (54 U.S.C. 102901). The land exchange process is described above in detail. Both temporary construction activities as well as permanent installation of project facilities would not be permitted under the terms of the easement. B-CSX Design Option would not permanently impact the Greens Scenic Area easement.

Table 3-4: Potential Property Impacts to the Greens Scenic Area Easement

Type of Impact	No Build	Build Alternative A (acres)	Build Alternative B (acres)	B-CSX Design Option (acres)	Build Alternative D (acres)
Permanent	0	0.00	1.71	0.00	0.00

CSXT Easement

CSXT holds a permanent railroad easement on the parcel owned by Potomac Yard Development, LLC. Only B-CSX Design Option would impact the CSXT Easement. Under B-CSX Design Option, 2.78 acres of the easement would be developed to accommodate the realigned WMATA right-of-way. An additional 4.15 acres of the existing CSXT Easement are necessary to accommodate the realigned CSXT right-of-way. Additional impacts by B-CSX Design Option to land owned by private landowners would occur outside of the CSXT easement.

Other Easements

Some existing utility easements would be impacted by the three Build Alternatives and B-CSX Design Option; potential impacts to utilities are described in **Section 3.22 Utilities**. Public street rights-of-way would be impacted by temporary construction activities, which are described in **Section 3.24 Construction Impacts**.

Displacements of Residences and Businesses

Table 3-5 lists potential displacements of residences or businesses and existing buildings that would be potentially affected by land and right-of-way acquisition for the three Build Alternatives and B-CSX Design Option. No residential displacements would be required for any of the alternatives. B-CSX Design Option and

Build Alternative D would result in a displacement of an existing business or building, requiring displacement of the movie theater in Potomac Yard Shopping Center. B-CSX Design Option would also result in the permanent relocation of the CSXT right-of-way.

Table 3-5: Potential Displacements of Residences, Businesses, and Buildings

Displacements	No Build	Alternative A	Alternative B	B-CSX Design Option	Alternative D
Residential	0	0	0	0	0
Business	0	0	0	1 (movie theater)	1 (movie theater)
Buildings (all types)	0	0	0	1 (movie theater)	1 (movie theater)

3.3.4 Mitigation

Compensation and relocation assistance to private landowners would be provided consistent with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended. Compensation for affected public properties would be determined by public agencies with landowning interest. If an alternative requires a land exchange with NPS or impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property or interest in property as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3.3.2**.

For B-CSX Design Option, compensation and relocation assistance would include the dedication of new parallel right-of-way to CSXT and the relocation of tracks and associated infrastructure.

3.4 Land Use and Zoning

This section identifies the potential impacts of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option to land use and zoning. The analysis was prepared pursuant to National Environmental Policy Act (NEPA) of 1969 regulations for analyzing “direct effects” of projects (40 CFR 1508.8). The analysis is described in more detail in the *Land Use, Zoning, and Plans Technical Memorandum,* in Volume II.

3.4.1 Methodology

Existing land use was analyzed based on aerial imagery and site visits to the analysis area. Anticipated land use changes by 2016 were determined based on existing plans and information provided by the City of Alexandria Planning and Zoning Department regarding redevelopment expected to occur by 2016. The anticipated impacts of each alternative on land use were determined by comparing the proposed station facilities and associated structures to the opening year land uses (existing and 2016 planned uses) in those locations and noting any possible conflicts.

Existing zoning within the study area was analyzed through review of City of Alexandria and Arlington County zoning maps, ordinances, and geographic information system (GIS) data. The impacts of the No Build, the three Build Alternatives, and B-CSX Design Option on zoning were identified by first confirming whether each alternative would conform to the zoning requirements. Each alternative was compared to the zoning to identify any conflicts with permitted land uses and the planned amount and type of development.

The study area for the land use and zoning analysis was expanded to include neighborhoods to the west of U.S. Route 1, because of the inter-relationships between Potomac Yard and adjoining neighborhoods. A portion of the neighborhoods west of U.S. Route 1 would be within one-half mile walking distance of the proposed Metrorail station, and the neighborhoods could experience some impacts from the proposed alternatives on land use and zoning. The City is currently conducting a land use planning process that may revise the existing zoning and development density for the neighborhood west and adjacent to U.S. Route 1. Mount Vernon Avenue served as a western border, as it allowed the analysis to consider the potential for impacts at a neighborhood scale. Within Arlington County, the land to the west of U.S. Route 1 is primarily light industrial. South Eads Street served as the study area boundary, in order to capture all land within one-half mile of the proposed improvements to the Metrorail line. The study area was also expanded east to the Potomac River to encompass local plans and recreational areas relevant to the alternatives. The expanded analysis area is bound by Mount Vernon Avenue, Four Mile Run and South Eads Street to the west, the Airport Access Road to the north, the Potomac River to the east, and Slaters Lane and East Monroe Avenue to the south.

3.4.2 Affected Environment

3.4.2.1 Opening Year Land Use

Figure 3-6 illustrates opening year land use in the land use analysis area and vicinity.

Railroad Corridor (City of Alexandria and Arlington County)

The middle of the analysis area is an active railroad corridor with associated utility uses for the Metrorail and CSXT railroads.

North Potomac Yard (City of Alexandria)

The portion of Potomac Yard north of East Glebe Road comprises the Potomac Yard Shopping Center, an established regional retail center with big box retail stores, a movie theater, restaurants, and general retail stores, surrounded by surface parking.

South Potomac Yard (City of Alexandria)

By the opening year of 2016, South Potomac Yard will consist of 1.885 million square feet of development, composed primarily of moderate density residential and mixed-use (residential with neighborhood-serving retail) comprised of townhomes and mid-rise buildings, and institutional uses. Higher-density commercial and office uses will be concentrated between East Glebe Road and Swann Avenue. In addition, Potomac Yard Park is already open, comprising a linear park between the CSXT right-of-way and Potomac Avenue, and linear parks also occupy the medians of Swann Avenue, Custis Avenue, and Howell Avenue.

West of U.S. Route 1 (City of Alexandria)

Areas west of U.S. Route 1 are largely residential in use, with a mix of single family homes, row houses, and apartments, with a few religious institutions and small green spaces. A variety of commercial establishments can be found along major arterials, as well as some light industrial uses along U.S. Route 1.

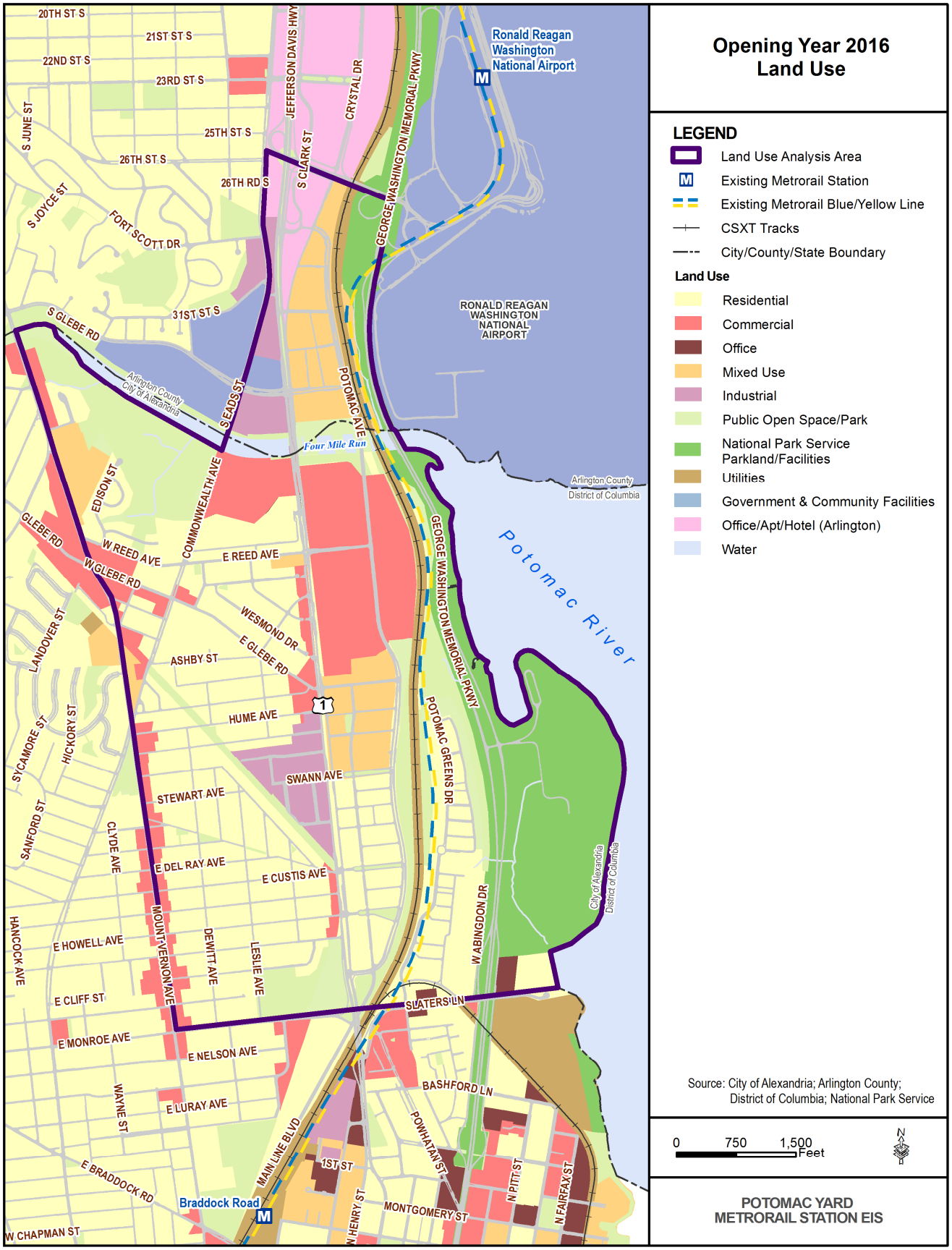
East of Metrorail/CSXT (City of Alexandria)

The southeast corner of the analysis area has small- to medium-scale commercial and office development along Slaters Lane and moderate-density residential development, including multi-family and townhouse. The eastern edge of the analysis area comprises Potomac Greens Park and the open space and memorial highway of the GWMP. A portion of Potomac Greens Park is covered by a scenic easement, which is administered by NPS.

Potomac Yard and Crystal City (Arlington County)

The northern end of the analysis area, west of the CSXT and Metrorail tracks, consists of the Arlington County portion of Potomac Yard and the southern portion of Crystal City. The Arlington County portion of Potomac Yard has a mix of medium-density office and residential buildings with some ground floor retail uses. The southern portion of Crystal City includes medium-density office and hotel uses. East of the CSXT tracks, in Arlington County, land uses consist of open space and the maintenance facilities of the GWMP.

Figure 3-6: Opening Year 2016 Land Use



3.4.2.2 Existing Zoning

Existing zoning for the analysis area is shown in **Figure 3-7**. The zoning within the City of Alexandria primarily consists of three Coordinated Development Districts (CDDs): CDD #7, CDD #10, and CDD #19. CDD #7 covers a portion of the Lynhaven neighborhood to the west of U.S. Route 1. CDD #10 and CDD #19 cover the Alexandria portion of Potomac Yard. Other analysis area zoning comprises a mix of low-, medium-, and high-density residential districts, as well as low-density commercial, public open space, and industrial districts. The majority of the analysis area within Arlington County is included in the *Potomac Yard Phased-Development Site Plan,* which allows for a high-density mix of uses.

CDDs are established by the City of Alexandria for larger re-development sites that require coordination among various property owners, such as Potomac Yard. CDDs are intended to create a mixture of uses, which may include combinations of office, residential, retail, hotel, or other uses with appropriate open space and recreational amenities to serve the project users as well as city residents in general. The CDDs within the study area are summarized in **Table 3-6.**

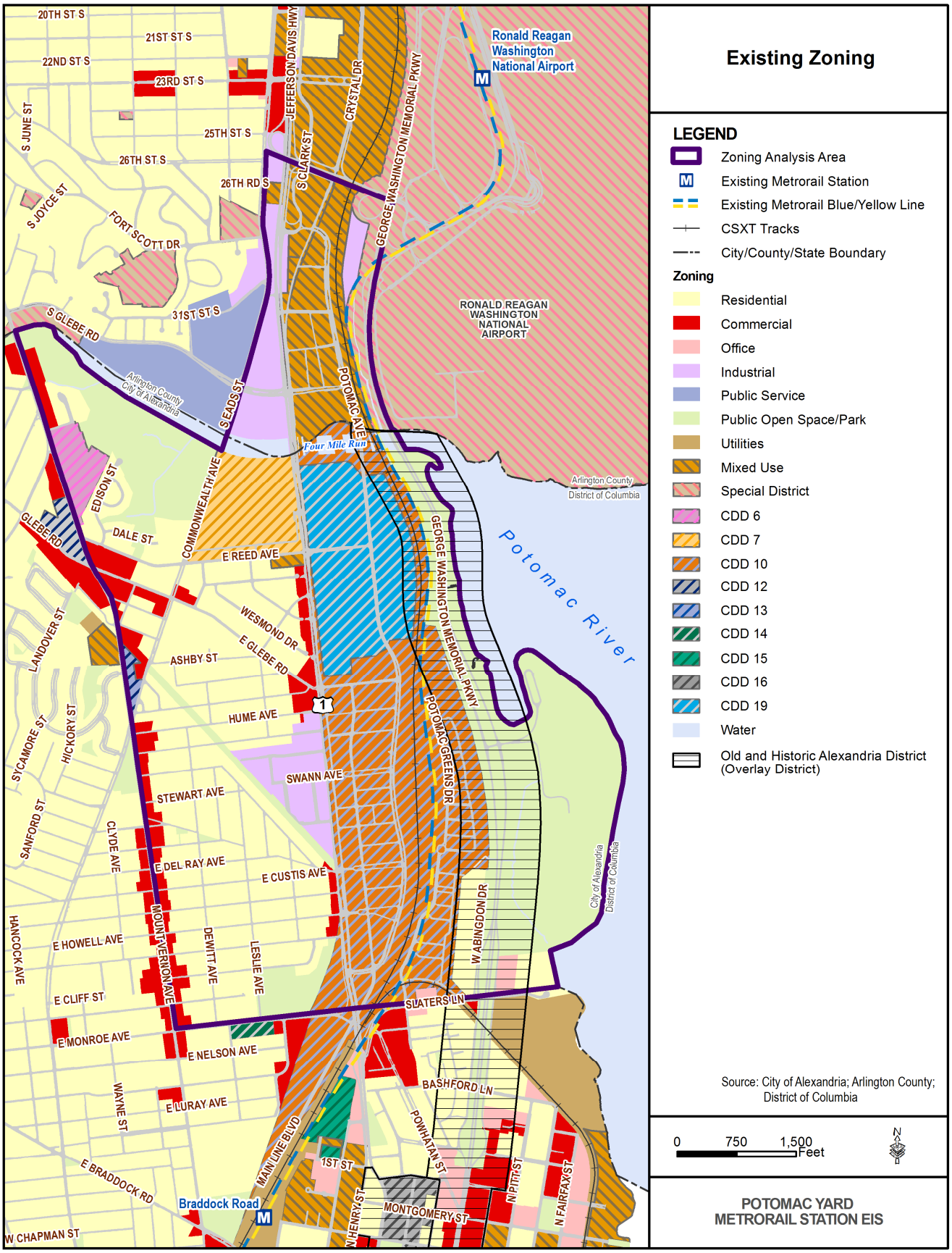
Table 3-6: Summary of City of Alexandria Coordinated Development Districts (CDDs)

CDD	Characteristics
CDD #19 North Potomac Yard	• Based on the *North Potomac Yard Small Area Plan.* • 7.525 million sf mixed-use development approved. • If no Metrorail station is built or if the Metrorail station is built at an alternate location from that specified in the plan, then the approved development volume would be reduced to 3.7 million sf and would require re-planning process for Small Area Plan and amendments to CDD #19. • "Flexible Metrorail Zone" adjacent to northern Metrorail station entrance shown in *North Potomac Yard Small Area Plan*. Within zone, layout of blocks may vary depending on final location and design of Metrorail station. • *North Potomac Yard Urban Design Standards* provide specific requirements for spaces and buildings.
CDD #10 South Potomac Yard/ Potomac Greens	• Based on the *Potomac Yard / Potomac Greens Small Area Plan*. • Allows predominantly medium-density residential uses, but includes a mix of office, retail, hotel, park, open space, and community facility uses.
CDD #7 Route 1 Properties	• Based on *Potomac West Small Area Plan*. • Allows a mix of office, residential, retail, hotel, and open space uses.

Within the City of Alexandria, the study area is covered by two height districts (HD): HD1, Old and Historic Alexandria Height District, and HD6, which includes all parts of the city not included in one of the other height districts. HD1 restricts building heights to 50 feet. In the study area, the HD1 district covers all of the area within 500 feet of the GWMP roadway. Within HD6, the maximum building height is set by the zoning district. In CDD #10, the height limits vary from 35 feet to 110 feet. Height limits in CDD #19 vary by block. In the blocks potentially affected by the project, height limits vary from 35 feet to 135 feet.

Construction within 500 feet of the GWMP roadway is subject to the Board of Architectural Review *Old and Historic Alexandria District Design Guidelines* (1993) and the *Washington Street Guidelines and Standards* (2000), which provide specific requirements for the design of buildings. NPS holds an easement for construction along the roadway.

Figure 3-7: Existing Zoning



3.4.3 Environmental Consequences

3.4.3.1 Land Use

The potential direct impacts of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option on land use are described below. Potential impacts to parklands are assessed in more detail separately in **Section 3.10 Parklands**. Potential indirect effects related to additional development that may occur as a result of a new Metrorail station are assessed separately **Section 3.23 Secondary and Cumulative Effects**.

3.4.3.2 No Build Alternative

The No Build Alternative has no anticipated land use impacts.

3.4.3.3 Build Alternative A

Build Alternative A would occupy the existing Metrorail right-of-way and portions of existing and planned parks. The pedestrian bridge landings would occupy portions of the existing Potomac Yard Park. Station facilities would occupy portions of Potomac Greens Park and open space planned for the future Rail Park. However, most of the station facilities would be within the Metrorail Reservation easement open space.

3.4.3.4 Build Alternative B

Build Alternative B would occupy existing public open space (Potomac Greens Park) north of the Potomac Greens neighborhood, which is covered by the Greens Scenic Area easement administered by NPS, as well as a portion of national parkland (GWMP). Proposed actions and resulting impacts would depend on agreement by NPS for release of the scenic easement and an equal value land exchange for affected NPS property and interests in property. Since Build Alternative B requires a land exchange with NPS or impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**. Within Potomac Yard, the southern station entrance for Alternative B would touch down on existing open space, and the northern station entrance would touch down on a portion of the shopping center parking lot that is planned for redevelopment and open space as dense mixed-use development incorporating a Metrorail station entrance.

3.4.3.5 B-CSX Design Option

B-CSX Design Option would occupy existing commercial development, mostly comprising a parking lot and movie theater building, as well as area planned for mixed-use development, new/realigned streets, and planned and existing public open space (Potomac Yard Park).

3.4.3.6 Build Alternative D

Build Alternative D would occupy existing commercial development, mostly comprising a parking lot and movie theater building, as well as areas planned for mixed-use development, new/realigned streets, and public open space. At the northern end, realigned tracks for the alternative would occupy national parkland (GWMP). Proposed actions and resulting impacts to national parkland would depend on agreement by NPS and an equal value land exchange for affected NPS property and interests in property. Since Build Alternative D requires a land exchange with NPS or impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**. The station and middle part of the realigned track alignment would occupy portions of existing and planned Potomac Yard Park. At the southern end, realigned tracks and the pedestrian bridge to Potomac Greens would occupy portions of existing public open space in the Rail Park, as well as a portion of the Potomac Yard Park.

3.4.3.7 Zoning

The potential impacts of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option on zoning are described below. The zoning impacts are primarily limited to CDD #19 (North Potomac Yard), as each alternative is generally consistent with all other zoning districts within the study area. Compliance with the *North Potomac Yard Urban Design Standards*, the *Old and Historic Alexandria District Design Guidelines*, and the *Washington Street Guidelines and Standards*, as applicable, will be addressed during final design. Each Build Alternative would occupy portions of land designated as open space in the plans which govern CDD #10

and CDD #19. The City of Alexandria is divided into six height districts, which set the maximum heights of buildings and structures. Although zoning districts set the maximum heights within each zone, the height specified may not exceed the maximum height allowed by the height district.

The selection of a preferred alternative other than Build Alternative B would require an amendment to the North Potomac Yard Small Area Plan (see **Section 3.5 Consistency with Local Plans**) and, as a result, an amendment to CDD #19 and its associated Design Standards and Guidelines. CDD amendments (and associated Small Area Plan amendments) would involve an extensive public process, the regulatory recommendation of the Planning Commission, and approval by City Council. For North Potomac Yard, the process would also include the recommendation of the Potomac Yard Design Advisory Commission (PYDAC) and would be subject to the Design Guidelines established in the CDDs. Depending on the extent of revision necessary, the process could take from 12 to 18 months.

3.4.3.8 No Build Alternative

CDD #19 zoning permits 3.7 million square feet of development if no Metrorail Station is built. The 3.7 million square feet is allowable subject to a future planning process and zoning approval.

3.4.3.9 Build Alternative A

Build Alternative A would be inconsistent with the approved zoning for CDD #19, which would reduce the amount of development permitted in North Potomac Yard to 3.7 million square feet under Build Alternative A. Based on a potential future planning process, including amending the Small Area Plan and CDD, required if Build Alternative A is selected as the preferred alternative, the mix of uses would likely change, and density may be greater than the otherwise allowed 3.7 million square feet. Build Alternative A is located entirely in HD6, and its proposed design complies with the District's applicable height limit of 50 feet.

Build Alternative A would not affect zoning in Arlington County or in the City of Alexandria zoning districts outside Potomac Yard.

3.4.3.10 Build Alternative B

Build Alternative B is consistent with CDD #19. If the station is built at this location, CDD #19 would permit up to 7.525 million square feet of development in North Potomac Yard. Build Alternative B is located within HD1, which limits the height of buildings to 50 feet. As currently designed, Build Alternative B would exceed the height limit.

Build Alternative B would not affect zoning in Arlington County or in the City of Alexandria zoning districts outside Potomac Yard.

3.4.3.11 B-CSX Design Option

B-CSX Design Option would be inconsistent with the approved zoning for CDD #19, which would reduce the amount of development permitted in North Potomac Yard to 3.7 million square feet under B-CSX Design Option. Based on a potential future planning process, including amending the Small Area Plan and CDD, required if B-CSX Design Option is selected as the preferred alternative, the mix of uses would likely change, and density may be greater than the otherwise allowed 3.7 million square feet. In addition, the station facilities and new tracks would occupy land designated as open space and planned development in CDD #19 and land designated as open space in CDD #10. Therefore, amendments to CDD 10 and CDD #19 would be required for B-CSX Design Option. The proposed design complies with the height limits of 50 feet and 100 feet.

B-CSX Design Option would not affect zoning in Arlington County or in the City of Alexandria zoning districts outside Potomac Yard.

3.4.3.12 Build Alternative D

Build Alternative D would be inconsistent with the approved zoning for CDD #19, which would reduce the amount of development permitted in North Potomac Yard to 3.7 million square feet under Build Alternative D. Based on a potential future planning process, including amending the Small Area Plan and CDD, required if Build Alternative D is selected as the preferred alternative, the mix of uses would likely change, and density may be greater than the otherwise allowed 3.7 million square feet. In addition, the station facilities and new tracks would occupy land designated as open space and planned development in CDD #19 and land designated as open space in CDD #10. Therefore, amendments to CDD #10 and CDD #19 would be required for Build Alternative D. The proposed design complies with the height limit of 50 feet.

Build Alternative D would not affect zoning in Arlington County or in the City of Alexandria zoning districts outside Potomac Yard.

3.4.4 Mitigation

For Build Alternative B, preliminary analysis of the conceptual design has identified methods to reduce the height to meet current zoning requirements. During preliminary engineering and final design, further refinement would explore options to reduce the structure height to the extent possible.

For the three Build Alternatives and B-CSX Design Option, the station elements proposed within parks would be designed so they are integrated with park facilities, and any affected park infrastructure would be replaced. For Potomac Yard Park, a provision which stipulates that Metrorail station uses within the landing sites are permitted was included in the deed for dedication of the park property to the City.

3.5 Consistency with Local Plans

This section identifies consistency with local plans of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option. The analysis was prepared pursuant to NEPA regulations for analyzing “direct effects” of projects (40 CFR 1508.8). The analysis is described in more detail in the *Land Use, Zoning, and Plans Technical Memorandum,* in Volume II.

3.5.1 Methodology

Local and regional plans from the City of Alexandria, Arlington County, the Northern Virginia Regional Commission (NVRC), MWCOG, Virginia Railway Express (VRE), and NPS were reviewed. Those plans considered applicable to the study area were identified and summarized in terms of overall content and provisions relevant to the study area and the project. Plans considered relevant included both citywide/countywide comprehensive plans and small area plans that overlapped with portions of the study area. Consistency of each alternative with relevant plans was determined based on whether or not the project would meet the goals, policies, and specific recommendations outlined in the plan.

The study area for consistency with local plans was expanded to include neighborhoods to the west of U.S. Route 1, because of the inter-relationships between Potomac Yard and adjoining neighborhoods. A portion of the neighborhoods west of U.S. Route 1 would be within one-half mile walking distance of the proposed Metrorail station, and the neighborhoods could experience some impacts from the proposed alternatives on local plans. Mount Vernon Avenue served as a rational western border, as it allowed the analysis to consider the potential for impacts at a neighborhood scale. Within Arlington County, the land to the west of U.S. Route 1 is primarily light industrial. South Eads Street served as the study area boundary, to capture all land within one-half mile of the proposed improvements. The study area was also expanded east to the Potomac River to encompass local plans and recreational areas relevant to the alternatives.

The expanded analysis area is bound by Mount Vernon Avenue, Four Mile Run and South Eads Street to the west, the Airport Access Road to the north, the Potomac River to the east, and Slaters Lane and East Monroe Avenue to the south.

3.5.2 Affected Environment

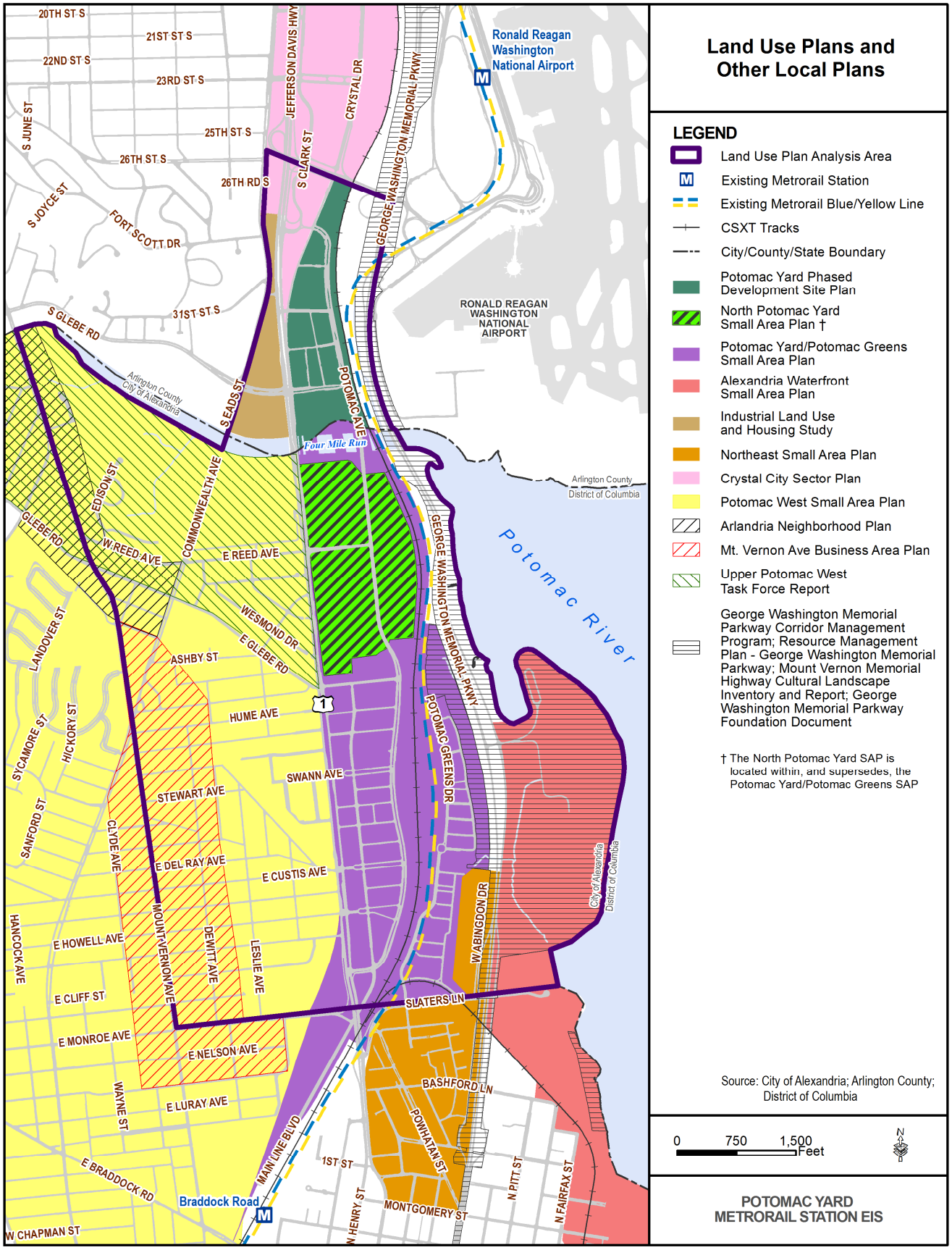
Table 3-7 summarizes local plans applicable to the analysis area and proposed project. The major plans relevant to Potomac Yard are described in more detail in the *Land Use, Zoning, and Consistency with Local Plans Technical Memorandum*, in Volume II. **Figure 3-8** shows the locations of the planning areas of the relevant small area plans.

668 **Table 3-7: Summary of Local Plans**

Plan	Analysis Area Provisions	Metrorail Station Provisions
City of Alexandria Plans		
North Potomac Yard Small Area Plan (2010)	Envisions a transit-oriented, mixed use development. Concentrations of residential, office, and retail uses would vary among neighborhoods, with the highest intensity of office uses in the Metro Square Neighborhood, which would be focused on a new Metrorail station. The plan defines a "Flexible Metrorail Zone," envisioned as an urban place centered on the Metrorail station.	Requires a Metrorail station to support the level of development planned. Station location recommended on the east side of the CSXT right-of-way, north of the existing traction power substation. The station location recommended in the plan is in the general location of Build Alternative B.
Potomac Yard / Potomac Greens Small Area Plan and CDD Concept Plan (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010)	Recommends a mix of land uses, with residential uses concentrated towards the southern part of Potomac Yard, public open space on the eastern edge, and higher-density office, residential, and retail uses in the central portion of Potomac Yard.	The CDD Concept Plan requires a Metrorail reservation in the Potomac Greens portion of the analysis area. The location in the plan is the approximate location of Build Alternative A. However, portions of plan are superseded by the *North Potomac Yard Small Area Plan*, which mandates a Metrorail station in the vicinity of the location of Build Alternative B.
Waterfront Small Area Plan (2012)	The portion of the waterfront adjacent to the analysis area is under NPS ownership.	Plan references need to connect Daingerfield Island (GWMP, NPS) with a possible Metrorail station.
City of Alexandria Comprehensive Transportation Master Plan	Corridor A is a north-south corridor that generally follows US Route 1 in the project study area and calls for the development of more reliable transit services through the use of dedicated transitways such as the CCPY Transitway that is now operating in the Potomac Yard area. Other types of improvements envisioned include smart shelters, pedestrian improvements at intersections along US Route 1, and a new bicycle/pedestrian bridge over the CSXT Railroad and the Metrorail Line.	The plan seeks to establish superior transit service connection with local and regional transit service including Metrorail.
City of Alexandria Environmental Action Plan 2030	Supports Small Area Plans that increase density in and around Metro Stations.	Plan calls for construction of a Metrorail station in Potomac Yard by the time occupancy of the development reaches 70%
City of Alexandria Master Plan (1992)	Recommends mixed-use development in Potomac Yard. Specific recommendations are included in the City small area plans.	Plan recommends a new Metrorail station as part of any potential development in Potomac Yard, but does not specify a location.
City of Alexandria Master Plan Water Quality Management Supplement (2001**)**	Classifies the development suitability of areas within the City based on potential impacts to water quality. Wetlands and stream buffer areas are classified as "generally unsuitable for development." Floodplains and floodplain soils are classified as having "limited development potential that requires special consideration." Small area plans will consider the general recommendations and apply them appropriately.	Neither assumes nor precludes a Metrorail station at Potomac Yard.
Northeast Small Area Plan (1992)	Focuses on preserving and protecting existing neighborhoods, with compatible redevelopment. Discourages non-local traffic.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Arlington County Plans		
Potomac Yard Phased Development Site Plan (2000)	Provides for a mix of uses in the Arlington County portion of Potomac Yard, to include residential, hotel, office, and retail uses.	Neither assumes nor precludes a Metrorail station in Potomac Yard.

Plan	Analysis Area Provisions	Metrorail Station Provisions
Arlington County General Land Use Plan (2011)	Incorporates the recommendations of the Potomac Yard Phased Development Site Plan into the overall County land use policy.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Crystal City Sector Plan (2010)	Provides for redevelopment of Crystal City, with increased densities, open space, and pedestrian-oriented streetscape.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Industrial Land Use and Zoning Study (2000)	Examines appropriate locations for industrial land uses within Arlington County.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Regional Plans		
VRE System Plan 2040 Study (VRE, 2014)	Recommends expanding the capacity of the Long Bridge Railroad Corridor (between the VRE Alexandria Station and southwest Washington DC) from three tracks to four tracks – two for passenger trains and two for freight trains.	No mention of a Metrorail station at Potomac Yard.
GWMP Foundation Document (NPS, 2014)	Describes the purpose of the GWMP, its significance, its fundamental resources and values, and its policy requirements, special mandates, and administrative commitments.	No mention of a Metrorail station at Potomac Yard.
Four Mile Run Restoration Master Plan (NVRC, 2006)	Envisions a park along Four Mile Run in the analysis area, including converting the former railroad bridge over Four Mile Run west of Potomac Avenue into open space and removing an additional former railroad bridge.	No mention of a Metrorail station at Potomac Yard or near Four Mile Run in the plan recommendations.
GWMP Corridor Management Program (NPS, 2005)	Purpose of the GWMP includes protecting and managing natural, cultural, and recreational resources and scenic values.	No mention of a Metrorail station at Potomac Yard. The program addresses the preservation of the historic character and scenic views along the parkway.
Resource Management Plan: George Washington Memorial Parkway (NPS, 1994)	Role of the GWMP includes preserving Potomac River shoreline, providing recreational opportunities, and providing a scenic roadway as a memorial to George Washington. Plan guides NPS natural resource management for the GWMP.	No mention of a Metrorail station at Potomac Yard. However, the plan emphasizes the protection of scenic views along the parkway.
GWMP- Potomac Greens Final EIS (NPS, 1991)	The Final EIS analyzed the potential impacts of the Potomac Greens development to the GWMP and identified alternatives that might eliminate or mitigate those impacts.	One of the six alternatives (Alternative 1A) references a location of a future Metrorail station at the proposed location of Alternative A.
Mount Vernon Memorial Highway (MVMH) Cultural Landscape Inventory and Report (NPS, 1987)	Describes past planning efforts for the MVMH (now part of the GWMP), which focused on design and landscaping of areas along the roadway "to maximize scenic, esthetic, and commemorative qualities." The report (Vol. I, pp. 72-74) documents the original design principles of the MVMH (engineering, landscape architecture and memorial character). The landscape architecture principles include: "Conserving the natural scenery as a means to quickly buffer adjacent properties, upgrade the existing woodland, and preserve existing topsoil;" and "Distributing new plantings in a 'natural' configuration that 'expresses not man's will but the operation of natural forces.'"	No mention of a Metrorail station at Potomac Yard. However, the CLR does note the encroachment of the Metrorail Yellow line and its visual impact on the MVMH.
Capper-Cramton Act of 1930 (46-Stat. 482)	Lands of the GWMP were and continue to be acquired under the Capper-Cramton Act of 1930 (46-Stat. 482), for conservation, environmental, and recreational purposes consistent with the provisions of this act.	The Capper Cramton Act was established long before the Metrorail System was planned and constructed. However, GWMP/MVMH took obvious efforts to block undesired views of "rail transport" from the roadway, particularly in the area of Potomac Yard.

Figure 3-8: Land Use Plans and Other Local Plans



3.5.3 Environmental Consequences

The plans with provisions related to or directly affected by the project alternatives are the *North Potomac Yard Small Area Plan*, the *Potomac Yard/Potomac Greens Small Area Plan*, the *City of Alexandria Master Plan*, and various planning documents for the GWMP. **Table 3-8** summarizes the extent to which the No Build Alternative, the three Build Alternatives, and B-CSX Design Option are consistent with these relevant local plans.

Table 3-8: Consistency with Local Plans by Alternative

Alternative	Anticipated Impacts on Local Plans
No Build	• Inconsistent with the *North Potomac Yard Small Area Plan,* the *Potomac Yard/Potomac Greens Small Area Plan*, and the *City of Alexandria Master Plan*.
Build Alternative A	• Inconsistent with the *North Potomac Yard Small Area Plan*. • Consistent with the *Potomac Yard/Potomac Greens Small Area Plan* (superseded by the *North Potomac Yard Small Area Plan*), the *City of Alexandria Master Plan,* and the *Water Quality Management Supplement*. • Not inconsistent with plans and policy documents for the GWMP.
Build Alternative B	• Consistent with the *North Potomac Yard Small Area Plan,* the *City of Alexandria Master Plan,* and the *Water Quality Management Supplement*. • Consistent with the *Potomac Yard/Potomac Greens Small Area Plan* (superseded by the *North Potomac Yard Small Area Plan*). • Not inconsistent with plans and policy documents for the GWMP.
B-CSX Design Option	• Inconsistent with the *North Potomac Yard Small Area Plan* and the *Potomac Yard/Potomac Greens Small Area Plan.* • Consistent with the *City of Alexandria Master Plan* and the *Water Quality Management Supplement*. • Not inconsistent with plans and policy documents for the GWMP.
Build Alternative D	• Inconsistent with the *North Potomac Yard Small Area Plan* and the *Potomac Yard/Potomac Greens Small Area Plan.* • Consistent with the *City of Alexandria Master Plan* and the *Water Quality Management Supplement*. • Not inconsistent with plans and policy documents for the GWMP.

The selection of the No Build Alternative, Build Alternative A, B-CSX Design Option, or Build Alternative D as the preferred alternative would require an amendment to the North Potomac Yard Small Area Plan, in turn requiring amendments to CDD #19 zoning and Design Standards. Small Area Plan amendments (and associated CDD zoning amendments) involve an extensive public process, the regulatory recommendation of the Planning Commission, and approval by City Council. For North Potomac Yard, the process would also include the recommendation of the Potomac Yard Design Advisory Commission (PYDAC) and would be subject to the Design Guidelines established in the CDDs. Depending on the extent of revision necessary, the process could take 12 to 18 months.

3.5.3.1 No Build Alternative

The No Build Alternative would be inconsistent with the *North Potomac Yard Small Area Plan*, because the plan recommends a high-density, transit-oriented development anchored by a future Metrorail station. The exclusion of the station would substantially impact the planned development at North Potomac Yard. The Metrorail station is a central element of the plan and is necessary to support the level of development approved for the site. The No Build Alternative would require an amendment to the North Potomac Yard Small Area Plan to re-plan the area for lower development levels, as stipulated by the provisions of CDD #19 (see **Section 3.4 Land Use and Zoning**). Amendments to the Small Area Plan would then require amendments to CDD zoning approvals and Design Standards and Guidelines.

The No Build Alternative would be inconsistent with other plans as well. A Metrorail station at Potomac Yard is recommended in the 1992 *Potomac Yard/Potomac Greens Small Area Plan*, as well as the *City of Alexandria Master Plan*.

3.5.3.2 Build Alternative A

Build Alternative A would be inconsistent with the *North Potomac Yard Small Area Plan* because it would locate the station south of the location identified in the plan and would result in less density and planned office use in North Potomac Yard than envisioned by the plan.

The Potomac Greens Final Environmental Impact Statement (1991) was initiated by Congress under appropriations bill (PL100-446) to assess the potential impacts of the Potomac Greens development to the GWMP and to identify alternatives that might eliminate or mitigate those impacts. One of the six evaluated alternatives, Alternative IA, references a Metrorail station in the approximate location of Alternative A.

The *Potomac Yard/Potomac Greens Small Area Plan* (1992, amended 1999) identifies a Metrorail station in the approximate location of Build Alternative A, and the CDD concept plan requires a reservation for a potential Metrorail station approximately at the location of Build Alternative A. However, the *North Potomac Yard Small Area Plan* (2010) supersedes portions of the *Potomac Yard / Potomac Greens Small Area Plan* and assumes a station location in the vicinity of Build Alternative B. If Build Alternative A is selected as the preferred alternative, the City of Alexandria would be required to initiate a planning process to revise the North Potomac Yard Small Area Plan that would likely result in lower development levels than currently envisioned in the plan. A potential new planning process would re-evaluate the plan's recommended development and land uses based on the preferred alternative and would result in amendments to the Small Area Plan, CDD zoning approvals, and Design Standards and Guidelines.

GWMP Plans do not address the addition of a Metrorail Station at Potomac Yard. Build Alternative A would not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and *the Mount Vernon Memorial Highway Cultural Inventory and Landscape Report* (1987). Some views from the GWMP roadway and parkland would also be affected by Build Alternative A. In 2016, the existing character of the views from the GWMP, of a curving roadway framed by vegetation with intermittent views of existing built elements to the west and views of the river to the east, would be changed through the introduction of new built elements related to the station and planned Potomac Yard development and the removal of vegetation from areas west of GWMP. By 2040, restored vegetation would grow to filter views of built elements from GWMP roadway and park, although the trees would unlikely reach a height and depth that would consistently block views of the station. In 2016, the visual quality would be very high, and in 2040, the visual quality of the GWMP would be high, as in the No Build Alternative. See **Section 3.8 Visual Resources**, for more detail.

3.5.3.3 Build Alternative B

Build Alternative B is consistent with the North Potomac Yard Small Area Plan because the station would be located where approved in the plan. The alternative would provide direct access to the core of the planned development and would support the approved development and land uses in North Potomac Yard.

Portions of the Build Alternative B site include wetlands, stream buffers, and floodplains. The *City of Alexandria Master Plan Water Quality Management Supplement* (2001) identifies these areas as "generally unsuitable for development" or as having "limited development potential that requires special consideration." However, the *Water Quality Management Supplement* does not forbid development in these areas. Instead, the supplement states that when impacts to wetlands occur, "the City will try to mitigate the impacts through wetland creation or enhancement, improvements to riparian areas, or through the use of Best Management Practices to treat stormwater" (2001, E-3), in accordance with the USACE regulations for wetlands mitigation and or restoration. Likewise, development within floodplains will be held to design and construction standards intended to protect users from the risks of flooding.

GWMP Plans do not address the addition of a Metrorail Station at Potomac Yard. Build Alternative B would not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Build Alternative B would also require the use of national parkland, as well as 1.71 acres of the Greens Scenic Area easement, the intention of which is to preserve and enhance the visual quality of the GWMP. Build Alternative B could not proceed unless the scenic easement is released by NPS subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. If Build Alternative B is able to proceed, some views from the GWMP roadway and parkland would be affected. In 2016, the visual character of the corridor would be changed from a divided four-lane roadway consistently framed by vegetation (with intermittent views of rail transportation and built elements to the west and river to the east) to that of a roadway framed by vegetation but more frequently interrupted with views of transportation facilities and built elements. By 2040, restored vegetation would grow to filter views of the Metrorail station from the GWMP roadway and park, although the trees would unlikely reach a height and depth that would consistently block views of the station. The visual quality of the continuous view corridor would be very high in 2016 and high in 2040, as in the No Build Alternative. See **Section 3.8 Visual Resources**, for more detail.

3.5.3.4 B-CSX Design Option

B-CSX Design Option is located north of where the station was identified in the *Potomac Yard/Potomac Greens Small Area Plan* (1992, amended 1999); however, the *North Potomac Yard Small Area Plan* (2010) supersedes portions of the earlier plan. If B-CSX Design Option is selected as the preferred alternative, the City of Alexandria would initiate a planning process to consider revision of the *North Potomac Yard Small Area Plan.* The new planning process would re-evaluate the plan's recommended development and land uses based on the preferred alternative and would result in amendments to the Small Area Plan, CDD zoning approvals, and Design Guidelines.

B-CSX-Design Option would be consistent with the *City of Alexandria Master Plan Water Quality Management Supplement* (2001) and the *Water Quality Management Supplement* (2001).

GWMP Plans do not address the addition of a Metrorail Station at Potomac Yard. B-CSX Design Option would not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and *the Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Some views from the GWMP roadway and parkland would also be affected by Design Option B-CSX. In 2016, the existing character of the views from the GWMP, of a curving roadway framed by vegetation with intermittent views of built elements to the west and views of the river to the east, would be changed through the introduction of new built elements and the removal of vegetation from areas west of the existing Metrorail Line. Portions of the station would be visible from the GWMP. By 2040, restored vegetation would grow to filter views of built elements of the station. By 2040 development in North Potomac Yard would also be visible from GWMP. In 2016, the visual quality would be very high, and in 2040, the visual quality of the GWMP would be high, as in the No Build Alternative. This change in visual quality by 2040 is due to the visibility of increasing development in North Potomac Yard. See **Section 3.8 Visual Resources**, for more detail.

3.5.3.5 Build Alternative D

Build Alternative D is located within North Potomac Yard. The alternative would provide direct access to "Metro Square," one of the primary nodes of development identified in the *North Potomac Yard Small Area Plan*. However, as Alternative D places the station platform west of the existing CSXT/Metrorail tracks, the station footprint would encroach on the buildable area of the plan, reducing the total developable area.

Build Alternative D is located north of where the station was identified in the *Potomac Yard/Potomac Greens Small Area Plan* (1992, amended 1999); however, the *North Potomac Yard Small Area Plan* (2010) supersedes portions of the earlier plan. If Build Alternative D is selected as the preferred alternative, the City of Alexandria would initiate a planning process to consider revision of the *North Potomac Yard Small Area Plan.* The new planning process would re-evaluate the plan's recommended development and land uses based on the preferred alternative and would result in amendments to the Small Area Plan, CDD zoning approvals, and Design Standards and Guidelines.

Portions of the Build Alternative D site include wetlands, stream buffers, and floodplains. The *City of Alexandria Master Plan Water Quality Management Supplement* (2001) identifies these areas as "generally unsuitable for development" or as having "limited development potential that requires special consideration." However, the *Water Quality Management Supplement* does not forbid development in these areas. Instead, the supplement states that when impacts to wetlands occur, "the City will try to mitigate the impacts through wetland creation or enhancement, improvements to riparian areas, or through the use of Best Management Practices to treat stormwater" (2001, E-3), in accordance with the USACE regulations for wetlands mitigation and or restoration. Likewise, development within floodplains will be held to design and construction standards intended to protect users from the risks of flooding.

GWMP Plans do not address the addition of a Metrorail Station at Potomac Yard. Build Alternative D would not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Build Alternative D would also require the use of GWMP parkland. Some views from the parkway would be affected. In 2016, the character of the corridor would change from a consistent four-lane roadway framed by vegetation with intermittent views of transportation facilities and built elements to the west and the river to the east, to that of a roadway partially framed by vegetation with views of transportation facilities and built elements. By 2040, replacement vegetation would have grown to filter much of the Metrorail facilities from the GWMP roadway. In 2016 and 2040, the visual quality of the GWMP would remain moderately high. See the **Section 3.8 Visual Resources**, for more detail.

3.5.4 Mitigation

No mitigation is proposed.

3.6 Neighborhoods, Demographics, and Community Resources

This section identifies the potential impacts of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option to neighborhoods, demographics, and community resources. The neighborhoods, demographics and community resources analysis was developed consistent with Executive Order (EO) 13045: Protection of Children from Environmental Health Risks and Safety Risks.

The analysis is described in more detail in the *Neighborhoods and Environmental Justice Technical Memorandum,* in Volume II.

3.6.1 Methodology

Impacts to neighborhoods and community resources were evaluated for the project, focusing on the elements of each alternative that could create a barrier to community facilities, impact emergency response, or isolate neighborhood residents from community facilities.

Demographic characteristics analyzed included total population, population percentages for minors and senior citizens, and future projected population and employment growth. Demographics were analyzed using 2010 U.S. Census and American Community Survey data. Forecasted changes in population and employment were determined using MWCOG forecasts for the year 2040.

The analysis area for neighborhoods, demographics, and community resources was expanded beyond the project study area to include neighborhoods to the west of U.S. Route 1, because of the interrelationships between Potomac Yard and adjoining neighborhoods. The expanded analysis area is bound by Mt. Vernon Avenue, Four Mile Run and Eads Street to the west, the Airport Access Road to the north, the GWMP to the east, and Slaters Lane to the south.

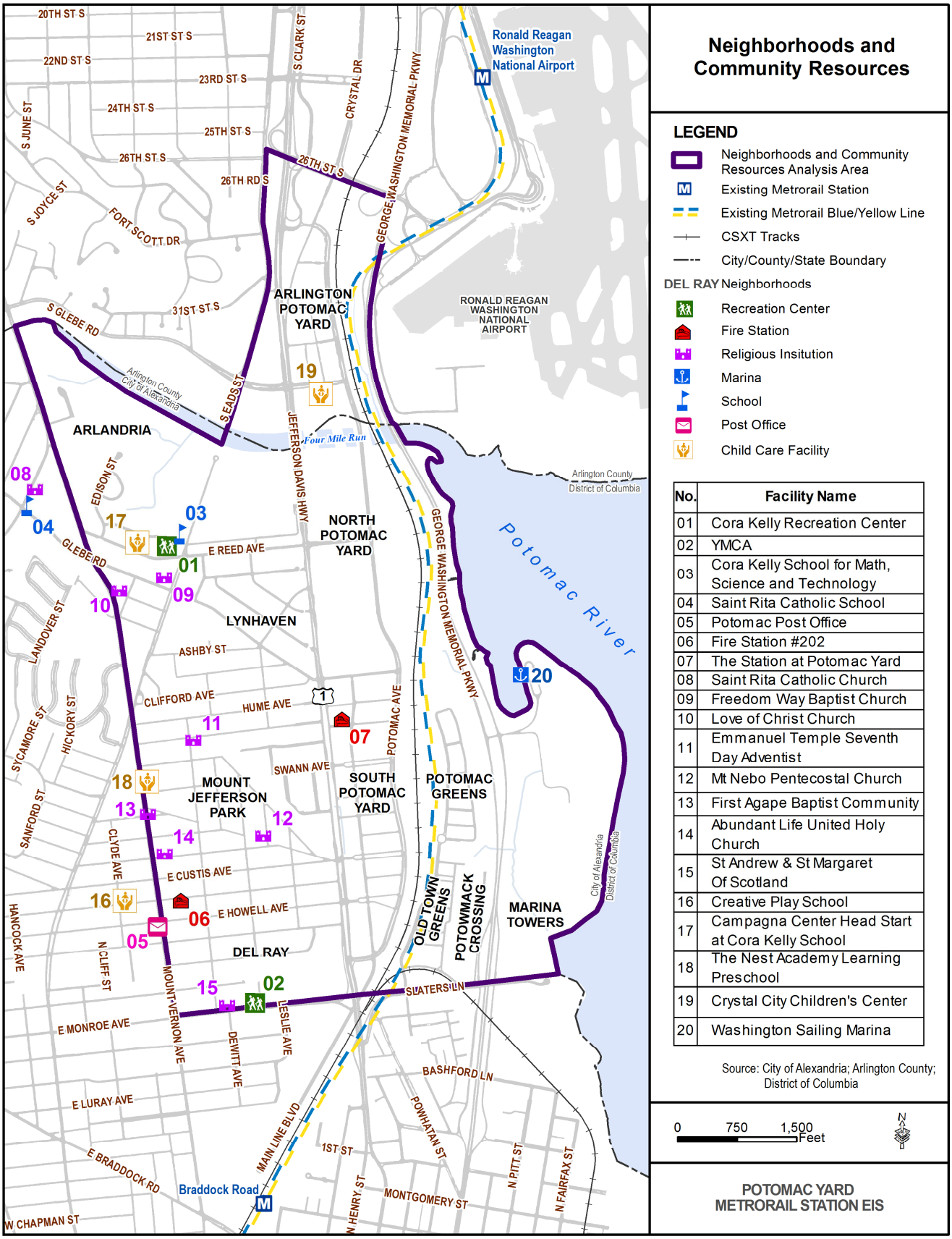
3.6.2 Affected Environment

The neighborhoods included in the analysis are Potomac Greens, Alexandria Potomac Yard, Old Town Greens, North Potomac Yard, South Potomac Yard, Arlandria, Del Ray, Mount Jefferson Park, Lynhaven, Potowmack Crossing Condominiums, and Marina Towers.

The Potomac Yard area (City of Alexandria and Arlington County sections) is anticipated to see a 109 percent increase in population and a 138 percent increase in employment by the year 2040. The population and employment growth within the analysis area are driven primarily by the redevelopment of Potomac Yard.

Community resources within the analysis area neighborhoods include schools, fire stations, religious institutions, childcare facilities, and state and Federal employers. These facilities are shown in **Figure 3-9** and listed in **Table 3-9**.

Figure 3-9: Neighborhoods and Community Resources



No.	Facility Name
01	Cora Kelly Recreation Center
02	YMCA
03	Cora Kelly School for Math, Science and Technology
04	Saint Rita Catholic School
05	Potomac Post Office
06	Fire Station #202
07	The Station at Potomac Yard
08	Saint Rita Catholic Church
09	Freedom Way Baptist Church
10	Love of Christ Church
11	Emmanuel Temple Seventh Day Adventist
12	Mt Nebo Pentecostal Church
13	First Agape Baptist Community
14	Abundant Life United Holy Church
15	St Andrew & St Margaret Of Scotland
16	Creative Play School
17	Campagna Center Head Start at Cora Kelly School
18	The Nest Academy Learning Preschool
19	Crystal City Children's Center
20	Washington Sailing Marina

Table 3-9: Existing Community Facilities

Map Reference	Facility Type	Name	Address (Alexandria unless otherwise noted)	Ownership	Location
01	Recreation Center	Cora Kelly Recreation Center	25 West Reed Avenue	City of Alexandria	Arlandria
02	Recreation Center	YMCA	420 E Monroe Avenue	Private	Del Ray
03	Public School	Cora Kelly School for Math, Science and Technology	3600 Commonwealth Avenue	City of Alexandria	Arlandria
04	Private School	Saint Rita Catholic School	3801 Russell Road	Private	Arlandria
05	Post Office	Potomac Post Office	1908 Mount Vernon Ave	USPS	Del Ray
06	Public Safety	Fire Station #202	213 East Windsor Avenue	City of Alexandria	Del Ray
07	Public Safety	Fire Station #209	2800 Main Line Blvd	City of Alexandria	Alexandria Potomac Yard
08	Religious Institution	Saint Rita Catholic Church	3815 Russell Road	Private	Arlandria
09	Religious Institution	Freedom Way Baptist Church	1 West Glebe Road	Private	Arlandria
10	Religious Institution	Love of Christ Church	101 Leadbeater Street	Private	Del Ray
11	Religious Institution	Emmanuel Temple Seventh Day Adventist	2707 Dewitt Avenue	Private	Del Ray
12	Religious Institution	Mt Nebo Pentecostal Church	2300 Burke Avenue	Private	Del Ray
13	Religious Institution	First Agape Baptist Community	2423 Mount Vernon Ave	Private	Del Ray
14	Religious Institution	Abundant Life United Holy Church	204 East Del Ray Avenue	Private	Del Ray
15	Religious Institution	St Andrew & St Margaret Of Scotland	402 East Monroe Avenue	Private	Del Ray
16	Childcare Facility	Creative Play School	100 East Windsor Avenue	Private	Del Ray
17	Childcare Facility	Campagna Center Head Start at Cora Kelly School	3600 Commonwealth Avenue	City of Alexandria	Arlandria
18	Childcare Facility	The Nest Academy Learning Preschool	2609 Mount Vernon Avenue	Private	Alexandria
19	Childcare Facility	Crystal City Children's Center	3650 South Glebe Road, Suite 170	Private	Arlington
20	Marina	Washington Sailing Marina	1 Marina Drive at Daingerfield Island	NPS	GWMP

Source: City of Alexandria, Arlington County, and field observations, May 2012.

3.6.3 Environmental Consequences

3.6.3.1 No Build Alternative

The No Build Alternative would not provide any mobility benefits beyond those that would be provided by planned future transportation projects and improvements, such as completion of the Arlington County segment of the CCPY Transitway, which are included in the CLRP. Development planned for Potomac Yard would proceed, but at lower levels than have been approved. Community cohesion and reduced community isolation would be provided through the provision of a 24-hour bicycle and pedestrian bridge connecting Potomac Greens and Potomac Yard based on an existing City requirement. The No Build Alternative would not cause any residential displacements, safety impacts, or changes in property values beyond those anticipated to occur due to planned future development projects and other planned transportation projects.

3.6.3.2 Build Alternatives

Each Build Alternative would result in similar impacts to the surrounding neighborhoods. The Potomac Greens and Old Town Greens neighborhoods, as well as Del Ray, Lynhaven, Arlandria, and South Potomac Yard, would benefit from increased access to the regional Metrorail system. The three Build Alternatives and B-CSX Design Option would result in increased economic activity, given the desirability for Metrorail access for large employers. Neighborhoods adjacent to other Northern Virginia Metrorail stations have historically experienced

increases in land and housing values due to the proximity to Metrorail; the identified neighborhoods would be expected to experience a similar effect.

The three Build Alternatives and B-CSX Design Option would affect views from Potomac Yard and the Potomac Greens neighborhood. Construction activities would result in traffic, noise, and dust that would primarily affect the neighborhoods immediately surrounding the construction site. See **Sections 3.8** and **3.24** for more detailed discussion of impacts to visual resources and construction impacts, respectively.

In addition to the impacts reviewed as instructed by USDOT Order 5610.2(a), the potential for negative impacts to facilities serving minors was evaluated per the requirements of EO 13045, Protection of Children from Environmental Health Risks. No negative impact to concentrations of children or children-serving facilities was identified due to any of the three Build Alternatives and B-CSX Design Option.

3.6.4 Mitigation

See **Section 3.8.4** for proposed mitigation measures of visual impacts and **Section 3.24.4** for proposed mitigation measures of construction impacts.

3.7 Environmental Justice

This section identifies the potential effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option to minority and low-income populations. Environmental justice is defined by Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Executive Order 12898 requires that Federal agencies identify and address disproportionately high and adverse Federal impacts on minority and low-income communities. The U.S. Department of Transportation (USDOT) is committed to the principles of environmental justice, which include:

- 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;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The environmental justice analysis was prepared in accordance with the following Federal guidance documents:

- USDOT Order 5610.2(a), Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, May 10, 2012;
- Federal Transit Administration Circular 4703.1, Environmental Justice Policy Guidance for Federal Transit Administration Recipients, August 15, 2012; and
- Council on Environmental Quality (CEQ), Environmental Justice – Guidance under the National Environmental Policy Act (NEPA) of 1969, December 10, 1997.

The analysis is described in more detail in the *Neighborhoods and Environmental Justice Technical Memorandum,* in Volume II.

3.7.1 Methodology

In accordance with FTA Circular 4703.1, both the potential for positive impacts, such as improved access to transit, and negative impacts, such as vibration or noise effects, were assessed in the environmental justice analysis. Because many transit projects produce both negative and positive effects, the determination of what constitutes a disproportionately high adverse effect was made by examining the “net results after consideration of the totality of the circumstances.”

USDOT Order 5680.1 defines a disproportionately high and adverse effect on minority and low-income populations as an impact that:

1) Is predominately borne by a minority and/or low-income population; or
2) Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or low-income population.

3.7.1.1 Identification of Minority and Low-Income Communities

The analysis identifies minority status, defined as all residents other than Non-Hispanic Whites, at the census block level geography using data from the 2010 Decennial Census. The 2006-2010 five-year American Community Survey estimates, available only at the census tract level, were used to collect information on the presence of low-income and minority low-income individuals. The FY2010 Area Median Income (AMI) for a low-income family of four of $64,400 was used as the AMI definition for low-income households in this analysis (HUD 2012). Additional details on the methodology used in the environmental justice analysis are included in the *Neighborhoods and Environmental Justice Technical Memorandum* in Volume II.

A one-half mile radius, the typical walking distance to high-quality, high-frequency transit, around the three Build Alternatives and B-CSX Design Option (platforms and construction easements) was determined to be the appropriate boundary to analyze the presence of environmental justice populations. Census blocks and tracts to the west of U.S. Route 1 were included in the environmental justice analysis area, because these neighborhoods could be affected by construction of the Metrorail station, and portions of these neighborhoods are within a one-half mile radius of the three Build Alternatives and B-CSX Design Option.

3.7.1.2 Analysis of Potential for Disproportionately High and Adverse Effects

The following multi-step process was used in the environmental justice analysis to identify the potential for disproportionately high and adverse effects on environmental justice populations:

1. Impact categories with localized impacts and the potential for high or disproportionate impacts to environmental justice populations were selected: traffic, bicycle and pedestrian facilities, parking, land acquisition and displacements, land use, neighborhoods and community facilities, visual resources, parklands, safety and security, noise, vibration, air quality, and temporary construction impacts. Other categories evaluated in the EIS were not considered, because they either presented no impacts, or their effects would be experienced by all populations living in the study area, regardless of race, ethnicity, or socioeconomic status.
2. Each project alternative was then evaluated in each category using the findings of the specific environmental resource analyses of the Draft EIS. The methodologies used in those resource analyses and their complete findings are reported in the other sections of **Chapter 3**.
3. Impact categories with potential effects were then analyzed to determine whether those effects were high or disproportionate to environmental justice populations.

3.7.2 Affected Environment

3.7.2.1 Minority Population

Table 3-10 summarizes the minority populations of the analysis area in comparison to the City of Alexandria, Arlington County, and the WMATA Compact Area. This table presents data on the presence of minority residents within the environmental justice analysis area. The U.S. Census Bureau categorizes Hispanic as an ethnicity, not a race. As a result, 2010 Census respondents who reported that they were White and Hispanic were included with racial minority groups to provide an accurate representation of minority groups in the environmental justice analysis area.

Minority groups make up 44.3 percent of the population in the environmental justice analysis area, which is lower than the overall percentages of minorities in the City of Alexandria (46.5 percent) and the WMATA Compact Area (58.1 percent) and higher than the overall percentage of minorities in Arlington County (36.0 percent). Within the environmental justice analysis area there are 20 Census block groups with higher proportions of minority residents than the WMATA Compact Area (see **Figure 3-10**).

Table 3-10: Minority Population Summary Table

Minority Group	Potomac Yard Analysis Area		City of Alexandria		Arlington County		WMATA Compact Area*	
	# of Residents	% of Total	# of Residents	% of Total	# of Residents	% of Total	# of Residents	% of Total
Hispanic White	889	8.3%	10,308	7.4%	16,009	7.7%	253,251	6.5%
Black or African American	2,017	18.8%	30,491	21.8%	17,632	8.5%	1,176,933	30.3%
Asian	481	4.5%	8,432	6.0%	19,931	9.6%	410,865	10.6%
American Indian/ Alaska Native	43	0.4%	589	0.4%	971	0.5%	15,453	0.4%
Native Hawaiian and Other Pacific Islander	10	0.1%	141	0.1%	171	0.1%	2,545	0.1%
Some Other Race	898	8.4%	9,902	7.1%	12,175	5.9%	254,192	6.6%
Two or More Races	398	3.7%	5,225	3.7%	7,777	3.7%	140,696	3.6%
Minority Total	**4,736**	**44.3%**	**65,088**	**46.5%**	**74,666**	**36.0%**	**2,253,935**	**58.1%**

Source: U.S. Census Bureau, 2010 Decennial Census, Summary File 1.
*WMATA Compact Area includes the District of Columbia, the Maryland counties of Montgomery and Prince George's, the Virginia counties of Arlington, Fairfax and Loudoun, and the Virginia cities of Alexandria, Falls Church, and Fairfax.

The proportion of residents reporting that they are Hispanic, of any race, in the environmental justice analysis area is slightly higher than that of the City of Alexandria, Arlington County, or the WMATA Compact area (see **Table 3-11**).

Table 3-11: Potomac Yard Analysis Area Hispanic Population (All Races)

Measure	Potomac Yard Analysis Area		City of Alexandria		Arlington County		WMATA Compact Area	
	# of Residents	% of Total	# of Residents	% of Total	# of Residents	% of Total	# of Residents	% of Total
Hispanic Population (people)	2,015	18.8%	22,524	16.1%	31,382	15.1%	572,616	14.8%

3.7.2.2 Low-Income Population

In the analysis area, two Census block groups fall below the $64,400 income limit for the Washington, DC Fair Market Rent region (see **Table 3-12** and **Figure 3-11**). Census Tract 2012, Block Group 3 covers the Arlandria and Lynhaven neighborhoods and has an AMI of $44,264. Census Tract 2012, Block Group 4 covers the Mount Jefferson Park neighborhood and has an AMI of $60,510.

Table 3-12: Census Tracts below AMI ($64,400)

Measure	Tract 2012.03	Tract 2012.04	City of Alexandria
Neighborhood	Arlandria Lynhaven	Mount Jefferson Park	(citywide)
Median Household Income	$44,264	$60,510	$82,899

As shown in **Figure 3-10** and **Figure 3-11,** minority and low-income residents are concentrated in the neighborhoods to the west of U.S. Route 1 and north of Hume Avenue. In addition, the "Station at Potomac Yard" development provides workforce and affordable housing, and a number of the residents are minorities.

Figure 3-10: Minority Populations

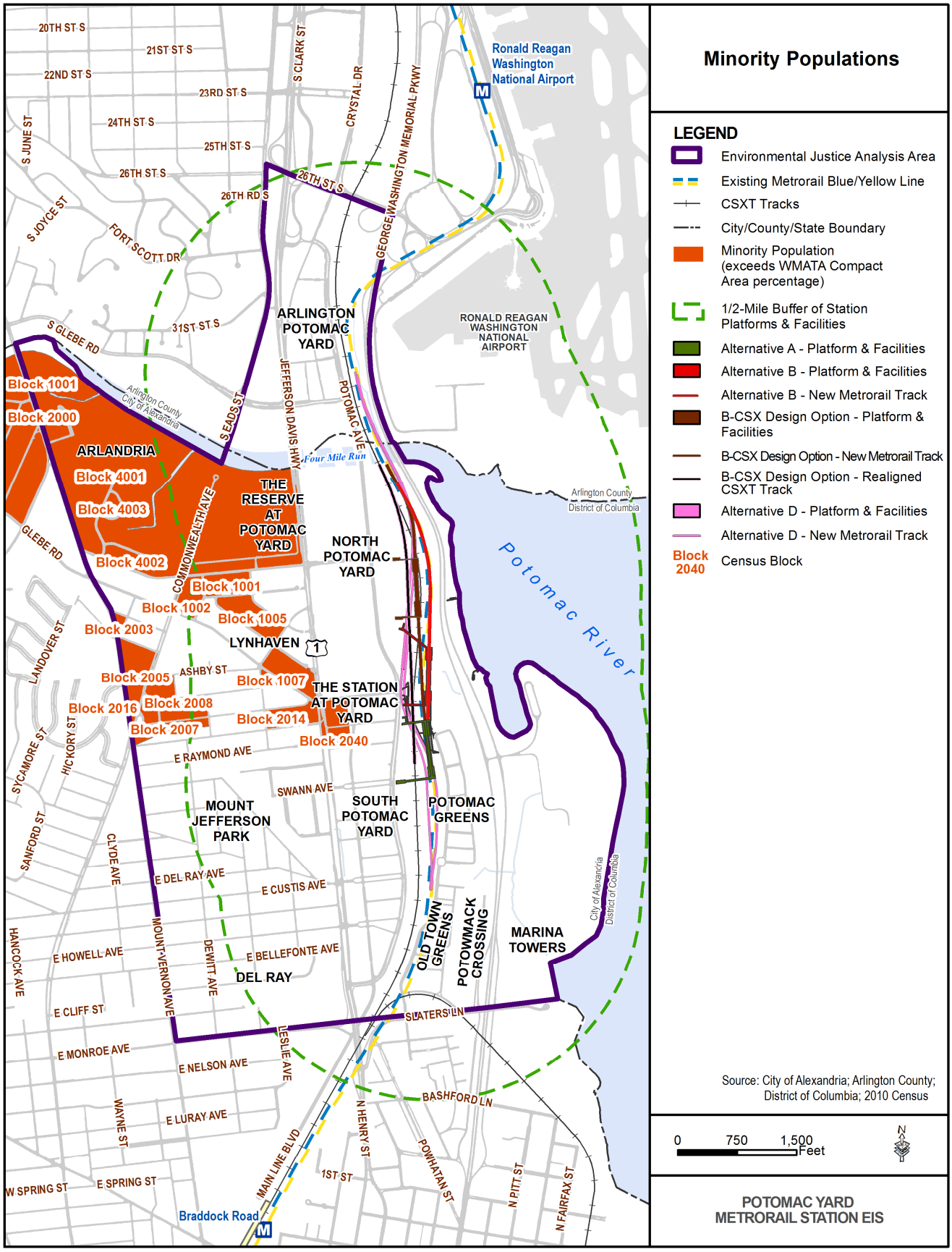
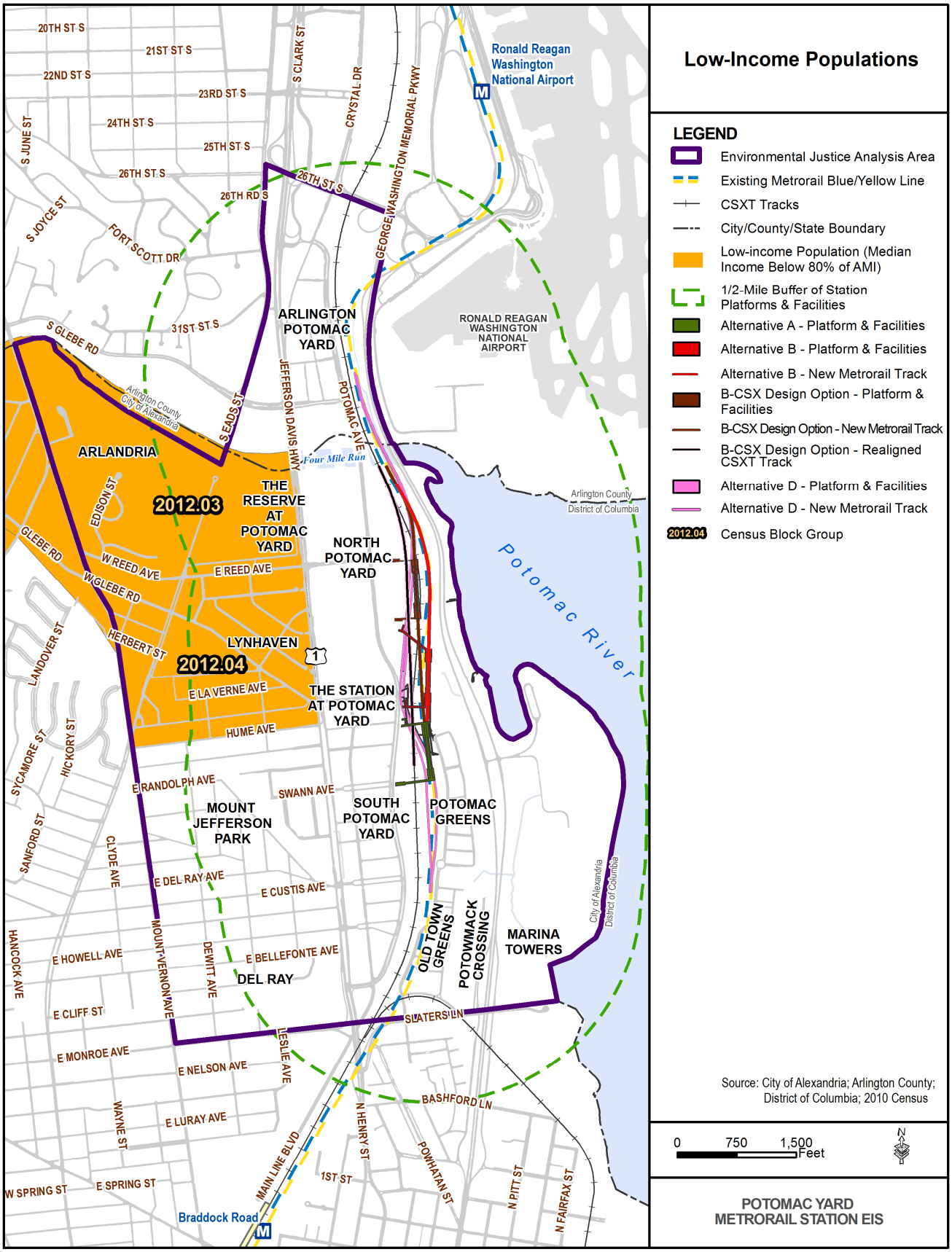


Figure 3-11: Low-Income Populations



3.7.3 Environmental Consequences

3.7.3.1 Environmental Justice Impacts Analysis

Potential effects, as documented in the other sections of **Chapter 3**, are identified by alternative below in **Table 3-13**. Categories with no effects are not carried forward for further analysis.

Table 3-13: Potential Adverse Impacts by Alternative

Impact Categories	No Build	Alternative A	Alternative B	B-CSX Design Option	Alternative D	Analyze for Potential High & Adverse Effects to EJ populations
Traffic	Yes	No	No	No	No	No
Bicycle and Pedestrian Accommodations	No	No	No	No	No	No
Parking	No	Yes	Yes	Yes	Yes	Yes
Land Acquisition	No	Yes	Yes	Yes	Yes	Yes
Displacements	No	No	No	Yes	Yes	Yes
Land Use	No	Yes	Yes	Yes	Yes	Yes
Neighborhoods and Community Facilities (including community cohesion)	No	Yes	Yes	Yes	Yes	Yes
Visual Resources	Yes	Yes	Yes	Yes	Yes	Yes
Parklands	No	Yes	Yes	Yes	Yes	Yes
Safety and Security	No	No	No	No	No	No
Noise	Yes	Yes	Yes	Yes	Yes	Yes
Vibration	No	Yes	No	No	Yes	Yes
Air Quality	No	No	No	No	No	No
Temporary Construction Impacts	No	Yes	Yes	Yes	Yes	Yes

The following categories were not carried forward for further analysis, as they do not have any potential effects.

Traffic

Growth in regional traffic plus additional development in the study area will cause slightly increased congestion under projected baseline conditions for each project alternative (No Build, Alternative A, Alternative B, Alternative D, and B-CSX Design Option). However, additional trips due to vehicle pick-ups and drop-offs at the Metrorail station would be low, similar to other urban stations, and none of the Build Alternatives would impact study area traffic. Since no direct adverse impacts resulting from the project alternatives were identified, there is no potential for any high and adverse impacts to be disproportionately borne by environmental justice populations.

Bicycle and Pedestrian Accommodations

The No Build Alternative includes a pedestrian and bicycle bridge over the CSXT and Metrorail tracks, which would improve local connectivity, shortening the average trip between the Potomac Greens/Old Town Greens neighborhood and Potomac Yard from the current distance of 1.6 miles to 0.4 mile, enabling shorter access to the planned amenities in Potomac Yard.

The Build Alternative station entrances would be connected to the planned sidewalk, bicycle route, and multi-use trail network in North and South Potomac Yard. The three Build Alternatives and B-CSX Design Option facilities would not remove or disrupt any existing or planned pedestrian or bicycle facilities. The new pedestrian and bicycle bridge across the CSXT and Metrorail tracks would be provided as part of Build Alternatives A and

B, and would enhance local pedestrian and bicycle connectivity similar to the No Build Alternative. For Build Alternative D, the pedestrian and bicycle bridge would be built simultaneously with the project. For B-CSX Design Option, the pedestrian and bicycle bridge would be built independently of the project.

Since no direct adverse impacts resulting from the project alternatives were identified, there is no potential for any high and adverse impacts to be disproportionately borne by environmental justice populations.

Safety and Security

No effects to safety and security are anticipated as a result of any of the project alternatives. The existing practices and procedures for safety and security and requirements for facility design would adequately avoid and minimize the identified safety and security issues. Since no adverse impacts resulting from the project alternatives were identified, there is no potential for any high and adverse impacts to be disproportionately borne by environmental justice populations.

Air Quality

Because none of the project alternatives are expected to degrade overall intersection LOS within the study area, the Potomac Yard Metrorail Station is not a project of local air quality concern under 40 CFR 93.123(b)(1), and no potential beneficial or adverse effects are expected on regional air quality. The project is included in the National Capital Region Transportation Planning Board 2012 Financially Constrained Long-Range Transportation Plan. Therefore, the project meets statutory and regulatory transportation conformity requirements without a hot-spot analysis.

No adverse air quality impacts are anticipated. Since no adverse impacts resulting from the project alternatives were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

3.7.3.2 No Build Alternative

No disproportionately high and adverse effects on identified minority and/or low-income populations were identified under the No Build Alternative. The following resource categories were analyzed to reach this finding.

Parking

No effect to existing or planning parking is expected as a result of the No Build Alternative. The redevelopment of North Potomac Yard will locate off-street parking in structures and on-street parking will be provided as paid hourly metered parking. Since no adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Land Acquisition

The No Build Alternative would not result in land acquisition related to the project. Since no adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Displacements

The No Build Alternative would not result in displacements related to the project. Since no adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Land Use

The No Build Alternative has no anticipated land use impacts. Since no adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Neighborhoods and Community Facilities

The No Build Alternative would not provide any mobility benefits beyond those that would be provided by planned future transportation projects and improvements included in the CLRP. Development planned for Potomac Yard would proceed, but at lower levels than have been approved. This alternative would improve community cohesion and reduce community isolation through the provision of a bicycle and pedestrian bridge connecting Potomac Greens and Potomac Yard. The No Build Alternative would not cause any residential

displacements, safety impacts, or changes in property values beyond those anticipated to occur due to planned future development projects and other planned transportation projects.

However, the additional development permissible in Potomac Yard without a Metrorail station, as well as other area improvements, may lead these communities to experience indirect social and economic changes, such as increases in property values and rental prices. To address potential indirect effects to housing affordability from additional development, the City of Alexandria's Potomac Yard zoning and development regulations for CDD #10 and CDD #19 (Concept Plan approval staff report CDD #99-01 and Rezoning staff report CDD #2009-0001) support maintaining a supply of affordable housing within the area. The newly constructed Station at Potomac Yard development, which provides workforce and affordable housing, and a recently approved affordable housing development across U.S. Route 1 from the Potomac Yard Shopping Center, are examples of projects in the area. The City of Alexandria maintains a Housing Opportunities Fund, which is funded by voluntary contributions from developers and is used for acquisition, rehabilitation, or new construction of affordable housing units. In addition, the City negotiates with developers to provide dedicated affordable rental or ownership units within new residential developments. In North Potomac Yard, a voluntary affordable housing contribution will be provided according to the formula set forth in the regulations for CDD #19. In the remainder of Potomac Yard, the amount of the voluntary contribution for each preliminary development plan will meet the requirements of the city-wide affordable housing policy in effect at the time the plan is submitted. Contributions may be monetary or set-aside affordable units.

Since no direct adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Visual Resources

New development in Potomac Yard would result in visual effects to viewsheds from the GWMP and Potomac Greens. No adverse effects to environmental justice populations are anticipated, because the visual effects to viewsheds from the GWMP and Potomac Greens occur within non-environmental justice population areas. Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Parklands

No effect to parkland is anticipated as a result of the No Build Alternative. Since no direct adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Noise

Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and landings at Ronald Reagan Washington National Airport. The residences in the Potomac Greens neighborhood were constructed alongside the existing Metrorail alignment. Because of the proximity of the existing Metrorail right-of-way to the residences in Potomac Greens, current Metrorail operations exceed WMATA noise criteria at seven residences. This baseline condition would remain the same under the No Build Alternative. No adverse effects to environmental justice populations are anticipated, because the Potomac Greens neighborhood is comprised of non-environmental justice populations. Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Vibration

Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and vehicular traffic, particularly heavy trucks. Because no project components or design elements are proposed under the No Build Alternative, the alternative would not cause any new vibration impacts. No exceedance of the FTA vibration significant increase criterion of 3 VdB or WMATA vibration criterion of 75 VdB is predicted under the No Build Alternative. Since no direct adverse impacts resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Temporary Construction Impacts

Construction activities associated with development in Potomac Yard would occur under the No Build Alternative. Anticipated effects include noise, vibration, dust, and traffic due to construction activity. Impacts from construction would not adversely or disproportionately affect the identified environmental justice

populations, as these impacts would be primarily borne by the communities immediately adjacent to the construction site, which are not minority or low-income.

3.7.3.3 Build Alternatives

The addition of a Metrorail station would provide beneficial effects to minority and/or low-income populations by providing direct access to the regional transit system, which in turn, would help improve mobility, by providing more transportation choices.

No disproportionately high and adverse impacts on identified minority and/or low-income populations were identified under any Build Alternative or B-CSX Design Option. The following resource categories were analyzed to reach this finding.

Parking

The three Build Alternatives and B-CSX Design Option are planned as urban stations, primarily accessed via foot, bicycle, or bus. Therefore, no additional parking for Metrorail patrons would be provided. However, some Metrorail passengers may attempt to drive and park in adjoining neighborhoods, including Potomac Greens, the developing neighborhoods of South Potomac Yard, and the surface parking lots surrounding the Potomac Yard Shopping Center. Use of neighborhood parking facilities by station passengers could result in less parking availability for residents and patrons of commercial uses in Potomac Yard. The introduction and enforcement of parking restrictions, including time limits and residential permitting, would largely avoid and minimize the potential effects of Metrorail patrons attempting to park along public streets in adjoining neighborhoods.

Potential parking impacts would not adversely or disproportionately affect the identified environmental justice populations, as these impacts would be primarily borne by the communities immediately adjacent to the proposed Metrorail station, which are not minority or low-income.

Land Acquisition

The three Build Alternatives and B-CSX Design Option would require additional property for station facilities and right-of-way for realigned track, depending on the alternative selected. Additional temporary construction easements would be needed for the three Build Alternatives and B-CSX Design Option. In addition, Build Alternative B would be in violation of the Greens Scenic Area easement, which is administered by NPS (easement held by U.S. Government). Build Alternative B could not proceed unless the easement is released by NPS subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. Build Alternatives B and D would also permanently acquire GWMP property subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Property impacts as a result of land acquisition would not adversely or disproportionately affect the identified environmental justice populations, as these impacts would affect the identified parcel owners, whom are not minority or low-income.

Displacements

No residential displacements would be required for any of the alternatives. B-CSX Design Option and Build Alternative D would result in a displacement of one existing business, the movie theater in the Potomac Yard Shopping Center. Compensation and relocation assistance to private landowners would be provided consistent with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.

The movie theater is located in a non-environmental justice population area and is not a minority-owned business; therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Land Use

The three Build Alternatives and B-CSX Design Option would impact existing and planned land use. Build Alternative A would have pedestrian access facilities located within Potomac Greens Park and Potomac Yard Park, and would have station facilities located within the Rail Park. Build Alternative B would have pedestrian access facilities within Potomac Yard Park and would occupy portions of and Potomac Greens Park, which is also covered by the Greens Scenic Area easement administered by NPS. Build Alternative B could not proceed unless the easement is released by NPS subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

The station and facilities associated with B-CSX Design Option and Build Alternative D would require the displacement of existing commercial development, comprising a parking lot and a movie theater, and would also affect planned streets, including Potomac Avenue, and open spaces, including Potomac Yard Park. The realigned tracks at the northern end of Build Alternative D in the vicinity of Four Mile Run would occupy existing national parkland between the GWMP roadway and the existing Metrorail right-of-way, and the realigned tracks at the southern end would occupy planned public open space in the Rail Park.

For the three Build Alternatives and B-CSX Design Option, the station elements would be designed to integrate into affected parks, and facilities would be redesigned as necessary to replace park infrastructure. Lands of the GWMP were and continue to be acquired under the Capper-Cramton Act of 1930 (46-Stat. 482), and activities proposed for these lands must be consistent with the provisions of this act.

Impacts to land use would not adversely or disproportionately affect the identified environmental justice populations, as these impacts would be experienced by all populations living in the study area, regardless of race, ethnicity, or socioeconomic status. Moreover, the area where land use impacts would occur is comprised of non-environmental justice populations.

Neighborhoods and Community Facilities

Each Build Alternative would result in similar effects to the surrounding neighborhoods. The Potomac Greens and Old Town Greens neighborhoods, as well as Del Ray, Lynhaven, Arlandria, and South Potomac Yard, would benefit from increased access to the regional Metrorail system. The Build Alternatives would result in increased economic activity, given the desirability for Metrorail access for large employers. Neighborhoods adjacent to other Northern Virginia Metrorail stations have historically experienced increases in land and housing values due to the proximity to Metrorail; the identified neighborhoods would be expected to experience a similar indirect effect. As under the No Build Alternative, minority and/or low-income populations may experience social and economic changes, such as increased property value and rental costs, due to the additional development permissible in Potomac Yard without a Metrorail station, as well as other area improvements. Measures to address potential indirect effects to housing affordability from additional development in the Potomac Yard area would be the same as in the No Build Alternative.

The Build Alternatives would affect views from Potomac Yard and the Potomac Greens neighborhood. Construction activities would result in traffic, noise, and dust that would primarily affect the neighborhoods immediately surrounding the construction site. See **Sections 3.8** and **3.24** for more detailed discussion of effects to visual resources and construction impacts, respectively. However, the visual effects and temporary construction impacts would not adversely or disproportionately affect the identified environmental justice populations, as these impacts would be primarily borne by the communities immediately adjacent to the proposed Metrorail station, which are not minority or low-income.

In addition to the impacts reviewed as instructed by USDOT Order 5610.2(a), the potential for negative impacts to facilities serving minors was evaluated per the requirements of Executive Order 13045, Protection of Children from Environmental Health Risks. No negative impact to concentrations of children or children-serving facilities was identified due to any of the Build Alternatives.

Since no direct adverse impacts resulting from the Build Alternatives were identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Visual Resources

The three Build Alternatives and B-CSX Design Option would result in visual impacts to the views from GWMP, Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard due to the introduction of new visual elements and removal of vegetation for construction access and staging areas. New visual elements include the stations for the three Build Alternatives and B-CSX Design Option, pedestrian bridges for the three Build Alternatives, as well as the elevated track and structures required for Build Alternative D. Build Alternative A would affect 6 of 10 viewsheds evaluated (including the continuous GWMP corridor). Build Alternative B would affect 6 of 10 viewsheds evaluated (including the continuous GWMP corridor). B-CSX Design Option would affect 3 of 10 viewsheds evaluated (including the continuous GWMP corridor). Build Alternative D would affect 7 of 10 viewsheds evaluated (including the continuous GWMP corridor), resulting in substantial declines in visual quality at several of the viewsheds. New development planned within North Potomac Yard by 2040 would also affect existing views from GWMP, Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard under the Build Alternatives.

All minority and/or low-income populations would be buffered from any visual impacts of a station by the planned development in Potomac Yard; the residents of the "Station at Potomac Yard" apartments would also be buffered from visual impacts by other buildings. No adverse impacts to environmental justice populations are anticipated because the visual effects to viewsheds from the GWMP, Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard occur within non-environmental justice population areas. Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Parklands

Table 3-14 shows potential permanent impacts to parklands, which would result from property acquisitions for station elements, track structures, or ancillary facilities in parklands. Visual impacts to parklands are described in **Section 3.8 Visual Resources**. Build Alternatives B and D would require portions of NPS parklands and would be subject to an equal value land exchange approved by NPS and completed as required by federal law (54 U.S.C. 102901). In addition, Build Alternative B could not proceed unless the Greens Scenic Area easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Table 3-14: Permanent Parkland Impacts by Alternative

Park	Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
GWMP		X		X
Potomac Greens Park	X	X	X	X
Greens Scenic Area easement		X		
Rail Park	X			X
Potomac Yard Park	X	X	X	X

Impacts to parklands would not adversely or disproportionately affect the identified environmental justice populations, as these impacts would be experienced by all populations living in the study area, regardless of race, ethnicity, or socioeconomic status. Moreover, none of the impacted parks are located within environmental justice communities; therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Noise

Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and landings at Ronald Reagan Washington National Airport. The residences in Potomac Greens were constructed alongside the existing Metrorail alignment, and current Metrorail operations for the No Build Alternative exceed WMATA noise criteria at seven residences. This condition would remain under Build Alternative A, Build Alternative B, and B-CSX Design Option, and would be reduced under Build Alternative D to four residences. However, Build Alternative D would result in an increased number of residences (eight residences) where noise would exceed the FTA threshold for moderate impact, due to the location of elevated track close to residential receptors. No exceedances of the FTA *severe* impact criteria are predicted. None of the project noise levels under the Build Alternatives would exceed the FTA impact criteria at any FTA Category 3 receptors, such as parks or schools.

No adverse effects to environmental justice populations are anticipated, because the Potomac Greens neighborhood comprises non-environmental justice populations. Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Vibration

Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and vehicular traffic, particularly heavy trucks. Build Alternative B and B-CSX Design Option would not exceed FTA or WMATA thresholds for vibration impacts. However, both Build Alternative A and Build Alternative D would result in increased vibration impacts to residences in Potomac Greens due to Metrorail trains passing over new switches.

No adverse effects to environmental justice populations are anticipated, because the Potomac Greens neighborhood comprises non-environmental justice populations. Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

Temporary Construction Impacts

Construction activities would occur within staging areas and access routes for the three Build Alternatives and B-CSX Design Option. Anticipated effects include noise, vibration, dust, and traffic due to construction activity. Temporary construction impacts were identified for the following resources and are described in more detail in **Section 3.24**: Metrorail operations, CSXT ROW and operations, public roadways and private driveways, Greens Scenic Area, visual resources, cultural resources, parklands, air quality, noise, vibration, wetlands, 100-year floodplain, resource protection areas, and contaminated materials.

Impacts from construction would not adversely or disproportionately affect the identified minority and/or low-income populations, as these impacts would be primarily borne by the communities immediately adjacent to the construction site, which are not minority or low-income.

Public Involvement

Full and fair access to meaningful involvement by minority and low-income populations in project planning and development is an important aspect of environmental justice. The engagement of local residents, business owners, and other stakeholders began during the project scoping phase in early 2011 and continues throughout the duration of the environmental review process. Participation of minority and low-income populations has been advanced through:

- Two public scoping meetings, held at the Cora Kelly Recreation Center, located in the Arlandria neighborhood, which has a high proportion of minority and low-income residents and is within the project's analysis area. The facility is accessible by multiple public transportation services. These two meetings were held on February 10, 2011 at 4:30 pm and 6:00 pm. A total of 65 members of the public attended the scoping meetings;
- One public meeting presenting project alternatives, which was also held at the Cora Kelly Recreation Center. This meeting was held on April 19, 2012, and approximately 75 members of the public attended;
- Availability of Spanish-speaking staff at all public involvement events;
- Translation of outreach materials into Spanish pursuant to Executive Order 13166 ("Improving Access to Services for Persons with Limited English Proficiency");
- Meetings with local neighborhoods and civic associations, including the Lynhaven Citizens Association, which includes minority and low-income communities; and
- Creation of the Potomac Yard Metrorail Implementation Work Group (PYMIG) by the City of Alexandria, which has met eleven times to date and has served as a venue for interested members of the public as well as City officials to stay informed of the EIS process.

Concerns and issues raised by community members through this outreach process have been considered carefully in the development of the project. The City of Alexandria will continue to work collaboratively with members of the public to address their concerns. See **Chapter 4** for a more detailed discussion on public involvement.

3.7.4 Mitigation

No disproportionate or adverse impact to minority or low-income communities is anticipated. Therefore, no mitigation is proposed.

3.8 Visual Resources

This section assesses the effects of the alternatives on visual resources in the study area. The visual resources analysis was prepared in accordance with Federal Highway Administration (FHWA) *Visual Impact Assessment Methodology for Highway Projects* (1981). The visual resources analysis was not conducted in accordance with NPS guidance or policy. The visualizations depicted in this section are based on conceptual renderings, and have not been developed in accordance to the Secretary of the Interior's *Standards for the Treatment of Historic Properties* nor with respect to the historic character of the GWMP.

The analysis is described in more detail in the *Visual Resources Technical Memorandum*, Volume II.

3.8.1 Methodology

A visual resource inventory was developed for the study area consistent with the FHWA *Visual Impact Assessment Methodology for Highway Projects* (1981), which is also commonly used by the Federal Transit Administration (FTA) to assess transit projects. Existing, opening year (2016), and horizon year (2040) visual resources were assessed at nine viewpoints and along the continuous GWMP roadway for each of the three Build Alternatives. The viewpoints were selected for analysis based on the likelihood that the project may be visible from that location. Viewsheds were chosen to assess impacts to views from the GWMP roadway and park, Potomac Greens neighborhood and park, and Potomac Yard development. Future development visualizations were based from development estimates from the *North Potomac Yard Small Area Plan* and represent the high end scenarios. To depict proposed station and aerial guideway structures as seen from the viewpoints, photograph digital renderings were prepared. The photos and visual analysis were developed in 2011 for the three Build Alternatives. The locations and heights of proposed station and aerial guideway structures as shown in the photograph renderings were verified with a "balloon test" that placed large balloons at specific points and heights of the Build Alternatives' stations and aerial guideway structures.

As B-CSX Design Option was developed after the completion of the DEIS visual resource analysis for the three Build Alternatives, B-CSX Design Option includes some of the existing photograph digital renderings (when applicable) and images from a visual simulation developed by the City of Alexandria. Views of B-CSX Design Option station used available drive-by digital simulations prepared by the City of Alexandria rather than architectural renderings, as its architectural design has not been developed to the same level of detail as that of the Build Alternatives. The drive-by digital simulations include viewsheds of 2040 summer (with foliage) and winter/fall (without foliage) from the northbound and southbound lanes of the GWMP roadway. The appearance and camera position of the City's views vary slightly from the nine chosen viewpoints. The City's drive-by simulation can be found online at http://alexandriava.gov/PotomacYard.

Views from the digital drive-by simulations were matched with the visuals from the 2011 analysis to the extent possible, but minimal variations between the two visuals do exist including slight variation in viewpoint locations as well as differences between the viewpoint angles. Images from the City's drive-by simulation vary slightly from one another based on the difficulty of capturing the exact same moment in each video. The 2011 visual analysis viewpoints are angled as though driving along the GWMP, while the City's drive-by simulation is slightly angled toward the proposed station locations. The development in Potomac Yard is also displayed differently, with some buildings appearing more profoundly in the City's drive by simulation (in 2040 winter viewsheds).

Additional visual analysis to use a single source of renderings would be completed as part of the Final EIS. The Final EIS analysis will use the same photograph digital renderings for the No Build Alternative and for the preferred alternative, including both summer (with foliage) and winter/fall (without foliage) renderings for all viewsheds. The Final EIS analysis will be updated to include new development constructed in Potomac Yard since the original analysis completed in 2012.

The analysis also considered summer and winter conditions, between which the vegetative foliage would vary. 2040 winter viewsheds are provided from the City of Alexandria's drive-by digital simulations for select views along the GWMP roadway. The inventory characterizes selected viewsheds, defined as the surface area visible from a given viewpoint or series of viewpoints, using the concepts of visual character, visual quality, and viewer sensitivity.

Visual character describes the natural, physical, and architectural/cultural features that give a location its distinct visual identity. As a measure, visual character is value-free in that it is neither qualified as good nor bad.

Visual quality is a rating of a landscape's visual character based on three criteria:

- ***Vividness (distinctiveness):*** the memorable quality or distinctiveness of the landscape components;
- ***Intactness:*** the visual integrity of the natural and human-built landscape and the extent to which the landscape is free from visual encroachment; and
- ***Unity:*** the degree with which visual resources of the landscape join together in a coherent, harmonious visual pattern.

These visual characteristics were evaluated on a scale of one to seven, with one being "very low" and seven being "very high" (see **Table 3-15**). The average of these visual quality characteristics indicates the overall visual quality of the viewshed.

Table 3-15: Visual Characteristic Evaluation Scoring

Visual Evaluation	Point Value
Very High	7
High	6
Moderately High	5
Moderate	4
Moderately Low	3
Low	2
Very Low	1

Source: *FHWA Visual Impact Assessment Methodology for Highway Projects* (1981).

Viewers can be categorized as having low, average, or high sensitivity to changes in the visual environment. Viewer sensitivity is strongly influenced by viewers' activity, awareness of surroundings, frequency, and length of time using a resource (a resident or park user, for example). The viewer sensitivity is not anticipated to change over time because viewers would engage in similar activities as they currently do, such as driving along a parkway, visiting a neighborhood park, or shopping.

For the Build Years 2016 and 2040, images reflect the additional background development that would occur under the No Build condition. As the visual quality is inextricably linked to development occurring within the viewsheds, the changes resulting from the Build Alternatives include the background development. The contributions of the Build Alternatives to changes in visual quality are described in the text.

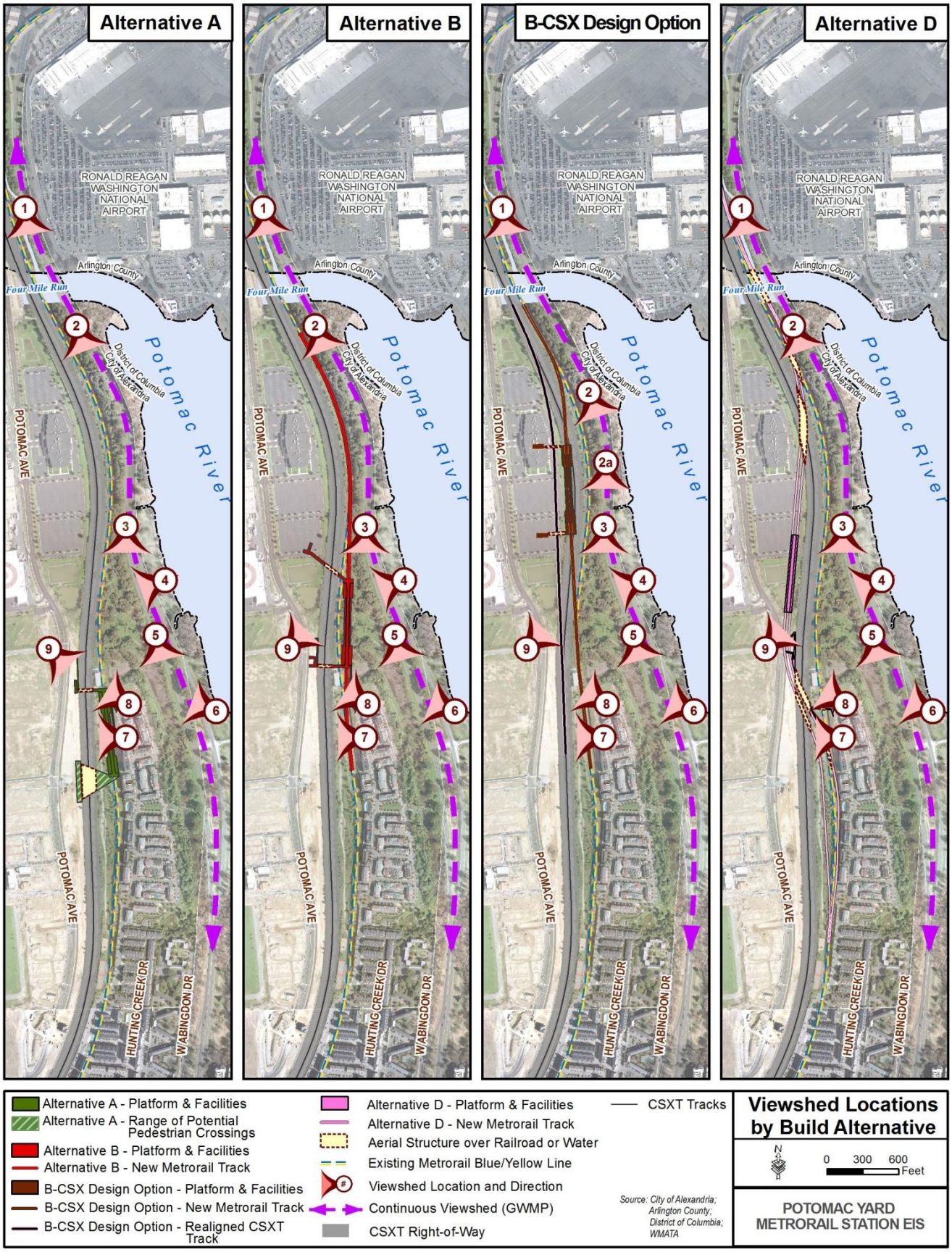
3.8.2 Affected Environment

Figure 3-12 illustrates the viewshed locations. The existing visual character and quality, as well as viewer sensitivity, of study area viewsheds is summarized in **Table 3-16**, and are described in more detail below.

Table 3-16: Existing Visual Character, Quality and Visual Sensitivity

Viewshed	Visual Character	Visual Quality	Viewer Sensitivity
Viewshed 1	Tree-lined roadway with break in vegetation at Four Mile Run.	Very High	High
Viewshed 2	Tree-lined roadway with intermittent breaks in vegetation.	Very High	High
Viewshed 2A (B-CSX only)	Tree-lined roadway with intermittent breaks in vegetation.	Very High	High
Viewshed 3	Curbed roadway framed by vegetation.	Very High	High
Viewshed 4	Framed view of layered vegetation with South Potomac Yard development in the background during winter.	High	High
Viewshed 5	Roadway framed by varied vegetation and large trees.	High	High
Viewshed 6	Roadway and vegetation in foreground with vegetation in background, with filtered views of townhomes.	Moderately High	High
Viewshed 7	Intermittent views of landscape vegetation and low horizontal wall, with South Potomac Yard development visible in background.	Moderate	High
Viewshed 8	Landscaped neighborhood park, with transportation facilities in background.	Moderate	High
Viewshed 9	Layered views of vegetation, with transportation infrastructure and development in the background.	Moderately Low	Moderate
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Potomac Greens neighborhood to the west and the Potomac River and Washington to the east.	Very High	High

Figure 3-12: Viewshed Locations by Build Alternative



3.8.2.1 George Washington Memorial Parkway

In general, the continuous viewshed along the GWMP roadway in the study area is characterized by a divided four-lane roadway framed by vegetation. Viewsheds 1, 2, 3, and 5 are specific views from the southbound lanes on the parkway (see **Figures 3-13, 3-14, 3-15, 3-16,** and **3-18**). For B-CSX Design Option viewshed analysis, Viewshed 2 was moved slightly south of the other Build Alternatives' Viewshed 2 due to the available imagery from the computer-generated model. Viewshed 2a was added to B-CSX Design Option viewshed analysis to specifically consider the design option in relation to the view from the southbound lanes on the GWMP roadway. Viewsheds 4 and 6 are views west across the roadway, characterized by trees and wetland vegetation with views of townhomes in the periphery (see **Figure 3-17** and **Figure 3-19**). Visual quality at GWMP viewsheds ranges from moderately high to very high. GWMP viewers are drivers on the parkway and users of the Mount Vernon Trail, expecting a primarily natural setting with views of distinctive elements along the GWMP roadway; therefore, the views along the GWMP possess high viewer sensitivity.

Figure 3-13: Viewshed 1 – George Washington Memorial Parkway (North Study Area), North of Four Mile Run, Looking Southeast

Figure 3-14: Viewshed 2 – George Washington Memorial Parkway (North Study Area), South of Four Mile Run, Looking Southeast

Figure 3-15: Viewshed 2a – George Washington Memorial Parkway (North Study Area), South of Four Mile Run, Looking Southeast (B-CSX Analysis Only)

Figure 3-16: Viewshed 3 – George Washington Memorial Parkway (Middle Study Area), Looking South

Figure 3-17: Viewshed 4 – George Washington Memorial Parkway (Middle Study Area), Mount Vernon Trail, Looking West

Figure 3-18: Viewshed 5 – George Washington Memorial Parkway (South Study Area), Looking South

Figure 3-19: Viewshed 6 – George Washington Memorial Parkway (South Study Area), Looking West

3.8.2.2 Potomac Greens

The Potomac Greens neighborhood lies immediately to the south and east of the project site. The development contains townhomes and community amenities, including Potomac Greens Park. Viewshed 7 is a view from the neighborhood looking west toward the existing Metrorail tracks and Potomac Yard (see **Figure 3-20**). Viewshed 8 is a view from Potomac Yard Park looking northwest toward the existing Metrorail tracks, Metrorail substation, portion of the Greens Scenic Area, and Potomac Yard (see **Figure 3-21**). Both viewsheds have moderate visual quality. Viewers comprise neighborhood residents and park users and have a high degree of viewer sensitivity.

Figure 3-20: Viewshed 7 – Potomac Greens, Looking West

Figure 3-21: Viewshed 8 – Potomac Greens Park

3.8.2.3 Potomac Yard

Potomac Yard lies to the west of the project site. The area south of the existing Potomac Yard Shopping Center includes vacant land, local streets, several blocks of recently built townhomes, multi-family buildings, a stormwater retention pond, recently planted street trees, and Potomac Yard Park (completed after photos were taken). Viewshed 9 has views looking northeast and southeast from East Glebe Road toward the Potomac Avenue streetscape and the landscape elements of Potomac Yard Park, with the CSXT tracks and fencing in the background (see **Figure 3-22** and **Figure 3-23**). Looking east and northeast, mature vegetation is visible in Potomac Greens Park and the Greens Scenic Area in the distance. Looking southeast, the WMATA traction power substation and the Potomac Greens townhomes are also visible in the distance. Viewshed 8 has a moderately low degree of visual quality. In addition, because viewers in this area would expect a developed area with a mix of uses, the level of viewer awareness at Potomac Yard results in a moderate degree of viewer sensitivity.

Note the photos and visual analysis were developed in 2011. Additional development has since progressed in and around Potomac Yard.

Figure 3-22: Viewshed 9 – Potomac Yard, looking Northeast at East Glebe Road and Potomac Avenue

Figure 3-23: Viewshed 9 – Potomac Yard, looking Southeast at East Glebe Road and Potomac Avenue

3.8.3 Environmental Consequences

The potential effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option on visual resources are described below.

3.8.3.1 No Build Alternative

Table 3-17 summarizes the anticipated visual impacts of the No Build Alternative by 2016 and 2040. **Figures 3-24** through **Figure 3-33** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years 2016 and 2040. Viewsheds 6, 7, 8, and 9 are anticipated to have changes. While the visual quality of Viewsheds 4 and 5 also declines slightly in 2040, change in future conditions in 2016 and 2040 is mostly attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer.

Table 3-17: No Build Alternative Visual Character and Quality

Viewshed	Visual Character and Impact of Alternative	Visual Quality	
		2016	2040
Viewshed 1	Tree-lined roadway with break in vegetation at Four Mile Run.	Very High	Very High
Viewshed 2	Tree-lined roadway with intermittent breaks in vegetation.	Very High	Very High
Viewshed 3	Curbed roadway framed by vegetation.	Very High	Very High
Viewshed 4	Framed view of layered vegetation with South Potomac Yard development in the background during winter; by 2040 additional development of North Potomac Yard visible.	High	Moderately High
Viewshed 5	Roadway framed by varied vegetation and large trees; by 2040 additional development of Potomac Yard visible along periphery.	High	Moderately High
Viewshed 6	Roadway and vegetation in foreground with vegetation in background, with filtered views of townhomes; by 2040, would include view of north Potomac Yard development.	Moderately High	Moderate
Viewshed 7	Intermittent views of landscape vegetation and low horizontal wall, with South Potomac Yard development visible in background; by 2040, would include North Potomac Yard development by 2040.	Moderate	Moderately Low
Viewshed 8	Landscape neighborhood park, with transportation facilities in background; by 2040, would include North Potomac Yard development.	Moderate	Moderately Low
Viewshed 9	Layered views of vegetation, with transportation infrastructure and development in the background; by 2040, would include North Potomac Yard development in 2040.	Moderate	Moderate
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Potomac Greens neighborhood; by 2040, North Potomac Yard and Crystal City development would be visible at visual breaks.	Very High	High

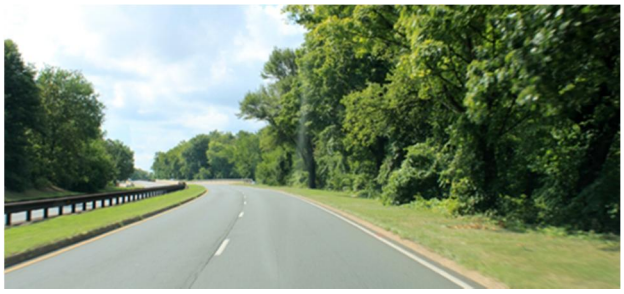
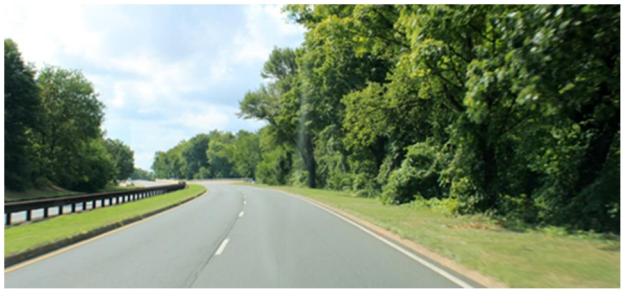
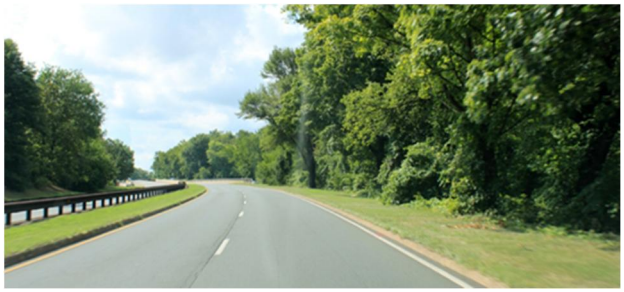
Under the No Build Alternative in 2016, the overall character of the continuous viewshed along the GWMP roadway would remain characterized by a divided four-lane roadway framed by vegetation, as would Viewsheds 1, 2, 3, and 5. Viewshed 6 would maintain a view across the GWMP roadway, characterized by trees and wetland vegetation with views of townhomes in the periphery (see **Figure 3-29**). The visual quality of the continuous viewshed and Viewsheds 1 through 3 would remain very high. The visual quality of Viewsheds 4 and 5 would remain high, and the visual quality of Viewshed 6 would remain moderately high. In 2040, some viewsheds would include new development from Potomac Yard and Crystal City, causing declines in Viewshed 4 to moderately high visual quality, Viewshed 5 to moderately high visual quality, Viewshed 6 to moderate visual quality, and the GWMP continuous view corridor to high.

For Viewsheds 7 and 8 in Potomac Greens, the Potomac Yard development would add built forms, and Potomac Yard Park vegetation would mature adjacent to the tracks (see **Figure 3-30** and **Figure 3-31**). The overall visual quality for Viewsheds 7 and 8 would remain moderate. In 2040, further development in North Potomac Yard would be added to the viewshed, which would diminish the visual quality of both viewsheds to moderately low levels.

At Potomac Yard, the South Potomac Yard development would add built forms along Potomac Avenue to the periphery of Viewshed 9 (outside the field of view of the photograph renderings), and Potomac Yard Park would vegetation would mature and augment the existing landscape of the site (see **Figure 3-32** and **Figure 3-33**). The visual quality would remain moderate due to the encroachment of buildings within the viewshed and improved visual patterns due to the maturation of vegetation at Potomac Yard Park. In 2040, the viewshed would experience additional encroachment from North Potomac Yard development, and the Potomac Yard Park

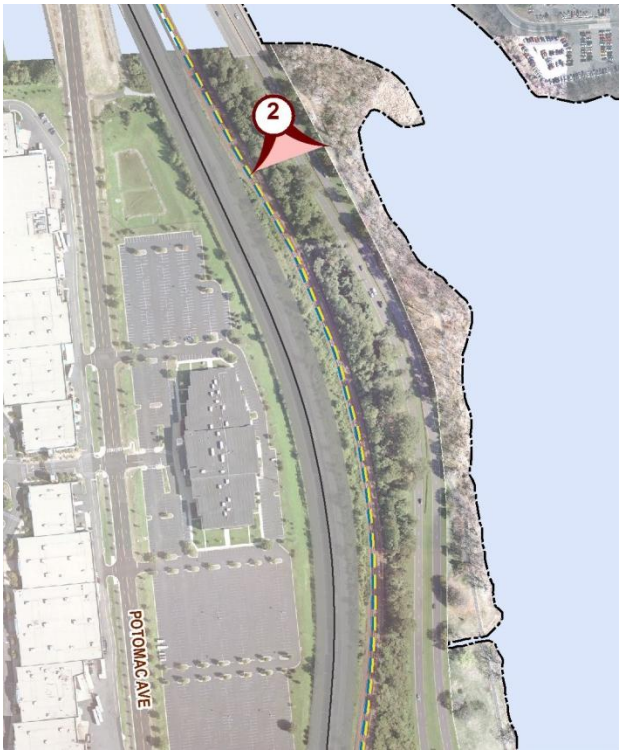
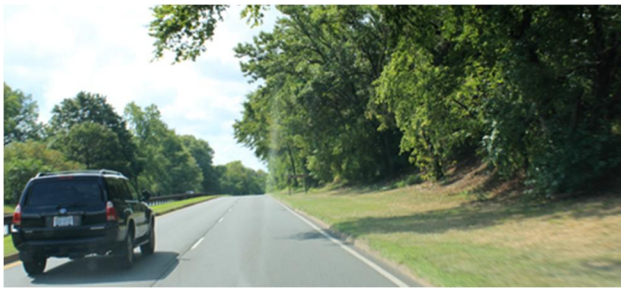
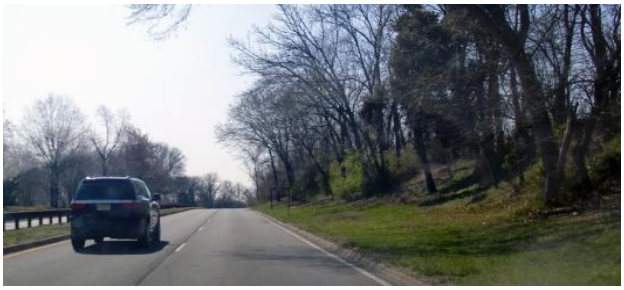
vegetation would be more mature, further filtering views of buildings in the background, retaining its moderate visual quality.

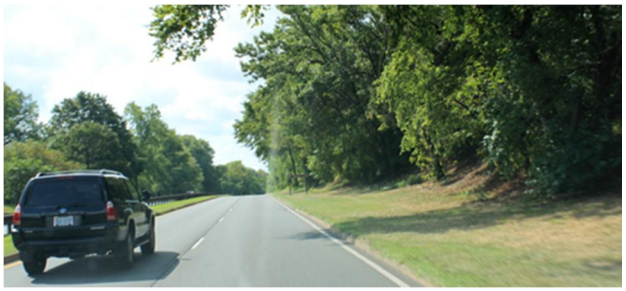
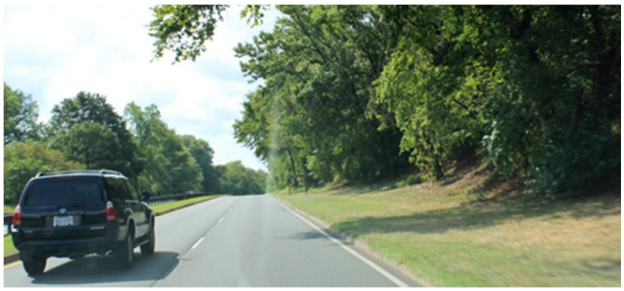
Figure 3-24: No Build Alternative Viewshed 1 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)**  **Existing Viewshed (without leaves)**
2016 No Build Alternative	**2040 No Build Alternative**
	

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High

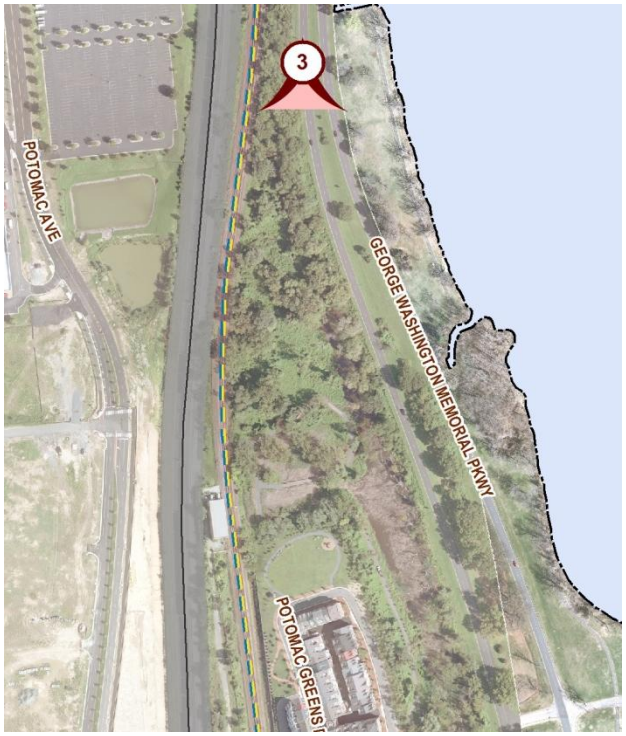
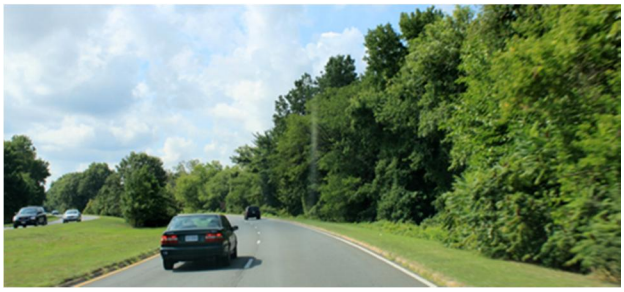
Figure 3-25: No Build Alternative Viewshed 2 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)**  **Existing Viewshed (without leaves)** 

2016 No Build Alternative	2040 No Build Alternative
	

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High

Figure 3-26: No Build Alternative Viewshed 3 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**
2016 No Build Alternative	**2040 No Build Alternative**
	

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High

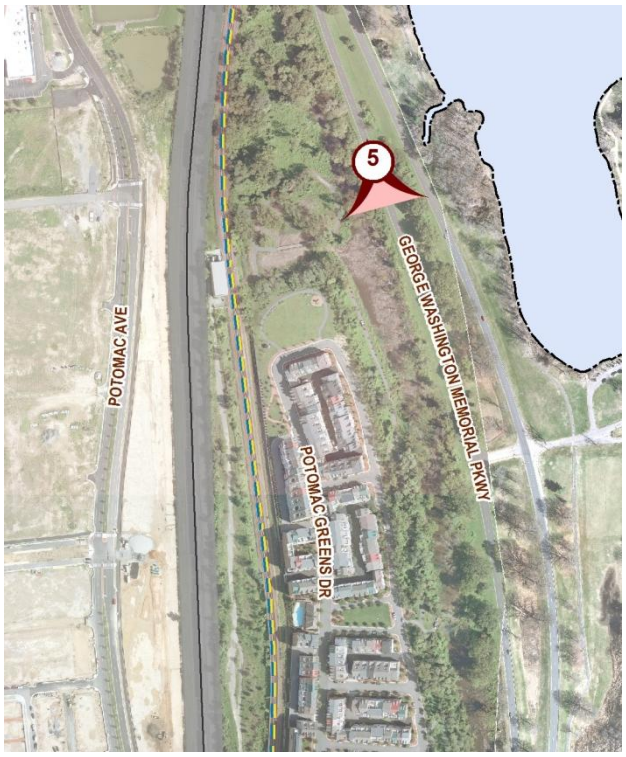
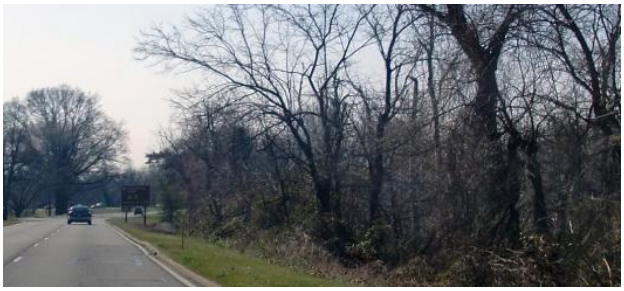
Figure 3-27: No Build Alternative Viewshed 4 Elements

View Location	Description/Focus
	From Mount Vernon Trail looking west across the GWMP roadway. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High

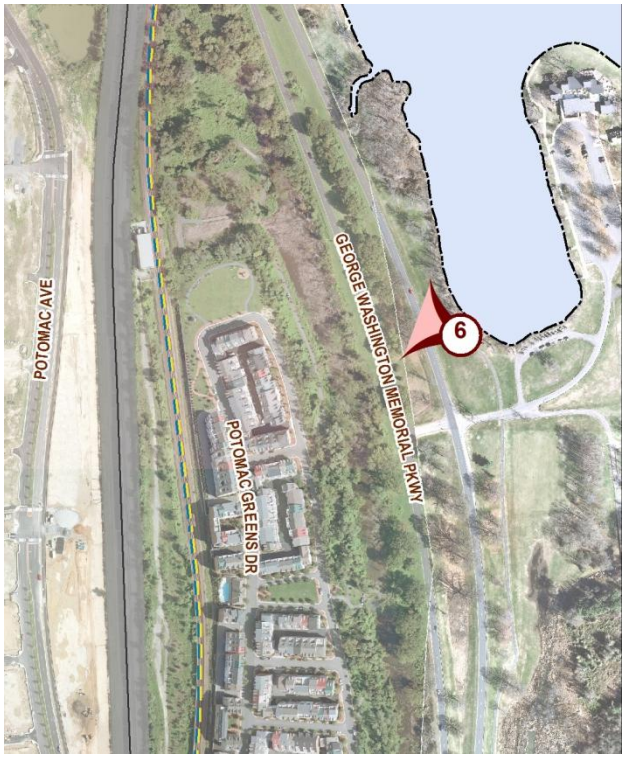
Figure 3-28: No Build Alternative Viewshed 5 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)** 

2016 No Build Alternative	2040 No Build Alternative

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High

Figure 3-29: No Build Alternative Viewshed 6 Elements

View Location	Description/Focus
	From GWMP roadway northbound shoulder, looking west toward existing substation. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately High	Moderately High	Moderate

Figure 3-30: No Build Alternative Viewshed 7 Elements

View Location	Description/Focus
	From Potomac Greens North neighborhood looking west. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative

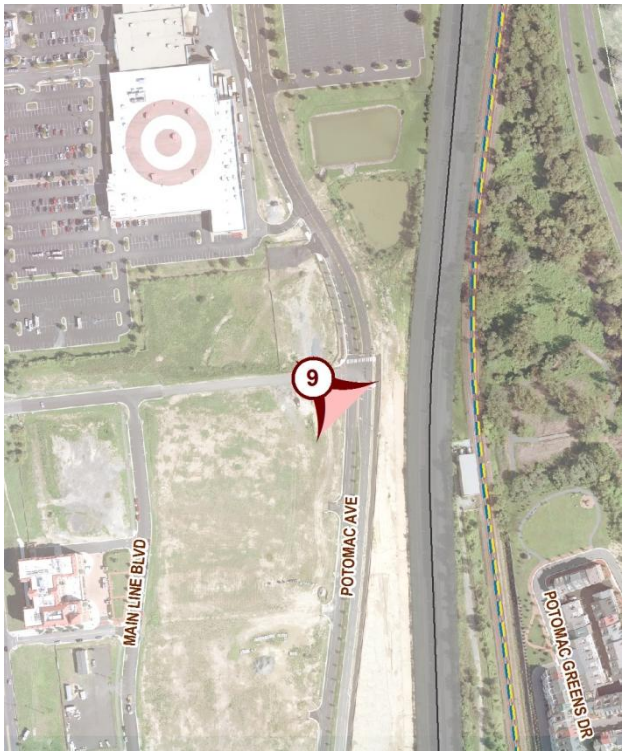
VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

Figure 3-31: No Build Alternative Viewshed 8 Elements

View Location	Description/Focus
	From Potomac Greens Park looking northwest towards existing substation. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**
2016 No Build Alternative	**2040 No Build Alternative**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

Figure 3-32: No Build Alternative Viewshed 9 Elements, Looking Southeast

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking southeast (photos taken 2011).
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate

Figure 3-33: No Build Alternative Viewshed 9 Elements, Looking Northeast

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast (photos taken 2011).
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate

3.8.3.2 Build Alternative A

Table 3-18 summarizes the anticipated visual impacts of Build Alternative A. **Figure 3-34** through **Figure 3-42** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years 2016 and 2040. Viewsheds 6, 7, 8, and 9 are anticipated to have changes. While the visual quality of Viewsheds 4 and 5 also decline slightly in 2040, change in future conditions in 2016 and 2040 is mostly attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-35, 3-36, and 3-38** include 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

Table 3-18: Build Alternative A Anticipated Visual Impacts

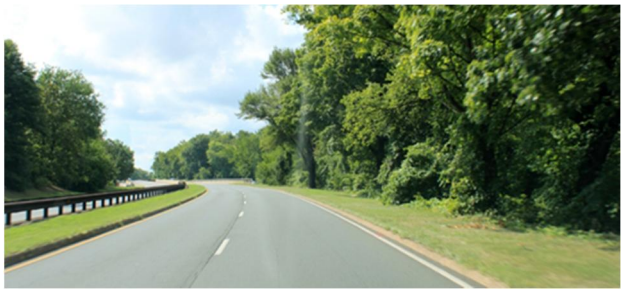
Viewshed	Description	Visual Quality	
		2016	2040
Viewshed 1	Same as No Build.	Very High	Very High
Viewshed 2	Same as No Build.	Very High	Very High
Viewshed 3	Same as No Build.	Very High	Very High
Viewshed 4	Would add filtered views of Metrorail station during winter; by 2040 would add additional Potomac Yard development.	Moderately High	Moderately High
Viewshed 5	Same as No Build.	High	Moderately High
Viewshed 6	Would include noticeable views of Potomac Yard Metrorail station in 2016; by 2040, the addition of Potomac Yard development into the viewshed would further diminish visual quality.	Moderate	Moderately Low
Viewshed 7	Would include the platform of Potomac Yard Metrorail station; in 2040 Potomac Yard development would be visible.	Moderately Low	Moderately Low
Viewshed 8	Would be dominated by the northern station entrance; by 2040, Potomac Yard development would be visible.	Low	Very Low
Viewshed 9	Would add new built elements; by 2040, additional development would be present.	Moderately Low	Moderately Low
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Metrorail facilities, Potomac Greens neighborhood, and Potomac Yard; by 2040, North Potomac Yard and Crystal City development would be visible at visual breaks.	Very High	High

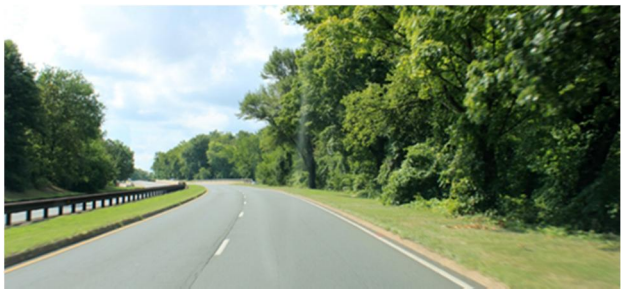
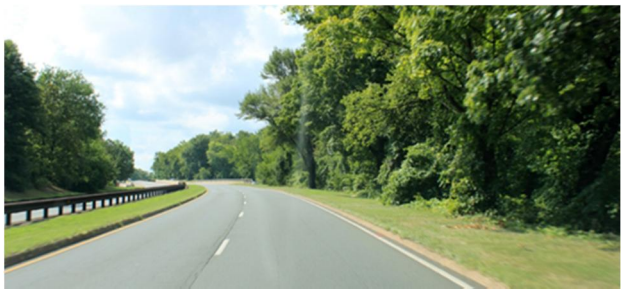
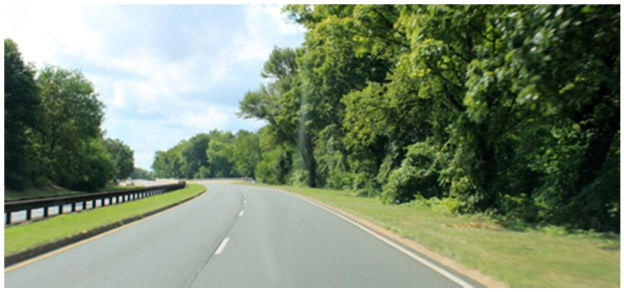
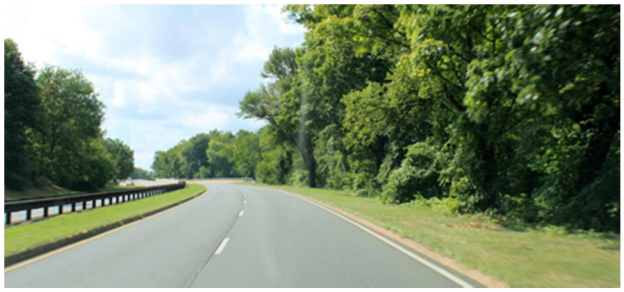
Along the GWMP roadway in 2016, Build Alternative A would add built elements of the new Metrorail station to Viewsheds 4 and 6; the other viewsheds would continue to be framed by continuous vegetation. As a result of the encroachment of buildings into the viewshed, Viewshed 4 would decline to moderately high visual quality due to the visibility of the station during winter (see **Figure 3-37**), and Viewshed 6 would decline to moderate visual quality (see **Figure 3-39**). The continuous viewshed and Viewsheds 1, 2, 3, and 5 would retain their existing visual quality. In 2040, Viewsheds 1 through 3 would include some development from Potomac Yard and Crystal City, but the changes would not be sufficient to alter their overall visual quality. The Potomac Yard development would encroach into the other viewsheds by 2040, resulting in declines to moderately high visual quality for Viewsheds 4 and 5, moderately low visual quality for Viewshed 6, and high visual quality for the GWMP continuous view corridor.

From Potomac Greens in 2016, Build Alternative A would block views of the existing retaining wall and fencing, as well as the traction power substation beyond. In Viewshed 7, the Metrorail station platform would add horizontal built elements, with a moderately low visual quality (see **Figure 3-40**). In Viewshed 8, the new Metrorail station would dominate the viewshed, resulting in low visual quality (see **Figure 3-41**). In 2040, development in Potomac Yard would be added to the viewsheds, reducing the visual quality of Viewshed 8 to very low levels; Viewshed 7 would continue to have moderately low visual quality.

In Potomac Yard in 2016, Build Alternative A would introduce new vertical elements, the station entrance and pedestrian bridge, into the foreground of Viewshed 9. Vegetation in the background would be removed, although Potomac Yard Park landscape would also serve to filter views of the Potomac Greens neighborhood (see **Figure 3-42**). The visual quality of Viewshed 8 would diminish to moderately low levels. In 2040, buildings of up to 250 feet in height, landscaping through the implementation of mixed-use development at Potomac Yard, and maturation of Potomac Yard Park are also visible. As a result, the visual quality would decline to moderately low.

Figure 3-34: Build Alternative A Viewshed 1 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)**  **Existing Viewshed (without leaves)**

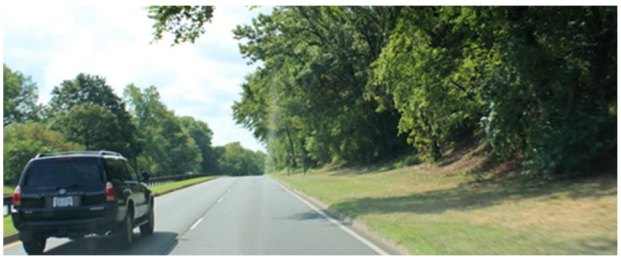
2016 No Build Alternative	2040 No Build Alternative
	
2016 Build	**2040 Build**
	

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative A	Very High	Very High	Very High

Figure 3-35: Build Alternative A Viewshed 2 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

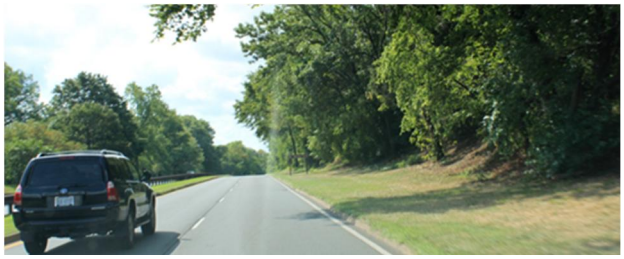
Existing Viewshed (with leaves)



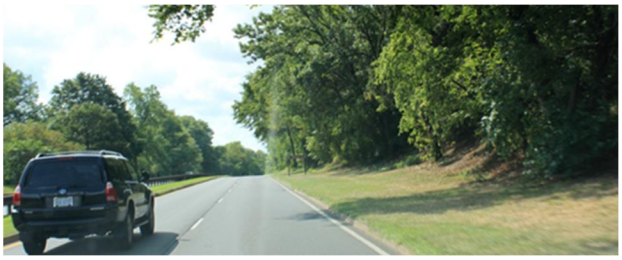
Existing Viewshed (without leaves)

2016 No Build Alternative

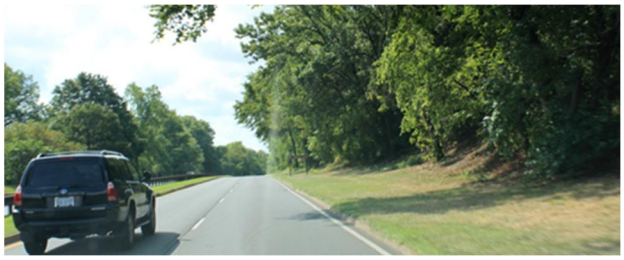
2040 No Build Alternative



2016 Build



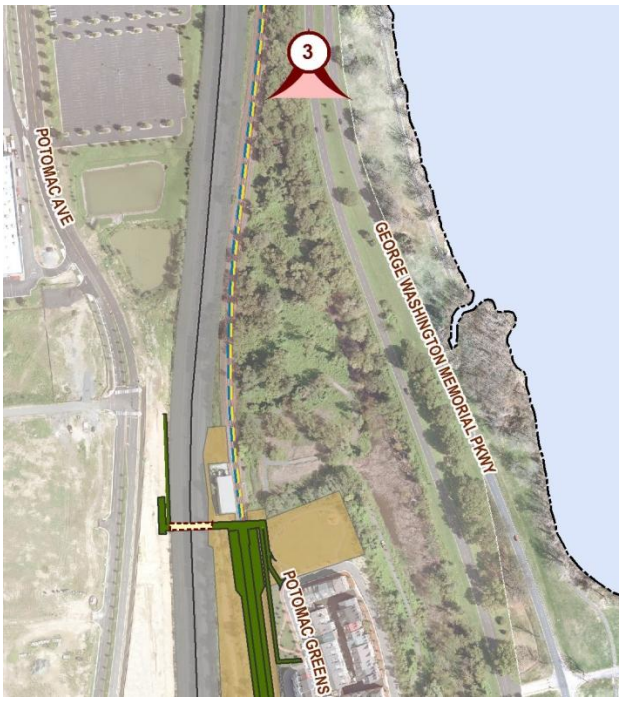
2040 Build (with leaves)



2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative A	Very High	Very High	Very High

Figure 3-36: Build Alternative A Viewshed 3 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative A	Very High	Very High	Very High

Figure 3-37: Build Alternative A Viewshed 4 Elements

View Location	Description/Focus
	From Mount Vernon Trail looking west across the GWMP roadway.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

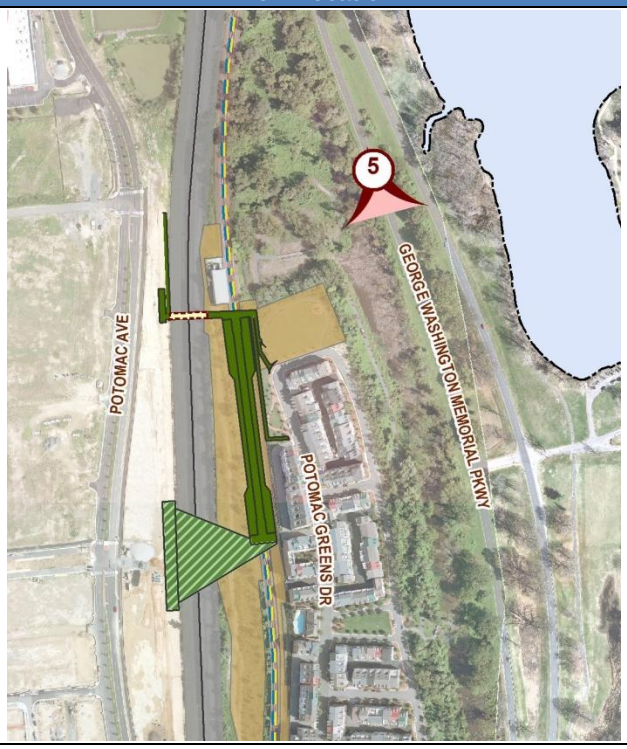
2040 No Build Alternative

2016 Build

2040 Build

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative A	High	Moderately High	Moderately High

Figure 3-38: Build Alternative A Viewshed 5 Elements

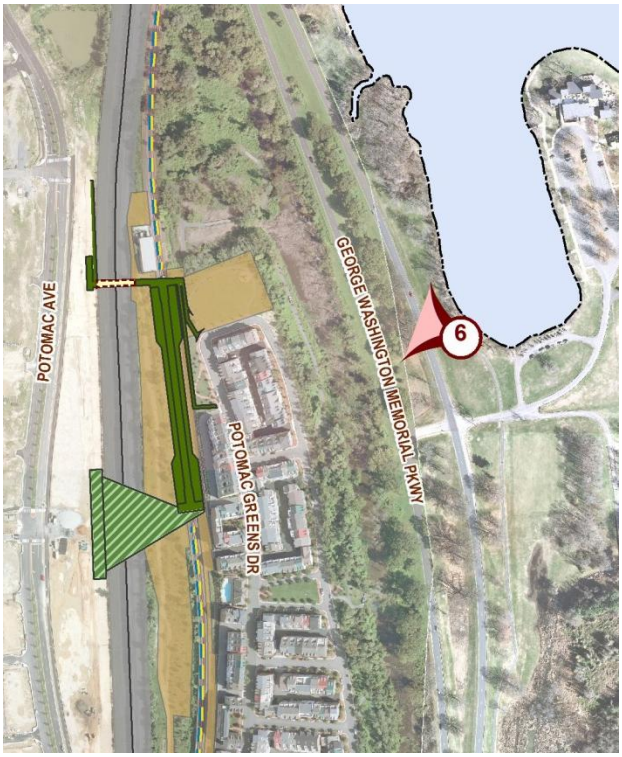
View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build (with leaves)**

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative A	High	High	Moderately High

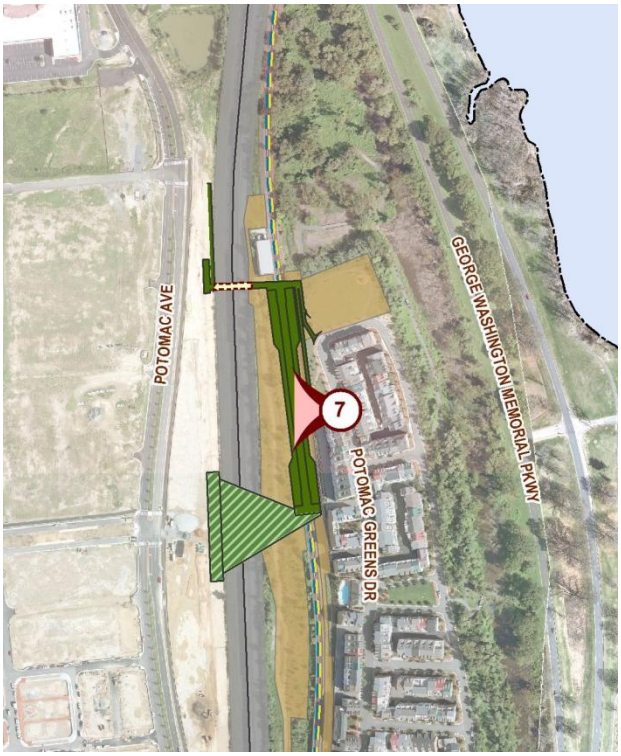
2040 Build (without leaves)

Figure 3-39: Build Alternative A Viewshed 6 Elements

View Location	Description/Focus
	From the GWMP roadway northbound shoulder, looking toward existing substation. Focus is on Build Alternative A's station elements and removal of at least two mature trees.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately High	Moderately High	Moderate
Build Alternative A	Moderately High	Moderate	Moderately Low

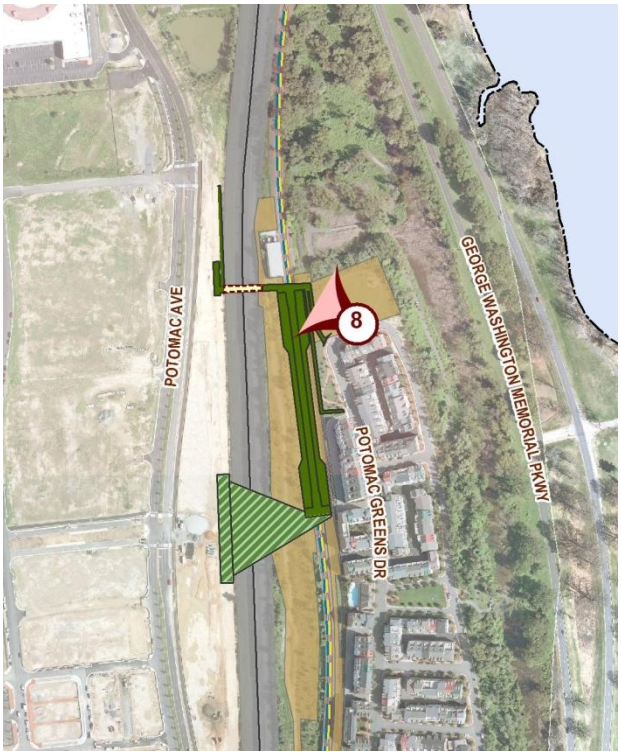
Figure 3-40: Build Alternative A Viewshed 7 Elements

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. Focus is on the impacts of Build Alternative A's station elements. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative A	Moderate	Moderately Low	Moderately Low

Figure 3-41: Build Alternative A Viewshed 8 Elements

View Location	Description/Focus
	From Potomac Greens Park looking northwest towards existing substation. Focus is on the impacts of Build Alternative A's station elements. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative A	Moderate	Low	Very Low

Figure 3-42: Build Alternative A Viewshed 9 Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking southeast. Focus is on the impact of Build Alternative A's station elements (photos taken 2011).

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

2016 Build

2040 Build

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate
Build Alternative A	Moderate	Moderately Low	Moderately Low

3.8.3.3 Build Alternative B

Table 3-19 summarizes the anticipated visual impacts of Build Alternative B. **Figure 3-43** through **Figure 3-51** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years 2016 and 2040. Viewsheds 3, 8, and 9 are anticipated to have changes. While the visual quality of Viewshed 4 also declines slightly in 2040, change in future conditions in 2016 and 2040 is mostly attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-44, 3-45, and 3-47** include 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

Table 3-19: Anticipated Visual Impacts of Build Alternative B

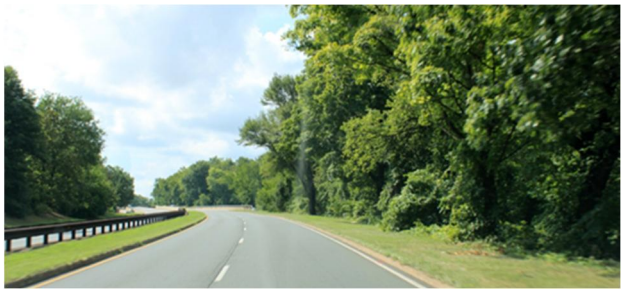
Viewshed	Description	Visual Quality	
		2016	2040
Viewshed 1	Same as No Build	Very High	Very High
Viewshed 2	Same as No Build	Very High	Very High
Viewshed 3	Would remove vegetation and include built elements; by 2040 replaced vegetation would mature.	Moderate	Moderately High
Viewshed 4	Would add filtered views of Metrorail station during winter; by 2040 would add additional Potomac Yard development.	Moderately High	Moderately High
Viewshed 5	Would remove vegetation and allow views of Metrorail station in 2016; by 2040 Potomac Yard Development would be visible.	Moderately High	Moderately High
Viewshed 6	Same as No Build	Moderately High	Moderate
Viewshed 7	Same as No Build	Moderate	Moderately Low
Viewshed 8	Would add low built elements; by 2040, further development would be present.	Moderately Low	Low
Viewshed 9	Would add Metrorail station; by 2040, vegetation would filter views of Metrorail station and North Potomac Yard development would be present.	Moderately Low	Moderately Low
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Metrorail facilities, Potomac Greens neighborhood, and Potomac Yard; by 2040, North Potomac Yard and Crystal City development would be visible at visual breaks.	High	High

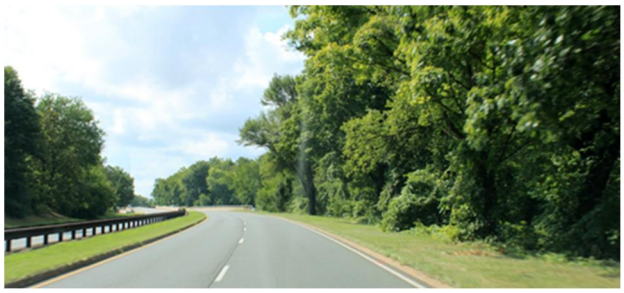
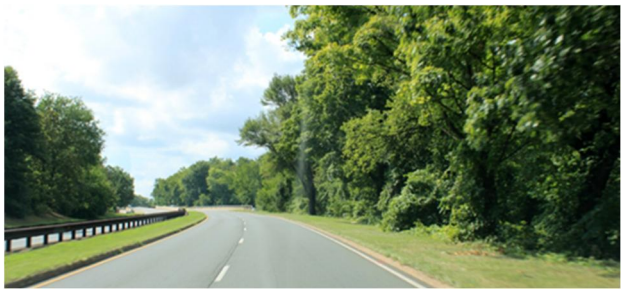
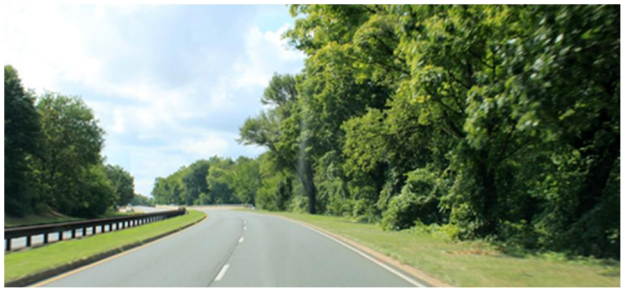
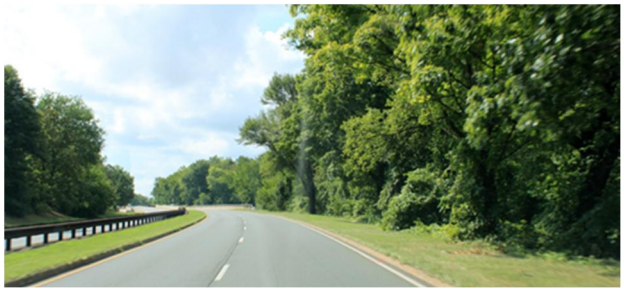
Along the GWMP in 2016, Build Alternative B would remove vegetation and add built elements to Viewsheds 3, 4, and 5 and the continuous view corridor, while the other viewsheds would continue to be framed by continuous vegetation. The encroachment of the Metrorail station and track into the viewshed would diminish Viewshed 3 to moderate visual quality (see **Figure 3-45**), Viewsheds 4 and 5 to moderately high visual quality, which would be due to the visibility of the station during winter in the case of Viewshed 4 (see **Figure 3-46** and **Figure 3-47**), and the GWMP continuous view corridor to high visual quality. Viewshed 3 would include the removal of vegetation for construction staging between the GWMP and the Metrorail station, which contribute to the diminished view quality in 2016. Construction activity would be located relatively close to the GWMP within the Greens Scenic Area easement, with little visual barrier to the GWMP, altering the vegetated appearance of the area due to the clearance of treed area and associated herbaceous vegetation within 0.55 acre of the GWMP, 0.83 acre of the Greens Scenic Area easement, and 0.31 acre along the east side of the Metrorail tracks. Viewsheds 1, 2, and 6 would retain their existing visual quality. Viewshed 6 would include filtered views at its periphery of a small portion of the Metrorail station along the GWMP during the winter months, but this encroachment would not be enough to degrade the overall visual quality of the viewshed (see **Figure 3-48**). Build Alternative B would not be able to proceed unless the Greens Scenic Area easement is released by NPS due to its impacts subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. In 2040, the vegetation along the roadway would mature, improving Viewshed 3 to a moderately high visual quality. Viewshed 4 and the GWMP continuous view corridor would retain their 2016 visual quality. Additional viewsheds would include some development from Potomac Yard and Crystal City, but with the exception of Viewshed 6, their visual quality would not change. In 2040, Viewshed 6 would have moderate visual quality due to the substantial amount of new development visible.

From the Potomac Greens neighborhood in 2016, Build Alternative B would maintain the same views in Viewshed 7 as under the No Build Alternative, and would retain moderate visual quality (see **Figure 3-49**). In Viewshed 8, Build Alternative B would add prominent built forms as part of the pedestrian bridge and station structure (see **Figure 3-50**). As a result, Viewshed 8 would have moderately low visual quality. In 2040, further development in Potomac Yard would be added to the viewsheds, reducing the visual quality of Viewsheds 7 and 8 to moderately low and low, respectively. The Metrorail facility would be visible from Potomac Greens Drive.

From Potomac Yard in 2016, Alternative B would add pedestrian bridges and station entrances, which would introduce vertical elements into the Viewshed 9 (see **Figure 3-51**). The station's platform would also be visible. Potomac Yard Park vegetation would filter portions of the Metrorail station. The visual quality would be diminished to moderately low levels. In 2040, mixed-use development at Potomac Yard would be visible and the matured vegetation of Potomac Yard would further filter views. The visual quality would continue to be moderately low.

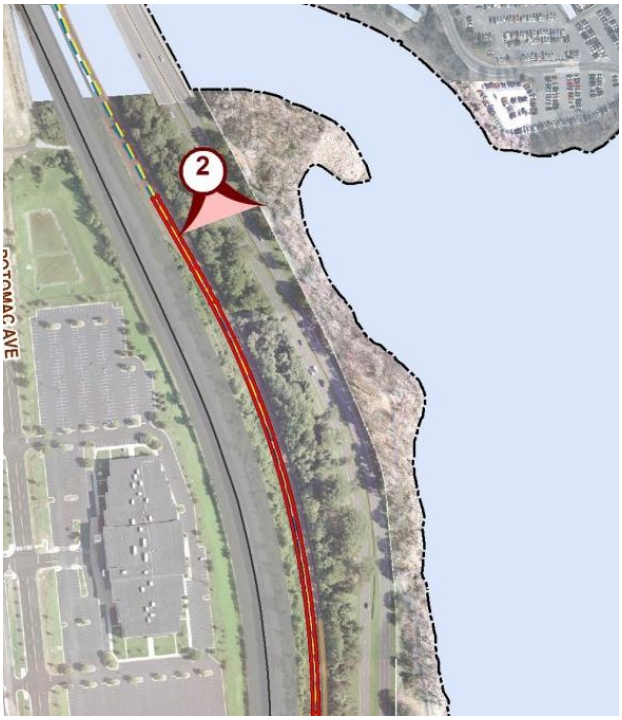
Figure 3-43: Build Alternative B Viewshed 1 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)**  **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
	
2016 Build	**2040 Build**
	

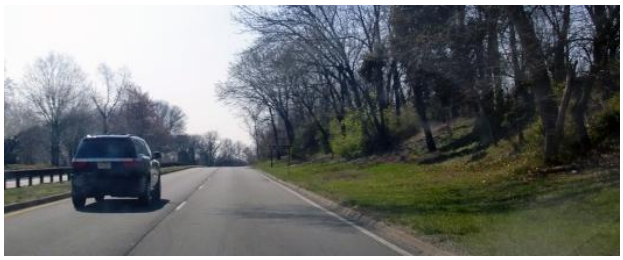
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative B	Very High	Very High	Very High

Figure 3-44: Build Alternative B Viewshed 2 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

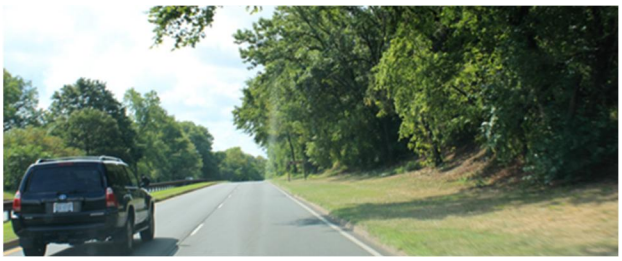
Existing Viewshed (without leaves)



2016 No Build Alternative

2040 No Build Alternative

2016 Build

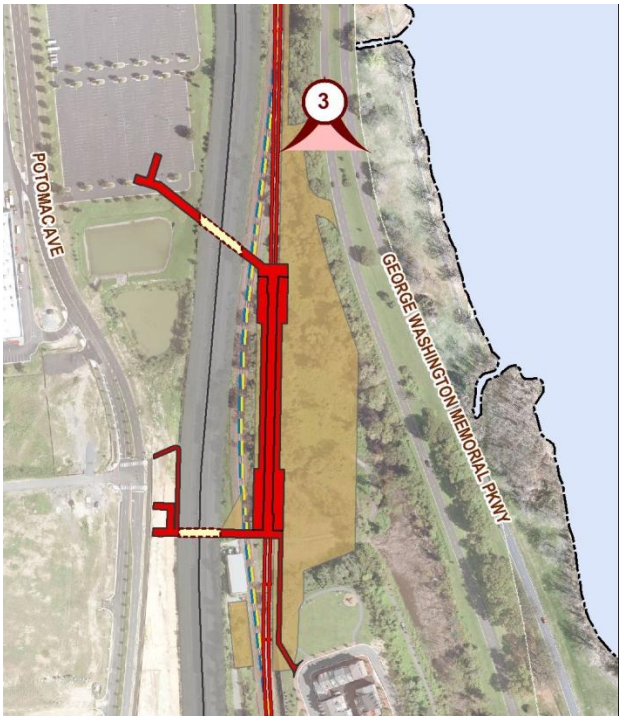


2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative B	Very High	Very High	Very High

Figure 3-45: Build Alternative B Viewshed 3 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. Focus is on the impacts of Build Alternative B's station elements with the removal of existing trees.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

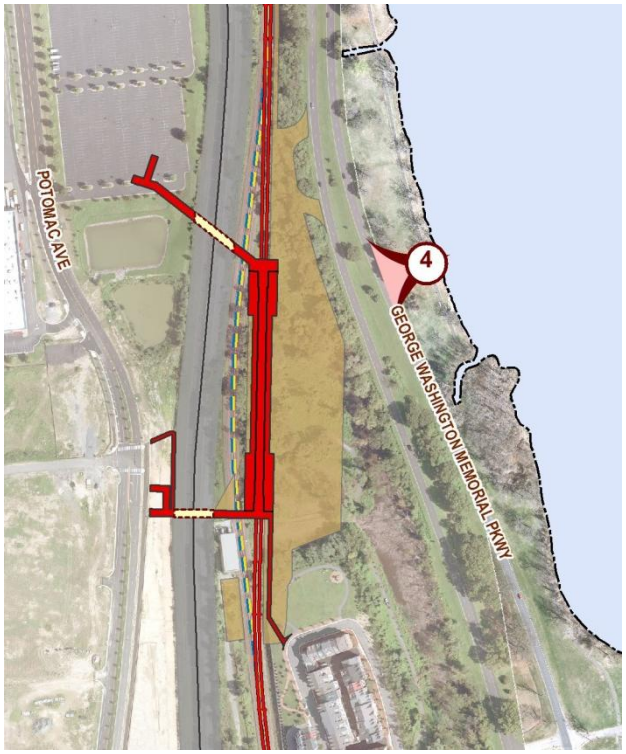
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

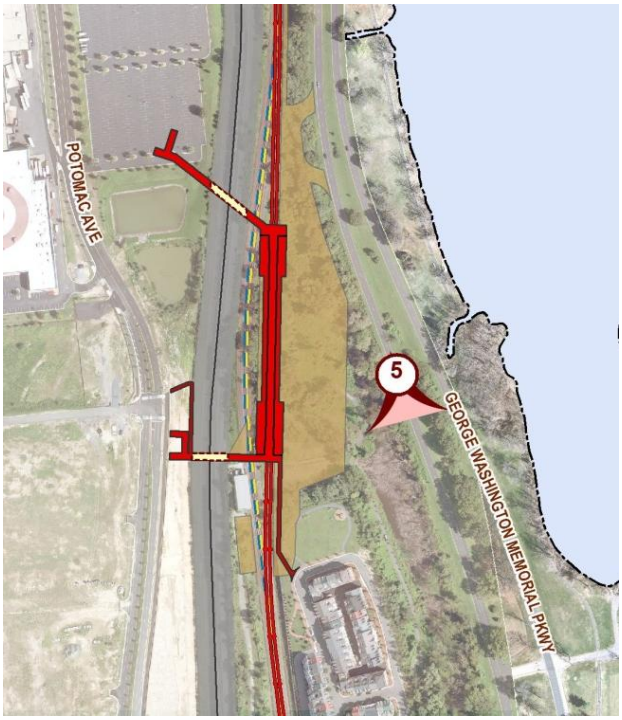
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative B	Very High	Moderate	Moderately High

Figure 3-46: Build Alternative B Viewshed 4 Elements

View Location	Description/Focus
	From Mount Vernon Trail looking west across the GWMP roadway.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative B	High	Moderately High	Moderately High

Figure 3-47: Build Alternative B Viewshed 5 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

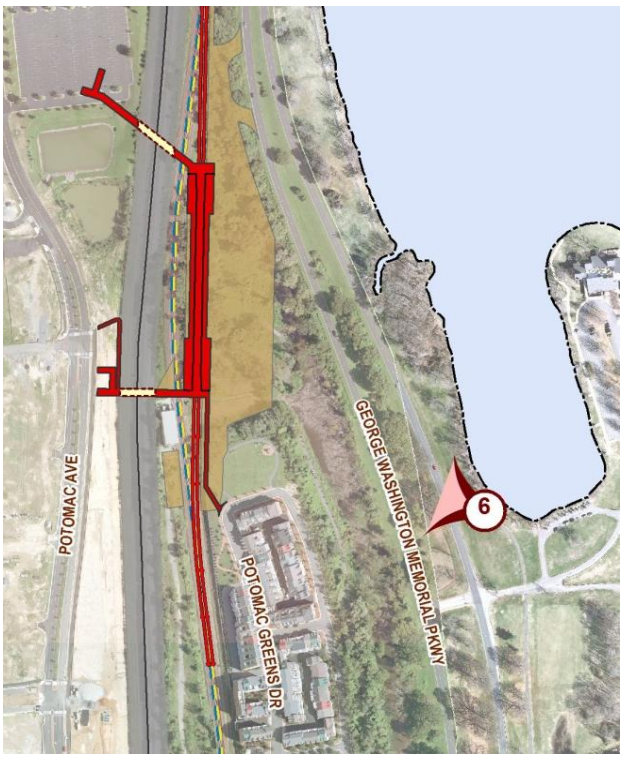
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative B	High	Moderately High	Moderately High

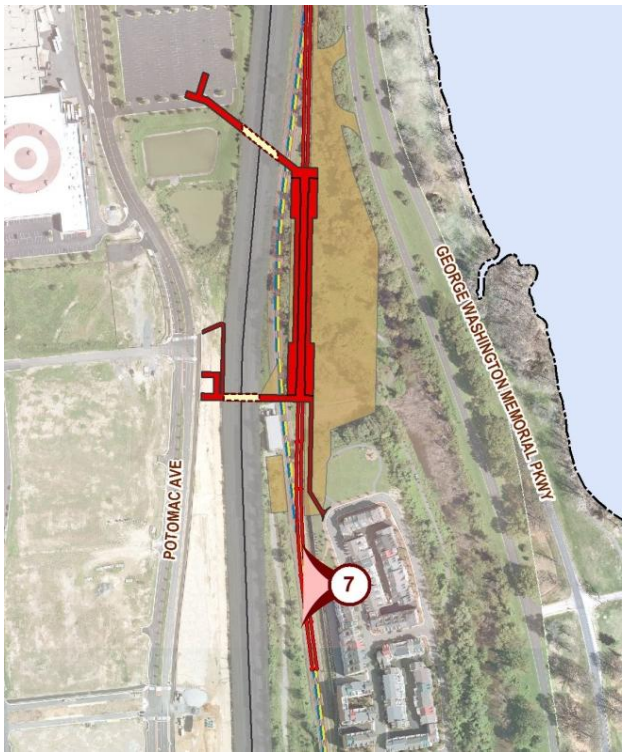
Figure 3-48: Build Alternative B Viewshed 6 Elements

View Location	Description/Focus
	From the GWMP roadway northbound shoulder looking toward existing substation. Focus is on Build Alternative B's station elements with removal of trees. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately High	Moderately High	Moderate
Build Alternative B	Moderately High	Moderately High	Moderate

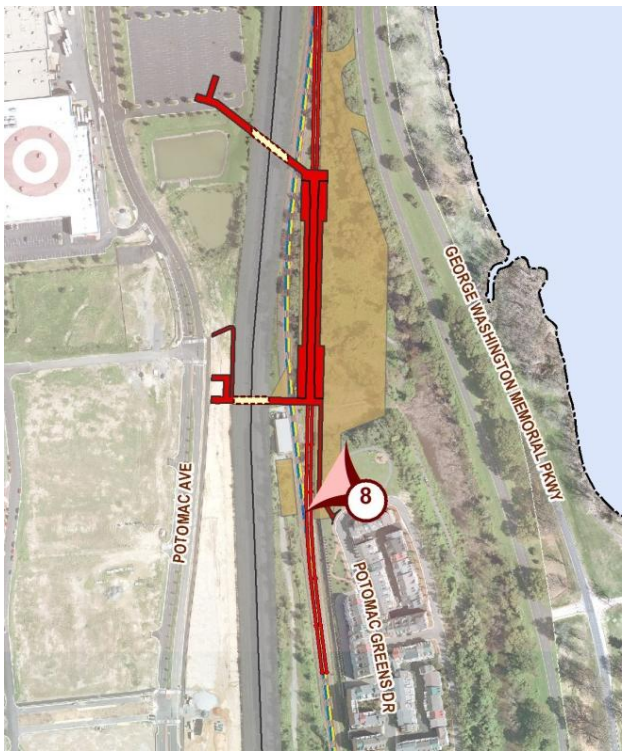
Figure 3-49: Build Alternative B Viewshed 7 Elements

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

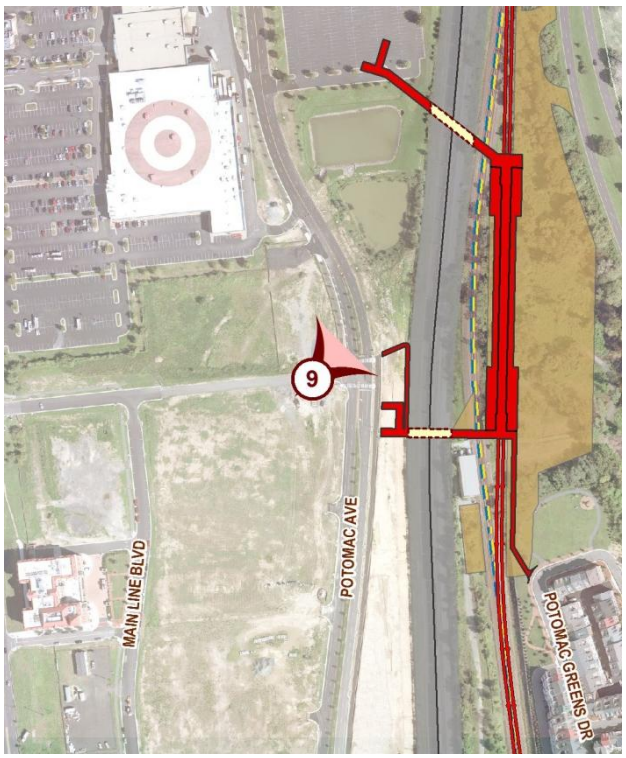
VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative B	Moderate	Moderate	Moderately Low

Figure 3-50: Build Alternative B Viewshed 8 Elements

View Location	Description/Focus
	From Potomac Greens park looking northwest towards existing substation. Focus is on the impacts of Build Alternative B's station elements.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative B	Moderate	Moderately Low	Low

Figure 3-51: Build Alternative B Viewshed 9 Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast. Focus is on the impact of Build Alternative B's station elements (photos taken 2011).
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate
Build Alternative B	Moderate	Moderately Low	Moderately Low

3.8.3.4 B-CSX Design Option

Table 3-20 summarizes the anticipated visual impacts of B-CSX Design Option. **Figure 3-52** through **Figure 3-61** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years 2016 and 2040. Views of B-CSX Design Option station used available drive-by digital simulations prepared by the City of Alexandria rather than architectural renderings, as its architectural design has not been developed to the same level of detail as that of the Build Alternatives.

Viewsheds 2, 2A, and 3 are anticipated to have changes. While the visual quality of Viewsheds 4 and 5 also decline slightly in 2040, the change in future conditions between 2016 and 2040 is mostly attributable to the loss of vegetative foliage in winter, similar to the No Build Alternative, and changes are minimal in the summer.

Table 3-20: Anticipated Visual Impacts of B-CSX Design Option

Viewshed	Description	Visual Quality	
		2016	2040
Viewshed 1	Same as No Build	Very High	Very High
Viewshed 2	Would remove background vegetation and include built elements.	High	High
Viewshed 2A	Would remove background vegetation and introduce built elements.	Moderately High	Moderately High
Viewshed 3	Would remove background vegetation and introduce built elements.	Moderately High	Moderately High
Viewshed 4	Same as No Build	High	Moderately High
Viewshed 5	Same as No Build	High	Moderately High
Viewshed 6	Same as No Build	Moderately High	Moderate
Viewshed 7	Same as No Build	Moderate	Moderately Low
Viewshed 8	Same as No Build	Moderate	Moderately Low
Viewshed 9	Same as No Build	Moderate	Moderate
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Metrorail facilities, Potomac Greens neighborhood, and Potomac Yard; by 2040, North Potomac Yard and Crystal City development would be visible at visual breaks.	High	High

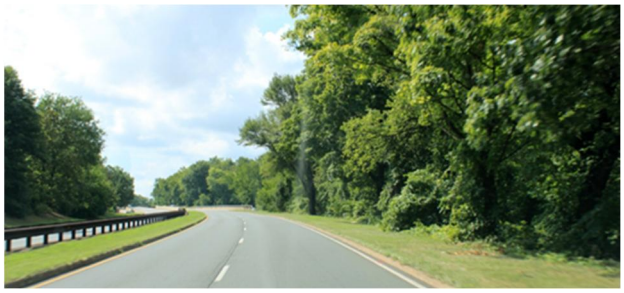
Along the GWMP in 2016, B-CSX Design Option would remove vegetation and add built elements to Viewsheds 2, 2A, 3, and the continuous view corridor, while the other viewsheds would continue to be framed by vegetation with limited interruptions. The encroachment of the Metrorail station and track into the viewshed would diminish Viewshed 2 to high visual quality (see **Figure 3-53**), Viewsheds 2A and 3 to moderately high visual quality (see **Figure 3-54** and **Figure 3-55**), and the Continuous GWMP Corridor to high visual quality. Viewshed 1 would retain a very high visual quality in 2016 and 2040 (see **Figure 3-52**). In Viewshed 3, the encroachment of new development in Potomac Yard would contribute to diminishing visual quality as construction staging would require the removal of an approximately 50-foot wide layer of thin, mostly low-lying vegetation with widely spaced trees west of the existing Metrorail line, between the Metrorail tracks and the CSXT tracks, that currently is part of the visual screen between GWMP and the proposed location of the Metrorail station. Although the current vegetative buffer on NPS property would continue to screen the GWMP from B-CSX Design Option since vegetation would not be cleared in the Greens Scenic Area easement or the GWMP. Viewsheds 4 and 5 would retain their high visual quality in 2016 (see **Figure 3-56** and **Figure 3-57**), and Viewshed 6 would remain moderately high (see **Figure 3-58**). Under Viewshed 4, station elements would not be visible from the Mount Vernon Trail, since the rising topography toward the station and the existing vegetation screen block any views of B-CSX Design Option. In 2040, some of the viewsheds would include new development from Potomac Yard and Crystal City, causing declines in Viewshed 4 to moderately high visual quality, Viewshed 5 to moderately high visual quality, and Viewshed 6 to moderate visual quality. In 2040, the Continuous GWMP Corridor would include new development from Potomac Yard and Crystal City along the periphery, while replanted vegetation

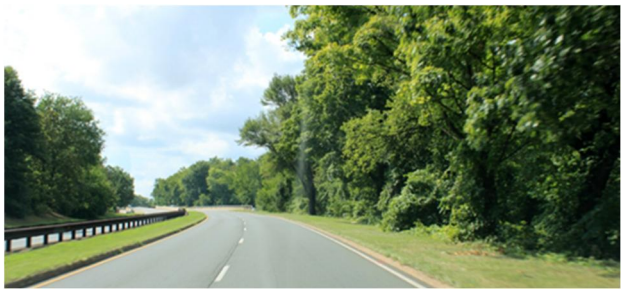
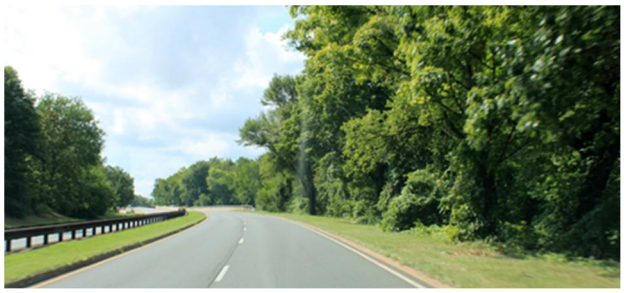
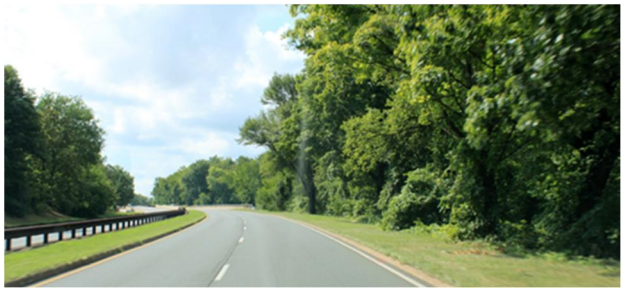
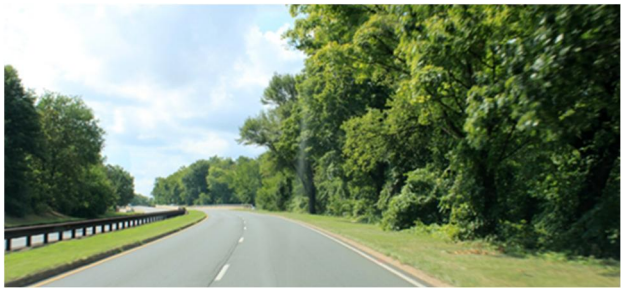
along the Metrorail station and track would be more mature; as a result, the visual quality would remain high. During the winter months, built elements for viewsheds would be more visible due to the lack of leaves.

For Viewsheds 7 and 8 in Potomac Greens, B-CSX Design Option would replace the existing Metrorail tracks; the Potomac Yard development would add built forms and Potomac Yard Park vegetation would mature adjacent to the tracks, similar to the No Build Alternative (see **Figure 3-59** and **Figure 3-60**). The overall visual quality for Viewsheds 7 and 8 would remain moderate. In 2040, further development in North Potomac Yard would be added to the viewshed, which would diminish the visual quality of both viewsheds to moderately low levels.

At Potomac Yard, B-CSX Design Option would replace and re-align Metrorail tracks near East Glebe Road. South Potomac Yard development would add built forms along Potomac Avenue to the periphery of Viewshed 9 (outside the field of view of the photograph renderings) and Potomac Yard Park vegetation would mature and augment the existing landscape of the site (see **Figure 3-61**). The visual quality would remain moderate due to minimal visibility of the realigned tracks, the encroachment of buildings within the viewshed, and improved visual patterns due to the introduction of vegetation at Potomac Yard Park. In 2040, the viewshed would experience additional encroachment from North Potomac Yard development, and the Potomac Yard Park vegetation would be more mature, further filtering views of buildings in the background, retaining its moderate visual quality.

Figure 3-52: B-CSX Design Option Viewshed 1 Elements

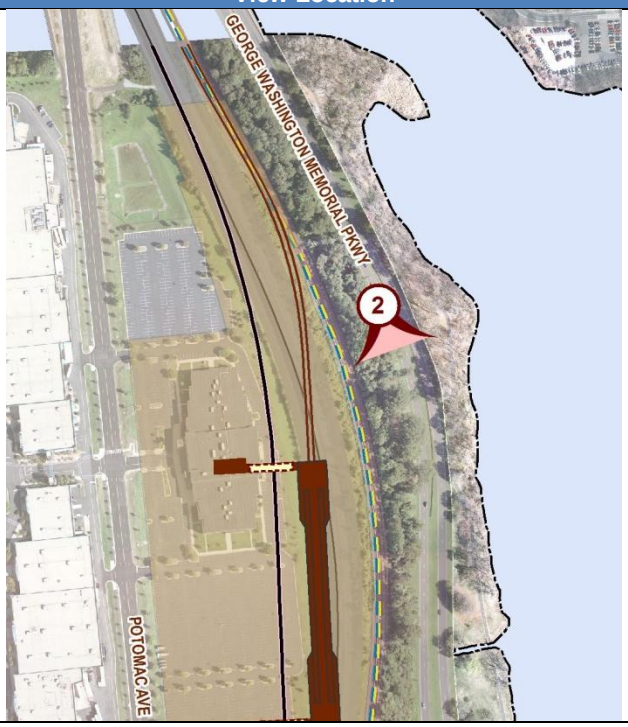
View Location	Description/Focus
	From southbound GWMP roadway looking south. **Existing Viewshed (with leaves)**  **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
	
2016 Build	**2040 Build**
	

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
B-CSX Design Option	Very High	Very High	Very High

Figure 3-53: B-CSX Design Option Viewshed 2 Elements

View Location



Description/Focus

From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

2016 No Build Alternative

2040 No Build Alternative

2016 Build

Not Available

2040 Build (with leaves)

2040 Build (without leaves)

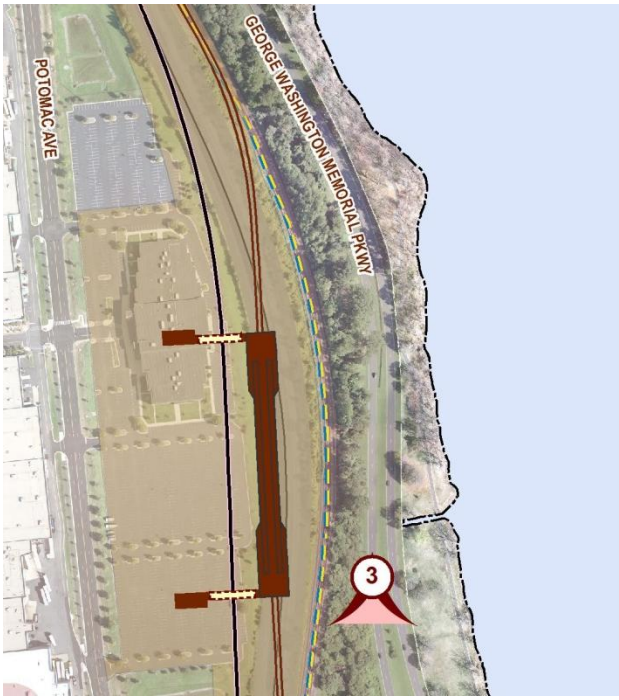
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
B-CSX Design Option	Very High	High	High

Figure 3-54: B-CSX Design Option Viewshed 2a Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. Viewshed 2a was added to the analysis for B-CSX Design Option, because the initial viewshed locations did not anticipate this later design option.
	Existing Viewshed (with leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build (with leaves)**
Not Available	
	2040 Build (without leaves)

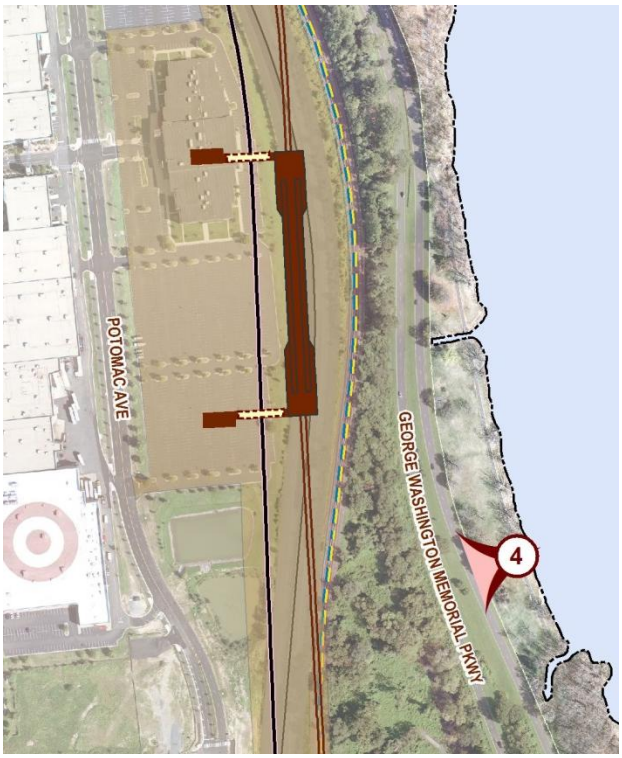
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
B-CSX Design Option	Very High	Moderately High	Moderately High

Figure 3-55: B-CSX Design Option Viewshed 3 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.
	Existing Viewshed (with leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build Not Availabile	**2040 Build (with leaves)**
	2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
B-CSX Design Option	Very High	Moderately High	Moderately High

Figure 3-56: B-CSX Design Option Viewshed 4 Elements

View Location	Description/Focus
	From Mount Vernon Trail looking west across the GWMP roadway. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
B-CSX Design Option	High	High	Moderately High

Figure 3-57: B-CSX Design Option Viewshed 5 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

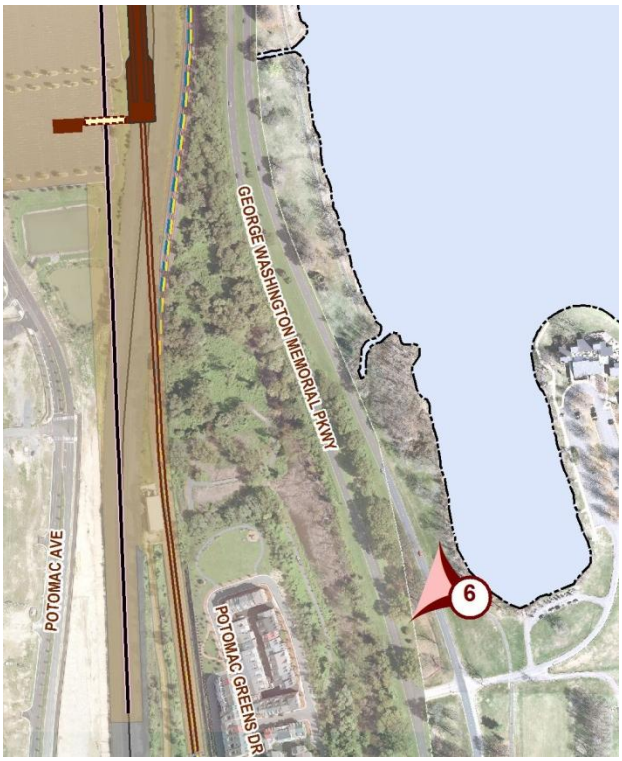
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
B-CSX Design Option	High	High	Moderately High

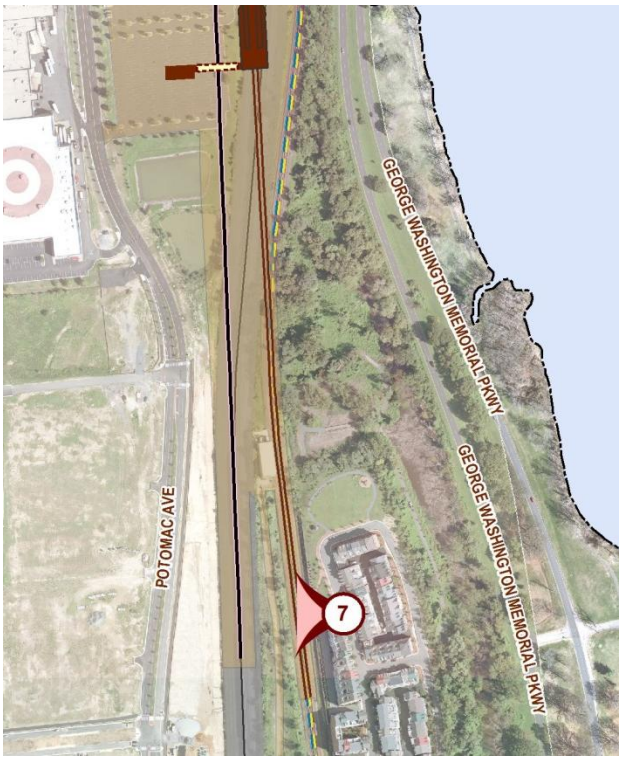
Figure 3-58: B-CSX Design Option Viewshed 6 Elements

View Location	Description/Focus
	From the GWMP roadway northbound shoulder looking toward existing substation. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately High	Moderately High	Moderate
B-CSX Design Option	Moderately High	Moderately High	Moderate

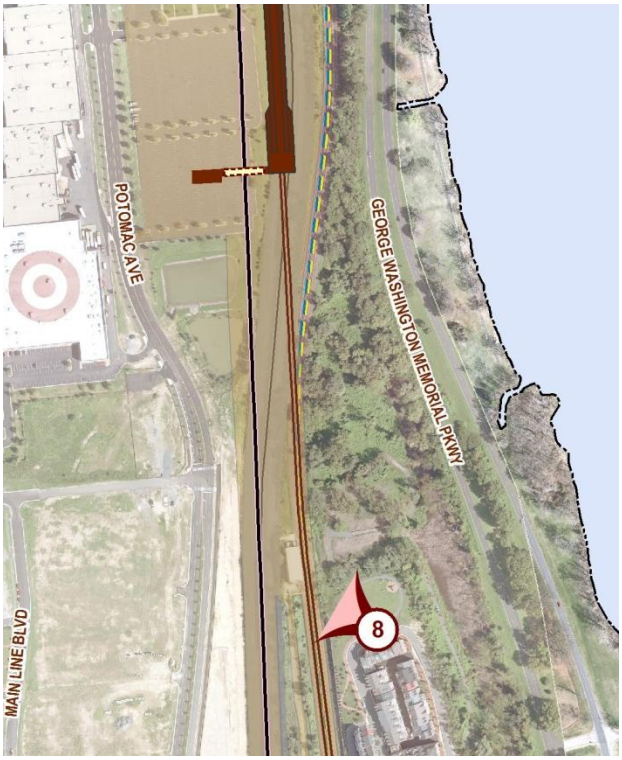
Figure 3-59: B-CSX Design Option Viewshed 7 Elements

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
B-CSX Design Option	Moderate	Moderate	Moderately Low

Figure 3-60: B-CSX Design Option Viewshed 8 Elements

View Location	Description/Focus
	From Potomac Greens park looking northwest towards existing substation.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
B-CSX Design Option	Moderate	Moderate	Moderately Low

Figure 3-61: B-CSX Design Option Viewshed 9 Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast (photos taken 2011). **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate
B-CSX Design Option	Moderate	Moderate	Moderate

3.8.3.5 Build Alternative D

Table 3-21 summarizes the anticipated visual impacts of Build Alternative D. **Figure 3-62** through **Figure 3-70** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years 2016 and 2040. Viewsheds 1, 2, 7, 8, and 9 are anticipated to have changes. While the visual quality of Viewsheds 5 and 6 also decline slightly in 2040, changes in future conditions in 2016 and 2040 are mostly attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-63, 3-64, and 3-66** include 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

Table 3-21: Anticipated Visual Impacts of Build Alternative D

Viewshed	Description	Visual Quality	
		2016	2040
Viewshed 1	Would have large breaks in vegetation with clearly visible track structures; by 2040, the replaced vegetation would mature.	Low	Moderate
Viewshed 2	Would have large breaks in vegetation with clearly visible Metrorail station; by 2040, the replaced vegetation would mature.	Low	Moderate
Viewshed 3	Same as No Build	Very High	Very High
Viewshed 4	Would add filtered views of Metrorail station during winter; by 2040 would add additional Potomac Yard development.	Moderately High	Moderately High
Viewshed 5	Same as No Build	High	Moderately High
Viewshed 6	Same as No Build	Moderately High	Moderate
Viewshed 7	Would be dominated by aerial track structures in 2016 and 2040.	Very Low	Very Low
Viewshed 8	Would have prominent built elements aerial, track and pedestrian bridge; by 2040 further North Potomac Yard development would be visible.	Moderately Low	Moderately Low
Viewshed 9	Would include the dominate view of aerial tracks in 2016 and 2040.	Very Low	Very Low
Continuous GWMP Corridor	Tree-lined roadway with intermittent views of Metrorail facilities, Potomac Greens neighborhood, and Potomac Yard; by 2040, North Potomac Yard and Crystal City development would be visible at visual breaks.	Moderately High	Moderately High

Along the GWMP in 2016, Build Alternative D would replace existing vegetation and add built elements to Viewsheds 1, 2, 4, and the continuous view corridor. As a result of the noticeable encroachment of the aerial track structure into the viewsheds and the removal of consistent vegetation, the visual quality of Viewsheds 1 and 2 would decline to low (see **Figure 3-62** and **Figure 3-63**). Construction staging would require clearing of 2.40 acres of treed area and associated herbaceous vegetation that serves as a visual barrier along the GWMP roadway, most notably in the vicinity of Four Mile Run. Construction activity would be located relatively close to the GWMP roadway with little visual barrier, noticeably altering the green appearance of the areas. Viewshed 4 (due to the visibility of the station during winter) and the GWMP continuous view corridor would decline in visual quality to moderately high. Changes to Viewsheds 3, 5, and 6 would be minimal and would not alter their visual quality. In 2040, the vegetation along the roadway would mature, improving Viewsheds 1 and 2 to a moderate visual quality; Viewshed 4 and the GWMP continuous view corridor would maintain their 2016 visual quality. Viewsheds 5 and 6 would include new development from Potomac Yard, which would result in a decline to moderately high and high visual quality, respectively (see **Figure 3-66** and **Figure 3-67**). Other GWMP viewsheds would include some new development from Potomac Yard and Crystal City, but would not diminish their overall visual quality.

From Potomac Greens neighborhood and park, Build Alternative D would add elevated tracks that would dominate Viewsheds 7 and 8. As a result, the visual quality of Viewshed 7 would decline to very low, while the visual quality of Viewshed 8 would decline to moderately low (see **Figure 3-68** and **Figure 3-69**). In 2040, development in North and South Potomac Yard would be added to the viewsheds although vegetation would be more mature. Viewsheds 7 would continue to have very low visual quality, and Viewshed 8 would continue to have moderately low visual quality.

From Potomac Yard in 2016, Alternative D would introduce the Metrorail station and aerial track structures to Viewshed 9 and remove vegetation. These structures would dominate the foreground of Viewshed 9, blocking views of portions of the landscape (see **Figure 3-70**). The aerial track structures would tightly frame broken views of vegetation and development in the background. The visual quality would be very low. In 2040, the

Metrorail station and aerial track structure would continue to dominate the viewshed, resulting in very low visual quality.

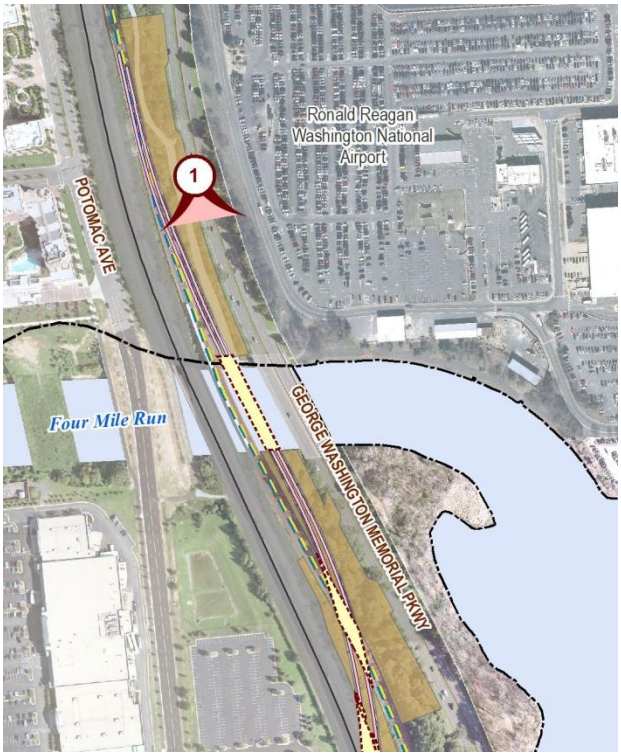
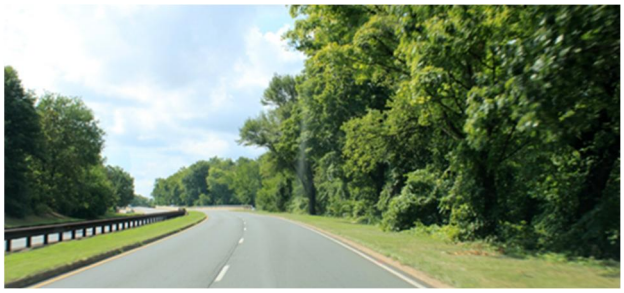
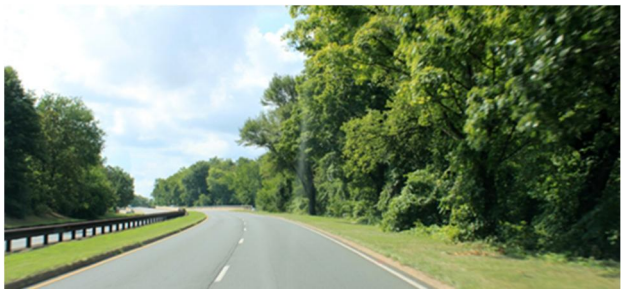
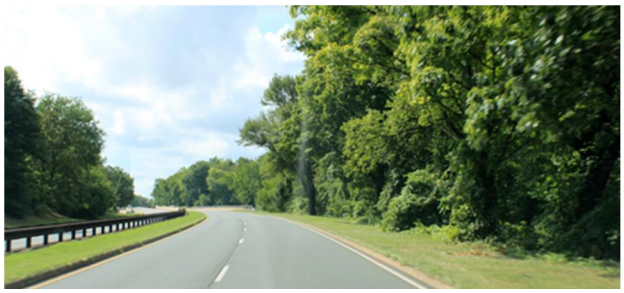
3.8.4 Mitigation

To mitigate the visual impacts as a result of any of the three Build Alternatives or B-CSX Design Option, several measures could be undertaken. Minimization measures such as native vegetation planting and building design may help minimize visual effects to the GWMP.

Vegetation, especially trees, could be planted between the GWMP and the Build Alternatives and the WMATA tracks, in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties*. Conversely, some vegetation along the GWMP within the study area could be thinned or removed to improve and restore important views east toward the Potomac River identified in the *Vegetation of the George Washington Memorial Parkway Cultural Landscape Report* (2009). Mitigation would reflect the core design principles of the GWMP as documented in the *Mount Vernon Memorial Highway Cultural Landscape Report,* Vol. I, p. 72-74 (NPS, 1987). Adding new landscaping to Potomac Greens Park and the Greens Scenic Area easement would provide a visual buffer to the proposed station. Landscape mitigation measures would be consistent with the terms of the scenic easement, as well as provide potential mitigation for impacts to the easement. Release of the scenic easement would be required for any clearing of vegetation within the Greens Scenic Area, and an equal value property exchange would be implemented to mitigate permanent impacts to the Greens Scenic Area easement.

Station building design and materials would be refined during later project design phases to mitigate impacts on visual resources. Elements of building design and station height could be modified as part of mitigation. The use of non-reflective materials would limit potential visual impacts by minimizing glare and changes to texture within the visual context. Building design and materials, including color and texture, for station entrances in Potomac Greens Park and Potomac Yard Park would be selected for compatibility with the surrounding parks to reduce visual impacts. During preliminary and final design, NPS would review proposed architectural designs of the preferred alternative for station elements visible from the GWMP roadway and Mount Vernon Trail as well as proposed landscape restoration and mitigation plans for the GWMP and Greens Scenic Area. Consulting parties with a demonstrated interested in preserving the character of the GWMP, most notably Virginia Department of Historic Resources (VDHR), would also be involved in discussions on station design and materials. NPS and consulting parties would need to evaluate and agree with both preliminary and final design of the station as stipulated in the Memorandum of Agreement (MOA) or Programmatic Agreement (PA) for this project. During preliminary and final design, the City of Alexandria would review architectural designs of station facilities proposed within City parks for compatibility with park facilities and landscape design.

Figure 3-62: Build Alternative D Viewshed 1 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. Focus is on the impacts of Build Alternative D's guideway as it rises to the southwest.
	Existing Viewshed (with leaves)
	
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
	
2016 Build	**2040 Build**

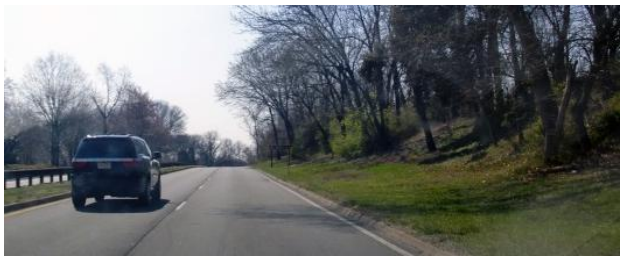
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative D	Very High	Low	Moderate

Figure 3-63: Build Alternative D Viewshed 2 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south. Focus is on the impacts of Build Alternative D's guideway as it rises to the southwest.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)



2016 No Build Alternative

2040 No Build Alternative

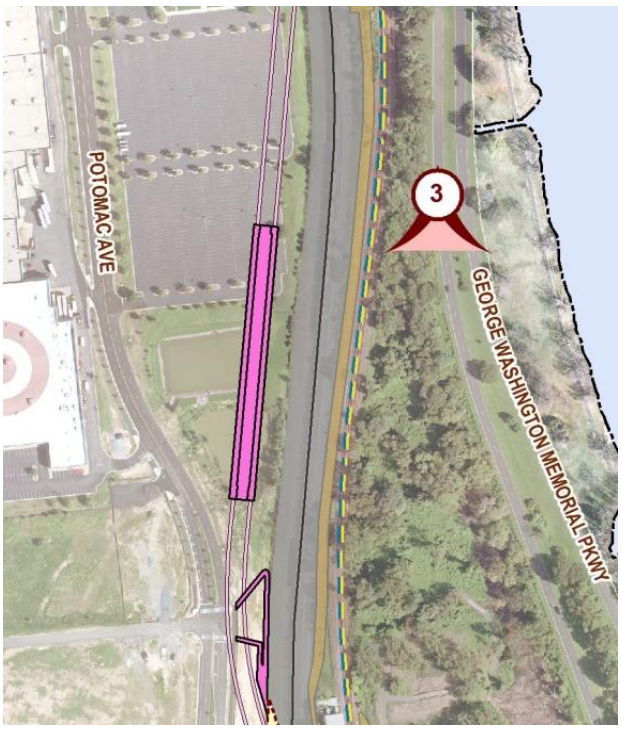
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative D	Very High	Low	Moderate

Figure 3-64: Build Alternative D Viewshed 3 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

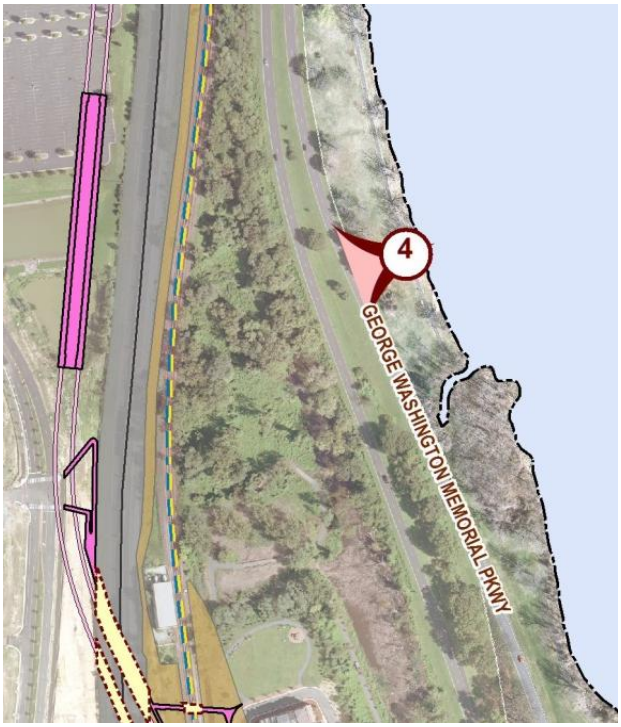
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High
Build Alternative D	Very High	Very High	Very High

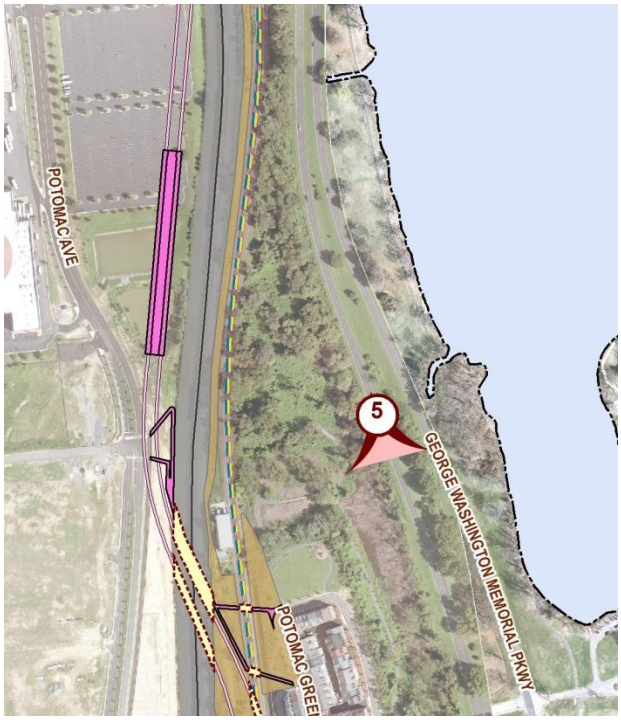
Figure 3-65: Build Alternative D Viewshed 4 Elements

View Location	Description/Focus
	From Mount Vernon Trail looking west across the GWMP roadway. **Existing Viewshed (with leaves)** **Existing Viewshed (without leaves)**

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative D	High	Moderately High	Moderately High

Figure 3-66: Build Alternative D Viewshed 5 Elements

View Location	Description/Focus
	From southbound GWMP roadway looking south.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

2040 No Build Alternative

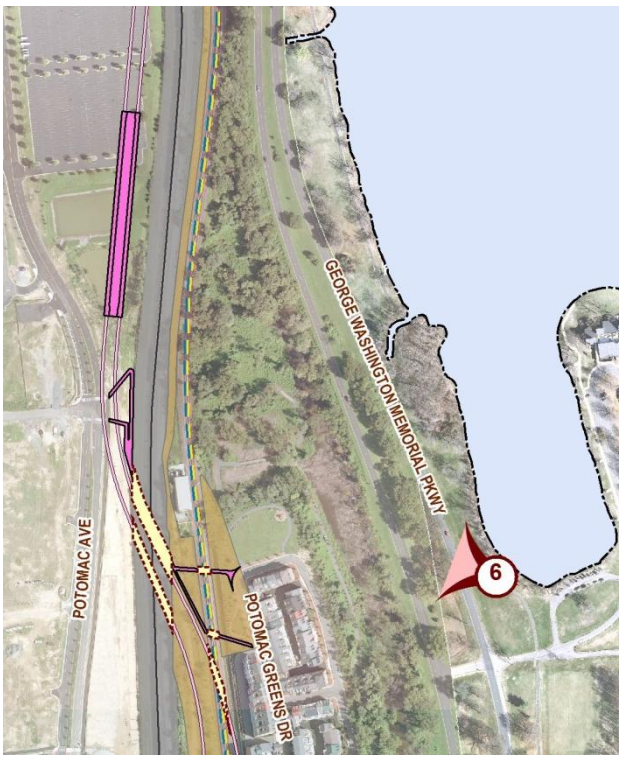
2016 Build

2040 Build (with leaves)

2040 Build (without leaves)

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High
Build Alternative D	High	High	Moderately High

Figure 3-67: Build Alternative D Viewshed 6 Elements

View Location	Description/Focus
	From the GWMP roadway northbound shoulder, looking toward existing substation.

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative

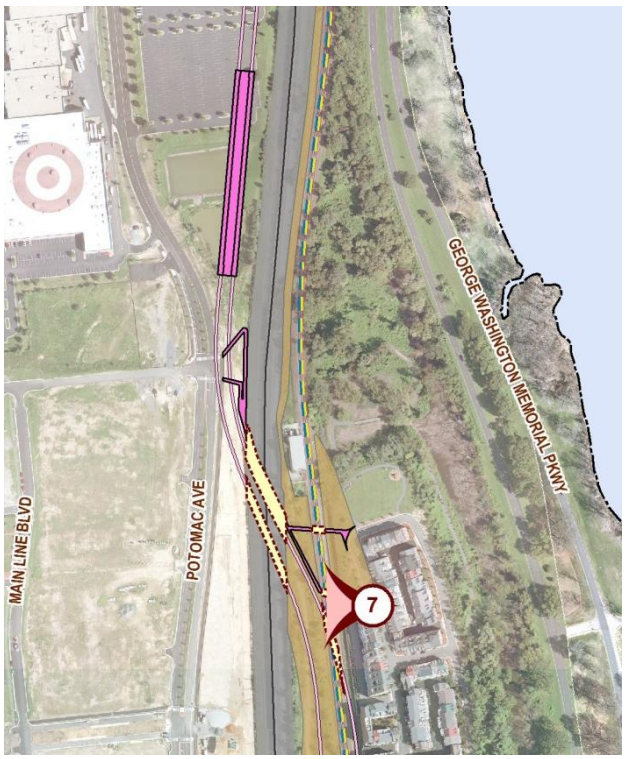
2040 No Build Alternative

2016 Build

2040 Build

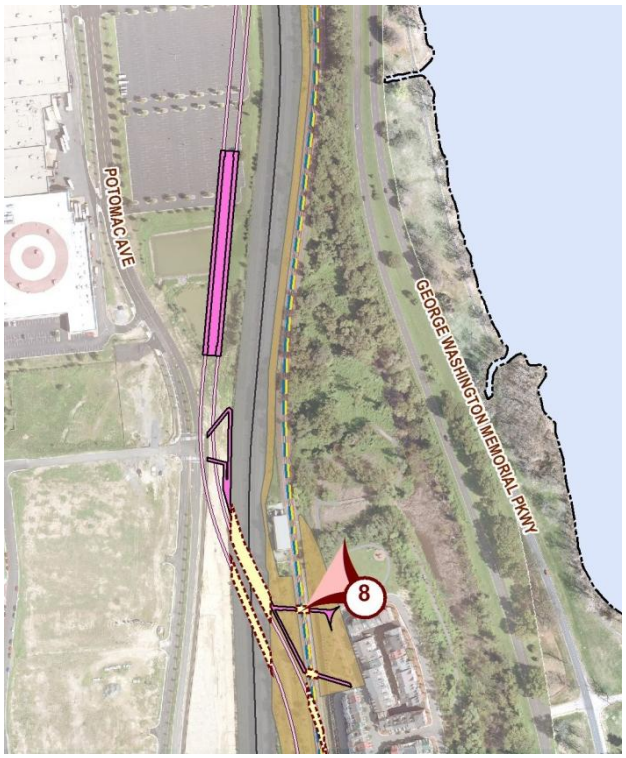
VISUAL QUALITY	Existing	2016	2040
No Build	Moderately High	Moderately High	Moderate
Build Alternative D	Moderately High	Moderately High	Moderate

Figure 3-68: Build Alternative D Viewshed 7 Elements

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. Focus is on the impacts of Build Alternative D aerial guideway in the background.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

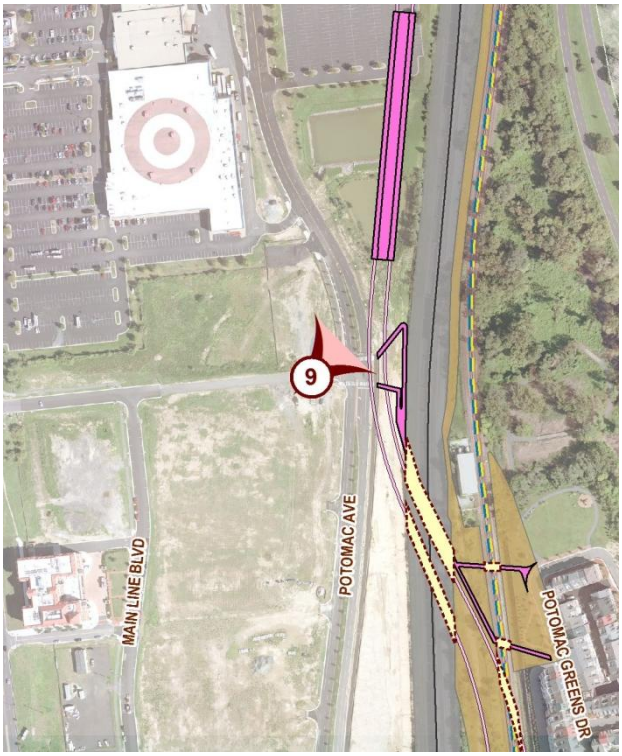
VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative D	Moderate	Very Low	Very Low

Figure 3-69: Build Alternative D Viewshed 8 Elements

View Location	Description/Focus
	From Potomac Greens Park looking northwest towards existing substation. Focus is on the impacts of Build Alternative D's aerial guideway in the background.
	Existing Viewshed (with leaves)
	Existing Viewshed (without leaves)
2016 No Build Alternative	**2040 No Build Alternative**
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low
Build Alternative D	Moderate	Moderately Low	Moderately Low

Figure 3-70: Build Alternative D Viewshed 9 Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast. Focus is on the impact of Build Alternative D's station and elevated tracks (photos taken 2011).

Existing Viewshed (with leaves)

Existing Viewshed (without leaves)

2016 No Build Alternative	2040 No Build Alternative
2016 Build	**2040 Build**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate
Build Alternative D	Moderate	Very Low	Very Low

3.9 Cultural Resources

This section summarizes the results of cultural resource investigations that identified and evaluated potential effects of the alternatives to historic architectural and archaeological resources listed or eligible for listing in the National Register of Historic Places (NRHP) within defined Areas of Potential Effect (APEs). The analysis is described in more detail in the *Cultural Resources Technical Memorandum* and the *Preliminary Architectural Effects Report* in Volume II.

As a federal action, the project is subject to review under Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. 300101 et. seq.), as amended, and its associated implementing regulations in 36 CFR Part 800, as well as the Archaeological Resource Protection Act (ARPA). The Virginia Department of Historic Resources (VDHR) is the State Historic Preservation Office (SHPO) for the Commonwealth of Virginia responsible for review of the project under Section 106. The project is also subject to review under relevant state and local cultural resources laws and regulations, including the Virginia Antiquities Act (§ 10.1-2300 Code of Virginia); the City of Alexandria Zoning Ordinance; and the City of Alexandria's Archaeological Protection Code. No cultural resource was identified in the Arlington County portion of the APEs for assessment.

Section 106 of the NHPA requires FTA to consider the effects of its actions on historic properties. FTA is responsible for compliance with Section 106 and initiated the review process with VDHR. In addition to seeking the views of VDHR, FTA has invited certain organizations and individuals who have a demonstrated interest in the project to participate in the process. These organizations and individuals are referred to as Section 106 consulting parties, and review information relevant to the identification, evaluation and assessment of effects to historic properties that could result from the project. FTA and VDHR work with each other and the consulting parties to resolve project-related adverse effects to historic properties, typically through a Memorandum of Agreement (MOA) or a Programmatic Agreement (PA).

Consulting parties involved in the Section 106 review process to date include FTA, VDHR, NPS, City of Alexandria, WMATA, the Alexandria Historical Restoration and Preservation Commission, the Alexandria Historical Society, the North East Citizens Association, and the Old Town Business and Professional Association. Additional consulting parties have been invited to participate in the process. The project is presently in the resource evaluation phase of the Section 106 process, and the first consulting parties meeting was held on February 20, 2013. The second consulting parties meeting was held on March 27, 2013. FTA contacted the Advisory Council on Historic Preservation (ACHP) to inform them of the project and provided them with copies of the materials from the consulting parties meeting. FTA will notify ACHP if a preliminary determination of adverse effects is likely, providing further opportunities for ACHP review and comment. **Appendix F** describes the Section 106 consultation process to date in more detail. The Draft EIS will be updated as the Section 106 review continues.

3.9.1 Methodology

Cultural resources were identified and assessed for the project study area within the defined APEs for historic architectural resources and archaeological resources, which are described below. The research and assessment of effects methodology was developed in consultation with VDHR.

Prior to establishing the APEs, initial background research identified archaeological and historic architectural resources already documented within the study area and evaluated the potential of the study area to contain previously unidentified archaeological and historic architectural resources. The following repositories, databases, and reports were consulted:

- VDHR Archives, Richmond, Virginia;
- National Register of Historic Places (NRHP);
- Virginia Landmarks Register (VLR);
- Alexandria Archaeology (AA), City of Alexandria, Virginia;
- Alexandria Library, Special Collections, City of Alexandria, Virginia;
- Arlington County Historical Markers List;
- Arlington County Historic Resources Inventory;
- Library of Congress, Washington, D.C.;
- National Archives, Washington, D.C., College Park, MD, and Suitland, MD;
- National Park Service, Mount Vernon Memorial Highway Cultural Landscape Report, 1987; and
- National Park Service, *Vegetation of the George Washington Memorial Parkway Cultural Landscape Report*, 2009.

3.9.1.1 Historic Architectural Resources

The APE for historic architecture, as depicted, includes all resources over 50 years of age with the potential to be directly or indirectly affected by the proposed project (shown in **Figure 3-71**). While the project study area is the general area within which existing environmental resources were identified, for specific resources, including historical architectural resources, the study area was modified to accurately identify and account for potential direct and indirect adverse effects. The APE was reviewed and approved in consultation with VDHR.

Two existing historic architectural resources were identified using the sources listed above. A field reconnaissance survey was conducted and identified one potentially eligible architectural resource (over 50 years of age) in the APE for historic architecture. Once additional historic architectural resources in the APE were identified, their potential eligibility for listing in the NRHP was assessed. Following the eligibility assessment, an analysis was conducted to determine if any Build Alternative has the potential to cause an adverse effect to historic properties. In addition to impacts assessed for NEPA, adverse effects to historic properties are also assessed in accordance with Section 106.

The Old and Historic Alexandria District is a zoning overlay district (Article X of the City of Alexandria Zoning Code) of which a portion extends into the APE for historic architecture. Although related to historic architectural resources in the APE, the zoning district itself is not evaluated as a historic resource. An analysis of the district is provided in **Section 3.4 Land Use and Zoning**.

Under Section 106, adverse effects include both direct and indirect effects. Direct effects include actions such as physical destruction, physical alteration, or removal of the resource to another location, and can be permanent or temporary. Indirect effects include the introduction of visual, atmospheric, and audible elements (including noise and vibration); neglect that causes deterioration; or transfer, lease, or sale of a federally owned property without adequate provisions (36 CFR 800.5(a)(2)(vii).

All eligibility determinations and recommendations and effects assessments contained in the EIS are both provisional and subject to review and approval by VDHR and other consulting parties in accordance with the ongoing Section 106 review process.

3.9.1.2 Archaeological Resources

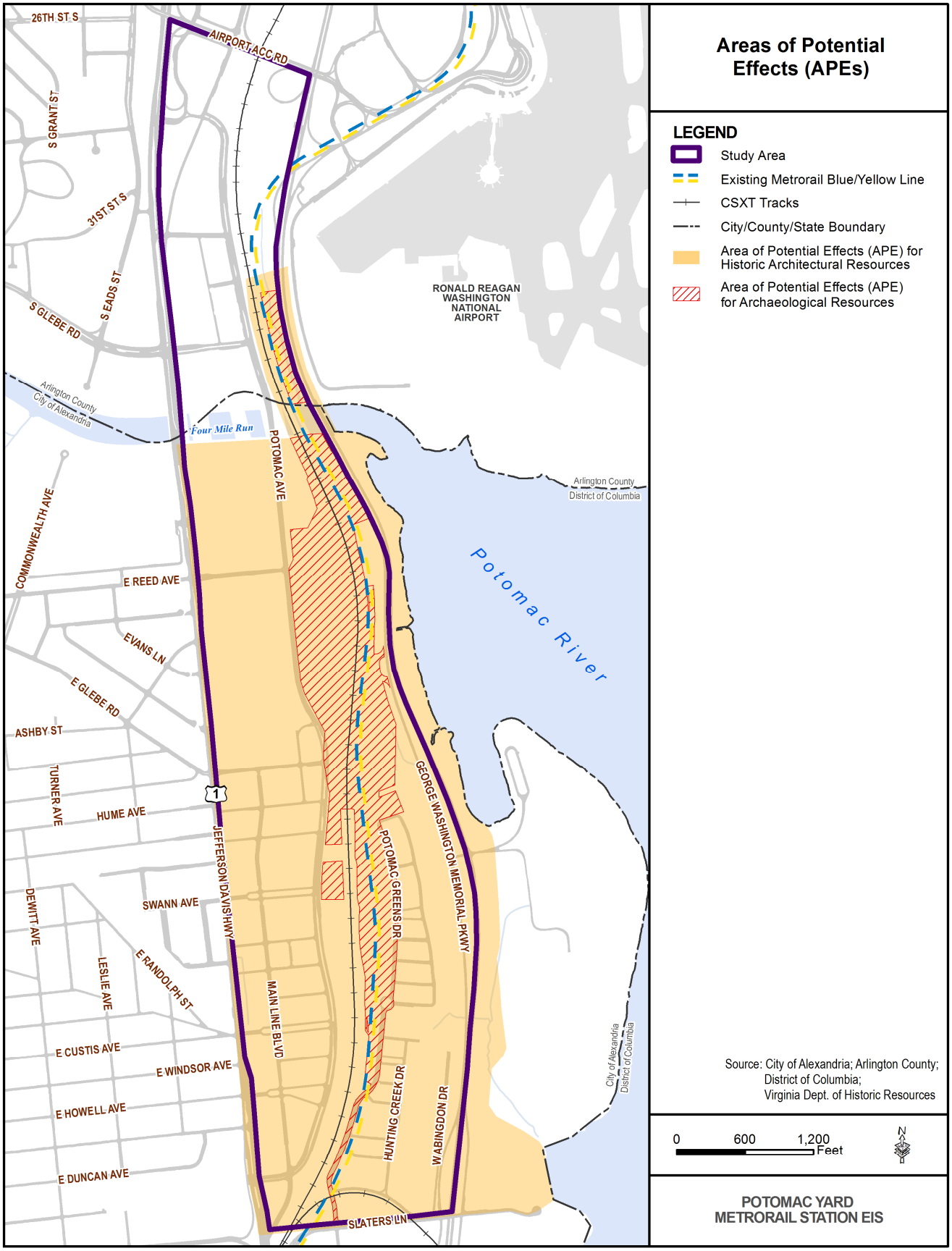
The APE for archaeology was established in consultation with VDHR and is shown in **Figure 3-71**. The APE for archaeology includes all areas of anticipated project-related ground disturbance. Ground-disturbing activities could include excavation, grading, cutting and filling, and utility installation activities as well as construction activities that may result in unintentional soil compaction, erosion or other disturbance.

Archaeological resources within the APE were identified using a combined program of documentary research and Phase I archaeological testing to identify resources potentially eligible for inclusion in the NRHP or the VLR. A report titled "Phase I Archaeological Survey Report Potomac Yard Metrorail Station Project, City of Alexandria, Virginia and Arlington County, Virginia" was completed in February 2013 and submitted to VDHR for review and approval.

Once identified, the analysis assessed whether each Build Alternative has the potential to result in an adverse effect to each eligible or potentially eligible resource in the APE.

Under Section 106, adverse effects to archaeological resources include both direct and indirect effects. Direct adverse effects include actions such as physical destruction, physical alteration, or removal of the archaeological resource. Indirect adverse effects include neglect that causes deterioration, or transfer, lease, or sale of a federally owned property without adequate provisions. All adverse effects to archaeological resources are considered permanent.

Figure 3-71: Areas of Potential Effects (APEs)



3.9.2 Affected Environment

3.9.2.1 Historic Architectural Resources

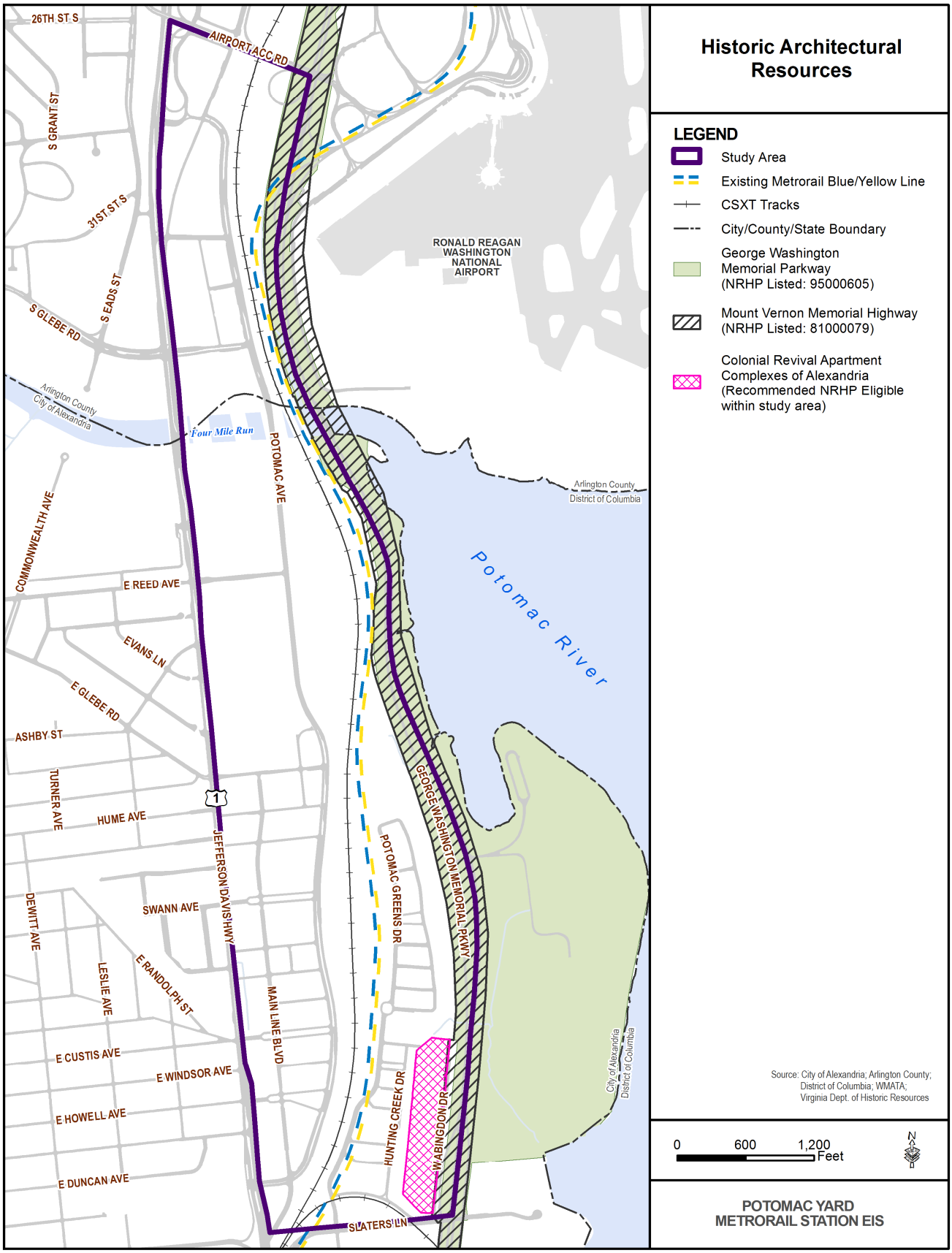
Documentary research identified two known historic architectural properties in the APE listed in the NRHP, the Mount Vernon Memorial Highway (MVMH) (VDHR ID# 029-0218) and George Washington Memorial Parkway (GWMP) (VDHR ID# 029-0228). A third potentially eligible resource was identified in the APE which is referred to as the Colonial Revival Apartment Complexes of Alexandria (CRACA). **Figure 3-72** shows the locations of historic architectural resources identified in the APE. **Table 3-22** summarizes the historic architectural resources in the APE.

Table 3-22: Listed or Potentially Eligible Historic Architectural Resources in the APE

Name	Location	Description	Federal/State Listing Status and Date	NRHP/VLR ID#	Area/Period of Significance
Mount Vernon Memorial Highway (MVMH)	Stretches 15.2 miles from Arlington Memorial Bridge in Arlington County, VA south to Mount Vernon in Fairfax County, VA.	Built to commemorate the bicentennial of George Washington's birth, the parkway connects Washington, DC and Mount Vernon.	NRHP: 5/18/1981 VLR: 3/17/1981	NRHP/NRIS: 81000079 VLR: 029-0218	Transportation engineering, landscape architecture, and sculpture; and a resource commemorative in intent. Period of Significance is 1929-1932.
George Washington Memorial Parkway (GWMP)	Consists of parkway and parkland in Virginia, Maryland, and the District of Columbia established under the authority of the Capper-Cramton Act of1930.	Authorized by the Capper-Cramton Act of 1930, the GWMP commemorates the first president, preserves the natural setting, and provides a quality entryway for visitors to the nation's capital.	NRHP: 6/2/1995 VLR: 10/8/1991	NRHP/NRIS: 95000605 VLR: 029-0228	Property associated with the life of a person significant in the nation's past (George Washington); Transportation/vehicle road-related, landscape, other/persons significant in our past. Property embodies the distinctive characteristics of a type, period, or method of construction in the area of transportation/ vehicle-road related landscape architecture. Period of Significance is 1930-1966.
Colonial Revival Apartment Complexes of Alexandria (CRACA)	Along GWMP/MVMH, City of Alexandria.	Multiple Property Submission that includes post-WWII apartment complexes built along the GWMP/MVMH in Alexandria.	Potential Future listing. Recommended Eligible.	VLR: 100-5264	Association with post-WWII development in Alexandria as a group of Colonial Revival-style apartment complexes.

Source: NRHP, VLR, City of Alexandria, and AECOM field research (March 2012).

Figure 3-72: Historic Architectural Resources



Resources Related to the George Washington Memorial Parkway

Both the MVMH and GWMP are listed in the NRHP and the VLR. The MVMH covers the extent of the original memorial highway between Arlington Memorial Bridge to the north of the study area and the Mount Vernon Estate to the south. The GWMP includes all Capper-Cramton Act acquired property which consists of MVMH and adjacent lands, the extent of the GWMP north of Arlington Memorial Bridge to its current northern terminus in Virginia at Interstate 495, and the Clara Barton Parkway in Montgomery County, Maryland (outside the APE). **Table 3-23** summarizes the major attributes and differences between the two historic properties.

Table 3-23: MVMH and GWMP Comparison Summary

	Mount Vernon Memorial Highway	George Washington Memorial Parkway
NRIS#	81000079	95000605
VLR#	029-0218	029-0228
Historic Name	Mount Vernon Memorial Highway	George Washington Memorial Parkway
Common Name	George Washington Memorial Parkway (southernmost portion)	George Washington Memorial Parkway; Clara Barton Parkway (in Maryland)
NR Listing Date	5/18/1981	6/2/1995
VLR Listing Date	3/17/1981	10/8/1991
Northern Extent	Arlington Memorial Bridge	I-495 in McLean, Virginia; northernmost limits of the Clara Barton Parkway in Cropley, Maryland (actual roadway only; GWMP land exists further north at Great Falls)
Southern Extent	Mount Vernon	Mount Vernon in Virginia and Chain Bridge in Washington, DC
Counties	Washington, D.C.; Arlington, Alexandria, and Fairfax Counties, VA	Montgomery County, MD; Washington, D.C.; Arlington, Alexandria, and Fairfax Counties, VA
Period of Significance	1929-1932	1930-1966
NR Areas of Significance	Engineering, Landscape Architecture, Sculpture, Transportation, Commemoration (George Washington)	Commemoration (George Washington and Clara Barton), Landscape Architecture
NR Criteria	B and C [not explicitly stated]	B and C; Criteria Consideration G
Type of Historic Property	Structure	District
Materials	[not explicitly stated]	steel, concrete, asphalt, stone, native vegetation

	Mount Vernon Memorial Highway	George Washington Memorial Parkway
Contributing Resources	Navy-Marine Memorial; Boundary Channel Bridge; Alexandria Avenue Overpass; Hunting Creek Bridge; Little Hunting Creek Bridge	5.21 miles of retaining walls; 12.49 miles of barrier walls; 35 culverts; 973 drop inlets. landscape elements

Source: National Register of Historic Places

Mount Vernon Memorial Highway

In 1922 Congress appropriated funds for the planning of Arlington Memorial Bridge, and in 1924 it created the *United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George Washington*. Construction of the Arlington Memorial Bridge began in 1926 which provided an impetus to plans for a road linking the bridge to Mount Vernon. On May 23, 1928, Congress approved and directed the survey and construction of a suitable memorial highway linking the two locations. The act ordered the Secretary of Agriculture, who had jurisdiction over the Bureau of Public Roads, to survey routes for selection by the commission and prepare plans for the highway.

Two routes were chosen as alternatives. The commission ultimately selected the route nearest the Potomac, which offered views of the river and an exceptional vista of the Washington Monument for traffic northbound from Alexandria. Construction of the MVMH was begun by the Bureau of Public Roads on September 17, 1929; the road was opened on January 16, 1932, the bicentennial year of Washington's birth.

The design of the MVMH was led by the landscape architects Wilbur Simonson and Gilmore Clarke. Simonson created a landscape in which motorists passed through places of distinct character. Over time more vegetation has been added, changing Simonson's original design.

Both the 1987 *Cultural Landscape Report Mount Vernon Memorial Highway* (1987 CLR) and *2009 Cultural Landscape Report for the George Washington Memorial Parkway* (2009 CLR) serve as primary references for cultural landscape information and history described in this section.

Historical Significance

The MVMH is nationally significant as the first parkway built and maintained by the U.S. government. The intended purpose of the MVMH was to provide an appropriately designed commemorative pilgrimage route to Mount Vernon as a memorial to George Washington. Its purpose as a commemorative pilgrimage route is its most significant historic characteristic. Integral to its character and significance, numerous national monuments, historic sites, parks, and other landscaped green spaces are visible along the corridor. The MVMH links Mount Vernon, in Fairfax County, with the Arlington Memorial Bridge. The original 15.2-mile segment was designed and landscaped to maximize scenic, aesthetic and commemorative qualities along its route.

Design Principles

The 1987 CLR provides a comprehensive description of the original design principles for the construction of the MVMH. The CLR identifies several landscape elements that formed the character of the Parkway as it proceeded from the Memorial Bridge to Mount Vernon:

- **Roadway alignment:** The road's horizontal and vertical alignment served two purposes – to follow the existing topography and to effectively control driving speeds.
- **Topography:** Careful grading was used to ensure natural transitions between the road and existing topography.
- **Plantings:** The planting plans were developed to fit with the existing tree plantings and wetlands in natural arrangements, while achieving different functional requirements, such as the as the screening of objectionable views (including the rail yard).
- **Viewsheds ("vistas"):** Through selective cutting, existing vegetation was cleared to expose long framed views across the Potomac towards the monumental core of Washington, DC. Other ways viewsheds were protected along the MVMH included the prohibition of signs and billboards and through the execution of an MOA between the City of Alexandria and United States which restricted the use and appearance of buildings in Old Town Alexandria.

- **Bridges:** The most visible structures along the MVMH were the original eight stone bridges constructed. The original stone bridge over Four Mile Run was demolished and rebuilt in 1939. The second bridge over Four Mile Run was demolished and rebuilt in 1977.
- **Other:** Other facilities constructed along the MVMH included concession buildings, bus shelters and lighting.

Cultural Landscape

The 1987 CLR summarizes the following general landscape architectural principles used by Clarke and Simonson in their design of the MVMH:

- Fitting the highway to the site with a mind toward utilizing both natural and historic features;
- Accommodating functional requirements in an attractive, aesthetic manner;
- Conserving the natural scenery as a means to quickly buffer adjacent properties, upgrade the existing woodland, and preserve existing topsoil; and
- Distributing new plantings in a natural configuration.

The "Daingerfield Island section" of the GWMP (where the project is located) is a low lying segment of the historic MVMH adjacent to the (former) rail yards at Potomac Yard on the west side (in operation during the twentieth century) and Daingerfield on the east. Potomac Yard was one of the largest rail yards in operation in the eastern United States during this time period and was owned and managed by the Richmond, Fredericksburg and Potomac Railroad (RF&P).

The topography on either side of the highway at Daingerfield Island is lower than the road itself, and the overall wet conditions drive the selection of plant species in this area. Plants chosen are adaptable to flooding and sustained wet conditions. On the west side, a group of amur cork trees (*Phellodendron amurense*) with Sargent's crabapples (*Malus sargentii*) were planted in the foreground to mark the change from mesic to wet soils and also makes a transition from the Alexandria approach.

Simonson proposed a different planting scheme for the east and west sides of the MVMH. On the west side plantings were also intended to create a thick vegetative screen of the swamp and rail yard, while on the east side the vegetation was used to frame the views of the significant monuments and buildings in Washington, DC across the Potomac River.

Simonson planned four large groupings of about fifteen oaks and elms on the west side of MVMH in the Daingerfield Island section. Simonson spaced the groupings widely apart, from two to four hundred feet, sometimes in combination with eleagnos willow (*Salix incana*). In one example, twelve American elms (*Ulmus americana*), four water oaks (*Quercus nigra*) and five red maples (*Acer rubrum*) anchor nearly three hundred feet of roadside. Medium size trees and a mass of large shrubs are planted between the large trees, leaving few glimpses into the swamp. Ornamental trees, such as white fringetree (*Chionanthus virginicus*), are kept in groups in the foreground where they are closer to motorists, but they are easily outnumbered by the shade and medium size trees.

The thick vegetative screen Simonson intended on the west side of the MVMH has been subject to considerable changes over the years. The loss of trees has compromised the integrity of the vegetative screen meant for the rail yard.

The original viewsheds identified by Simonson in 1932 (east towards Washington, DC) were significantly impacted by the construction of Reagan National Airport. Construction of the airport also shifted the original alignment of the MVMH west from the Potomac River in the 1940s. At the mouth of Four Mile Run the MVMH was shifted slightly to the west. The original stone bridge built in 1931 over Four Mile Run (within the APE) was demolished in 1939. The second bridge which replaced it was also demolished and rebuilt again in 1977.

The marina was excavated and developed at Daingerfield Island in 1958, and in 1961 a second lane of traffic was added along MVMH within the Daingerfield Island segment.

Simonson identified one viewshed on the MVMH facing west towards the George Washington Masonic National Memorial in Alexandria in the 1932 plan. This viewshed is noted in the northeast corner of the project APE. The George Washington Masonic National Memorial is privately owned by the Freemasons and is not listed in the National Register of Historic Places.

The 1987 CLR does not identify any of the original concession buildings or bus shelters within the APE.

George Washington Memorial Parkway

The GWMP, which includes MVMH, also serves as a memorial to George Washington, as the Parkway was conceived as a route connecting his home at Mount Vernon and the Patowmack Canal in Great Falls, Virginia.

The MVMH was incorporated as a component of the larger GWMP, as directed by the Capper-Cramton Act of 1930, and over the subsequent 30 years the parkway was extended north through Arlington County and Fairfax County to its present terminus at I-495 near McLean, Virginia. The Capper-Cramton Act, Public No. 284, 71st Congress, 46 Stat. 482, approved May 29, 1930, appropriated Federal funds to the National Capital Park and Planning Commission for the expeditious, economical and efficient development and completion, among other projects, the George Washington Memorial Parkway to include the shores of the Potomac, and adjacent lands, from Mount Vernon to a point above Great Falls, VA. The lands acquired as part of the MVMH were to be managed as part of the memorial parkway under the authority conferred by the Act approved February 26, 1925. All GWMP-administered land (which includes the MVMH) within the project APE are NRHP-listed.

The GWMP comprises a total of 7,146 acres and extends 38.3 miles on both sides of the Potomac River in Virginia and Maryland. In continuation of the intent of the MVMH, the purpose of the GWMP is to commemorate the first president, preserve the natural setting of the shoreline of the Potomac River and provide a high-quality entryway to Washington, DC. Construction of the remainder of the GWMP (beyond the MVMH) continued after 1932 through 1965.

Beyond the project study area, the northern section of the GWMP includes both sides of the Potomac River from Arlington Memorial Bridge to the Capital Beltway/Interstate 495, a distance of 9.7 miles in Virginia, and the 6.6 mile Clara Barton Parkway in Maryland. This portion protects scenic vistas, contains numerous historical and archeological resources, and serves as another quality entryway into Washington, D.C. All but a small portion of the GWMP was opened by 1965.

Historical Significance

The NRHP nomination describes several reasons for the national and historic significance of the GWMP. Like the older MVMH portion, the upper parkway commemorates the life of Washington as well as Clara Barton (in Maryland). A major reason for the GWMP's significance involves George Washington's association with the Potomac River corridor and the construction of canals along the river. A second reason for the GWMP significance is the selection of the site for the nation's new capital by George Washington, and his selection of L'Enfant to design the capital.

Another area of historical significance is the planning efforts related to parkways and roadways in the region that began with Pierre L'Enfant in the 18th century, to Frederick Law Olmstead, Jr. in the early 20th century. Specific efforts in the early 20th century, which incorporated the GWMP, included in the Park Improvement Commission of the District of Columbia, (commonly known as the "McMillan Plan" of 1902). Olmstead was the principal landscape architect for the McMillan Plan. Olmsted pushed for "intensively used" parks and connections between parks including a road network that would extend parks to the perimeters of the regional city, in particular to Mount Vernon, and along both sides of the Potomac to Great Falls. Charles W. Eliot II (an official of the National Capital Park and Planning Commission instrumental in the development of the GWMP) and Olmsted stated the importance of parks and linkages between them and gave a strong endorsement to the McMillan Commission's findings for a parkway along the Potomac.

Cultural Landscape

As described in the NRHP nomination, the landscape values for the GWMP have been to preserve the scenic and aesthetic qualities associated with the Potomac River valley, which extends from the Coastal Plain past the fall line to the Piedmont. The McMillan Commission was concerned with the preservation of its landscape, including the palisades and the tree covered slopes, flowering understory, steep-sided creek valleys (runs), and hilltop vistas. The hilltop vistas provide views of the monumental core of Washington, D.C., a central purpose for the establishment and continuing protection of the GWMP.

Eliot described the GWMP concisely as containing "grade separations, few entrances, border roads for service of abutting property, and a right-of-way never less and often much more than two hundred feet."

Planting plans exist for the Mount Vernon Memorial Highway portion, the interchanges from Route 123 to Turkey Run, and the area near the David Taylor Naval Ship Research and Development Center of the Clara Barton Parkway, and in the portion in proximity to the Central Intelligence Agency. Besides this description, few other details are provided in the NRHP nomination in regards to the cultural landscape, vegetation or viewsheds

in the study area. The National Park Service is currently undergoing a documentation effort to update the NRHP nomination for the GWMP.

Following the McMillan Plan, the National Capital Park and Planning Commission (NCP&PC) released a report titled *Preliminary Report, Park System for the District of Columbia* in December 1926. The NCP&PC vision for parks and linkages was enabled by the Capper-Cramton Act of 1930. This act established the funding and planning for the GWMP, creating the means for design and construction between 1930 and 1966.

The 2009 Cultural Landscape Report (CLR) states that two additional plantings of trees were added to the Daingerfield Island section in 1936 soon after Simonson's plantings were installed. The first planting consisted of over one thousand pines planted adjacent to the western side of the GWMP, further screening it from the railroad activity at Potomac Yard. The plan used four species of pines, the first major planting of evergreens along the central section of the Parkway. Red pine (*Pinus resinosa*) dominates, along with Scots pine (*P. sylvestris*), white pine (*P. strobus*) and Virginia pine (*P. virginiana*). They are planted in large groupings along the entire western side of this stretch.

The second set of plantings added about 250 deciduous trees and 400 more pines to the previous plantings to further increase the buffer. The species mixture is similar to Simonson's—maples, elms, oaks, and sycamores—but it also includes more white pine (*P. strobus*). Most of these trees are planted in groups of a single species. The CLR states that these were the last plantings along the western edge of Daingerfield Island.

Per the CLR, the plantings that remain today are a mixture of 1932 and 1936 plants. Currently, the portion of the western side of the GWMP within the APE has scarce remnants of the 1932 and 1936 plantings. The majority of the 1930's-era trees though have succumbed to mortality due to mature age or the high surface water due to a former beaver dam in the area which has since been removed. Very few of the pine trees remain along this stretch of the GWMP.

Other species from later planting plans are still found among the vegetation along the western side of the GWMP. The plantings that are currently present have returned to a more natural state through ecological succession. Species present include mulberry (*Morus alba*), sycamore (*Platanus* spp.), privet (*Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.), sumac (*Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*). A variety of volunteer herbaceous and woody plants have also naturally established.

Colonial Revival Apartment Complex of Alexandria (CRACA)

In addition to the NRHP-listed properties in the APE, one additional historic architectural resource, the Potowmack Crossing at Old Town Condominiums (over 50 years of age), was identified by the City of Alexandria as eligible for listing in the NRHP. The Potowmack Crossing complex is located in the City of Alexandria on West Abingdon Drive near the intersection of Slaters Lane and the GWMP. The complex was evaluated and not recommended as individually eligible for listing in the NRHP. However, this apartment complex is a contributing resource to a recommended NRHP-eligible multiple property submission for post-World War II Colonial Revival apartment complexes along the GWMP in Alexandria called the Colonial Revival Apartment Complexes of Alexandria (CRACA).

Potential Resources Under Evaluation

The Greens Scenic Area easement was established in 2000. The easement comprises 15.27 acres that are administered by the National Park Service (NPS), located on land owned by the City of Alexandria to the north and east of the Potomac Greens neighborhood along the GWMP. The purpose of the easement, as stated in the title documents, is to conserve and preserve the natural vegetation, topography, habitat, and other natural features within its area. This easement is currently being evaluated for NRHP eligibility by the Keeper of the National Register. See **Appendix G** for additional background information, terms and conditions, and the title instruments related to the Greens Scenic Area easement.

3.9.2.2 Archaeological Resources

Five archaeological resources were identified within the APE that are potentially eligible for inclusion in the NRHP and VLR (see **Table 3-24**). None of the five resources has been evaluated for NRHP and VLR eligibility. Background research conducted at the VDHR archives in Richmond, Virginia identified the Alexandria Canal portion of the Chesapeake and Ohio/Alexandria Canal (44AX0028) and Campsite Number 1 of the American Wagon Train, September, 1781 (44AX0207) within the APE. Subsequent Phase I archaeological testing identified three new sites (44AX0220, 44AX0221, and 44AX0222) within the APE for archaeology. The three new sites are located within the boundaries of the GWMP parkland.

Phase II archaeological evaluations (field investigations) are recommended to determine whether any of these archaeological resources are eligible for inclusion in the NRHP or VLR. The Phase II evaluation would occur after the selection of the Preferred Alternative and before construction begins.

Table 3-24: Archaeological Resources in the APE

Site Name	VDHR ID	Description	State/Federal Listing Status	Jurisdiction
Chesapeake and Ohio/ Alexandria Canal	44AX0028	Established by Congressional charter and operated between 1843 and 1886, the Alexandria Canal carried freight between Alexandria and Georgetown, where it linked to the Chesapeake and Ohio Canal. Together, the two canals carried coal from western Maryland to Alexandria, as well as grain, flour and whiskey, and they returned materials needed on the western frontier through Georgetown including fish, salt and plaster.	Potentially eligible for inclusion in the NRHP and the VLR.	Multiple
Campsite No. 1 of the American Wagon Train Sept. 1781	44AX0207	Eighteenth-century military site occupied by American and French wagon trains in September, 1781. The site was recorded with VDHR in 2008 based on descriptions in historic documents; however, its location has not been archaeologically verified.	Potentially eligible for inclusion in the NRHP and the VLR.	Multiple
Unnamed	44AX0220	Seventeenth- through nineteenth-century domestic site possibly associated with the historic Preston Plantation. A pre-contact (prior to the arrival of Europeans) component of unknown age is also present at this location.	Potentially eligible for inclusion in the NRHP and the VLR.	NPS
Unnamed	44AX0221	Eighteenth- through nineteenth-century domestic site possibly associated with the historic Preston Plantation. A pre-contact (prior to the arrival of Europeans) component of unknown age is also present at this location.	Potentially eligible for inclusion in the NRHP and the VLR.	NPS
Unnamed	44AX0222	The presence of a buried intact historic Belgian block masonry feature predating 1957 at this location indicates the presence of intact historic archaeological resources at this location.	Potentially eligible for inclusion in the NRHP and the VLR.	NPS

Source: VDHR; AECOM field research (October 2012).

3.9.3 Environmental Consequences

This section describes preliminary findings of adverse effects to cultural resources in accordance with Section 106 only. FTA will make a determination of effect for the project after the preferred alternative is selected by the City of Alexandria. Under Section 106, effects to cultural resources lead to a general finding of either *No*

Adverse Effect or an *Adverse Effect*. No differentiation is made between permanent and temporary impacts under Section 106 regulations. Under NEPA, more specific detailed impact determinations are made which include both temporary and permanent impacts, as well as possible benefits of a project. The concept of *significance* of an impact is also evaluated under NEPA, i.e., the context and intensity of the impact from a project. For each alternative, this section states preliminary determinations of effect under Section 106 and then describes in detail the specific effects, providing relevant information necessary for evaluation under both Section 106 and NEPA.

Please refer to the following sections that are also relevant to effects under Section 106 and impacts under NEPA to cultural resources:

- **3.3 Land Acquisitions and Displacements**
- **3.8 Visual Resources**
- **3.24 Construction Impacts**

3.9.3.1 Historic Architectural Resources

Effects of the Build Alternatives on MVMH and GWMP property include permanent land transfers, temporary construction access and staging areas, temporary and permanent visual effects, and temporary and permanent loss of vegetation and plantings. For some of the Build Alternatives, permanent transfers would be necessary for the permanent operation of the Metrorail station facility. NPS permits would be required for any temporary construction access or staging activities on MVMH and GWMP property. Areas of effects for each alternative are summarized in **Table 3-25.** The permanent and temporary impact areas are shown in **Figure 3-73** through **Figure 3-76** on the following pages, which illustrate where temporary staging and access roads may occur, as well as the permanent footprints of the station facility and associated trackwork.

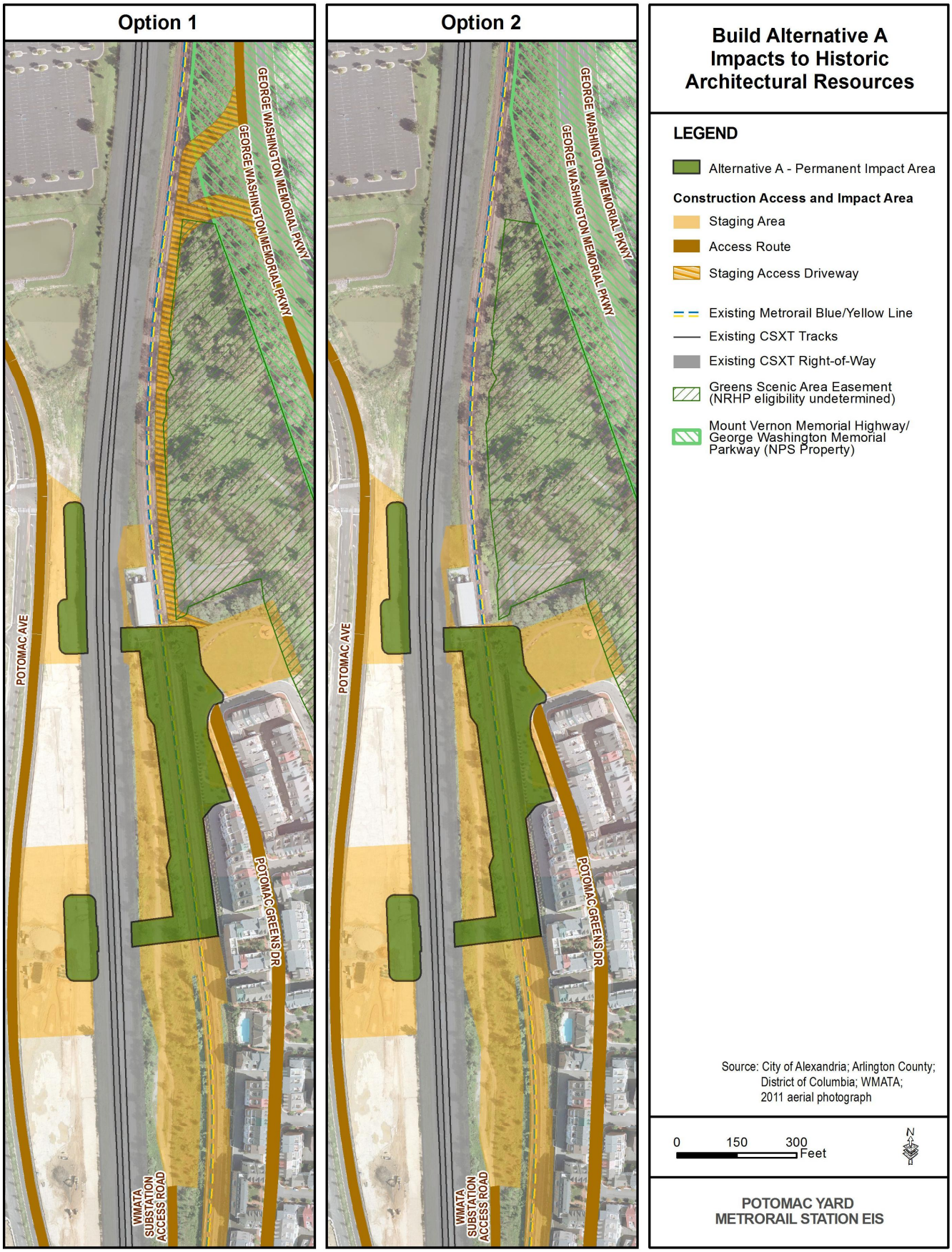
Table 3-25: Temporary Construction Areas on and Permanent Land Transfers from Historic Architectural Resources

Resource	No Build Alternative	Alternative A		Alternative B		B-CSX Design Option	Alternative D
		Option 1 Construction Access	Option 2 Construction Access	Option 1 Construction Access	Option 2 Construction Access		
Temporary Construction Areas (acres)							
GWMP[1]	0.00	0.30	0.00	0.78	0.55	0.00	2.40
MVMH[1]	0.00	0.30	0.00	0.78	0.55	0.00	2.40
CRACA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Permanent Land Transfer (acres)							
GWMP[1]	0.00	0.00	0.00	0.16	0.16	0.00	1.43
MVMH[1]	0.00	0.00	0.00	0.16	0.16	0.00	1.43
CRACA	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[1]The boundaries of the MVMH and GWMP are the same for the purpose of this analysis; therefore, the land transfer estimates are the same.

For the alternatives which require a permanent land transfer, a land exchange with NPS would need to be approved by NPS and completed subject to an equal value in property or interest in property as required by federal law (54 U.S.C. 102901). For any temporary construction activities on NPS parklands and requiring an NPS permit, these areas would be restored based on an NPS-approved planting plan. Regrowth of some areas of vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS. In assessing effects on historic properties, FTA, in consultation with VDHR, NPS, and other consulting parties, will consider the opportunity for adequate and legally enforceable conditions on land transfers to ensure the long-term preservation of the property's historic significance.

Figure 3-73: Build Alternative A Impacts to Historic Architectural Resources



Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed construction project areas for Build Alternatives A and B and B-CSX Design Option are accessible from locations other than the GWMP. However, since potential impacts would occur to residential communities at these other locations, construction access from the GWMP was also studied as an option in the Draft EIS.

Additional detail for temporary construction impacts to NPS parkland is provided in **Section 3.24**.

No Build Alternative

Adverse effects are not anticipated as a result of the No Build Alternative. Planned development within North Potomac Yard by others is anticipated to cause visual effects to the MVMH and GWMP through the introduction of non-historic visual elements to the properties' setting that contributes to their historic significance.

Build Alternative A

FTA has preliminarily determined that Build Alternative A (both construction access options) would have adverse effects on the MVMH and GWMP. Build Alternative A (both construction access options) would have temporary and permanent visual effects. Option 1 Construction Access would also involve temporary construction activities within MVMH and GWMP property requiring a permit from NPS and a long-term loss of vegetation in areas that were part of the original landscape design for MVMH and GWMP. For the portions of these resources within the APE, these effects would result in some diminishment of the landscape architecture area of significance included in their NRHP nominations:

- MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route between Washington, DC and Mount Vernon.
- GWMP – landscaped to preserve the scenic and aesthetic qualities associated with the Potomac River valley.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Build Alternative A would have no adverse effect on CRACA because of the distance of this property from the proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

MVMH and GWMP impacts and the two construction staging and access options are analyzed in more detail in the following sections and shown in **Figure 3-73**. Additional analysis for construction impacts is provided in **Section 3.24 Construction Impacts**.

Effects to MVMH and GWMP: Option 1 Construction Access

Cultural Landscape

Construction of temporary access driveways on MVMH and GWMP property would require the clearance of 0.30 acre of treed area (treed upland and forested wetland), which would remove roughly five to ten trees over two inches diameter at breast height (DBH), in areas planted as part of the original landscape design of the MVMH and GWMP. These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present.

The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm (*Ulmus americana*), and pin oak (*Quercus palustrus*). Additionally, other landscape plan vegetation proposed for removal includes privet *(Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.), sumac *(Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*).

The proposed activities associated with construction of the temporary access driveways would include removing contributing features (trees) of NRHP-listed resources. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40

years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Visual Effects

In addition to the vegetation and resulting visual impacts described above related to the cultural landscape within the MVMH and GWMP, trees and shrubs would be removed for the construction of temporary access driveways and a portion of the staging area within 0.18 acre of the Greens Scenic Area easement and would have visual effects to the MVMH and GWMP as a result.

- Removal of the vegetation in the location of the temporary access driveways would introduce visual elements into the properties' setting that would compromise their historic significance. The gap in vegetation created by the access roads temporarily would open up views to the proposed Potomac Yard Metrorail Station, Metrorail tracks, and the Potomac Yard Shopping Center. While the rail yard is no longer extant, removing the trees at this location temporarily would introduce views to the west that were never intended as part of the design. These temporary views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.
- Immediately north of the development, a piece of land that is currently occupied by a modern loop road, parking, and open park space (Potomac Greens Park), would be used for construction staging. As part of the effort to prepare the area for construction access, vegetation and trees would be removed on the east side of the Potomac Greens Park lawn and playground area. Approximately ten to thirty woody stemmed trees and shrubs would be removed for the construction of this option within the Greens Scenic Area easement. Although some trees would be removed for construction, the proposed removal of vegetation does not appear to make the station more visible from the MVMH and GWMP. As designed, the top floor of the proposed station would be permanently visible from the MVHM and GWMP, adding a low horizontal line to the viewshed of vehicular traffic traveling northbound on the MVMH and GWMP in select areas. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

The Metrorail Station would introduce permanent non-historic built elements visible from the MVMH and GWMP at two viewsheds. Although the intent of the original 1929 MVMH landscaping plan was to buffer the view of the rail yard from the MVMH, the integrity of the setting of the western side of the MVMH and GWMP has been compromised by the construction of the Potomac Greens development in 2005-2006. Nonetheless, the permanent addition of the low horizontal line of the station under this option would have an effect on the corridor viewshed.

See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative A.

Land Transfers

Under this option, no MVMH or GWMP property would be permanently transferred from NPS to the project.

Construction Areas

0.30 acre of MVMH and GWMP property would be required temporarily for construction access under this option. For temporary construction activities permitted by NPS on MVMH and GWMP property, consultation would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Restoration of NPS property temporarily used for construction activities to a condition equal to or better than current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed

construction project areas for Build Alternative A are accessible from locations other than the GWMP. However, since potential impacts would occur to residential communities at these other locations, construction access from the GWMP was also studied as an option in the Draft EIS.

Effects to MVMH and GWMP: Option 2 Construction Access

Cultural Landscape

No permanent or temporary construction effects to vegetation would occur within MVMH or GWMP property.

Visual Effects

Trees and shrubs would be removed for construction staging within 0.09 acre of the Greens Scenic Area easement. Immediately north of the development, a piece of land that is currently occupied by a modern loop road, parking, and open park space (Potomac Greens Park), would be used for construction staging. As part of the effort to prepare the area for construction access, vegetation and trees would be removed on the east side of the Potomac Greens Park lawn and playground area. Approximately ten to thirty woody stemmed trees and shrubs would be removed for the construction of this option within the Greens Scenic Area easement. Although some trees would be removed, the proposed removal of vegetation does not appear to make the station more visible from the MVMH and GWMP. As designed, the top floor of the proposed station would be visible from the MVHM and GWMP, adding a low horizontal line to the viewshed of vehicular traffic traveling northbound on the MVMH and GWMP in select areas. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

The Metrorail Station would introduce permanent non-historic built elements visible from the MVMH and GWMP at two viewsheds. Although the intent of the original 1929 MVMH landscaping plan was to buffer the view of the rail yard from the MVMH, the integrity of the setting of the western side of the MVMH and GWMP has been compromised by the construction of the Potomac Greens development in 2005-2006. Nonetheless, the permanent addition of the low horizontal line of the station under this option would have an effect on the corridor viewshed.

See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative A.

Land Transfers

No permanent land transfers from MVMH and GWMP property are required for this option.

Construction Areas

No temporary construction access or other activities on MVMH and GWMP property are required for this option.

Build Alternative B

FTA has preliminarily determined that Build Alternative B (both construction access options) would have adverse effects on the MVMH and GWMP resulting from permanent land transfers, temporary construction activities within MVMH and GWMP property requiring a permit from NPS, and temporary and permanent visual effects. Option 1 Construction Access would also have effects on the MVMH and GWMP resulting from long-term loss of vegetation in areas that were part of the original landscape design. For the portions of these resources within the APE, these effects would result in some diminishment of the landscape architecture area of significance included in their NRHP nominations:

- MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route between Washington, DC and Mount Vernon.
- GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River valley.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Build Alternative B would have no adverse effect on CRACA because of the distance of this property from the proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

MVMH and GWMP impacts and the two construction staging and access options are analyzed in more detail in the following sections and shown in **Figure 3-74**. Additional analysis for construction impacts is provided in **Section 3.24 Construction Impacts**.

Effects to MVMH and GWMP: Option 1 Construction Access

Cultural Landscape

Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original landscape design of the MVMH and GWMP:

- Construction of temporary access driveways and staging areas on MVMH and GWMP property would require clearance of 0.77 acre of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly 15 to 20 trees over two inches DBH.
- Permanent station facilities and realigned track would require clearance of 0.16 acre of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly up to five trees over two inches DBH.

These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present.

The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and GWMP for construction staging and permanent facilities for Build Alternative B Option 1 is 0.93 acre including the removal of a total of 15 to 20 trees over two inches DBH.

The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm (*Ulmus americana*), and pin oak (*Quercus palustrus*). Additionally, other landscape plan vegetation proposed for removal includes privet *(Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.), sumac *(Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*).

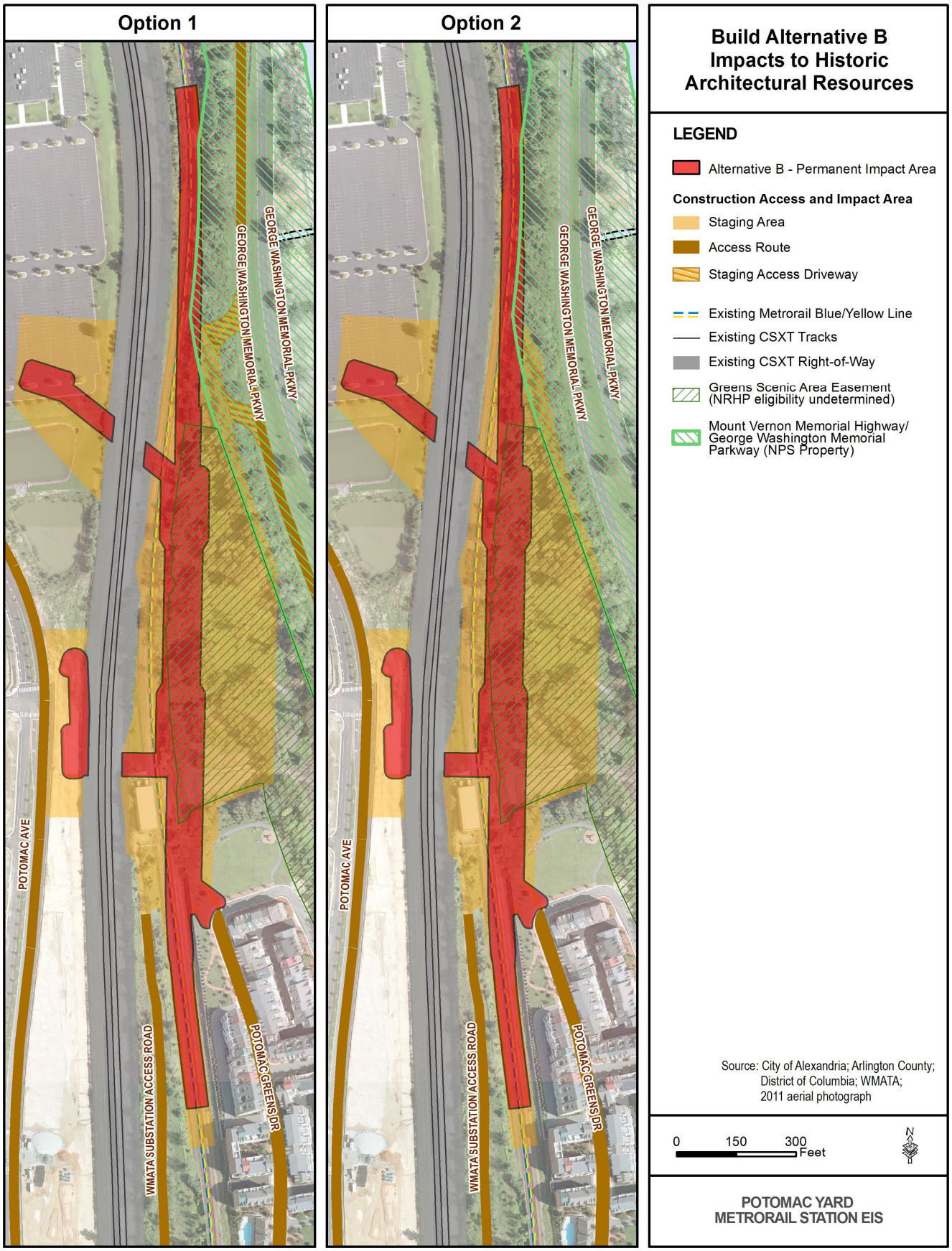
The proposed activities associated with construction of the temporary access driveways and staging areas and permanent station and track facilities would include removing contributing features (trees) of NRHP-listed resources. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening in areas temporarily cleared for construction would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Visual Effects

In addition to the vegetation and resulting visual impacts described above related to the cultural landscape within the MVMH and GWMP, 1.51 acres of trees and shrubs would be removed from the Greens Scenic Area easement consisting of 0.83 acre for the temporary construction staging area and 0.68 acre for the permanent station and track facilities. This removal of trees and shrubs would cause visual effects to the MVMH and GWMP as a result. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Removal of the vegetation in the location of the temporary access driveways and adjacent construction staging areas within the MVMH and GWMP and the Greens Scenic Area easement and in the locations of permanent station facilities and realigned track would introduce visual elements into the properties' setting that would compromise their historic significance. The gap in vegetation created by the access roads and staging area would open up views to non-historic elements: the proposed Potomac Yard Metrorail Station, Metrorail tracks, and the Potomac Yard Shopping Center. While the rail yard is no longer extant, removing the trees at this location would introduce views to the west that were never intended as part of the design. The Metrorail Station would also introduce permanent non-historic built elements visible from the GWMP at three viewsheds and affect the continuous view corridor. These views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience.

Figure 3-74: Build Alternative B Impacts to Historic Architectural Resources



See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative B.

Land Transfers

0.16 acre of MVMH and GWMP property would be permanently transferred from NPS to the project. Per 36 CFR 800.5(a)(2)(vii), transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance is an example of an adverse effect. The land transfer from MVMH and GWMP and permanent use of the property for a Metrorail station and realigned track would contribute to FTA's adverse effect determination for the alternative. Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**.

Construction Areas

0.77 acre of MVMH and GWMP property would be required temporarily for the construction of this option. Discussions are ongoing regarding the location of construction areas and have yet to be resolved. Preliminary areas have been identified. More detail on construction areas would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Restoration of NPS property temporarily used for construction activities to a condition equal to or better than current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed construction project areas for Build Alternative B are accessible from locations other than the GWMP. However, since potential impacts would occur to residential communities at these other locations, construction access from the GWMP was also studied as an option in the Draft EIS.

Effects to MVMH and GWMP: Option 2 Construction Access

Cultural Landscape

Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original landscape design of the MVMH and GWMP:

- Construction staging areas on MVMH and GWMP property would require clearance of 0.55 acre of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly 10 to 15 trees over two inches DBH.
- Permanent station facilities and realigned track would require clearance of 0.16 acre of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly five to ten trees over two inches DBH.

These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present.

The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and GWMP for construction staging and permanent facilities for Build Alternative B Option 2 is 0.71 acre including the removal of a total of 10 to 15 trees over two inches DBH.

The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm (*Ulmus americana*), and pin oak (*Quercus palustrus*). Additionally, other landscape plan vegetation proposed for removal includes privet *(Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.), sumac *(Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*).

The proposed activities associated with construction of the temporary access driveways and staging areas and permanent station and track facilities would include removing contributing features (trees) of NRHP-listed resources. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening in areas temporarily cleared for construction would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Visual Effects

In addition to the vegetation and resulting visual impacts described above related to the cultural landscape within the MVMH and GWMP, 1.51 acres of trees and shrubs would be removed from the Greens Scenic Area easement consisting of 0.83 acre for the temporary construction staging area and 0.68 acre for the permanent station and track facilities. This removal of trees and shrubs would cause visual effects to the MVMH and GWMP as a result. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Removal of the vegetation in the construction staging areas within the MVMH and GWMP and the Greens Scenic Area easement and in the locations of permanent station facilities and realigned track would introduce visual elements into the properties' setting that would compromise their historic significance. The gap in vegetation created by the access roads and staging area would open up views to non-historic elements: the proposed Potomac Yard Metrorail Station, Metrorail tracks, and the Potomac Yard Shopping Center. While the rail yard is no longer extant, removing the trees at this location would introduce views to the west that were never intended as part of the design. The Metrorail Station would also introduce permanent non-historic built elements three viewsheds along the GWMP and affect the continuous view corridor. These views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience.

See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative B.

Land Transfers

0.16 acre of MVMH and GWMP property would be permanently transferred from NPS for the project. Land transfer from the MVMH and GWMP qualifies as an adverse effect under Section 106 (36 CFR 800.5(a)(2)(vii)). Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**.

Construction Areas

0.55 acre of MVMH and GWMP property would be required temporarily for the construction of this option. Discussions are ongoing regarding the location of construction areas and have yet to be resolved. Preliminary areas have been identified. More detail on construction areas would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Restoration of NPS property temporarily used for construction activities to a condition equal to or better than current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed construction project areas for Build Alternative B are accessible from locations other than the GWMP. However, since potential impacts would occur to residential communities at these other locations, construction access from the GWMP was also studied as an option in the Draft EIS.

B-CSX Design Option

FTA has preliminarily determined that B-CSX Design Option would have adverse effects on the MVMH and GWMP resulting from temporary and permanent visual effects. No construction access roads or staging are proposed within the MVMH and GWMP under the B-CSX Design Option. For the portions of these resources within the APE, these effects would result in some diminishment of the landscape architecture area of significance included in their NRHP nominations:

- MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route between Washington, DC and Mount Vernon.
- GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River valley.

B-CSX Design Option would have no adverse effect on the CRACA because of the distance of this property from the proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

Figure 3-75 shows the location of B-CSX Design Option permanent impact areas and construction access and staging areas relative to the MVMH and GWMP. Additional analysis for construction impacts is provided in **Section 3.24 Construction Impacts**. See **Section 3.8 Visual Resources** for additional analysis relating to the permanent viewshed impacts of B-CSX Design Option.

Effects to MVMH and GWMP

Cultural Landscape

No vegetation would be removed from the GWMP or MVMH under the B-CSX Design Option.

Visual Effects

B-CSX Design Option construction staging would require the removal of a layer of vegetation west of the existing Metrorail line, between the Metrorail tracks and the CSXT tracks, that currently is part of the visual screen between the MVMH and GWMP and the proposed location of the Metrorail station. The layer of vegetation within the MVMH and GWMP west of the parkway would remain, maintaining some vegetative screening.

The Metrorail Station would be visible from three viewsheds along the GWMP and affect the continuous view corridor. The location of permanent station facilities in proximity to the MVMH and GWMP would introduce non-historic visual elements into the properties' setting that would compromise their historic significance. These views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience.

See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of B-CSX Design Option.

Land Transfers

No permanent land transfers from MVMH and GWMP property are anticipated under the B-CSX Design Option.

Construction Areas

No temporary construction activities on MVMH and GWMP property are anticipated under the B-CSX Design Option.

Build Alternative D

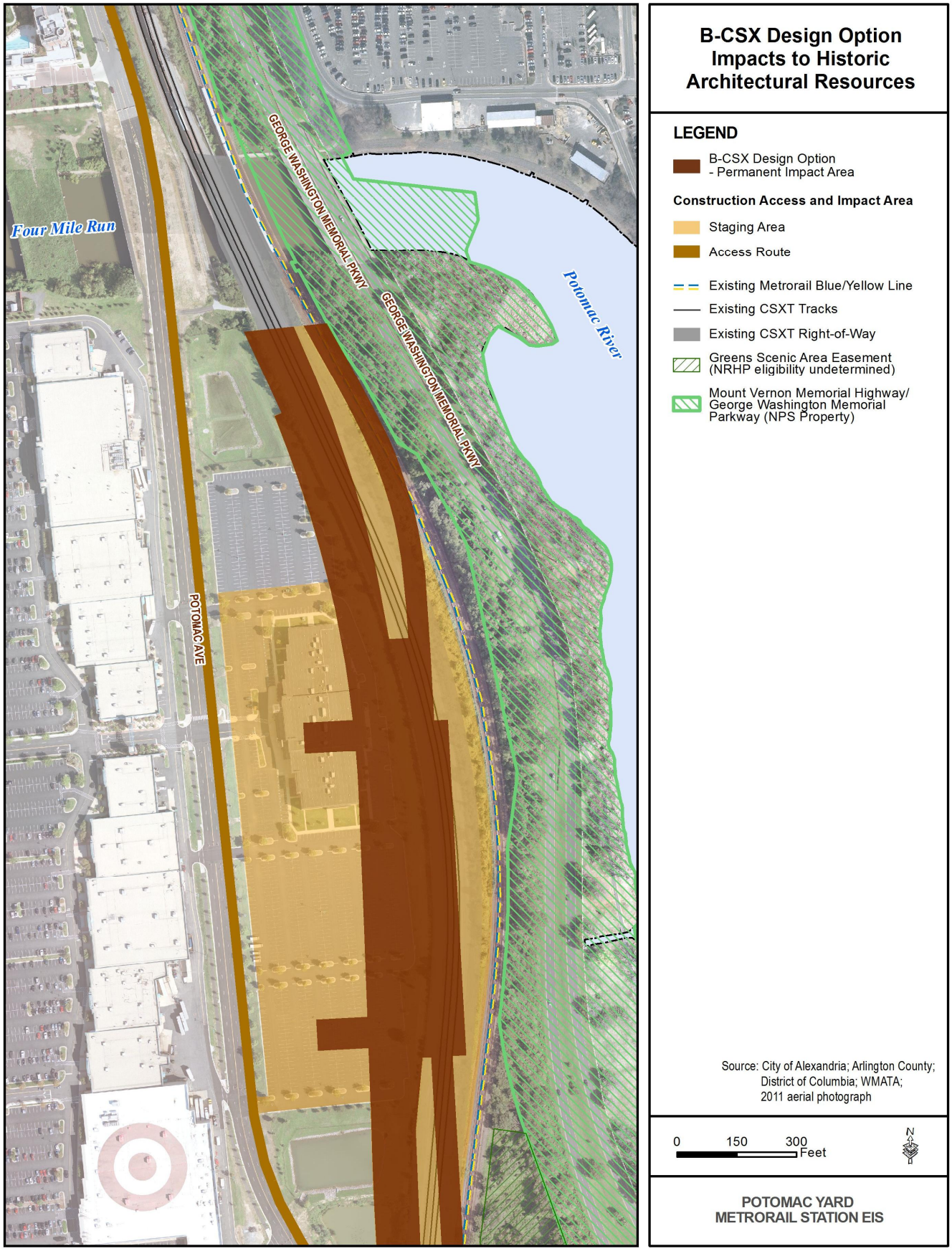
FTA has preliminarily determined that Build Alternative D would have adverse effects on the MVMH and GWMP resulting from permanent land transfers, temporary construction activities within MVMH and GWMP property requiring a permit from NPS, temporary and permanent visual effects, and temporary and permanent loss of vegetation. Construction access would also cause effects to the MVMH and GWMP resulting from long-term loss of vegetation in areas that were part of the original landscape design. For the portions of these resources within the APE, these effects would result in some diminishment of the landscape architecture area of significance included in their NRHP nominations:

- MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route between Washington, DC and Mount Vernon.
- GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River valley.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Build Alternative D would have no adverse effect on CRACA because of the distance of CRACA from the proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

Figure 3-75: B-CSX Design Option Impacts to Historic Architectural Resources



MVMH and GWMP impacts are analyzed in more detail below and shown in **Figure 3-76**. Additional analysis for construction impacts is provided in **Section 3.24 Construction Impacts**. See **Section 3.8 Visual Resources** for additional analysis relating to the permanent viewshed impacts of Build Alternative D.

Effects to MVMH and GWMP

Cultural Landscape

Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original landscape design of the MVMH and GWMP:

- Construction of temporary access driveways and staging areas would require clearance of 2.40 acres of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly 45-50 trees over two inches DBH.
- Permanent realigned track and associated structures would require clearance of 1.14 acres of treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which would remove roughly 20-25 trees over two inches DBH.

These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present.

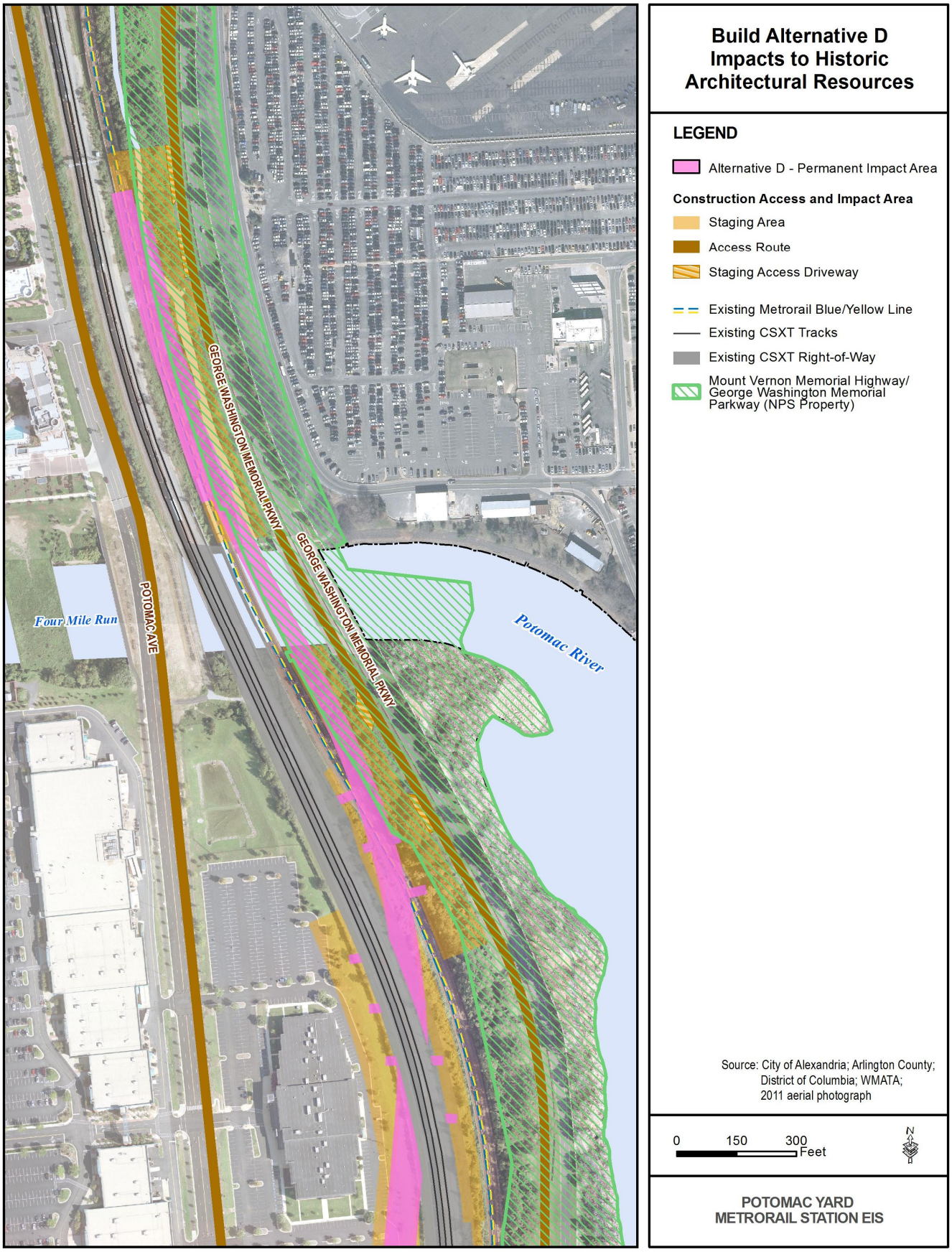
The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and GWMP for construction staging and permanent facilities for Build Alternative D is 3.54 acres including the removal of a total of 70 to 75 trees over two inches DBH.

The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm (*Ulmus americana*), and pin oak (*Quercus palustrus*). Additionally, other landscape plan vegetation proposed for removal includes privet *(Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.), sumac *(Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*).

The area north of Four Mile Run is an area referred to as the Airport segment of the MVMH and GWMP and stretches to the northern end of Ronald Reagan Washington National Airport. This section was realigned in 1940 when the airport was constructed on the site of the original alignment. Trees located on the west side of the MVMH and GWMP in this area were largely planted during the 1963 planting plan, but the area has since returned to its natural woodland state, filling out the vegetation among the earlier plantings. The plantings in this area were intended to shield views of the Potomac Yard rail yard and the railroad, and, while the plantings have lost some integrity, they still function as intended. The proposed activities associated with realignment of track would include removing contributing features (trees) of a NRHP-listed resource. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Construction staging and temporary access roads south of Four Mile Run would also cause damage to part of the NRHP-listed MVMH and GWMP, requiring removal of trees and other vegetation that were planted in 1936 and contribute to the significance of the MVMH and GWMP. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Figure 3-76: Build Alternative D Impacts to Historic Architectural Resources



Visual Effects

Removal of the vegetation in the location of the temporary construction staging areas and access driveways would introduce visual elements into the properties' setting that would compromise their historic significance. The gap in vegetation created by the temporary construction staging areas and access driveways would open up views to non-historic elements: the Metrorail tracks and Potomac Yard Shopping Center. While the rail yard is no longer extant, removing the trees at this location temporarily would introduce views to the west that were never intended as part of the design. These temporary views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

The Metrorail Station, realigned track, and associated structures would be permanently visible from three viewsheds along the GWMP and affect the continuous view corridor. As previously discussed, Wilbur Simonson's original design intent (which was perpetuated in subsequent planting plans) for the western side of the MVMH between Four Mile Run and Slaters Lane was to thickly screen the western side of the GWMP with vegetation to obscure views of the rail yard. While the loss of trees in this area has compromised the integrity of the MVMH, the western side of the GWMP has since returned to its natural woodland state and still functions as intended: to shield views of uses in Potomac Yard from the parkway. The views of these non-historic elements, (Metrorail Station, realigned track, and associated structures) would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience.

See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative D.

Land Transfers

1.43 acres of MVMH and GWMP property would be permanently transferred from Build Alternative D. Per 36 CFR 800.5(a)(2)(vii), transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance is an example of an adverse effect. The land transfer from MVMH and GWMP and permanent use of the property for realigned Metrorail track would contribute to FTA's adverse effect determination for the alternative. Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**.

Construction Areas

2.40 acres of MVMH and GWMP property would be required temporarily for the construction of Build Alternative D. Discussions are ongoing regarding the location of construction areas and have yet to be resolved. Preliminary areas have been identified. More detail on construction areas would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Restoration of NPS property temporarily used for construction activities to a condition equal to or better than current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles.

3.9.3.2 Archaeological Resources

Potential archaeological effects are being determined by ongoing and concurrent Section 106 studies. The assessment of effects to archaeological resources assumes that the resources are eligible for listing in the NRHP or VLR. If the archaeological resources are determined by VDHR and NPS to be not eligible, then there would be no adverse effects.

No Build Alternative

No effect to archaeological resources is anticipated as a result of the No Build Alternative.

Build Alternative A

FTA has preliminarily determined that, without design-based avoidance, Build Alternative A Option 1 Construction Access would have an adverse effect on two archaeological resources if these properties are eligible for the NRHP. The effects of Build Alternative A are described further below for the two construction access options.

Option 1 Construction Access

Build Alternative A Option 1 Construction Access is anticipated to have effects on Sites 44AX0221 and 44AX0222. Specifically, if Sites 44AX0221 and 44AX0222 are determined to be eligible for NRHP listing and avoidance of these sites is not possible, construction of temporary access roads would have effects resulting from damage to all or part of the property. Effects to both resources would result from superficial soil disturbance and soil compression caused by the construction of temporary access roads. Other effects may be caused by subsequent soil erosion and restoration efforts.

Design-based avoidance for effects to NRHP and VLR-eligible archaeological resources would be developed in later project design phases based on further Phase II archaeological evaluations and in accordance with the ongoing Section 106 review process. Additionally, any investigations associated with the Phase II archaeological evaluations would require an ARPA permit from NPS.

Option 2 Construction Access

Build Alternative A Option 2 Construction Access is not anticipated to have effects on archaeological resources. Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking. Build Alternative A Option 2 Construction Access is not anticipated to cause the deterioration of potentially eligible archaeological resources, or transfer, lease or sale of resources on federally-owned property.

Build Alternative B

FTA has preliminarily determined that, without design-based avoidance, Build Alternative B Option 1 Construction Access would have an adverse effect on two archaeological resources if these properties are eligible for the NRHP. The effects of Build Alternative B are described further below for the two construction access options.

Option 1 Construction Access

Build Alternative B Option 1 Construction Access, without avoidance measures, is anticipated to have effects on Sites 44AX0221 and 44AX0222. Specifically, if Sites 44AX0221 and 44AX0222 are determined to be eligible for NRHP listing and avoidance of these sites is not possible, construction of temporary access roads would have effects resulting from damage to all or part of the property. Without avoidance measures, other effects on both resources would result from superficial soil disturbance and soil compression caused by the construction of temporary access roads. Without avoidance measures, other effects may be caused by subsequent soil erosion and restoration efforts.

Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in later project design phases based on further Phase II archaeological evaluations and in accordance with the ongoing Section 106 review process. Additionally, any investigations associated with the Phase II archaeological evaluations would require an ARPA permit from NPS.

Option 2 Construction Access

Build Alternative B Option 2 Construction Access is not anticipated to have effects on archaeological resources. Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking. Build Alternative B Option 2 Construction Access is not anticipated to cause the deterioration of potentially eligible archaeological resources, or transfer, lease or sale of resources on federally-owned property.

B-CSX Design Option

B-CSX Design Option would not have effects on archaeological resources, because no construction staging areas, temporary access roads, or transfers of land for the design option would occur at the sites. Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking.

B-CSX Design Option is not anticipated to cause the deterioration of potentially eligible archaeological resources, or transfer, lease or sale of resources on federally-owned property.

Build Alternative D

FTA has preliminarily determined that, without design-based avoidance, Build Alternative D would have an adverse effect on one archaeological resource if this property is eligible for the NRHP.

Specifically, if avoidance of 44AX0220 is not possible, construction staging and access roads would have effects resulting from damage to all of the property. Other effects to 44AX0220 would result from superficial soil disturbance, erosion and compression caused by the construction of temporary access roads as well as planting restoration efforts.

Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in later project design phases based on further Phase II archaeological evaluations and in accordance with the ongoing Section 106 review process. Additionally, any investigations associated with the Phase II archaeological evaluations would require an ARPA permit from NPS.

3.9.4 Mitigation

3.9.4.1 Historic Architectural Resources

Mitigation measures for adversely affected historic architectural resources would include avoidance of impacts in accordance with 40 CFR 1508.20(a) and 36 CFR 800.6(a). If a property is restored, rehabilitated, repaired, maintained, stabilized, remediated or otherwise changed in accordance with the Secretary of Interior's Standards and agreement by VDHR, then it will not be considered an adverse effect (36 CFR 800.5(a)(2)). VDHR may suggest changes in a project or impose conditions so that adverse effects can be avoided and thus result in a no adverse effect determination (36 CFR 800.5(b)).

In addition, mitigation measures determined in coordination with VDHR, NPS, and all other Section 106 consulting parties could include the following:

- Implementation of a Section 106 MOA or PA that includes the following stipulations:
  - Development of landscape and visual screening plans for the GWMP and Greens Scenic Area easement consistent with the *Vegetation CLR* and the U.S. Department of Agriculture, Bureau of Public Roads, *Plan for Development, Mount Vernon Memorial Highway, Washington, DC to Mount Vernon, VA.* (1930);
  - New landscaping for Potomac Greens Park and the GWMP. A primary goal of the mitigation/landscape plan will be to develop a landscape planting strategy that is consistent with the historic character and design principles of the GWMP, as documented in the *Mount Vernon Memorial Highway Cultural Landscape Report*, Vol. I, p. 72-74 (NPS, 1987). The planting strategy ideally will utilize native plant and tree species described and used for the MVMH construction in the 1930s;
- Preparation of an interpretive exhibit for installation at the Potomac Yard Metrorail Station or local library discussing the history and context of the MVMH and GWMP; and
- Implementation of a public artwork project illustrating history and context of the MVMH and GWMP; and
- Selection of building design and materials that could minimize visual effects (see **Section 3.8.4 Visual Resources, Mitigation,** for more details).

3.9.4.2 Archaeological Resources

Mitigation for any unavoidable effects to NRHP and VLR eligible archaeological resources would first include avoidance of impacts to historic properties in accordance with 40 CFR 1508.20(a) and 36 CFR 800.6(a) and completion of Phase III archaeological data recovery efforts, as appropriate. Phase III archaeological data recovery includes large-scale excavations to be developed in consultation with VDHR and other consulting parties, formalized in an MOA or PA and completed prior to the initiation of construction. Mitigation could also include the execution of an Archeological Overview and Assessment for the GWMP (MVMH) South of Alexandria. Alteration or destruction of an archaeological site is an adverse effect; data recovery or Phase III investigations constitute mitigation of those adverse effects (36 CFR 800.5(a)(2)).

3.10 Parklands

This section assesses potential impacts to publicly owned and publicly accessible parkland, recreational areas, and open space areas that exist within the study area or are to exist by the opening year (2016). Parkland includes properties owned by local, state, or Federal agencies, as well as public or private properties with preservation or open space easements or that otherwise provide for public access for passive or active recreational uses. Additional discussion of related parkland impacts and mitigation measures are discussed in **Section 3.8 Visual Resources** and **Section 3.24 Construction Impacts**.

Separate evaluations of parklands and related resources regulated under Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended, and under Section 6(f) of the Land and Water Conservation Fund Act of 1965 are included in **Appendix D** and **Appendix E**, respectively.

3.10.1 Methodology

Existing publicly owned or leased parks and recreation areas within the study area were identified using information provided by the City of Alexandria, Arlington County, and NPS, and property deed and title document searches. Future planned parks and recreational facilities were identified using the following local plans and policies:

- City of Alexandria:
  - *North Potomac Yard Small Area Plan*, June 2010;
  - *Alexandria Commission for Arts Report*, 2007;
  - *Athletic Field Master Plan*, 2006;
  - *Dog Parks Master Plan*, 2000 (updated 2011);
  - *Four Mile Run Restoration Final Master Plan*, 2006;
  - *Open Space Plan*, 2003;
  - *Strategic Master Plan for Open Space, Parks & Recreation*, 2002; and
  - *Potomac Yard/Potomac Greens Small Area Plan and CDD Concept Plan* (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010).
- Arlington County:
  - *Public Spaces Master Plan*, 2005; and
  - *Land Acquisition and Preservation Policy*, May 2010.

Parklands assessed include existing parklands and those anticipated to be open to the public by 2016 based on current property information and development approvals provided by the City of Alexandria. Potential impacts of the alternatives to parklands were determined by assuming a minimum 20-foot setback from proposed permanent facilities and structures.

For Build Alternative A, the Metrorail Reservation easement was excluded from potential parkland impacts. The easement was established as part of the plans and development agreements that created the parks and allows a future station facility at the location. However, the Metrorail Reservation easement includes 3.6 acres of land in the Rail Park and Potomac Yard Park. Existing park amenities within the Metrorail Reservation easement include pedestrian paths, playgrounds, and seating areas. Build Alternatives B and D and B-CSX Design Option have a portion of realigned track within the Metrorail Reservation but not station facilities, so the Metrorail Reservation area was not excluded from the parkland impacts for these alternatives.

3.10.2 Affected Environment

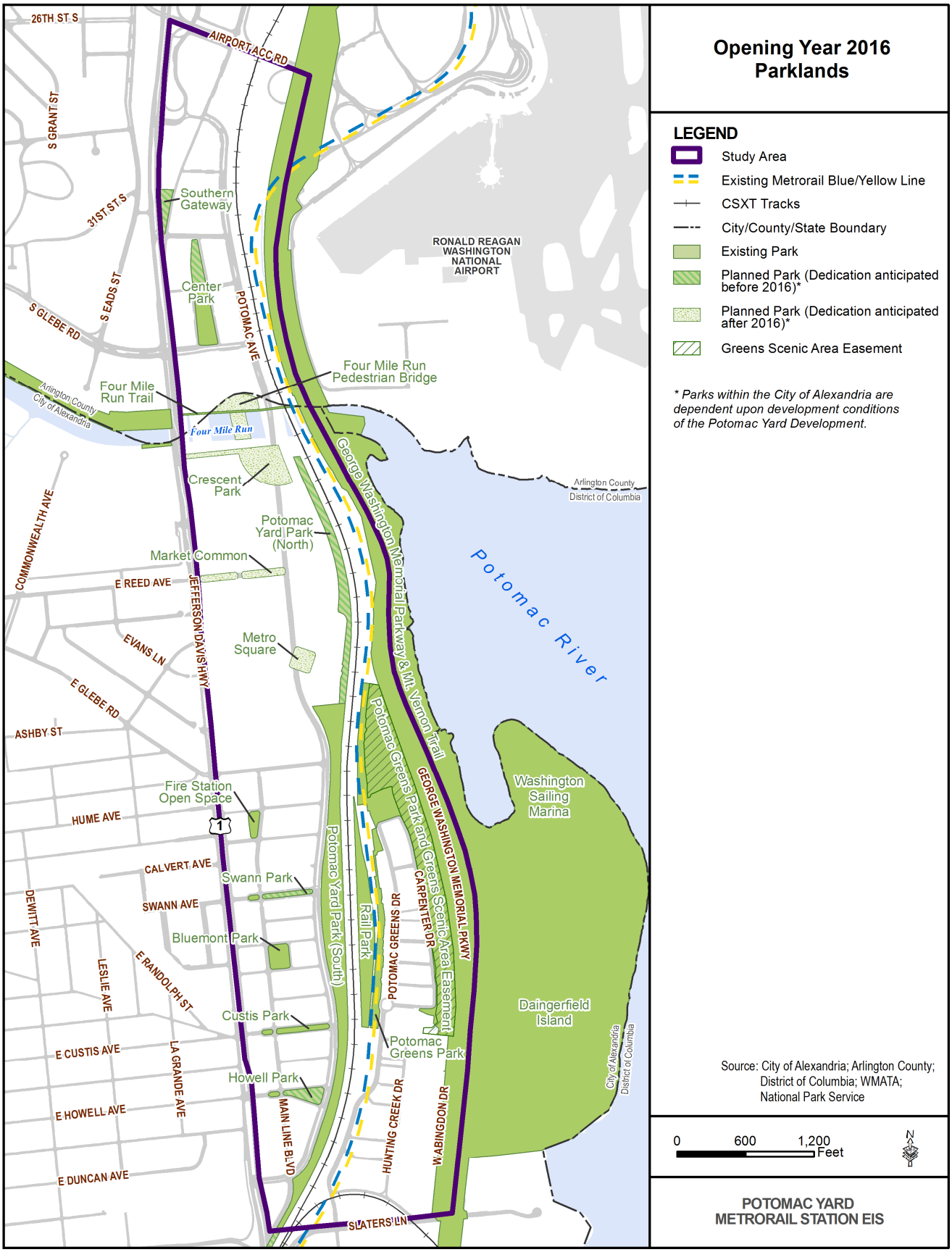
Figure 3-77 shows publicly accessible parkland, recreation areas, and open space within the study area, which are described in **Table 3-26**.

Table 3-26: Parklands, Recreation Areas, and Open Spaces

Park Name	Total Area (acres)	Park Status (as of 2012)	Opening Year Ownership
George Washington Memorial Parkway & Mount Vernon Trail	37.09[1]	Existing	NPS
Potomac Greens Park (Greens Scenic Area easement)	20.54 (15.19)[2,3]	Existing	City of Alexandria (easement held by NPS)
Four Mile Run Trail	0.35[1]	Existing	Arlington County
Neighborhood Park at Bluemont Avenue	0.88	Existing	Private property (with public access)
Custis Park	0.44	Existing	City of Alexandria
Potomac Yard Park (South)	12.80[1,3]	Existing	City of Alexandria
Rail Park	4.21	Existing (dedicated in 2012; anticipated opening after 2016)	City of Alexandria
Howell Park	0.73	Planned park (dedication anticipated Oct. 2015)*	City of Alexandria
Swann Park	0.41	Planned park (dedication anticipated Oct. 2015)*	City of Alexandria
Potomac Yard Park (North)	3.39[4]	Planned park (dedication anticipated before 2016)*	City of Alexandria
Crescent Park	3.15[4]	Planned park (dedication anticipated after 2016)*	City of Alexandria
Metro Square	0.84[4]	Planned park (dedication anticipated after 2016)*	City of Alexandria
Market Common	1.05[4]	Planned park (dedication anticipated after 2016)*	City of Alexandria
Four Mile Run Pedestrian Bridge	1.80[4]	Planned park (dedication anticipated after 2016)*	City of Alexandria
Center Park	2.55	Existing – portion south of 35th Street; Planned – portion north of 35th Street (dedication anticipated before 2016)	Private property (with public access)
Southern Gateway	0.76	Planned park (dedication anticipated before 2016)	Private property (with public access)

[1] Area within the Study Area.
[2] Area in parentheses refers to the Greens Scenic Area easement.
[3] Area includes land within the Metrorail Reservation area.
[4] Area is estimated based on current plans.
* Planned parks within the City of Alexandria are dependent upon the development conditions of the Potomac Yard development.

Figure 3-77: Opening Year 2016 Parklands



3.10.3 Environmental Consequences

3.10.3.1 No Build Alternative

No impact to parkland is anticipated as a result of the No Build Alternative.

3.10.3.2 Build Alternatives

Figure 3-78 shows the three Build Alternatives and B-CSX Design Option in relation to parklands, and **Table 3-27** summarizes potential parkland impacts by each alternative. Types of potential impacts to parklands include permanent impacts by project facilities located within park property. Temporary impacts due to construction are discussed in **Section 3.24 Construction Impacts**.

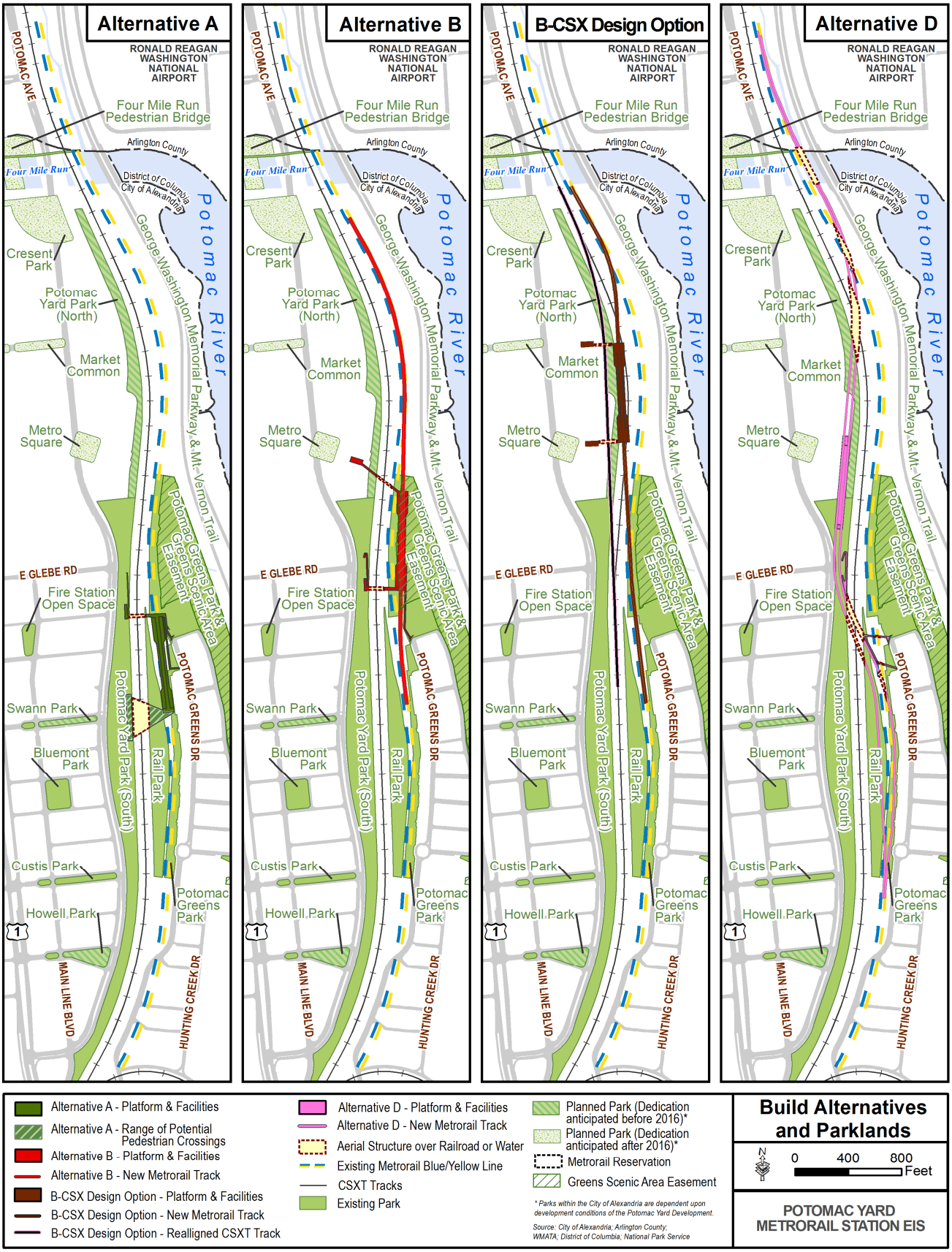
All three Build Alternatives and B-CSX Design Option would impact Potomac Yard Park (southern portion) and Potomac Greens Park, which were required as part of the South Potomac Yard development approvals. The parks were implemented through Development Special Use Permits (DSUP). Therefore, any significant alterations to either park (including the construction of station pedestrian bridge landings) would require an amendment to its DSUP by the City of Alexandria. This process would involve the input of several City advisory groups, including the Park and Recreation Commission, which would convey its recommendations to the Planning Commission and City Council for approval.

Table 3-27: Parkland Property Acquisitions

Park Name	Opening Year Ownership	Property Acquisitions (acres)			
		Build Alternative A	Build Alternative B	B-CSX Design Option	Build Alternative D
George Washington Memorial Parkway & Mount Vernon Trail	NPS	0.00	0.16	0.00	1.43
Potomac Greens Park and Greens Scenic Area easement	City of Alexandria (easement held by NPS)	0.71 (0.00)[1]	2.54 (1.71)[1]	0.10 (0.00)[1]	1.21 (0.00)[1]
Four Mile Run Trail	City of Alexandria	0.00	0.00	0.00	0.00
Rail Park	City of Alexandria	Less than 0.01	0.00	0.00	1.55
Potomac Yard Park (South)	City of Alexandria	0.45[2]	0.38	0.72	1.75
Potomac Yard Park (North)	City of Alexandria	0.00	0.09	3.04	0.87
Total NPS Parkland Property Acquisitions[3]		0.00	0.16	0.00	1.43
Total City of Alexandria Parkland Property Acquisitions		1.16	3.01	3.86	5.38

[1] Area in parentheses refers to impacts to the Greens Scenic Area easement.
[2] Estimated acreage is approximate, as the configuration and location of the southern pedestrian bridge landing and entrance pavilion will be determined at a later design phase.
[3] Total NPS parkland property acquisitions do not include the Greens Scenic Area easement acreages.

Figure 3-78: Build Alternatives and Parklands



3.10.3.3 Build Alternative A

Build Alternative A would require the acquisition of 0.71 acre of Potomac Greens Park, 0.45 acre of the southern portion of Potomac Yard Park, and less than 0.01 acre of Rail Park. These acreages do not include land within the Metrorail Reservation area.

For Build Alternative A, impacts related to the acquisition of Potomac Greens Park property include the removal of existing vegetation, pedestrian paths, open space, and a seating area. Impacts related to the acquisition of the southern portion of Potomac Yard Park to accommodate the pedestrian bridges include removing areas that contain pedestrian paths, playgrounds, and seating areas. Impacts related to the acquisition of the Rail Park include the removal of existing vegetation.

3.10.3.4 Build Alternative B

Build Alternative B would require the acquisition of 0.16 acre of the GWMP, 2.54 acres of Potomac Greens Park, 1.71 acres of the Greens Scenic Area easement, and a total of 0.47 acre across the southern and northern portions of Potomac Yard Park.

For Build Alterative B, impacts related to the acquisition of GWMP property include the removal of existing vegetation. Impacts related to the acquisition of Potomac Greens Park and Greens Scenic Area easement property include the removal of existing vegetation, pedestrian paths, open space, and a seating area. Impacts related to the acquisition of the northern and southern portions of Potomac Yard Park to accommodate aerial bridge include the pedestrian bridges include removing areas that contain pedestrian paths, playgrounds, and seating areas.

3.10.3.5 B-CSX Design Option

B-CSX Design Option would require the acquisition of 0.10 acre of Potomac Greens Park and a total of 3.76 acres across the southern and northern portions of Potomac Yard Park.

For B-CSX Design Option, impacts related to the acquisition of Potomac Greens Park property to accommodate the pedestrian bridges include the removal of existing vegetation and pedestrian paths. Impacts related to the acquisition of the southern and northern portions of Potomac Yard Park to accommodate realigned CSXT tracks include removing areas that contain pedestrian paths, playgrounds, and seating areas. Impacts related to the acquisition of the Rail Park include the removal of existing vegetation.

3.10.3.6 Build Alternative D

Build Alternative D would require the acquisition of 1.43 acres of the GWMP, 1.21 acres of Potomac Greens Park, 1.55 acres of the Rail Park, and a total of 2.62 acres across the southern and northern portions of Potomac Yard Park.

For Build Alterative D, impacts related to the acquisition of GWMP property include the removal of existing vegetation. Impacts related to the acquisition of Potomac Greens Park property include the removal of existing vegetation, pedestrian paths, open space, and a seating area. Impacts related to the acquisition of the Rail Park include the removal of existing vegetation. Impacts related to the acquisition of the northern and southern portions of Potomac Yard Park to accommodate the pedestrian bridges include removing areas that contain pedestrian paths, playgrounds, and seating areas.

3.10.4 Mitigation Measures

3.10.4.1 Build Alternative A

The partial acquisition of the Rail Park and Potomac Greens Park could be mitigated by replacing impacted park features, vegetation, and landscaping. The station elements could be designed to integrate with the parks, and park facilities could be redesigned as necessary in conjunction with the replacement of park infrastructure in Rail Park, Potomac Greens Park, and Potomac Yard Park. The property deed for the existing southern portion of Potomac Yard Park includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site are permitted. Alterations to Potomac Greens Park and Potomac Yard Park would require an amendment to its DSUP.

The visual impacts to GWMP and Mount Vernon Trail, Potomac Greens Park and the Greens Scenic Area easement, Rail Park, and Potomac Yard Park could be partially mitigated through landscaping and vegetation plans. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual Resources.**

3.10.4.2 Build Alternative B

Build Alternative B would partially acquire the GWMP and Greens Scenic Area easement and could not proceed unless the easement and land is released by NPS. Since Build Alternative B requires a land exchange with NPS or impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements** and **Section 3.9 Cultural Resources**.

The partial acquisition of Potomac Yard Park could be mitigated by designing station elements to integrate with the parks and replace park facilities. The property deed for the existing southern portion of Potomac Yard Park includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site are permitted, and the planned northern portion of the park is anticipated to include a similar provision in the property dedication to the City of Alexandria. The permanent use of Potomac Greens Park could be mitigated by redesigning park facilities as necessary in conjunction with the replacement of park infrastructure. Alterations to Potomac Yard Park and Potomac Greens Park would require an amendment to its respective DSUP.

The visual impacts to the GWMP and Mount Vernon Trail, Potomac Greens Park and Greens Scenic Area easement, and Potomac Yard Park could be partially mitigated through landscaping and vegetation plans. Impacts to the GWMP and Mount Vernon Trail and Greens Scenic Area easement would be partially mitigated through plans in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural Landscapes*. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual Resources.**

3.10.4.3 B-CSX Design Option

B-CSX Design Option would require the acquisition of most of the land area being allocated to the northern portion of Potomac Yard Park. Only 0.35 acre of park land associated with northern portion of Potomac Yards Park would not be impacted, but the remaining acreage would be separated into non-contiguous segments due to the CSXT and Metrorail corridors bisecting the park. The acquisition of Potomac Yard Park could be mitigated by designing station elements to integrate with the parks and replacing park facilities and park land. The property deed for the existing southern portion of Potomac Yard Park includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site are permitted, and the planned northern portion of the park is anticipated to include a similar provision in the property dedication to the City of Alexandria. Alterations to Potomac Yard Park and Potomac Greens Park would require an amendment to its respective DSUP.

The visual impacts to Potomac Greens Park and Potomac Yard Park could be partially mitigated through landscaping and vegetation plans. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual Resources**.

3.10.4.4 Build Alternative D

Build Alternative D would partially acquire the GWMP and could not proceed unless the land is released by NPS. Since Build Alternative D requires a land exchange with NPS, the transfer would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements** and **Section 3.9 Cultural Resources**. The partial acquisition of Potomac Yard Park could be mitigated by redesigning the park. The property deed for the existing southern portion of Potomac Yard Park includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site are permitted, and the planned northern portion of the park is anticipated to include a similar provision in the property dedication to the City of Alexandria. The partial acquisition of Potomac Greens Park and Rail Park could be mitigated by designing station elements to integrate into the parks and redesigning park facilities as necessary in conjunction with the replacement of park infrastructure. Alterations to Potomac Yard Park and Potomac Greens Park would require an amendment to its respective DSUP.

The visual impacts to GWMP, Potomac Greens Park and Greens Scenic Area easement, Rail Park, and Potomac Yard Park could be partially mitigated through landscaping and vegetation plans. Impacts to GWMP and Greens Scenic Area easement would be partially mitigated through plans in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural Landscapes*. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual Resources**.

3.11 Air Quality

This section assesses the potential impacts to air quality resulting from the construction and operation of the alternatives. “Air pollution” is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. The pollutants that are most relevant to the project are those principally traceable to motor vehicle engines and electrical power plants. The air quality assessment identified pollutant exceedances as well as the potential changes in greenhouse gas (GHG) emissions measured by Vehicle Miles Traveled (VMT) from vehicular trips under each of the alternatives. The reduction in VMT indicates the degree to which the alternatives would contribute positively to air quality. The analysis is described in more detail in the *Air Quality Technical Memorandum,* in Volume II.

The air quality assessment was prepared in accordance with NEPA and guidelines set forth in the *Clean Air Act* (CAA). The Virginia State Implementation Plan (SIP), developed in accordance with the CAA, contains the major state-level requirements with respect to transportation in general. Any project constructed in the Commonwealth of Virginia must comply with the National Ambient Air Quality Standards (NAAQS), a set of standards established by USEPA under the authority of the CAA for various “criteria” air pollutants.

The CAA requires USEPA to specify geographic areas of the country that have measured pollutant concentrations exceeding the levels prescribed by the NAAQS, termed “non-attainment areas”. The study area is located in the USEPA-defined Metropolitan Washington Air Quality Designation Area, which is currently designated as a moderate non-attainment area for 8-hour ozone (O_3) and non-attainment area for annual average particulate matter less than 2.5 microns ($PM_{2.5}$). However, the metropolitan Washington area is in attainment for all other criteria pollutants including carbon monoxide (CO), particulate matter less than 10 microns (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb).

3.11.1 Methodology

Opening year conditions were evaluated using data from Virginia Department of Environmental Quality (VDEQ) air quality monitoring stations identified in the study area vicinity. VDEQ maintains an area-wide network of monitoring stations that routinely measure pollutant concentrations in the ambient air. These stations provide data to assess air quality compliance with the NAAQS proximate to the project study area and to evaluate the effectiveness of pollution control strategies. The closest monitoring stations include:

- **Site M1:** Pentagon City area (Station Number 47-T; USEPA ID 51-013-0020; Aurora Hills Visitor Center, Arlington County);
- **Site M2:** Old Town Alexandria area (Station Number L-126-C; USEPA ID 51-510-0009; City of Alexandria Health Department); and
- **Site M3:** Eastern Fairfax County (Station Number 46-B9; USEPA ID 51-059-0030; Lee District Park, Fairfax County).

To estimate changes in GHG emissions from vehicular trips under the No Build Alternative, the three Build Alternatives, and B-CSX Design Option, the numbers of vehicle trips and VMT were estimated using the MWCOG regional travel model (Version 2.3) as part of the separate travel demand analysis for the project (see the *Transportation Technical Memorandum,* Volume II). By using an average per-mile emission factor, changes to CO_2 emissions can be estimated from the difference in VMT. Relative differences in VMT were compared to the regional total to determine if the effects of the project on regional GHG emissions would be substantial.

3.11.2 Affected Environment

The eight-hour O_3 concentrations at Site M1 (Pentagon City) exceeded the limit of 0.075 ppm in 2011 and 2012 but did not exceed the limit in 2013 and 2014. Although the region is also currently in non-attainment for $PM_{2.5}$, concentrations at Site M1 did not exceed the 24-hour criterion limit of 35 $\mu g/m^3$ or the annual average limit of 15 $\mu g/m^3$ in any of the previous three years. Similarly, recent concentrations of PM_{10}, CO, and all of the other pollutants are reported to be well below their respective standards for the three most recent years for which data are available. These trends are expected to continue for the foreseeable future through the 2016 opening year.

3.11.3 Environmental Consequences

3.11.3.1 No Build Alternative

The No Build Alternative is anticipated to have air quality conditions similar to existing conditions in the short term.

3.11.3.2 Build Alternatives

Because none of the three Build Alternatives or B-CSX Design Option is expected to degrade overall intersection LOS within the study area, the Potomac Yard Metrorail Station is not a project of local air quality concern under 40 CFR 93.123(b)(1), and no potential beneficial or adverse impacts are expected on regional air quality. The project is included in the National Capital Region Transportation Planning Board 2012 Financially Constrained Long-Range Transportation Plan. Therefore, the project meets statutory and regulatory transportation conformity requirements without a hot-spot analysis.

Greenhouse Gas Emissions

Table 3-28 lists the opening year regional average weekday VMT for the No Build Alternative, the three Build Alternatives, and B-CSX Design Option. At the regional level, the Build Alternatives would result in slight decreases in VMT (approximately 2,500 fewer weekday VMT out of 106,258,400 total regional VMT) and in vehicle trips (600 fewer weekday vehicle trips out of 13,553,000 total regional trips), relative to the No Build Alternative as a result of personal automobile trips diverted to transit. As the difference in total vehicle trips and VMT at the regional level is insignificant, there would be no substantial impact on GHG emissions by the three Build Alternatives or B-CSX Design Option.

Table 3-28: 2016 Opening Year Regional Average Weekday VMT

	No Build Alternative	Build Alternatives (incl. B-CSX Design Option)
Average Weekday Total		
Vehicle Trips	13,553,600	13,553,000
VMT	106,258,400	106,255,900
Change versus No Build Alternative		
Vehicle Trips	-	(600)
VMT	-	(2,500)

Source: Project travel demand forecasting, Potomac Yard Metrorail Station EIS Transportation Technical Memorandum, 2012.

3.11.4 Mitigation Measures

As no additional air pollutant emissions are expected beyond the No Build opening year conditions, no mitigation is proposed.

3.12 Noise & Vibration

This section describes potential noise and vibration impacts of the alternatives. Noise is "unwanted sound" and, by this definition, the perception of noise is a subjective process; however, Federal guidelines for noise assessment exist and are described in the following methodology section. Several factors affect the actual level and quality of sound (or noise) as perceived by the human ear and can generally be described in terms of loudness, pitch (or frequency), and time variation. The loudness, or magnitude, of noise determines its intensity and is measured in decibels (dB) that can range from below 40 dB (e.g. the rustling of leaves) to over 100 dB (e.g. a rock concert).

Unlike noise, which travels in air, transit vibration typically travels along the surface of the ground. Ground-borne vibration associated with vehicle movements is usually the result of uneven interactions between wheels and the road or rail surfaces. Examples of such interactions (and subsequent vibrations) include train wheels over a jointed rail, rail car wheel with "flats," and a motor vehicle wheel hitting a pothole, a manhole cover, or any other uneven surface.

The noise and vibration assessment was prepared in accordance with NEPA and guidelines set forth in the following guidance:

- **Transit Noise and Vibration Impact Assessment (FTA, 2006):** The future predicted noise and vibration levels from the project were evaluated using both the FTA guidelines; and
- **Manual of Design Criteria for Maintaining and Continued Operation of Facilities and Systems (WMATA, 2010):** While the FTA criteria are used to evaluate cumulative noise exposure (such as the day-night noise level over 24-hours), the WMATA criteria are used to evaluate instantaneous levels from single events (such as a single Metrorail pass-by).

The analysis is described in more detail in the *Noise and Vibration Technical Memorandum,* in Volume II.

3.12.1 Methodology

3.12.1.1 Noise

For each of the three Build Alternatives, both the FTA criterion and WMATA criterion were applied to assess potential impacts. The reference noise levels for each of the proposed noise sources (such as Metrorail pass-bys) and other operating characteristics (such as average train dwell times at the station and height of the noise source) were used to predict future project noise levels at nearby sensitive receptors. These levels are based on default FTA data as well as information included in recent WMATA projects (such as the *Dulles Corridor Rapid Transit Project, Phase II*, May 2012). A total of 34 noise-sensitive receptors were identified in the project area that could be affected by the project (see **Figure 3-79**).

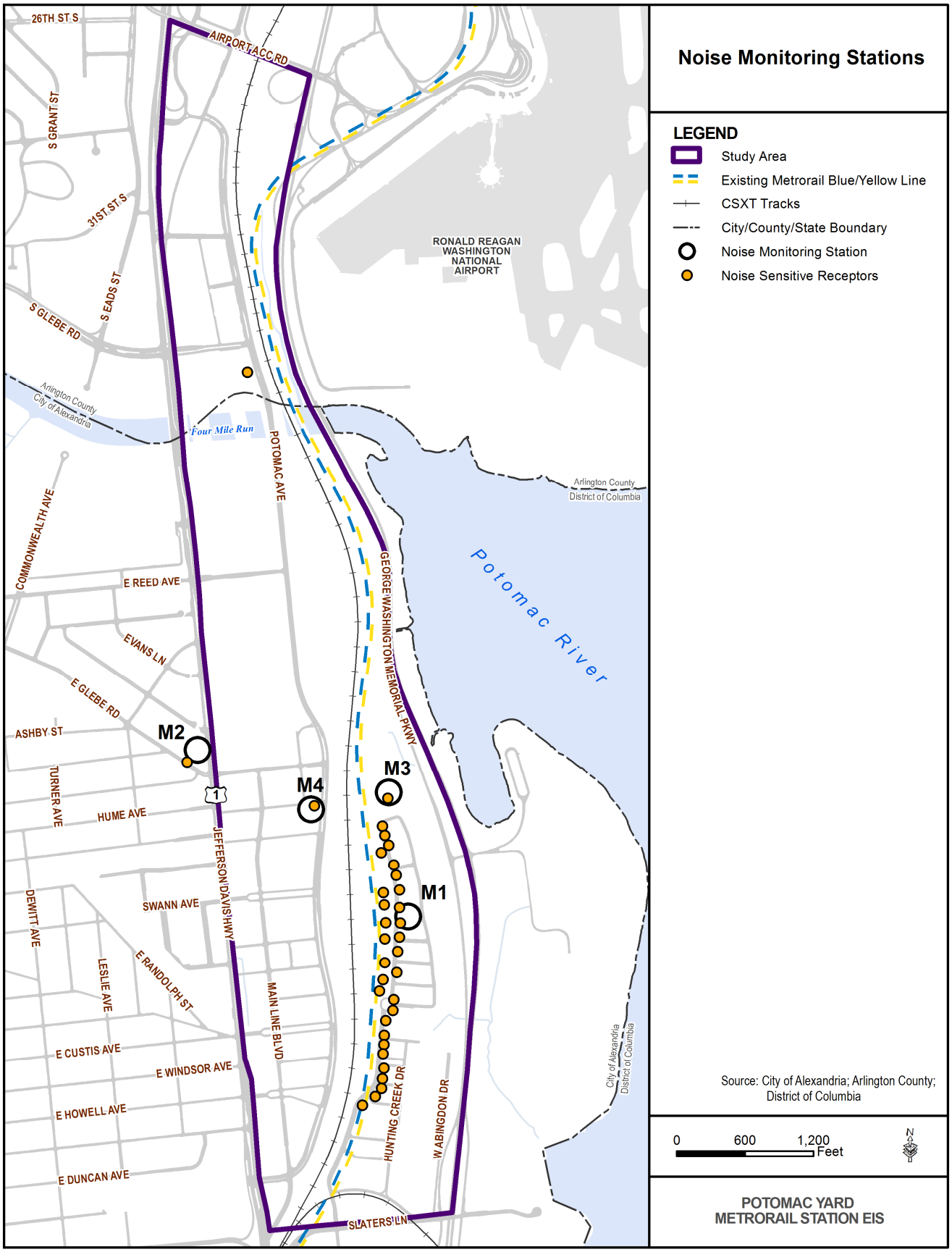
To determine the existing background noise levels at sensitive receptors in the vicinity of the proposed Metrorail Station, a noise-monitoring program was conducted at four representative locations shown in **Figure 3-73** and described in **Table 3-29**. Sites for noise monitoring stations were chosen to cover existing residential neighborhoods (Potomac Greens and Lynhaven), existing parks (Potomac Greens Park), and planned/under construction residential neighborhoods (South Potomac Yard) near the proposed project site.

Project elements of B-CSX Design Option (relocated Metrorail and freight rail tracks, new Metrorail track crossover, and the station facility) would be moved farther away from sensitive noise and vibration receptors than those of the other Build Alternatives. Thus, B-CSX Design Option would have no additional noise or vibration impacts above the No Build Alternative as measured by FTA and WMATA criteria.

Table 3-29: Noise Monitoring Sites

Receptor ID	Description	Land Use Category
M1	Potomac Greens, Potomac Greens Drive	Residential
M2	Lynhaven Community, East Glebe Road	Residential
M3	Potomac Greens Park/Trail (north of Potomac Greens)	Park
M4	South Potomac Yard (proposed development)	Residential

Figure 3-79: Noise Monitoring Stations



FTA Criteria: Transit noise impacts are assessed based on land use categories and sensitivity to noise from transit sources under the FTA guidelines. The FTA land use categories and required noise metrics are described in **Table 3-30**. The FTA noise criteria are delineated into two categories: *moderate* and *severe* impact. The *moderate* impact threshold defines areas where the change in noise is noticeable but may not be sufficient to cause a strong, adverse community reaction. The *severe* impact threshold defines the noise limits above which a significant percentage of the population would be highly annoyed by new noise.

Table 3-30: FTA Land Use Categories and Noise Metrics

Land Use Category	Noise Metric	Description
1	$L_{eq}(h)$[1]	Tracts of land set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and historic landmarks.
2	L_{dn}[2]	Buildings used for sleeping such as residences, hospitals, hotels, and other areas where nighttime sensitivity to noise is of utmost importance.
3	$L_{eq}(h)$[1]	Institutional land uses with primarily daytime and evening uses including schools, libraries, churches, museums, cemeteries, historic sites, and parks, and certain recreational facilities used for study or meditation.

[1] $L_{eq}(h)$ = Average hourly equivalent noise level;
[2] L_{dn} = 24-hour day-night noise level.
Source: FTA, 2006.

WMATA Criteria: Noise limits for transit lines are based on the maximum level that would not cause significant intrusion or alteration of the pre-existing noise environment and represent noise levels which are considered acceptable for the type of land use in each area (see **Table 3-26**). Residential receptors in the study area consist of multi-family residences in high-density or mixed-use commercial development; therefore, the WMATA criterion of 80 A-weighted decibel (dBA) was used to evaluate maximum pass-by noise impacts from train pass-bys.

3.12.1.1 Vibration

Unlike noise, which is assessed using cumulative noise levels over one-hour and 24-hour periods, transit vibration impacts are assessed based on individual events, such as a train pass-by. All predicted vibration levels were compared with the FTA significant increase criterion of 3 VdB and the WMATA vibration criteria to assess the onset of impact. Based on the land uses identified in the vicinity of the proposed project, the maximum acceptable level under the WMATA design criterion for evaluating ground-borne vibration impacts from train pass-bys at all residences is 75 VdB. For consistency, transit vibration levels were predicted at the same receptor locations as for the noise analysis. The appropriate vibration criteria for maximum ground-borne vibration for various types of residential buildings apply to measurements of vertical vibration of floor surfaces within the buildings.

3.12.2 Affected Environment

3.12.2.1 Noise

Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and landings at Ronald Reagan Washington National Airport. The existing peak-hour average noise levels (L_{eq}) measured in the vicinity of the project range from 60 dBA within South Potomac Yard to 72 dBA at single- and multi-family residences along East Glebe Road near U.S. Route 1. Similarly, the 24-hour day-night noise levels (L_{dn}) range from 62 dBA to 72 dBA at these sites. As no major new sources of noise will be introduced between now and 2016, the future noise levels are expected to remain approximately the same in the Opening Year of 2016 as the current conditions.

3.12.2.2 Vibration

Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and vehicular traffic, particularly heavy trucks. In accordance with accepted FTA practice, a General Assessment of vibration did not include vibration measurements. Instead, the general assessment identified existing vibration sources, plus new vibration sources that would be introduced as part of the project. As no new sources of vibration will be introduced between now and 2016, the future vibration levels in the Opening Year of 2016 are expected to remain the same as the current conditions.

3.12.3 Environmental Consequences

3.12.3.1 No Build Alternative

Noise

Future noise levels under the No Build Alternative are anticipated to be similar to those under existing conditions (see **Figure 3-74**). Predicted exceedances under the No Build Alternative do not represent a change in noise levels from current conditions because there is no change in Metrorail operations between existing condition and No Build Alternative.

- **FTA Criteria:** No FTA noise impacts are expected under the No Build Alternative.
- **WMATA Criteria:** Modeled maximum noise levels from Metrorail pass-bys would exceed the WMATA criterion of 80 dBA at seven multi-family residences in the Potomac Greens development under the No Build Condition.

Vibration

Because no project components or design elements are proposed under the No Build Alternative, the alternative would not cause any new vibration impacts. No exceedance of the FTA vibration significant increase criterion of 3 VdB or WMATA vibration criterion of 75 VdB is predicted under the No Build Alternative (see **Figure 3-81**).

3.12.3.2 Build Alternatives

Table 3-31 summarizes the noise impacts for Build Alternatives A, B and D using the FTA Criteria, and **Table 3-32** summarizes the results using the WMATA Criteria. The tables show the existing ambient noise level, estimated noise level for the No Build condition, estimated noise level for the Build Alternative, the change in noise level compared to the No Build, and the threshold values for assessing impacts.

Noise modeling was not conducted for B-CSX Design Option; however, this option would be located farther away from sensitive noise and vibration receptors than all of the Build Alternatives, including Build Alternative B, which would have no additional impacts than the No Build Alternative. Thus, B-CSX Design Option is expected to have no additional noise or vibration impacts at sensitive receptors above the No Build Alternative as measured by FTA and WMATA criteria.

For the three Build Alternatives and B-CSX Design Option, other ancillary noise sources associated with the proposed station, such as Metrorail door chimes, train conductor announcements, station public address announcements, and brake noise, may be audible in the community as a new noise source but are not expected to contribute to any exceedance or noise impact, as the ambient noise levels are significantly higher. As a result, these ancillary sources were not included in the noise assessment but would be evaluated more closely during final design when the station features are finalized, and would be mitigated, as appropriate.

The noise and vibration impacts associated with each build alternative are further summarized in **Figures 3-80** and **3-81** and described in Sections 3.12.3.3 through 3.12.3.6.

Table 3-31: Predicted Noise Levels at Representative Receptors Compared to FTA Criteria for Impacts

ID	Receptor Cluster Description	Land Use[1]	Noise Metric	Noise Levels (dBA)			Change in Noise (dBA)[2]	FTA Criteria	
		Type		Existing	No Build	Build Altern-ative		Moderate (dBA)	Severe (dBA)
Build Alternative A									
M1	Potomac Greens, Potomac Greens Dr.	Residential	L_{dn}	63	60.0	60.0	+0.0	+2.0	+5.0
M2	Lynhaven Community, East Glebe Road	Residential	L_{dn}	72	55.7	56.0	+0.01[3]	+0.8	+2.5
M3	Potomac Greens Park/Trail	Park	L_{eq}	63	60.7	61.2	+0.5	+4.8	+9.2
Build Alternative B									
M1	Potomac Greens, Potomac Greens Dr.	Residential	L_{dn}	63	60.0	60.0	+0.0	2.0	5.0
M2	Lynhaven Community, East Glebe Road	Residential	L_{dn}	72	55.7	56.7	+0.03[3]	0.8	2.5
M3	Potomac Greens Park/Trail	Park	L_{eq}	63	60.7	62.5	+1.8	4.8	9.2
Build Alternative D									
M1	Potomac Greens, Potomac Greens Dr.	Residential	L_{dn}	63	60.0	62.4	+2.4	+2.0	+5.0
M2	Lynhaven Community, East Glebe Road	Residential	L_{dn}	72	55.7	60.2	+0.18[4]	+0.8	+2.5
M3	Potomac Greens Park/Trail	Park	L_{eq}	63	60.7	57.3	-3.4	+4.8	+9.2

[1]Land use types include single- or multi-family residences (Res) and parks (Park).
[2]FTA moderate impacts are bold and underlined.
[3]Since traffic along Route 1 dominates the ambient conditions at Site M2, the change in project noise is based on the difference between the measured existing noise and the cumulative noise under the Build Alternative.
[4]Since traffic along Route 1 dominated the ambient conditions at Site M2, the change in project noise is based on a comparison with the measured existing noise rather than the predicted No Build level.

Table 3-32: Predicted Maximum Noise Levels from Metrorail Pass-bys at Representative Receptors Compared to WMATA Criteria for Impacts

ID	Receptor Description	Land Use	Metric	No Build Noise (dBA)	Build Noise (dBA)	Change in Noise (dBA)	WMATA Criterion (dBA)
		Type					
Build Alternative A							
M1	Potomac Greens, Potomac Greens Dr.	Multi-Family	L_{max}	70.3	70.3	0.0	80
M2	Lynhaven Community, Glebe Road	Multi-Family	L_{max}	66.0	66.0	0.0	80
M3	Potomac Greens Park/Trail	Park	L_{max}	72.9	72.9	0.0	N/A
Build Alternative B							
M1	Potomac Greens, Potomac Greens Dr.	Multi-Family	L_{max}	70.3	70.3	0.0	80
M2	Lynhaven Community, East Glebe Road	Multi-Family	L_{max}	66.0	65.8	-0.2	80
M3	Potomac Greens Park/Trail	Park	L_{max}	72.9	74.3	1.4	N/A
Build Alternative D							
M1	Potomac Greens, Potomac Greens Dr.	Multi-Family	L_{max}	70.3	72.8	2.4	80
M2	Lynhaven Community, East Glebe Road	Multi-Family	L_{max}	66.0	70.4	4.4	80
M3	Potomac Greens Park/Trail	Park	L_{max}	72.9	69.5	-3.4	N/A

"N/A" means not applicable. The WMATA noise criteria are applicable to residential and commercial buildings; not parks.

Figure 3-80: Noise Impacts

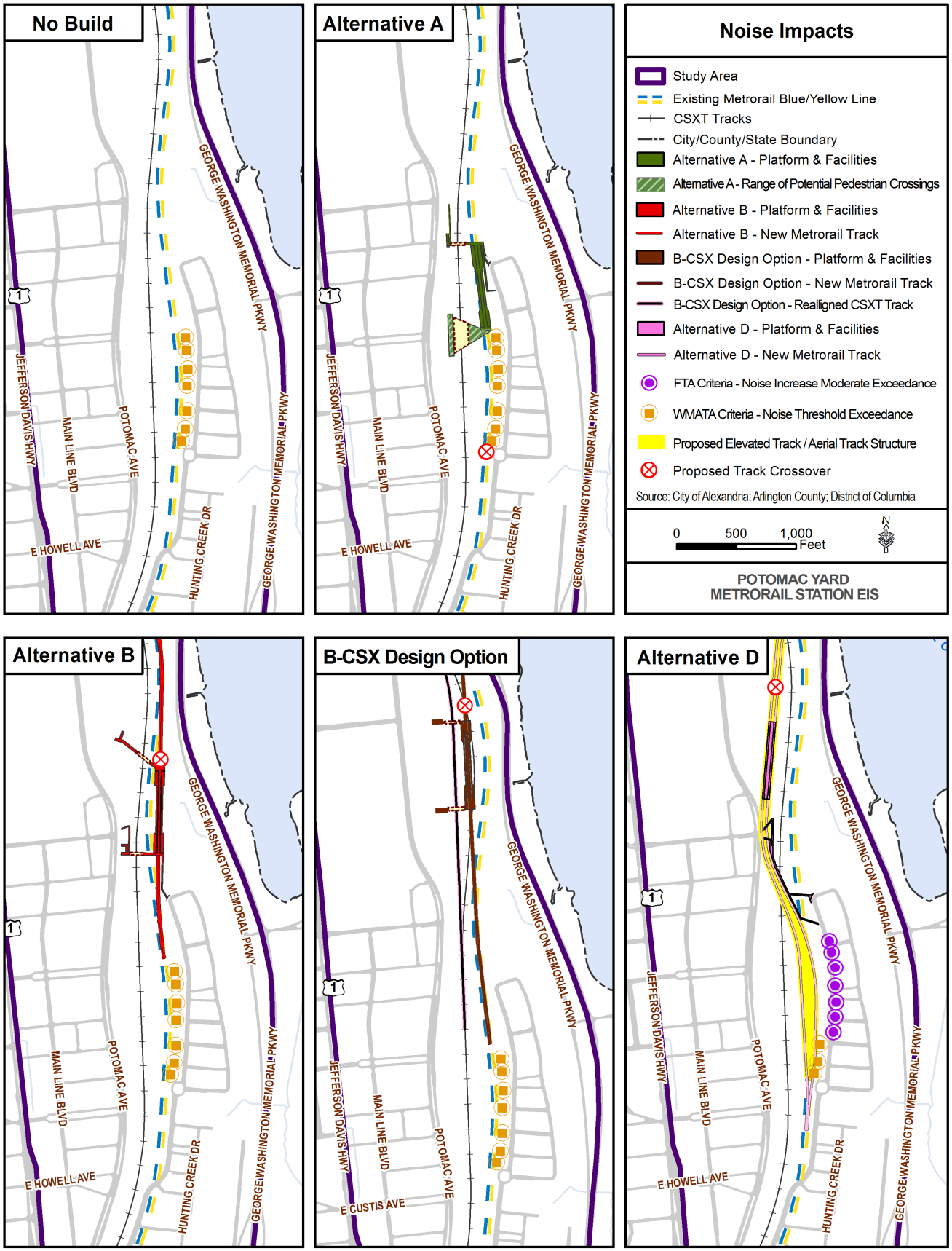
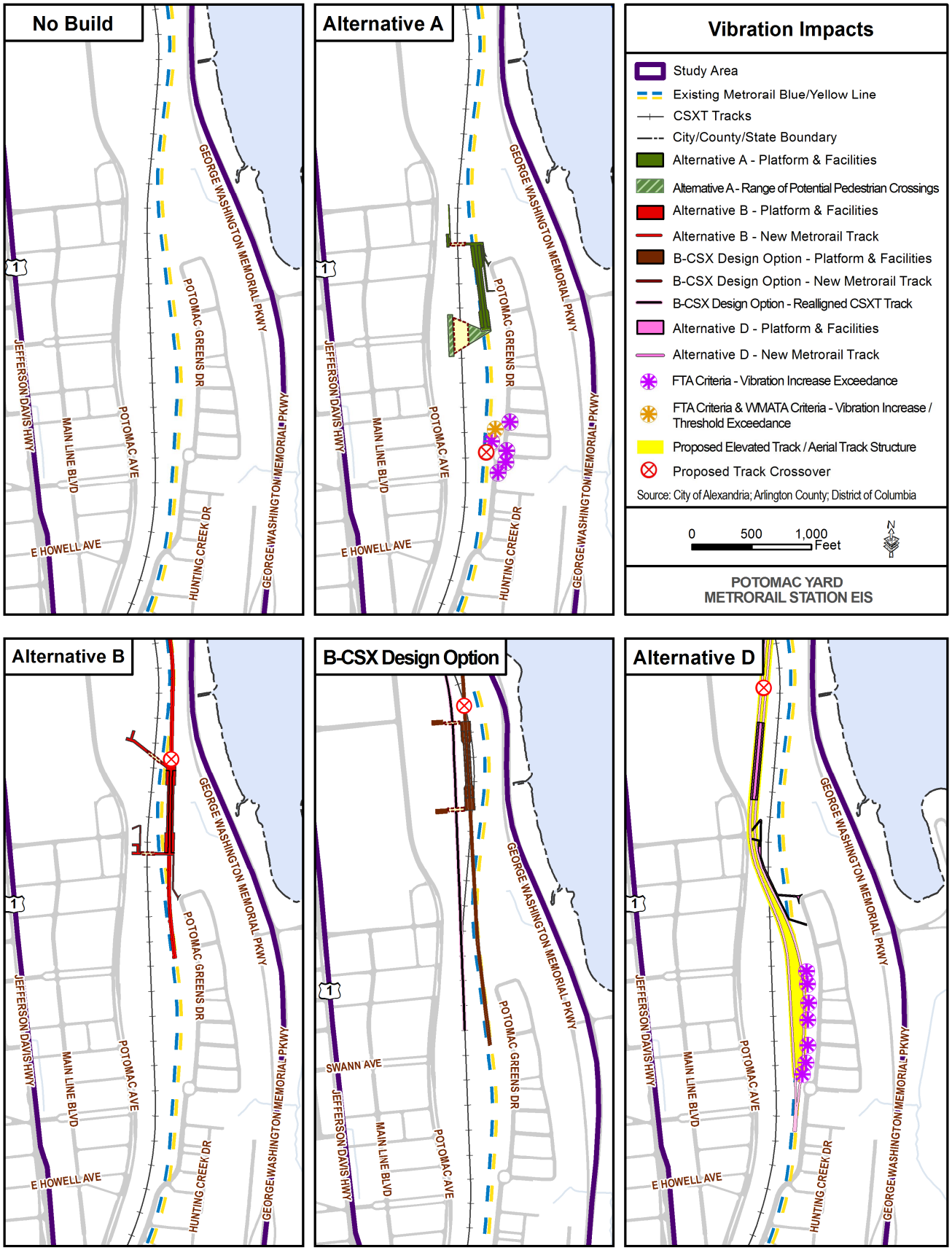


Figure 3-81: Vibration Impacts



3.12.3.3 Build Alternative A

Noise

- **FTA Criteria:** No exceedances of the FTA *moderate* or *severe* impact criteria are predicted. Additionally, none of the project noise levels under Build Alternative A would exceed the FTA impact criteria at any FTA Category 3 receptors (parks and schools).
- **WMATA Criteria:** Same as the No Build Alternative. Maximum pass-by noise levels from Metrorail operations are predicted to exceed the WMATA criterion of 80 dBA at seven multi-family residences in the Potomac Greens development under Build Alternative A. However, station and train public address announcements have the potential to impact residences in the Potomac Greens neighborhood.

Vibration

- **FTA Criteria:** Although none of the vibration levels at the representative receptors would exceed the FTA criteria, vibration levels from Metrorail pass-bys over switches would exceed the FTA significant increase criterion of 3 VdB and minimum frequent criterion threshold of 72 VdB at six residences in Potomac Greens.
- **WMATA Criteria:** Vibration levels from Metrorail operations under Build Alternative A are also predicted to exceed the WMATA design criterion of 75 VdB at one residence.

3.12.3.4 Build Alternative B

Noise

- **FTA Criteria:** No exceedances of the FTA *moderate* or *severe* impact criteria are predicted. Additionally, none of the project noise levels under Build Alternative B would exceed the FTA impact criteria at any FTA Category 3 receptors (parks and schools).
- **WMATA Criteria:** Same as the No Build Alternative. Maximum pass-by noise levels from Metrorail operations are predicted to exceed the WMATA criterion of 80 dBA at seven multi-family residences in the Potomac Greens development under Build Alternative B.

Vibration

- **FTA Criteria:** Maximum vibration levels from Metrorail pass-bys under Build Alternative B would range from well below background levels to 62 VdB. None of the vibration levels at the representative receptors or elsewhere in the study area would exceed the FTA significant increase criterion of 3 VdB under Build Alternative B (see **Figure 3-80)**.
- **WMATA Criteria:** Vibration levels from Metrorail operations under Build Alternative B are also not predicted to exceed the WMATA design criterion of 75 VdB at any receptor locations.

3.12.3.5 B-CSX Design Option

Project elements of B-CSX Design Option (relocated Metrorail and freight rail tracks, new Metrorail track crossover, and the station facility) would be moved farther away from sensitive noise and vibration receptors than all of the Build Alternatives, including Build Alternative B, which would have no additional impacts than the No Build Alternative. Thus, B-CSX Design Option is expected to have no additional noise or vibration impacts at sensitive receptors above the No Build Alternative as measured by FTA and WMATA criteria.

3.12.3.6 Build Alternative D

Noise

- **FTA Criteria:** Seven exceedances of the FTA Category 2 (residential areas) *moderate* criteria are predicted under Build Alternative D; these residential sites would potentially be affected by the change in noise levels due to the elevated Metrorail alignment shifted closer to the Potomac Greens development. No exceedances of the FTA *severe* impact criteria are predicted. Additionally, none of the project noise levels under Build Alternative D would exceed the FTA impact criteria at any FTA Category 3 (parks and schools) receptors.
- **WMATA Criteria:** Build Alternative D is predicted to have three exceedances of the WMATA criterion. The Metrorail noise levels at these three sites were adjusted upward to reflect an aerial track alignment (+4 dBA) and adjusted downward to reflect shielding due to the solid trackside parapet wall (-7 dBA). The net difference in noise resulted in no impacts for these four sites.

Vibration

- **FTA Criteria:** Modeled maximum vibration levels from Metrorail pass-bys under Build Alternative D would range from well below background levels to 62 VdB. Vibration levels from Metrorail pass-bys along the relocated track would exceed the FTA significant increase criterion of 3 VdB and minimum frequent criterion threshold of 72 VdB at seven residences in Potomac Greens. Although one residential receptor in South Potomac Yard is predicted to experience a significant increase in vibration levels (21.8 VdB) over the No Build condition from Metrorail pass-bys over switches, the predicted absolute level is still well under the FTA frequent criterion threshold of 72 VdB. Therefore, no impacts are predicted at this location.
- **WMATA Criteria:** Vibration levels from Metrorail operations under Build Alternative D are not predicted to exceed the WMATA design criterion of 75 VdB at any receptor locations.

3.12.4 Mitigation Measures

The proposed mitigation measures described below were investigated to determine their effectiveness in reducing the impacts. All proposed mitigation measures were found to reduce all project related impacts.

For the three Build Alternatives and B-CSX Design Option, the potential noise impacts from station public address announcements and train announcements would be minimized by the following station design features:

- Solid platform windscreens that would mostly enclose the platform area and help screen internal noise from the outside; and
- Design of the station public address system with speakers at relatively close spacing, permitting lower audio volumes.

3.12.4.1 Build Alternative A

Both noise and vibration impacts are predicted for Build Alternative A. The following mitigation measures are proposed to eliminate noise and vibration criteria exceedances:

- Locating on-street bus stops for the station away from new residences planned to minimize noise impacts from idling buses; or
- Addressing track switch noise impacts by:
    - Applying vibration control measures, such as ballast mats under the switches to decouple the switch from the track bed and replacing standard swing switches with spring frogs or other “gapless” switches to eliminate the impact caused by the gap; or
    - Using low-profile barriers that shield the wheel-rail interaction.

3.12.4.2 Build Alternative B

The following mitigation measure is proposed to eliminate noise impacts in the study area:

- Locating on-street bus stops for the station away from new residences to minimize noise impacts from idling buses.

Since no vibration impacts are predicted, no vibration control measures are required.

3.12.4.3 B-CSX Design Option

Since no noise or vibration impacts are predicted, no noise or vibration control measures are required.

3.12.4.4 Build Alternative D

Both noise and vibration impacts are predicted for Build Alternative D. The following mitigation measures are proposed to eliminate noise and vibration impacts in the study area:

- Increasing the height of the standard 3 foot 8 inch parapet along aerial track to 7 feet to shield nearby residences from new elevated Metrorail operations;
- Installing 3 foot 8 inch parapets along at-grade sections of track by the Potomac Greens neighborhood; and
- Applying vibration control measures, such as resilient rail fasteners or resilient tie pads, along continuous welded rail track by the Potomac Greens neighborhood to decouple the rail from the track bed and eliminate impacts from Metrorail pass-bys.

3.13 Water Quality

This section identifies the study area water bodies and evaluates the potential impacts resulting from the project. This water quality assessment identifies existing impaired waters, as defined by the Federal Clean Water Act and state regulatory agencies, and calculates the increase in impervious surface from each of the alternatives. The analysis of water resources was developed consistent with the following laws and regulations:

- Clean Water Act of 1972;
- Virginia Stormwater Management Act;
- City of Alexandria, Environmental Management Ordinance (Article XIII of the Zoning Ordinance);
- City of Alexandria Code, Erosion and Sediment Control (Sec. 5-4);
- City of Alexandria Master Plan, Water Quality Management Supplement, 2001;
- Arlington County Code, Erosion and Sediment Control (Chapter 57); and
- Arlington County Code, Stormwater Detention (Chapter 60).

The analysis is described in more detail in the *Water Resources Technical Memorandum,* in Volume II.

3.13.1 Methodology

The water quality analysis identified designated impaired streams in the study area using the Virginia Department of Environment Quality (VDEQ) 305(b)/303(d) Water Quality Assessment Integrated Report. The Clean Water Act (CWA) requires states to identify and develop a list of water bodies that are both impaired and are not in attainment of water quality standards. The analysis reviewed existing water quality testing data within the study area using National Pollutant Discharge Elimination System (NPDES) and Virginia Pollutant Discharge Elimination System (VPDES) information for permit holders. The analysis also qualitatively assessed the capacity for water resources with NPDES and VPDES permits to accommodate the project. Project impacts to water quality were assessed by identifying anticipated point and non-point sources and operational impacts such as oil or lubricant leakage, deicing chemicals, and long-term stormwater runoff.

Impervious surface calculations were based on proposed impervious structures, which include the station structures and platforms, aerial track structures, and pedestrian bridges. Areas of existing impervious surface, such as asphalt parking lots, were subtracted from the estimate. The at-grade freight railroad track is not considered an impervious surface and is not included in the calculation. Metrorail railroad track is considered an impervious surface for the purposes of this analysis.

3.13.2 Affected Environment

3.13.2.1 Designated Impaired Waters

Both the Potomac River and Four Mile Run are designated as impaired waters by USEPA and VDEQ. The causes of impairments in Four Mile Run are high levels of Escherichia coli and polychlorinated biphenyl (PCB). The section of the Potomac River adjacent to the study area contains elevated levels of bacteria and organic compounds and adverse pH conditions. A water quality monitoring station is located on Four Mile Run, directly west of the project study area, which monitors both the general quality of Four Mile Run and discharges from the Arlington County Water Pollution Control Plant.

A Total Maximum Daily Load (TMDL) plan was developed to regulate the total amount of pollutants that a water body can assimilate and still adhere to USEPA's standards. TMDLs were approved for both Four Mile Run and the Potomac River. Discharges of water to both water bodies are permitted through NPDES permits that regulate the amount of pollutants discharged. Virginia regulates discharges to Four Mile Run using the VPDES; while USEPA Region 3 regulates discharges directly into the Potomac River within the study area.

Within the project study area, three major NPDES permits are applicable: GWMP, City of Alexandria storm sewer, and Arlington County storm sewer. Additionally, individual sediment and erosion control plans for construction within the study area would fall under the Construction Stormwater General Permit, which Virginia holds for construction-related NPDES permits.

3.13.2.2 Stormwater Management

For the redevelopment of the Potomac Yard, the City of Alexandria requires the developer to provide a Water Management Master Plan (WMMP) to coordinate water supply, stormwater, and wastewater systems for the completed development. As parcels develop, the site plans are also required to employ small on-site Low Impact Design (LID) techniques such as green roofs, rainwater harvesting, and bioretention to reduce the amount of stormwater generated and reuse the remaining stormwater to the greatest extent possible.

Developers of parcels within Potomac Yard have already begun implementing large-scale stormwater management techniques, such as retention ponds and structural Best Management Practices (BMPs). The City of Alexandria Department of Transportation and Environmental Services is responsible for approving all proposed WMMPs. The stormwater runoff is treated to meet the water quality standards of the City of Alexandria and Arlington County. All BMP facilities for Potomac Yard will be maintained privately, in accordance with the provisions of Potomac Yard CDD #10 and CDD #19. WMATA will own and maintain any BMPs constructed as part of the Metrorail station.

Impervious surface calculations were based on proposed impervious structures, which include the station structures and platforms, aerial track structures, and pedestrian bridges. Areas of existing impervious surface, such as asphalt parking lots, were subtracted from the estimate. The at-grade railroad track is not considered an impervious surface and was not included in the calculation. The impervious surface for Alternative D includes new elevated tracks that would replace the existing tracks.

3.13.2.3 Water Quality Management

To guide City development policies, the *Water Quality Management Supplement* (2001) of the *City of Alexandria Master Plan* classifies areas of the City with “constraints to development” based on potential impacts to water quality that could occur as a result of development in these areas. Wetlands and stream buffer areas are considered to be generally unsuitable for development, and floodplains and floodplain soils are considered to have limited development potential that requires special consideration. The project study area contains wetlands, floodplains, and stream buffer areas; these resources are described in their respective sections: **Section 3.14, Waters of the United States (Wetlands), Section 3.15 Floodplains; and Section 3.16 Navigable Waterways and Coastal Zones** (this section addresses stream buffer areas, which are included in Chesapeake Bay Preservation Areas).

3.13.3 Environmental Consequences

3.13.3.1 No Build

No further impact or degradation to the quality of surface waters within the study area is anticipated beyond the existing and planned projects.

3.13.3.2 Build Alternatives

The project is not anticipated to impact or degrade the quality of surface waters within the study area. The station would connect to the existing municipal sanitary sewer system, which serves the Potomac Yard area. Potential pollutants resulting from project activities include point and non-point sources, such as sewerage generated by the station and operational impacts such as oil or lubricant leakage, and deicing chemicals. These pollutants would be captured and treated using stormwater management techniques approved by the City of Alexandria and Arlington County.

Table 3-33 lists the estimated net new impervious surface for each Build Alternative. The three Build Alternatives would increase the amount of impervious surface and resulting stormwater runoff at the site beyond the No Build condition. B-CSX Design Option would result in a slight net decrease in impervious surface from the No Build condition. Although additional impervious surface and runoff would result from the three Build Alternatives, the project would adhere to water quality performance management criteria set by the City of Alexandria in accordance with Sec. 13-109€(5) of the City Zoning Ordinance or by Arlington County in accordance with Chapter 60 of the Arlington County Code, which control the rate and water quality of stormwater runoff. These existing stormwater management plans and practices in the City of Alexandria and Arlington County would minimize potential impacts from increases in impervious surface.

Table 3-33: Net New Impervious Surface

Alternative	Impervious Area (acres)
Build Alternative A	1.82
Build Alternative B	2.24
B-CSX Design Option	(0.02)[1]
Build Alternative D	9.24

[1] B-CSX Design Option would result in a net decrease in impervious surface due to the removal of the movie theater and surface parking lot and their replacement with freight railroad right-of-way for at-grade ballasted tracks.

3.13.4 Mitigation

As no water quality impact is anticipated beyond the No Build opening year conditions, no mitigation is proposed.

3.14 Waters of the United States (Wetlands)

This section assesses potential impact to Waters of the U.S. (WOUS) within the study area. WOUS include all waters, such as intrastate rivers, streams (including intermittent streams), wetlands, and natural ponds. WOUS are regulated by the United States Army Corps of Engineers (USACE) pursuant to Section 400/401 of the CWA. Virginia Department of Environmental Quality (VDEQ) regulates activities in state waters and wetlands under Section 401 of the CWA and Title 62.1 of the Code of Virginia. The Virginia Marine Resources Commission (VMRC) regulates activities on state-owned submerged lands, tidal wetlands, and dunes/beaches in accordance with Chapters 12, 13, and 14 of Title 28.2 of the Code of Virginia. NPS regulates WOUS on NPS property under NPS Director's Order 77-1; within the study area, this property includes the George Washington Memorial Parkway and the Greens Scenic Area easement.

Both the USACE and NPS delineation methodologies were used to identify wetlands for the project area. As a result, wetlands were identified and categorized as follows:

- ***USACE Only:*** WOUS and wetlands areas meet the criteria for wetlands consistent with USACE methodology and are not located on NPS parkland or land on which the NPS has a property interest.
- ***NPS Only:*** Wetlands areas meet the criteria for wetlands consistent with the NPS methodology only, and are located on NPS parkland or land on which the NPS has a property interest.
- ***USACE and NPS:*** Wetlands areas meet the criteria for wetlands consistent with both the USACE and NPS methodologies and are located on NPS parkland or land on which the NPS has a property interest.

The analysis is described in more detail in the *Water Resources Technical Memorandum,* in Volume II.

3.14.1 Methodology

Wetlands within the study area were delineated by qualified environmental scientists through field reviews and GIS analysis. The wetland analysis methodology consisted of the following tasks:

- ***Regulatory agency coordination:*** Regulatory agencies for the project include USACE, NPS, and VDEQ.
- ***Background research and preliminary field walk*:** Available federal, state and local natural environmental data were used to assist in identification of study area wetlands and WOUS prior to the field delineation.
- ***WOUS and wetlands field delineation:*** A delineation report for WOUS and wetlands was prepared consisting of soil sampling, vegetation surveys, and hydrologic indicator studies consistent with both USACE and NPS wetland delineation methodologies. While the USACE uses a three parameter approach where a wetland must have hydrophytic vegetation, hydric soils, and wetland hydrology to qualify as a wetland, NPS uses the Cowardin classification of wetlands. Under the Cowardin definition, a wetland must have one or more of the following three attributes:
    - At least periodically, the land supports predominantly hydrophytes (wetland vegetation);
    - The substrate is predominantly undrained hydric soil; or
    - The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

  These three attributes encompass wetland areas that fall into five categories:

    1. Areas with hydrophytes and hydric soils, such as those commonly known as marshes, swamps, and bogs;
    2. Areas without hydrophytes but with hydric soils - for example, flats where drastic fluctuations in water level, wave action, turbidity, or high concentration of salts may prevent the growth of hydrophytes;
    3. Areas with hydrophytes but non-hydric soils, such as margins of impoundments or excavations where hydrophytes have become established but hydric soils have not yet developed;
    4. Areas without soils but with hydrophytes such as the seaweed-covered portion of rocky shores; and

5. Wetlands without soil and without hydrophytes, such as gravel beaches or rocky shores without vegetation.

- ***Preparation of a Jurisdictional Determination (JD) application package*:** The JD application includes site descriptions, procedural descriptions for the delineation, study findings, proposed wetland boundaries, background information, map exhibits, and completed USACE data sheets.
- ***Wetlands impact assessment*:** The impact analysis was completed using GIS mapping by overlaying the delineated wetland areas with the proposed temporary limits of construction (LOC) and permanent limits of disturbance (LOD) for the three Build Alternatives and B-CSX Design Option.

3.14.2 Affected Environment

The WOUS and wetlands identified during the investigation are shown in **Figure 3-82.** The wetland delineation using USACE criteria identified three wetlands on NPS lands or land on which NPS has a property interest, and two WOUS in the study area outside of NPS land or land on which NPS has a property interest; the delineation using NPS criteria identified eight wetlands in the study area within NPS land or land on which the NPS has a property interest. **Table 3-34** summarizes the total area of study area WOUS and wetland areas under the jurisdiction of USACE and NPS.

The predominant types of wetlands identified within the study area are Palustrine Forested/Shrub Wetlands (PFO) and Palustrine Emergent Wetlands (PEM) as defined by the guidance in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). 11.5 acres of PEM wetlands and 4.2 acres of PFO wetlands are located within the study area. A Palustrine system can generally be defined as all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent.

Based on a desktop review, a preliminary, qualitative assessment of wetland services and functions was performed. The wetlands on-site likely provide some degree of flood protection from surface water detention and the wetlands have some potential to abate a small degree of storm surge. The developed nature of the surrounding landscape may increase the relative value of these storm-related services. The emergent wetlands appear to serve some recreational function, evidenced by the existing walking path. The historical contamination of the site combined with a known history of beaver activity, lends itself to poor recreational fishing services. The fragmented nature of the site and its situation near major infrastructure contribute to poor wildlife habitat and poor wildlife diversity aside from potential waterfowl and waterbirds using the nearby Potomac River. The pervasive invasive species coverage throughout the PEM and PFO wetlands, combined with the continual disturbance along the edge conditions of the ecosystem, contributes to a low likelihood of unique, uncommon, or highly diverse wetland plant communities. No commercial products are provided from the wetlands. The PFO and PEM wetlands likely serve some functions of nutrient transformation and retention of sediments and other particulates. Once a preferred alternative is determined, the alternative will undergo a Function and Value Assessment as required by NPS for the Wetlands Statement of Findings per Director's Order 77-1 and will also be included in the Final EIS.

Table 3-34: USACE and NPS Wetlands and Waters of the U.S.

	USACE Only (acres)	NPS and USACE (acres)	NPS Only (acres)	Total (acres)	Linear Feet
Wetlands					
W404-1	N/A	12.19	N/A	**12.19**	N/A
W404-2	N/A	0.06	N/A	**0.06**	N/A
W404-3	N/A	0.17	N/A	**0.17**	N/A
TOTAL	**N/A**	**12.42**	**N/A**	**12.42**	**N/A**
Waters of the U.S.					
WOUS-1	1.32	0.61	N/A	**1.93**	396
WOUS-2	0.19	0.54	N/A	**0.73**	1,795
Area of Four Mile Run Not Delineated*	N/A	N/A	N/A	**4.40**	860
TOTAL	**1.51**	**1.15**	**N/A**	**7.06**	N/A
NPS Wetlands					
WNPS-1	N/A	N/A	0.92	**0.92**	N/A
WNPS-2	N/A	N/A	0.04	**0.04**	N/A
WNPS-3	N/A	N/A	1.17	**1.17**	N/A
WNPS-4	N/A	N/A	0.02	**0.02**	N/A
WNPS-5	N/A	N/A	0.17	**0.17**	N/A
WNPS-6	N/A	N/A	0.05	**0.05**	N/A
WNPS-7	N/A	N/A	0.21	**0.21**	N/A
WNPS-8	**N/A**	**N/A**	**0.02**	**0.02**	
TOTAL	**N/A**	**N/A**	**2.60**	**2.60**	**N/A**

N/A = Not Applicable
*The area of Four Mile Run within the project Study Area and outside of the wetlands survey area (west of Potomac Avenue) was estimated using GIS.

3.14.3 Environmental Consequences

3.14.3.1 No Build Alternative

No effect to wetlands or WOUS is anticipated as a result of the No Build Alternative.

3.14.3.2 Build Alternatives

Table 3-35 summarizes permanent wetland impacts for USACE, NPS, and USACE/NPS regulated WOUS and wetlands. Temporary impact to wetlands is described in **Section 3.24 Construction Impacts**.

Table 3-35: Permanent Impacts to NPS and USACE Regulated Wetlands

Alternative	USACE-only WOUS	NPS-only Wetlands (acres)	USACE and NPS Wetlands (acres)[1]	USACE Wetlands TOTAL (acres)	NPS Wetlands TOTAL (acres)
No Build	0.00	0.00	0.00	**0.00**	**0.00**
Build Alternative A	0.00	0.00	0.02	**0.02**	**0.02**
Build Alternative B	0.00	0.06	1.22	**1.22**	**1.28**
B-CSX Design Option	0.00	0.00	0.00	**0.00**	**0.00**
Build Alternative D[2]	0.06	0.04	0.46	**0.52**	**0.50**

[1]Areas that are classified as wetlands by both USACE and NPS.
[2]WOUS impacts only.

Figure 3-82: Waters of the United States Including Wetlands

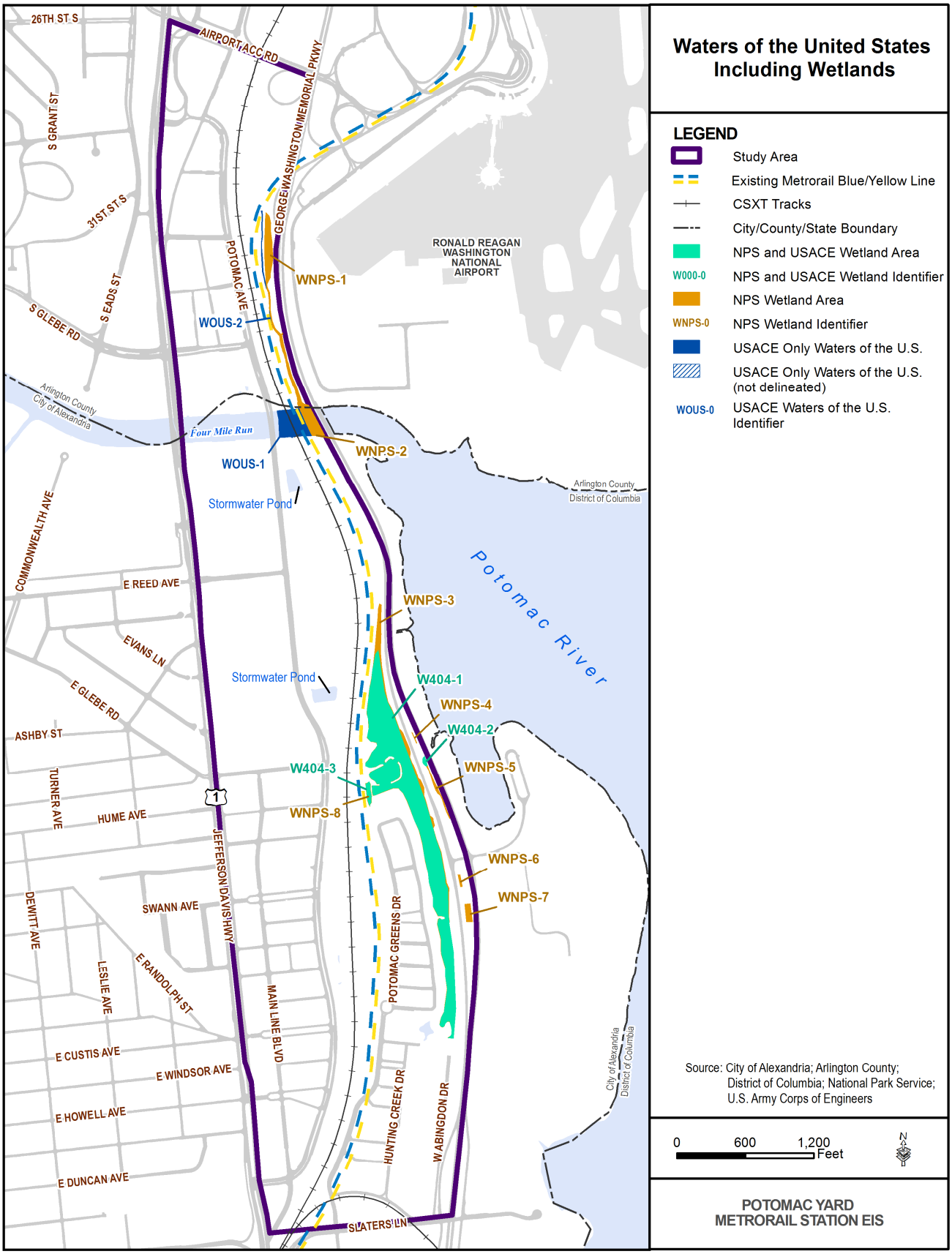


Table 3-36 summarizes permanent impact to wetland and WOUS for each Build Alternative and Design Option. Temporary impact to wetlands is described in **Section 3.24 Construction Impacts**. Based on a desktop review, a preliminary qualitative assessment of impacts to wetland services and functions was performed. For wetland impacts on NPS parkland and the Greens Scenic Area easement, the preferred alternative will undergo a Function and Value Assessment as required for the Statement of Findings per DO 77-1 and will also be included in the Final EIS.

Table 3-36: Permanent Wetland and WOUS Impacts (USACE Regulated)

Alternative	Wetlands (acres)				WOUS (acres)		
	W404-1	W404-2	W404-3	TOTAL	WOUS-1	WOUS-2	TOTAL
No Build	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Build Alternative A	0.00	0.00	0.02	0.02	0.00	0.00	0.00
Build Alternative B	1.05	0.00	0.17	1.22	0.00	0.00	0.00
B-CSX Design Option	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Build Alternative D	0.00	0.00	0.00	0.00	0.34	0.18	0.52

Build Alternative A

Build Alternative A would impact 0.02 acre of delineated wetlands regulated by both USACE and NPS east of the Metrorail tracks (see **Figure 3-83**).

The impact of 0.02 acre of wetlands would not significantly alter the services or functions the wetlands on-site due to the small impact footprint proposed.

Build Alternative B

Build Alternative B would permanently impact 1.28 acres of the wetland areas delineated east of the Metrorail tracks, including 1.22 acres of wetland regulated by both USACE and NPS. Of the proposed permanent impacts to wetlands regulated by both the USACE and the NPS, 0.88 acre are PEM and 0.34 acre are PFO. Build Alternative B would not impact delineated WOUS. Alternative B would fill wetland areas and require a retaining wall to accommodate the eastward shift of the Metrorail track alignment (see **Figure 3-83**).

A preliminary, qualitative assessment of impacts to wetland services and functions was performed. The walking path providing recreational services through the emergent wetlands would be eliminated. Through hydrology and hydraulics modeling, appropriate BMPs would be installed to mitigate or improve the water retention, nutrient transformation, and retention of sediments and other particulates. Impacts to waterfowl usage to this particular section of wetlands are anticipated, but in the greater scheme of the watershed, the loss is likely small.

B-CSX Design Option

B-CSX Design Option would not permanently impact any wetland regulated by either USACE or NPS or any delineated WOUS (see **Figure 3-84**).

Build Alternative D

Build Alternative D would impact 0.56 acre of wetlands, including 0.52 acre of WOUS identified in the northern part of the study area. The alternative would require a new bridge over Four Mile Run, placing new bridge piers in the stream. Build Alternative D would require fill and piers within the tributary channel where the tracks tie back to the existing Metrorail alignment in Arlington (at the northern end of the study area). Build Alternative D would not impact any wetlands delineated east of the Metrorail tracks and south of Four Mile Run (see **Figure 3-85**).

A preliminary, qualitative assessment of impacts to wetland services and functions was performed. The impacted wetland area north of Four Mile Run is generally confined within the disturbed area between the existing Metrorail and CSXT railroad tracks and the GWMP and likely provides very poor wildlife habitat. Therefore, no significant impacts to wildlife habitat are expected. Through hydrology and hydraulics modeling, appropriate BMPs would be installed to mitigate or improve the water retention, nutrient transformation, and retention of sediments and other particulates.

Figure 3-83: Alternatives A and B Permanent Impacts on NPS and USACE Wetland Areas

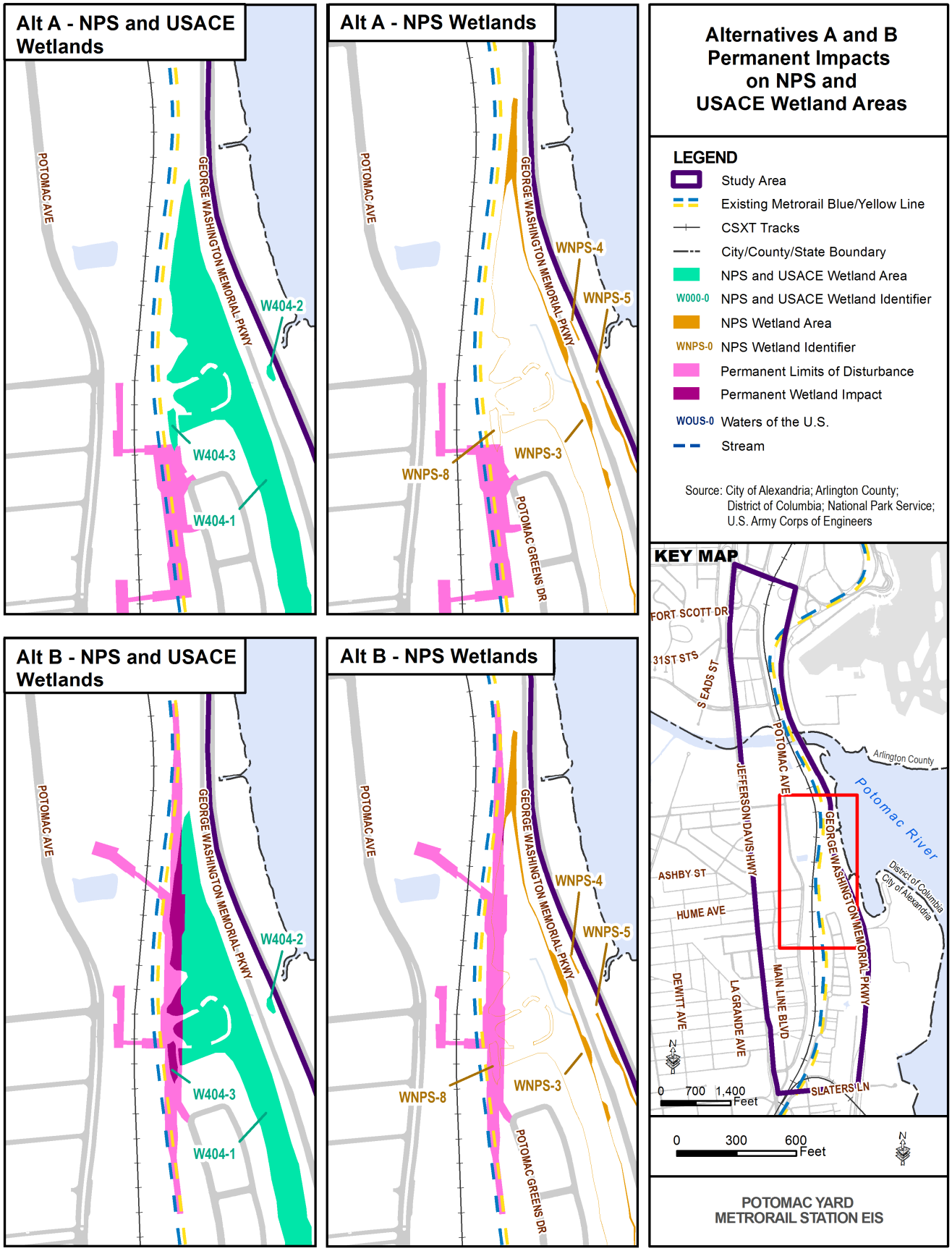


Figure 3-84: B-CSX Design Option Permanent Impacts on NPS and USACE WOUS and Wetland Areas

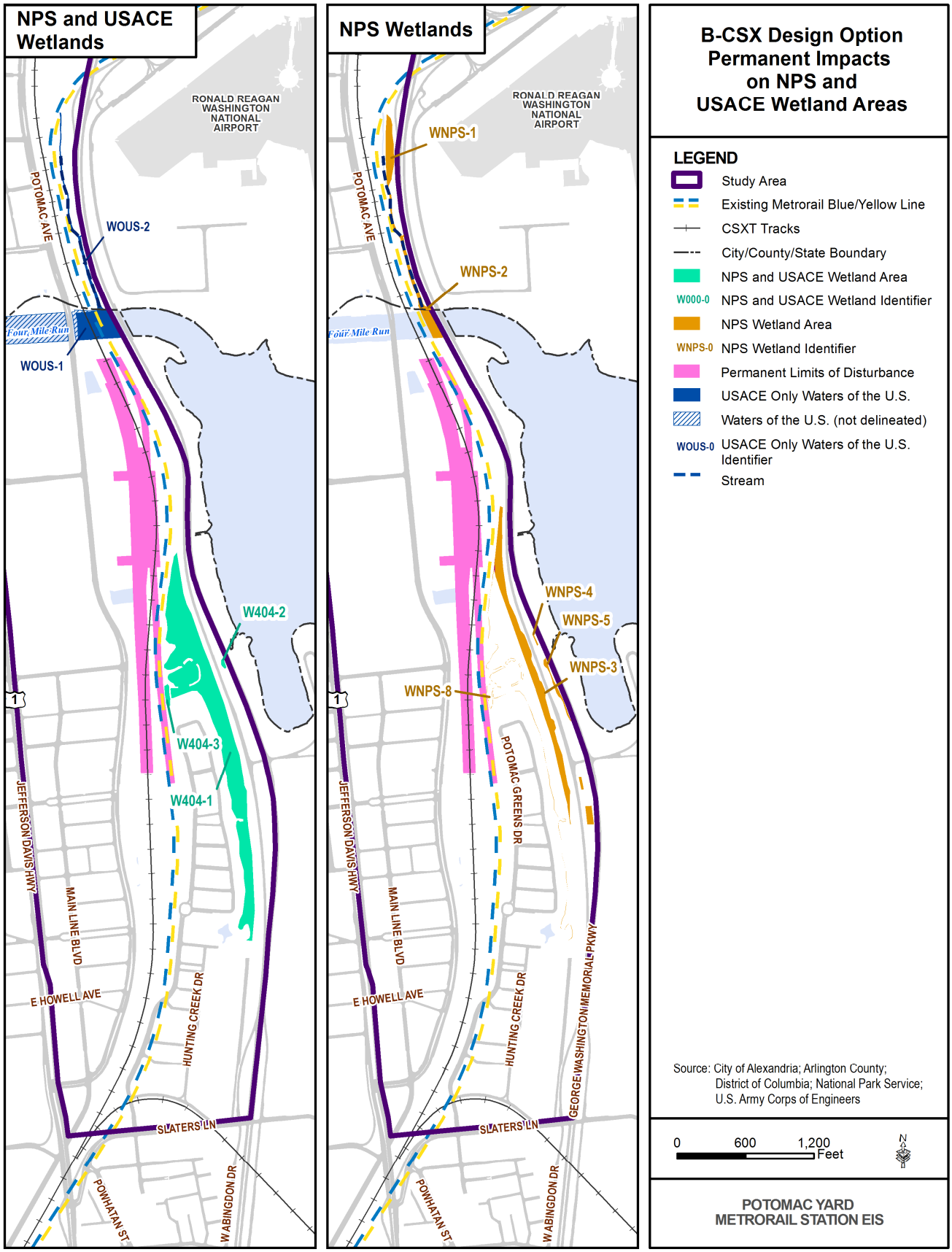
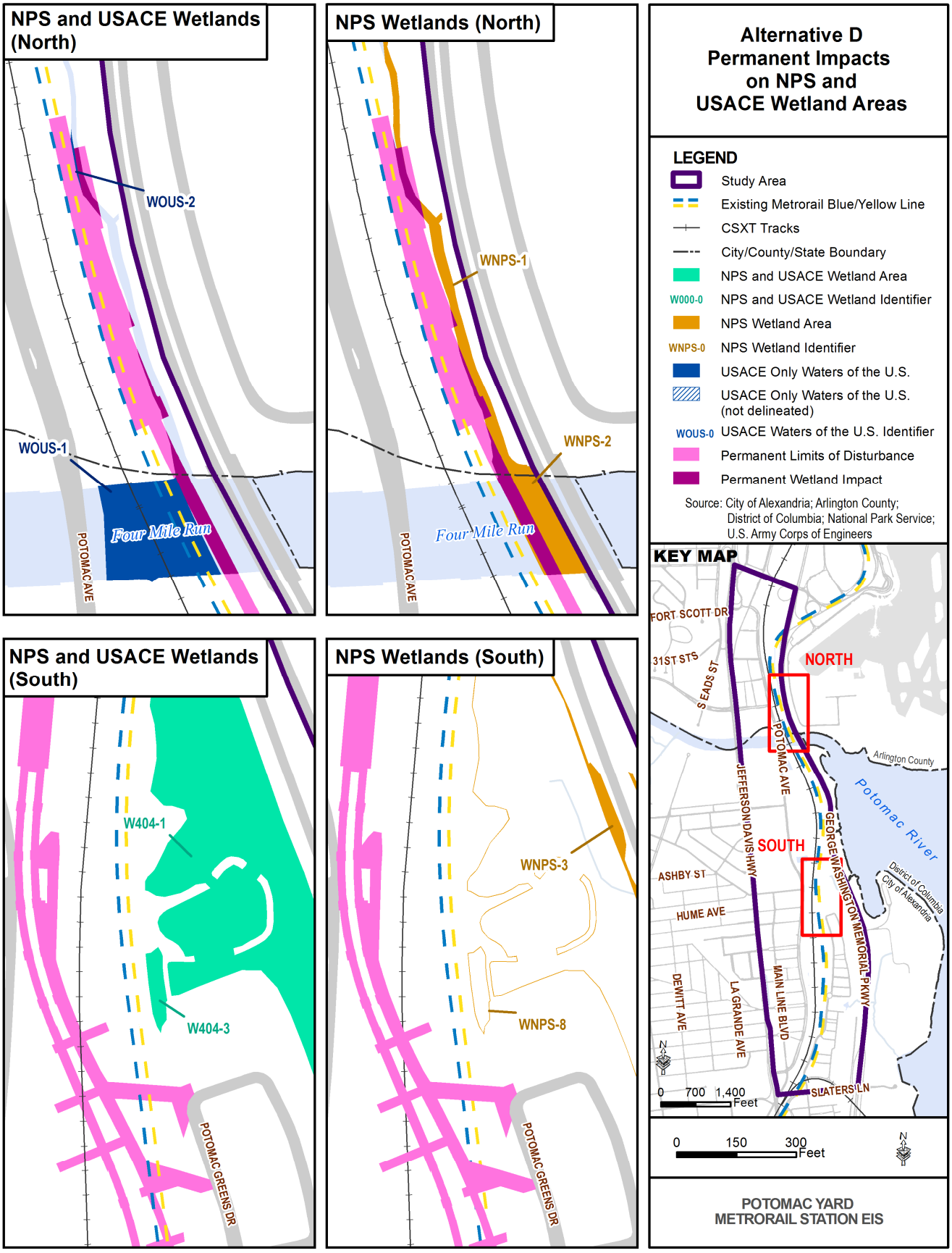


Figure 3-85: Alternative D Permanent Impacts on NPS and USACE WOUS and Wetland Areas



3.14.4 Mitigation

A Joint Permit Application (JPA) would be developed for both permanent and temporary project-related wetland impacts in compliance with Section 404 of the CWA. The permitting process would be initiated with USACE, VDEQ, and NPS. If wetlands are deemed tidal wetlands, the permitting process would also be initiated with VMRC. All NPS actions with the potential to have adverse impacts on wetlands must also comply with Director's Order 77-1. In the case where both NPS and USACE procedures apply, coordination with the appropriate USACE office will be initiated early in the process to reduce potential duplication of effort, and the JPA and NPS processes would be initiated at the design phase of the project. The USACE will review the permit application for the preferred alternative. Thereafter, the USACE may conduct an Alternatives Analysis to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) prior to completion of the Final EIS. Furthermore, the NPS will require a Statement of Findings with the Final EIS before the Record of Decision is signed. The Statement of Findings will require its own public review period.

Specific wetland mitigation strategies would be determined through the JPA and NPS processes for unavoidable impacts to WOUS and wetlands resulting from the preferred alternative. USACE, VDEQ, VMRC, and NPS would determine mitigation measures, as part of the JPA process and NPS Director's Order 77-1, where appropriate. If wetland compensation is necessary, the wetland restoration proposal will meet the compensation requirements of both the USACE and the NPS processes as well as EO 11990 for no net loss. Typical wetland mitigation measures include on-site or off-site wetland compensation according to specified ratios of acres of created or restored wetland to be provided for each acre of impacted wetland; ratios are based on the size and function of existing wetland impacted and the type of wetland compensation (on-site, off-site, fee-in-lieu) as determined during the JPA process.

3.15 Floodplains

This section assesses the potential impact of the alternatives to Federal Emergency Management Agency (FEMA) designated flood hazard zones. Floodplains are protected under EO 11988 Floodplain Management and USDOT Order 5650.2 Floodplain Management and Protection. The analysis is described in more detail in the *Water Resources Technical Memorandum,* in Volume II. Temporary impacts to floodplains due to construction are described in **Section 3.24 Construction Impacts**.

3.15.1 Methodology

Floodplains were analyzed using Flood Insurance Rate Maps (FIRMs) developed by the FEMA. The FIRMs depict 100-year and 500-year flood zones within the study area. The impact analysis was completed in GIS by overlaying the 100-year and 500-year flood zone areas with the proposed LOC and LOD for the three Build Alternatives and B-CSX Design Option. Referenced elevations of flood zones and proposed structures are in relation to current sea level as measured by the North American Vertical Datum 1988 (NAVD), which is the standard reference elevation for sea level.

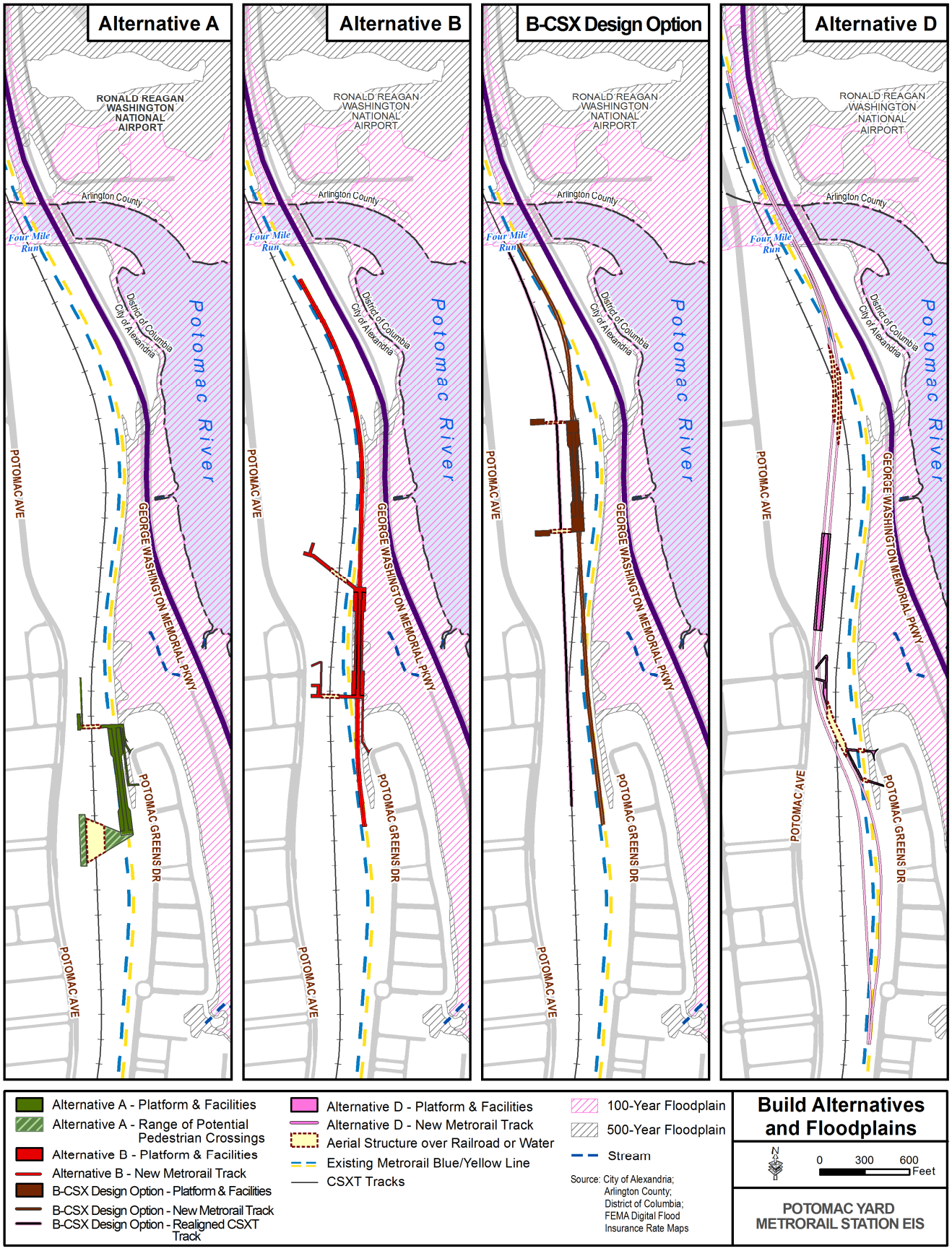
3.15.2 Affected Environment

Figure 3-86 illustrates 100-year and 500-year flood zones within the study area. The Base Flood Elevation for 100-year flood zones within the study area is 10 feet NAVD88 (FIRM datum). The average elevation for the 500-year flood zone is estimated at 12 feet NAVD88.

The 100-year floodplain extends from the Potomac River to the eastern edge of the Potomac Greens neighborhood and to the eastern side of the Metrorail tracks north of the Potomac Greens neighborhood. 39.88 acres of the project area are located within the 100-year floodplain.

The 500-year floodplain covers an additional 6.29 acres of the study area (excluding the area also within the 100-year floodplain), mostly along the edges of the Potomac Greens neighborhood and along the existing Metrorail tracks near the northern edge of the Potomac Greens neighborhood.

Figure 3-86: Build Alternatives and Floodplains



Study area floodplains generally serve multiple functions relating to flood and erosion control, surface water quality maintenance, groundwater recharge, and biological productivity. The following is a summary of the general functional values of the floodplain areas:

- Natural Flood & Erosion Control – provide flood storage and conveyance; reduce flood velocities, flood peaks and sedimentation;
- Surface Water Quality Maintenance – filter nutrients and impurities from runoff; process organic wastes, and moderate temperature of water;
- Groundwater Recharge – promote infiltration and aquifer recharge; reduce frequency and duration of low surface flows;
- Biological Productivity – support high rate of plant growth; maintain biodiversity and integrity of ecosystem; and
- Fish and Wildlife Habitats – provide breeding and feeding grounds; and create and enhance waterfowl habitat.

3.15.3 Environmental Consequences

3.15.3.1 No Build Alternative

No effect to floodplains is anticipated as a result of the No Build Alternative.

3.15.3.2 Build Alternatives

Floodplain impacts for each Build Alternative are summarized in **Table 3-37**. 100-year flood zones have a one percent chance of flooding in any given year, and 500-year flood zones have a 0.2 percent chance of flooding in any given year. Based on discussions with the City of Alexandria and Arlington County's engineering staff, none of the three Build Alternatives or B-CSX Design Option is expected to raise the 100-year Base Flood Elevation within the study area if constructed within the flood zones. This statement is based on the location of the large surface area of the Potomac River relative to the station area. Impacts to the habitat function of the floodplain areas are described in **Section 3.15 Waters of the U.S. and Wetlands** and **Section 3.18 Ecosystems and Endangered Species**.

Table 3-37: Permanent Floodplain Impacts

Alternative	100-year (acres)	500-year[1] (acres)
No Build	0	0
Build Alternative A	0.00	0.41
Build Alternative B	1.48	0.95
B-CSX Design Option	0.00	0.00
Build Alternative D	0.90	0.41

[1]Acreage excludes areas in 100-year floodplain.

Specific impacts to floodplain areas within NPS parkland and the Greens Scenic Area easement for each Build Alternative are summarized in **Table 3-38**.

Table 3-38: Permanent Floodplain Impacts (NPS Parkland and Greens Scenic Area Easement)

Alternative		100-year Floodplain (acres)	500-year Floodplain[1] (acres)
No Build	GWMP	0.00	0.00
	Greens Scenic Area easement	0.00	0.00
Build Alternative A	GWMP	0.00	0.00
	Greens Scenic Area easement	0.00	0.00
Build Alternative B	GWMP	0.05	0.04
	Greens Scenic Area easement	1.26	0.45
B-CSX Design Option	GWMP	0.00	0.00
	Greens Scenic Area easement	0.00	0.00
Build Alternative D	GWMP	0.77	0.14
	Greens Scenic Area easement	0.00	0.00

[1]Acreage excludes areas in 100-year floodplain.

For construction within 100-year flood zones, the project would be subject to local development approvals and Federal approvals for any activities on NPS land. Approvals would be obtained in accordance with Sec. 6-300 of

the *City of Alexandria Zoning Ordinance*, Chapter 48 of the *Arlington County Code* and NPS Director's Order #77-2: Floodplain Management, which includes the development of a Floodplain Assessment and Floodplain Statement of Findings. As part of the City of Alexandria and Arlington County development review processes, the project would quantify how the preferred alternative would change the 100-year Base Flood Elevation through a hydrologic engineering analysis. The *City of Alexandria Zoning Ordinance* also requires that structures built within the 100-year flood zones be "flood-proof." The City of Alexandria defines flood-proofing as "any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents" (Section 6-200, *City of Alexandria Zoning Ordinance*).

Impacts to regulated floodplains on NPS land are subject to the policies of *NPS Director's Order 77-2 Floodplain Management*, which requires the preparation of a Statement of Findings. The general procedures for the development of a Statement of Findings are further detailed in *NPS Procedural Manual 77-2*. The Statement of Findings must be completed before the Record of Decision (ROD) is issued for the Final EIS.

The *Procedural Manual* requires that a proposed action be classified into one of three "Action Classes":

- *Class I Actions* include location or construction of administrative, residential, warehouse, and maintenance buildings; non-excepted parking lots; or other man-made features which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values. Class I Actions are subject to the floodplain policies and procedures if they lie within the 100-year floodplain.
- *Class II Actions* include any activity for which even a slight chance of flooding is too great. Class II Actions are subject to the floodplain policies and procedures if they lie within the 500-year floodplain.
- *Class III Actions* include Class I or Class II Actions in high hazard areas, which include coastal high hazard areas and areas subject to flash flooding.

After the Action Class is determined, the Statement of Findings is prepared. The Statement of Findings includes the following information:

- *Preliminary Floodplain Assessment* uses existing data sources such as FIRMs and an analysis of ecological functions and value, and associated hydrologic factors such as the rate of flood water rise, duration of flooding, likely sediment and debris loads, potential pollution hazards, and hazards associated with ice and/or debris jams;
- *Delineation of the Regulatory Floodplain* within the proposed action area;
- *Information on Flood Conditions and Hazards* which describes flooding frequency at the proposed activity site, the probability of flooding over the planned project life, and the hydraulic attributes associated with the regulatory floodplain including flood depth and velocity; and
- *Design Actions to Manage Flood Conditions* which will be taken to manage floodplain conditions including selection of an alternative (non-floodplain) site, structural or other forms of mitigation, and/or flood warning and evacuation plans.

Build Alternative A

Build Alternative A would not impact 100-year flood zones but would impact the 500-year flood zone, east of the existing Metrorail tracks.

Build Alternative B

Build Alternative B would impact both 100-year and 500-year flood zones, east of the existing Metrorail tracks. The impacted flood zones span the GWMP from the Potomac River. The station platform and realigned track would be constructed on retained or graded fill for a segment approximately 1,400 feet in length. The fill and retaining walls would be constructed within the 100-year flood zone. The station and track would be built at approximately the same elevation as the existing Metrorail tracks, 25 feet above sea level NAVD88, which is above the 100-year Base Flood elevation of 10 feet NAVD88 (FIRM datum).

B-CSX Design Option

B-CSX Design Option would not impact either the 100-year or 500-year flood zones.

Build Alternative D

Build Alternative D would impact 100-year and 500-year flood zones associated with Four Mile Run. A section of fill is necessary for the segment of track north of Four Mile Run where the aerial structure touches down before tying back into the existing Metrorail alignment. The fill would be placed within the 100-year flood zone. The track segment to be constructed on fill would extend approximately 600 feet in length at an elevation of approximately 25 feet NAVD88, which is above the Base Flood Elevation of 10 feet NAVD88 (FIRM datum).

3.15.4 Mitigation

Mitigation would include flood-proofing and other design techniques that would prevent the structure from collapsing or being damaged during a flood. The local, state, and Federal agencies are expected to offer project specific design recommendations to mitigate floodplain impacts at the permitting stage. Proposed mitigation would be consistent with permitting requirements, and local, state, and Federal regulatory requirements.

3.16 Navigable Waterways and Coastal Zones

This section discusses the potential impacts on navigable waterways and the coastal zone status of and regulations applicable to the study area. Both the City of Alexandria and Arlington County are subject to compliance with the requirements the Coastal Zone Management Act and Chesapeake Bay Preservation Act. A Coastal Zone Consistency Statement was prepared and submitted to the Virginia Department of Environmental Quality (VDEQ) for review and determination.

Federal regulations define navigable waterways as “waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Once made, a determination of navigability applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity” (33 CFR Part 329.4). In other words, once a waterway is designated as a navigable waterway (meaning that it is sufficiently wide, deep, and free from obstructions to allow travel by vessels), the designation is not allowed to be violated or changed by current or future actions or events that interfere with vessel movement.

Under Virginia’s Chesapeake Bay Preservation Act, both the City of Alexandria and Arlington County have designated Resource Protection Areas (RPAs) as 100-foot buffer area around tributaries, shore line, and delineated wetlands where development is restricted. This section assesses impacts to RPAs due to the construction and operation of the alternatives.

The following Federal and local guidance and policies are applicable to the resource:

- *Coastal Zone Management Act of 1972*;
- *Rivers and Harbors Appropriations Act of 1899*;
- *Navigation and Navigable Waterways*;
- *Code of Virginia, Waters of the State, Ports and Harbors*;
- *Chesapeake Bay Preservation Act of 1988*;
- *City of Alexandria Zoning Ordinance, Article XIII, Environmental Management*; and
- *Arlington County Code, Chesapeake Bay Preservation Ordinance*.

The analysis is described in more detail in the *Water Resources Technical Memorandum,* in Volume II.

3.16.1 Methodology

3.16.1.1 Navigable Waterways

FTA coordinated with the U.S. Coast Guard (USCG) to verify whether Four Mile Run is considered a Navigable Water of the United States. To further verify the navigability of Four Mile Run, National Oceanic and Atmospheric Administration (NOAA) navigation charts were also reviewed and the USACE-Norfolk District provided guidance on “Navigable Waters of the U.S.”

3.16.1.2 Coastal Zone

To ensure project consistency with the Coastal Zone Management Act (CZMA), a Coastal Zone Consistency Determination for the project was submitted to VDEQ and is currently under review. The consistency determination demonstrates the project’s compliance with “enforceable policies” in Virginia’s coastal zone.

To assess the impacts to RPAs, GIS mapping was used to identify the portion of RPAs that overlap with the proposed temporary LOC and permanent LOD for the three Build Alternatives and B-CSX Design Option.

3.16.2 Affected Environment

3.16.2.1 Navigable Waterways

Through consultations with the FTA for the project, the USCG confirmed that Four Mile Run is considered both a Navigable Water of the U.S. and tidal water body within the study area.

3.16.2.2 Coastal Zones

Figure 3-87 illustrates RPAs in the study area that are associated with the Potomac River and Four Mile Run. Existing RPAs are designated in Chesapeake Bay Preservation Area Overlay District maps adopted by the City and County. RPAs in the study area include areas identified on the City and County's adopted RPA maps, USACE-regulated wetlands delineated for the project, and 100-foot buffers around the delineated wetlands.

RPAs were identified for the project in accordance with the Virginia *Chesapeake Bay Preservation Act*, and Sec. 13-105(B) of the *City of Alexandria Zoning Ordinance*. The Coastal Zone Consistency Certification for the project is provided in Appendix C of the *Water Resources Technical Memorandum*, Volume II.

3.16.3 Environmental Consequences

3.16.3.1 Navigable Waterways

Build Alternative A

Build Alternative A would not impact or cross any navigable waterways in the study area.

Build Alternative B

Build Alternative B would not impact or cross any navigable waterways in the study area.

B-CSX Design Option

B-CSX Design Option would not impact or cross any navigable waterways in the study area.

Build Alternative D

Build Alternative D would require the construction of a new bridge approximately 75 feet east of the existing Metrorail bridge over Four Mile Run. The horizontal clearance of the replacement bridge is expected to be similar to the existing Metrorail bridge, and the vertical clearance would be higher. The bridge would not adversely affect the existing navigability of Four Mile Run. If Build Alternative D is selected as the preferred alternative and is advanced to design, a bridge permit or waiver would be sought through the U.S. Coast Guard in accordance with Section 10 of the Rivers and Harbors Act.

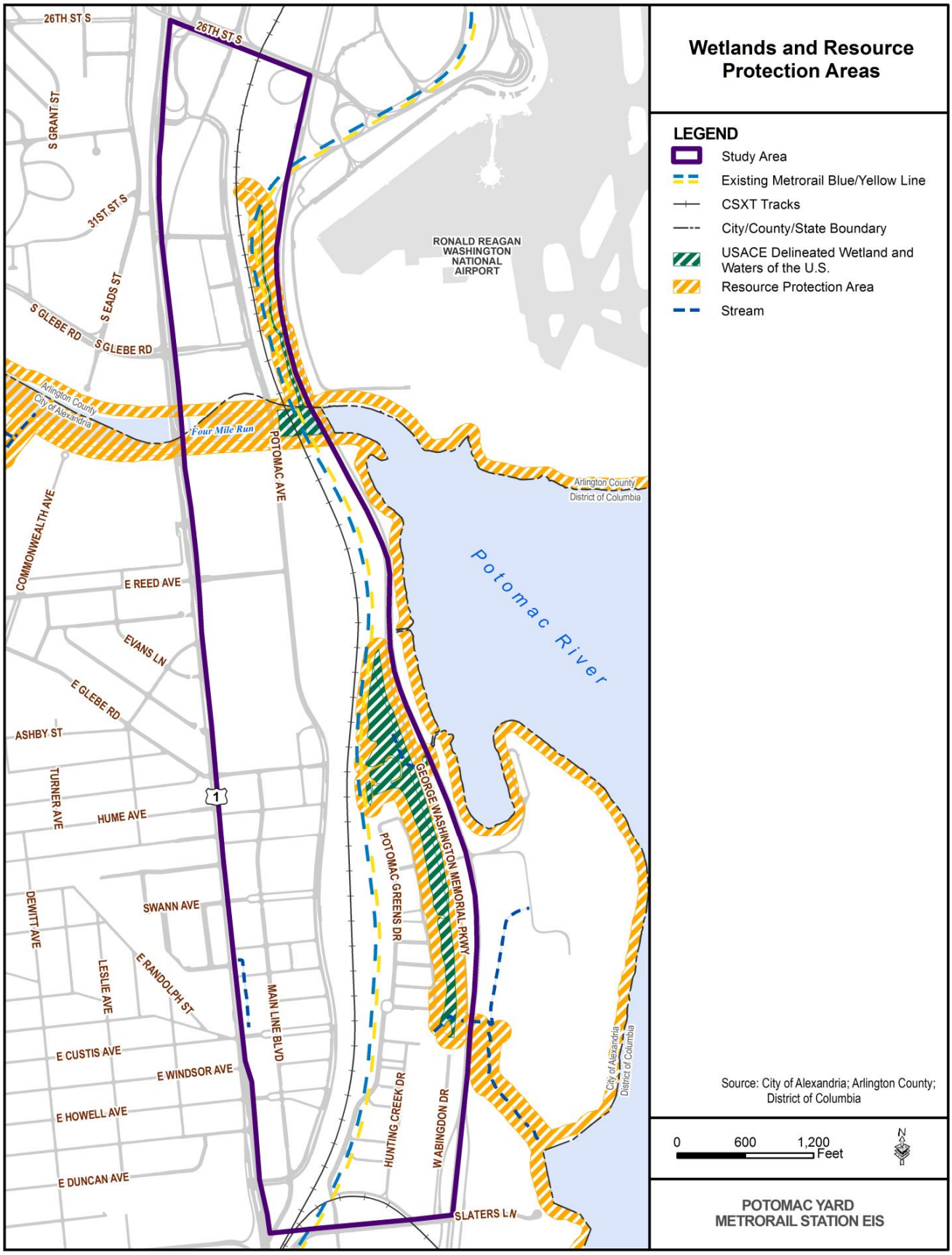
3.16.3.2 Chesapeake Bay Preservation Areas

Table 3-39 summarizes the estimated permanent impacts to RPAs. These impact estimates include RPAs identified on the City's adopted RPA map, wetlands delineated for the project, and 100-foot buffers around the delineated wetlands consistent with Sec. 13-105(B) of the City zoning ordinance.

Table 3-39: Permanent Resource Protection Area Impacts

Alternative	Impact (acres)
No Build	0.00
Build Alternative A	0.41
Build Alternative B	3.36
B-CSX Design Option	1.12
Build Alternative D	2.07

Figure 3-87: Wetlands and Resource Protection Areas



Build Alternative A

Build Alternative A would impact 0.41 acre of RPAs around the proposed platform areas where wetlands have been delineated east of the Metrorail tracks.

Build Alternative B

Build Alternative B would impact 3.36 acres of RPAs around the proposed platform areas where wetlands have been delineated east of the Metrorail tracks.

B-CSX Design Option

B-CSX Design Option would impact 1.12 acres of RPAs around the proposed platform areas where wetlands have been delineated east of the Metrorail tracks.

Build Alternative D

Build Alternative D would impact 2.07 acres of RPAs buffering Four Mile Run with a new bridge crossing the waterway.

3.16.3.3 Coastal Zone Consistency

The project is expected to be consistent with the enforceable policies of Virginia's Coastal Zone Management Program as described in the draft Consistency Determination (pending review by VDEQ), which is included in the *Water Resources Technical Memorandum* in Volume II. To comply with the City of Alexandria and Arlington County's Chesapeake Bay Preservation Ordinances, the project would disturb no more land than is necessary, preserve indigenous vegetation, develop a project-specific landscape plan, and minimize impervious surface cover.

3.16.4 Mitigation

3.16.4.1 Navigable Waterways

As no effect to the navigability of Four Mile Run is anticipated under the three Build Alternatives and B-CSX Design Option, no mitigation is proposed.

3.16.4.2 Coastal Zones and Chesapeake Bay Preservation Areas

Mitigation would be developed in accordance with VDEQ Chesapeake Bay Local Assistance Department (CBLAD), *Riparian Buffers Modification & Mitigation Manual* planting recommendations or other mitigation deemed appropriate to the satisfaction of the City of Alexandria Director of the Department of Transportation and Environmental Services. Contribution to the City of Alexandria Water Quality Improvement Fund may be acceptable in combination with mitigation strategies.

3.17 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 protects rivers designated by Congress or the Secretary of Interior as wild, scenic, or recreational rivers. No Federal or state designated scenic river is located in the study area, based on a review of the Interagency Wild & Scenic Rivers Council, Designated Wild & Scenic Rivers for Virginia and Washington, DC (National Wildlife and Scenic River System, 2012). No scenic river designated by the Commonwealth of Virginia is located in the study area. Therefore, no impact to this resource is anticipated and no further analysis is necessary.

3.18 Ecosystems and Endangered Species

This section describes the potential impacts of the alternatives to study area ecosystems (terrestrial and aquatic biological resources and habitats), including ecologically sensitive areas, and Federally listed or state listed rare, threatened and endangered species.

In the context of the EIS, ecologically sensitive areas refer to natural areas that the state or Federal government has designated for conservation purposes. At the Federal level, ecologically sensitive areas include designated National Wildlife Refuges and "critical habitat" areas. National Wildlife Refuges are designated public lands and waters that are managed by U.S. Fish and Wildlife Service (USFWS) to conserve fish, wildlife, and plants. USFWS also formally designates certain areas as "critical habitat" for Federally listed threatened or endangered species. USFWS defines critical habitat as "geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection."

At the state level, ecologically sensitive areas include those designated by VDCR as Natural Area Preserves and Natural Community areas. Biological resources within the study area are protected by Federal and state law, as well as local regulation. The analysis is described in more detail in the *Ecosystems and Endangered Species Technical Memorandum*, Volume II.

3.18.1 Methodology

3.18.1.1 Ecosystems

Study area ecosystems were assessed using findings from this project's water resources and wetlands analyses, including the *Waters of the U.S. (Including Wetlands) Delineation Report* (February 2012). Other relevant studies of natural resources in the study area included the City of Alexandria, *Water Quality Management Supplement* (2001), and NPS, *Final Environmental Impact Statement, George Washington Memorial Parkway, Potomac Greens* (1991). Study area ecosystems were identified through aerial imagery and field observations. Potential impacts on existing habitat were assessed using GIS mapping overlays of the project limits of disturbance for each Build Alternative. Ecologically sensitive areas (apart from documented habitat of Federally or state-listed rare, threatened or endangered species described below) were identified using the USFWS list of National Wildlife Refuges and the Virginia Department of Conservation and Recreation (VDCR) Natural Heritage database.

3.18.1.2 Threatened and Endangered Species

The USFWS Threatened and Endangered Species Database System was used to identify Federal and state species listed within the study area for the City of Alexandria and Arlington County. VDCR and Virginia Department of Game and Inland Fisheries (VDGIF) provided written determinations regarding whether the project would impact any Federally listed or state listed species.

3.18.2 Affected Environment

3.18.2.1 Ecosystems

Habitat is utilized by plant and animal species for food, shelter, and water. Within the study area, existing habitat is divided into the following four general categories (see **Figure 3-88**):

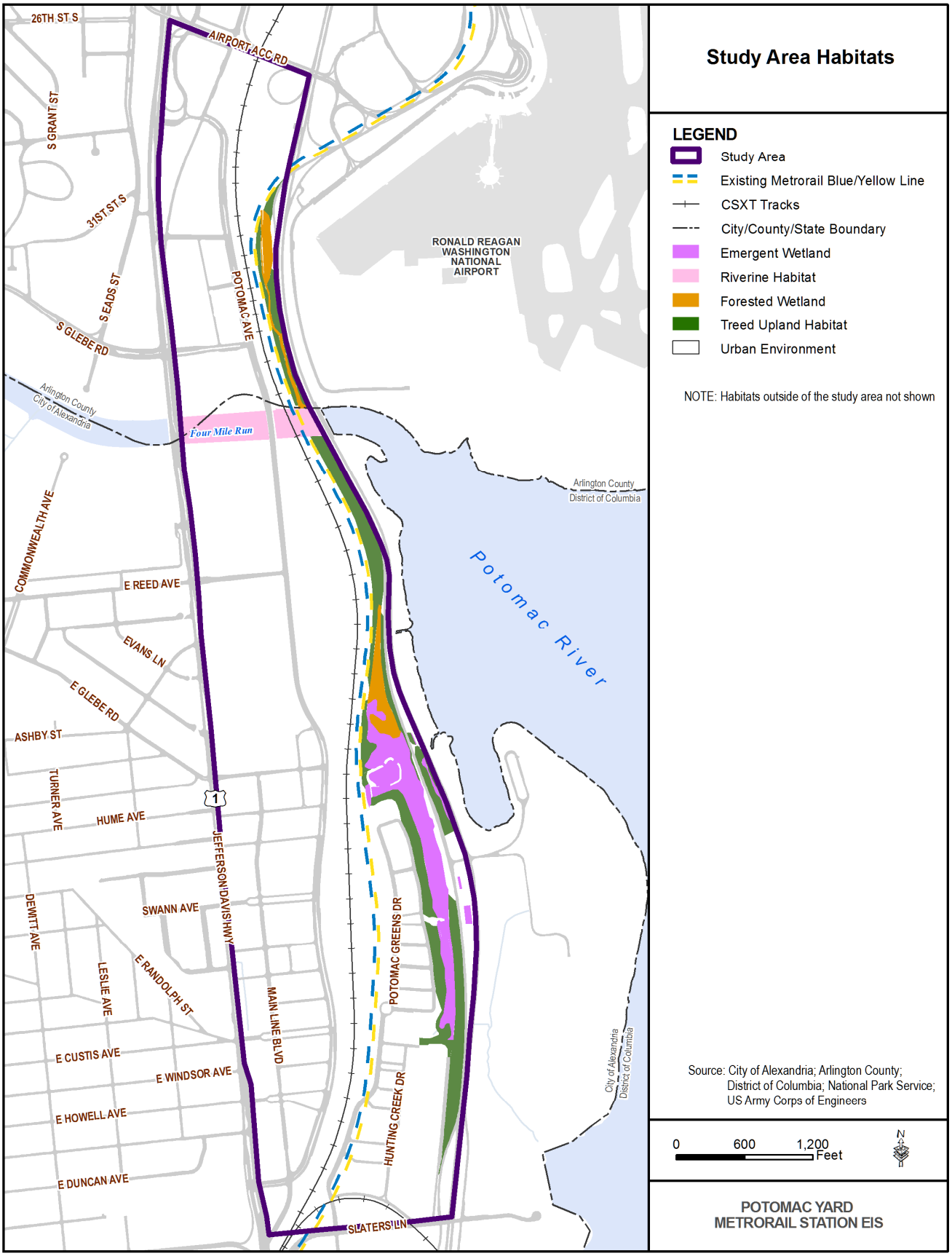
- **Emergent wetlands:** Generally characterized by erect, rooted herbaceous hydrophytic vegetation. The ecosystem functions of Emergent wetlands include floodflow protection, sediment trapping, nutrient retention and removal, and valuable habitat for many animal and plant species.
- **Riverine habitat:** Generally characterized by floating and sub-emergent herbaceous vegetation, insect, fish, amphibian and reptile species.
- **Forested wetlands:** Dominated by woody species that are adapted to tolerate saturation of their roots for long periods during the growing season. The ecosystem functions of Forested wetlands include flood flow alteration, sediment trapping, nutrient retention and removal, and wildlife habitat.
- **Treed uplands:** Generally dominated by hardwood tree species. Ecosystem functions of Treed Uplands include moisture retention, flood flow protection, soil stabilization, and habitat for many small mammals, local nesting birds, and migratory birds.

The functions and values of the study area wetland and riverine habitats are described in **Section 3.14** Wetlands. For the treed upland habitat, the fragmented nature and urbanized location of the study area habitat contribute to poor wildlife habitat, though the existing treed upland habitat may provide a refuge for species adapted to urbanized environments. The pervasive invasive species coverage, combined with the continual disturbance along the edge conditions of the ecosystem, contribute to a low likelihood of unique, uncommon, or highly diverse plant communities. No commercial products are provided from the treed uplands. The vegetation within the treed uplands likely provides some sediment and nutrient retention through runoff reduction. Partially due to the aggressive growth habit of the invasive species, the vegetation of the treed uplands also serve as a visual screen of adjacent land uses for residential areas and parklands.

3.18.2.2 Ecologically Sensitive Areas

No National Wildlife Refuge exists in the study area, nor is there any Federally designated critical habitat within the study area (*Critical Habitat Portal*, 2012). VDCR did not identify any state-designated Natural Communities within the study area in the agency's project determination (see *Ecosystems & Endangered Species Technical Memorandum*, Volume II, Appendix C). Invasive species were identified in the study area.

Figure 3-88: Study Area Habitats



3.18.2.3 Threatened and Endangered Species

Table 3-40 summarizes the Federally listed and state listed species that have the potential to occur within the study area.

Table 3-40: Federally listed and State listed Species

Species	Status	Notes/Documentation
Federally Endangered, Threatened, Proposed, and Candidate, or Protected Species		
Sensitive Joint-Vetch (*Aeschynomene virginica*)	Threatened	This plant species occurs in fresh to slightly brackish tidal river systems, typically at the outer fringe of marshes or shores. The northern portion of the study area crosses Four Mile Run. Within the study area, Four Mile Run is tidally influenced; therefore, the appropriate habitat to support the Sensitive Joint-Vetch may occur within the study area.
Bald Eagle *(Haliaeetus leucocephalus)*	Bald and Golden Eagle Protection Act of 1940	The College of William & Mary Center for Conservation Biology does not report any bald eagle nests within the City of Alexandria or the study area specifically.
State listed Endangered, Threatened, Proposed, Candidate Species, and Species of Concern		
Appalachian Springsnail *(Fontigens bottimeri)*	State: Listed Endangered	This species may inhabit jurisdictions within the Potomac River basin, including the District of Columbia and Maryland. The VDCR-DNH Natural Heritage database reports potential species or habitat within Arlington County. USFWS lists the Appalachian Springsnail as a Federal Species of Concern.
Wood Turtle *(Glyptemys insculpta)*	State: Listed Threatened	VDCR-DNH reports this species in the City of Alexandria. The City of Alexandria Master Plan's Water Quality Supplement (2001) states that "Wood Turtles can be found near clear brooks and streams in deciduous woodlands, although they have also been found in woodland bogs and marshy fields."

USFWS has proposed that the Northern Long-Eared Bat (*Myotis septentrionalis*) be listed as Threatened under the Endangered Species Act. USFWS anticipates a final decision by April 2, 2015. The project study area is included in the bat's White-Nose Syndrome Buffer Zone under the proposed rule. Should the proposed listing be adopted, the project would undergo additional analysis as required by the Endangered Species Act.

3.18.3 Environmental Consequences

3.18.3.1 No Build Alternative

Under the No Build Alternative, no impact to Federally listed or state listed species, Federally designated critical habitat for protected species, or study area ecosystems is projected.

3.18.3.2 Build Alternatives

Table 3-41 provides estimates of permanent and temporary impact for each type of habitat and Build Alternative.

Table 3-41: Permanent Wetland, Riverine, and Upland Habitat Impacts (Study Area)

Habitat	No Build	Build Alternative A (acres)	Build Alternative B (acres)	B-CSX Design Option (acres)	Build Alternative D (acres)
Emergent Wetland*	0.00	0.02	0.96	0.00	0.00
Forested Wetland*	0.00	0.00	0.32	0.00	0.23
Riverine Habitat	0.00	0.00	0.00	0.00	0.34
Wetland Total	**0.00**	**0.02**	**1.28**	**0.00**	**0.57**
Treed Upland	0.00	0.01	1.30	0.18	1.19
Natural Habitat Total	**0.00**	**0.03**	**2.58**	**0.18**	**1.76**

For just the portions of the study area within NPS parkland and the Greens Scenic Area easement, **Table 3-42** provides estimates of permanent and temporary impact for each type of habitat and Build Alternative.

Table 3-42: Permanent Wetland, Riverine, and Upland Habitat Impacts (NPS Parkland and Greens Scenic Area Easement)

Habitat		No Build	Build Alternative A (acres)	Build Alternative B (acres)	B-CSX Design Option (acres)	Build Alternative D (acres)
Emergent Wetland*	GWMP	0	0	0	**0**	0
	Greens Scenic Area easement	0	0	0.88	0	0
Forested Wetland*	GWMP	0	0	0.01	0	0.21
	Greens Scenic Area easement	0	0	0.23	0	0
Riverine Habitat	GWMP	0	0	0	0	0.29
	Greens Scenic Area easement	0	0	0	0	0
WOUS and Wetland Total	**GWMP**	**0**	**0**	**0.01**	**0**	**0.50**
	Greens Scenic Area easement	**0**	**0**	**1.11**	**0**	**0**
Treed Upland	GWMP	0	0	0.15	0	0.93
	Greens Scenic Area easement	0	0	0.45	0	0

*Includes wetlands delineated with both USACE and NPS methodologies. For information on delineated wetland areas, including the separately delineated wetland areas using the USACE and NPS methodologies, see the Potomac Yard Metrorail Station EIS, Waters of the U.S. (Including Wetlands) Delineation Report, February 2012.

For habitat impacts on NPS parkland and the Greens Scenic Area easement, the preferred alternative will undergo a Function and Value Assessment as required for the Statement of Findings per DO 77-1 and will also be included in the Final EIS.

None of the three Build Alternatives or B-CSX Design Option is anticipated to impact Federally listed or state listed threatened or endangered species based on available data. A field survey for the presence of the Sensitive Joint-Vetch plant was completed on August 15, 2012, and no specimen was found within the project study area. An additional survey for the Sensitive Joint-Vetch will be conducted after selection of the preferred alternative and during the seasonal periods specified by the USFWS Virginia Field Office. No Federally designated National Wildlife Refuge or Critical Habitat exists in the study area; therefore, no impact is anticipated to these resources. Additionally, VDCR did not identify any state-designated Natural Communities in the study area, and no impact is anticipated to these resources.

3.18.4 Mitigation Measures

As no National Wildlife Refuges, Critical Habitat or state-designated Natural Communities, or Threatened or Endangered species would be impacted, no mitigation is proposed.

The development and implementation of an Invasive Species Management Plan, which addresses the removal and management of invasive species, is proposed to improve the quality of natural habitat and mitigate reduction in natural habitat within the study area due to the three Build Alternatives and B-CSX Design Option. The plan can serve as a reference for best practices and can support decisions and problem solving as progress is made in reaching vegetative condition goals. A management plan can help ensure consistency among several cooperating agencies, maintain continuity through project personnel changes, educate and engage stakeholders and citizens, and support efforts to obtain additional resources for invasive species management.

3.19 Sustainability

This section identifies existing plans and policies that address sustainability in the study area and that are potentially applicable to the project. As defined in the Federal Executive Orders (EO) listed below, sustainability focuses on creating and maintaining conditions "under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans."

The following Federal and local guidance and policies are applicable to the resource:

- EO 13423 Strengthening Federal Environmental, Energy, and Transportation Management;
- EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance;
- City of Alexandria 2008 Eco-City Charter;
- City of Alexandria Environmental Action Plan 2030;
- City of Alexandria Green Building Policy; and
- WMATA's Policy on Leadership in Energy and Environmental Design (LEED) Certification.

3.19.1 Methodology

Local plans and policies were reviewed for sustainability criteria that would be applicable to the project alternatives, including local transportation and green building objectives.

3.19.2 Affected Environment

3.19.2.1 Local Sustainability Plans

The City of Alexandria's *2008 Eco-City Charter* reflects the goals established in Alexandria's *2015 Strategic Plan*. The charter includes a network of guiding principles and policies related to land use, open space, water resources, transportation, building design, and construction. The City of Alexandria's *Environmental Action Plan 2030* (EAP) serves as the road map to implement the sustainability visions and principles set forth in Alexandria's *Eco-City Charter*. Relevant goals of the EAP to the project are concerned with expanding and promoting the mass transit system and using green building practices. Relevant action steps include adding a Metrorail station at Potomac Yard, construction and renovation of City buildings to LEED Gold or equivalent standard, promoting pedestrian and bicycle modes, and implementing the recommendations of adopted City plans.

3.19.2.2 Local Green Building Policies

The City of Alexandria's *Green Building Policy* states that the City will take a leadership role by mandating sustainable design for all public buildings. The policy also sets development standards for public and private development permitted under a Development Site Plan (DSP) or Development Special Use Permit (DSUP), requiring new non-residential buildings to achieve LEED Silver building standards.

WMATA's *Policy on LEED Certification* (2008) established that all new and substantially rehabilitated Metro facilities be designed and built with the goal of receiving LEED Silver Certification.

3.19.3 Environmental Consequences

3.19.3.1 No Build Alternative

The No Build Alternative would be generally consistent with local sustainability requirements. Although the No Build Alternative does not include the City of Alexandria's specific action step to construct a Metrorail station at Potomac Yard, it includes other projects that support the City's EAP goals to expand the mass transit system and support pedestrian and bicycle modes.

3.19.3.2 Build Alternatives

The three Build Alternatives and B-CSX Design Option would be consistent with the local sustainability requirements. Station building designed to comply with green building policies and objectives, such as LEED Silver Certification, would be developed during detailed design phases of the project.

3.19.4 Mitigation

The three Build Alternatives and B-CSX Design Option would have no adverse impact so no mitigation is proposed.

3.20 Hazardous and Contaminated Materials

This section identifies hazardous and contaminated materials potentially present within the study area and their potential to be encountered by the project alternatives. The presence of these materials in Potomac Yard, primarily as a result of former rail yard activities, has been previously documented, including extensive remedial investigations and reports. The current analysis was prepared consistent with the requirements of the American Society of Testing and Materials (ASTM) Phase I Environmental Site Assessment (ESA) procedures. The Phase I ESA is a due diligence task that includes the review of previous analyses and reports, provides confirmation of this information, and provides additional information as needed. The contaminated materials analysis and Phase I ESA was prepared in accordance with the following guidance documents:

- ASTM E1527-05 *Standard Practice for Environmental Site Assessments*; Phase I Environmental Site Assessment Process.; and
- USEPA All Appropriate Inquiries (AAI).

The analysis is described in more detail in the *Phase I Environmental Assessment and Hazardous & Contaminated Materials Technical Memorandum*, in Volume II.

3.20.1 Methodology

The Phase I ESA for hazardous and contaminated materials included the following tasks:

- Review of historical documentation, including historic aerial photographs and historic topographic maps;
- Review of Federal and state online database records and publications for known contaminated sites and for sites containing or generating hazardous substances;
- Review of Potomac Yard's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation records and reports acquired through the Freedom of Information Act (FOIA), the EPA's on-line administrative record, VDEQ, and the City of Alexandria Office of Environmental Quality;
- Meetings with VDEQ and City of Alexandria staff regarding past investigations; and
- Site reconnaissance which focused on potential Recognized Environmental Condition Sites (RECs).

RECs are defined by ASTM as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property".

3.20.1.1 Environmental Data Resources Project Report

The first step in the Phase I ESA process was to obtain a project-specific report from the Environmental Data Resources (EDR) Incorporated. The EDR Report satisfies ASTM E1527-05 and EPA's All Appropriate Inquiry rule. EDR maintains a proprietary database, referred to as the National Environmental Data Information System (NEDIS), which integrates environmental records and land use information from thousands of Federal, state, tribal, local, and private sources. The EDR project report provides a variety of data sources for the purpose of identifying potential RECs, including historic aerial photographs and maps, and city directory abstracts.

3.20.1.2 Review of Prior Remedial Actions and Reports

Prior remedial actions and reports were reviewed for the analysis. Extensive remedial investigations and reports have been completed for Potomac Yard in compliance with Federal, state and local laws. In September 1992, EPA and the RF&P Railroad signed a CERCLA Administrative Order by Consent requiring RF&P to study the extent of contamination at the Potomac Rail Yard. Reports and remediation documents were obtained from the EPA Administrative Record, VDEQ, and the City of Alexandria. **Table 3-43** lists the most relevant reports to the study area.

As part of redevelopment activities, property owners have summarized the environmental conditions, conducted additional voluntary site assessments, and developed site construction management plans to ensure compliance with Virginia solid waste management regulations and City of Alexandria planning requirements. Multiple assessment reports are available from the City of Alexandria or the VDEQ Voluntary Remediation Program (VRP) office locations. Assessment reports have been completed for Landbay D, Landbay E, Landbay F, and Landbay G within Potomac Yard.

Table 3-43: Potomac Yard Remedial Investigations and Reports

Published Date	Report Name
July 21, 1995	*Potomac Yard Extent of Contamination Study*
October 14, 1995	*Potomac Yard Human Health Risk Assessment and On-Site Ecological Risk Assessment*
June 19, 1996	*Potomac Yard Engineering Evaluation/Cost Analysis*
March 20, 1997	*Potomac Yard Off-Site Ecological Risk Assessment*
November 13, 1998	*Potomac Yard Removal Response Action*
August 4, 1999	*Site Characterization Report Addendum, Potomac Yard, Central Operations Area*
October 9, 2000	*Potomac Yard Central Operations Area Closure Report for Corrective Action Plan Implementation*
October 15, 2003	*Phase I Environmental Site Assessment Retail Center – North Yard, Potomac Yard*
February 15, 2011	*Site Characterization Report, Potomac Yard Landbay D*
February 15, 2011	*Site Characterization Report, Potomac Yard Landbay E*
October 18, 2011	*Remedial Action Plan, Potomac Yard Landbay G*

3.20.2 Affected Environment

Potomac Yard is a former rail yard, which was operated by the Richmond Fredericksburg and Potomac (RF&P) railroad from approximately 1906 to 1990. Historic operations at the site were characterized by reports obtained from the EPA CERCLA Administrative Record, VDEQ and the City of Alexandria Office of Environmental Quality. The 1995 *Extent of Contamination Study* (ECS) is the primary source of historic site operations information and soil and groundwater sample laboratory analysis and results.

RECs within the study area have been remediated or mitigated by risk management methods during previous EPA, VDEQ, and City of Alexandria oversight of historic remedial activities and during more recent subsequent redevelopment activities. Risk management methods of contaminants encountered during redevelopment activities have included measures such as removal of contaminated soils. **Figure 3-89** shows the locations of potential and former RECs.

3.20.2.1 Fill Material

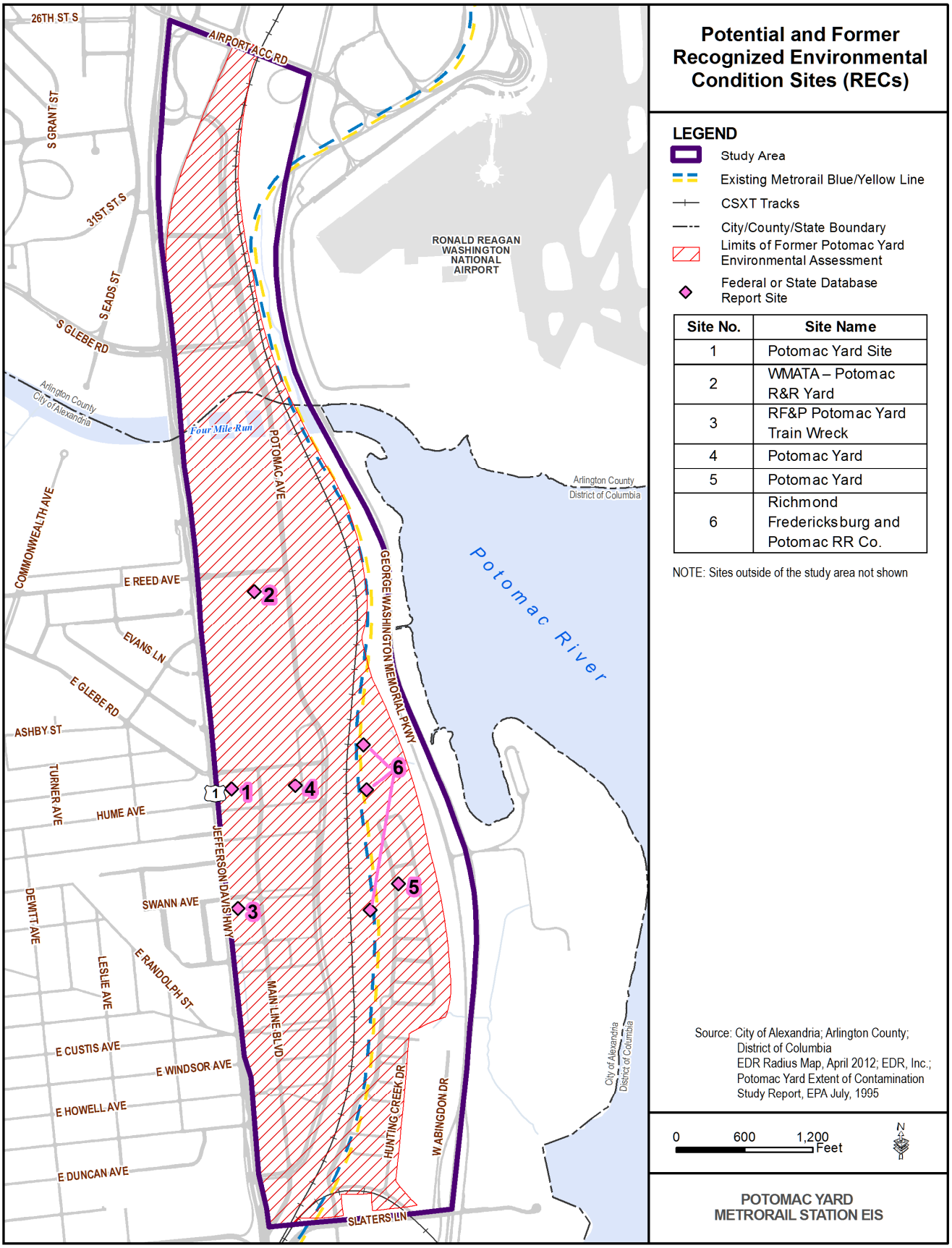
Ballast

Based upon multiple environmental assessment reports completed for the former Potomac Yard rail yard site, much of the shallow fill used to level the rail yard appears to have been cinder ballast potentially containing elevated levels of petroleum products or elevated concentrations of metals. Cinder ballast, the bottom ash left over from coal burning, was used as fill material throughout large portions of the former Potomac Yard. Much of the ballast material at the former Potomac Yard has been removed from areas no longer occupied by track during on-going redevelopment activities. However, ballast can still be sporadically encountered in previously undisturbed areas and/or at undisturbed depths. Ballast within the study area commonly contains elevated levels of arsenic, lead, and copper, and therefore is a potential REC. Based on previous studies, the ballast is usually encountered to an average thickness of three feet, but has been encountered up to a depth of 12 feet below ground surface (bgs) in the study area.

Potential Construction Debris Landfill

The 1995 CERCLA Study identified a construction debris landfill in the area west of the Metrorail tracks near the current site of the movie theater. The construction debris landfill is noted to have been removed to an off-site landfill during redevelopment in 1977. Subsurface debris were encountered during construction of a sewer line for Landbay F (the Potomac Yard Retail Center) in the former historic “stock pen” area, also located in this portion of the property.

Figure 3-89: Potential and Former Recognized Environmental Condition Sites (RECs)



Potential Fly Ash Area

Previous geotechnical investigations identified a potential widespread layer of fly ash 5 to 20 feet thick deposited throughout the Potomac Greens Sub-Area between the mid-1950s and 1963. Detectable concentrations of the metals arsenic, lead, and copper were found within the fly ash areas over the course of the CERCLA analyses in 1995. Following the CERCLA analyses, additional soil borings were completed in 2011 for Landbay D. The 2011 soil borings found concentrations of Total Petroleum Hydrocarbons Diesel-Range Organics (TPH-DRO) in the soils, as well as silver and lead concentrations above the VDEQ Tier II Risk Based Screening Level (RBSL) for industrial and commercial property reuse. One soil boring tested in the analysis exceeded USEPA's hazardous soil designation level of 5 mg/L for lead.

3.20.2.2 Groundwater

The CERCLA analyses detected contaminants in ground water. The groundwater analyses focused on the metals most commonly associated with ballast; arsenic, copper, and lead. The 1995 CERCLA analysis identified metals and petroleum hydrocarbons present in the groundwater at the property. Recent groundwater sampling conducted at Landbay G in 2004 and 2006 also detected concentrations of metals and petroleum hydrocarbons.

3.20.2.3 Soil

The CERCLA analyses detected contaminants in soil. The 1995 CERCLA analysis identified metals and petroleum hydrocarbons present in the soil at the property. Recent soil sampling conducted at Landbay G in 2004 and 2006 also detected concentrations of metals and petroleum hydrocarbons.

3.20.3 Environmental Consequences

3.20.3.1 No Build Alternative

The No Build Alternative would not disturb potential residual contaminants at RECs.

3.20.3.2 Build Alternatives

The three Build Alternatives and B-CSX Design Option have the potential to encounter contaminated fill material, soils, and groundwater related to RECs identified within the study area. However, the three Build Alternatives and B-CSX Design Option would not result in long-term or permanent adverse effects due to risk mitigation and engineering controls and measures that would be used during construction. Temporary impacts are described in **Section 3.24 Construction Impacts**.

Contaminated Fill Material and Soil Excavation and Disposal

Subsurface soil and fill material consisting of fly ash, metals and petroleum-impacted soils, construction debris, and ballast material, have been identified within the LOD for Alternative A, Alternative B, B-CSX Design Option, and to a lesser extent at Alternative D. Residual oil may also be present in subsurface soil at the former oil/water separator ponds within the LOD for Alternative B and B-CSX Design Option.

Contaminated Groundwater Dewatering

Based on CERCLA, VDEQ, and other environmental assessment reports, shallow groundwater in the vicinity of the three Build Alternatives and B-CSX Design Option is likely contaminated with residual levels of petroleum hydrocarbons, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. The groundwater depth should be evaluated at the project design phase to identify the necessity of dewatering, groundwater control requirements (if dewatering is required), and disposal or treatment requirements of contaminated groundwater.

U.S. DOT Brownfields Policy

Construction of the project would be consistent with the U.S. DOT Brownfields Policy, adopted in 1998, which encourages participation in transportation projects that include the use and redevelopment of potentially contaminated sites, when appropriate, in support of the EPA's Brownfields Initiative. The project site is not a registered EPA Brownfield; however, the former Potomac Rail Yard has been the subject of extensive Federal and state regulated remedial actions.

3.20.4 Mitigation

The potential impacts of the three Build Alternatives and B-CSX Design Option on RECs would occur during construction activities. Soil disturbance could be lessened by use of driven piles, shafts, or sheeting, rather than drilled shafts to accommodate any excavations. In areas of the site where pile foundations may need to be

installed by alternative methods due to geotechnical and/or vibration concerns, impacts from the generation of potentially contaminated fill, soil, and groundwater would be mitigated in accordance with a Site Management Work Plan developed for the project construction process. Management of contaminated soils and groundwater on the site and disposal off-site would be conducted in accordance with applicable Virginia solid waste management regulations. These BMPs and construction mitigation methods are intended to lessen impacts from contaminated materials wherever possible and comply with the law where applicable.

3.21 Safety and Security

This section assesses safety and security issues associated with the operation of a new Metrorail station and associated facilities. Safety refers to providing safe conditions for passengers, employees, and pedestrians within the Metrorail system. Security refers to the enforcement of laws and protection measures for passengers, employees, and pedestrians within the Metrorail system.

The following Federal and local guidance and policies are applicable to the resource:

- *Rail Fixed Guideway Systems State Safety Oversight* – The FTA created a state-managed oversight program for rail transit safety and security under the *State Safety Oversight Rule*. The program is applicable to all states that have, within their boundaries, a fixed guideway rail system not regulated by the FRA. The rule requires that transit agencies address the personal safety and security of their passengers and employees by preparing a System Safety Program Plan and a System Security Plan.
- Federal Transit Administration, An Introduction to All Hazards Preparedness Training for Transit Agencies, May 2010.
- Transportation Research Board, Transit Cooperative Research Program, *TCRP Synthesis 80, Transit Security Update*, 2009.
- Federal Transit Administration, *The Public Transportation System Security and Emergency Preparedness Planning Guide*, January 2003.
- National Fire Protection Association, NFPA 130: *Standard for Fixed Guideway Transit and Passenger Rail Systems*, 2010 Edition.
- WMATA, *System Safety Program Plan*, January 2011.
- WMATA, *Manual of Design Criteria*, Release 9, 2008.

3.21.1 Methodology

Current safety and security measures within the Metrorail system are contained in WMATA's *System Safety Program Plan* (SSPP). Safety and security issues were identified as they related to the facilities to be constructed for each alternative.

3.21.2 Affected Environment

WMATA's SSPP identifies the procedures and design features which are intended to ensure the safety and security of employees and patrons of the WMATA system. In addition, WMATA design criteria specify that the design of facilities be consistent with National Fire Protection Association (NFPA) 130, which is an industry standard intended to ensure the safety of passengers and employees in the event of an emergency. WMATA ensures compliance with its safety and security procedures and policies through training, coordination, and periodic audits.

3.21.2.1 Stations and Facilities

All Metrorail facilities are designed and built in accordance with applicable laws, building codes and accessibility guidelines at the time of construction. Stations have clearly marked escalators, stairs, and elevators that provide vertical circulation between street, fare collection, and platform levels. Lights are installed along the granite edges of station platforms and flash to alert passengers when a train is arriving, thereby decreasing the tendency for passengers to stand at the platform edge to watch for the train. In many stations, detectable tiles are located on station platforms adjacent to the granite edges to alert passengers that they are approaching the edge of the platforms. Safety zones under the platforms provide space for passengers who fall off the platform to avoid an incoming train.

Metrorail stations are required to adhere to NFPA 130 and provide areas of refuge. As defined by NFPA, an area of refuge is "a space located in a path of travel leading to a public way that is protected from the impacts of fire, either by means of separation from other spaces in the same building or by virtue of location, thereby permitting a delay in egress travel from any level."

Metrorail stations are designed to eliminate recessed or hidden areas and provide unimpeded lines of sight for station users, station managers, and Metro Transit Police Department (MTPD) personnel. In addition, all passenger stations and elevators are equipped with closed-circuit television (CCTV) cameras. Station manager kiosks are located adjacent to the fare gates and are equipped with direct phone lines to the Rail Operations Control Center (ROCC). Emergency Trip Stations (ETS) are located at both ends of every platform for emergency removal of traction power if a person falls onto the tracks or any other emergency occurs. These trip stations include emergency telephones that connect directly to the ROCC. In addition, two call boxes are located approximately 200 feet from the ends of station platforms and enable passengers or staff to report emergency situations to the station manager. Stations are also equipped with fire alarm control panels and other features to minimize risk from fires.

3.21.2.2 Trains

Each Metrorail train car contains standard safety features designed to maintain a safe passenger and employee environment.

3.21.2.3 Law Enforcement

MTPD performs law enforcement and public safety services on the Metrorail and Metrobus systems. The MTPD has an authorized strength of 420 sworn police officers, 106 security special police, and 24 civilian personnel. MTPD officers have jurisdiction and arrest powers for crimes that occur in or against WMATA facilities throughout the 1,500-square mile Transit Zone.

3.21.2.4 Emergency Management

Emergency management within WMATA focuses on the preparedness, response, recovery, and mitigation of incidents and regional special events that impact transit operations. The WMATA Office of Emergency Management (OEM), which is part of MTPD, runs the Emergency Operations Center (EOC) and has the primary responsibility to respond to the incident scene and coordinate with on-scene rescue personnel and WMATA officials.

WMATA also works closely with and relies on jurisdictional fire and emergency management services (EMS) departments to respond to emergencies that result in the need for assessing fire or hazmat hazards, providing medical assistance, and performing extraction, recovery, and triage tasks at the incident scene. Fire protection, life safety requirements, procedures and training are coordinated by MTPD/OEM with jurisdictional emergency services departments through several MWCOG committees and subcommittees.

3.21.3 Environmental Consequences

3.21.3.1 No Build Alternative

Under the No Build Alternative, there would be no safety and security related impacts from the Potomac Yard Metrorail Station project. However, there could be impacts from the other improvements assumed under this alternative. Identification of these impacts would be the responsibility of the agencies and jurisdictions responsible for implementing the improvements.

3.21.3.2 Build Alternatives

The three Build Alternatives and B-CSX Design Option can be expected to result in safety and security concerns similar to those at existing Metrorail stations. Potential safety or security events include: fire, derailment, loss of power, flooding, hazardous materials incidents, criminal or terrorist acts, extreme weather, and medical emergencies. The ability for first responders to access the station, and for employees and passengers to safely evacuate the station, are the primary concern should any of these events occur. In emergency situations, operations along the Blue and Yellow Lines would follow the existing plans and procedures outlined in the SSPP. Evacuation and other first response actions would be performed by the local jurisdiction (the City of Alexandria and Arlington County). Each Build Alternative would be constructed according to existing WMATA standards and would include the safety features described above, including NFPA 130 standards. Access for emergency personnel would be designed in accordance with applicable codes and standards, and in consultation with City of Alexandria and Arlington County emergency services departments.

In addition, passengers and employees at Metrorail stations are concerned with threats of personal crime. Station design would include elements intended to minimize the potential for personal crime on platforms and within station access facilities.

WMATA requires completion of the Safety and Security Certification (SSC) process prior to entering the pre-revenue demonstration phase of a new rail line segment or rail-related facility, ensuring that hazards and security vulnerabilities are addressed, safety and security critical elements are working, and all systems are operationally safe and secure.

No impacts to safety and security are anticipated as a result of any of the three Build Alternatives or B-CSX Design Option. The existing practices and procedures for safety and security and requirements for facility design would adequately avoid and minimize the identified safety and security issues.

3.21.4 Mitigation

The three Build Alternatives and B-CSX Design Option would have no adverse effect, so no mitigation is no proposed.

3.22 Utilities

This section identifies utilities within the study area in the vicinity of the project site and assesses potential impacts of the alternatives on utilities.

3.22.1 Methodology

The inventory of existing surface and subsurface utilities was performed using available documentation and field observations. A subarea of the project study area along the locations of the three Build Alternatives and B-CSX Design Option was assessed, focusing on the area along and immediately adjacent to the WMATA and CSXT railroad corridor, bound on the north by Four Mile Run, to the west by Potomac Avenue, and to the east and south by Potomac Greens Drive.

3.22.2 Affected Environment

Utilities present within the project area include existing and planned stormwater, sanitary sewer, water, gas, petroleum pipeline, electric, communications (includes telephone, cable television, and fiber optic), street lighting, traffic signals, and railroad utilities.

3.22.3 Environmental Consequences

3.22.3.1 No Build Alternative

The No Build Alternative would not affect existing utilities in the study area.

3.22.3.2 Build Alternatives

The proposed locations of new track and station structures for the three Build Alternatives and B-CSX Design Option would require portions of existing and planned utilities to be re-routed around planned structures. To re-route affected utilities, new segments of utility line would be built and installed up to the new connection points. During a short service disruption the old utility line would be connected to the new utility line. All utility re-routing would be conducted under compliance with applicable laws, codes and service agreements. Potential adverse effects could be avoided or minimized during later design phases of the project. Each Build Alternative would impact utility services as follows:

Build Alternative A

Build Alternative A would require portions of existing stormwater and water utilities to be re-routed around proposed Metrorail station structures.

Build Alternative B

Build Alternative B require portions of existing stormwater and water utilities to be re-routed around proposed Metrorail station structures. Portions of a planned electrical utility line may also need to be realigned to avoid impacts from the Metrorail Station.

B-CSX Design Option

B-CSX Design Option would require portions of stormwater, water, sanitary, petroleum pipeline, railroad utilities, and Metrorail ductbank utilities to be re-routed around proposed Metrorail station structures. Portions of a planned electrical utility line may also need to be realigned to avoid impacts from the Metrorail Station.

Build Alternative D

Build Alternative D would require portions of stormwater, water, sanitary, petroleum pipeline, and Metrorail ductbank utilities to be re-routed around proposed Metrorail station structures. The petroleum pipeline and other utilities could be affected by the locations of piers for the aerial structures over the CSXT tracks. Portions of a planned electrical utility line may also need to be realigned to avoid impacts from the Metrorail Station.

3.22.4 Mitigation

Utility impacts would be reduced by refining the station design or the location of structural members. Service disruptions would be minimized by installing new utility lines first and scheduling a single service disruption to connect all new lines to existing lines. Scheduling each utility's work at non-peak hours would also lessen the impacts of any utility disruptions.

3.23 Secondary and Cumulative Effects

This section describes the potential secondary and cumulative effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option. The secondary and cumulative effects analysis was prepared pursuant to the following Federal regulation and guidance:

- Council on Environmental Quality (CEQ), Considering Cumulative Effects Under the National Environmental Policy Act (NEPA), January 1997;
- Federal Highway Administration, Interim Guidance: Indirect and Cumulative Impacts in NEPA, January 31, 2003;
- National Academy of Sciences, Transportation Research Board, Desk Reference for Estimating Indirect Effects of Transportation Projects (NCHRP 466), 2002;
- National Academy of Sciences, Transportation Research Board, Forecasting Indirect Land Use Effects of Transportation Projects (NCHRP Project 25-25), January 5, 2008;
- CEQ, Federal Greenhouse Gas Accounting and Reporting Guidance, October 6, 2010; and
- City of Alexandria Energy and Climate Change Action Plan 2012-2020, May 2011.

3.23.1 Methodology

3.23.1.1 Secondary Effects

The analysis of secondary effects evaluated the project's potential to induce land development and travel demand. The analysis assumed land development scenarios both with and without a Metrorail station, and variations of development intensity dependent on whether one of the three Build Alternatives or B-CSX Design Option is selected as the preferred alternative. Assumptions regarding the level of development under each alternative were developed in consultation with City of Alexandria staff, based on adopted land use plans for Potomac Yard.

3.23.1.2 Cumulative Effects

The cumulative effects analysis evaluated the longer-term effects to natural resources in a larger context that included past, present, and future "reasonably foreseeable" activities within the project area. The analysis process involved identifying sensitive resources and their areas of effect; identifying potential sources of effects; and identifying potential effects. Resources directly affected by any of the project alternatives, as well as those resources that are particularly susceptible to cumulative effects, were included in the analysis.

The cumulative effects assessment also addressed the potential effects of climate change on the project. The City of Alexandria's *Energy and Climate Change Action Plan 2012-2020* identifies potential effects of climate change on the city, including sea level rise, increases in annual rainfall, increases in air and water temperature, ecological disruptions to ecosystems, effects on quality of life, and other impacts. The cumulative impacts analysis included a qualitative assessment of the impacts of climate change on the environmental effects identified for the project alternatives. The assessment also identified refinements to the design of the project to reduce vulnerability to climate change impacts, adapt to changes in the environment, and mitigate the potential impacts of the project that would be exacerbated by climate change. The potential contribution of the project to greenhouse gas emissions related to automobile trips and VMT is assessed in **Section 3.11 Air Quality**.

3.23.2 Potential Sources of Effects

Potential sources of secondary and cumulative effects include recent and planned development within the City of Alexandria and Arlington County portions of Potomac Yard, as well as recent and planned infrastructure projects within the study area.

3.23.2.1 Recent and Planned Development in Alexandria Potomac Yard

Recent and planned development within the Alexandria portion of Potomac Yard includes the Old Town Greens and Potomac Greens neighborhoods, which have been completed, as well as the existing and planned development in South Potomac Yard and North Potomac Yard.

The *North Potomac Yard Small Area Plan* and Coordinated Development District (CDD) #19 allow for different levels of development, depending on whether the City of Alexandria decides to build a Metrorail station in Potomac Yard, and where that station is located. In total, a maximum of 7.5 million square feet of development is permitted in North Potomac Yard if a Metrorail station is built at approximately the location of Build Alternative B. If a Metrorail station is not built, only 3.7 million square feet of development is permitted. The approved plan was developed based on a station in the vicinity of the location of Build Alternative B, and therefore would treat only Build Alternative B as a "Build" situation – both Build Alternative A and Build Alternative D would be treated as a "No Build" situation. However, if Build Alternative A or D is selected as the preferred alternative, the City of Alexandria would initiate a process to review the *North Potomac Yard Small Area Plan* (NPYSAP) to consider additional development that could be supported by the Metrorail station location. Therefore, the secondary effects analysis assumed additional levels of development for the three Build Alternatives and B-CSX Design Option. Note that any changes to permitted development levels would require amendment of the North Potomac Yard Plan and CDD #19 zoning provisions as part of a community process.

Table 3-44 lists the development assumptions for each alternative. Build Alternative B includes the additional development that allowed under current plans in North Potomac Yard if a Metrorail Station is constructed in the location of Build Alternative B and documented in the NPYSAP. Total development is listed in square feet, without reference to type of land use (for example, office, residential, or commercial), because plans recommend mixed-use development, and the exact development volumes for each specific use have yet to be determined.

Table 3-44: Estimated Development Levels for Horizon Year 2040

Alternative	Square Feet of Development			TOTAL (square feet)
	Potomac Greens/ Old Town Greens	South Potomac Yard	North Potomac Yard	
No Build	500,000	5,050,000	3,700,000	**9,250,000**
Build Alternative A	500,000	5,050,000	3,700,000	**9,250,000**
Build Alternative B	500,000	5,050,000	7,525,000	**13,075,000**
B-CSX Design Option	500,000	5,050,000	3,700,000	**9,250,000**
Build Alternative D	500,000	5,050,000	3,700,000	**9,250,000**

Source: City of Alexandria *North Potomac Yard Small Area Plan*.

3.23.2.2 Recent and Planned Development in Arlington Potomac Yard

Since 2005, redevelopment of the Arlington County portion of Potomac Yard has resulted in the addition of approximately 175,000 square feet of retail space, 1 million square feet of office space, and 850 dwelling units. The area is expected to add another 74,000 square feet of retail space, 1 million square feet of office space, and 700 dwelling units (Arlington County, *Development in the Metro Corridors* report, 2011).

3.23.2.3 Infrastructure Projects

A number of improvements to transportation infrastructure are either planned or have been recently completed to facilitate the redevelopment of Potomac Yard. The projects include the recently completed realignment of the Monroe Avenue Bridge, as well as completion of the planned street network within Potomac Yard and the completion of the first phase of the CCPY Transitway.

Dominion Power is also planning a new electrical power line connecting the existing Glebe Power Substation, located just north of Four Mile Run and west of U.S. Route 1, to the Potomac River Substation, located east of the George Washington Memorial Parkway and south of Slaters Lane. The project is considering several routing

options that traverse the Potomac Yard Metrorail Station EIS Study Area. The project is scheduled to be constructed by 2018.

3.23.3 Secondary Effects

This section describes the secondary effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option. For the Potomac Yard Metrorail Station project, secondary effects are those effects related to the increased amount of development that would occur under various alternatives.

3.23.3.1 No Build Alternative

Under the No Build Alternative, 9.25 million square feet of development would be permitted in the Alexandria portion of Potomac Yard by the year 2040. Potential secondary effects due to this development include traffic, impacts to community facilities, and visual impacts.

Under the No Build Alternative, no new Metrorail station would be constructed, and thus relatively little of the travel demand generated by the development is expected to be served by Metrorail. A certain portion of trips would be expected to use surface transit options in the corridor, including the CCPY Transitway, but transit mode share would not be maximized.

The No Build Alternative would result in additional population and employment in Potomac Yard, which could place a strain on community facilities. However, small area plans of the City of Alexandria (*North Potomac Yard Plan* and *Potomac Yard/Potomac Greens Small Area Plan*) and Arlington County (*Potomac Yard Phased Development Site Plan*) address the adequate provision of community facilities for the population within Potomac Yard and surrounding areas.

The No Build Alternative would include the construction of several tall buildings in North Potomac Yard (up to 250 feet maximum height; 100 to 180 feet maximum height along the eastern portion of the site), which could be visible from the GWMP and the Potomac Greens neighborhood.

3.23.3.2 Build Alternatives

The construction of a Metrorail station in Build Alternatives A, D, and B-CSX Design Option locations would each allow a total of 9.25 million square feet of development within Potomac Yard. Build Alternative B would allow a total of 13.075 million square feet of development in Potomac Yard. The increased development in Potomac Yard under Build Alternative B would provide more opportunities for housing and commercial uses close to the region's core in a location with Metrorail access, resulting in fewer and shorter automobile trips than if the same development were to occur farther from the core in a site without walkable Metrorail access.

To varying degrees, the additional development for Build Alternative B would result in secondary effects on transportation, community facilities and services, and visual resources.

- The increased development in Potomac Yard under Build Alternative B would result in additional trips, including peak-period trips. However, the provision of a Metrorail station under the Build Alternative B would help to offset the additional trips in both the peak- and off-peak periods. The provision of a Metrorail station in addition to a pedestrian- and bicycle-friendly environment with a strong local transit network would be expected to result in higher non-auto mode splits. The highest percentage of transit trips would be to or from development adjacent to or within ¼ mile of the Metrorail station. For residential uses, a high transit mode split would be expected within ½ mile of the Metrorail station.
- Ridership projections that include the additional development permitted under Build Alternative B (see **Table 3-44**) would be expected to result in higher transit ridership. Build Alternative B is projected to result in the highest Metrorail ridership, with 13,200 daily boardings at the Potomac Yard Metrorail station, as compared to 10,000 boardings under the other Build Alternatives and B-CSX Design Option.
- With the increase in permitted development for Build Alternative B, the model shows an increase in the number of automobile trips. However, the share of trips taken using modes other than the automobile would increase, compared to the No Build scenario. Under each Build Alternative, the non-auto mode share would be expected to be 34 percent, compared to 29 percent under the No Build Alternative.
- The additional development permitted under Build Alternative B is projected to result in increases in population and employment within Potomac Yard. The small area plans of the City of Alexandria (*North Potomac Yard Plan* and *Potomac Yard/Potomac Greens Small Area Plan*) and Arlington County (*Potomac Yard Phased Development Site Plan*) address the adequate provision of community facilities for the population within Potomac Yard and surrounding areas.

- The additional development in North Potomac Yard permitted under Build Alternative B would include several tall buildings (up to 250 feet maximum height; 100 to 180 feet maximum height along the eastern portion of the site), which would be visible from the GWMP and the Potomac Greens neighborhood.
- The additional bus idling at on-street stops near the proposed stations for all of the Build Alternatives and B-CSX Design Option would potentially affect one residential receptor and exceed the FTA Category 2 (residential areas) *moderate* criteria in South Potomac Yard, near the intersection of Potomac Avenue and Seaton Avenue. See the *Noise & Vibration Technical Memorandum* in Volume II for more detail.

3.23.4 Cumulative Effects

This section describes the potential cumulative effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option, when combined with the projects described in **Section 3.23.2**. Based on potential effects from the Potomac Yard Metrorail Station project, recent and planned projects in the study area, and specific concerns regarding cumulative effects identified during project scoping, the cumulative effects analysis addresses effects to transportation, visual resources, utilities, and water resources, as well as effects due to construction activities.

3.23.4.1 No Build Alternative

The No Build Alternative would not result in any project-related cumulative effects. However, projects included in the No Build Alternative may have direct and indirect effects within the study area on the resources identified. These cumulative effects include the potential adverse visual effects to the GWMP and the North and South Potomac Yard neighborhoods from the new development in Potomac Yard, inconsistency with the NPYSAP, and noise impacts to residences in Potomac Greens that were constructed after the adjacent Metrorail Line was built and operating. With the exception of the new planned electrical power line, the projects described in **Section 3.23.2** and potential effects to study area resources are unrelated to any of the three Build Alternatives and B-CSX Design Option and would occur with or without the new Metrorail station transit investment.

3.23.4.2 Build Alternatives

The potential cumulative effects are similar for the three Build Alternatives and B-CSX Design Option, and are more closely related to the development planned for Potomac Yard. Cumulative effects are not expected for most of the resources analyzed in the Draft EIS, either because no direct effects are expected from this project or no direct effects are expected from other projects. The projects, other than the three Build Alternatives and B-CSX Design Option that are included in the cumulative effects analysis are mostly located within existing rights-of-way or on previously developed land where effects would be limited, particularly in relation to natural resources. Potential cumulative effects are summarized below:

- The full development of Potomac Yard would contribute to additional vehicular trip generation in the study area. The *Potomac Yard Multimodal Transportation Study* (2010) assessed the traffic impacts of full build-out of North and South Potomac Yard in the year 2030. The Multimodal Study found that all of the study intersections in 2030 would operate acceptably with the exception of the intersections of U.S. Route 1 with East Reed Avenue, East Glebe Road, and Potomac Avenue. By 2040, the background traffic volumes would grow by another 10 percent from the 2030 levels. The overall delays would increase generally, but there would still be additional capacity on the grid network to redistribute traffic and provide a better balanced distribution, as other intersections are projected to operate at acceptable levels of delay. Although some traffic conditions would worsen due to the cumulative effects of new development projects, the additional transit projects and improved pedestrian and bicycle network would expand travel options. The combination of a Metrorail station at Potomac Yard, the CCPY Transitway, and other planned transit improvements is expected to provide an extensive transit network within the study area. The planned development would be expected to support the transit network, through urban densities and transit-friendly urban design. The cumulative effect therefore would be improved mobility and accessibility to accommodate the City's projected growth.
- The three Build Alternatives and B-CSX Design Option have the potential for adverse effects to views from the GWMP, Potomac Yard, and Potomac Greens neighborhood, as described in **Section 3.8 Visual Resources**. By 2040, built elements in the North Potomac Yard development, including buildings of up to 250 feet in height, would be visible from GWMP, which would be characterized by a roadway framed by vegetation with intermittent views of built elements. Additional development in Crystal City would be visible in the northern portion of the study area. Vegetation would be removed during construction of the three Build Alternatives and B-CSX Design Option, which would affect views from the parkway. By 2040, restored vegetation would grow to filter views of the Metrorail station from GWMP. However, trees would be unlikely to reach a height and

depth that would consistently block views of the station and facilities, although they would serve to screen views of the station and facilities.

- Construction of any of the three Build Alternatives or B-CSX Design Option would likely occur in tandem with construction of development within Potomac Yard. Therefore, cumulative effects are likely to occur from noise, vibration, dust, and traffic due to construction activity. Potential mitigation measures are discussed in detail in **Section 3.24 Construction Impacts**.

Build Alternative A

No additional cumulative impacts, other than listed above, are likely to occur due to the construction of Build Alternative A.

Build Alternative B

Portions of Build Alternative B have the potential to be affected by sea-level rise during the design life of the station, based on projections contained in the City of Alexandria's *Climate Change Action Plan 2012-2020.* The plan identifies areas of the City along the Potomac River and its tributaries that are vulnerable to sea-level rise by the year 2100. The plan cites a range of sea level-rise projections based on several global climate models that result in a rise in the median sea level during high tide from the current high tide level of approximately 2 feet NAVD88 in the year 2012 to 2.94 to 4.96 feet NAVD88 by the year 2100.[1] For the 50-year design life of the project, the projected median sea level during high tide cited in the plan is approximately 2.6 to 3.6 feet NAVD88 by the year 2066. As described in **Section 3.15 Floodplains**, portions of Build Alternative B would be built on retained fill within the 100-year floodplain; the alternative has realigned track at an elevation of 25 feet NAVD88, and the Build Alternative B station platform is also at an elevation of 25 feet NAVD88, which are above the current 100-year Base Flood Elevation of 10 feet NAVD88 (FIRM datum). The *Climate Change Action Plan* anticipates flood events with more intense tidal storm surges related to sea level rise. Potential mitigation measures related to flood zones are discussed in **Section 3.15 Floodplains**.

Build Alternative B is potentially affected by one of the nine alignment options under consideration for the planned new Dominion Power electrical line.

B-CSX Design Option

B-CSX Design Option is potentially affected by three of the nine alignment options under consideration for the planned new Dominion Power electrical line. No other cumulative impacts, other than listed above, are likely to occur due to the construction of B-CSX Design Option.

Build Alternative D

Portions of Build Alternative D have the potential to be affected by sea-level rise during the design life of the station, based on projections contained in the City of Alexandria's *Climate Change Action Plan 2012-2020.* The plan identifies areas of the City along the Potomac River and its tributaries that are vulnerable to sea-level rise by the year 2100. The plan cites a range of sea level-rise projections based on several global climate models that result in a rise in the median sea level during high tide from the current high tide level of approximately 2 feet NAVD88 in the year 2012 to 2.94 to 4.96 feet NAVD88 by the year 2100.[2] For the 50-year design life of the project, the projected median sea level during high tide cited in the plan is approximately 2.6 to 3.6 feet NAVD88 by the year 2066. As described in **Section 3.15 Floodplains**, portions of Build Alternative D would be built on retained fill within the 100-year floodplain; the alternative has realigned track at an elevation of 25 feet NAVD88. The *Climate Change Action Plan* anticipates flood events with more intense tidal storm surges related to sea level rise. Potential mitigation measures related to flood zones are discussed in **Section 3.15 Floodplains**.

Build Alternative D is potentially affected four of the nine alignment options under consideration for the planned new Dominion Power electrical line.

[1] Elevations are in relation to current sea level as measured by the North American Vertical Datum 1988 (NAVD), which is the standard reference elevation for sea level. The current 2012 median high tide level along the Potomac River waterfront in the City of Alexandria is approximately 2 feet above NAVD sea level.

[2] Elevations are in relation to current sea level as measured by the North American Vertical Datum 1988 (NAVD), which is the standard reference elevation for sea level. The current 2012 median high tide level along the Potomac River waterfront in the City of Alexandria is approximately 2 feet above NAVD sea level.

3.24 Construction Impacts

This section describes the potential temporary construction impacts that could result from the construction of the three Build Alternatives and B-CSX Design Option. The duration of project construction is estimated to be approximately two years. Construction activities would include clearing, grubbing, and leveling for realigned tracks, station facilities and pedestrian bridge entrance pavilions; construction of new embankments for track; construction of piers or bents for aerial sections of track and platforms; drilling shafts and driving piles for structural foundations; fill activities, and the delivery and storage of equipment and materials. Proposed construction staging and access for the three Build Alternatives and B-CSX Design Option are described in detail in **Section 2.4 Build Alternatives** and summarized in this section under **3.24.3.2 Build Alternatives**.

The assessment of temporary construction impacts is preliminary and based on the current conceptual level of design developed at the EIS phase of the project. The types and levels of potential impacts from the three Build Alternatives and B-CSX Design Option are subject to revision through the design and development review processes, with a goal to further avoid or minimize impacts to the maximum extent practicable. Any impact that cannot be avoided, including temporary impacts during construction, would be mitigated.

3.24.1 Methodology

Construction impacts of the three Build Alternatives and B-CSX Design Option were assessed by reviewing existing site conditions and proposed construction staging areas, access points and transportation routes and consulting WMATA and CSXT regarding their procedures for construction activities occurring near or within track right-of-way.

3.24.2 Affected Environment

Figure 3-86 illustrates the locations of construction staging and access points specific to the three Build Alternatives and B-CSX Design Option. Existing resources within these areas are described in **Section 3.2** through **Section 3.22**.

3.24.3 Environmental Consequences

This subsection is organized as follows:

- 3.24.3.1 No Build Alternative
- 3.24.3.2 Build Alternatives
    - Construction Access Options and Staging Areas

For the Build Alternatives and B-CSX Design Option, impacts are described for the following resources:

- Transportation
- Property Impacts
- Visual Resources
- Cultural Resources
- Parklands
- Air Quality
- Noise and Vibration
- Water Resources – Wetlands, Water Quality, Floodplains, Coastal Zones and Chesapeake Bay Preservation Areas, and Groundwater
- Ecosystems
- Soils
- Hazardous and Contaminated Materials
- Safety and Security

3.24.3.1 No Build Alternative

Construction activities associated with development in Potomac Yard would occur under the No Build Alternative. Anticipated effects include noise, vibration, dust, and traffic due to construction activity.

3.24.3.2 Build Alternatives

Construction Access Options and Staging Areas

Construction access options for the alternatives are summarized as follows:

- **Build Alternatives A and B:** two options for construction access from areas east of the existing Metrorail tracks (with and without GWMP roadway access) are provided and the impacts assessed for each.
- **B-CSX Design Option:** no construction access would be needed from the GWMP roadway and a single construction access option is provided and assessed.
- **Build Alternative D:** construction access from the GWMP roadway is needed for the northern part of Build Alternative D near Four Mile Run, because access is precluded from the west due to the existing Metrorail Line and the Four Mile Run waterway. A single construction access option is provided and assessed. Access points from the GWMP roadway would be required approximately several hundred feet north of Four Mile Run and approximately several hundred feet south of Four Mile Run.

Construction activities would occur within staging areas and access routes for the three Build Alternatives and B-CSX Design Option, as shown in **Figure 3-90**. A staging area is a designated area where vehicles, supplies, and construction equipment are positioned for access and use adjacent to or nearby the immediate construction site. Areas designated for staging would be cleared of all trees and other natural vegetation and filled in or leveled as necessary to make construction activities possible. After the completion of construction activities, the areas would be replanted and landscaped according to their prior uses and wetlands would be restored in coordination with associated stakeholders and federal and state regulations.

Acreages of temporary construction impact areas exclude permanent impact areas and include only those areas that would be temporarily occupied or otherwise affected by construction activities during the duration of project construction. Temporary impact areas would be restored or returned to their former use or condition upon completion of construction activities. **Figures 3-91** through **3-96** provide close-up views of construction access and staging areas for Build Alternative A, Build Alternative B, B-CSX Design Option, and Build Alternative D.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Figure 3-90: Build Alternatives

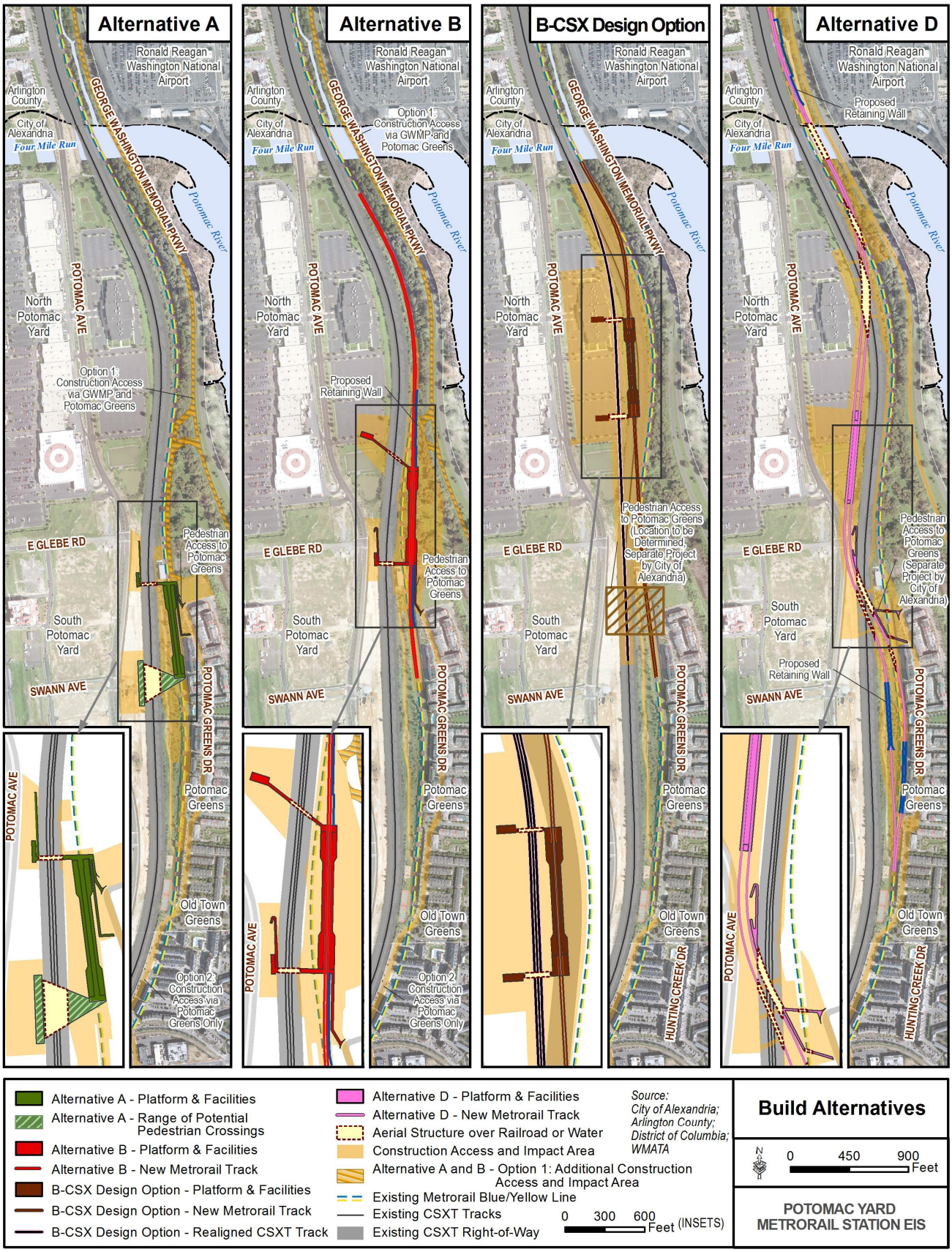


Figure 3-91: Build Alternative A Construction Access Options

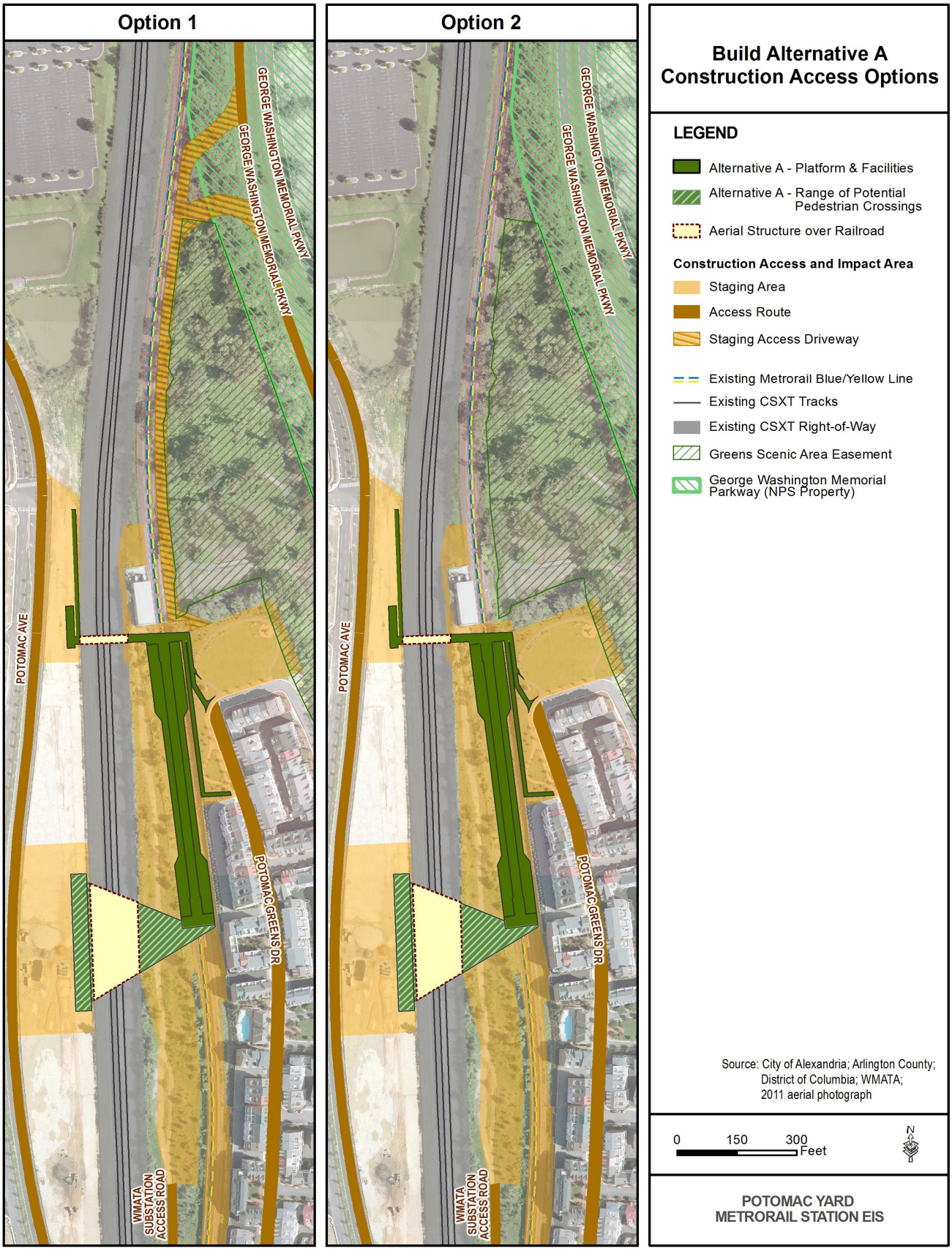


Figure 3-92: Build Alternative B Construction Access Options

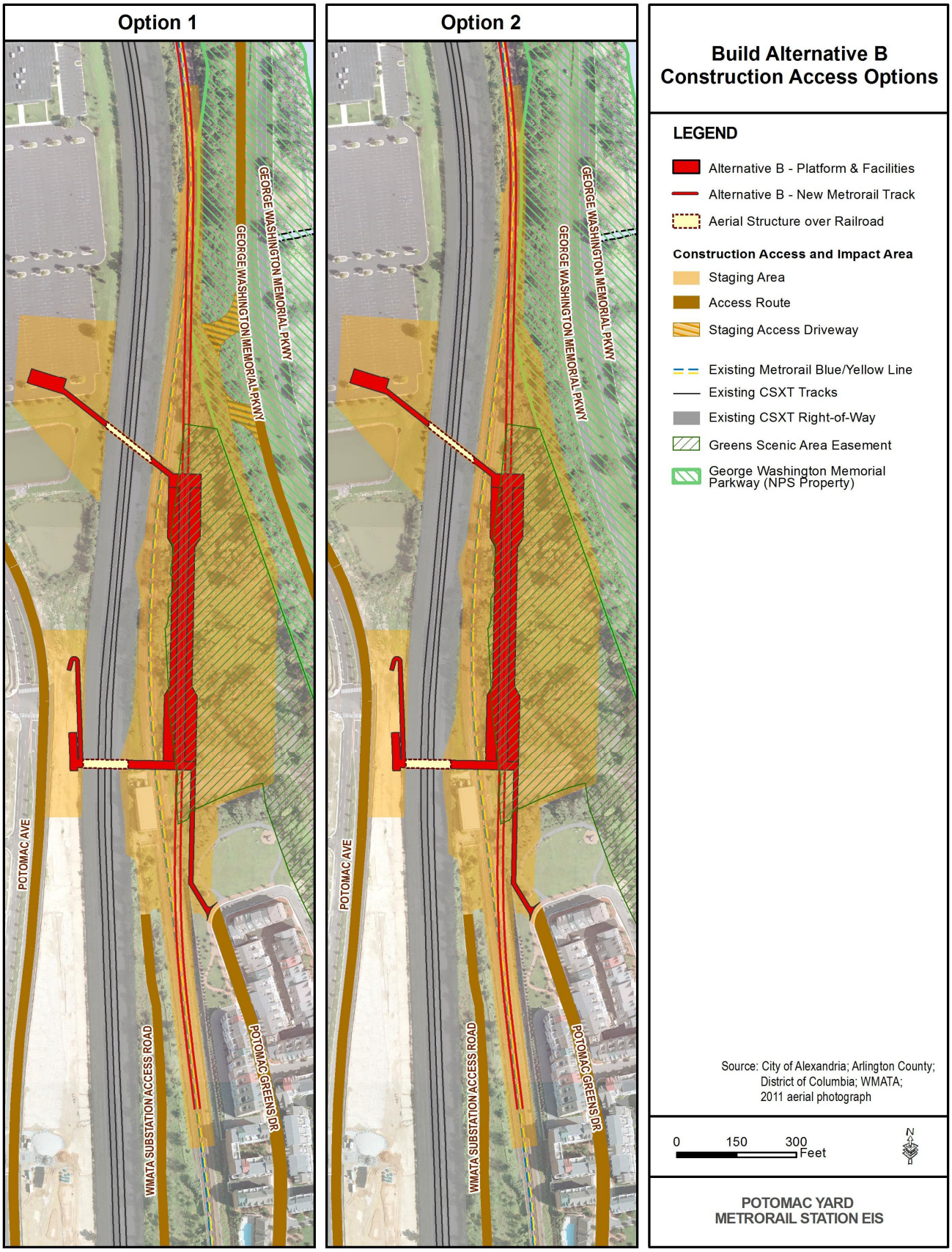


Figure 3-93: B-CSX Design Option (North) Construction Staging and Access

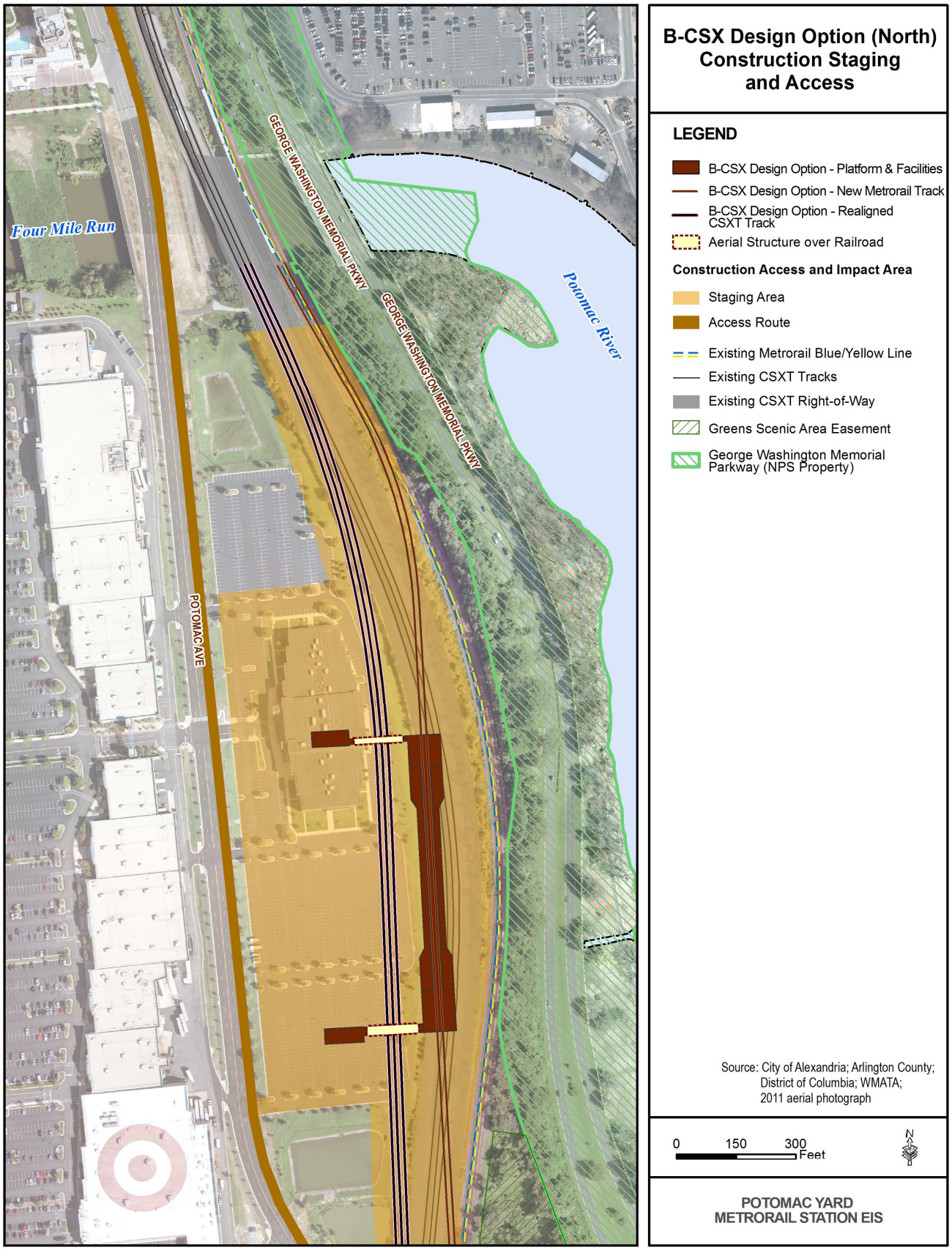


Figure 3-94: B-CSX Design Option (South) Construction Staging and Access

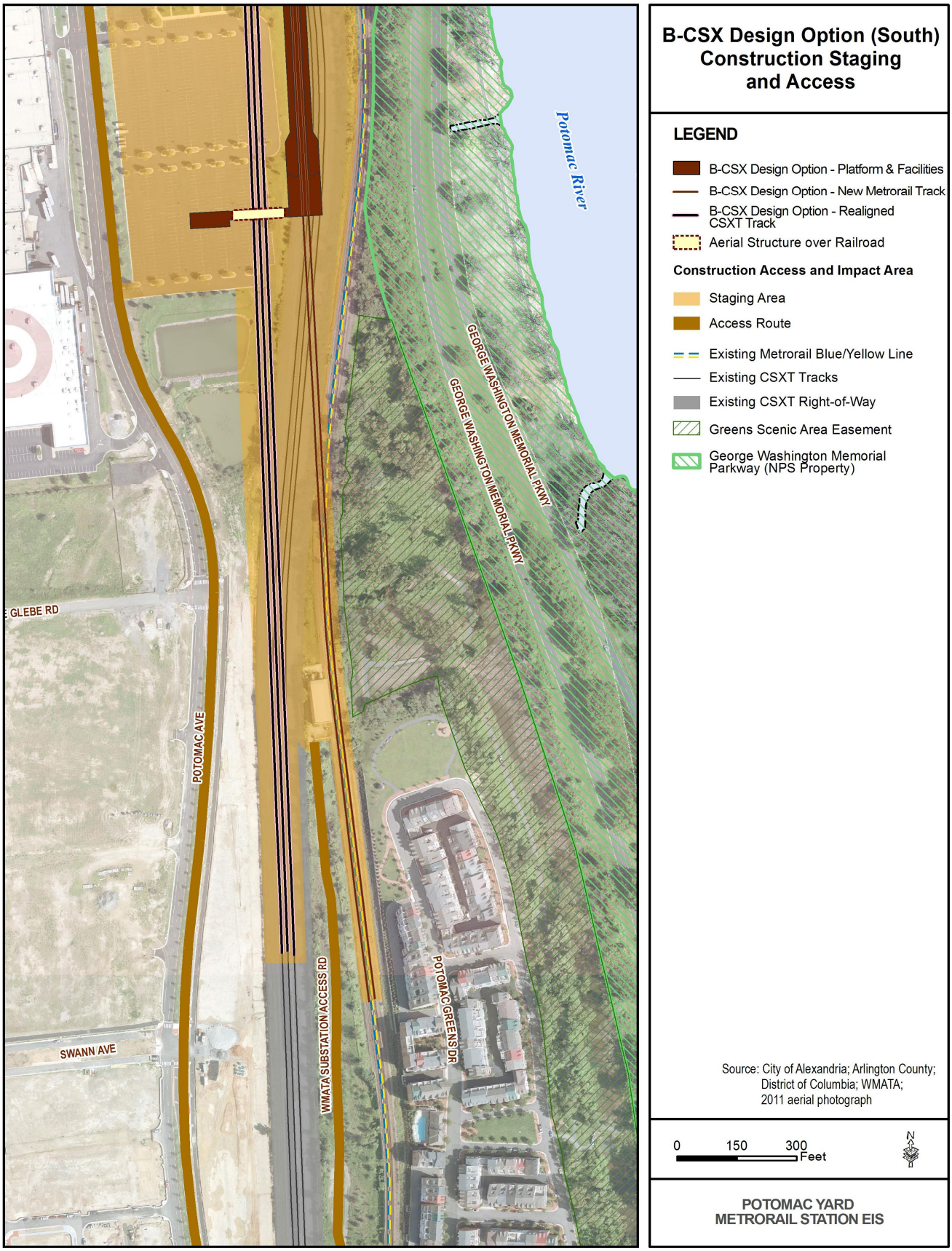


Figure 3-95: Build Alternative D (North) Construction Staging and Access

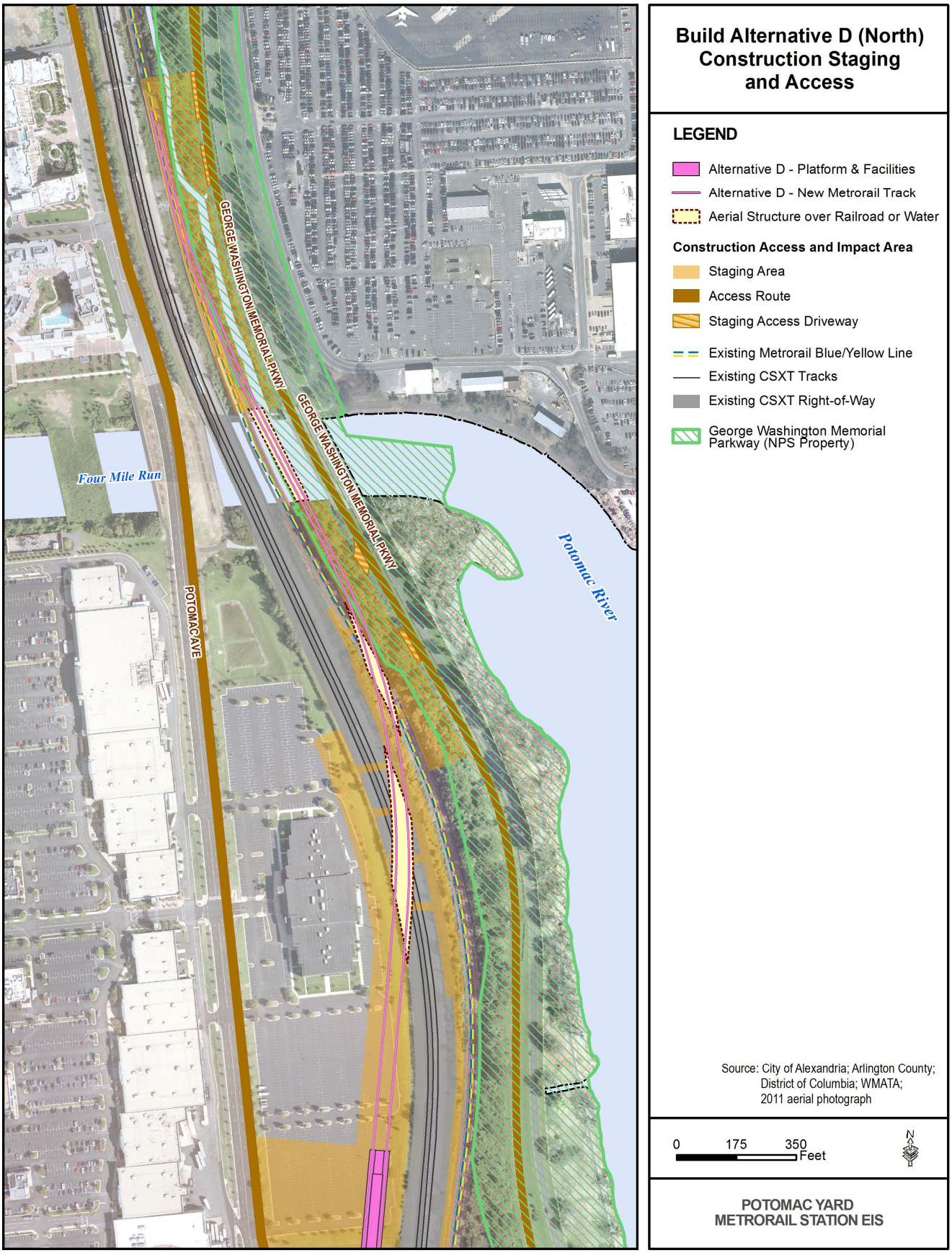
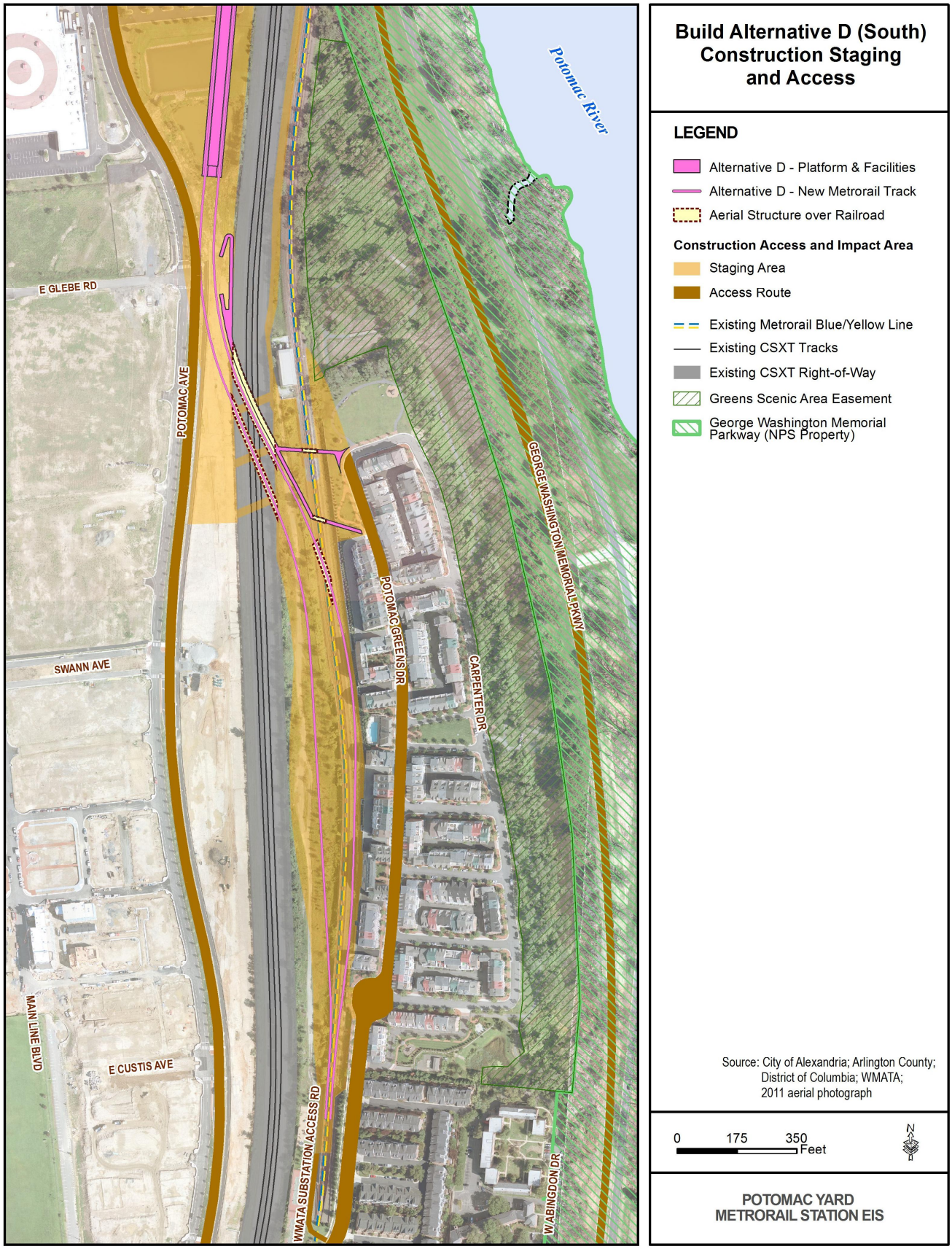


Figure 3-96: Build Alternative D (South) Construction Staging and Access



Transportation

Metrorail Operations

Temporary track shutdowns would be necessary during specific construction activities for the three Build Alternatives and B-CSX Design Option. Shutdowns would close Metrorail service between the Ronald Reagan Washington National Airport station and Braddock Road station, require the use of temporary bus shuttle service to transport riders between the two stations, and be limited to a maximum outage of 76 hours at a time per WMATA standards. All necessary single-tracking, shutdowns, and testing would be conducted in compliance with WMATA policies. To minimize these impacts, construction efforts would be scheduled and coordinated to minimize their occurrences, for example, by scheduling single-tracking and shutdowns during nighttime periods or special weekend maintenance periods on the line.

The construction of B-CSX Design Option would be phased to accommodate the realignment of both the Metrorail and CSXT rail corridors with minimal disruption to rail operations. B-CSX Design Option requires the construction of the new CSXT alignment followed by the demolition of the existing CSXT tracks before constructing the new Metrorail station and track.

CSXT Right-of-Way and Operations

Installation of any element over the CSXT track clearance area requires a pre-planned outage on CSXT track. At the end of the outage, all structural elements must be secured such that they will not dislodge and become a hazard to rail operations. In addition, construction access for the three Build Alternatives and B-CSX Design Option proposes to use the existing WMATA power substation service road. To allow construction equipment access to the north of the substation, a temporary construction access easement around the west side of the substation would be required due to the narrow width between CSXT property and the substation building.

Construction activities which occur on CSXT property, or within 25 feet of CSXT track, or which involve construction equipment or activities that in the event of a structural or mechanical failure or other type of accident could result in disturbances within 25 feet of CSXT track would be considered by CSXT to “foul the track.” When construction activities involve fouling of track, CSXT would require one or more CSXT flagmen on site to verify that the railroad is clear for safe passage of trains. Construction activities which cannot be stopped, moved in the clear, and secured within a few minutes’ notice would require a pre-planned outage of railroad operations.

B-CSX Design Option would require temporary track shutdowns during construction to accommodate realigned track segments. The new CSXT track alignment would be constructed as much as possible before connecting to the existing track segments. Once the new track alignment is operational, the original CSXT track alignment would be demolished and construction on the new WMATA right-of-way would ensue. To minimize impacts to CSXT operations, construction efforts would be scheduled and coordinated with CSXT to minimize their occurrences.

Public Roadways and Private Driveways

The three Build Alternatives and B-CSX Design Option would impact public roadways and private drives due to temporary construction access and routing of construction vehicles. The roadway operations of Potomac Avenue, Potomac Greens Drive, Slaters Lane, U.S. Route 1, and the WMATA traction power substation access road would be affected during construction. In addition, construction of Build Alternative A (Option 1 Construction Access), Build Alternative B (Option 1 Construction Access), and Build Alternative D would use temporary access from the GWMP roadway, which would involve effects on roadway operations in the vicinity of the access points. Temporary lane closures would be required on public roads that have more than two lanes, including the GWMP roadway and Potomac Avenue. Flagmen would be used on smaller two-lane roads to direct vehicle movements and allow construction vehicles to access the building sites. Routes for the construction vehicle access by each alternative are described in more detail in **Chapter 2, Alternatives Considered**.

During construction, the number of vehicles accessing the site would vary daily. For the three Build Alternatives and B-CSX Design Option, the number of vehicles on each access route would fluctuate depending on the activities associated with construction and time of day. At this early stage of project design, proposed construction techniques, types of equipment, and precise locations and durations of different activities within the project construction areas have not yet been defined sufficiently to quantitatively assess and compare the potential traffic effects of the three Build Alternatives and B-CSX Design Option.

Commercial vehicles are prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed construction project areas for Build Alternatives A and B and B-CSX Design Option are accessible from locations other than the GWMP. However, since potential impacts would occur to residential communities at the other access locations, construction access from the GWMP was also studied as an option in the Draft EIS. NPS correspondence regarding use of the GWMP roadway for project construction access is included in **Appendix H, Agency Correspondence**.

Construction would also be completed in accordance to the City of Alexandria's noise ordinance, which limits construction to business hours on weekdays and limited hours on Saturdays. A permit from the City's Department of Transportation and Environmental Services is necessary to haul construction materials on city streets (*City of Alexandria Code of Ordinances Section 5-2-27*).

To minimize potential impacts from construction traffic, site access by construction vehicles could be strategically scheduled to minimize its occurrence, and access times to the GWMP roadway would occur only during non-rush hours and traffic plans would be coordinated with and approved by the proper authorities. For Build Alternative A (Option 1 Construction Access), Build Alternative B (Option 1 Construction Access), and Build Alternative D, construction vehicles accessing the site from the GWMP roadway would be limited to using the southbound GWMP roadway between the Airport Access Road and Slaters Lane.

For each of the three Build Alternatives or B-CSX Design Option, when construction is complete, any road infrastructure damaged by construction activity would be restored to its former condition.

GWMP Access

Option 1 Construction Access for Build Alternatives A and B would require two temporary driveways for construction vehicle access from the GWMP roadway; driveway areas would be cleared of all trees and other natural vegetation and filled in or leveled as necessary to make construction activities possible. The access driveways from the GWMP southbound lanes to the construction staging areas would be 0.30 acre in total area (two driveways, each approximately 50 to 75 feet in width by 100 feet in length, providing one-way access off of and onto the GWMP southbound roadway). Parkway facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction, although a temporary lane closure of a portion of one southbound lane in the vicinity of the construction access areas would be required. Construction vehicles would use the southbound GWMP roadway from the Airport Access Road to Slaters Lane (1.7 miles). Users of the GWMP would experience additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times and would diminish the scenic quality of the GWMP. The additional traffic of construction vehicles may also damage the roadway pavement, which would eventually need to be replaced as part of the project.

Option 2 Construction Access for Build Alternatives A and B would not require any access roadways from the GWMP. All construction vehicles accessing the eastside of the site would travel through the Potomac Greens and Old Town Greens neighborhoods along Potomac Greens Drive (see "Potomac Greens Drive Access" below).

B-CSX Design Option would not require any access from the GWMP.

Build Alternative D construction staging would require the removal of 2.40 acres of vegetation along the GWMP roadway in the vicinity of Four Mile Run. Construction activity would be located relatively close to the parkway with little visual barrier, noticeably altering the appearance of the vegetated area proposed for construction. The access driveways from the GWMP southbound lanes to the construction staging areas consist of short access points into the construction staging areas, due to the narrow dimensions of the GWMP parkland west of the roadway in this area (two driveways, providing one-way access off of and onto the GWMP southbound roadway approximately several hundred feet north of Four Mile Run; and two driveways providing one-way access off of and onto the GWMP southbound roadway approximately several hundred feet south of Four Mile Run; dimensions of each driveway are approximately 50 to 75 feet in width by 20-30 feet in length). All parkway facilities would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction, although temporary lane closure of a portion of one southbound lane of in the vicinity of Four Mile Run would be required. Construction vehicles would use the southbound GWMP roadway from the Airport Access Road to Slaters Lane (1.7 miles). Users of the GWMP

would experience additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times and would diminish the scenic quality associated of the GWMP. The additional traffic of construction vehicles may also damage the roadway pavement, which would eventually need to be replaced.

Potomac Greens Drive Access

Build Alternatives A and B would both require access through the residential areas of Potomac Greens and Old Town Greens via the entire length of Potomac Greens Drive (0.7 mile); construction vehicles would access this area from U.S. Route 1.

- **Option 1 Construction Access** would also provide access to the area east of the existing Metrorail tracks via a temporary construction access driveway from the GWMP through Potomac Greens Park, resulting in lower overall construction traffic volumes on Potomac Greens Drive than Option 2.
- **Option 2 Construction Access** would not provide access to the area east of the existing Metrorail tracks from the GWMP, and the access would be provided entirely via Potomac Greens Drive, resulting in higher overall volumes of construction traffic on Potomac Greens Drive than Option 1.

Both options would require access on the west side of the existing Metrorail alignment; temporary construction access would be provided utilizing the access road through the Rail Park to the WMATA traction power substation (0.5 mile), crossing over the existing Metrorail alignment at the tennis court area of Old Town Greens (where Metrorail begins to travel in a tunnel below-grade).

Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles, which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the roadway pavement, which would eventually need to be replaced as part of the project.

B-CSX Design Option would require access on the west side of the existing Metrorail alignment; temporary construction access would be provided utilizing the access road through the Rail Park to the WMATA traction power substation (0.5 mile), crossing over the existing Metrorail alignment at the tennis court area of Old Town Greens (where Metrorail begins to travel in a tunnel below-grade). No construction access from Potomac Greens Drive would be required north of Old Town Greens.

Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles, which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the roadway pavement, which would eventually need to be replaced as part of the project.

Build Alternative D

For construction activities in the vicinity of the Potomac Greens and Old Town Greens neighborhoods, access would be provided via the entire length of Potomac Greens Drive; construction vehicles would access this area from U.S. Route 1. Access to the area between the existing Metrorail tracks and CSXT right-of-way would be provided through Potomac Greens Drive (0.7 mile) and via the access road through the Rail Park to the WMATA traction power substation (0.5 mile). Additional construction access would be required at locations where proposed Metrorail aerial structures cross over the CSXT right-of-way, including locations north and south of the proposed station and locations west of the Potomac Greens and Old Town Greens neighborhoods.

Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles, which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the roadway pavement, which would eventually need to be replaced as part of the project.

Property Impacts

The three Build Alternatives and B-CSX Design Option would require temporary easements or permits for construction activities, including vehicular access, staging and material laydown areas. For construction activities on GWMP property, Build Alternatives B and D would require a National Park Service Special Use Permit – form 10-114. Temporary property acreage impacts to NPS parkland are described further below in this section under **Parklands**. All temporary easements necessary for the project would be consistent with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as Amended. **Figure 3-97** shows existing property ownership within areas proposed for construction access, staging, and material laydown

for the three Build Alternatives and B-CSX Design Option. Temporary construction easements would be needed for the three Build Alternatives and B-CSX Design Option.

Table 3-45 lists construction impacts to the Greens Scenic Area easement. As described in **Section 3.3 Land Acquisitions and Displacements**, clearing of vegetation is not permitted within the Greens Scenic Area easement. The scenic easement prohibits most improvements, clearing, tree removal, and grading, except for uses such as light passive recreation and underground utilities, for which any improvements require prior written approval of the United States. However, the three Build Alternatives as designed would temporarily impact the scenic easement to varying degrees. None of the three Build Alternatives could proceed unless the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**. Due to the relatively small areas of impact to the scenic easement, re-design of the proposed construction staging areas for Build Alternatives A and D to avoid the scenic easement would be pursued if either is selected as the preferred alternative; this refinement involves more detailed project design that would occur as part of the preparation of the Final EIS. B-CSX Design Option would not impact the Greens Scenic Area easement.

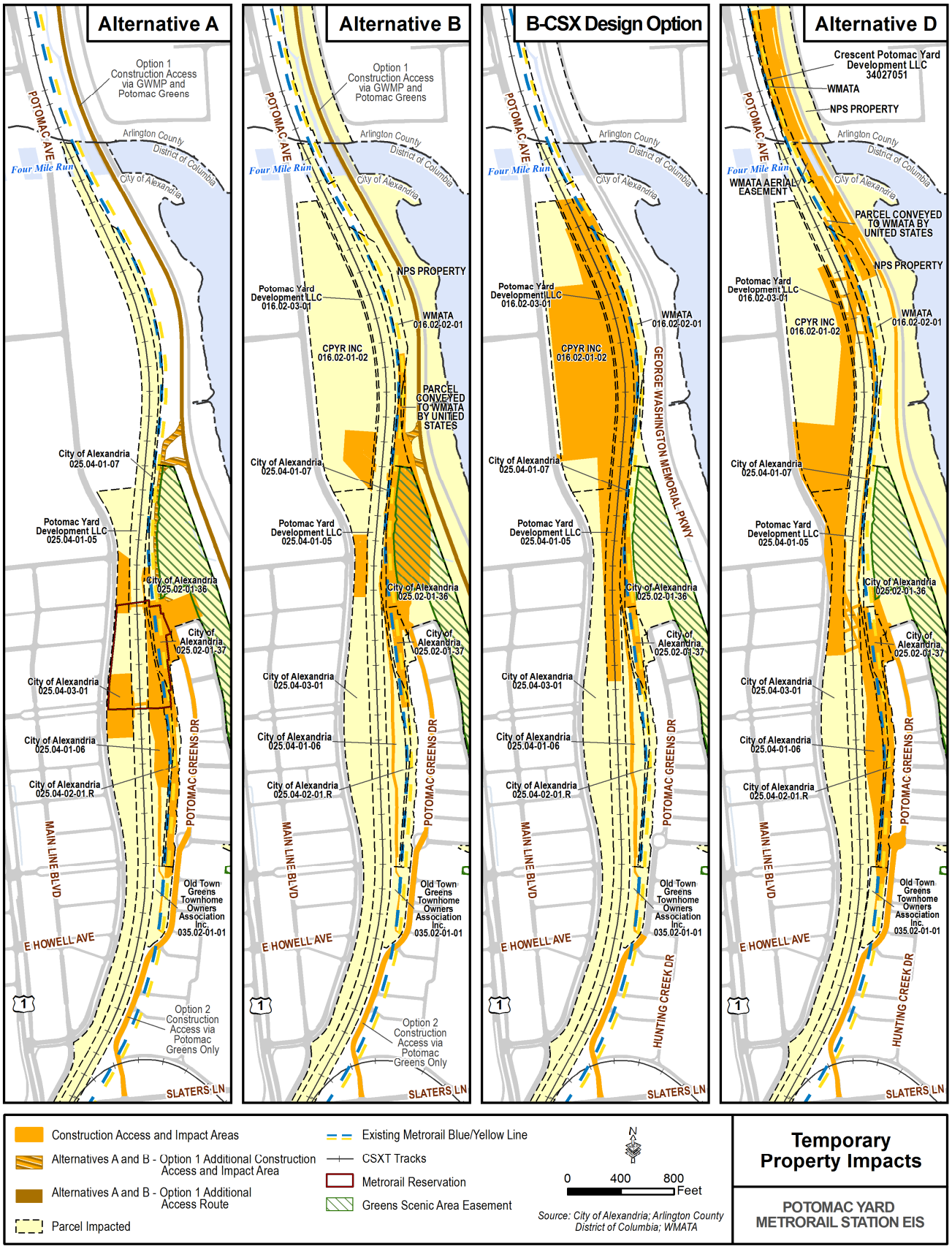
Table 3-45: Potential Construction Impacts to the Greens Scenic Area Easement

Type of Impact	Build Alternative A		Build Alternative B		B-CSX Design Option (acres)	Build Alternative D (acres)
	Option 1 Construction Access (acres)	Option 2 Construction Access (acres)	Option 1 Construction Access (acres)	Option 2 Construction Access (acres)		
Temporary [1]	0.25	0.13	3.09	3.09	0.00	0.02

[1]Acreage excludes areas with permanent property impacts.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Figure 3-97: Temporary Property Impacts



Visual Resources

Temporary impacts to visual resources would result from the removal of vegetation for construction staging, the location of construction equipment, and the provision of temporary vehicular access to GWMP roadway for Alternatives A, B, and D. Standard Best Management Practices (BMPs) would be used to minimize visual impacts during construction activities, and efforts would be made to minimize vegetation loss. Vegetated areas cleared for construction activities would be replanted.

For vegetation cleared from NPS parkland, the relationship of vegetation to historic planting plans and time required for re-growth are described in **Section 3.9 Cultural Resources**. Vegetation clearance within GWMP property, as described below for the Build Alternatives, would occur within areas planted as part of the original landscape design of the MVMH and GWMP. These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present and further described in Section 3.9. Further description of the natural character, acreages, and time required for re-growth of the vegetation that would be impacted is provided further below under **Ecosystems** (see page 3-225) temporary construction impacts.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

The assessment of temporary visual impacts references the analysis of existing conditions described in detail in **Section 3.8 Visual Resources** that was prepared in accordance with Federal Highway Administration (FHWA) *Visual Impact Assessment Methodology for Highway Projects* (1981). For reference, existing visual character and quality ratings for views described below are summarized as follows:

- GWMP viewsheds – the current visual character of the continuous GWMP corridor within the study area is described as a tree-lined roadway with intermittent views of Potomac Greens neighborhood to the west and the Potomac River and Washington to the east; its visual quality rating is Very High. Individual viewshed ratings (#1 through #6) are generally Very High, with some High and Moderately High ratings where existing development is visible through breaks in the trees.
- Potomac Greens neighborhood viewsheds – the current visual character looking west toward South Potomac Yard and the Rail Park is described as intermittent views of landscape vegetation and low horizontal wall, with South Potomac Yard development visible in background; its visual quality rating is Moderate. The current visual character looking north toward Potomac Greens Park is described as a landscaped neighborhood park, with transportation facilities in the background; its visual quality rating is Moderate.
- South Potomac Yard viewshed – the current visual character looking east toward the Potomac Yard Park and the Potomac Greens neighborhood and Potomac Greens Park in the distance is described as layered views of vegetation, with transportation infrastructure and development in the background; its visual quality rating is Moderately Low.

Build Alternative A

Build Alternative A temporary construction impacts would occur due clearing of construction staging areas and the storage of construction equipment within Potomac Greens Park and Potomac Yard Park; additional impacts by Option 1 Construction Access would occur due to removal of vegetation from the GWMP.

- Under Option 1 Construction Access, the construction access point from the parkway would interrupt the continuous visual line created by the roadway, requiring clearing of treed area and associated herbaceous vegetation consisting of 0.30 acre along the GWMP and 0.88 acre along the eastern side of the existing Metrorail tracks, removing some of the visible barrier between the GWMP and the tracks.
- Under both construction access options, construction would also remove 0.09 acre of treed area and associated herbaceous vegetation along the eastern edge of the Potomac Greens neighborhood by the park, removing some vegetation within the Greens Scenic Area easement that currently provides a visual barrier between GWMP and the proposed location of the Metrorail station.

NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Both construction access options would use 1.61 acres of Potomac Greens Park as a staging area, altering the viewshed of the park from the neighborhood by removing landscape plantings and visitor use facilities, such as the existing gazebo, playground, lawn and associated paths.

The temporary construction impacts to Potomac Yard Park by both options would include the removal of landscaped vegetation and park facilities such as the paths, lawn, playground, and event stage within 1.40 acres of parkland. Construction equipment would be placed within viewsheds, thereby introducing new features not previously present. As a result of changes to the views from Potomac Greens and South Potomac Yard, Build Alternative A would have short-term visual impacts.

Build Alternative B

Build Alternative B construction staging and equipment storage areas would remove much of the vegetation that currently provides a visual barrier between GWMP and the proposed location of the Metrorail station.

- Under Option 1 Construction Access, the construction access point from the GWMP roadway would interrupt the continuous visual line created by the roadway. Temporary driveways would require clearing of 0.22 acre of treed area and associated herbaceous vegetation.
- Under both construction access options, construction activity would be located relatively close to GWMP within the Greens Scenic Area easement, with little visual barrier to the GWMP, altering the vegetated appearance of the area due to the clearance of treed area and associated herbaceous vegetation within 0.55 acre of the GWMP, 0.83 acre of the Greens Scenic Area easement, and 0.31 acre along the east side of the Metrorail tracks. Construction equipment would be placed within GWMP viewsheds, thereby introducing new features not previously present. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Outside of the Greens Scenic Area easement, 3.43 acres Potomac Greens Park would be used as a staging area, altering the layered vegetated elements and removing landscape plantings and some visitor use facilities, such as the existing gazebo. Construction staging and equipment storage areas would remove much of the landscaped vegetation and park amenities within 1.09 acres of Potomac Yard Park in the vicinity of East Glebe Road.

Construction equipment would be placed within viewsheds, thereby introducing new features not previously present. As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard, Build Alternative B would have short-term visual impacts.

B-CSX Design Option

B-CSX Design Option construction staging would require the removal of an approximately 50-foot wide layer of thin, mostly low-lying vegetation with widely spaced trees west of the existing Metrorail line, between the Metrorail tracks and the CSXT tracks, that currently is part of the visual screen between GWMP and the proposed location of the Metrorail station. The vegetation within the GWMP would not be removed, leaving some of the visual barrier between the roadway and the station. Construction equipment would be placed along the existing Metrorail tracks within GWMP viewsheds, thereby introducing new features not previously present.

Construction activities would occur within 0.01 acre of Potomac Greens Park outside of the Greens Scenic Area easement, altering the layered vegetated elements and removing landscape plantings.

As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard, B-CSX Design Option would have short-term visual impacts.

Build Alternative D

Build Alternative D construction staging would require clearing of 2.40 acres of treed area and associated herbaceous vegetation that serves as a visual barrier along the GWMP roadway, most notably in the vicinity of Four Mile Run. In addition, the construction access points from the GWMP roadway would interrupt the continuous visual line created by the roadway. Construction activity would be located relatively close to the GWMP roadway with little visual barrier, noticeably altering the green appearance of the areas. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

A portion of Potomac Greens Park would be used as a staging area, altering the layered vegetated elements within 0.40 acre of parkland.

A portion of Potomac Yard Park would be used for staging and would remove vegetation and park facilities within 3.42 acres of parkland. From Potomac Yard, the construction staging would alter views of existing asphalt parking lots, park vegetation, and the stormwater management pond to that of a construction zone.

As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard, Build Alternative D would have short-term visual impacts.

Cultural Resources

Temporary construction impacts to Cultural Resources are described in **Section 3.9 Cultural Resources,** which analyzes project effects under Section 106 of the National Historic Preservation Act and considers temporary as well as permanent effects.

- **Historic Architectural Resources:** The three Build Alternatives and B-CSX Design Option would have temporary construction effects to the MVMH and GWMP related to clearing vegetation within cultural landscapes, visual effects related to vegetation clearance and construction staging, and construction access and staging areas, requiring a permit from NPS. Potential effects for Build Alternatives A and B vary based on the construction access option. These potential impacts to the MVMH and GWMP are described in detail in Section 3.9.
- **Archaeological Resources:** Build Alternatives A and B Option 1 Construction Access and Build Alternative D would have potential construction effects to archaeological sites that are potentially eligible for listing on the NRHP. These potential effects to archaeological resources are described in detail in Section 3.9.

Related temporary impacts to public roadways, visual resources, parklands, water resources, ecosystems (including general vegetation), and soils associated with areas within the MVMH and GWMP are described elsewhere in this section.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Parklands

The areas of temporary impacts to parklands due to construction staging and access are summarized in **Table 3-46**. The listed acreages of temporary construction impacts do not include acreage that would be permanently displaced by the three Build Alternatives and B-CSX Design Option. See **Section 3.10 Parklands** for permanent parkland impacts. Standard BMPs would be used for construction, and efforts would be made to minimize vegetation loss during construction and minimize impacts to park facilities.

For each of the three Build Alternatives or B-CSX Design Option, vegetation, soils, infrastructure, and facilities in parkland areas temporarily used for construction activities would be restored. Temporary construction impacts to the Greens Scenic Area easement that violate the terms of the easement, such as clearing of vegetation, would require an easement modification subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**.

Specific construction staging and access areas with parks and the effects on visitor use and experience for each alternative are described in more detail below. Temporary construction impacts to other resources within parklands are described in the following other subsections of Section 3.24, including noting specific impacts to GWMP and Greens Scenic Area:

- Traffic impacts to parks are described above under **Transportation, Public Roadways and Private Driveways** (see page 3-208);
- Visual impacts to specific viewsheds within parks are described above under **Visual Resources** (see page 3-213);
- Impacts to wetlands, floodplains, and groundwater (see page 3-221);
- Impacts to habitat and vegetation impacts are described below under **Ecosystems** (see page 3-225);
- Impacts to **Soils** (see page 3-226); and
- Potential to encounter **Hazardous and Contaminated Materials** (see page 3-226).

Table 3-46: Acreage of Temporary Construction Impacts to Parklands

Resource	Opening Year Ownership	Total Area of Park (acres)	Temporary Impact (acres)	Area Affected (percent of total area)
Build Alternative A Option 1 Construction Access				
George Washington Memorial Parkway	NPS	37.09[2]	0.30	0.8%
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	2.30 (0.25)[1]	11.2% (1.6%)[1]
Rail Park	City of Alexandria	4.21	1.79[3]	42.5%
Potomac Yard Park (South)	City of Alexandria	13.58[2]	1.40[3]	10.3%
Total NPS Parkland Property Acquisitions[3]		37.09[2]	0.30	0.8%
Total City of Alexandria Parkland Property Acquisitions		38.33	5.49	14.5%
Build Alternative A Option 2 Construction Access				
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	1.61 (0.13)[1]	7.8% (0.9%)[1]
Rail Park	City of Alexandria	4.21	1.79[3]	42.5%
Potomac Yard Park (South)	City of Alexandria	13.58[2]	1.40[3]	10.3%
Total City of Alexandria Parkland Property Acquisitions		38.33	4.80	12.5%
Build Alternative B Option 1 Construction Access				
George Washington Memorial Parkway	NPS	37.09[2]	0.78	2.1%
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	3.43 (3.09)[1]	16.7% (20.3%)[1]
Rail Park	City of Alexandria	4.21	0.96	22.8%
Potomac Yard Park (South)	City of Alexandria	13.58[2]	0.62	4.6%
Potomac Yard Park (North)	City of Alexandria	2.61	0.47	18.0%
Total NPS Parkland Property Acquisitions[3]		37.09[2]	0.78	2.1%
Total City of Alexandria Parkland Property Acquisitions		40.94	5.48	13.4%
Build Alternative B Option 2 Construction Access				
George Washington Memorial Parkway	NPS	37.09[2]	0.55	1.5%
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	3.43 (3.09)[1]	16.7% (20.3%)[1]
Rail Park	City of Alexandria	4.21	0.96	22.8%
Potomac Yard Park (South)	City of Alexandria	13.58[2]	0.62	4.6%
Potomac Yard Park (North)	City of Alexandria	2.61	0.47	18.0%
Total NPS Parkland Property Acquisitions[3]		37.09[2]	0.55	1.5%
Total City of Alexandria Parkland Property Acquisitions		40.94	5.48	13.4%
B-CSX Design Option				
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	0.01 (0.00)[1]	0.5% (0.0%)[1]
Rail Park	City of Alexandria	4.21	0.96	22.8%
Total City of Alexandria Parkland Property Acquisitions		40.94	0.97	2.4%
Build Alternative D				
George Washington Memorial Parkway	NPS	37.09[2]	2.40	6.5%
Potomac Greens Park (Greens Scenic Area easement)	City of Alexandria (NPS)	20.54 (15.19)[1]	0.40 (0.02)[1]	1.9% (0.1%)[1]
Rail Park	City of Alexandria	4.21	1.71	40.6%
Potomac Yard Park (South)	City of Alexandria	13.58 [2]	2.12	15.6%
Potomac Yard Park (North)	City of Alexandria	2.61	1.29	49.4%
Total NPS Parkland Property Acquisitions[3]		37.09[2]	2.40	6.5%
Total City of Alexandria Parkland Property Acquisitions		40.94	5.53	13.5%

[1] Area within parenthesis refers to the Greens Scenic Area easement.
[2] Area within the Study Area.
[3] Build Alternative A Temporary Impacts to Rail Park and Potomac Yard Park (South) exclude land within the Metrorail Reservation easement area.

Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

Build Alternative A

Option 1 Construction Access

Construction Staging and Access Areas

Under Build Alternative A Option 1 Construction Access, temporary access driveways and construction staging would impact 5.46 acres of parkland in Potomac Greens Park, Rail Park, and Potomac Yard Park (South) not including the Metrorail Reservation easement area. Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn, and playground. Impacted park facilities in Potomac Yard Park include the lawn, paths, playground, stage, event space, and park vegetation.

Option 1 Construction Access would impact 0.30 acre of GWMP, requiring clearance of vegetated areas along the western side of the southbound roadway to construct temporary access driveways.

Option 1 Construction Access would impact 0.25 acre of the Greens Scenic Area easement. To accommodate the construction access, staging, and laydown areas, 0.18 acre of trees and shrubs would be removed from the Greens Scenic Area easement. If the proposed construction staging area could not be redesigned to avoid the scenic easement, Build Alternative A Option 1 Construction Access could not proceed unless the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects throughout the two-year project construction duration related to:

- Vegetation clearance and construction equipment in staging areas near the station and access areas; and
- Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times and would diminish the scenic quality associated of the GWMP.

GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction, although the temporary lane closure of a portion of one southbound lane in the vicinity of the construction access areas would be required.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

Option 2 Construction Access

Construction Staging and Access Areas

Under Build Alternative A Option 2 Construction Access, temporary access driveways and construction staging would impact 4.80 acres of parkland in Potomac Greens Park, Rail Park, and Potomac Yard Park (South) not including the Metrorail Reservation easement area. Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn and playground. Impacted park facilities in Potomac Yard Park include the lawn, paths, playground, stage, event space, and park vegetation.

No construction activities would occur on the GWMP for Build Alternative A Option 2 Construction Access.

Under Build Alternative A Option 2 Construction Access, 0.13 acre of the Greens Scenic Area easement would be affected during construction, requiring the clearing of 0.09 acre of vegetation. If the proposed construction staging area could not be redesigned to avoid the scenic easement, Build Alternative A Option 2 Construction Access could not proceed unless the easement is released by NPS under the stipulation of a construction access permit, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects related to vegetation clearance and construction equipment in staging areas located off of GWMP property near the station. GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

Build Alternative B

Option 1 Construction Access

Construction Staging and Access Areas

Under Build Alternative B Option 1 Construction Access, temporary construction-related activities would impact 5.48 acres of parkland in Potomac Greens Park, Rail Park, Potomac Yard Park (South), and Potomac Yard Park (North). Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn, and vegetation. Impacted park facilities in Potomac Yard Park include park plazas, lawn, paths, stormwater management pond, and park vegetation.

Build Alternative B Option 1 Construction Access would impact 0.78 acre of GWMP, requiring clearance of vegetated areas along the western side of the southbound roadway to construct temporary access driveways and use for construction staging areas. Construction would require the removal of trees in areas planted as part of the original landscape design of the GWMP and MVMH. These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present. Vegetation proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The Vegetation of the George Washington Memorial Parkway*. Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

3.09 acres of the Greens Scenic Area easement would also be affected during construction, requiring the clearing of 1.51 acres of vegetation. Build Alternative B Option 1 Construction Access could not proceed unless the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects throughout the two-year project construction duration related to:

- Vegetation clearance and construction equipment in staging areas on GWMP property and adjacent areas near the station and realigned track and access areas on GWMP property; and
- Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times and would diminish the scenic quality associated of the GWMP.

GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction, although temporary lane closure of a portion of one southbound lane in the vicinity of the construction access areas would be required.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

Option 2 Construction Access

Construction Staging and Access Areas

Under Build Alternative B Option 2 Construction Access, temporary construction-related activities would impact 5.48 acres of parkland in Potomac Greens Park, Rail Park, Potomac Yard Park (South), and Potomac Yard Park (North). Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn, and vegetation. Impacted park facilities in Potomac Yard Park include park plazas, lawn, paths, stormwater management pond, and park vegetation.

Build Alternative B Option 2 Construction Access would impact 0.55 acre of GWMP. Option 2 Construction Access would require temporary construction staging areas on the GWMP, but would not result in temporary

access roads on the GWMP. Construction would require the removal of trees in areas planted as part of the original landscape design of the GWMP and MVMH. These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present. Vegetation proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The Vegetation of the George Washington Memorial Parkway*. Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More detail on construction staging would become available as discussions with property owners continue through the Final EIS and through final engineering design prior to construction.

3.09 acres of the Greens Scenic Area easement would also be affected during construction, requiring the clearing of 1.51 acres of vegetation. Build Alternative B Option 2 Construction Access could not proceed unless the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects throughout the two-year project construction duration related to vegetation clearance and construction equipment in staging areas on GWMP property and adjacent areas near the station and realigned track. GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

B-CSX Design Option

Construction Staging and Access Areas

Temporary construction-related activities would impact 0.97 acre of parkland in Potomac Greens Park and Rail Park. Impacted park facilities include park vegetation.

B-CSX Design Option was developed to minimize temporary as well as permanent impacts to NPS properties, including the GWMP and the Greens Scenic Area easement, and no construction activities would occur on these properties.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects related to vegetation clearance and construction equipment in staging areas located off of GWMP property near the realigned track and station. The vegetation within the GWMP would not be removed, leaving some of the visual barrier between the roadway and the station. GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

Build Alternative D

Construction Staging and Access Areas

Construction-related activities would impact 5.53 acres of parkland in Potomac Greens Park, Rail Park, Potomac Yard Park (South), and Potomac Yard Park (North) and 2.40 acres of GWMP. Impacted park facilities in Potomac Greens Park include the gazebo, lawn, paths, and vegetation. Impacted park facilities in Potomac Yard Park include planned park plazas, lawn, paths, the stormwater management pond, and park vegetation.

Construction activities would result in temporary impacts to 2.40 acres of the GWMP requiring clearance of vegetated areas along the western side of the southbound roadway to construct temporary access driveways and use for construction staging areas. Construction would require the removal of trees in areas planted as part of the original landscape design of the GWMP and MVMH. These locations have since returned to a more naturally vegetated state, although some of the species from the planting plans are still present. Vegetation

proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The Vegetation of the George Washington Memorial Parkway*.

0.02 acre of the Greens Scenic Area easement would also be affected during construction, requiring clearing of vegetation. If the proposed construction staging area could not be redesigned to avoid the scenic easement, Build Alternative D could not proceed unless the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

Visitor Use and Experience

Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects throughout the two-year project construction duration related to:

- Vegetation clearance and construction equipment in staging areas on GWMP property and adjacent areas near the station and realigned track and access areas on GWMP property; and
- Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times and would diminish the scenic quality associated of the GWMP.

GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both directions of travel during the duration of construction, although temporary lane closure of a portion of one southbound lane in the vicinity of the construction access areas would be required.

Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and noise effects of vegetation clearance and construction equipment in staging areas near the station and access areas as well as closures of specific park facilities in the construction staging and access areas.

Air Quality

Potential air quality impacts from construction of the three Build Alternatives and B-CSX Design Option would be similar and would include direct emissions from construction equipment and trucks, increased emissions from motor vehicles on the streets due to disruption of traffic flow, as well as fugitive dust emissions resulting from demolition, ground excavation, material handling and storage, movement of equipment at the site, and transport of material to and from the site. These impacts would be temporary, and would affect only the immediate vicinity of the construction sites and their access routes. Emissions from project-related construction equipment and trucks would be much less than the total emissions from other industrial and transportation sources in the region, and therefore are expected to be insignificant with respect to compliance with National Ambient Air Quality Standards (NAAQS). During final design, when details of the final alignment are determined, a closer review of the potential construction impacts would be re-evaluated to better gauge the likelihood of impact.

For each of the three Build Alternatives or B-CSX Design Option, to minimize construction-related effects on air quality, project construction activities would comply with Virginia Department of Environmental Quality (VDEQ) requirements for fugitive dust and emissions, as well as any local regulations.

Noise and Vibration

The bulk of the construction would normally occur during daylight hours when most residents are not at home, when residents who are at home are less sensitive to construction activities, and when other community noise sources contribute to higher ambient noise levels. However, some construction activities would also occur during the nighttime and on weekends to complete the project sooner and reduce the overall duration of impact on the community. Whenever possible, construction activities would be conducted during the daytime and during weekdays in accordance with local noise ordinances (such as the City of Alexandria's Noise Control Code, Section 11-5 and Arlington County's Noise Control Code, Chapter 15).

Construction activities are expected to impact only the closest residences and park users in adjacent neighborhoods (Potomac Greens and Potomac Yard) and any commercial properties in the vicinity of the station construction and Metrorail track realignment. Potential impacts to the community will be minimized by requiring contractors to implement appropriate noise and vibration control measures for extended disruption of normal activities. The use of impact pile drivers would be avoided whenever possible to eliminate the potential for vibration impacts (such as minor cosmetic damage to structures) at nearby sensitive receptors.

At this early stage of project design, proposed construction techniques, types of equipment, and precise locations and durations of different activities within the project construction areas have not yet been defined sufficiently to quantitatively assess and compare the potential noise and vibration effects of the three Build Alternatives and B-CSX Design Option. The three Build Alternatives and B-CSX Design Option would have some adverse impacts during construction in specific locations, due to activities at the project site as well as at staging and/or material laydown areas if they take place in noise-sensitive areas. Similarly, the three Build Alternatives and B-CSX Design Option would have the potential for noise increases along detour routes and truck haul routes. This analysis made conservative assumptions regarding construction noise in order to ensure that potential maximum adverse impacts are analyzed and disclosed consistent with NEPA requirements. In later stages of project design when a detailed construction plan is available, this analysis, including mitigation, will be refined.

Water Resources

Wetlands

Temporary construction impacts to USACE and NPS wetlands are summarized in **Table 3-47**. The listed acreages of temporary construction impacts exclude wetland acreage that would also be permanently displaced by the three Build Alternatives. The composition, functions, and values of these wetlands are described in **Section 3.14 Waters of the United States**. B-CSX Design Option would not temporarily impact any wetland regulated by either USACE or NPS or delineated WOUS.

Table 3-47: Temporary Impacts to USACE and NPS Regulated Wetlands

Alternative	USACE-only Wetlands (acres)	NPS-only Wetlands (acres)	USACE and NPS Wetlands (acres)[1]	USACE Wetlands TOTAL (acres)	NPS Wetlands TOTAL (acres)
No Build	0.00	0.00	0.00	**0.00**	**0.00**
Build Alternative A (Option 1 Construction Access)	0.00	0.05	0.30	**0.30**	**0.35**
Build Alternative A (Option 2 Construction Access)	0.00	<0.01	0.01	**0.01**	**0.01**
Build Alternative B (Option 1 Construction Access)	0.00	0.07	3.61	**3.61**	**3.68**
Build Alternative B (Option 2 Construction Access)	0.00	0.03	3.54	**3.54**	**3.57**
B-CSX Design Option	0.00	0.00	0.00	**0.00**	**0.00**
Build Alternative D	0.00	0.07	0.41	**0.41**	**0.48**

[1]Areas that are classified as wetlands by both USACE and NPS.

Temporarily impacted wetlands would be restored after construction is completed through a variety of BMPs. Existing drainage patterns to or from wetlands would be maintained through the use of engineering controls such as culverts under temporary access driveways. After construction is complete, all temporary impact areas, including access roads, will be restored. The restoration will include removal of fill to prior grade, amelioration of soil compaction, and revegetation. Within the project site, surface water and near surface water flow for recharge and drainage of wetlands are not expected to be significantly altered or diverted by soil compaction associated with establishment of access driveways for construction equipment and vehicles.

If a Build Alternative that impacts wetlands is chosen as the preferred alternative, a hydrologic and hydraulic (H&H) study would be conducted to establish baseline conditions that would model surface and near-surface flows so that more quantitative impacts could be established. Surface water recharge and discharge patterns would be identified such that existing drainage patterns would be maintained during construction.

Through the H&H modeling, appropriate BMPs would be installed to mitigate or improve the water retention, nutrient transformation, and retention of sediments and other particulates. While these mitigation strategies are intended to eliminate or minimize the temporary impacts to wetlands on-site, the following impacts to wetland

services and functions may occur during construction based on the qualitative assessment described in **Section 3.14**:

- **Build Alternate A Option 1 Construction Access:** This alternative would temporarily impact 0.30 acre of USACE regulated wetlands and 0.35 acre of NPS regulated wetlands, a majority of which are forested. The temporary impacts to this ecosystem during construction may include reduced wildlife habitat quality as well as sediment and nutrient retention due to vegetation removal. Mobile wildlife, such as birds, squirrels, and deer, would be able to easily relocate to adjacent, undisturbed habitat. This impact is unlikely to affect the adjacent, undisturbed wetlands associated with this wetland complex. As described above, mitigation strategies would be included to reduce the temporary impacts and the wetlands will be restored to existing conditions.
- **Build Alternative A Option 2 Construction Access:** This alternative would temporarily impact 0.01 acre of USACE and NPS regulated wetlands. This impact is unlikely to have any significant impacts to this ecosystem due to the small size. Impacts to the nutrient and flood abatement services of the adjacent, undisturbed wetlands are unlikely. Wildlife in the adjacent wetlands may experience some nuisance-level disturbance from nearby construction activities but would not be significantly higher than the existing daily activity of the urbanized habitat location.
- **Build Alternative B Option 1 Construction Access:** This alternative would temporarily impact 3.61 acres of USACE regulated wetlands and 3.68 acres of NPS regulated wetlands, a majority of which are emergent. The impacts would likely displace wildlife during construction activities. Temporary impacts could occur to flood abatement and sediment and nutrient retention in the areas of construction. This impact is unlikely to affect the adjacent, undisturbed areas associated with this wetland complex due to the proposed hydrology management systems described above. Mitigation strategies would be included to reduce the temporary impacts, and the wetlands would be restored to existing conditions.
- **Build Alternative B Option 2 Construction Access:** This alternative would temporarily impact 3.54 acres of USACE regulated wetlands and 3.57 acres of NPS regulated wetlands, a majority of which are emergent. Impacts to the wetland ecosystem services and functions would be similar to Build Alternative B Option 2 Construction Access.
- **B-CSX Design Option:** This alternative would not directly impact wetlands. Due to the proximity of construction activities, wildlife in the adjacent wetlands may experience some nuisance-level disturbance from nearby construction activities but would not be significantly higher than the existing daily activity of the urbanized habitat location.
- **Build Alternative D:** This alternative would temporarily impact 0.41 acre of USACE regulated wetlands and 0.48 acre of NPS regulated wetlands. These wetlands are located near Four Mile Run and are not in the same drainage as those potentially impacted by Build Alternative A and B. Areas impacted include both forested and emergent wetlands. These areas are generally confined within the disturbed area between the existing Metrorail and CSXT railroad tracks and the GWMP and likely provide very poor wildlife habitat. Therefore, no significant temporary impacts to wildlife habitat in wetlands near Four Mile Run are expected. Temporary impacts could occur to flood abatement and nutrient and sediment retention services in the areas of construction. This impact is unlikely to affect the adjacent, undisturbed wetlands associated with this wetland complex due to the proposed hydrology management systems as described above. Mitigation strategies would be included to reduce the temporary impacts, and the wetlands will be restored to existing conditions.

Once a preferred alternative is determined, the alternative will undergo a Function and Value Assessment as required by NPS for the Wetlands Statement of Findings per Director's Order 77-1 (see below). Following this assessment and the completion of construction activities, the existing ecological functions and values would be restored. These measures to ensure restoration have yet to be defined at this stage of project planning; following the selection of the preferred alternative, the mitigation and restoration measures will be developed and included in the Final EIS and Statement of Findings.

Joint Permit Application and Statement of Findings

A Joint Permit Application (JPA) would be developed for temporary, as well as permanent, project-related wetland impacts in compliance with Section 404 of the CWA. The permitting process would be initiated with USACE, VDEQ, and NPS. If wetlands are deemed tidal wetlands, the permitting process would also be initiated with VMRC. All NPS actions with the potential to have adverse impacts on wetlands must also comply with DO

77-1. Any alteration of wetlands on GWMP property or the Greens Scenic Area easement would be included in the description of impacts in the JPA, Final EIS, and Statement of Findings required by the NPS. In the case where both NPS and USACE procedures apply, coordination with the appropriate USACE office will be initiated early in the process to reduce potential duplication of effort, and the JPA and NPS processes would be initiated at the design phase of the project.

Mitigation Strategies

Specific wetland mitigation strategies would be determined through the JPA and NPS processes for unavoidable impacts to WOUS and wetlands resulting from the preferred alternative. USACE, VDEQ, VMRC, and NPS would determine mitigation measures, as part of the JPA process and NPS Director's Order 77-1, where appropriate.

Impacts would be minimized through the use, to the maximum extent practicable, of raised temporary driveways constructed of crushed gravel, culverts, and erosion controls to maintain surface water drainage and quality. The boundaries of the temporary access driveways would be clearly delineated to prevent vehicles and equipment from operating outside the limits of disturbance. In addition to the H&H study, monitoring of groundwater will be performed to establish baseline conditions prior to construction. After the construction is complete, groundwater monitoring will be performed to show restoration consistent with baseline conditions.

Therefore, short-term impacts on surface water and near surface water recharge and drainage from the temporary access driveways would be minor in the context of the project site and surrounding area. In the long term, wetlands disturbed during construction activities would be restored to pre-construction conditions.

Water Quality

Potential effects on water quality from construction of the three Build Alternatives and B-CSX Design Option would be similar and would be primarily the result of erosion and sedimentation occurring at the construction site and washing into surface waterways. BMPs, as outlined in guidance, policies, standards, and specifications, and all other applicable requirements, would be used to minimize construction-related impacts to water quality.

Floodplains

Temporary construction impacts within the 100-year and 500-year floodplains are listed in **Table 3-48**. All construction activities would comply with flood zone regulations of the City of Alexandria, Arlington County, and NPS.

Table 3-48: Temporary 100-Year and 500-Year Floodplain Impacts

Alternative	100-year Floodplain (acres)	500-year Floodplain[1] (acres)
No Build	0.00	0.00
Build Alternative A (Option 1 Construction Access)	0.53	0.28
Build Alternative A (Option 2 Construction Access)	0.00	0.01
Build Alternative B (Option 1 Construction Access)	3.86	0.14
Build Alternative B (Option 2 Construction Access)	3.63	0.14
B-CSX Design Option	0.00	0.00
Build Alternative D	1.22	0.32

[1]Acreage excludes areas in 100-year floodplain.

Within NPS parkland and the Greens Scenic Area easement, temporary construction impacts within the 100-year and 500-year floodplains are listed in **Table 3-49**.

Table 3-49: Temporary 100-Year and 500-Year Floodplain Impacts (NPS Parkland and Greens Scenic Area Easement)

Alternative		100-year Floodplain (acres)	500-year Floodplain1 (acres)
No Build	GWMP	0	0
	Greens Scenic Area easement	0	0
Build Alternative A (Option 1 Construction Access)	GWMP	0.30	0
	Greens Scenic Area easement	0.08	0.04
Build Alternative A (Option 2 Construction Access)	GWMP	0	0
	Greens Scenic Area easement	0	0
Build Alternative B (Option 1 Construction Access)	GWMP	0.74	0.03
	Greens Scenic Area easement	3.04	0.05
Build Alternative B (Option 2 Construction Access)	GWMP	0.51	0.03
	Greens Scenic Area easement	3.04	0.05
B-CSX Design Option	GWMP	0	0
	Greens Scenic Area easement	0	0
Build Alternative D	GWMP	1.15	0.09
	Greens Scenic Area easement	0.01	0.01

[1]Acreage excludes areas in 100-year floodplain.

Based on discussions with the City of Alexandria and Arlington County's engineering staff, none of the three Build Alternatives or B-CSX Design Option is expected to raise the 100-year Base Flood Elevation within the study area if constructed within the flood zones. This statement is based on the location of the large surface area of the Potomac River relative to the station area. Temporary impacts to the habitat function of the floodplain are described in **Wetlands** (see page 3-221) and in **Ecosystems** (see page 3-225).

Impacts to regulated floodplains on NPS land are subject to the policies of *NPS Director's Order 77-2 Floodplain Management*, which requires the preparation of a Statement of Findings. See **Section 3.15 Floodplains** for further description of the Statement of Findings.

Coastal Zones and Chesapeake Bay Preservation Areas

Temporary construction impacts to water resource buffer areas regulated by local Chesapeake Bay ordinances and related environmental protection ordinances would result from construction staging and laydown areas. Within the study area, these Resource Protection Areas (RPAs) extend 100 feet from streams and delineated wetlands. Estimates of temporary impacts to water resource buffers are provided in **Table 3-50**.

Table 3-50: Temporary Construction Impacts to Resource Protection Areas

Alternative	Resource Protection Areas (acres)
No Build	0.00
Build Alternative A (Option 1 Construction Access)	1.75
Build Alternative A (Option 2 Construction Access)	0.49
Build Alternative B (Option 1 Construction Access)	5.50
Build Alternative B (Option 2 Construction Access)	5.27
B-CSX Design Option	0.58
Build Alternative D	2.40

Navigable Waterways

Build Alternatives A and B and B-CSX Design Option would have no construction effects on navigable waterways. Build Alternative D would temporarily encroach into Four Mile Run for the purpose of constructing a new Metrorail bridge. If Build Alternative D is selected as the preferred alternative, a bridge permit from the U.S. Coast Guard would be required. The permit application would describe the techniques and duration of bridge construction activities which could temporarily impact the navigability of Four Mile Run.

Groundwater

Within the project site, subsurface groundwater flows and recharge within the water table aquifer or underlying regional aquifers would not be altered or diverted by the proposed construction activities. Any alteration of groundwater on GWMP property would require a permit from USACE. Localized alteration of the shallow seasonal perched aquifer, where present, could occur due to excavations, building construction, or soil compaction associated with project activities. However, this construction impact to the perched aquifer would be anticipated to be temporary and localized in the area of subsurface disturbance and minor in the context of the project site and surrounding area.

Ecosystems

Temporary construction impacts to natural habitats, including specific impacts to the GWMP and Greens Scenic Area, are listed in **Table 3-51**.

Table 3-51: Temporary Wetland, Riverine, and Upland Habitat Impacts

Habitat		No Build (acres)	Build Alternative A		Build Alternative B		B-CSX Design Option (acres)	Build Alternative D (acres)
			Option 1 Access (acres)	Option 2 Access (acres)	Option 1 Access (acres)	Option 2 Access (acres)		
Emergent Wetland	GWMP	0	0	0	0	0	0	0
	Greens Scenic Area easement	0	0.02	0	2.17	2.17	0	0.02
	Other	0	0.05	0.01	0.04	0.04	0	0.05
	TOTAL	0	0.07	0.01	2.20	2.20	0	0.07
Forested Wetland	GWMP	0	0.18	0	0.61	0.51	0	0.40
	Greens Scenic Area easement	0	0.04	0	0.80	0.80	0	0
	Other	0	0.07	0	0.06	0.06	0	0
	TOTAL	0	0.28	0	1.47	1.37	0	0.40
Riverine Habitat	GWMP	0	0	0	0.00	0	0	0.00
	Greens Scenic Area easement	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0
WOUS and Wetland Total	GWMP	0	**0.18**	**0**	**0.61**	**0.51**	**0**	**0.40**
	Greens Scenic Area easement	0	**0.06**	**0**	**2.97**	**2.97**	**0**	**0.02**
	Other	0	**0.12**	**0.01**	**0.10**	**0.10**	**0**	**0.05**
	TOTAL	0	**0.35**	**0.01**	**3.68**	**3.58**	**0**	**0.47**
Treed Upland	GWMP	0	0.12	0	0.16	0.04	0	2.00
	Greens Scenic Area easement	0	0.15	0.09	0.03	0.03	0	0
	Other	0	0.63	0.04	0.25	0.25	0	0.43
	TOTAL	0	0.90	0.13	0.44	0.32	0	2.43

For Treed Upland and Forested Wetland areas, vegetation proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The Vegetation of the George Washington Memorial Parkway*. Numerous shrubs and herbaceous plants would be disturbed, but the effect on the vegetative cover would be temporary; shrubs and herbaceous plants would be planted shortly after construction activities have ceased.

The project study area was surveyed for the federally listed threatened species Sensitive Joint-Vetch (*Aeschynomene virginica*) between August and October 2012, and no specimens were identified (see additional information in **Section 3.18 Ecosystems and Endangered Species**). Thus, no impact to Sensitive Joint-Vetch is anticipated. The study area will be re-inventoried following selection of the preferred alternative; the field survey will be conducted during the seasonal period specified by the USFWS Virginia Field Office.

Any clearing of vegetation on GWMP property would require a permit from NPS. Project limits of disturbance would be clearly delineated prior to the start of driveway construction, thereby ensuring that impacts on vegetation would not occur beyond the project boundaries. The need for conducting additional vegetation surveys will be further assessed as project planning and design continues, and upon the selection of the preferred alternative.

The soils in areas where the temporary access driveways and construction staging areas are established would be restored (see **Soils** below) and the areas would be planted and seeded to restore them to a vegetated condition following the completion of construction activities. NPS parklands used for construction activities would be restored based on an NPS-approved planting plan. Forest vegetation in areas temporarily cleared for construction would require approximately 20-40 years of regrowth to be re-established with functions similar to its current state as a disturbed, intermediate aged forest, based on the species currently present. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

Construction activities may temporarily displace wildlife, either due to direct use of habitat areas for construction staging areas or due to indirect effects on adjacent habitat, such as noise and visual impacts. Upon completion of construction activities and restoration of temporarily impacted areas, wildlife would be expected to return.

Soils

The proposed excavation, construction, and establishment of temporary construction access driveways would result in shallow soil disturbance, soil exposure and compaction that could cause potential adverse effects on shallow soil permeability, and soil erosion from water and wind.

Construction activities for the Build Alternatives would result in temporary impacts to soils on the GWMP and Greens Scenic Area easement; the areas of these impacts are listed above in **Table 3-38, Acreage of Temporary Construction Impacts to Parklands**. Any disturbance to soils on GWMP property would require a permit from NPS.

To minimize these effects, a sediment and erosion control plan would be developed as part of the construction documents for the site and would require measures needed to minimize impact to the site and surrounding water bodies. Once graded and established, access driveways are typically covered with stone or rock used to disperse storm water sheet flows and minimize soil erosion from wind. These measures include engineering controls such as drainage culverts and filter fabric to protect the integrity of the temporary access driveways and minimize impacts to the existing site drainage patterns and water quality. Silt fence would also be required as part of the soil and erosion plan to prevent stormwater run-off. The soil erosion and control measures would be inspected periodically and replenished as necessary throughout the project's construction phase. After construction is complete, all temporary impact areas, including access driveways, will be restored. The restoration will include removal of fill to prior grade, amelioration of soil compaction, and revegetation; measures to ensure soils are restored have yet to be defined and will be included in the Final EIS. Therefore, short-term impacts on soils from excavation and fill activities would be minor.

Hazardous and Contaminated Materials

Recognized Environmental Conditions sites (RECs) are most likely to be encountered during construction activities associated with the three Build Alternatives and B-CSX Design Option. RECs are located on the former Potomac Yard rail yard and include areas within the Greens Scenic Area easement area but not on the GWMP. Temporary measures taken during construction, such as construction worker health and safety practices, management of excavated contaminated soil, and construction dewatering management and permitting would be implemented during construction to prevent exposure to potential contaminants at RECs.

The avoidance measures will be outlined in a Site Management Work Plan or in equivalent site plans. The Site Management Work Plan will be site specific and will include pre-emergency planning and coordination with outside parties, personnel roles, lines of authority, and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up.

Safety and Security

For each of the three Build Alternatives or B-CSX Design Option, construction-related safety and security measures would be provided by the contractor for both construction workers and the general public. During construction, measures that may be used to address safety and security issues would include: temporary construction fencing and security staff to protect the public and the worksite from unauthorized entry of vehicles, people, and animals; temporary signage to direct motorists and pedestrians around construction areas; and on-going communication with neighboring property owners and the surrounding community regarding construction activities. WMATA would update its Safety and Security Program for the project with elements required by CSXT and other agencies as needed.

For each of the three Build Alternatives or B-CSX Design Option, mutual aid agreements for emergency response during construction would be developed among the City of Alexandria, Arlington County, and WMATA. These agreements would identify the roles and responsibilities of each jurisdiction in responding to emergencies, general policing and security, and emergency access.

3.24.4 Mitigation

3.24.4.1 Noise and Vibration

For each of the three Build Alternatives or B-CSX Design Option, all construction activities would comply with WMATA's design criteria to ensure that noise impacts are minimized during construction. Although WMATA, as a federally chartered agency, is exempt from local noise ordinances, project construction activities would comply with local construction noise and vibration limits whenever feasible and reasonable in accordance with WMATA construction specifications. For example, to reduce temporary construction noise and vibration impacts that are expected under the three Build Alternatives and B-CSX Design Option, several "good housekeeping" practices are recommended. The following control measures could be incorporated into the construction process to effectively minimize noise and vibration impacts in the community:

- Whenever possible, conducting all construction activities during the daytime and during weekdays in accordance with local noise ordinances (such as the City of Alexandria's Noise Control Code, Section 11-5 and Arlington County's Noise Control Code, Chapter 15);
- Where practical, erecting temporary noise barriers between noisy activities and noise-sensitive receptors;
- Locating construction equipment and material staging areas away from sensitive receptors;
- Routing construction traffic and haul routes along roads in non-noise-sensitive areas where possible;
- Using construction equipment with effective noise-suppression devices;
- Using noise control measures, such as enclosures and noise barriers, as necessary to protect the public and achieve compliance with WMATA's design criteria;
- Adequately notifying the public of construction operations and schedules. Methods such as construction-alert publications or a Noise Complaint Hotline could be used to handle complaints quickly;
- Utilizing construction methods that minimize vibration and complying with any local regulations governing vibration; and
- Conducting all operations in a manner that will minimize, to the greatest extent feasible, disturbance to the public in areas adjacent to the construction activities and to occupants of nearby buildings.

All mitigation measures would be confirmed during the final design phase of the project when the details of the project components and the construction scenarios would be finalized.

Although NPS has several policies regarding noise impacts on federal parks such as the GWMP included in the *2006 Management Policies*, including the "NPS Cultural Soundscape Management Policy 5.3.1.7", none of these policies specifically addresses impacts on heavily traveled roadways. Since GWMP visitors using the parkway generate noise due to the resulting automobile traffic, the parkway is not a sensitive land use as defined by the FTA guidelines and would not be adversely affected by noise from the construction or operation of the project under the FTA guidelines. However, NPS and the project team would identify measures to

minimize any additional adverse noise impacts to passive uses (such as walking and bird-watching) along the parkway during construction.

3.24.4.2 Ecosystems

For each of the three Build Alternatives or B-CSX Design Option, restoration for temporary impacts to wetland habitat areas is described above under Environmental Consequences for **Wetlands** (see page 3-221). Temporary impacts to upland habitat areas, including functions and values, would be mitigated through restoration of vegetation, as described above under Environmental Consequences for **Ecosystems** (see page 3-225). Restoration of habitats to their prior state would include the removal of temporary access roads and construction staging areas to prior grade, amelioration of soil compaction, and revegetation; measures to ensure they return to existing ecological function have yet to be defined and will be included in the Final EIS and the Statement of Findings.

4.0 PUBLIC AND AGENCY INVOLVEMENT

This chapter presents the public outreach and agency coordination activities undertaken during the Potomac Yard Metrorail Station Environmental Impact Statement (EIS) process.

This chapter is organized as follows:

- **Section 4.1** describes the coordination among the lead agency, cooperating agencies, and participating agencies. This section also documents the agency scoping meeting and other agency outreach meetings.
- **Section 4.2** describes the public involvement activities, including the:
  - Public scoping meetings and other public meetings;
  - Draft EIS public comment period and public hearing; and
  - On-going public outreach activities and information exchange.
- **Section 4.3** describes other public meetings and outreach related to the project that were coordinated by the City of Alexandria to inform city officials, neighborhoods, civic organizations and the public about the project and the EIS process.

4.1 Agency Coordination

4.1.1 Lead and Cooperating Agencies

The Federal Transit Administration (FTA), as a modal agency under the United States Department of Transportation (USDOT), is the lead Federal agency for the project and is responsible for the implementation of National Environmental Policy Act of 1969 (NEPA) regulations as required by the applicable sections of Federal surface transportation program authorization laws – the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005, and the subsequent Moving Ahead for Progress in the 21st Century (MAP-21), enacted in 2012 and effective on October 12, 2012. Since the Potomac Yard Metrorail Station EIS process was initiated before MAP-21 came into effect, the regulations outlined in Section 6002 of SAFETEA-LU apply to the project. FTA is also leading the review process for Section 106 of the National Historic Preservation Act of 1966, which requires FTA to consider the effects of its actions on historic properties. FTA is responsible for compliance with Section 106 and has initiated the review process with the Virginia Department of Historic Resources (VDHR).

Section 6002 of SAFETEA-LU (and Section 1305 of MAP-21) addresses the roles and responsibilities of the lead agency, the joint lead agency, the project sponsor, and cooperating agencies in preparation of the EIS and the provision of opportunities for public and agency involvement.[1] Section 6002 is codified as Title 23, Section 139 of the United States Code (23 U.S.C. 139), which was amended following the enactment of MAP-21. The City of Alexandria is the project sponsor and the joint lead agency. The National Park Service (NPS) is a cooperating agency due to the potential for project impacts to the George Washington Memorial Parkway (GWMP) and the adjacent Greens Scenic Area easement administered by NPS. The Washington Metropolitan Area Transit Authority (WMATA) also serves as a cooperating agency on the project because it owns and operates the Metrorail system. The WMATA Board of Directors must approve changes to the system Mass Transit Plan, as specified in the WMATA Compact. Before any changes to the plan are considered, the Board of Directors must advertise and then hold a public hearing (see **Section 4.2.4**).

The agency coordination process has been a continuing effort that began in 2010. In compliance with Section 6002 of SAFETEA-LU and 23 U.S.C. 139(g)(1), an Agency Coordination Plan was developed at the outset of the Potomac Yard Metrorail Station EIS process. The plan provided information about how agency coordination would be accomplished for the project, how and when the lead agencies would communicate information to cooperating and participating agencies and to the public, and how input from agencies and the public would be solicited and considered. Key activities and meetings are described in **Sections 4.1.4** and **4.1.5**.

As required by Title 40, Chapter V, Part 1501 of the Code of Federal Regulations (40 C.F.R. 1501.7), FTA developed a Notice of Intent (NOI) to prepare an EIS for the proposed Potomac Yard Metrorail Station. The NOI was published in the Federal Register (Vol. 76, No. 18) on Thursday, January 27, 2011.

[1] https://www.fhwa.dot.gov/hep/section6002/appx.htm#Lead_Agencies_Text

4.1.2 Participating Agencies

As required by Section 6002 of SAFETEA-LU and 23 U.S.C. 139(d), the lead agencies also identified Federal and non-Federal agencies that, because of their regulatory role or technical expertise, may have had an interest in the project.

Any Federal agency invited to participate in the environmental review process was designated as a participating agency unless the invited agency informed the lead agency, in writing, by the deadline specified in the invitation that the invited agency (1) had no jurisdiction or authority with respect to the project, (2) had no expertise or information relevant to the project, and (3) did not intend to submit comments on the project. The U.S. Department of Homeland Security declined the invitation to be a participating agency. A state, tribal, or local agency was required to respond affirmatively to the invitation to be designated as a participating agency.

The final list of 20 cooperating and participating agencies is included in **Appendix B**.

4.1.3 Agency Consultation

Agency consultation and review of the project is also being conducted concurrently from the NEPA process under the following regulations:

- Section 4(f) of the U.S. Department of Transportation Act of 1966 – protects public parks and recreational lands, wildlife and waterfowl refuges, and historic sites of national, state, or local significance from acquisition and conversion to transportation use;
- Section 106 of the National Historic Preservation Act of 1966 – requires Federal agencies to consider effects of their undertakings on historic architectural and archaeological resources;
- Coastal Zone Management Act of 1972 – requires a Coastal Zone Consistency Determination by the Virginia Department of Environmental Quality;
- Clean Air Act – requires consultation with the Metropolitan Washington Council of Governments and inclusion of the project in the Transportation Improvement Program for the region;
- Clean Water Act – requires consultation with the U.S. Army Corps of Engineers for the establishment of a Jurisdictional Determination for Wetlands and Waters of the U.S.;
- Section 7 of the Endangered Species Act – requires consultation with the U.S. Fish and Wildlife Service, Virginia Field Office regarding impacts to threatened or endangered species;
- Section 6(f) of the Land and Water Conservation Fund Act – requires consultation with the Virginia Department of Conservation and Recreation regarding potential impacts to parkland acquired using Land and Water Conservation funds; and
- Rivers and Harbors Appropriations Act – requires consultation with the U.S. Coast Guard regarding potential impacts to navigable waterways and bridges over navigable waterways.
- Archaeological Resources Protection Act – requires consultation with NPS and VDHR regarding archaeological resources.

The Section 4(f) consultation process is described in **Appendix D**, and the Section 106 consultation process is described in **Appendix F**.

4.1.4 Agency Scoping Meeting

Potential cooperating and participating agencies were invited to attend an interagency scoping meeting held on February 10, 2011, at the Cora Kelly Recreation Center, 25 West Reed Avenue, Alexandria, Virginia. In addition to presenting an overview of the project, the meeting provided an opportunity for the early identification of significant issues related to the project.

FTA, the City of Alexandria, WMATA, NPS, the Potomac and Rappahannock Transportation Commission, the National Capital Planning Commission, Virginia Department of Transportation, and Arlington County staff representatives attended the agency scoping meeting. Comments and responses from the agency scoping meeting are summarized in the Scoping Report, which is included in Volume II.

4.1.5 Additional Agency Outreach and Briefings

Between January 2012 and September 2012, agency briefings were conducted to provide an overview of the project status, including the scoping and screening processes that led to the development of the three project

alternatives. The intent of the individual meetings was to enable in-depth discussions about the resources that were of interest to each agency and discuss proposed methodologies for the assessment of potential effects. **Table 4-1** lists agency outreach meetings.

Table 4-1: Agency Outreach Meetings

Date	Agency
January 6, 2012	Metropolitan Washington Airports Authority
January 12, 2012	City of Alexandria Archaeology
January 12, 2012	National Park Service
February 22, 2012	Federal Aviation Administration
February 29, 2012	National Park Service
April 5, 2012	Federal Railroad Administration
April 23, 2012	National Capital Planning Commission
June 11, 2012	U.S. Army Corps of Engineers
July 9, 2012	Virginia Department of Historic Resources
September 17, 2012	Arlington County Department of Environmental Services

Additional communication with the following local, state and Federal agencies on specific areas of expertise or areas within their reviewing purview included:

- **U.S. Coast Guard**: correspondence for the review of navigable waters status of Four Mile Run;
- **National Park Service and Virginia Department of Historic Resources**: correspondence related to the Archaeological Resource Protection Act;
- **U.S. Fish and Wildlife Service**: online project review certification to identify Federally listed species and habitat, specifically the potential occurrence of bald eagle nesting areas and the threatened sensitive joint-vetch plant species within the study area; and
- **Virginia Department of Conservation and Recreation**: correspondence regarding the potential use of Land and Water Conservation Fund Section 6(f) funds to develop the portion of the Four Mile Run Trail within the study area.
- **Advisory Council on Historic Preservation (ACHP):** the Virginia Department of Historic Resources requested ACHP advice regarding the status of the Greens Scenic Area Easement as a historic property under Section 106 of the National Historic Preservation Act. The ACHP advised that whether or not the Greens Scenic Area Easement is a historic property is more of an eligibility question better answered by the Keeper of the National Register.
- **Keeper of the National Register:** the Federal Transit Administration sent a letter to the Keeper of the National Register requesting advice on the status of the Greens Scenic Easement as a historic property under Section 106 of the National Historic Preservation Act. The Keeper of the National Register has not yet responded to the letter.

4.2 Public Involvement

This section describes public involvement events and activities held during the Potomac Yard Metrorail Station EIS process to date. Ongoing public outreach was conducted throughout the process, and specific public meetings were held to present project information and solicit public comments on project scoping, alternatives considered, and preliminary environmental effects.

Informational materials at all public meetings, including project newsletters and comment sheets, were available in Spanish as well as English. In addition, a Spanish-speaking staff member was present at all meetings for participants who needed to ask questions or give comments verbally in Spanish.

4.2.1 Public Scoping Meetings

Two public scoping meetings were held on February 10, 2011, at the Cora Kelly Recreation Center, 25 West Reed Avenue, Alexandria, Virginia, at 4:30 pm and 6:00 pm. Public input was sought on the purpose and need

for the project, alternatives being considered, key environmental considerations, and the public involvement and agency coordination process.

Meeting participants were asked to register and were given a handout and a copy of the scoping information booklet. Members of the public who wanted to give oral comments were asked to sign-up on a separate speaker sign-in sheet at the check-in desk, or with any project staff member in the meeting room. The meetings used an "open house" format in which participants were able to review display boards and hand-out information on the project. Project staff was available to answer any questions. Following the open house portion of the meetings, a presentation was given to summarize the purpose of the project, the initial set of alternative station locations, and key environmental considerations. Participants were then given an opportunity to make oral comments. A court reporter was present to record all comments during this time. Participants were also able to provide comments directly to the court reporter, on comment sheets, or on one of the sketch pads located around the room. Participants could submit completed comment sheets at the meeting, mail them to the project post office box, or submit them via email after the meeting.

A total of 65 members of the public attended the scoping meetings. Of these, ten members of the public offered oral comments at the meetings, and seven comments were provided on the sketch pads. One comment sheet from the public was submitted. Public comments and responses are included in the Scoping Report, which is included in Volume II of the Draft EIS.

4.2.2 Public Meeting – Project Alternatives

On April 19, 2012, the project team held a public meeting at the Cora Kelly Recreation Center, 25 West Reed Avenue, Alexandria, Virginia. As with the public scoping meetings, display boards around the room provided an overview and project staff was present to answer questions. This open house portion of the meeting was followed by a brief presentation and a formal public comment session. The presentation reviewed the project to date, the environmental review process, refinement of EIS alternatives, the functionality and appearance of the alternatives, preliminary cost drivers, overall project schedule, and next steps.

Approximately 75 members of the public attended this meeting. Of these, 18 members of the public offered oral comments at the meeting, and 16 written comments were provided. Between April 5 and April 24, 2012, nine comments were received via the project e-mail address. Comments were reviewed by the project team so that materials for subsequent public meetings and the Draft EIS incorporated additional explanation, where needed, to address questions from the public.

4.2.3 Public Meeting – Environmental Effects

A series of public meetings will be held in April 2015. The meetings will be held to provide an opportunity for the public to learn more about technical analyses in the Draft EIS and ask questions of project staff in advance of the public hearing. For more information on these meetings, please visit www.alexandriava.gov/potomacyard.

4.2.4 Draft EIS Public Comment Period and Public Hearing

After the April 3, 2015 publication of the Draft EIS, a public comment period on the Draft EIS will be open until May 18, 2015. Electronic copies of the Draft EIS are available to the public on the project website, and paper copies are available for public review at the City of Alexandria City Hall and public libraries. During the comment period, written comments may be submitted in the following ways:

- Via email: comments@potomacyardmetro.com and/or writtentestimony@wmata.com
- Via U.S. mail:

Potomac Yard Metrorail Station EIS P.O. Box 16531 Alexandria, VA 22302	and/or	Office of the Secretary Washington Metropolitan Area Transit Authority 600 Fifth Street, NW Washington, DC 20001

A public hearing on the Draft EIS under the NEPA process is being held on Thursday, April 30, 2015 at 6:30pm at Cora Kelly Recreation Center, 25 W. Reed Avenue, Alexandria, VA 22305. The public hearing is an opportunity for interested parties to provide oral and written comments on the Draft EIS. The comments presented at the hearing will be recorded by a court reporter and entered into the public record. Responses will be prepared for the comments, and the comments and responses will be presented in the Final EIS. The

hearing is separate from any other public hearings that may be held by the City of Alexandria on matters related to the project to fulfill its internal legislative requirements separate from the NEPA process.

WMATA Compact Process Requirements

The WMATA Compact also requires a public hearing. WMATA's public hearing process allows for public comment and customarily keeps the public comment period open for ten days after the hearing. Following the hearing, a staff report will be circulated summarizing comments received and WMATA staff's responses to those comments. Members of the public then have an opportunity to comment on this staff report. Once finalized, the public hearing staff report and public hearing report supplement are submitted to the WMATA Board of Directors.

4.2.5 On-Going Public Outreach Activities and Information Exchange

A number of different approaches were used over the course of the environmental review process to ensure that the public remained informed of project developments and was provided an opportunity to comment throughout the project planning and design process. A project website, e-mail list, and newsletters were developed and maintained; project materials were distributed at City of Alexandria libraries and community centers; and project presentations were made at local civic association meetings and in coordination with the City of Alexandria's Potomac Yard Metrorail Implementation Work Group (PYMIG). These activities are listed in more detail below:

- **Project Website (http://www.potomacyardmetro.com):** The project website has been updated on an ongoing basis to provide information about the project, including project overview, schedule, description of the NEPA process, alternatives under consideration, public involvement opportunities, publications, maps, photographs, frequently asked questions, and other related materials. The website has also offered a link to contact the project team directly through the project e-mail address for those who have questions, suggestions and comments.
- **City of Alexandria Website (http://www.alexandriava.gov/potomacyard):** The City of Alexandria's Potomac Yard Development website includes a section on the New Potomac Yard Metrorail Station. The site includes responses to frequently asked questions, announcements, meeting dates, project information, access to key reports and documents, and a link to provide comments via the project website.
- **Project E-mail List:** A project e-mail list was developed, maintained and used to distribute newsletters, updates, meeting notices, and other project materials.
- **Project Newsletters:** To update the public and to obtain public comment, a project newsletter was posted online, emailed to the project e-mail list, and printed copies were distributed at the public meeting in April 2012.
- **Project E-mail Address (comments@potomacyardmetro.com)**: The address has been included on all publicly distributed project materials, and has offered a convenient way for the public to provide comments, ask questions, and request additional information on the project. Over the course of the EIS process, over 200 e-mail comments and questions have been received and responded to by the project team.

4.3 Other Outreach and Coordination

In addition to the scoping and general public meetings, the City of Alexandria, with support from the project team, has conducted briefings of City officials and community associations.

4.3.1 Section 106 Cultural Resources Consulting Parties Meetings

As part of the Section 106 process, FTA has invited certain organizations and individuals who have a demonstrated interest in the project to participate in the process. These organizations and individuals are referred to as Section 106 consulting parties, and review information relevant to the identification, evaluation and assessment of effects to historic properties that could result from the project. The following agencies and organizations agreed to serve as consulting parties for the project.

- Alexandria Federation of Civic Associations
- Alexandria Historical Restoration and Preservation Commission
- Alexandria Historical Society
- Arlington County Department of Community Planning- Housing and Development- Neighborhood Services Division
- City of Alexandria – Alexandria Archeology

- City of Alexandria – Historic Preservation Office- Department of Planning and Zoning
- City of Alexandria – Office of Historic Alexandria
- Lynhaven Civic Association
- National Park Service – George Washington Memorial Parkway
- National Park Service – National Capital Region
- Northeast Citizens' Association
- Old Town Business and Professional Association
- United States Army Corps of Engineers – Norfolk District

Two consulting party meetings have been held to date: February 20, 2013, and March 27, 2013. The first consulting parties meeting included and overview of the project, role of the consulting parties, the Area of Potential Effect (APE) for archaeological and historic resources, and the historic and archaeological resources located within the APEs for each resource type, It was noted that the three archaeological sites located within the APE are potentially eligible for listing on the National Register of Historic Places (NRHP). The second consulting parties meeting included a review of the preliminary effects evaluation for historic architectural resources for the Build Alternatives.

4.3.2 Potomac Yard Metrorail Implementation Work Group (PYMIG)

The Alexandria City Council created PYMIG to assist in the EIS process, by informing City officials, including representatives of the City Council and Transportation Commission, and providing a venue for them to give input on the project to City of Alexandria staff and WMATA staff. Additionally, PYMIG meetings have served as a venue for interested members of the public to stay informed of the EIS process. The public is invited to attend all PYMIG meetings.

Twelve meetings have been held to date: June 30, 2011; October 26, 2011; February 6, 2012; May 16, 2012; October 10, 2012; January 30, 2013; June 10, 2013; January 6, 2014; May 15, 2014; June 26, 2014; October 23, 2014; and January 29, 2015.

4.3.3 Presentations at Neighborhoods and Civic Association Meetings

The City of Alexandria held meetings in April 2012 to discuss the alternatives being evaluated in the EIS with neighborhood associations in the vicinity of the project site. Meetings were held with the following groups:

- Old Town Civic Association, April 11, 2012; and
- Potomac Greens Homeowners Association, April 12, 2012.

The City of Alexandria held additional follow up meetings to discuss the project status in 2013 and 2014 with neighborhood associations in the vicinity of the project site. Meetings were held with the following groups:

- Old Town Civic Association, May 8, 2013;
- NorthEast Citizens' Association, September 18, 2013;
- North Old Town Independent Citizens Association, September 26, 2013;
- Lynhaven Civic Association, November 4, 2013; and
- West Old Town Citizens Association, January 9, 2014.

4.3.4 CSX Transportation

The City of Alexandria held a meeting with CSX Transportation (CSXT) staff on March 8, 2012 to discuss the initial set of alternatives being evaluated in the Draft EIS. A follow up meeting with CSXT staff was held on November 13, 2013 to review the conceptual plans for B-CSX Design Option. CSXT staff responded to the conceptual plans via a letter to the City of Alexandria on May 28, 2014.

5.0 PROJECT COSTS AND FUNDING

This chapter presents the estimated capital and operating costs of the three Build Alternatives and B-CSX Design Option and identifies potential sources of project funding. The project is included in the City of Alexandria's Capital Improvement Program (CIP) demonstrating the City's commitment to provide the necessary local funding for the project.

This chapter is organized as follows:

- **Section 5.1** presents the *Capital Cost and Funding Strategy.* This section summarizes the estimated capital costs to construct each Build Alternative and describes the sources of funding that the City of Alexandria will use to cover the costs of building the station.
- **Section 5.2** presents the *Operating and Maintenance Cost and Funding Strategy*. This section summarizes the cost impacts to the City resulting from changes in the WMATA subsidy contribution that would be necessary to fund operations of the Build Alternatives. The section also identifies the source of funds used to cover the required increase in WMATA subsidy.

The financial analysis and planning documented in this Draft EIS reflect a level of detail appropriate for a project in the EIS phase. Subsequent phases will define the project at a greater level of detail and result in more detailed cost estimates.

5.1 Capital Cost and Funding Strategy

5.1.1 Capital Cost Estimate

The capital cost estimates for the Potomac Yard Metrorail Station presented in this Draft EIS are preliminary and are based on the conceptual engineering of the three Build Alternatives and B-CSX Design Option completed to date.

Methodology and Assumptions

The costs are presented as a range from low to high for each alternative. The capital costs for each alternative were escalated to 2016 dollars, assuming a 3 percent annual inflation rate. The cost estimates are based on Federal Transit Administration (FTA) Project and Construction Management (CM) Guidelines (2003), which are based on the Association for Advancement of Cost Estimating (AACE), Order of Magnitude (Conceptual) Estimates. For future financial planning and analysis purposes, a representative value of 85 percent of the high end of the capital cost range will be used. The capital cost estimates are presented using FTA's Standard Cost Categories (SCC) (2011), consistent with FTA guidance for capital cost estimation for major capital projects.

The capital cost estimates are based on an implementation schedule that assumes an opening date for the Potomac Yard Metrorail Station in 2016. Cost estimates will be updated in the Final EIS in accordance with any updates to the project schedule. If the timing of the station construction and opening is later than 2016, the effects of construction cost inflation would increase the estimated capital costs.

Any financing costs necessary to cover delays or shortfalls in funding once construction begins are not included in the cost estimates. The costs of mitigation, including wetlands replacement and soil remediation, are included in the cost estimates. For B-CSX Design Option, the cost estimate includes the relocation of CSXT tracks; potential costs for compensation of any CSXT penalties for delay of Amtrak and Virginia Railway Express (VRE) operations during construction are not included. A more detailed implementation schedule and refined cost estimates will be developed as the project advances into the implementation phase. The costs to complete the environmental review process and to prepare General Plans are not included in the capital cost estimate.

Cost Estimates

Table 5-1 lists capital costs by SCC category for the alternatives, described as follows:

- **Build Alternative A** – estimated capital costs between $119 million and $228 million are the lowest cost of the three Build Alternatives and the B-CSX Design Option. This lowest cost results from the least amount of guideway and track element construction relative to the other alternatives.

- **Build Alternative B** – estimated capital costs between $149 million and $293 million. Compared to Build Alternative A, the costs for Build Alternative B reflect additional guideway and track construction.
- **B-CSX Design Option** – estimated capital costs between $193 million and $358 million. Compared to Build Alternative B, the costs for the B-CSX Design Option reflect the additional site work for relocation of CSXT tracks and additional right-of-way acquisition.
- **Build Alternative D** – estimated capital costs between $277 million and $539 million. The alternative has an aerial station design and two bridge structures and is located north and slightly west relative to Build Alternatives A and B. This location across the CSXT tracks results in significantly higher guideway and track element costs, as well as substantially higher real estate acquisition costs than Build Alternatives A and B and the B-CSX Design Option.

Table 5-1: Capital Cost Estimate: Station Cost Ranges by Alternative ($millions, $2016)

SCC Cat. no.	SCC Description	No Build	Build Alternative A		Build Alternative B		B-CSX Design Option		Build Alternative D	
			Low	High	Low	High	Low	High	Low	High
10	Guideways & Track Elements	0.00	1.96	4.20	18.20	39.44	21.75	46.60	103.50	221.78
20	Stations, Stops, Terminals, Intermodal	0.00	49.47	106.02	50.12	107.40	50.12	107.40	33.42	71.62
30	Support Facilities: Yards, Shops, Admin. Building	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	Sitework & Special Conditions	0.00	24.62	51.56	33.38	70.32	41.10	86.86	50.52	107.06
50	Systems	0.00	9.47	20.29	10.23	21.91	13.24	28.37	14.49	31.05
60	Right-of-Way, Land, Existing Improve-ments	0.00	0.63	0.81	0.99	1.30	27.45	30.45	25.81	28.45
70	Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	Professional Services	0.00	23.16	25.86	23.86	27.56	24.31	28.41	26.46	33.26
90	Unallocated Contingency	0.00	9.69	19.49	12.38	25.3	15.16	29.81	22.75	46.18
TOTAL		**$0.00**	**$119.00**	**$228.23**	**$149.16**	**$293.23**	**$193.13**	**$357.90**	**$276.95**	**$539.40**

5.1.2 Capital Funding Sources

The City of Alexandria will manage the capital funding plan. The City of Alexandria's plan has been to fund the station using revenue generated by new development in Potomac Yard. To account for and manage the revenues collected for the station, the City has created the Potomac Yard Metrorail Station Fund ("Station Fund"). Proceeds from the Station Fund are to be used solely for the design, construction, and financing of the station and will be accounted for separately from other City revenues. The Station Fund collects revenue from two special tax districts, developer contributions, and net new tax revenues generated by Potomac Yard development. These revenue sources are described in more detail below.

Net New Taxes

This category of funding includes revenue from growth related taxes and fees on real property, sales, transient lodging, meals, business licenses, and business personal property. Current tax revenues generated (with 2010 defined as the base tax year) at Potomac Yard will continue to go to the City's General Fund and are not counted as available for Metrorail station financing. For new tax revenues generated by new development at Potomac Yard, fixed percentages based on development type (60 percent of residential, 13 percent of retail, 17 percent of office, and 6 percent of hotel taxes) would go to the General Fund to pay for City and school services that the new residents and businesses in Potomac Yard are likely to generate. The remainder of the new tax revenues would go to the Station Fund.

Special Tax Districts

Two different special tax districts have been established to generate further revenue for the Station Fund. All taxable real property in both districts is to be taxed with the exception of affordable housing units owned by a nonprofit organization. A Tier I special tax of 20 cents per $100 of valuation applies to portions of North Potomac Yard as well as Landbays of G, H, and a small portion of Landbay I of South Potomac Yard. A Tier II special tax of 10 cents per $100 of valuation applies to most all of South Potomac Yard. Collections for Tier I began in 2011 while Tier II collections will begin the calendar year after the station opening.

Developer Contributions

The third source of revenue is from developer contributions made by the various owners of the different landbays. The owner of North Potomac Yard (Landbay F, owner CPYR, Inc.) has agreed with the City of Alexandria to contribute $10 per square foot (in 2010 dollars) of new development for up to 4.9 million square feet of development, indexed to inflation, for Alternative B or a location similar to Alternative B (see *City of Alexandria Potomac Yard Memoranda of Understanding,* Volume II of the Draft EIS).

Total developer contributions will vary based on timing and amount of development. The North Potomac Yard developer contributions are not applicable to Alternative A and B-CSX Design Option, as the developer has indicated that they would not provide contributions for Alternative A and B-CSX Design Option since the station would not be close enough to the North Potomac Yard development site. In addition, the North Potomac Yard developer contributions are not applicable to Alternative D at this time, as the developer has indicated that it would likely only provide a "meaningfully less" contribution for Alternative D due to the loss of significant development potential and negative impact on the redevelopment value of North Potomac Yard. The amount of the contribution for Alternative D would need to be negotiated with the developer.

Additionally, the owners of portions of South Potomac Yard have agreed to provide $2 million to the City towards the construction of a pedestrian bridge and have already made several payments towards this agreed upon amount.

5.1.3 Other Potential Federal Capital Funding Sources

The project funding also includes a $1 million FTA grant ("FTA Project VA-95-X112 (RSTP)") that was used to fund the NEPA study for the project. The City will also continue to evaluate potential opportunities for Federal or state funds, including Surface Transportation Program (STP) funds. These funds, which are typically used for highway projects, would need to be allocated by the Virginia Department of Transportation (VDOT) to the project and "flexed" (or transferred) into an eligible grant program.

In addition to potential Federal funding sources, the City of Alexandria may pursue financing assistance through the Transportation Infrastructure Financing Innovation Act (TIFIA). This loan program has been expanded under

MAP-21 and could offer attractive financing terms such as lower interest rates or the ability to defer principal and interest payments until five years after operations commence. A TIFIA direct loan could be used to finance up to 50 percent of the project's capital costs. TIFIA can be used on a subordinate basis to the City's general obligation bonds and might provide a credit enhancement that would reduce financing costs or risk to the City.

The City of Alexandria plans to request funding from the Northern Virginia Transportation Authority's (NVTA) "70 percent" funding stream for local projects. While NVTA has not yet developed a multi-year long-range funding plan, the City of Alexandria has notified NVTA that it intends to request funding for the Potomac Yard Metrorail Station project. The City of Alexandria's planned request is consistent with NVTA's authorizing statutes that require NVTA to allocate a portion of its funding to local jurisdiction projects in proportion to the NVTA tax and fee revenue generated in the jurisdiction.

5.1.4 Other Potential State Capital Funding Sources

The project has been approved for a $50 million loan through the Virginia Transportation Infrastructure Bank (VTIB). The VTIB is a special revolving loan fund established by the state to assist localities and other eligible borrowers to finance transportation projects. Revenue from the Tier 1 Special Tax District is anticipated to be used for the repayment of the VTIB loan. The VTIB loan lowers the amount that will need to be borrowed for the project from other higher cost sources.

5.2 Operating and Maintenance Cost and Funding Strategy

5.2.1 Operating Costs

The Potomac Yard Metrorail Station would add system-wide operating costs to Metrorail. Currently, the majority of Metrorail systems operating funds come from the annual operating subsidy provided by member jurisdictions of the WMATA Compact. The WMATA Compact is an agreement among jurisdictions in Virginia, Maryland, and the District of Columbia that governs the management and operation of the Washington region's Metrorail, Metrobus, and MetroAccess systems. WMATA's operating revenue from passenger fares and related sources covers 55 percent of the bus and rail system operating expenses. The remaining 45 percent is subsidized by local and state governments, including the City of Alexandria. The annual incremental Metrorail subsidy is allocated among its members using an established and approved formula.

The City provides an annual contribution to WMATA's capital improvement program based on the same Board-approved formulas. The City's total WMATA operating subsidy for Metrorail operating and capital rehabilitation is approximately $10 million in FY 2013. The City has currently allocated 5.1 percent of WMATA's total subsidy under this subsidy allocation formula. The addition of one station and an estimated 5,000 additional City residents would increase the City's share to 5.3 percent requiring an additional $1.39 million annual contribution from the City. The subsidy increase will be approximately the same for each Build Alternative.

5.2.2 Operating Funding Sources

Along with ongoing debt service, the city plans to fund the additional WMATA subsidy required to cover the operations cost for the Potomac Yard Metrorail Station with the Potomac Yard Metrorail Station Fund, which would include net new growth-related tax revenue and special tax district revenue, as described in **Section 5.1.2**.