

1 3.0 ENVIRONMENTAL CONSEQUENCES

2 3.1 Introduction

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

6 3.1.1 Resources Evaluated

7 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

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

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

19 The discussion of each environmental resource includes the following:

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

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

29 3.1.2 Impacts Summary

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

34

35 Table 3-1: Summary of Impacts¹

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	<ul style="list-style-type: none"> Additional train midday off-peak (2016 and 2040) Direct Metrorail access 	<ul style="list-style-type: none"> Additional train midday off-peak (2016 and 2040) Direct Metrorail access 	<ul style="list-style-type: none"> Additional train midday off-peak (2016 and 2040) Direct Metrorail access 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Station, entrance facilities, and realigned track occupy portion of existing commercial development and existing public open space 	<ul style="list-style-type: none"> 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)				<ul style="list-style-type: none"> Realigned track would affect planned street network 	<ul style="list-style-type: none"> Elevated track structures occupy existing and planned open space
Zoning	Permits 3.700 million square feet of development in North Potomac Yard (CDD #19)	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Not consistent with station location in North Potomac Yard Small Area Plan Consistent with regional transportation plans Not inconsistent with GWMP plans 	<ul style="list-style-type: none"> Consistent with City of Alexandria plans Consistent with regional transportation plans Not inconsistent with GWMP plans 	<ul style="list-style-type: none"> Not consistent with City of Alexandria plans Consistent with regional transportation plans Not inconsistent with GWMP plans 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Improved mobility with access to Metrorail Increased economic activity due to Metrorail access Visual impacts to views from Potomac Yard and Potomac Greens 	<ul style="list-style-type: none"> Improved mobility with access to Metrorail Increased economic activity due to Metrorail access Visual impacts to views from Potomac Yard and Potomac Greens 	<ul style="list-style-type: none"> Improved mobility with access to Metrorail Increased economic activity due to Metrorail access Visual impacts to views from Potomac Yard and Potomac Greens 	<ul style="list-style-type: none"> Improved mobility with access to Metrorail Increased economic activity due to Metrorail access Visual impacts to views from Potomac Yard and 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 <i>(Build Alternatives compared to the No Build Alternative)</i>	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.	<ul style="list-style-type: none"> • Visual impacts to GWMP reduce visual quality for two viewsheds: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - Two from Moderate to Moderately Low - One from Moderate to Low 	<ul style="list-style-type: none"> • Visual impacts to GWMP reduce visual quality for three viewsheds and the Continuous Corridor: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - Two from Moderate to Moderately Low 	<ul style="list-style-type: none"> • Visual impacts to GWMP reduce visual quality for three viewsheds and the Continuous Corridor: <ul style="list-style-type: none"> - Two from Very High to Moderately High - One from Very High to High - Continuous Corridor from Very High to High 	<ul style="list-style-type: none"> • Visual impacts to the GWMP reduce visual quality for three viewsheds and the Continuous Corridor by 2016: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - 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)					
<p>Long-term (2040) Impacts to Visual Resources</p> <p><i>(Build Alternatives compared to the No Build Alternative)</i></p>	<p>Anticipated changes to existing views from GWMP and Potomac Yard/Potomac Greens by 2040 due to North Potomac Yard development</p>	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> - One from Moderately Low to Very Low - One from Moderate to Moderately Low 	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> - One from Moderately Low to Low - One from Moderate to Moderately Low 	<ul style="list-style-type: none"> Visual impacts to the GWMP reduce visual quality for three viewsheds and the Continuous Corridor: <ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> Visual impacts to the GWMP reduce visual quality for two viewsheds and the Continuous Corridor: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - 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	<p><u>Option 1</u> 0.30 acre</p> <p><u>Option 2</u> None</p>	<p><u>Option 1</u> 0.78 acre</p> <p><u>Option 2</u> 0.55 acre</p>	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	<p><u>Option 1</u> 5 to 10 trees</p> <p><u>Option 2</u> None</p>	<p><u>Option 1</u> 15 to 20 trees</p> <p><u>Option 2</u> 10 to 15 trees</p>	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	<u>Option 1</u> 0.30 acre <u>Option 2</u> None	<u>Option 1</u> 0.93 acre <u>Option 2</u> 0.71 acre	None	3.54 acres
Acres of Trees removed on Greens Scenic Area Easement Land	None	<u>Option 1</u> 0.18 acre <u>Option 2</u> 0.09 acre	<u>Option 1</u> 1.51 acres <u>Option 2</u> 1.51 acres	None	None
Archaeological Sites Affected	None Known	<u>Option 1</u> 2 sites <u>Option 2</u> None known	<u>Option 1</u> 2 sites <u>Option 2</u> None known	None known	1 site
Parklands					
Impacts to Parks	None	<ul style="list-style-type: none"> City of Alexandria: 1.16 acres (Metrorail Reservation area excluded from impacts) Federal (NPS): none 	<ul style="list-style-type: none"> City of Alexandria: 3.01 acres Federal (NPS): 0.16 acre 	<ul style="list-style-type: none"> City of Alexandria: 3.86 acres Federal (NPS): none 	<ul style="list-style-type: 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	<u>GWMP Land</u> 0.05 acre <u>GSAE Land</u> 1.26 acres <u>Other Land</u> 0.17 acre <u>Total Land</u> 1.48 acres	None	<u>GWMP Land</u> 0.77 acre <u>GSAE Land</u> 0 acres <u>Other Land</u> 0.13 acre <u>Total Land</u> 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	<u>GWMP Land</u> 0 acres <u>GSAE Land</u> 0 acres <u>Other Land</u> 0.41 acre <u>Total Land</u> 0.41 acre	<u>GWMP Land</u> 0.10 acre <u>GSAE Land</u> 1.71 acres <u>Other Land</u> 1.54 acres <u>Total Land</u> 3.36 acres	<u>GWMP Land</u> 0 acres <u>GSAE Land</u> 0 acres <u>Other Land</u> 1.12 acres <u>Total Land</u> 1.12 acres	<u>GWMP Land</u> 1.12 acres <u>GSAE Land</u> 0 acres <u>Other Land</u> 0.95 acre <u>Total Land</u> 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 (<i>permanent impacts for each resource listed above</i>)					
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: 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 	<ul style="list-style-type: 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 and Potomac Avenue during approved times 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<u>Option 1</u> 0.25 acre <u>Option 2</u> 0.13 acre	<u>Option 1</u> 3.09 acres <u>Option 2</u> 3.09 acres	None	0.02 acre
Visual Resources <i>(Acreages reported are for acres of treed area and associated vegetation removed)</i>	No trees on GWMP or Greens Scenic Area easement removed	<ul style="list-style-type: none"> Removal of 0.30 acre of trees on GWMP/MVMH Land for Option 1 Removal of trees on Greens Scenic Area easement: <ul style="list-style-type: none"> <u>Option 1</u> 0.18 acre <u>Option 2</u> 0.09 acre Visible construction equipment and materials 	<ul style="list-style-type: none"> Removal of trees on GWMP/MVMH Land: <ul style="list-style-type: none"> <u>Option 1</u> 0.77 acre <u>Option 2</u> 0.55 acre Removal of trees on Greens Scenic Area easement: <ul style="list-style-type: none"> <u>Option 1</u> 0.83 acre <u>Option 2</u> 0.83 acre Visible construction equipment and materials 	<ul style="list-style-type: none"> No trees on GWMP or Greens Scenic Area easement removed Visible construction equipment and materials 	<ul style="list-style-type: none"> 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	<u>Option 1</u> Affects MVMH/ GWMP and two archaeological sites <u>Option 2</u> None	<u>Option 1</u> Affects MVMH/ GWMP and two archaeological sites <u>Option 2</u> Affects MVMH/ GWMP	None	Affects MVMH/ GWMP and one archaeological site
Parklands	None	<u>Option 1</u> <ul style="list-style-type: none"> City of Alexandria: 5.49 acres Federal (NPS): 0.30 acre; access along 1.7 miles of GWMP roadway <u>Option 2</u> <ul style="list-style-type: none"> City of Alexandria: 4.80 acres (Metrorail Reservation area excluded from impacts) Federal (NPS): none 	<u>Option 1</u> <ul style="list-style-type: none"> City of Alexandria: 5.48 acres Federal (NPS): 0.78 acre; access along 1.7 miles of GWMP roadway <u>Option 2</u> <ul style="list-style-type: none"> City of Alexandria: 5.48 acres Federal (NPS): 0.55 acre 	<ul style="list-style-type: none"> City of Alexandria: 0.97 acre Federal (NPS): none 	<ul style="list-style-type: 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	<u>Option 1</u> 0.30 acre <u>Option 2</u> 0.01 acre	<u>Option 1</u> 3.61 acres <u>Option 2</u> 3.54 acres	None	0.41 acre
NPS Regulated Wetlands	None	<u>Option 1</u> 0.35 acre <u>Option 2</u> 0.01 acre	<u>Option 1</u> 3.68 acres <u>Option 2</u> 3.57 acres	None	0.48 acre
100-year Floodplain Impacts	None	<u>Option 1</u> 0.53 acre <u>Option 2</u> None	<u>Option 1</u> 3.86 acres <u>Option 2</u> 3.63 acres	None	1.22 acres
Resource Protection Areas	None	<u>Option 1</u> 1.75 acres <u>Option 2</u> 0.49 acre	<u>Option 1</u> 5.50 acres <u>Option 2</u> 5.27 acres	0.58 acre	2.40 acres
Hazardous and Contaminated Materials	None	Potential to encounter contaminated materials			

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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).

39 **3.2 Transportation**

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

44 **3.2.1 Methodology**

45 **3.2.1.1 Roadway, Surface Transit, Pedestrian, Bicycle, and Parking Facilities and Services**

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

51 **3.2.1.2 Traffic Conditions**

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

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

70 **3.2.1.3 Metrorail Operations**

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

75 **3.2.1.4 Potomac Yard Metrorail Station Ridership**

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

87

88 3.2.2 Affected Environment

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

90 3.2.2.1 Existing and Opening Year Base Transportation Network

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

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

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

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

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

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

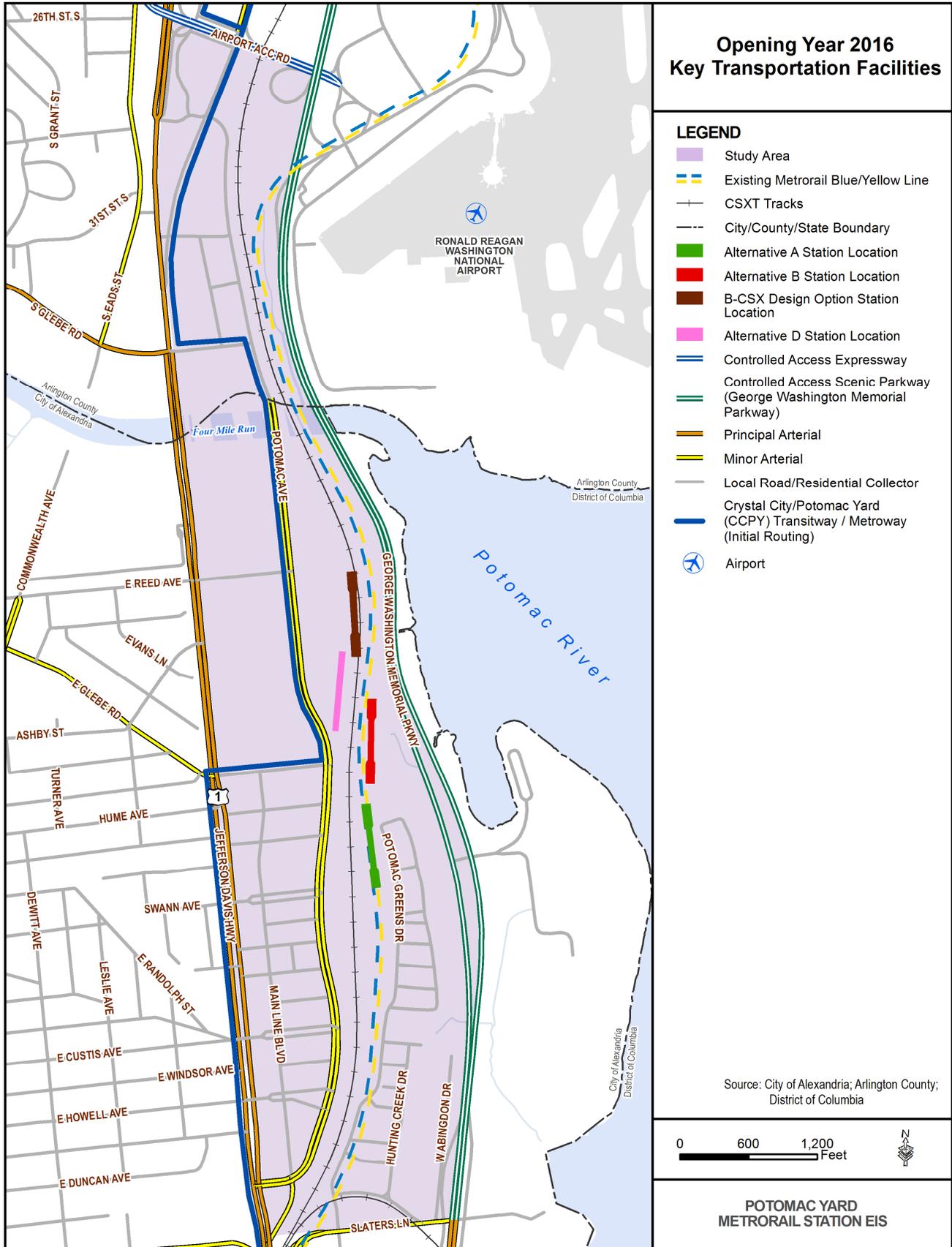
117 3.2.2.2 2040 Base Transportation Network

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

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

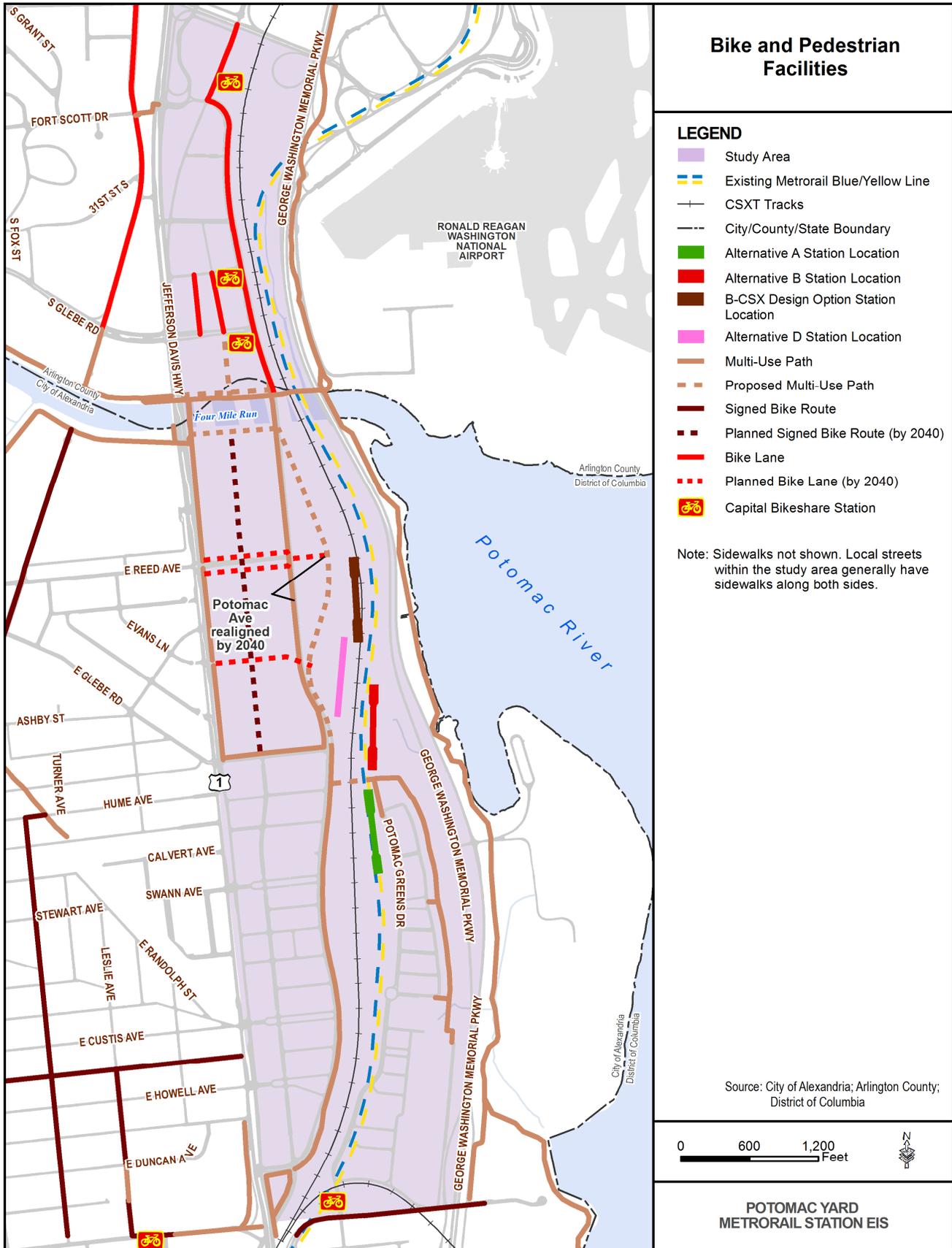
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137 **Figure 3-1: Opening Year 2016 Key Transportation Facilities**



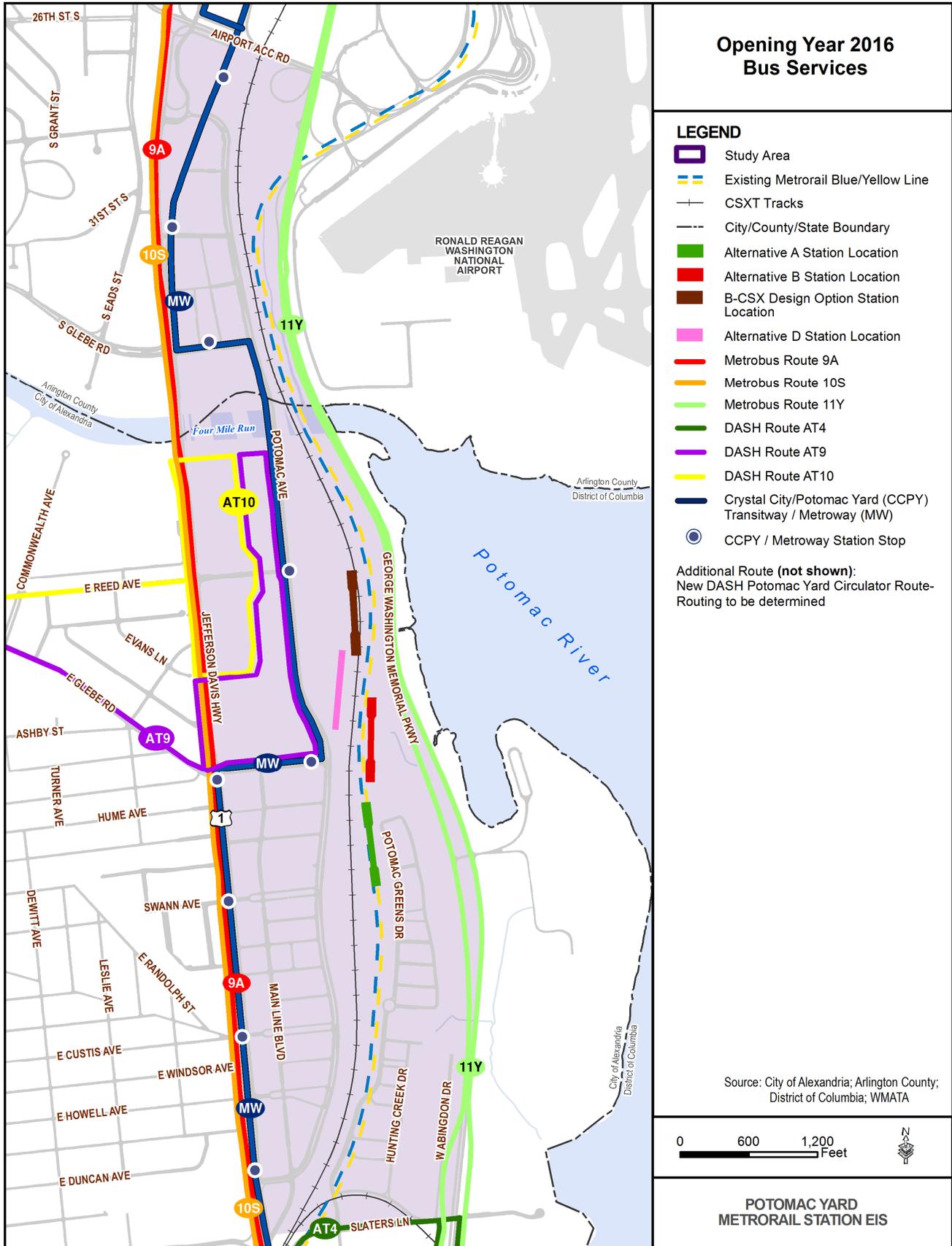
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139 **Figure 3-2: Bike and Pedestrian Facilities**



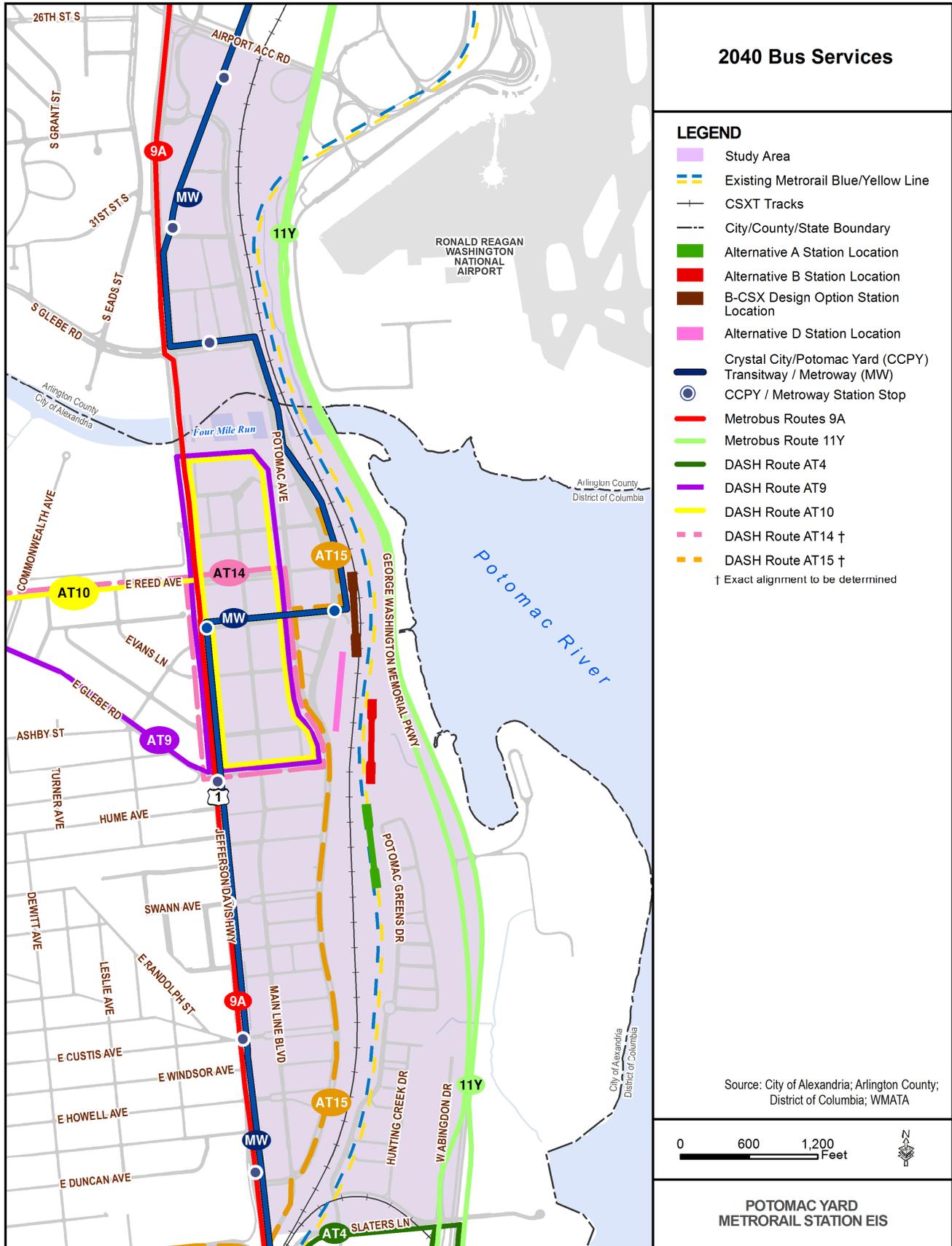
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141 **Figure 3-3: Opening Year 2016 Bus Services**



142

143 Figure 3-4: 2040 Bus Services



144

145 3.2.3 Environmental Consequences

146 3.2.3.1 No Build Alternative

147 Roadways and Traffic

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

153 Rail Operations

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

156 Surface Transit

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

159 Pedestrian and Bicycle Accommodations

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

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

171 Parking Facilities

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

175 Airport

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

177 3.2.3.2 Build Alternatives

178 Roadways and Traffic

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

184 Rail Operations

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

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

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

199 **Station Ridership**

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

209 **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

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

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

216 **Surface Transit**

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

222 **Pedestrian and Bicycle Accommodations**

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

231 **Parking Facilities**

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

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

241 **Airport**

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

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

249 **3.2.4 Mitigation**

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

252 **3.3 Land Acquisitions and Displacements**

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

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

- 256 • Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as Amended.
- 257 • 49 CFR, Part 24.
- 258 • FTA Circular 5010.1D, Chapter IV, Section 2.
- 259 • 54 U.S.C. 102901.

260 **3.3.1 Methodology**

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

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

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

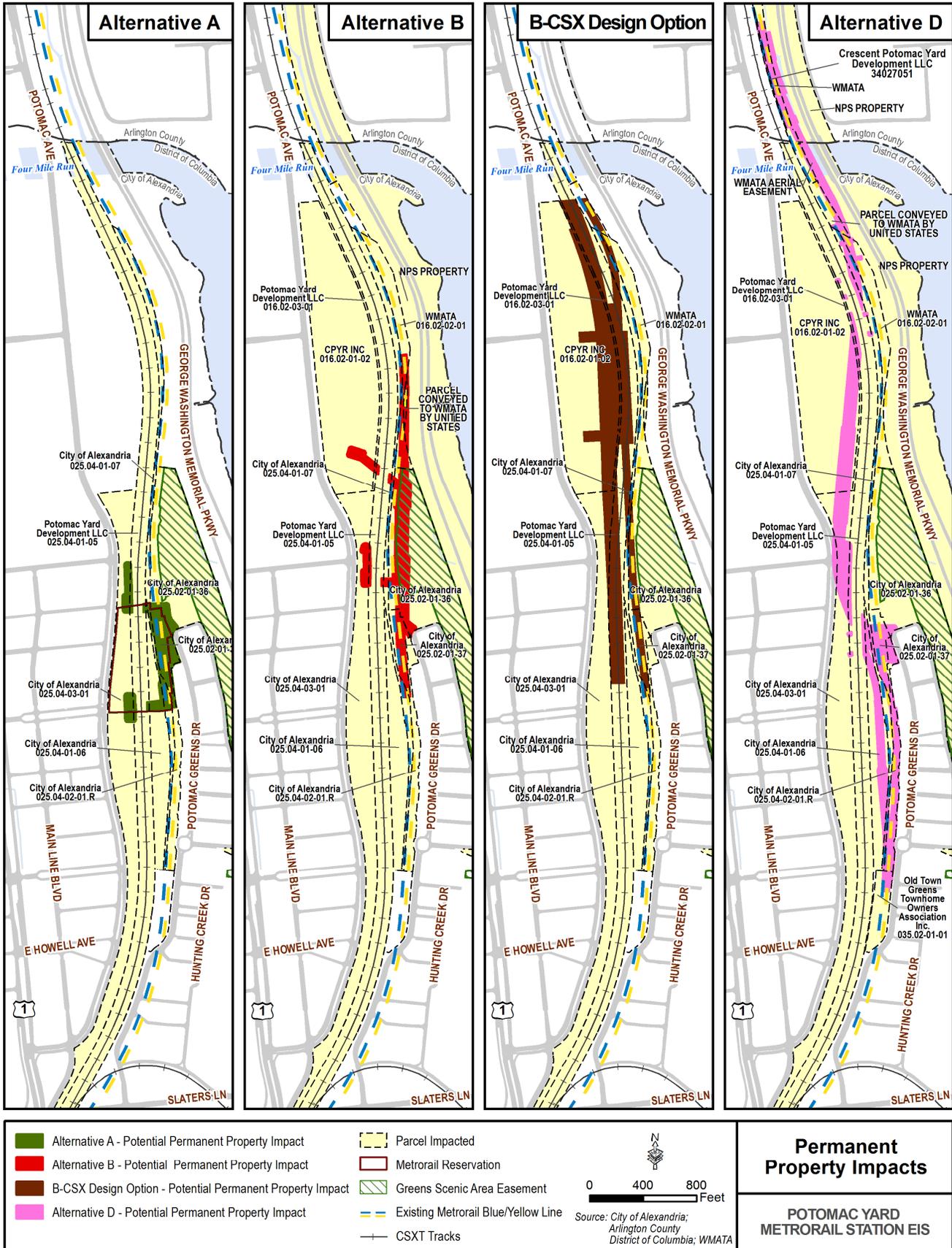
275 **3.3.2 Affected Environment**

276 **3.3.2.1 Key Landowners**

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

279

280 **Figure 3-5: Permanent Property Impacts of Build Alternatives**



282 **WMATA**

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

288 **The City of Alexandria**

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

297 **The United States of America (National Park Service)**

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

302 **Private Landowners**

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

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

307 **3.3.2.2 Key Easements, Other Title Instruments and Title Provisions**

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

312 **WMATA Right-of-Way**

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

314 **CSXT Right-of-Way**

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

318 **Greens Scenic Area Easement**

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

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

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

333 **Metrorail Reservation**

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

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

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

348 **3.3.2.3 Anticipated Changes in Property Ownership**

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

356 **3.3.3 Environmental Consequences**

357 **3.3.3.1 No Build Alternative**

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

359 **3.3.3.2 Build Alternatives**

360 **Property Impacts**

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

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

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

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

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

387 **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

388 Note: only the portions of parcels required for each alternative are included in the listed acreage.

389 ¹Alternative A property requirement excludes the area within the Metrorail Reservation.

390 ²Some City of Alexandria parcels include area within the Greens Scenic Area easement held by NPS.

391 ³NPS property impact acreage includes only NPS parcels and does not include the Greens Scenic Area easement held by NPS on City of Alexandria property.

392 ⁴Impacts to the CSXT right-of-way easement by B-CSX Design Option are included within private landowner property impacts.

393 ⁵Individual acreages may not equal total acreage due to rounding.

395 Greens Scenic Area Easement

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

405 **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

406 CSXT Easement

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

413 Other Easements

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

417 Displacements of Residences and Businesses

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

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

424 **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)

425 3.3.4 Mitigation

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

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

434 3.4 Land Use and Zoning

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

439 3.4.1 Methodology

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

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

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

464 **3.4.2 Affected Environment**

465 **3.4.2.1 Opening Year Land Use**

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

467 **Railroad Corridor (City of Alexandria and Arlington County)**

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

470 **North Potomac Yard (City of Alexandria)**

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

474 **South Potomac Yard (City of Alexandria)**

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

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

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

485 **East of Metrorail/CSXT (City of Alexandria)**

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

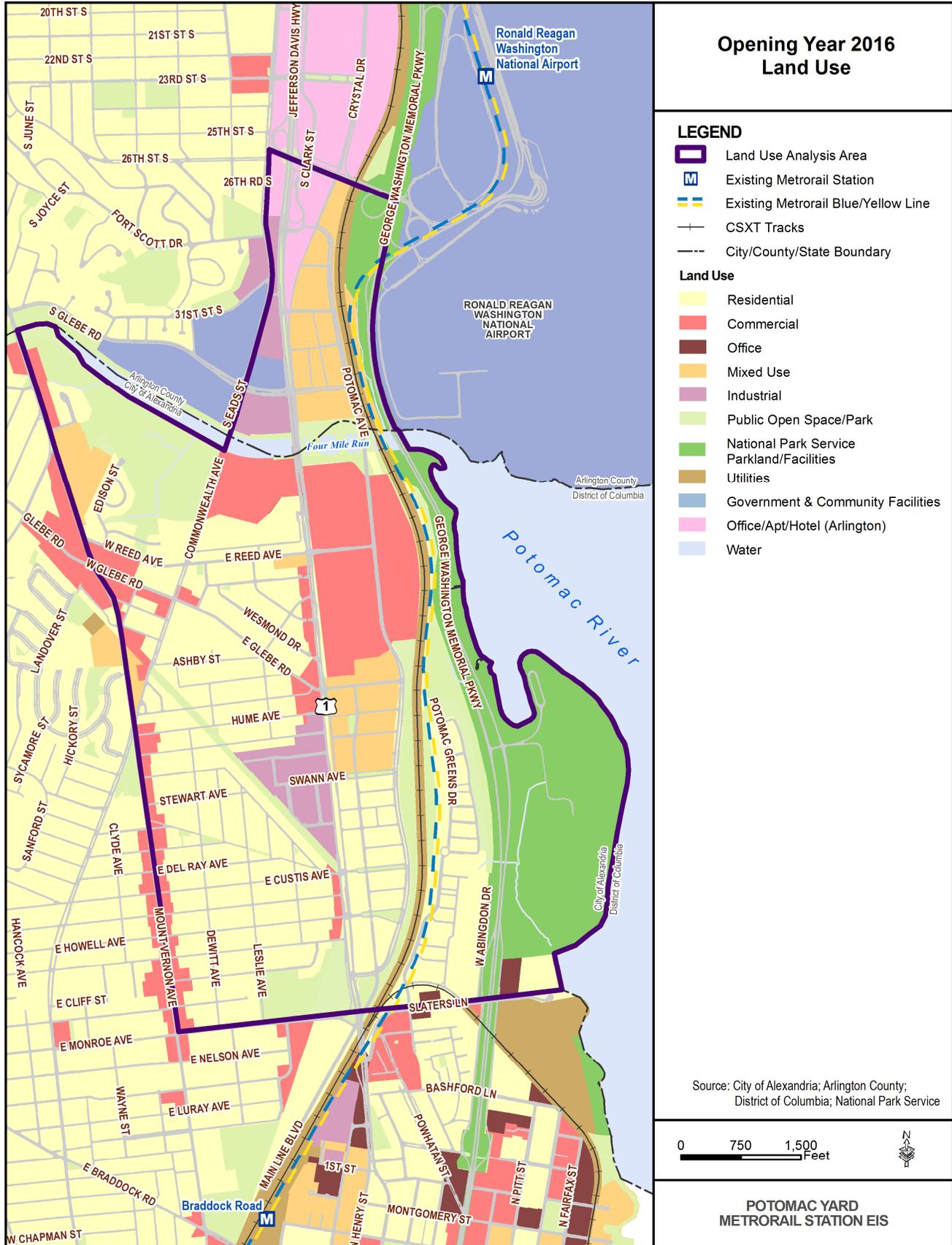
490 **Potomac Yard and Crystal City (Arlington County)**

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

496

497

498 **Figure 3-6: Opening Year 2016 Land Use**



500 **3.4.2.2 Existing Zoning**

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

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

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

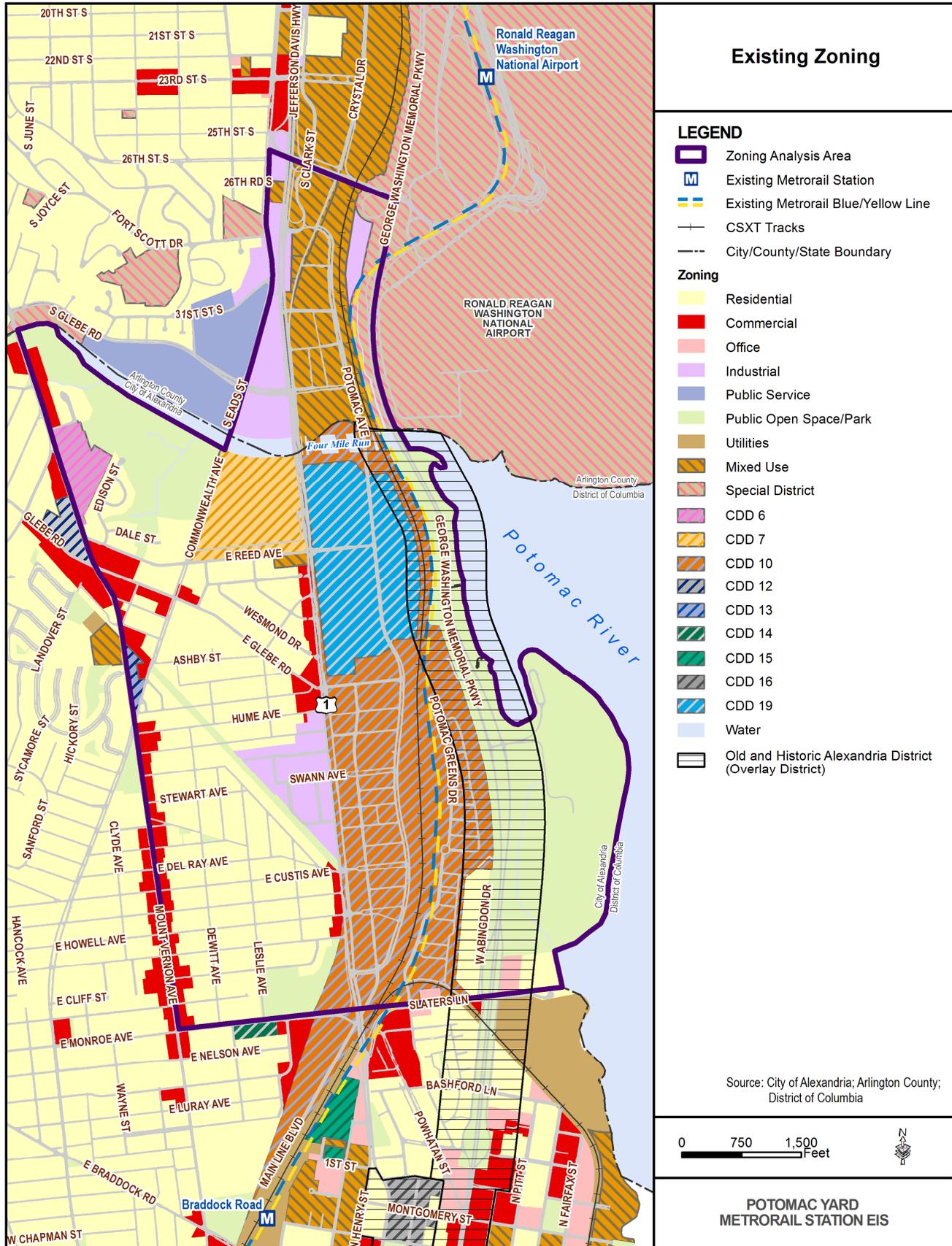
CDD	Characteristics
CDD #19 North Potomac Yard	<ul style="list-style-type: none"> • Based on the <i>North Potomac Yard Small Area Plan</i>. • 7.525 million sf mixed-use development approved. • If no Metrorail station is built or if the Metrorail station is built at an alternate location from that specified 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 <i>North Potomac Yard Small Area Plan</i>. Within zone, layout of blocks may vary depending on final location and design of Metrorail station. • <i>North Potomac Yard Urban Design Standards</i> provide specific requirements for spaces and buildings.
CDD #10 South Potomac Yard/ Potomac Greens	<ul style="list-style-type: none"> • Based on the <i>Potomac Yard / Potomac Greens Small Area Plan</i>. • 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	<ul style="list-style-type: none"> • Based on <i>Potomac West Small Area Plan</i>. • Allows a mix of office, residential, retail, hotel, and open space uses.

514 Within the City of Alexandria, the study area is covered by two height districts (HD): HD1, Old and Historic
 515 Alexandria Height District, and HD6, which includes all parts of the city not included in one of the other height
 516 districts. HD1 restricts building heights to 50 feet. In the study area, the HD1 district covers all of the area within
 517 500 feet of the GWMP roadway. Within HD6, the maximum building height is set by the zoning district. In CDD
 518 #10, the height limits vary from 35 feet to 110 feet. Height limits in CDD #19 vary by block. In the blocks
 519 potentially affected by the project, height limits vary from 35 feet to 135 feet.

520 Construction within 500 feet of the GWMP roadway is subject to the Board of Architectural Review *Old and*
 521 *Historic Alexandria District Design Guidelines* (1993) and the *Washington Street Guidelines and Standards*
 522 (2000), which provide specific requirements for the design of buildings. NPS holds an easement for construction
 523 along the roadway.

524

525 **Figure 3-7: Existing Zoning**



526

527 3.4.3 Environmental Consequences

528 3.4.3.1 Land Use

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

533 3.4.3.2 No Build Alternative

534 The No Build Alternative has no anticipated land use impacts.

535 3.4.3.3 Build Alternative A

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

540 3.4.3.4 Build Alternative B

541 Build Alternative B would occupy existing public open space (Potomac Greens Park) north of the Potomac
542 Greens neighborhood, which is covered by the Greens Scenic Area easement administered by NPS, as well as
543 a portion of national parkland (GWMP). Proposed actions and resulting impacts would depend on agreement by
544 NPS for release of the scenic easement and an equal value land exchange for affected NPS property and
545 interests in property. Since Build Alternative B requires a land exchange with NPS or impacts an easement
546 owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property
547 or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C.
548 102901). The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**.
549 Within Potomac Yard, the southern station entrance for Alternative B would touch down on existing open space,
550 and the northern station entrance would touch down on a portion of the shopping center parking lot that is
551 planned for redevelopment and open space as dense mixed-use development incorporating a Metrorail station
552 entrance.

553 3.4.3.5 B-CSX Design Option

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

557 3.4.3.6 Build Alternative D

558 Build Alternative D would occupy existing commercial development, mostly comprising a parking lot and movie
559 theater building, as well as areas planned for mixed-use development, new/realigned streets, and public open
560 space. At the northern end, realigned tracks for the alternative would occupy national parkland (GWMP).
561 Proposed actions and resulting impacts to national parkland would depend on agreement by NPS and an equal
562 value land exchange for affected NPS property and interests in property. Since Build Alternative D requires a
563 land exchange with NPS or impacts an easement owned by NPS, the transfer or easement modification would
564 be subject to an equal value exchange in property or interest in property and need to be approved by NPS and
565 completed as required by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section**
566 **3.3 Land Acquisitions and Displacements**. The station and middle part of the realigned track alignment would
567 occupy portions of existing and planned Potomac Yard Park. At the southern end, realigned tracks and the
568 pedestrian bridge to Potomac Greens would occupy portions of existing public open space in the Rail Park, as
569 well as a portion of the Potomac Yard Park.

570 3.4.3.7 Zoning

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

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

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

588 **3.4.3.8 No Build Alternative**

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

591 **3.4.3.9 Build Alternative A**

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

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

600 **3.4.3.10 Build Alternative B**

601 Build Alternative B is consistent with CDD #19. If the station is built at this location, CDD #19 would permit up to
 602 7.525 million square feet of development in North Potomac Yard. Build Alternative B is located within HD1,
 603 which limits the height of buildings to 50 feet. As currently designed, Build Alternative B would exceed the height
 604 limit.

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

607 **3.4.3.11 B-CSX Design Option**

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

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

618 **3.4.3.12 Build Alternative D**

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

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

629 **3.4.4 Mitigation**

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

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

637 **3.5 Consistency with Local Plans**

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

642 **3.5.1 Methodology**

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

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

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

662 **3.5.2 Affected Environment**

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

667

668 Table 3-7: Summary of Local Plans

Plan	Analysis Area Provisions	Metrorail Station Provisions
City of Alexandria Plans		
<i>North Potomac Yard Small Area Plan (2010)</i>	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.
<i>Potomac Yard / Potomac Greens Small Area Plan and CDD Concept Plan (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010)</i>	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 <i>North Potomac Yard Small Area Plan</i> , which mandates a Metrorail station in the vicinity of the location of Build Alternative B.
<i>Waterfront Small Area Plan (2012)</i>	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.
<i>City of Alexandria Comprehensive Transportation Master Plan</i>	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.
<i>City of Alexandria Environmental Action Plan 2030</i>	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%
<i>City of Alexandria Master Plan (1992)</i>	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.
<i>City of Alexandria Master Plan Water Quality Management Supplement (2001)</i>	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.
<i>Northeast Small Area Plan (1992)</i>	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		
<i>Potomac Yard Phased Development Site Plan (2000)</i>	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
<i>Arlington County General Land Use Plan (2011)</i>	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.
<i>Crystal City Sector Plan (2010)</i>	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.
<i>Industrial Land Use and Zoning Study (2000)</i>	Examines appropriate locations for industrial land uses within Arlington County.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Regional Plans		
<i>VRE System Plan 2040 Study (VRE, 2014)</i>	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.
<i>GWMP Foundation Document (NPS, 2014)</i>	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.
<i>Four Mile Run Restoration Master Plan (NVRC, 2006)</i>	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.
<i>GWMP Corridor Management Program (NPS, 2005)</i>	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.
<i>Resource Management Plan: George Washington Memorial Parkway (NPS, 1994)</i>	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.
<i>GWMP- Potomac Greens Final EIS (NPS, 1991)</i>	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.
<i>Mount Vernon Memorial Highway (MVMH) Cultural Landscape Inventory and Report (NPS, 1987)</i>	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.
<i>Capper-Cramton Act of 1930 (46-Stat. 482)</i>	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.

671 **3.5.3 Environmental Consequences**

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

676 **Table 3-8: Consistency with Local Plans by Alternative**

Alternative	Anticipated Impacts on Local Plans
No Build	<ul style="list-style-type: none"> Inconsistent with the <i>North Potomac Yard Small Area Plan</i>, the <i>Potomac Yard/Potomac Greens Small Area Plan</i>, and the <i>City of Alexandria Master Plan</i>.
Build Alternative A	<ul style="list-style-type: none"> Inconsistent with the <i>North Potomac Yard Small Area Plan</i>. Consistent with the <i>Potomac Yard/Potomac Greens Small Area Plan</i> (superseded by the <i>North Potomac Yard Small Area Plan</i>), the <i>City of Alexandria Master Plan</i>, and the <i>Water Quality Management Supplement</i>. Not inconsistent with plans and policy documents for the GWMP.
Build Alternative B	<ul style="list-style-type: none"> Consistent with the <i>North Potomac Yard Small Area Plan</i>, the <i>City of Alexandria Master Plan</i>, and the <i>Water Quality Management Supplement</i>. Consistent with the <i>Potomac Yard/Potomac Greens Small Area Plan</i> (superseded by the <i>North Potomac Yard Small Area Plan</i>). Not inconsistent with plans and policy documents for the GWMP.
B-CSX Design Option	<ul style="list-style-type: none"> Inconsistent with the <i>North Potomac Yard Small Area Plan</i> and the <i>Potomac Yard/Potomac Greens Small Area Plan</i>. Consistent with the <i>City of Alexandria Master Plan</i> and the <i>Water Quality Management Supplement</i>. Not inconsistent with plans and policy documents for the GWMP.
Build Alternative D	<ul style="list-style-type: none"> Inconsistent with the <i>North Potomac Yard Small Area Plan</i> and the <i>Potomac Yard/Potomac Greens Small Area Plan</i>. Consistent with the <i>City of Alexandria Master Plan</i> and the <i>Water Quality Management Supplement</i>. Not inconsistent with plans and policy documents for the GWMP.

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

685 **3.5.3.1 No Build Alternative**

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

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

697 **3.5.3.2 Build Alternative A**

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

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

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

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

727 3.5.3.3 Build Alternative B

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

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

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

756 3.5.3.4 B-CSX Design Option

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

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

766 GWMP Plans do not address the addition of a Metrorail Station at Potomac Yard. B-CSX Design Option would
 767 not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway*
 768 *Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial*
 769 *Parkway* (1994), and the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Some views from
 770 the GWMP roadway and parkland would also be affected by Design Option B-CSX. In 2016, the existing
 771 character of the views from the GWMP, of a curving roadway framed by vegetation with intermittent views of
 772 built elements to the west and views of the river to the east, would be changed through the introduction of new
 773 built elements and the removal of vegetation from areas west of the existing Metrorail Line. Portions of the
 774 station would be visible from the GWMP. By 2040, restored vegetation would grow to filter views of built
 775 elements of the station. By 2040 development in North Potomac Yard would also be visible from GWMP. In
 776 2016, the visual quality would be very high, and in 2040, the visual quality of the GWMP would be high, as in the
 777 No Build Alternative. This change in visual quality by 2040 is due to the visibility of increasing development in
 778 North Potomac Yard. See **Section 3.8 Visual Resources**, for more detail.

779 3.5.3.5 Build Alternative D

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

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

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

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

810 3.5.4 Mitigation

811 No mitigation is proposed.

812 3.6 Neighborhoods, Demographics, and Community Resources

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

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

819 3.6.1 Methodology

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

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

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

832 3.6.2 Affected Environment

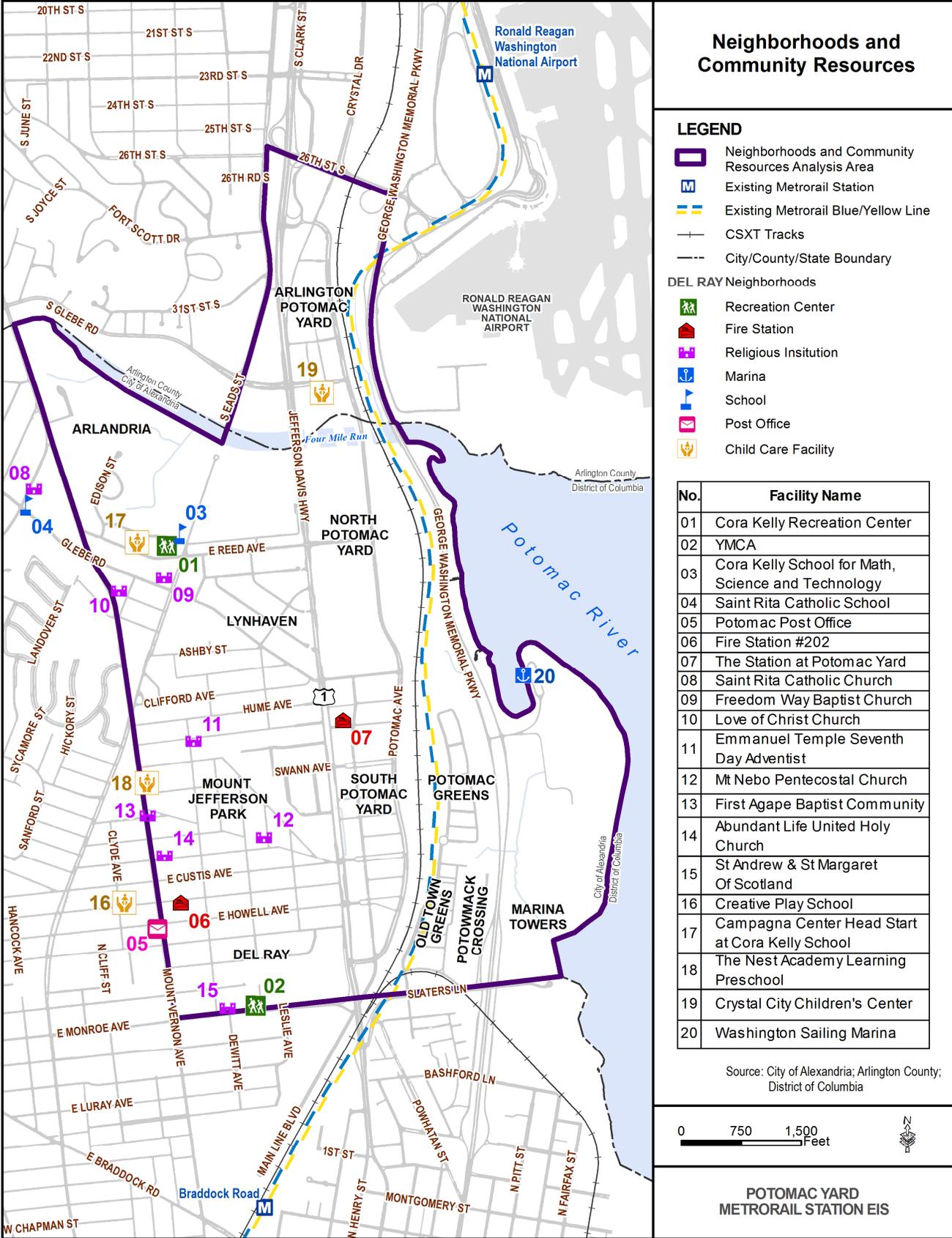
833 The neighborhoods included in the analysis are Potomac Greens, Alexandria Potomac Yard, Old Town Greens,
834 North Potomac Yard, South Potomac Yard, Arlandria, Del Ray, Mount Jefferson Park, Lynhaven, Potowmack
835 Crossing Condominiums, and Marina Towers.

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

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

842

843 Figure 3-9: Neighborhoods and Community Resources



844
845

846 **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

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

848 **3.6.3 Environmental Consequences**849 **3.6.3.1 No Build Alternative**

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

858 **3.6.3.2 Build Alternatives**

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

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

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

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

874 **3.6.4 Mitigation**

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

877 **3.7 Environmental Justice**

878 This section identifies the potential effects of the No Build Alternative, the three Build Alternatives, and B-CSX
879 Design Option to minority and low-income populations. Environmental justice is defined by Executive Order
880 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.
881 Executive Order 12898 requires that Federal agencies identify and address disproportionately high and adverse
882 Federal impacts on minority and low-income communities. The U.S. Department of Transportation (USDOT) is
883 committed to the principles of environmental justice, which include:

- 884 • To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental
- 885 effects, including social and economic effects, on minority populations and low-income populations;
- 886 • To ensure the full and fair participation by all potentially affected communities in the transportation
- 887 decision-making process; and
- 888 • To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-
- 889 income populations.

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

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

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

899 **3.7.1 Methodology**

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

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

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

911 3.7.1.1 Identification of Minority and Low-Income Communities

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

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

925 3.7.1.2 Analysis of Potential for Disproportionately High and Adverse Effects

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

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

940 3.7.2 Affected Environment

941 3.7.2.1 Minority Population

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

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

953

954 **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%

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

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

961 **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%

962 **3.7.2.2 Low-Income Population**

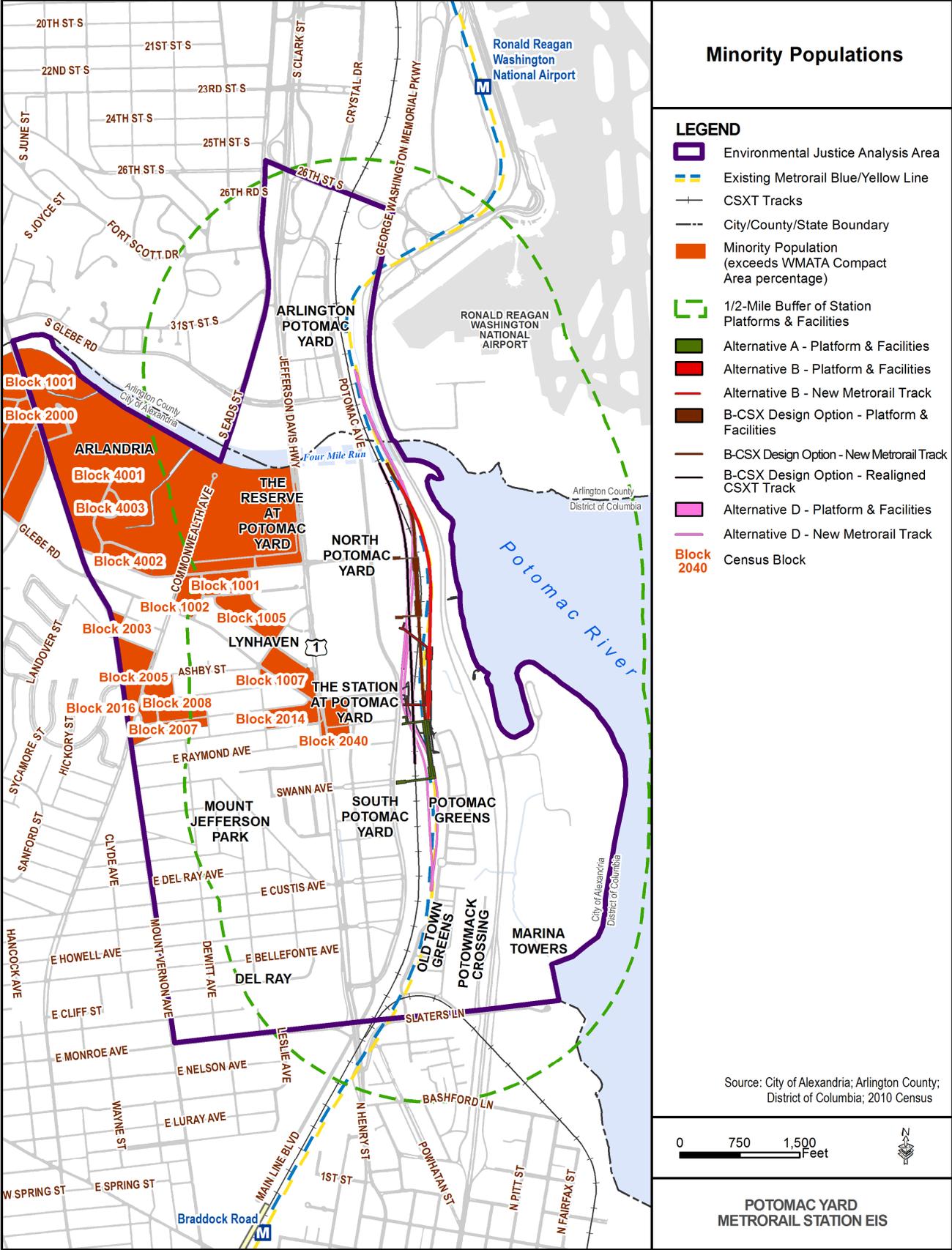
963 In the analysis area, two Census block groups fall below the \$64,400 income limit for the Washington, DC Fair
 964 Market Rent region (see **Table 3-12** and **Figure 3-11**). Census Tract 2012, Block Group 3 covers the Arlandria
 965 and Lynhaven neighborhoods and has an AMI of \$44,264. Census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

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

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

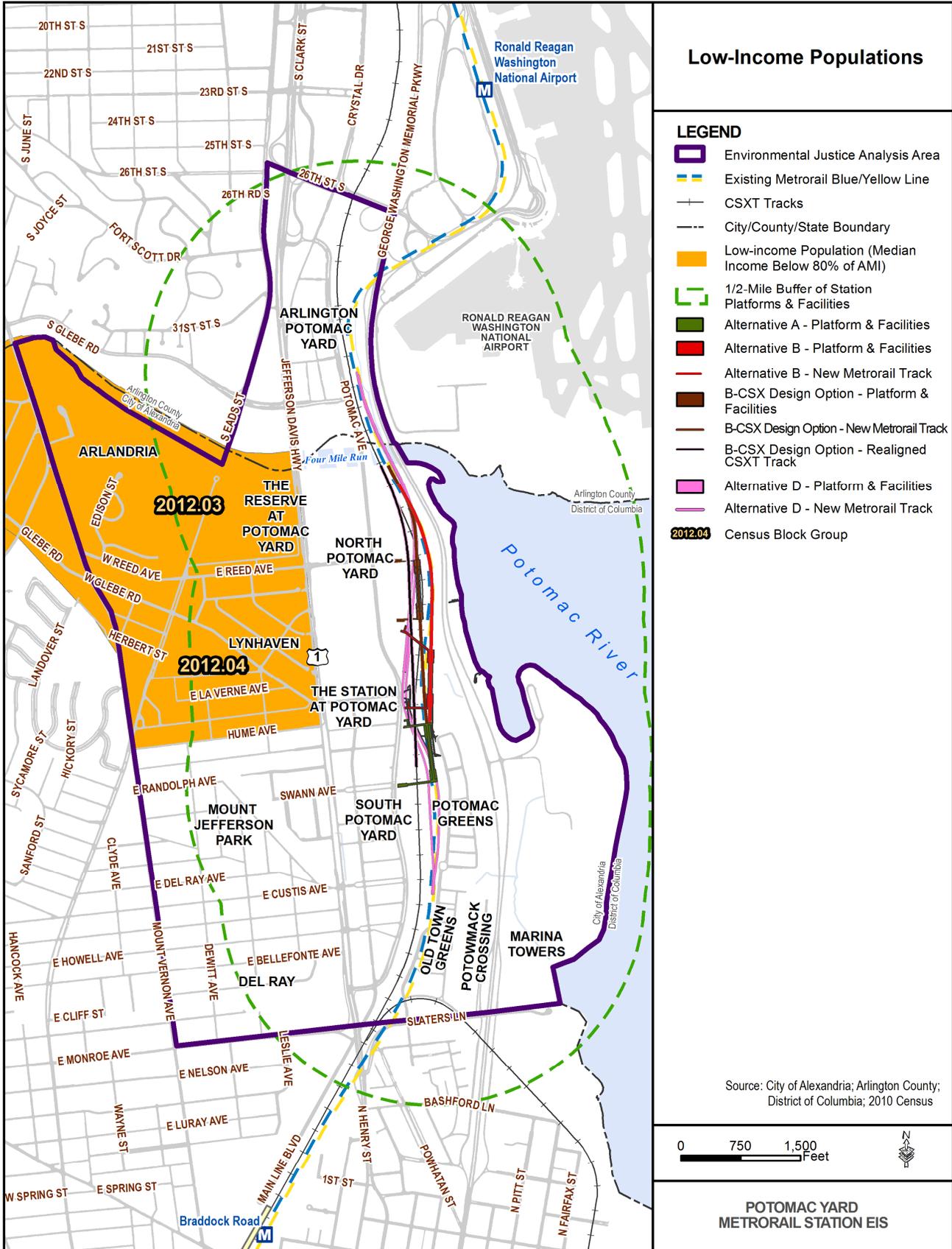
968 As shown in **Figure 3-10** and **Figure 3-11**, minority and low-income residents are concentrated in the
 969 neighborhoods to the west of U.S. Route 1 and north of Hume Avenue. In addition, the "Station at Potomac
 970 Yard" development provides workforce and affordable housing, and a number of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

971 Figure 3-10: Minority Populations



972

973 Figure 3-11: Low-Income Populations



975 **3.7.3 Environmental Consequences**

976 **3.7.3.1 Environmental Justice Impacts Analysis**

977 Potential effects, as documented in the other sections of **Chapter 3**, are identified by alternative below in **Table**
 978 **3-13**. Categories with no effects are not carried forward for further analysis.

979 **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

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

981 **Traffic**

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

989 **Bicycle and Pedestrian Accommodations**

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

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

998 B, and would enhance local pedestrian and bicycle connectivity similar to the No Build Alternative. For Build
 999 Alternative D, the pedestrian and bicycle bridge would be built simultaneously with the project. For B-CSX
 1000 Design Option, the pedestrian and bicycle bridge would be built independently of the project.

1001 Since no direct adverse impacts resulting from the project alternatives were identified, there is no potential for
 1002 any high and adverse impacts to be disproportionately borne by environmental justice populations.

1003 **Safety and Security**

1004 No effects to safety and security are anticipated as a result of any of the project alternatives. The existing
 1005 practices and procedures for safety and security and requirements for facility design would adequately avoid
 1006 and minimize the identified safety and security issues. Since no adverse impacts resulting from the project
 1007 alternatives were identified, there is no potential for any high and adverse impacts to be disproportionately borne
 1008 by environmental justice populations.

1009 **Air Quality**

1010 Because none of the project alternatives are expected to degrade overall intersection LOS within the study area,
 1011 the Potomac Yard Metrorail Station is not a project of local air quality concern under 40 CFR 93.123(b)(1), and
 1012 no potential beneficial or adverse effects are expected on regional air quality. The project is included in the
 1013 National Capital Region Transportation Planning Board 2012 Financially Constrained Long-Range
 1014 Transportation Plan. Therefore, the project meets statutory and regulatory transportation conformity
 1015 requirements without a hot-spot analysis.

1016 No adverse air quality impacts are anticipated. Since no adverse impacts resulting from the project alternatives
 1017 were identified, there is no potential for any high or adverse impacts to be disproportionately borne by
 1018 environmental justice populations.

1019 **3.7.3.2 No Build Alternative**

1020 No disproportionately high and adverse effects on identified minority and/or low-income populations were
 1021 identified under the No Build Alternative. The following resource categories were analyzed to reach this finding.

1022 **Parking**

1023 No effect to existing or planning parking is expected as a result of the No Build Alternative. The redevelopment
 1024 of North Potomac Yard will locate off-street parking in structures and on-street parking will be provided as paid
 1025 hourly metered parking. Since no adverse impacts resulting from the No Build Alternative were identified, there
 1026 is no potential for any high or adverse impacts to be disproportionately borne by environmental justice
 1027 populations.

1028 **Land Acquisition**

1029 The No Build Alternative would not result in land acquisition related to the project. Since no adverse impacts
 1030 resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be
 1031 disproportionately borne by environmental justice populations.

1032 **Displacements**

1033 The No Build Alternative would not result in displacements related to the project. Since no adverse impacts
 1034 resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be
 1035 disproportionately borne by environmental justice populations.

1036 **Land Use**

1037 The No Build Alternative has no anticipated land use impacts. Since no adverse impacts resulting from the No
 1038 Build Alternative were identified, there is no potential for any high or adverse impacts to be disproportionately
 1039 borne by environmental justice populations.

1040 **Neighborhoods and Community Facilities**

1041 The No Build Alternative would not provide any mobility benefits beyond those that would be provided by
 1042 planned future transportation projects and improvements included in the CLRP. Development planned for
 1043 Potomac Yard would proceed, but at lower levels than have been approved. This alternative would improve
 1044 community cohesion and reduce community isolation through the provision of a bicycle and pedestrian bridge
 1045 connecting Potomac Greens and Potomac Yard. The No Build Alternative would not cause any residential

1046 displacements, safety impacts, or changes in property values beyond those anticipated to occur due to planned
1047 future development projects and other planned transportation projects.

1048 However, the additional development permissible in Potomac Yard without a Metrorail station, as well as other
1049 area improvements, may lead these communities to experience indirect social and economic changes, such as
1050 increases in property values and rental prices. To address potential indirect effects to housing affordability from
1051 additional development, the City of Alexandria's Potomac Yard zoning and development regulations for CDD
1052 #10 and CDD #19 (Concept Plan approval staff report CDD #99-01 and Rezoning staff report CDD #2009-0001)
1053 support maintaining a supply of affordable housing within the area. The newly constructed Station at Potomac
1054 Yard development, which provides workforce and affordable housing, and a recently approved affordable
1055 housing development across U.S. Route 1 from the Potomac Yard Shopping Center, are examples of projects in
1056 the area. The City of Alexandria maintains a Housing Opportunities Fund, which is funded by voluntary
1057 contributions from developers and is used for acquisition, rehabilitation, or new construction of affordable
1058 housing units. In addition, the City negotiates with developers to provide dedicated affordable rental or
1059 ownership units within new residential developments. In North Potomac Yard, a voluntary affordable housing
1060 contribution will be provided according to the formula set forth in the regulations for CDD #19. In the remainder
1061 of Potomac Yard, the amount of the voluntary contribution for each preliminary development plan will meet the
1062 requirements of the city-wide affordable housing policy in effect at the time the plan is submitted. Contributions
1063 may be monetary or set-aside affordable units.

1064 Since no direct adverse impacts resulting from the No Build Alternative were identified, there is no potential for
1065 any high or adverse impacts to be disproportionately borne by environmental justice populations.

1066 **Visual Resources**

1067 New development in Potomac Yard would result in visual effects to viewsheds from the GWMP and Potomac
1068 Greens. No adverse effects to environmental justice populations are anticipated, because the visual effects to
1069 viewsheds from the GWMP and Potomac Greens occur within non-environmental justice population areas.
1070 Therefore, there is no potential for any high or adverse impacts to be disproportionately borne by environmental
1071 justice populations.

1072 **Parklands**

1073 No effect to parkland is anticipated as a result of the No Build Alternative. Since no direct adverse impacts
1074 resulting from the No Build Alternative were identified, there is no potential for any high or adverse impacts to be
1075 disproportionately borne by environmental justice populations.

1076 **Noise**

1077 Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and
1078 landings at Ronald Reagan Washington National Airport. The residences in the Potomac Greens neighborhood
1079 were constructed alongside the existing Metrorail alignment. Because of the proximity of the existing Metrorail
1080 right-of-way to the residences in Potomac Greens, current Metrorail operations exceed WMATA noise criteria at
1081 seven residences. This baseline condition would remain the same under the No Build Alternative. No adverse
1082 effects to environmental justice populations are anticipated, because the Potomac Greens neighborhood is
1083 comprised of non-environmental justice populations. Therefore, there is no potential for any high or adverse
1084 impacts to be disproportionately borne by environmental justice populations.

1085 **Vibration**

1086 Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and
1087 vehicular traffic, particularly heavy trucks. Because no project components or design elements are proposed
1088 under the No Build Alternative, the alternative would not cause any new vibration impacts. No exceedance of
1089 the FTA vibration significant increase criterion of 3 VdB or WMATA vibration criterion of 75 VdB is predicted
1090 under the No Build Alternative. Since no direct adverse impacts resulting from the No Build Alternative were
1091 identified, there is no potential for any high or adverse impacts to be disproportionately borne by environmental
1092 justice populations.

1093 **Temporary Construction Impacts**

1094 Construction activities associated with development in Potomac Yard would occur under the No Build
1095 Alternative. Anticipated effects include noise, vibration, dust, and traffic due to construction activity. Impacts
1096 from construction would not adversely or disproportionately affect the identified environmental justice

1097 populations, as these impacts would be primarily borne by the communities immediately adjacent to the
1098 construction site, which are not minority or low-income.

1099 **3.7.3.3 Build Alternatives**

1100 The addition of a Metrorail station would provide beneficial effects to minority and/or low-income populations by
1101 providing direct access to the regional transit system, which in turn, would help improve mobility, by providing
1102 more transportation choices.

1103 No disproportionately high and adverse impacts on identified minority and/or low-income populations were
1104 identified under any Build Alternative or B-CSX Design Option. The following resource categories were analyzed
1105 to reach this finding.

1106 **Parking**

1107 The three Build Alternatives and B-CSX Design Option are planned as urban stations, primarily accessed via
1108 foot, bicycle, or bus. Therefore, no additional parking for Metrorail patrons would be provided. However, some
1109 Metrorail passengers may attempt to drive and park in adjoining neighborhoods, including Potomac Greens, the
1110 developing neighborhoods of South Potomac Yard, and the surface parking lots surrounding the Potomac Yard
1111 Shopping Center. Use of neighborhood parking facilities by station passengers could result in less parking
1112 availability for residents and patrons of commercial uses in Potomac Yard. The introduction and enforcement of
1113 parking restrictions, including time limits and residential permitting, would largely avoid and minimize the
1114 potential effects of Metrorail patrons attempting to park along public streets in adjoining neighborhoods.

1115 Potential parking impacts would not adversely or disproportionately affect the identified environmental justice
1116 populations, as these impacts would be primarily borne by the communities immediately adjacent to the
1117 proposed Metrorail station, which are not minority or low-income.

1118 **Land Acquisition**

1119 The three Build Alternatives and B-CSX Design Option would require additional property for station facilities and
1120 right-of-way for realigned track, depending on the alternative selected. Additional temporary construction
1121 easements would be needed for the three Build Alternatives and B-CSX Design Option. In addition, Build
1122 Alternative B would be in violation of the Greens Scenic Area easement, which is administered by NPS
1123 (easement held by U.S. Government). Build Alternative B could not proceed unless the easement is released by
1124 NPS subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. Build
1125 Alternatives B and D would also permanently acquire GWMP property subject to an equal value exchange in
1126 property or interest in property per 54 U.S.C. 102901.

1127 Property impacts as a result of land acquisition would not adversely or disproportionately affect the identified
1128 environmental justice populations, as these impacts would affect the identified parcel owners, whom are not
1129 minority or low-income.

1130 **Displacements**

1131 No residential displacements would be required for any of the alternatives. B-CSX Design Option and Build
1132 Alternative D would result in a displacement of one existing business, the movie theater in the Potomac Yard
1133 Shopping Center. Compensation and relocation assistance to private landowners would be provided consistent
1134 with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.

1135 The movie theater is located in a non-environmental justice population area and is not a minority-owned
1136 business; therefore, there is no potential for any high or adverse impacts to be disproportionately borne by
1137 environmental justice populations.

1138 **Land Use**

1139 The three Build Alternatives and B-CSX Design Option would impact existing and planned land use. Build
1140 Alternative A would have pedestrian access facilities located within Potomac Greens Park and Potomac Yard
1141 Park, and would have station facilities located within the Rail Park. Build Alternative B would have pedestrian
1142 access facilities within Potomac Yard Park and would occupy portions of and Potomac Greens Park, which is
1143 also covered by the Greens Scenic Area easement administered by NPS. Build Alternative B could not proceed
1144 unless the easement is released by NPS subject to an equal value exchange in property or interest in property
1145 per 54 U.S.C. 102901.

1146 The station and facilities associated with B-CSX Design Option and Build Alternative D would require the
 1147 displacement of existing commercial development, comprising a parking lot and a movie theater, and would also
 1148 affect planned streets, including Potomac Avenue, and open spaces, including Potomac Yard Park. The
 1149 realigned tracks at the northern end of Build Alternative D in the vicinity of Four Mile Run would occupy existing
 1150 national parkland between the GWMP roadway and the existing Metrorail right-of-way, and the realigned tracks
 1151 at the southern end would occupy planned public open space in the Rail Park.

1152 For the three Build Alternatives and B-CSX Design Option, the station elements would be designed to integrate
 1153 into affected parks, and facilities would be redesigned as necessary to replace park infrastructure. Lands of the
 1154 GWMP were and continue to be acquired under the Capper-Cramton Act of 1930 (46-Stat. 482), and activities
 1155 proposed for these lands must be consistent with the provisions of this act.

1156 Impacts to land use would not adversely or disproportionately affect the identified environmental justice
 1157 populations, as these impacts would be experienced by all populations living in the study area, regardless of
 1158 race, ethnicity, or socioeconomic status. Moreover, the area where land use impacts would occur is comprised
 1159 of non-environmental justice populations.

1160 **Neighborhoods and Community Facilities**

1161 Each Build Alternative would result in similar effects to the surrounding neighborhoods. The Potomac Greens
 1162 and Old Town Greens neighborhoods, as well as Del Ray, Lynhaven, Arlandria, and South Potomac Yard,
 1163 would benefit from increased access to the regional Metrorail system. The Build Alternatives would result in
 1164 increased economic activity, given the desirability for Metrorail access for large employers. Neighborhoods
 1165 adjacent to other Northern Virginia Metrorail stations have historically experienced increases in land and
 1166 housing values due to the proximity to Metrorail; the identified neighborhoods would be expected to experience
 1167 a similar indirect effect. As under the No Build Alternative, minority and/or low-income populations may
 1168 experience social and economic changes, such as increased property value and rental costs, due to the
 1169 additional development permissible in Potomac Yard without a Metrorail station, as well as other area
 1170 improvements. Measures to address potential indirect effects to housing affordability from additional
 1171 development in the Potomac Yard area would be the same as in the No Build Alternative.

1172 The Build Alternatives would affect views from Potomac Yard and the Potomac Greens neighborhood.
 1173 Construction activities would result in traffic, noise, and dust that would primarily affect the neighborhoods
 1174 immediately surrounding the construction site. See **Sections 3.8** and **3.24** for more detailed discussion of
 1175 effects to visual resources and construction impacts, respectively. However, the visual effects and temporary
 1176 construction impacts would not adversely or disproportionately affect the identified environmental justice
 1177 populations, as these impacts would be primarily borne by the communities immediately adjacent to the
 1178 proposed Metrorail station, which are not minority or low-income.

1179 In addition to the impacts reviewed as instructed by USDOT Order 5610.2(a), the potential for negative impacts
 1180 to facilities serving minors was evaluated per the requirements of Executive Order 13045, Protection of Children
 1181 from Environmental Health Risks. No negative impact to concentrations of children or children-serving facilities
 1182 was identified due to any of the Build Alternatives.

1183 Since no direct adverse impacts resulting from the Build Alternatives were identified, there is no potential for any
 1184 high or adverse impacts to be disproportionately borne by environmental justice populations.

1185 **Visual Resources**

1186 The three Build Alternatives and B-CSX Design Option would result in visual impacts to the views from GWMP,
 1187 Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard due to the introduction of new visual
 1188 elements and removal of vegetation for construction access and staging areas. New visual elements include the
 1189 stations for the three Build Alternatives and B-CSX Design Option, pedestrian bridges for the three Build
 1190 Alternatives, as well as the elevated track and structures required for Build Alternative D. Build Alternative A
 1191 would affect 6 of 10 viewsheds evaluated (including the continuous GWMP corridor). Build Alternative B would
 1192 affect 6 of 10 viewsheds evaluated (including the continuous GWMP corridor). B-CSX Design Option would
 1193 affect 3 of 10 viewsheds evaluated (including the continuous GWMP corridor). Build Alternative D would affect 7
 1194 of 10 viewsheds evaluated (including the continuous GWMP corridor), resulting in substantial declines in visual
 1195 quality at several of the viewsheds. New development planned within North Potomac Yard by 2040 would also
 1196 affect existing views from GWMP, Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard
 1197 under the Build Alternatives.

1198 All minority and/or low-income populations would be buffered from any visual impacts of a station by the
 1199 planned development in Potomac Yard; the residents of the “Station at Potomac Yard” apartments would also
 1200 be buffered from visual impacts by other buildings. No adverse impacts to environmental justice populations are
 1201 anticipated because the visual effects to viewsheds from the GWMP, Potomac Greens neighborhood, Potomac
 1202 Greens Park, and Potomac Yard occur within non-environmental justice population areas. Therefore, there is no
 1203 potential for any high or adverse impacts to be disproportionately borne by environmental justice populations.

1204 **Parklands**

1205 **Table 3-14** shows potential permanent impacts to parklands, which would result from property acquisitions for
 1206 station elements, track structures, or ancillary facilities in parklands. Visual impacts to parklands are described
 1207 in **Section 3.8 Visual Resources**. Build Alternatives B and D would require portions of NPS parklands and
 1208 would be subject to an equal value land exchange approved by NPS and completed as required by federal law
 1209 (54 U.S.C. 102901). In addition, Build Alternative B could not proceed unless the Greens Scenic Area easement
 1210 is released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C.
 1211 102901.

1212 **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

1213 Impacts to parklands would not adversely or disproportionately affect the identified environmental justice
 1214 populations, as these impacts would be experienced by all populations living in the study area, regardless of
 1215 race, ethnicity, or socioeconomic status. Moreover, none of the impacted parks are located within environmental
 1216 justice communities; therefore, there is no potential for any high or adverse impacts to be disproportionately
 1217 borne by environmental justice populations.

1218 **Noise**

1219 Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and
 1220 landings at Ronald Reagan Washington National Airport. The residences in Potomac Greens were constructed
 1221 alongside the existing Metrorail alignment, and current Metrorail operations for the No Build Alternative exceed
 1222 WMATA noise criteria at seven residences. This condition would remain under Build Alternative A, Build
 1223 Alternative B, and B-CSX Design Option, and would be reduced under Build Alternative D to four residences.
 1224 However, Build Alternative D would result in an increased number of residences (eight residences) where noise
 1225 would exceed the FTA threshold for moderate impact, due to the location of elevated track close to residential
 1226 receptors. No exceedances of the FTA severe impact criteria are predicted. None of the project noise levels
 1227 under the Build Alternatives would exceed the FTA impact criteria at any FTA Category 3 receptors, such as
 1228 parks or schools.

1229 No adverse effects to environmental justice populations are anticipated, because the Potomac Greens
 1230 neighborhood comprises non-environmental justice populations. Therefore, there is no potential for any high or
 1231 adverse impacts to be disproportionately borne by environmental justice populations.

1232 **Vibration**

1233 Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and
 1234 vehicular traffic, particularly heavy trucks. Build Alternative B and B-CSX Design Option would not exceed FTA
 1235 or WMATA thresholds for vibration impacts. However, both Build Alternative A and Build Alternative D would
 1236 result in increased vibration impacts to residences in Potomac Greens due to Metrorail trains passing over new
 1237 switches.

1238 No adverse effects to environmental justice populations are anticipated, because the Potomac Greens
 1239 neighborhood comprises non-environmental justice populations. Therefore, there is no potential for any high or
 1240 adverse impacts to be disproportionately borne by environmental justice populations.

1241 Temporary Construction Impacts

1242 Construction activities would occur within staging areas and access routes for the three Build Alternatives and
 1243 B-CSX Design Option. Anticipated effects include noise, vibration, dust, and traffic due to construction activity.
 1244 Temporary construction impacts were identified for the following resources and are described in more detail in
 1245 **Section 3.24:** Metrorail operations, CSXT ROW and operations, public roadways and private driveways, Greens
 1246 Scenic Area, visual resources, cultural resources, parklands, air quality, noise, vibration, wetlands, 100-year
 1247 floodplain, resource protection areas, and contaminated materials.

1248 Impacts from construction would not adversely or disproportionately affect the identified minority and/or low-
 1249 income populations, as these impacts would be primarily borne by the communities immediately adjacent to the
 1250 construction site, which are not minority or low-income.

1251 Public Involvement

1252 Full and fair access to meaningful involvement by minority and low-income populations in project planning and
 1253 development is an important aspect of environmental justice. The engagement of local residents, business
 1254 owners, and other stakeholders began during the project scoping phase in early 2011 and continues throughout
 1255 the duration of the environmental review process. Participation of minority and low-income populations has been
 1256 advanced through:

- 1257 • Two public scoping meetings, held at the Cora Kelly Recreation Center, located in the Arlandria
 1258 neighborhood, which has a high proportion of minority and low-income residents and is within the
 1259 project's analysis area. The facility is accessible by multiple public transportation services. These two
 1260 meetings were held on February 10, 2011 at 4:30 pm and 6:00 pm. A total of 65 members of the public
 1261 attended the scoping meetings;
- 1262 • One public meeting presenting project alternatives, which was also held at the Cora Kelly Recreation
 1263 Center. This meeting was held on April 19, 2012, and approximately 75 members of the public attended;
- 1264 • Availability of Spanish-speaking staff at all public involvement events;
- 1265 • Translation of outreach materials into Spanish pursuant to Executive Order 13166 ("Improving Access to
 1266 Services for Persons with Limited English Proficiency");
- 1267 • Meetings with local neighborhoods and civic associations, including the Lynhaven Citizens Association,
 1268 which includes minority and low-income communities; and
- 1269 • Creation of the Potomac Yard Metrorail Implementation Work Group (PYMIG) by the City of Alexandria,
 1270 which has met eleven times to date and has served as a venue for interested members of the public as
 1271 well as City officials to stay informed of the EIS process.

1272 Concerns and issues raised by community members through this outreach process have been considered
 1273 carefully in the development of the project. The City of Alexandria will continue to work collaboratively with
 1274 members of the public to address their concerns. See **Chapter 4** for a more detailed discussion on public
 1275 involvement.

1276 3.7.4 Mitigation

1277 No disproportionate or adverse impact to minority or low-income communities is anticipated. Therefore, no
 1278 mitigation is proposed.

1279 3.8 Visual Resources

1280 This section assesses the effects of the alternatives on visual resources in the study area. The visual resources
 1281 analysis was prepared in accordance with Federal Highway Administration (FHWA) *Visual Impact Assessment*
 1282 *Methodology for Highway Projects* (1981). The visual resources analysis was not conducted in accordance with
 1283 NPS guidance or policy. The visualizations depicted in this section are based on conceptual renderings, and
 1284 have not been developed in accordance to the Secretary of the Interior's *Standards for the Treatment of Historic*
 1285 *Properties* nor with respect to the historic character of the GWMP.

1286 The analysis is described in more detail in the *Visual Resources Technical Memorandum*, Volume II.

1287 3.8.1 Methodology

1288 A visual resource inventory was developed for the study area consistent with the FHWA *Visual Impact*
 1289 *Assessment Methodology for Highway Projects* (1981), which is also commonly used by the Federal Transit
 1290 Administration (FTA) to assess transit projects. Existing, opening year (2016), and horizon year (2040) visual
 1291 resources were assessed at nine viewpoints and along the continuous GWMP roadway for each of the three
 1292 Build Alternatives. The viewpoints were selected for analysis based on the likelihood that the project may be
 1293 visible from that location. Viewsheds were chosen to assess impacts to views from the GWMP roadway and
 1294 park, Potomac Greens neighborhood and park, and Potomac Yard development. Future development
 1295 visualizations were based from development estimates from the *North Potomac Yard Small Area Plan* and
 1296 represent the high end scenarios. To depict proposed station and aerial guideway structures as seen from the
 1297 viewpoints, photograph digital renderings were prepared. The photos and visual analysis were developed in
 1298 2011 for the three Build Alternatives. The locations and heights of proposed station and aerial guideway
 1299 structures as shown in the photograph renderings were verified with a “balloon test” that placed large balloons at
 1300 specific points and heights of the Build Alternatives’ stations and aerial guideway structures.

1301 As B-CSX Design Option was developed after the completion of the DEIS visual resource analysis for the three
 1302 Build Alternatives, B-CSX Design Option includes some of the existing photograph digital renderings (when
 1303 applicable) and images from a visual simulation developed by the City of Alexandria. Views of B-CSX Design
 1304 Option station used available drive-by digital simulations prepared by the City of Alexandria rather than
 1305 architectural renderings, as its architectural design has not been developed to the same level of detail as that of
 1306 the Build Alternatives. The drive-by digital simulations include viewsheds of 2040 summer (with foliage) and
 1307 winter/fall (without foliage) from the northbound and southbound lanes of the GWMP roadway. The appearance
 1308 and camera position of the City’s views vary slightly from the nine chosen viewpoints. The City’s drive-by
 1309 simulation can be found online at <http://alexandriava.gov/PotomacYard>.

1310 Views from the digital drive-by simulations were matched with the visuals from the 2011 analysis to the extent
 1311 possible, but minimal variations between the two visuals do exist including slight variation in viewpoint locations
 1312 as well as differences between the viewpoint angles. Images from the City’s drive-by simulation vary slightly
 1313 from one another based on the difficulty of capturing the exact same moment in each video. The 2011 visual
 1314 analysis viewpoints are angled as though driving along the GWMP, while the City’s drive-by simulation is slightly
 1315 angled toward the proposed station locations. The development in Potomac Yard is also displayed differently,
 1316 with some buildings appearing more profoundly in the City’s drive by simulation (in 2040 winter viewsheds).

1317 Additional visual analysis to use a single source of renderings would be completed as part of the Final EIS. The
 1318 Final EIS analysis will use the same photograph digital renderings for the No Build Alternative and for the preferred
 1319 alternative, including both summer (with foliage) and winter/fall (without foliage) renderings for all viewsheds. The
 1320 Final EIS analysis will be updated to include new development constructed in Potomac Yard since the original
 1321 analysis completed in 2012.

1322 The analysis also considered summer and winter conditions, between which the vegetative foliage would vary.
 1323 2040 winter viewsheds are provided from the City of Alexandria’s drive-by digital simulations for select views
 1324 along the GWMP roadway. The inventory characterizes selected viewsheds, defined as the surface area visible
 1325 from a given viewpoint or series of viewpoints, using the concepts of visual character, visual quality, and viewer
 1326 sensitivity.

1327 Visual character describes the natural, physical, and architectural/cultural features that give a location its distinct
 1328 visual identity. As a measure, visual character is value-free in that it is neither qualified as good nor bad.

1329 Visual quality is a rating of a landscape’s visual character based on three criteria:

- 1330 • **Vividness (distinctiveness):** the memorable quality or distinctiveness of the landscape components;
- 1331 • **Intactness:** the visual integrity of the natural and human-built landscape and the extent to which the
 1332 landscape is free from visual encroachment; and
- 1333 • **Unity:** the degree with which visual resources of the landscape join together in a coherent, harmonious
 1334 visual pattern.

1335 These visual characteristics were evaluated on a scale of one to seven, with one being “very low” and seven
 1336 being “very high” (see **Table 3-15**). The average of these visual quality characteristics indicates the overall
 1337 visual quality of the viewshed.

1338

1339 **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).

1341 Viewers can be categorized as having low, average, or high sensitivity to changes in the visual environment.
 1342 Viewer sensitivity is strongly influenced by viewers' activity, awareness of surroundings, frequency, and length
 1343 of time using a resource (a resident or park user, for example). The viewer sensitivity is not anticipated to
 1344 change over time because viewers would engage in similar activities as they currently do, such as driving along
 1345 a parkway, visiting a neighborhood park, or shopping.

1346 For the Build Years 2016 and 2040, images reflect the additional background development that would occur
 1347 under the No Build condition. As the visual quality is inextricably linked to development occurring within the
 1348 viewsheds, the changes resulting from the Build Alternatives include the background development. The
 1349 contributions of the Build Alternatives to changes in visual quality are described in the text.

1350 **3.8.2 Affected Environment**

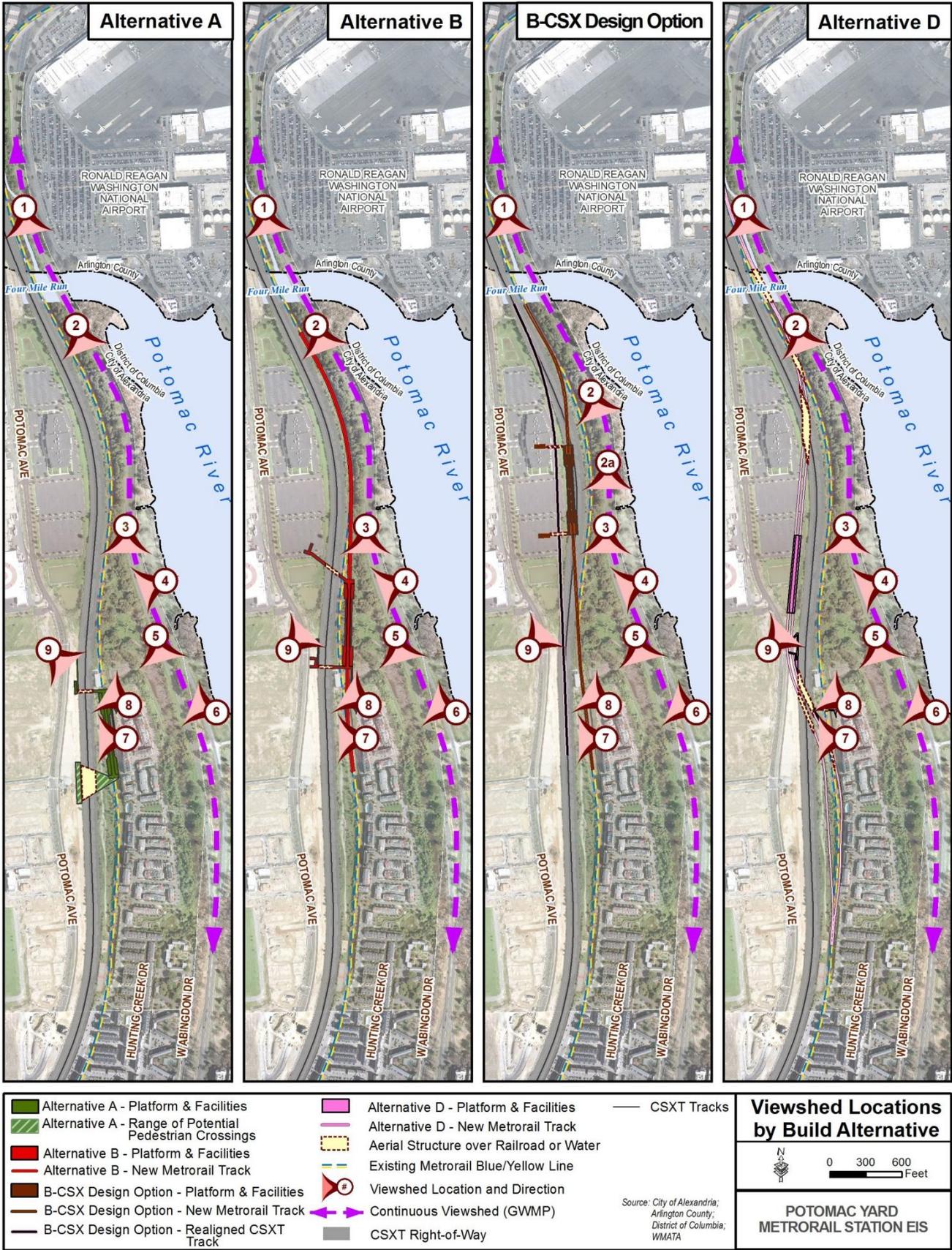
1351 **Figure 3-12** illustrates the viewshed locations. The existing visual character and quality, as well as viewer
 1352 sensitivity, of study area viewsheds is summarized in **Table 3-16**, and are described in more detail below.

1353 **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

1354

1355 Figure 3-12: Viewshed Locations by Build Alternative



1356

1357 **3.8.2.1 George Washington Memorial Parkway**

1358 In general, the continuous viewshed along the GWMP roadway in the study area is characterized by a divided
1359 four-lane roadway framed by vegetation. Viewsheds 1, 2, 3, and 5 are specific views from the southbound lanes
1360 on the parkway (see **Figures 3-13, 3-14, 3-15, 3-16, and 3-18**). For B-CSX Design Option viewshed analysis,
1361 Viewshed 2 was moved slightly south of the other Build Alternatives' Viewshed 2 due to the available imagery
1362 from the computer-generated model. Viewshed 2a was added to B-CSX Design Option viewshed analysis to
1363 specifically consider the design option in relation to the view from the southbound lanes on the GWMP roadway.
1364 Viewsheds 4 and 6 are views west across the roadway, characterized by trees and wetland vegetation with
1365 views of townhomes in the periphery (see **Figure 3-17** and **Figure 3-19**). Visual quality at GWMP viewsheds
1366 ranges from moderately high to very high. GWMP viewers are drivers on the parkway and users of the Mount
1367 Vernon Trail, expecting a primarily natural setting with views of distinctive elements along the GWMP roadway;
1368 therefore, the views along the GWMP possess high viewer sensitivity.

1369 **Figure 3-13: Viewshed 1 – George Washington Memorial Parkway (North Study Area), North of Four Mile**
1370 **Run, Looking Southeast**

1371

1372

1373 **Figure 3-14: Viewshed 2 – George Washington Memorial Parkway (North Study Area), South of Four Mile**
1374 **Run, Looking Southeast**



1375 **Figure 3-15: Viewshed 2a – George Washington Memorial Parkway (North Study Area), South of Four**
1376 **Mile Run, Looking Southeast (B-CSX Analysis Only)**
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1380

1381 **Figure 3-16: Viewshed 3 – George Washington Memorial Parkway (Middle Study Area), Looking South**



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



1386
1387

1388 **Figure 3-18: Viewshed 5 – George Washington Memorial Parkway (South Study Area), Looking South**



1389

1390

1391 **Figure 3-19: Viewshed 6 – George Washington Memorial Parkway (South Study Area), Looking West**



1392

1393

1394 **3.8.2.2 Potomac Greens**

1395 The Potomac Greens neighborhood lies immediately to the south and east of the project site. The development
1396 contains townhomes and community amenities, including Potomac Greens Park. Viewshed 7 is a view from the
1397 neighborhood looking west toward the existing Metrorail tracks and Potomac Yard (see **Figure 3-20**). Viewshed
1398 8 is a view from Potomac Yard Park looking northwest toward the existing Metrorail tracks, Metrorail substation,
1399 portion of the Greens Scenic Area, and Potomac Yard (see **Figure 3-21**). Both viewsheds have moderate visual
1400 quality. Viewers comprise neighborhood residents and park users and have a high degree of viewer sensitivity.

1401 **Figure 3-20: Viewshed 7 – Potomac Greens, Looking West**



1402
1403

1404 **Figure 3-21: Viewshed 8 – Potomac Greens Park**

1405

1406

1407 **3.8.2.3 Potomac Yard**

1408 Potomac Yard lies to the west of the project site. The area south of the existing Potomac Yard Shopping Center
 1409 includes vacant land, local streets, several blocks of recently built townhomes, multi-family buildings, a
 1410 stormwater retention pond, recently planted street trees, and Potomac Yard Park (completed after photos were
 1411 taken). Viewshed 9 has views looking northeast and southeast from East Glebe Road toward the Potomac
 1412 Avenue streetscape and the landscape elements of Potomac Yard Park, with the CSXT tracks and fencing in
 1413 the background (see **Figure 3-22** and **Figure 3-23**). Looking east and northeast, mature vegetation is visible in
 1414 Potomac Greens Park and the Greens Scenic Area in the distance. Looking southeast, the WMATA traction
 1415 power substation and the Potomac Greens townhomes are also visible in the distance. Viewshed 8 has a
 1416 moderately low degree of visual quality. In addition, because viewers in this area would expect a developed
 1417 area with a mix of uses, the level of viewer awareness at Potomac Yard results in a moderate degree of viewer
 1418 sensitivity.

1419 Note the photos and visual analysis were developed in 2011. Additional development has since progressed in
 1420 and around Potomac Yard.

1421

1422 **Figure 3-22: Viewshed 9 – Potomac Yard, looking Northeast at East Glebe Road and Potomac Avenue**



1423
1424
1425 **Figure 3-23: Viewshed 9 – Potomac Yard, looking Southeast at East Glebe Road and Potomac Avenue**



1426
1427
1428

1429 **3.8.3 Environmental Consequences**

1430 The potential effects of the No Build Alternative, the three Build Alternatives, and B-CSX Design Option on
 1431 visual resources are described below.

1432 **3.8.3.1 No Build Alternative**

1433 **Table 3-17** summarizes the anticipated visual impacts of the No Build Alternative by 2016 and 2040. **Figures 3-**
 1434 **24** through **Figure 3-33** compare photographs of existing viewsheds with renderings of anticipated changes to
 1435 viewsheds by the years 2016 and 2040. Viewsheds 6, 7, 8, and 9 are anticipated to have changes. While the
 1436 visual quality of Viewsheds 4 and 5 also declines slightly in 2040, change in future conditions in 2016 and 2040
 1437 is mostly attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer.

1438 **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

1439 Under the No Build Alternative in 2016, the overall character of the continuous viewshed along the GWMP
 1440 roadway would remain characterized by a divided four-lane roadway framed by vegetation, as would Viewsheds
 1441 1, 2, 3, and 5. Viewshed 6 would maintain a view across the GWMP roadway, characterized by trees and
 1442 wetland vegetation with views of townhomes in the periphery (see **Figure 3-29**). The visual quality of the
 1443 continuous viewshed and Viewsheds 1 through 3 would remain very high. The visual quality of Viewsheds 4 and
 1444 5 would remain high, and the visual quality of Viewshed 6 would remain moderately high. In 2040, some
 1445 viewsheds would include new development from Potomac Yard and Crystal City, causing declines in Viewshed
 1446 4 to moderately high visual quality, Viewshed 5 to moderately high visual quality, Viewshed 6 to moderate visual
 1447 quality, and the GWMP continuous view corridor to high.

1448 For Viewsheds 7 and 8 in Potomac Greens, the Potomac Yard development would add built forms, and
 1449 Potomac Yard Park vegetation would mature adjacent to the tracks (see **Figure 3-30** and **Figure 3-31**). The
 1450 overall visual quality for Viewsheds 7 and 8 would remain moderate. In 2040, further development in North
 1451 Potomac Yard would be added to the viewshed, which would diminish the visual quality of both viewsheds to
 1452 moderately low levels.

1453 At Potomac Yard, the South Potomac Yard development would add built forms along Potomac Avenue to the
 1454 periphery of Viewshed 9 (outside the field of view of the photograph renderings), and Potomac Yard Park would
 1455 vegetation would mature and augment the existing landscape of the site (see **Figure 3-32** and **Figure 3-33**).
 1456 The visual quality would remain moderate due to the encroachment of buildings within the viewshed and
 1457 improved visual patterns due to the maturation of vegetation at Potomac Yard Park. In 2040, the viewshed
 1458 would experience additional encroachment from North Potomac Yard development, and the Potomac Yard Park

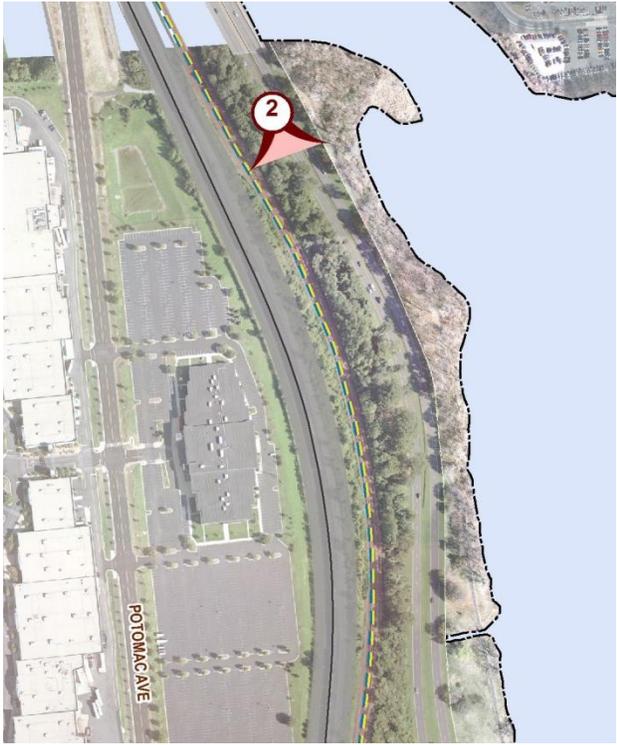
1459 vegetation would be more mature, further filtering views of buildings in the background, retaining its moderate
 1460 visual quality.

1461 **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

1462

1463 **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

1464

1465 **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

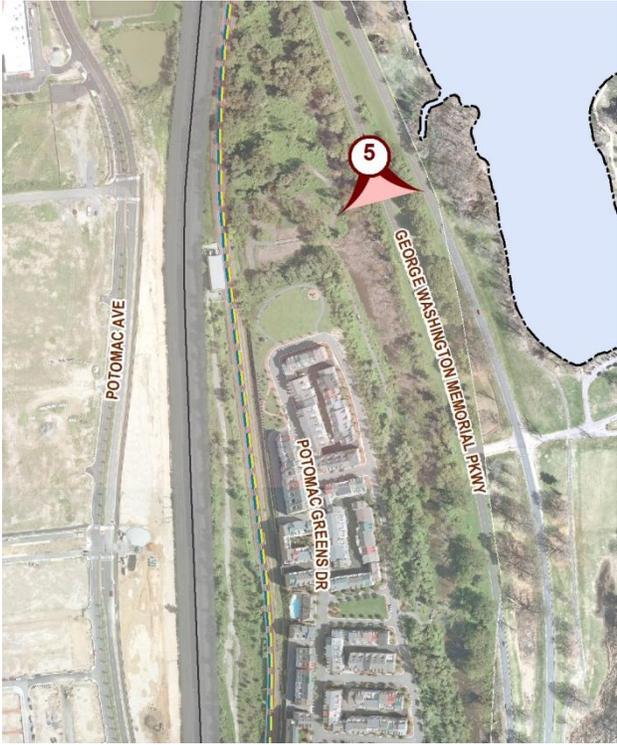
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1467 **Figure 3-27: No Build Alternative Viewshed 4 Elements**

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

1468

1469 **Figure 3-28: No Build Alternative Viewshed 5 Elements**

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

VISUAL QUALITY	Existing	2016	2040
No Build	High	High	Moderately High

1470

1471 **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

1472

1473 **Figure 3-30: No Build Alternative Viewshed 7 Elements**



VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

1474

1475 **Figure 3-31: No Build Alternative Viewshed 8 Elements**



VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

1476

1477 **Figure 3-32: No Build Alternative Viewshed 9 Elements, Looking Southeast**



VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderate

1478

1479 **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

1480

1481

1482 **3.8.3.2 Build Alternative A**

1483 **Table 3-18** summarizes the anticipated visual impacts of Build Alternative A. **Figure 3-34** through **Figure 3-42**
 1484 compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years
 1485 2016 and 2040. Viewsheds 6, 7, 8, and 9 are anticipated to have changes. While the visual quality of Viewsheds
 1486 4 and 5 also decline slightly in 2040, change in future conditions in 2016 and 2040 is mostly attributable to the
 1487 loss of vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-35, 3-36, and 3-**
 1488 **38** include 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

1489 **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

1490 Along the GWMP roadway in 2016, Build Alternative A would add built elements of the new Metrorail station to
 1491 Viewsheds 4 and 6; the other viewsheds would continue to be framed by continuous vegetation. As a result of
 1492 the encroachment of buildings into the viewshed, Viewshed 4 would decline to moderately high visual quality
 1493 due to the visibility of the station during winter (see **Figure 3-37**), and Viewshed 6 would decline to moderate
 1494 visual quality (see **Figure 3-39**). The continuous viewshed and Viewsheds 1, 2, 3, and 5 would retain their
 1495 existing visual quality. In 2040, Viewsheds 1 through 3 would include some development from Potomac Yard
 1496 and Crystal City, but the changes would not be sufficient to alter their overall visual quality. The Potomac Yard
 1497 development would encroach into the other viewsheds by 2040, resulting in declines to moderately high visual
 1498 quality for Viewsheds 4 and 5, moderately low visual quality for Viewshed 6, and high visual quality for the
 1499 GWMP continuous view corridor.

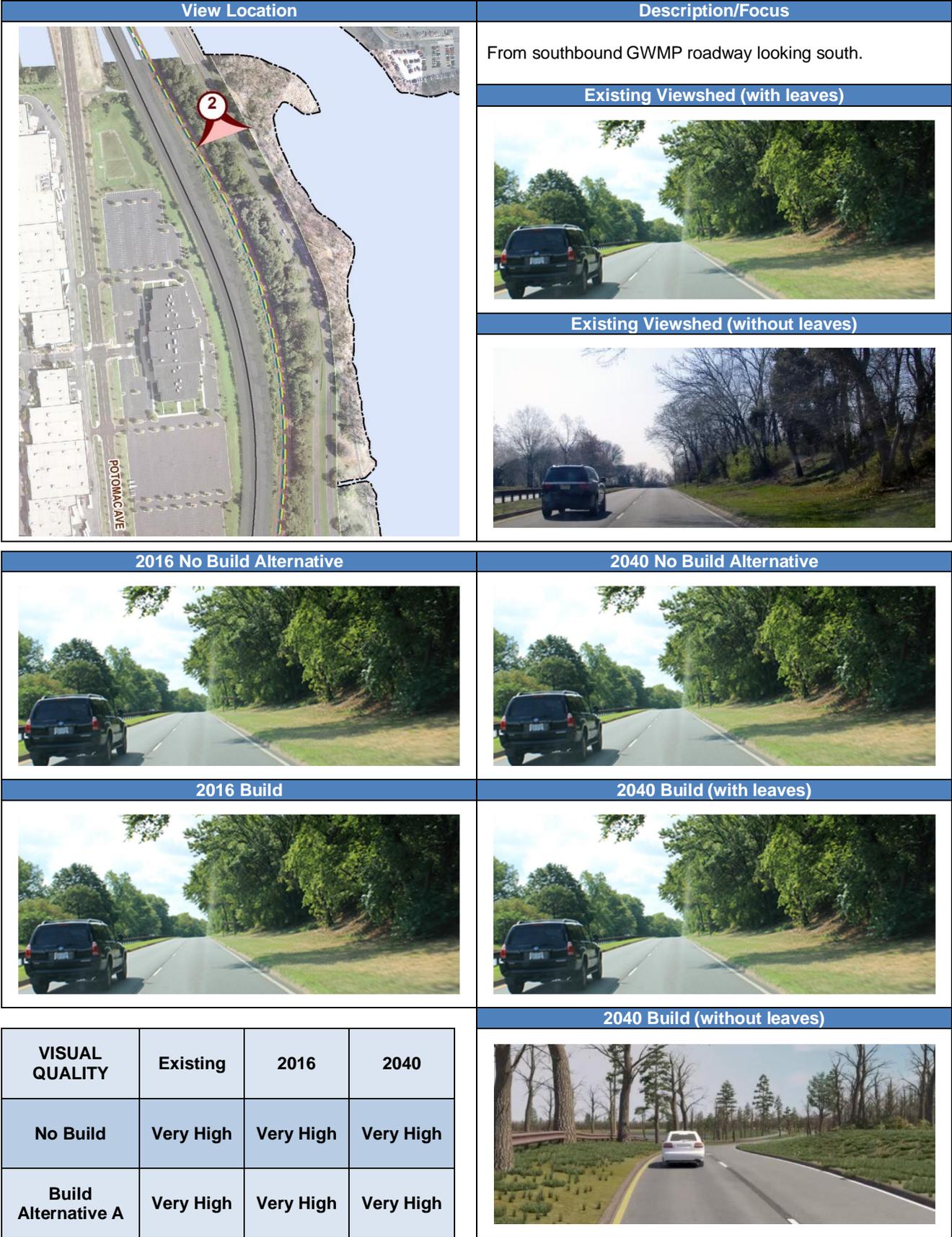
1500 From Potomac Greens in 2016, Build Alternative A would block views of the existing retaining wall and fencing,
 1501 as well as the traction power substation beyond. In Viewshed 7, the Metrorail station platform would add
 1502 horizontal built elements, with a moderately low visual quality (see **Figure 3-40**). In Viewshed 8, the new
 1503 Metrorail station would dominate the viewshed, resulting in low visual quality (see **Figure 3-41**). In 2040,
 1504 development in Potomac Yard would be added to the viewsheds, reducing the visual quality of Viewshed 8 to
 1505 very low levels; Viewshed 7 would continue to have moderately low visual quality.

1506 In Potomac Yard in 2016, Build Alternative A would introduce new vertical elements, the station entrance and
 1507 pedestrian bridge, into the foreground of Viewshed 9. Vegetation in the background would be removed, although
 1508 Potomac Yard Park landscape would also serve to filter views of the Potomac Greens neighborhood (see
 1509 **Figure 3-42**). The visual quality of Viewshed 8 would diminish to moderately low levels. In 2040, buildings of up
 1510 to 250 feet in height, landscaping through the implementation of mixed-use development at Potomac Yard, and
 1511 maturation of Potomac Yard Park are also visible. As a result, the visual quality would decline to moderately low.

1512 Figure 3-34: Build Alternative A Viewshed 1 Elements

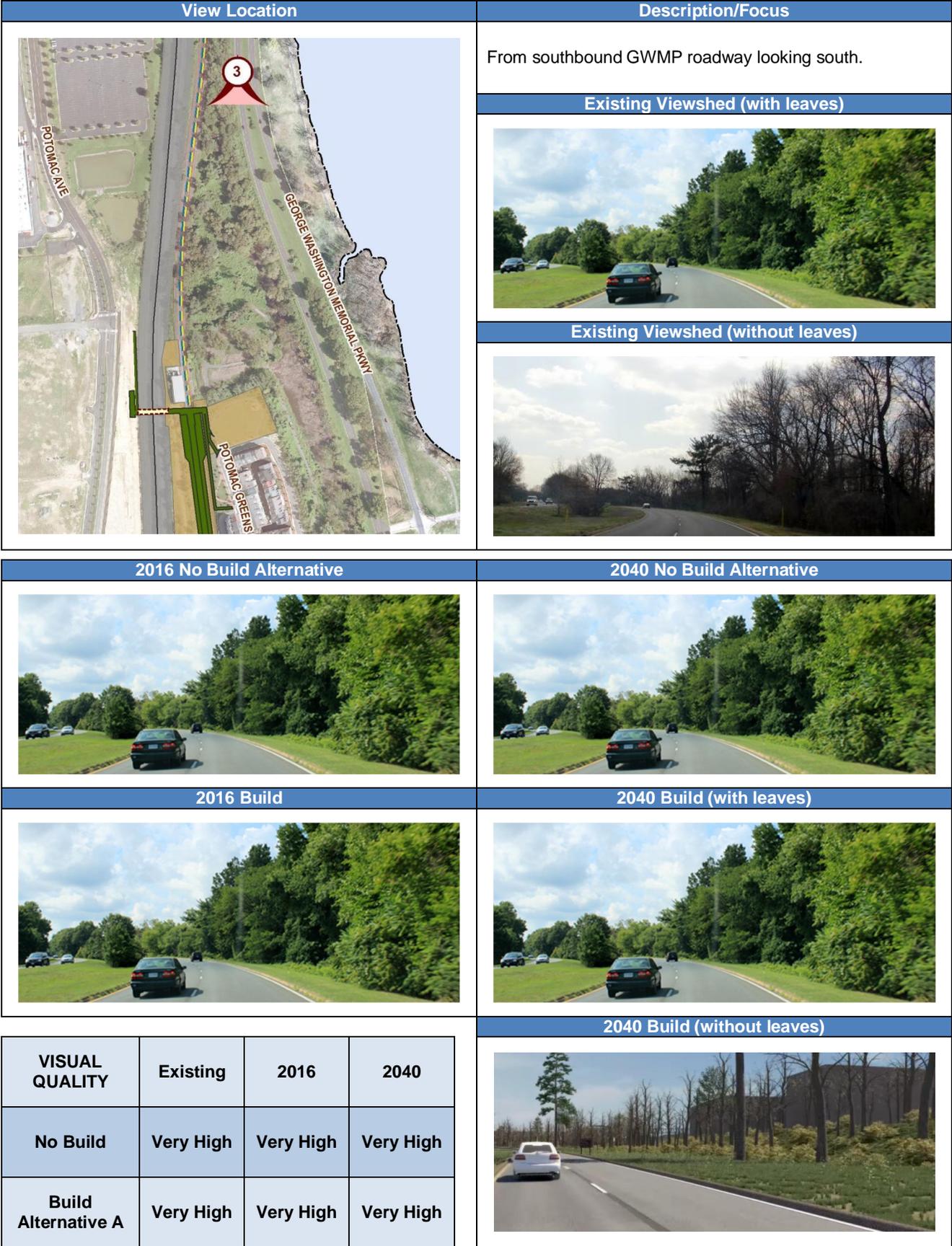
View Location		Description/Focus	
		From southbound GWMP roadway looking south.	
		Existing Viewshed (with leaves)	
		Existing Viewshed (without leaves)	
2016 No Build Alternative		2040 No Build Alternative	
2016 Build		2040 Build	
VISUAL QUALITY	Existing	2016	2040
No Build	Very High	Very High	Very High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

1513 Figure 3-35: Build Alternative A Viewshed 2 Elements



1514

1515 Figure 3-36: Build Alternative A Viewshed 3 Elements

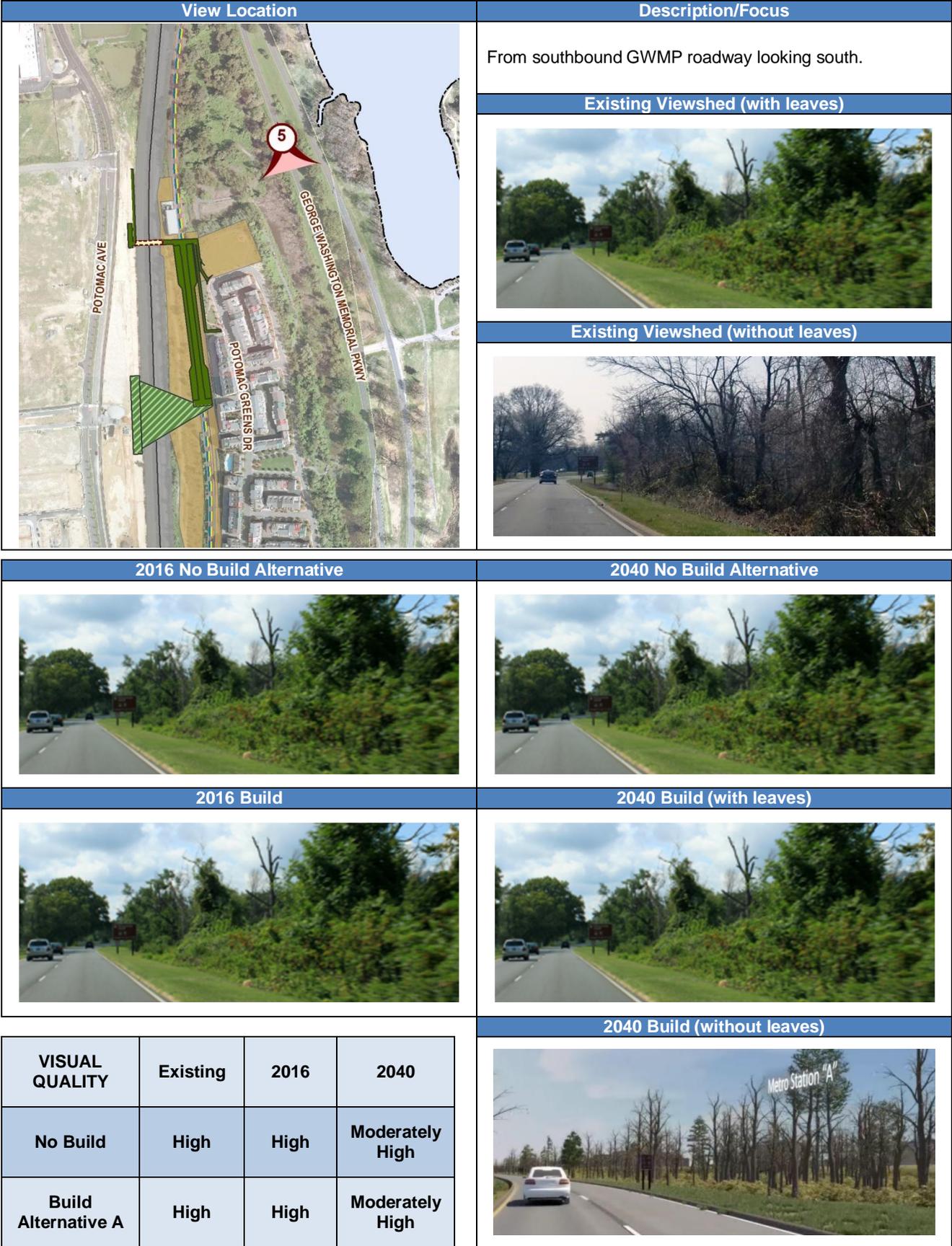


1517 **Figure 3-37: Build Alternative A Viewshed 4 Elements**

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

1518

1519 Figure 3-38: Build Alternative A Viewshed 5 Elements



1520

1521 **Figure 3-39: Build Alternative A Viewshed 6 Elements**

View Location		Description/Focus	
		<p>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.</p>	
		<p>Existing Viewshed (with leaves)</p>	
		<p>Existing Viewshed (without leaves)</p>	
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

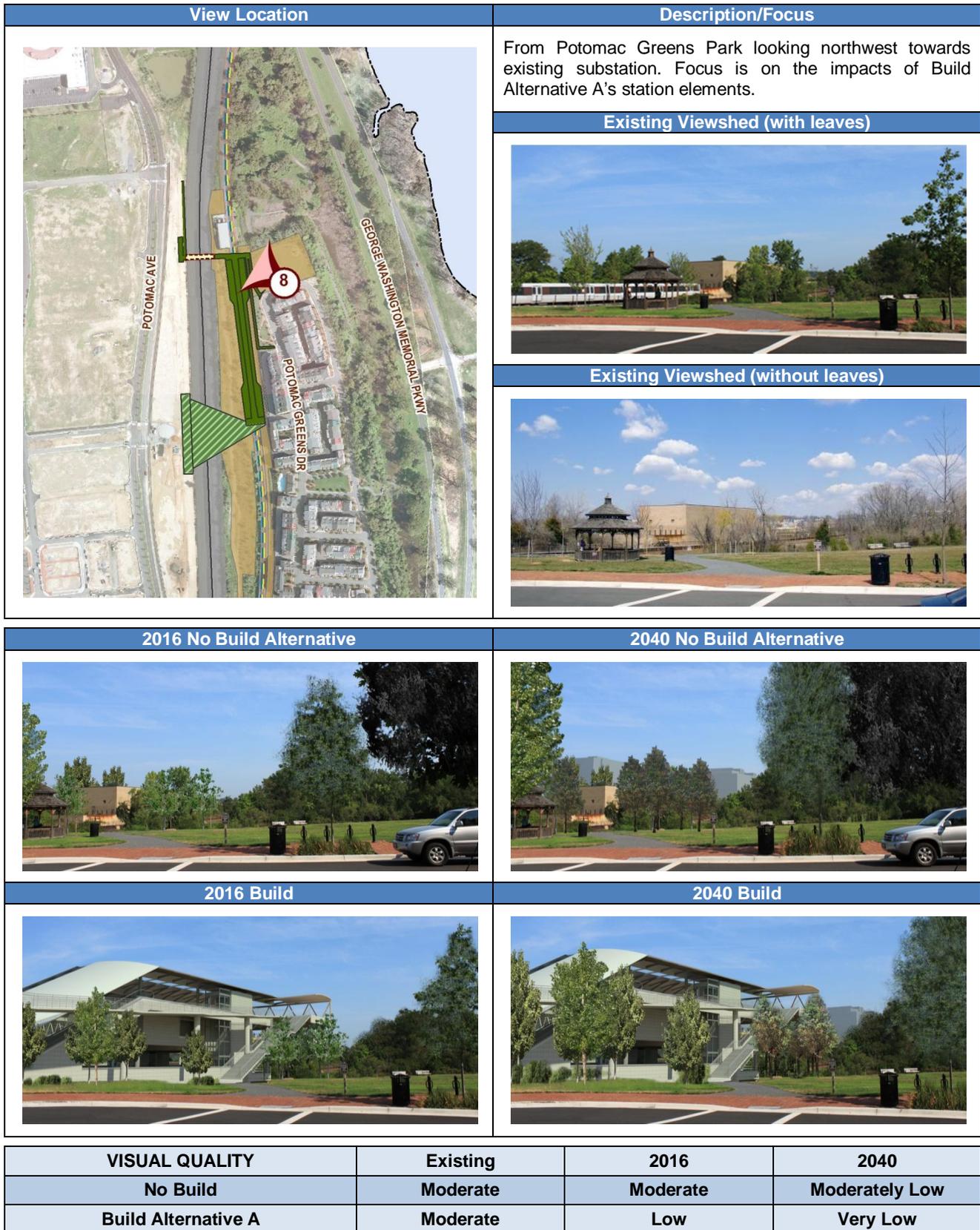
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1523 **Figure 3-40: Build Alternative A Viewshed 7 Elements**



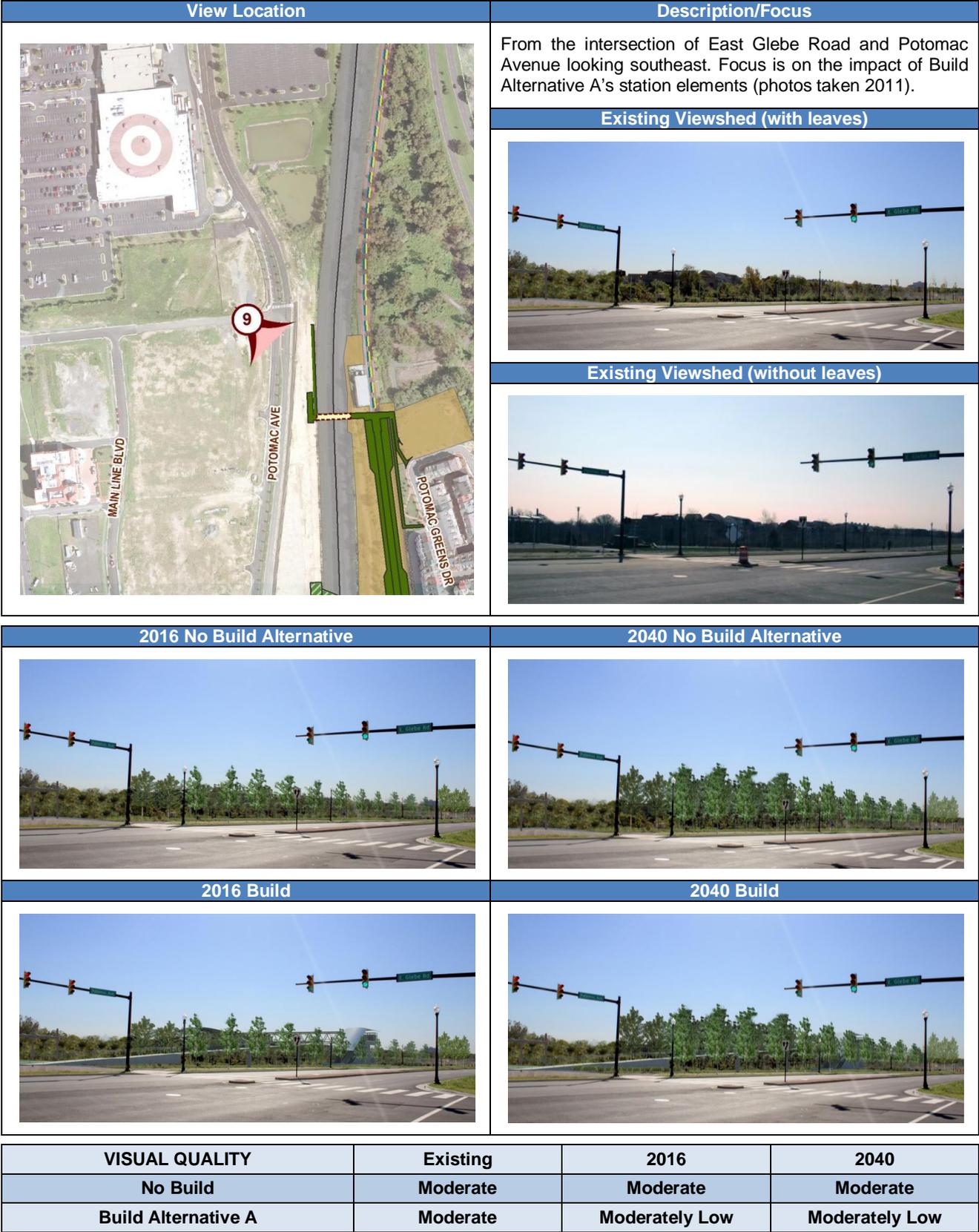
1524

1525 **Figure 3-41: Build Alternative A Viewshed 8 Elements**



1526

1527 **Figure 3-42: Build Alternative A Viewshed 9 Elements**



1528

1529 **3.8.3.3 Build Alternative B**

1530 **Table 3-19** summarizes the anticipated visual impacts of Build Alternative B. **Figure 3-43** through **Figure 3-51**
 1531 compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years
 1532 2016 and 2040. Viewsheds 3, 8, and 9 are anticipated to have changes. While the visual quality of Viewshed 4
 1533 also declines slightly in 2040, change in future conditions in 2016 and 2040 is mostly attributable to the loss of
 1534 vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-44, 3-45, and 3-47** include
 1535 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

1536 **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

1537 Along the GWMP in 2016, Build Alternative B would remove vegetation and add built elements to Viewsheds 3,
 1538 4, and 5 and the continuous view corridor, while the other viewsheds would continue to be framed by continuous
 1539 vegetation. The encroachment of the Metrorail station and track into the viewshed would diminish Viewshed 3 to
 1540 moderate visual quality (see **Figure 3-45**), Viewsheds 4 and 5 to moderately high visual quality, which would be
 1541 due to the visibility of the station during winter in the case of Viewshed 4 (see **Figure 3-46** and **Figure 3-47**),
 1542 and the GWMP continuous view corridor to high visual quality. Viewshed 3 would include the removal of
 1543 vegetation for construction staging between the GWMP and the Metrorail station, which contribute to the
 1544 diminished view quality in 2016. Construction activity would be located relatively close to the GWMP within the
 1545 Greens Scenic Area easement, with little visual barrier to the GWMP, altering the vegetated appearance of the
 1546 area due to the clearance of treed area and associated herbaceous vegetation within 0.55 acre of the GWMP,
 1547 0.83 acre of the Greens Scenic Area easement, and 0.31 acre along the east side of the Metrorail tracks.
 1548 Viewsheds 1, 2, and 6 would retain their existing visual quality. Viewshed 6 would include filtered views at its
 1549 periphery of a small portion of the Metrorail station along the GWMP during the winter months, but this
 1550 encroachment would not be enough to degrade the overall visual quality of the viewshed (see **Figure 3-48**).
 1551 Build Alternative B would not be able to proceed unless the Greens Scenic Area easement is released by NPS
 1552 due to its impacts subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.
 1553 In 2040, the vegetation along the roadway would mature, improving Viewshed 3 to a moderately high visual
 1554 quality. Viewshed 4 and the GWMP continuous view corridor would retain their 2016 visual quality. Additional
 1555 viewsheds would include some development from Potomac Yard and Crystal City, but with the exception of
 1556 Viewshed 6, their visual quality would not change. In 2040, Viewshed 6 would have moderate visual quality due
 1557 to the substantial amount of new development visible.

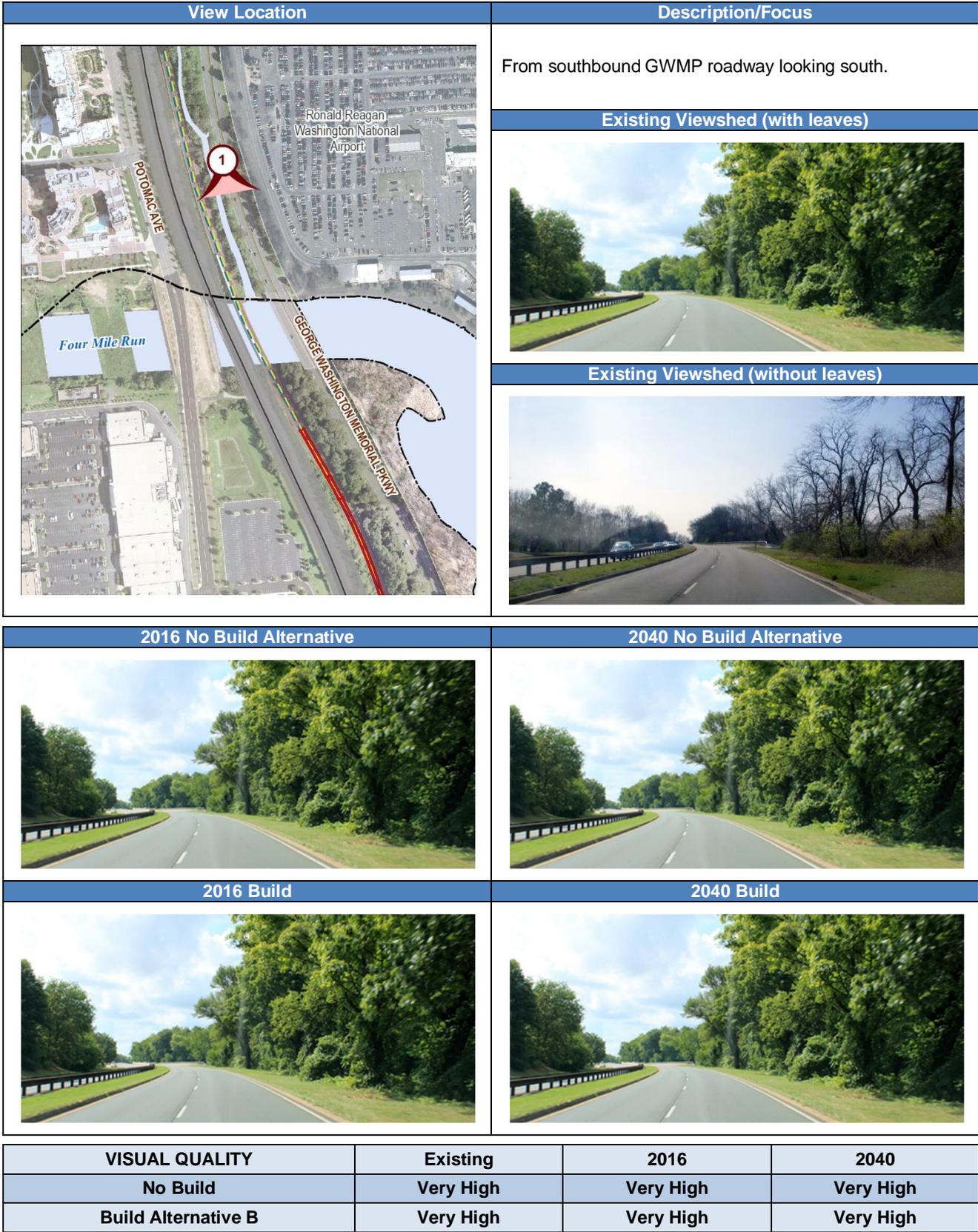
1558 From the Potomac Greens neighborhood in 2016, Build Alternative B would maintain the same views in
 1559 Viewshed 7 as under the No Build Alternative, and would retain moderate visual quality (see **Figure 3-49**). In
 1560 Viewshed 8, Build Alternative B would add prominent built forms as part of the pedestrian bridge and station
 1561 structure (see **Figure 3-50**). As a result, Viewshed 8 would have moderately low visual quality. In 2040, further
 1562 development in Potomac Yard would be added to the viewsheds, reducing the visual quality of Viewsheds 7 and
 1563 8 to moderately low and low, respectively. The Metrorail facility would be visible from Potomac Greens Drive.

1564

1565 From Potomac Yard in 2016, Alternative B would add pedestrian bridges and station entrances, which would
1566 introduce vertical elements into the Viewshed 9 (see **Figure 3-51**). The station's platform would also be visible.
1567 Potomac Yard Park vegetation would filter portions of the Metrorail station. The visual quality would be
1568 diminished to moderately low levels. In 2040, mixed-use development at Potomac Yard would be visible and the
1569 matured vegetation of Potomac Yard would further filter views. The visual quality would continue to be
1570 moderately low.

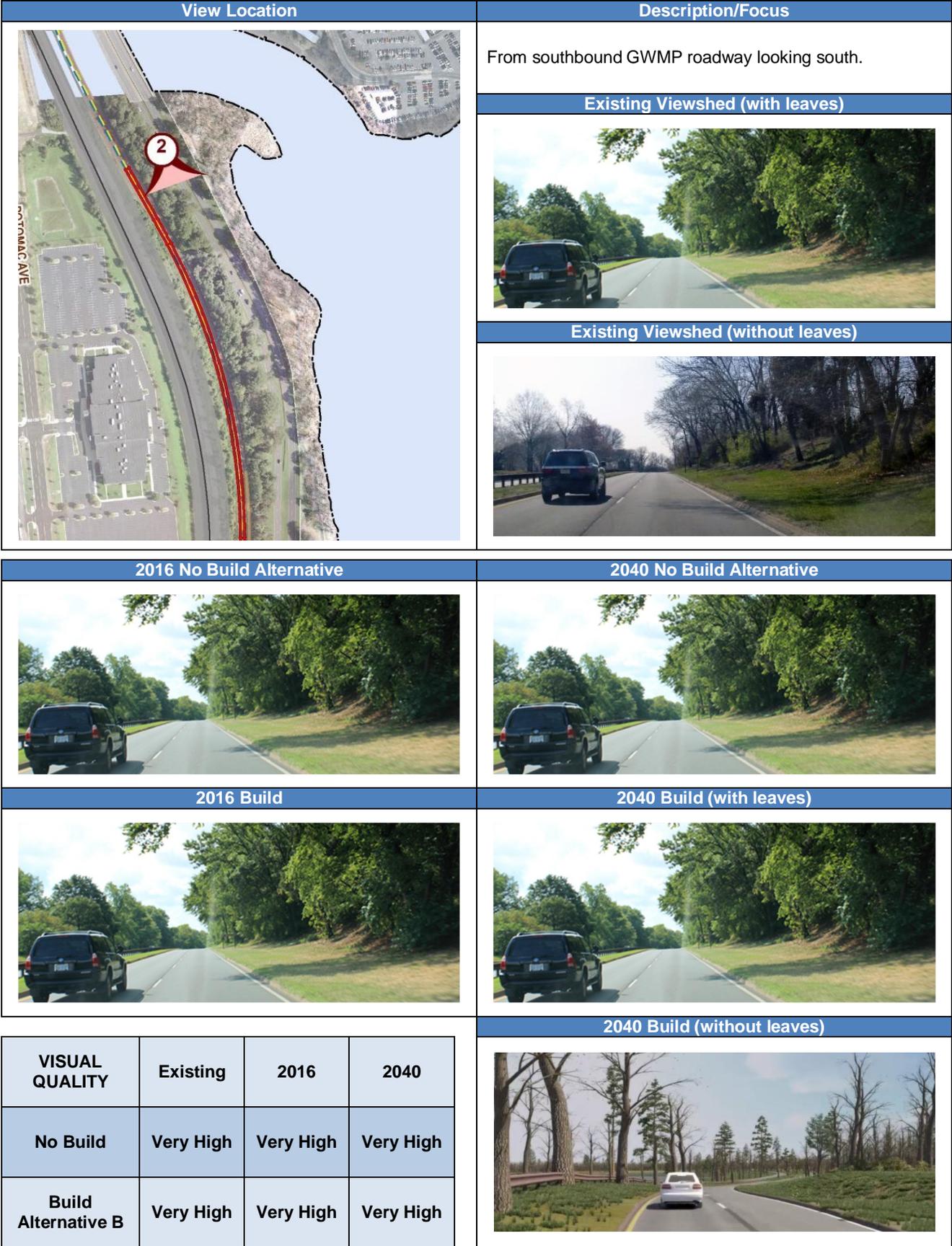
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1572 **Figure 3-43: Build Alternative B Viewshed 1 Elements**

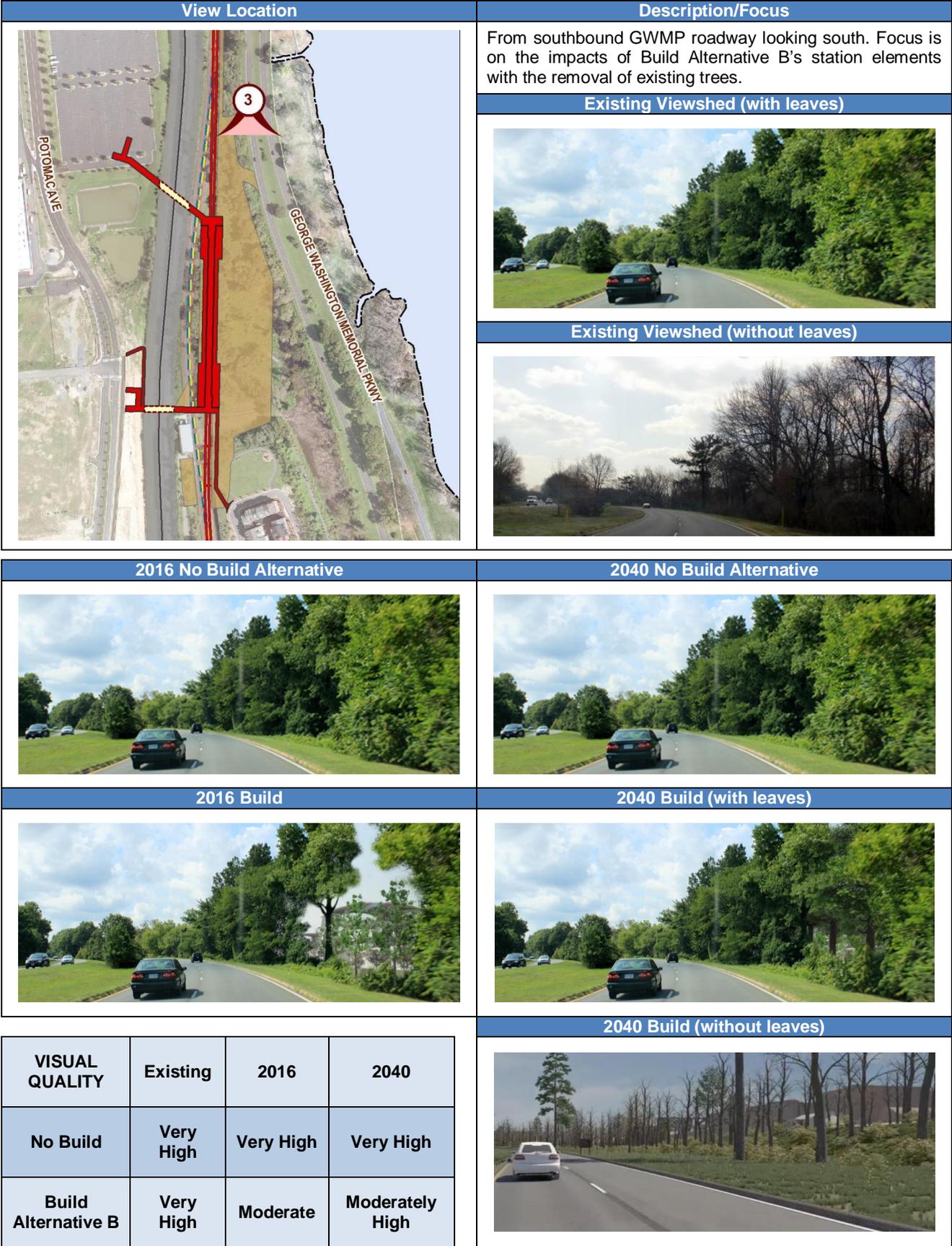


1573

1574 Figure 3-44: Build Alternative B Viewshed 2 Elements



1575 Figure 3-45: Build Alternative B Viewshed 3 Elements

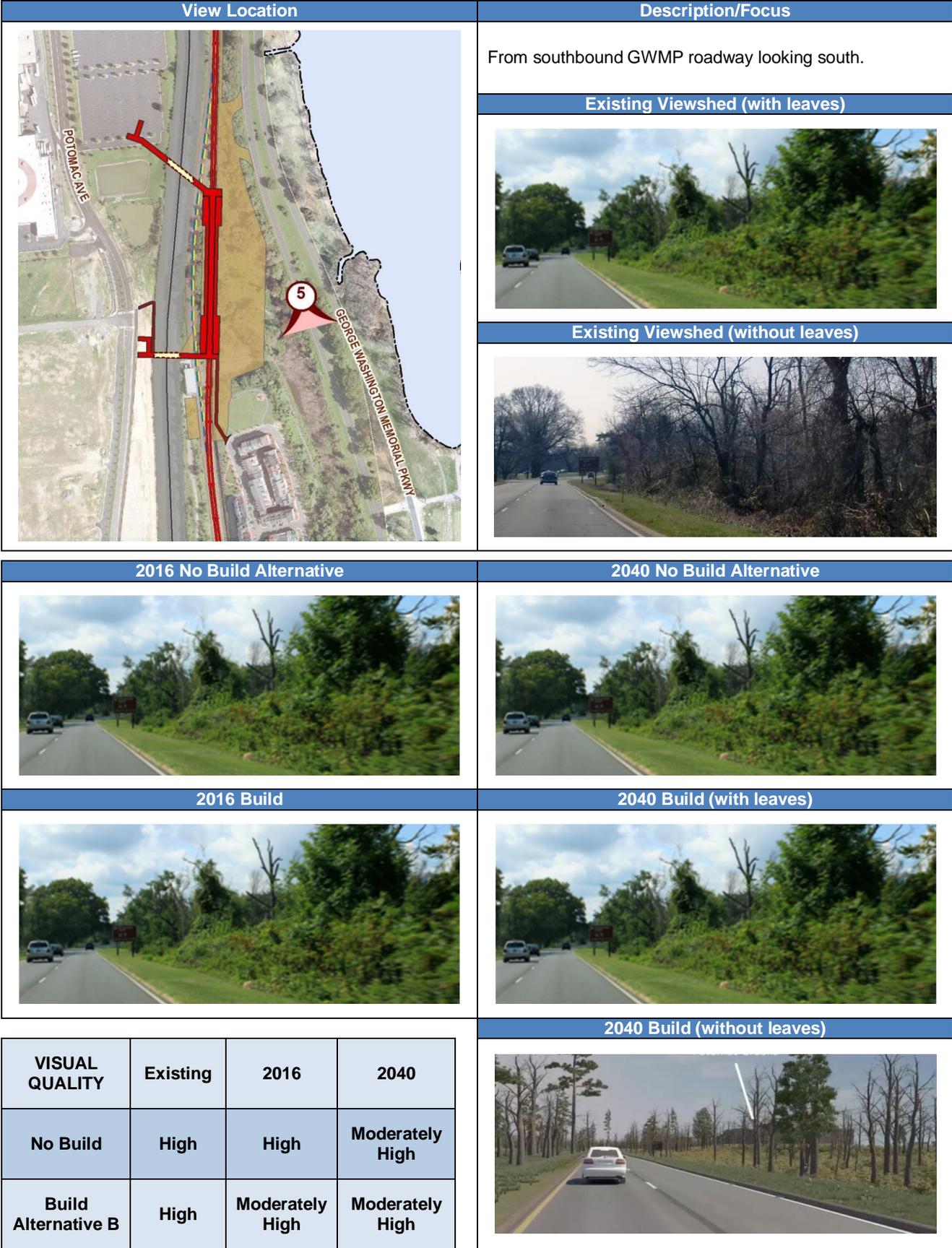


1576 Figure 3-46: Build Alternative B Viewshed 4 Elements

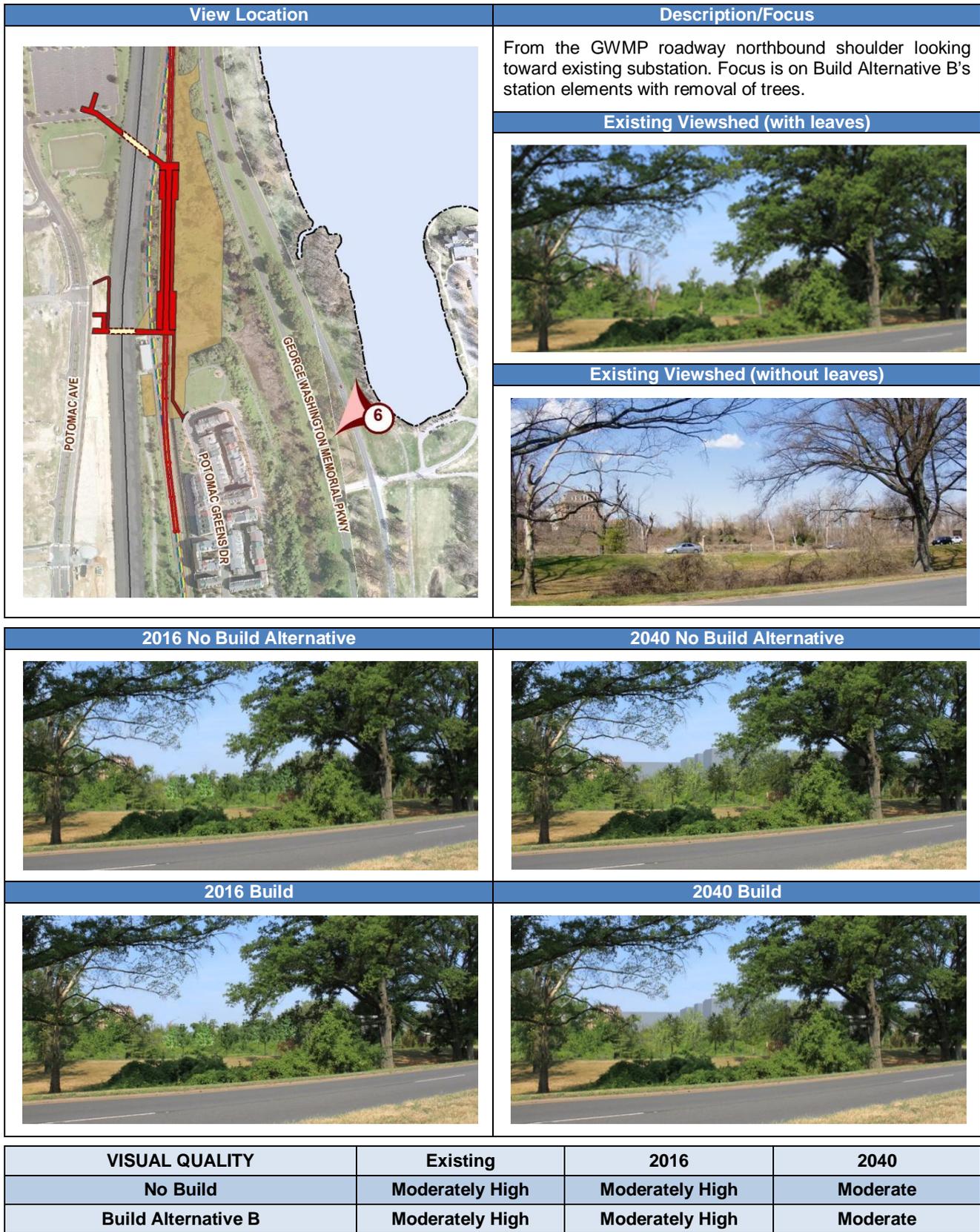


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1578 Figure 3-47: Build Alternative B Viewshed 5 Elements

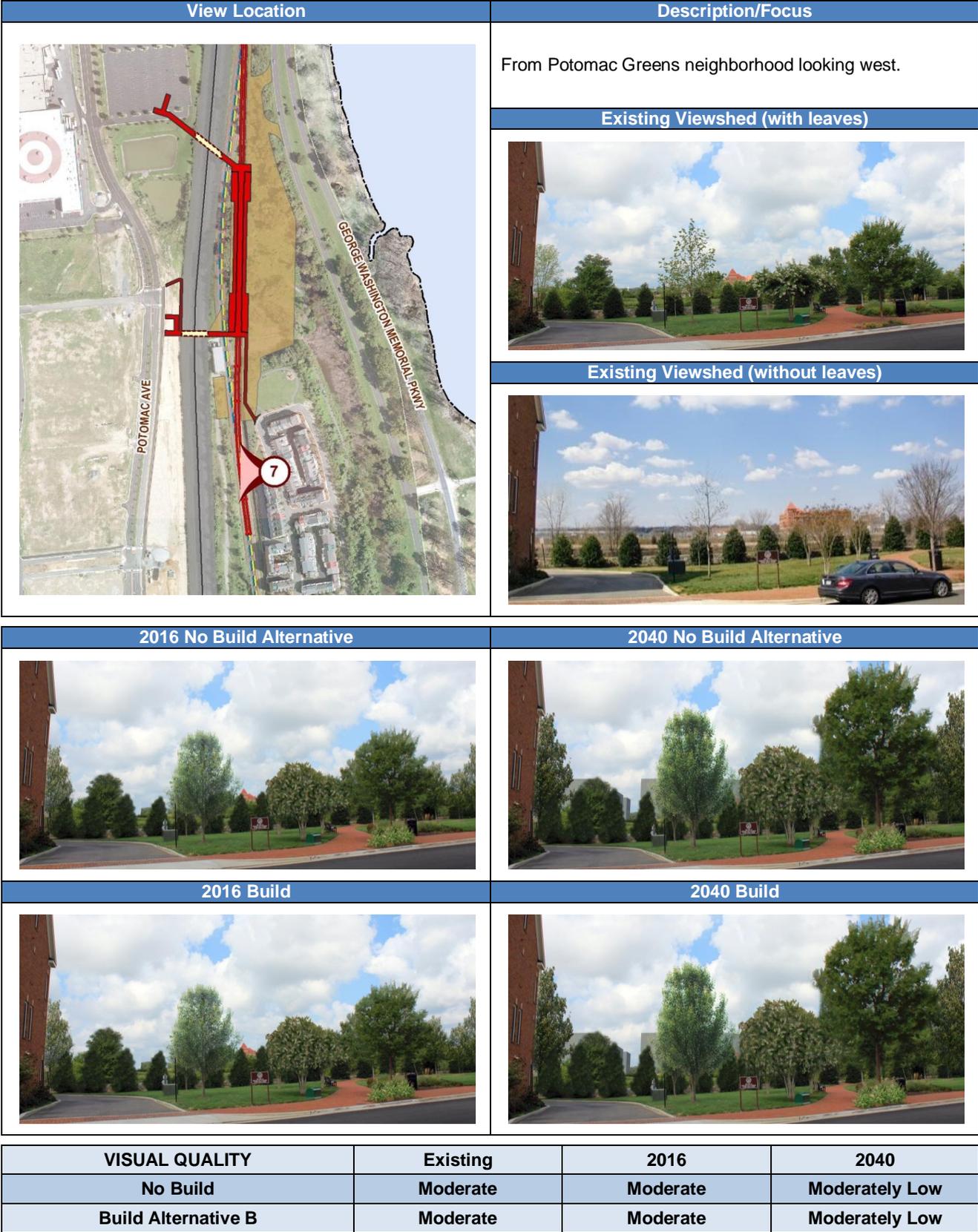


1579 **Figure 3-48: Build Alternative B Viewshed 6 Elements**



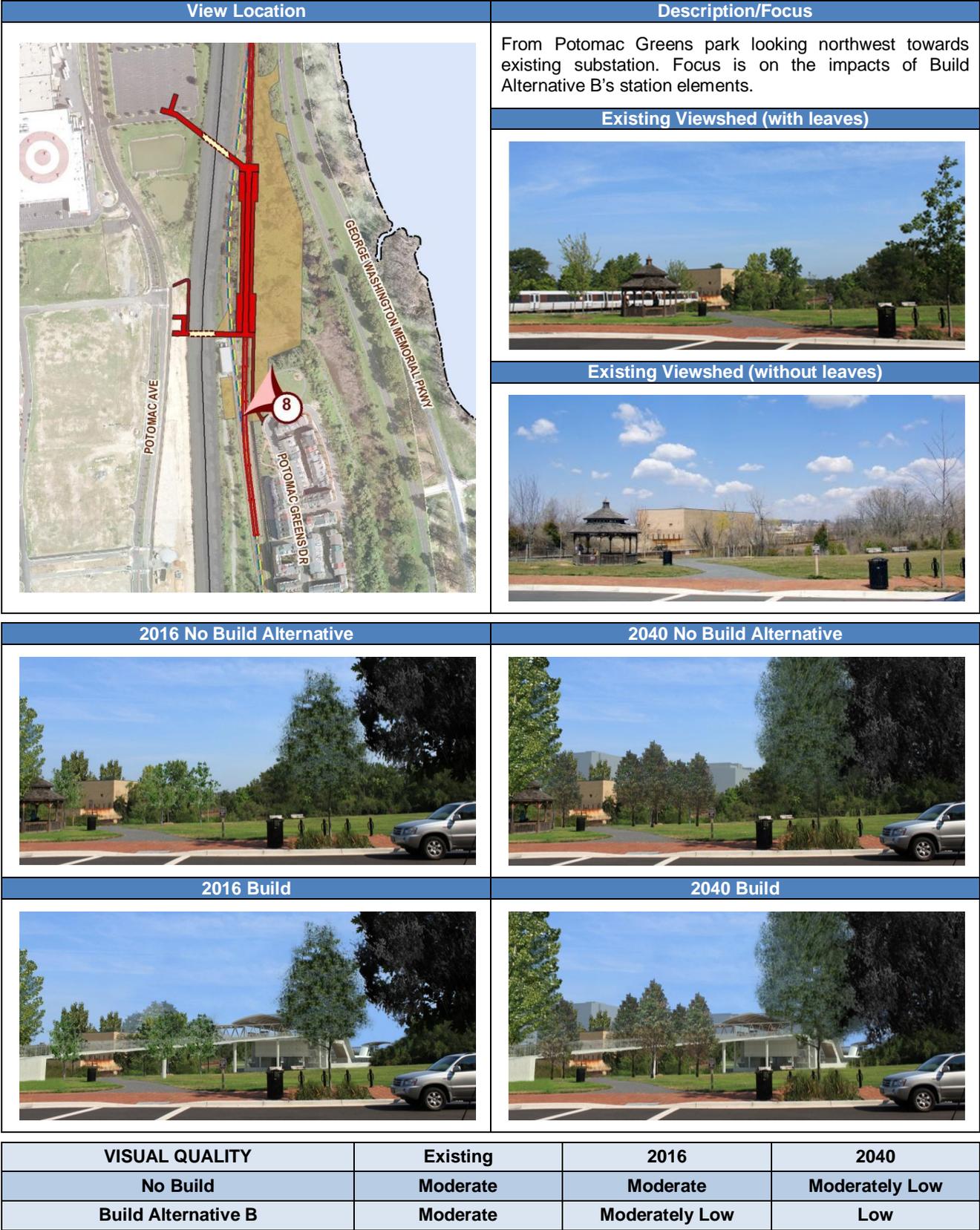
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1581 **Figure 3-49: Build Alternative B Viewshed 7 Elements**



1582

1583 **Figure 3-50: Build Alternative B Viewshed 8 Elements**



1584

1585 **Figure 3-51: Build Alternative B Viewshed 9 Elements**



1586

1587 **3.8.3.4 B-CSX Design Option**

1588 **Table 3-20** summarizes the anticipated visual impacts of B-CSX Design Option. **Figure 3-52** through **Figure 3-**
 1589 **61** compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the
 1590 years 2016 and 2040. Views of B-CSX Design Option station used available drive-by digital simulations
 1591 prepared by the City of Alexandria rather than architectural renderings, as its architectural design has not been
 1592 developed to the same level of detail as that of the Build Alternatives.

1593 Viewsheds 2, 2A, and 3 are anticipated to have changes. While the visual quality of Viewsheds 4 and 5 also
 1594 decline slightly in 2040, the change in future conditions between 2016 and 2040 is mostly attributable to the loss
 1595 of vegetative foliage in winter, similar to the No Build Alternative, and changes are minimal in the summer.

1596 **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

1597 Along the GWMP in 2016, B-CSX Design Option would remove vegetation and add built elements to Viewsheds
 1598 2, 2A, 3, and the continuous view corridor, while the other viewsheds would continue to be framed by vegetation
 1599 with limited interruptions. The encroachment of the Metrorail station and track into the viewshed would diminish
 1600 Viewshed 2 to high visual quality (see **Figure 3-53**), Viewsheds 2A and 3 to moderately high visual quality (see
 1601 **Figure 3-54** and **Figure 3-55**), and the Continuous GWMP Corridor to high visual quality. Viewshed 1 would
 1602 retain a very high visual quality in 2016 and 2040 (see **Figure 3-52**). In Viewshed 3, the encroachment of new
 1603 development in Potomac Yard would contribute to diminishing visual quality as construction staging would
 1604 require the removal of an approximately 50-foot wide layer of thin, mostly low-lying vegetation with widely
 1605 spaced trees west of the existing Metrorail line, between the Metrorail tracks and the CSXT tracks, that currently
 1606 is part of the visual screen between GWMP and the proposed location of the Metrorail station. Although the
 1607 current vegetative buffer on NPS property would continue to screen the GWMP from B-CSX Design Option
 1608 since vegetation would not be cleared in the Greens Scenic Area easement or the GWMP. Viewsheds 4 and 5
 1609 would retain their high visual quality in 2016 (see **Figure 3-56** and **Figure 3-57**), and Viewshed 6 would remain
 1610 moderately high (see **Figure 3-58**). Under Viewshed 4, station elements would not be visible from the Mount
 1611 Vernon Trail, since the rising topography toward the station and the existing vegetation screen block any views
 1612 of B-CSX Design Option. In 2040, some of the viewsheds would include new development from Potomac Yard
 1613 and Crystal City, causing declines in Viewshed 4 to moderately high visual quality, Viewshed 5 to moderately
 1614 high visual quality, and Viewshed 6 to moderate visual quality. In 2040, the Continuous GWMP Corridor would
 1615 include new development from Potomac Yard and Crystal City along the periphery, while replanted vegetation

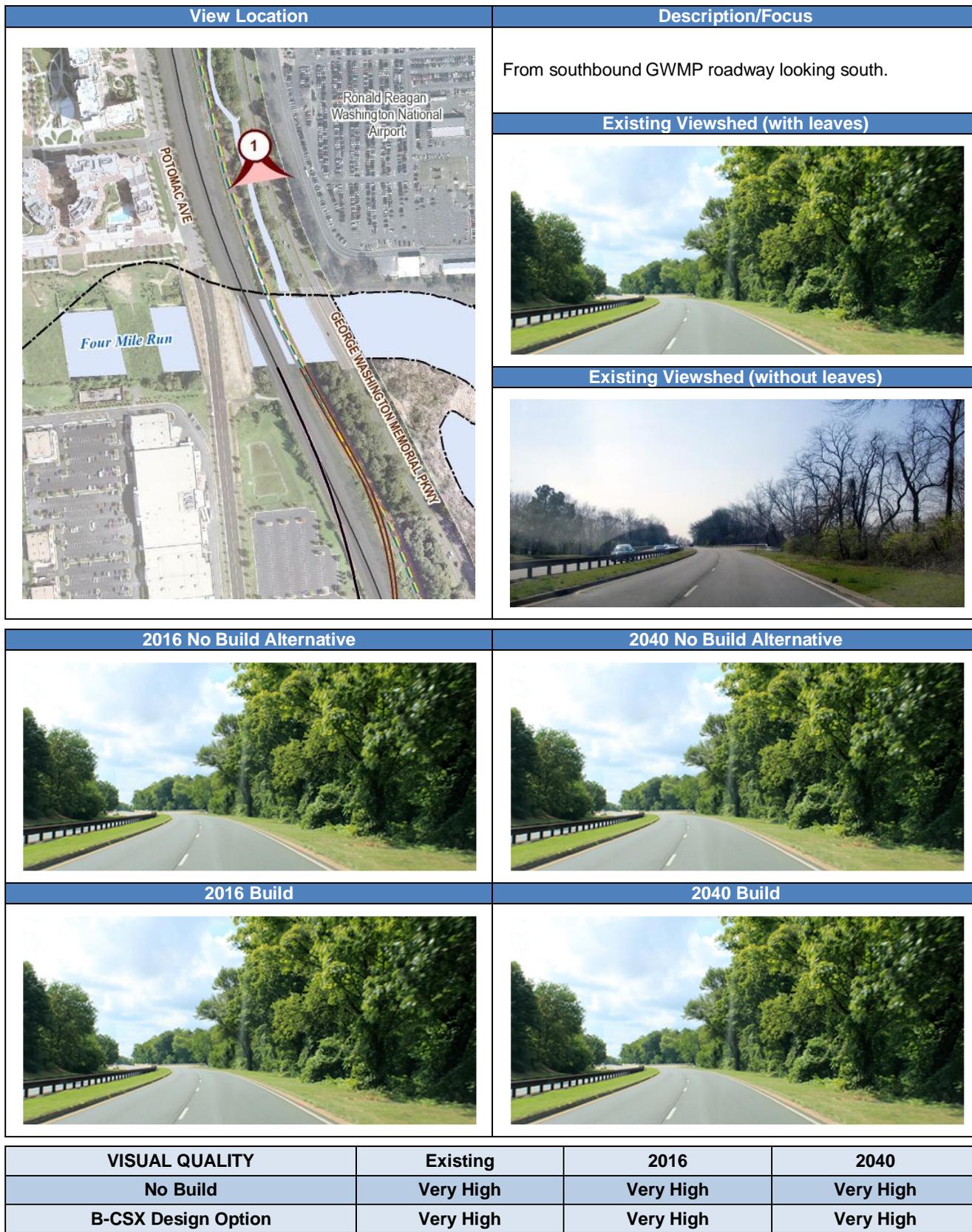
1616 along the Metrorail station and track would be more mature; as a result, the visual quality would remain high.
1617 During the winter months, built elements for viewsheds would be more visible due to the lack of leaves.

1618 For Viewsheds 7 and 8 in Potomac Greens, B-CSX Design Option would replace the existing Metrorail tracks;
1619 the Potomac Yard development would add built forms and Potomac Yard Park vegetation would mature
1620 adjacent to the tracks, similar to the No Build Alternative (see **Figure 3-59** and **Figure 3-60**). The overall visual
1621 quality for Viewsheds 7 and 8 would remain moderate. In 2040, further development in North Potomac Yard
1622 would be added to the viewshed, which would diminish the visual quality of both viewsheds to moderately low
1623 levels.

1624 At Potomac Yard, B-CSX Design Option would replace and re-align Metrorail tracks near East Glebe Road.
1625 South Potomac Yard development would add built forms along Potomac Avenue to the periphery of Viewshed 9
1626 (outside the field of view of the photograph renderings) and Potomac Yard Park vegetation would mature and
1627 augment the existing landscape of the site (see **Figure 3-61**). The visual quality would remain moderate due to
1628 minimal visibility of the realigned tracks, the encroachment of buildings within the viewshed, and improved visual
1629 patterns due to the introduction of vegetation at Potomac Yard Park. In 2040, the viewshed would experience
1630 additional encroachment from North Potomac Yard development, and the Potomac Yard Park vegetation would
1631 be more mature, further filtering views of buildings in the background, retaining its moderate visual quality.

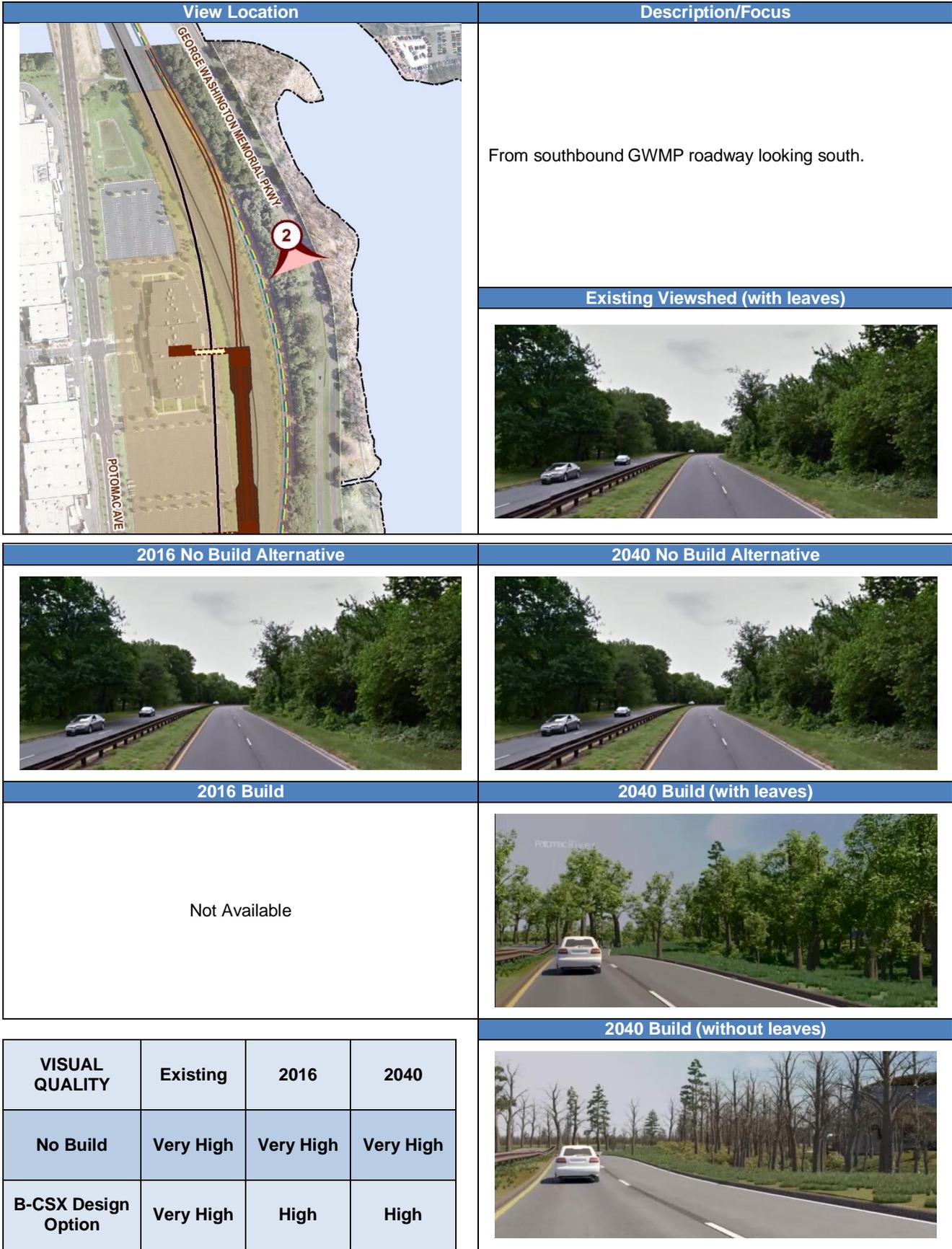
1632

1633 Figure 3-52: B-CSX Design Option Viewshed 1 Elements

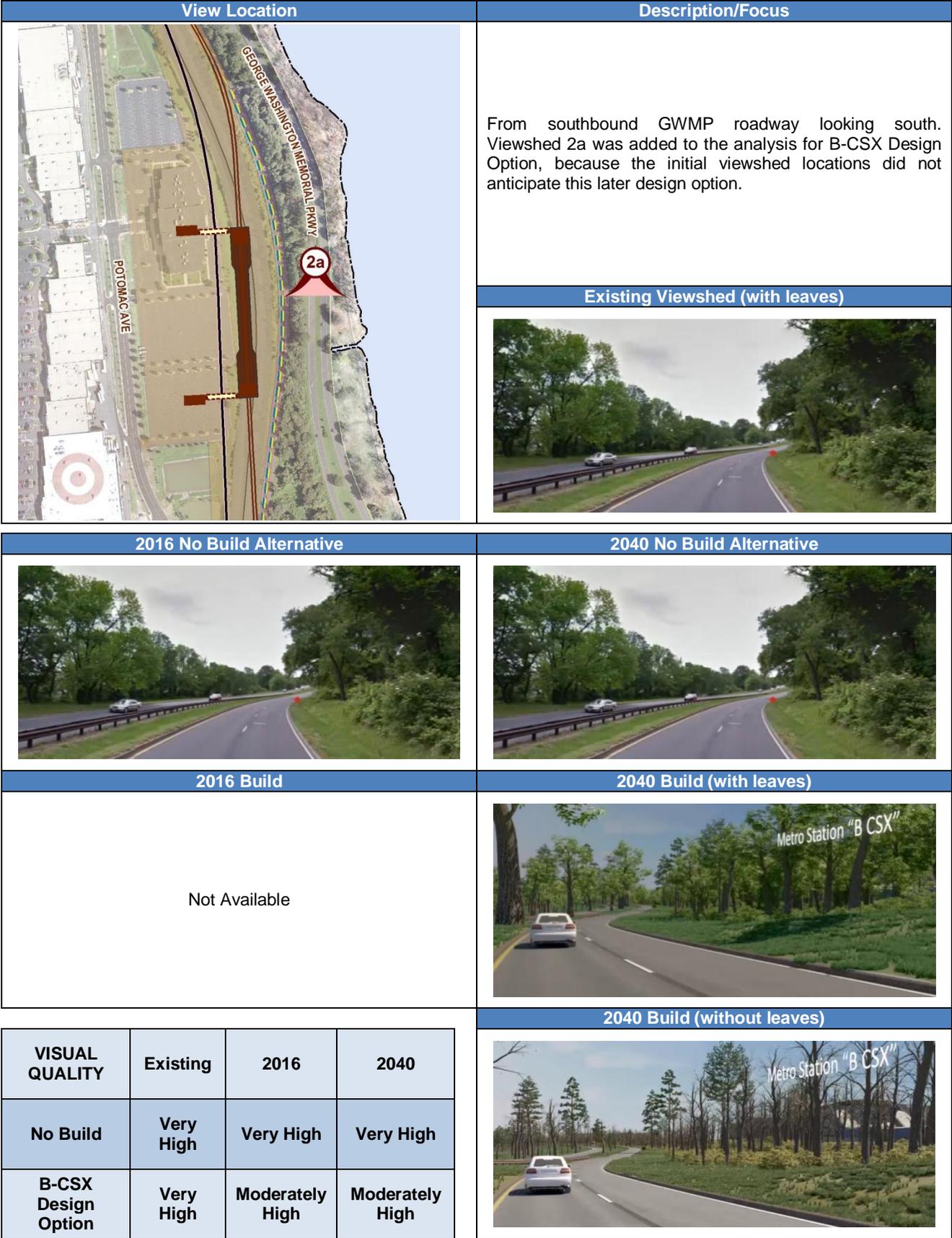


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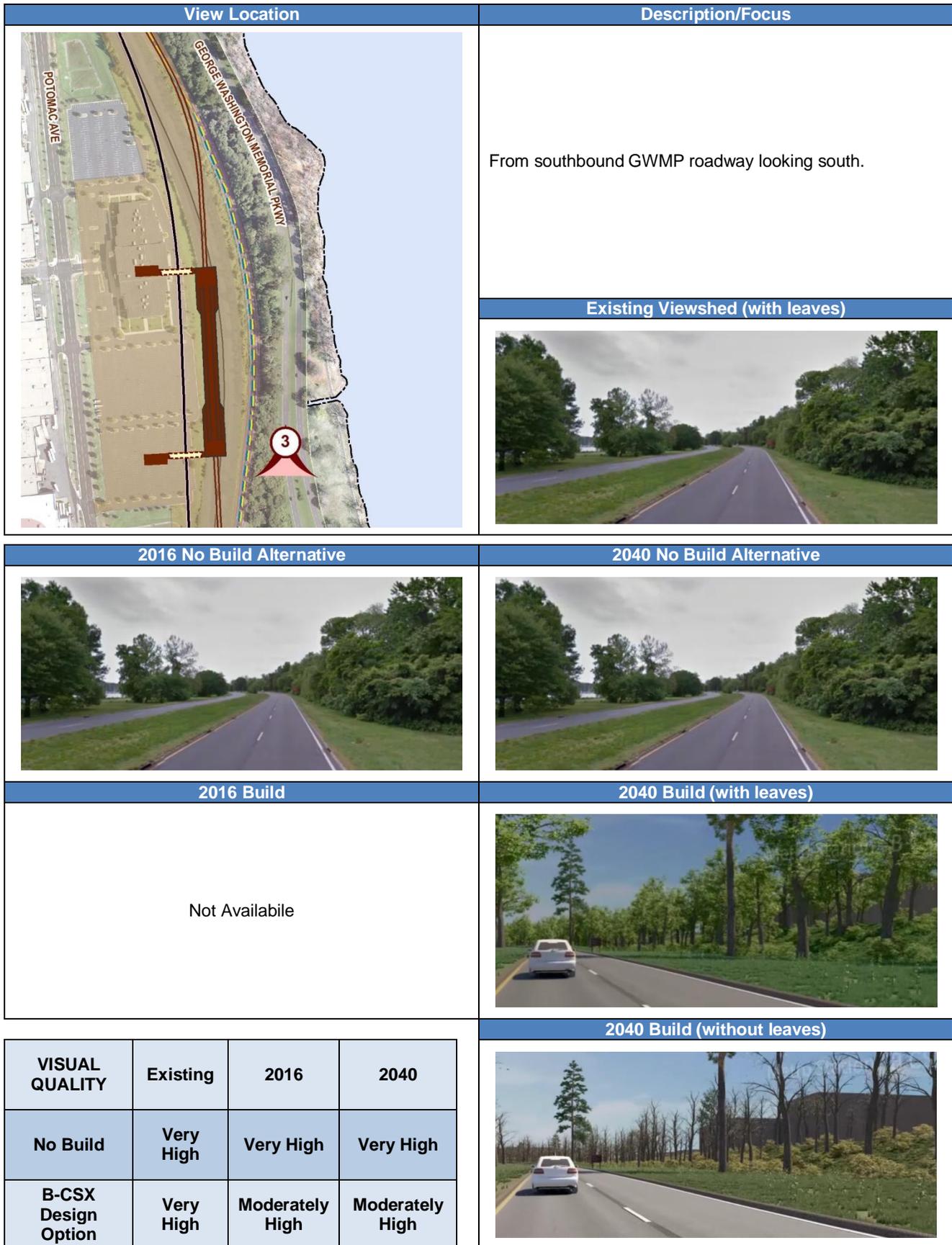
1635 Figure 3-53: B-CSX Design Option Viewshed 2 Elements



1636 Figure 3-54: B-CSX Design Option Viewshed 2a Elements



1637 Figure 3-55: B-CSX Design Option Viewshed 3 Elements

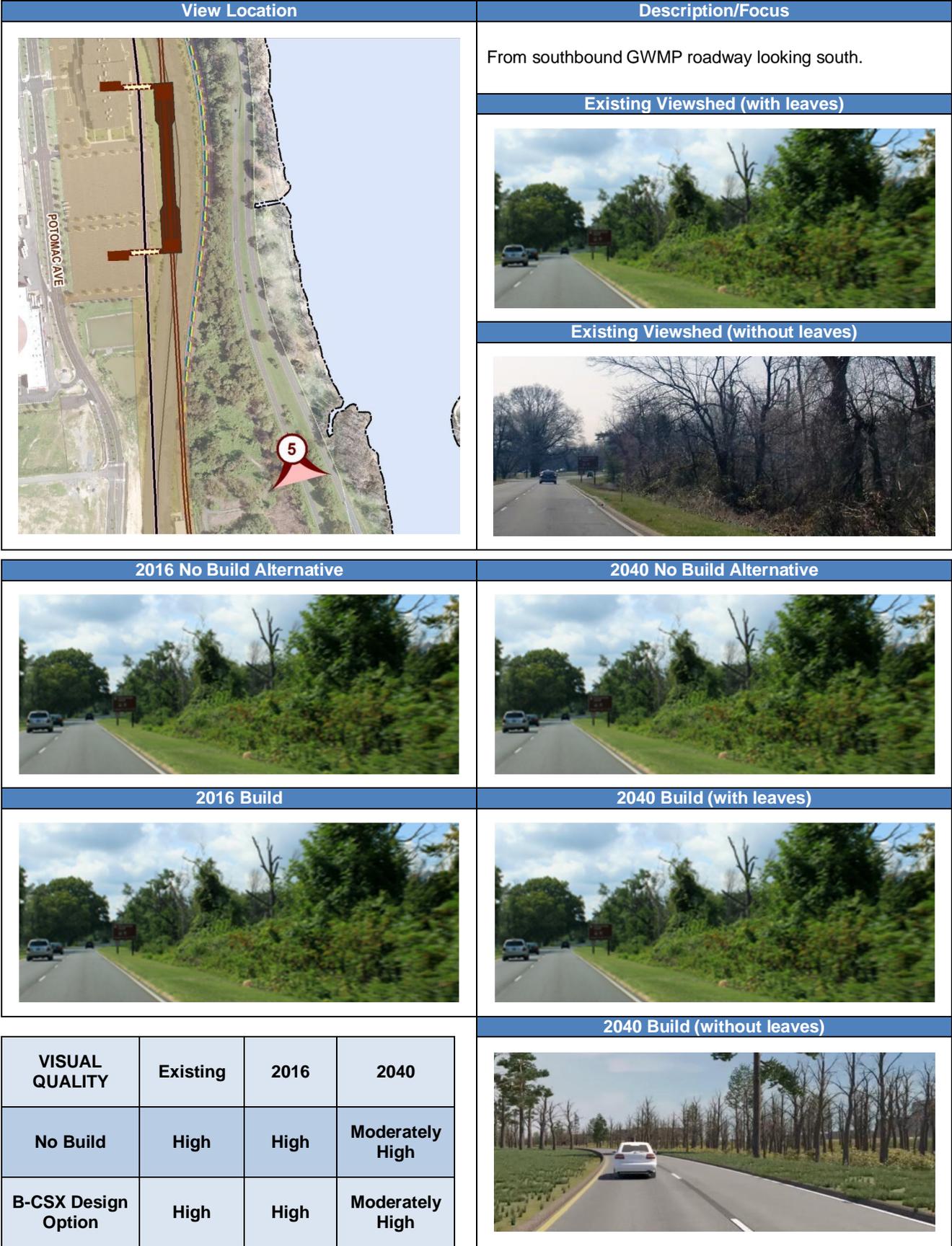


1638 Figure 3-56: B-CSX Design Option Viewshed 4 Elements

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

1639

1640 Figure 3-57: B-CSX Design Option Viewshed 5 Elements



1641 **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

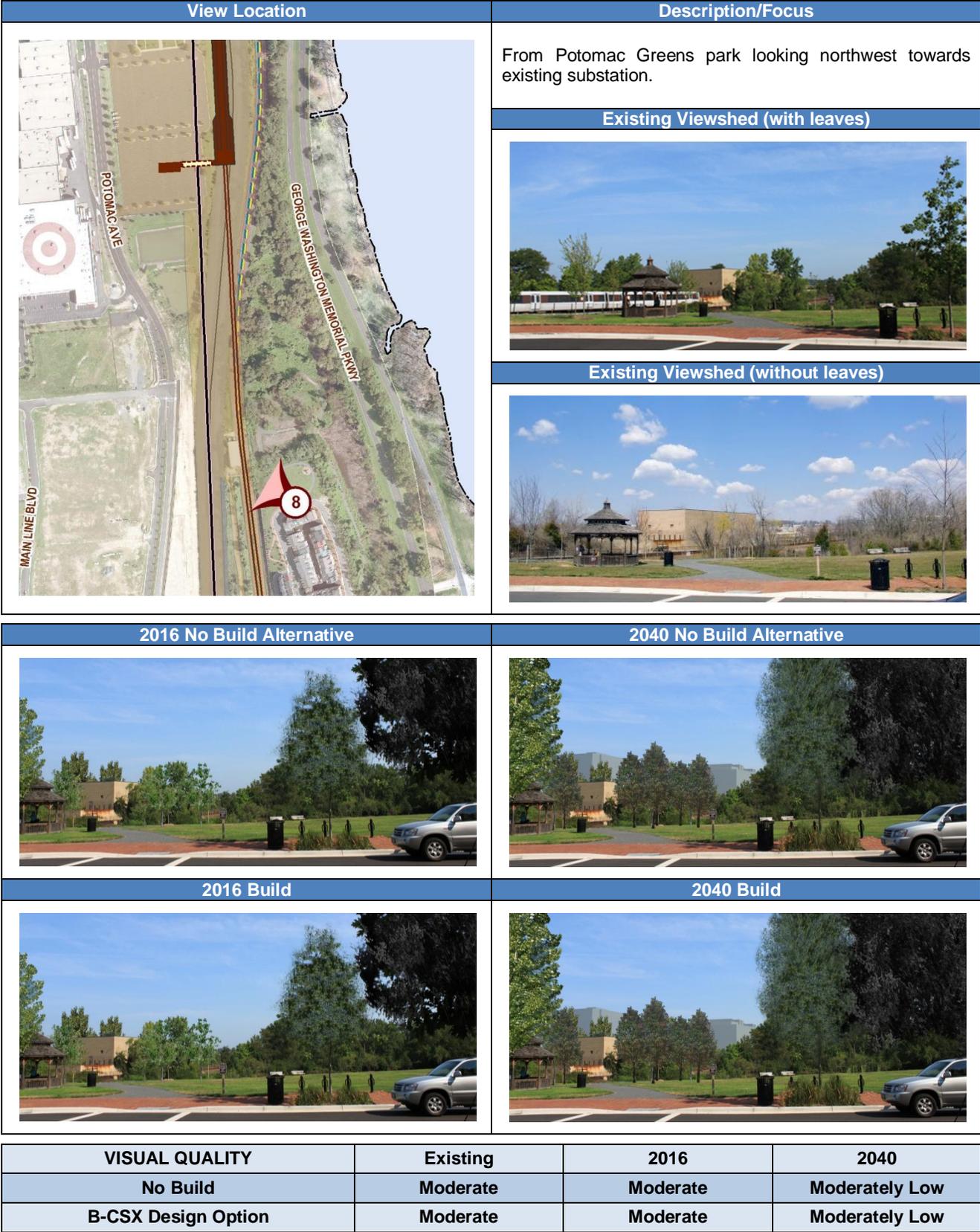
1642

1643 Figure 3-59: B-CSX Design Option Viewshed 7 Elements



1644

1645 **Figure 3-60: B-CSX Design Option Viewshed 8 Elements**



1646

1647 Figure 3-61: B-CSX Design Option Viewshed 9 Elements

View Location		Description/Focus	
		<p>From the intersection of East Glebe Road and Potomac Avenue looking northeast (photos taken 2011).</p>	
		<p>Existing Viewshed (with leaves)</p>	
		<p>Existing Viewshed (without leaves)</p>	
<p>2016 No Build Alternative</p>		<p>2040 No Build Alternative</p>	
<p>2016 Build</p>		<p>2040 Build</p>	
<p>VISUAL QUALITY</p>	<p>Existing</p>	<p>2016</p>	<p>2040</p>
<p>No Build</p>	<p>Moderate</p>	<p>Moderate</p>	<p>Moderate</p>
<p>B-CSX Design Option</p>	<p>Moderate</p>	<p>Moderate</p>	<p>Moderate</p>

1648 **3.8.3.5 Build Alternative D**

1649 **Table 3-21** summarizes the anticipated visual impacts of Build Alternative D. **Figure 3-62** through **Figure 3-70**
 1650 compare photographs of existing viewsheds with renderings of anticipated changes to viewsheds by the years
 1651 2016 and 2040. Viewsheds 1, 2, 7, 8, and 9 are anticipated to have changes. While the visual quality of
 1652 Viewsheds 5 and 6 also decline slightly in 2040, changes in future conditions in 2016 and 2040 are mostly
 1653 attributable to the loss of vegetative foliage in winter, and changes are minimal in the summer. **Figures 3-63, 3-**
 1654 **64, and 3-66** include 2040 winter viewsheds provided from the City of Alexandria's drive-by digital simulations.

1655 **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

1656 Along the GWMP in 2016, Build Alternative D would replace existing vegetation and add built elements to
 1657 Viewsheds 1, 2, 4, and the continuous view corridor. As a result of the noticeable encroachment of the aerial
 1658 track structure into the viewsheds and the removal of consistent vegetation, the visual quality of Viewsheds 1
 1659 and 2 would decline to low (see **Figure 3-62** and **Figure 3-63**). Construction staging would require clearing of
 1660 2.40 acres of treed area and associated herbaceous vegetation that serves as a visual barrier along the GWMP
 1661 roadway, most notably in the vicinity of Four Mile Run. Construction activity would be located relatively close to
 1662 the GWMP roadway with little visual barrier, noticeably altering the green appearance of the areas. Viewshed 4
 1663 (due to the visibility of the station during winter) and the GWMP continuous view corridor would decline in visual
 1664 quality to moderately high. Changes to Viewsheds 3, 5, and 6 would be minimal and would not alter their visual
 1665 quality. In 2040, the vegetation along the roadway would mature, improving Viewsheds 1 and 2 to a moderate
 1666 visual quality; Viewshed 4 and the GWMP continuous view corridor would maintain their 2016 visual quality.
 1667 Viewsheds 5 and 6 would include new development from Potomac Yard, which would result in a decline to
 1668 moderately high and high visual quality, respectively (see **Figure 3-66** and **Figure 3-67**). Other GWMP
 1669 viewsheds would include some new development from Potomac Yard and Crystal City, but would not diminish
 1670 their overall visual quality.

1671 From Potomac Greens neighborhood and park, Build Alternative D would add elevated tracks that would
 1672 dominate Viewsheds 7 and 8. As a result, the visual quality of Viewshed 7 would decline to very low, while the
 1673 visual quality of Viewshed 8 would decline to moderately low (see **Figure 3-68** and **Figure 3-69**). In 2040,
 1674 development in North and South Potomac Yard would be added to the viewsheds although vegetation would be
 1675 more mature. Viewsheds 7 would continue to have very low visual quality, and Viewshed 8 would continue to
 1676 have moderately low visual quality.

1677 From Potomac Yard in 2016, Alternative D would introduce the Metrorail station and aerial track structures to
 1678 Viewshed 9 and remove vegetation. These structures would dominate the foreground of Viewshed 9, blocking
 1679 views of portions of the landscape (see **Figure 3-70**). The aerial track structures would tightly frame broken
 1680 views of vegetation and development in the background. The visual quality would be very low. In 2040, the

1681 Metrorail station and aerial track structure would continue to dominate the viewshed, resulting in very low visual
1682 quality.

1683 **3.8.4 Mitigation**

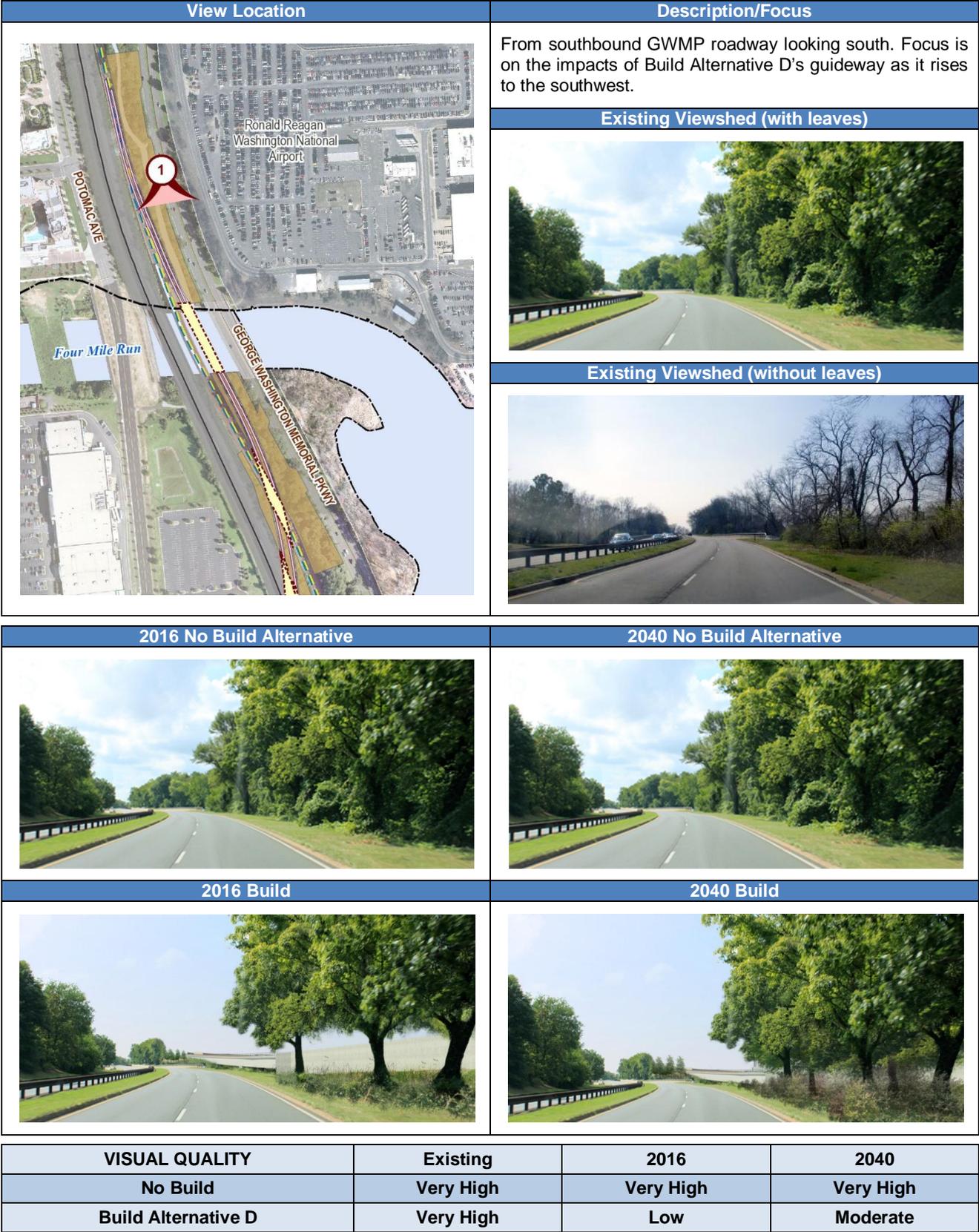
1684 To mitigate the visual impacts as a result of any of the three Build Alternatives or B-CSX Design Option, several
1685 measures could be undertaken. Minimization measures such as native vegetation planting and building design
1686 may help minimize visual effects to the GWMP.

1687 Vegetation, especially trees, could be planted between the GWMP and the Build Alternatives and the WMATA
1688 tracks, in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties*.
1689 Conversely, some vegetation along the GWMP within the study area could be thinned or removed to improve
1690 and restore important views east toward the Potomac River identified in the *Vegetation of the George*
1691 *Washington Memorial Parkway Cultural Landscape Report* (2009). Mitigation would reflect the core design
1692 principles of the GWMP as documented in the *Mount Vernon Memorial Highway Cultural Landscape Report*,
1693 Vol. I, p. 72-74 (NPS, 1987). Adding new landscaping to Potomac Greens Park and the Greens Scenic Area
1694 easement would provide a visual buffer to the proposed station. Landscape mitigation measures would be
1695 consistent with the terms of the scenic easement, as well as provide potential mitigation for impacts to the
1696 easement. Release of the scenic easement would be required for any clearing of vegetation within the Greens
1697 Scenic Area, and an equal value property exchange would be implemented to mitigate permanent impacts to
1698 the Greens Scenic Area easement.

1699 Station building design and materials would be refined during later project design phases to mitigate impacts on
1700 visual resources. Elements of building design and station height could be modified as part of mitigation. The use
1701 of non-reflective materials would limit potential visual impacts by minimizing glare and changes to texture within
1702 the visual context. Building design and materials, including color and texture, for station entrances in Potomac
1703 Greens Park and Potomac Yard Park would be selected for compatibility with the surrounding parks to reduce
1704 visual impacts. During preliminary and final design, NPS would review proposed architectural designs of the
1705 preferred alternative for station elements visible from the GWMP roadway and Mount Vernon Trail as well as
1706 proposed landscape restoration and mitigation plans for the GWMP and Greens Scenic Area. Consulting parties
1707 with a demonstrated interest in preserving the character of the GWMP, most notably Virginia Department of
1708 Historic Resources (VDHR), would also be involved in discussions on station design and materials. NPS and
1709 consulting parties would need to evaluate and agree with both preliminary and final design of the station as
1710 stipulated in the Memorandum of Agreement (MOA) or Programmatic Agreement (PA) for this project. During
1711 preliminary and final design, the City of Alexandria would review architectural designs of station facilities
1712 proposed within City parks for compatibility with park facilities and landscape design.

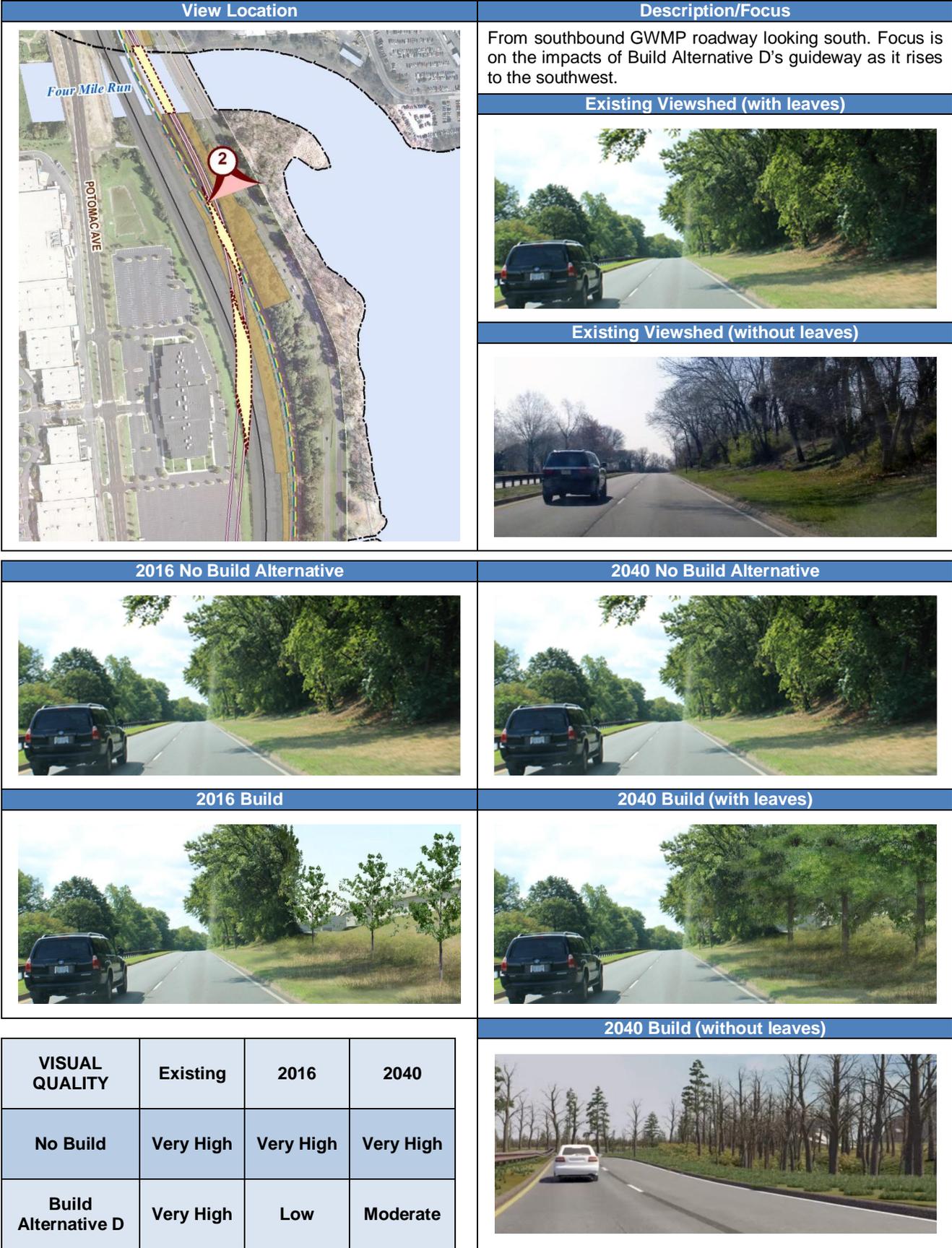
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1714 Figure 3-62: Build Alternative D Viewshed 1 Elements



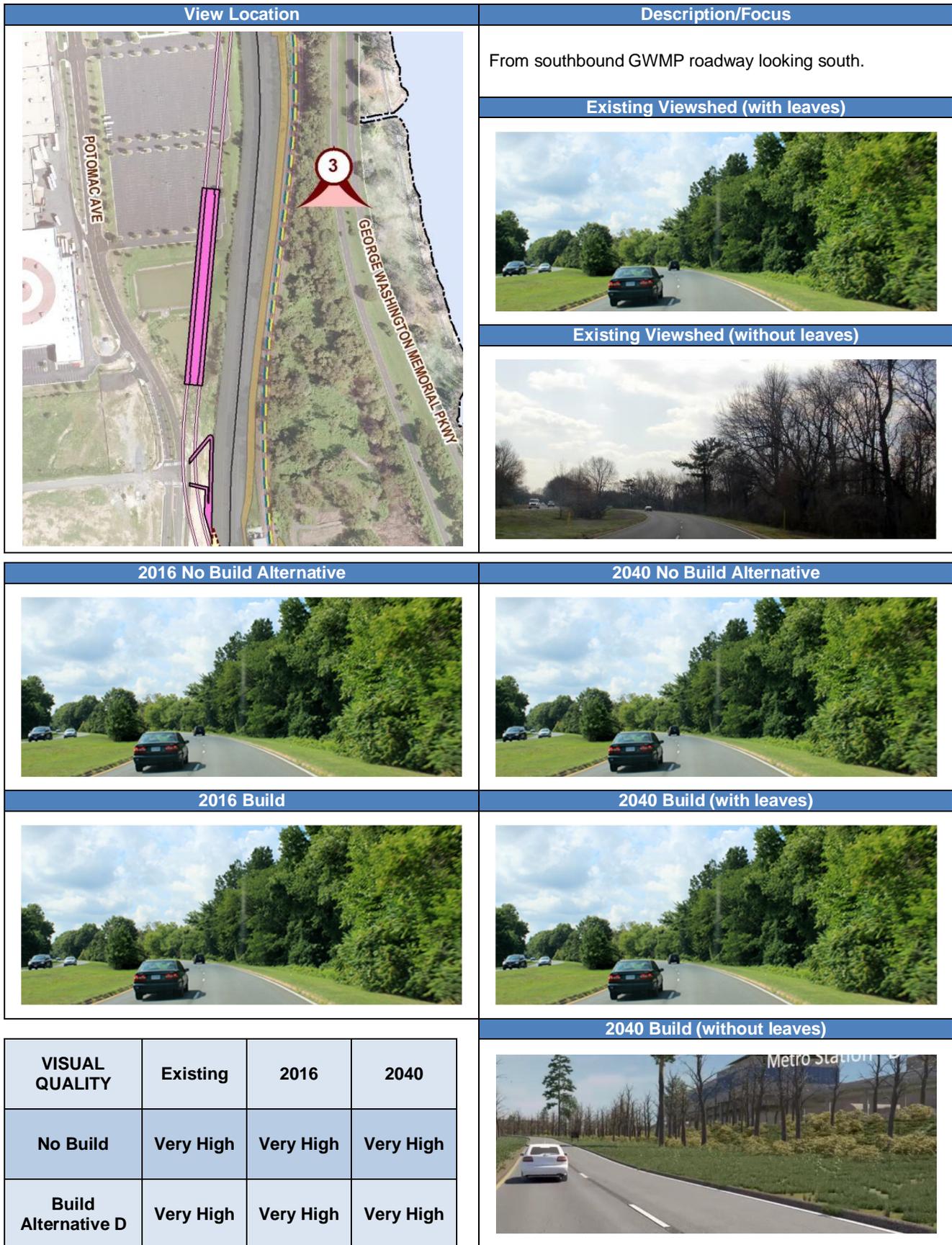
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1716 Figure 3-63: Build Alternative D Viewshed 2 Elements



1717

1718 Figure 3-64: Build Alternative D Viewshed 3 Elements



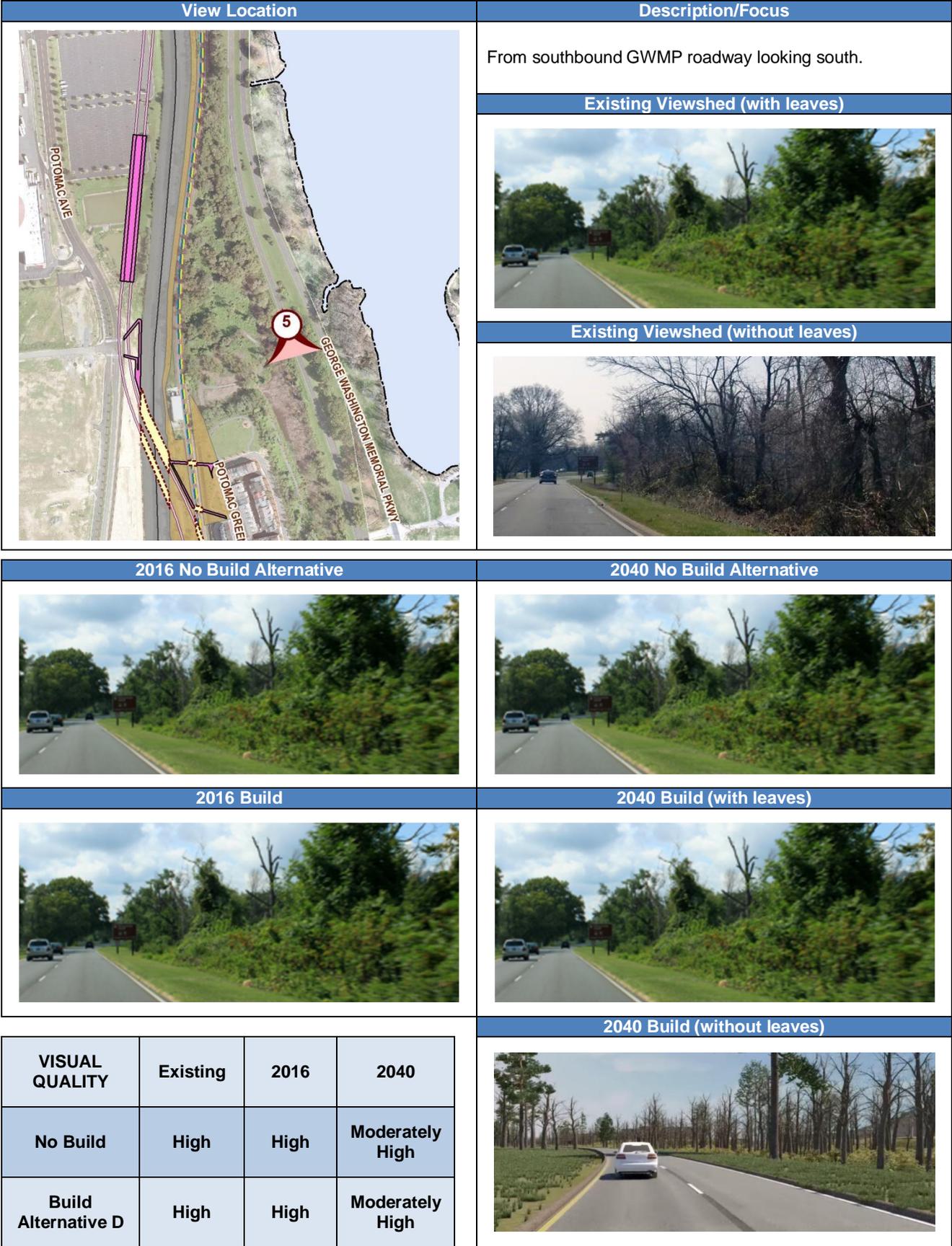
1719

1720 **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

1721

1722 Figure 3-66: Build Alternative D Viewshed 5 Elements



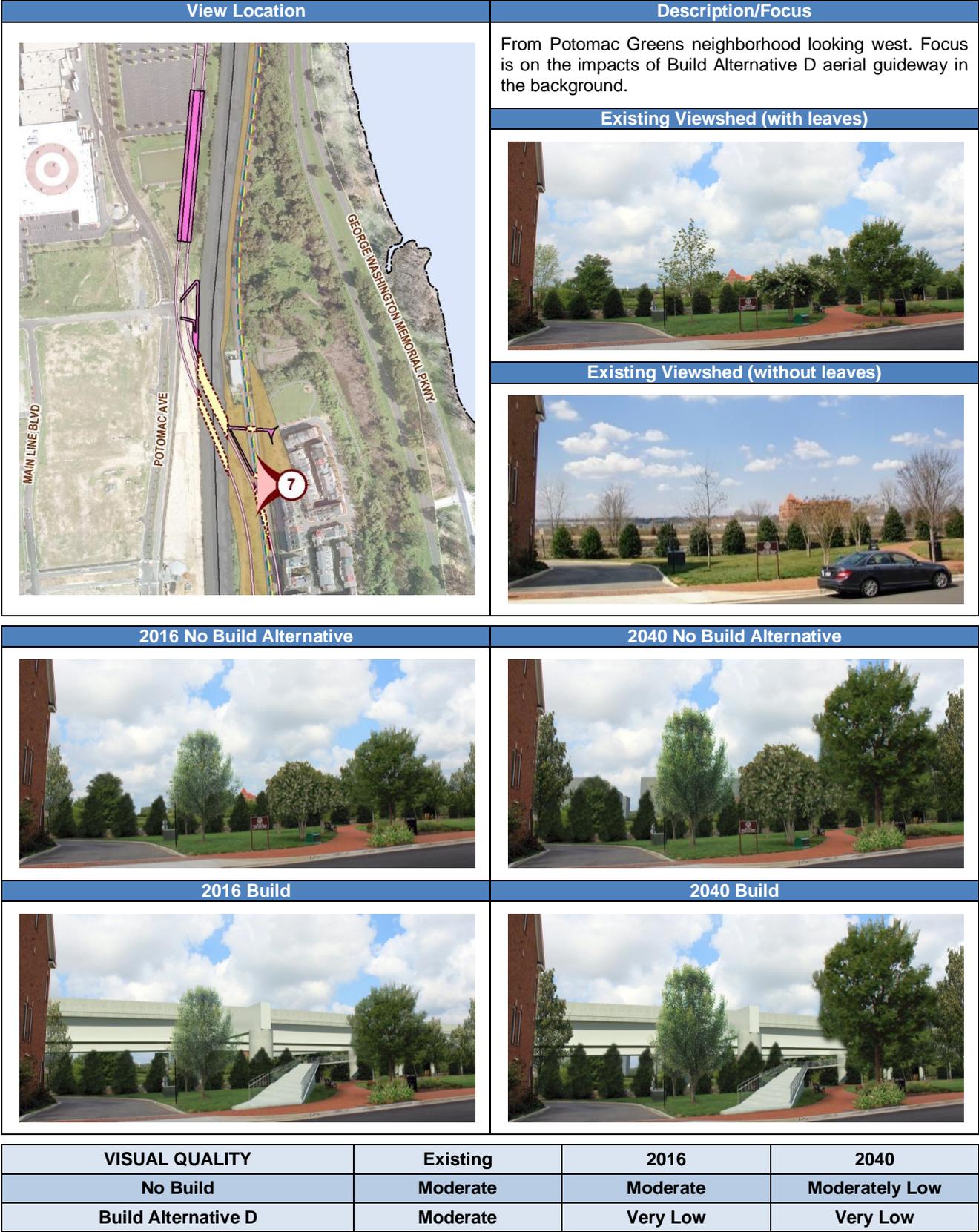
1723 **Figure 3-67: Build Alternative D Viewshed 6 Elements**

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

1724

1725

1726 **Figure 3-68: Build Alternative D Viewshed 7 Elements**



1727

1728 **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

1729

1730 **Figure 3-70: Build Alternative D Viewshed 9 Elements**



1731

1732 3.9 Cultural Resources

1733 This section summarizes the results of cultural resource investigations that identified and evaluated potential
 1734 effects of the alternatives to historic architectural and archaeological resources listed or eligible for listing in the
 1735 National Register of Historic Places (NRHP) within defined Areas of Potential Effect (APEs). The analysis is
 1736 described in more detail in the *Cultural Resources Technical Memorandum* and the *Preliminary Architectural*
 1737 *Effects Report* in Volume II.

1738 As a federal action, the project is subject to review under Section 106 of the National Historic Preservation Act
 1739 (NHPA) (54 U.S.C. 300101 et. seq.), as amended, and its associated implementing regulations in 36 CFR Part
 1740 800, as well as the Archaeological Resource Protection Act (ARPA). The Virginia Department of Historic
 1741 Resources (VDHR) is the State Historic Preservation Office (SHPO) for the Commonwealth of Virginia
 1742 responsible for review of the project under Section 106. The project is also subject to review under relevant
 1743 state and local cultural resources laws and regulations, including the Virginia Antiquities Act (§ 10.1-2300 Code
 1744 of Virginia); the City of Alexandria Zoning Ordinance; and the City of Alexandria's Archaeological Protection
 1745 Code. No cultural resource was identified in the Arlington County portion of the APEs for assessment.

1746 Section 106 of the NHPA requires FTA to consider the effects of its actions on historic properties. FTA is
 1747 responsible for compliance with Section 106 and initiated the review process with VDHR. In addition to seeking
 1748 the views of VDHR, FTA has invited certain organizations and individuals who have a demonstrated interest in
 1749 the project to participate in the process. These organizations and individuals are referred to as Section 106
 1750 consulting parties, and review information relevant to the identification, evaluation and assessment of effects to
 1751 historic properties that could result from the project. FTA and VDHR work with each other and the consulting
 1752 parties to resolve project-related adverse effects to historic properties, typically through a Memorandum of
 1753 Agreement (MOA) or a Programmatic Agreement (PA).

1754 Consulting parties involved in the Section 106 review process to date include FTA, VDHR, NPS, City of
 1755 Alexandria, WMATA, the Alexandria Historical Restoration and Preservation Commission, the Alexandria
 1756 Historical Society, the North East Citizens Association, and the Old Town Business and Professional
 1757 Association. Additional consulting parties have been invited to participate in the process. The project is presently
 1758 in the resource evaluation phase of the Section 106 process, and the first consulting parties meeting was held
 1759 on February 20, 2013. The second consulting parties meeting was held on March 27, 2013. FTA contacted the
 1760 Advisory Council on Historic Preservation (ACHP) to inform them of the project and provided them with copies
 1761 of the materials from the consulting parties meeting. FTA will notify ACHP if a preliminary determination of
 1762 adverse effects is likely, providing further opportunities for ACHP review and comment. **Appendix F** describes
 1763 the Section 106 consultation process to date in more detail. The Draft EIS will be updated as the Section 106
 1764 review continues.

1765 3.9.1 Methodology

1766 Cultural resources were identified and assessed for the project study area within the defined APEs for historic
 1767 architectural resources and archaeological resources, which are described below. The research and
 1768 assessment of effects methodology was developed in consultation with VDHR.

1769 Prior to establishing the APEs, initial background research identified archaeological and historic architectural
 1770 resources already documented within the study area and evaluated the potential of the study area to contain
 1771 previously unidentified archaeological and historic architectural resources. The following repositories,
 1772 databases, and reports were consulted:

- 1773 • VDHR Archives, Richmond, Virginia;
- 1774 • National Register of Historic Places (NRHP);
- 1775 • Virginia Landmarks Register (VLR);
- 1776 • Alexandria Archaeology (AA), City of Alexandria, Virginia;
- 1777 • Alexandria Library, Special Collections, City of Alexandria, Virginia;
- 1778 • Arlington County Historical Markers List;
- 1779 • Arlington County Historic Resources Inventory;
- 1780 • Library of Congress, Washington, D.C.;
- 1781 • National Archives, Washington, D.C., College Park, MD, and Suitland, MD;
- 1782 • National Park Service, Mount Vernon Memorial Highway Cultural Landscape Report, 1987; and
- 1783 • National Park Service, *Vegetation of the George Washington Memorial Parkway Cultural Landscape*
 1784 *Report*, 2009.

1785 3.9.1.1 Historic Architectural Resources

1786 The APE for historic architecture, as depicted, includes all resources over 50 years of age with the potential to
 1787 be directly or indirectly affected by the proposed project (shown in **Figure 3-71**). While the project study area is
 1788 the general area within which existing environmental resources were identified, for specific resources, including
 1789 historical architectural resources, the study area was modified to accurately identify and account for potential
 1790 direct and indirect adverse effects. The APE was reviewed and approved in consultation with VDHR.

1791 Two existing historic architectural resources were identified using the sources listed above. A field
 1792 reconnaissance survey was conducted and identified one potentially eligible architectural resource (over 50
 1793 years of age) in the APE for historic architecture. Once additional historic architectural resources in the APE
 1794 were identified, their potential eligibility for listing in the NRHP was assessed. Following the eligibility
 1795 assessment, an analysis was conducted to determine if any Build Alternative has the potential to cause an
 1796 adverse effect to historic properties. In addition to impacts assessed for NEPA, adverse effects to historic
 1797 properties are also assessed in accordance with Section 106.

1798 The Old and Historic Alexandria District is a zoning overlay district (Article X of the City of Alexandria Zoning
 1799 Code) of which a portion extends into the APE for historic architecture. Although related to historic architectural
 1800 resources in the APE, the zoning district itself is not evaluated as a historic resource. An analysis of the district
 1801 is provided in **Section 3.4 Land Use and Zoning**.

1802 Under Section 106, adverse effects include both direct and indirect effects. Direct effects include actions such
 1803 as physical destruction, physical alteration, or removal of the resource to another location, and can be
 1804 permanent or temporary. Indirect effects include the introduction of visual, atmospheric, and audible elements
 1805 (including noise and vibration); neglect that causes deterioration; or transfer, lease, or sale of a federally owned
 1806 property without adequate provisions (36 CFR 800.5(a)(2)(vii).

1807 All eligibility determinations and recommendations and effects assessments contained in the EIS are both
 1808 provisional and subject to review and approval by VDHR and other consulting parties in accordance with the
 1809 ongoing Section 106 review process.

1810 3.9.1.2 Archaeological Resources

1811 The APE for archaeology was established in consultation with VDHR and is shown in **Figure 3-71**. The APE for
 1812 archaeology includes all areas of anticipated project-related ground disturbance. Ground-disturbing activities
 1813 could include excavation, grading, cutting and filling, and utility installation activities as well as construction
 1814 activities that may result in unintentional soil compaction, erosion or other disturbance.

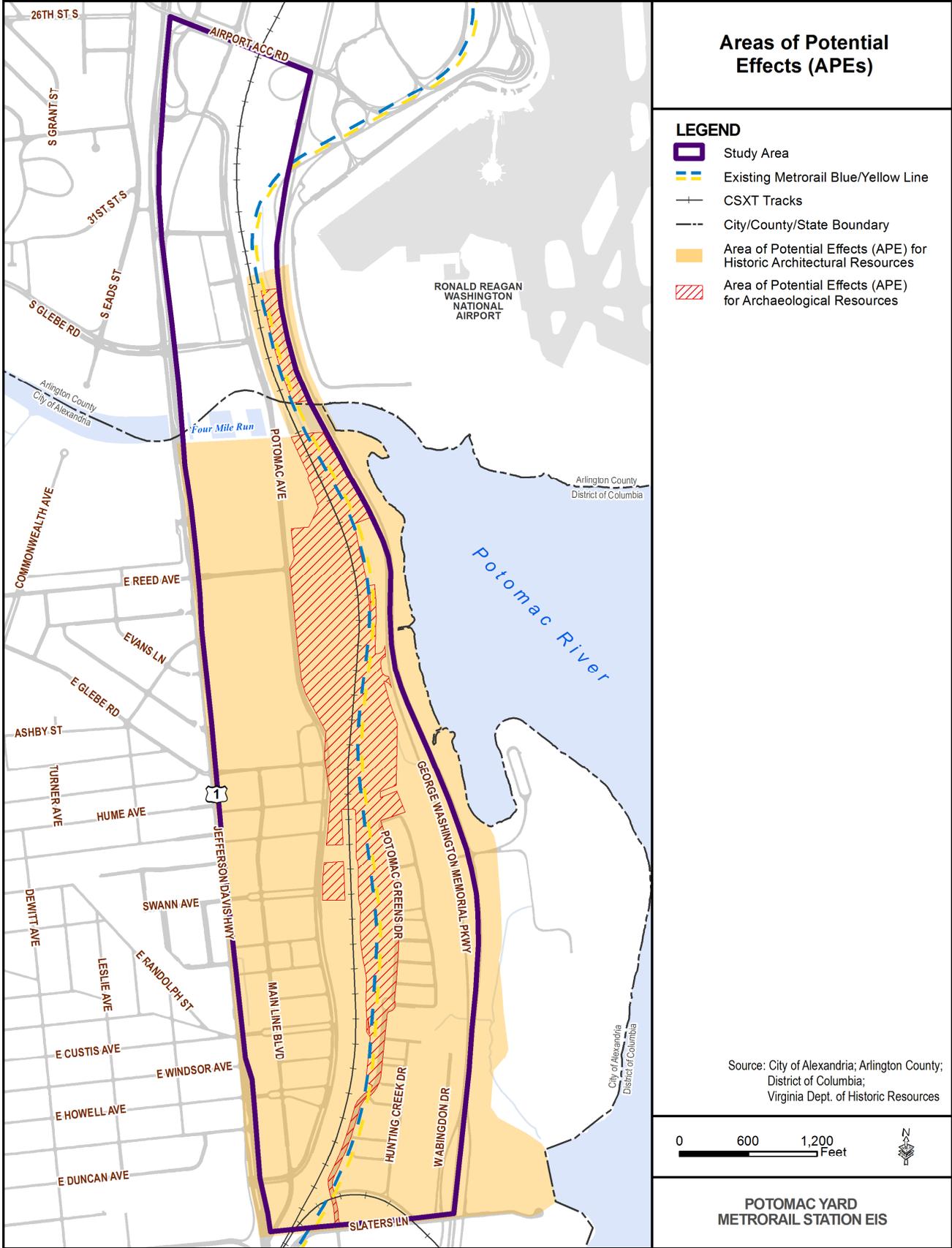
1815 Archaeological resources within the APE were identified using a combined program of documentary research
 1816 and Phase I archaeological testing to identify resources potentially eligible for inclusion in the NRHP or the VLR.
 1817 A report titled "Phase I Archaeological Survey Report Potomac Yard Metrorail Station Project, City of
 1818 Alexandria, Virginia and Arlington County, Virginia" was completed in February 2013 and submitted to VDHR for
 1819 review and approval.

1820 Once identified, the analysis assessed whether each Build Alternative has the potential to result in an adverse
 1821 effect to each eligible or potentially eligible resource in the APE.

1822 Under Section 106, adverse effects to archaeological resources include both direct and indirect effects. Direct
 1823 adverse effects include actions such as physical destruction, physical alteration, or removal of the
 1824 archaeological resource. Indirect adverse effects include neglect that causes deterioration, or transfer, lease, or
 1825 sale of a federally owned property without adequate provisions. All adverse effects to archaeological resources
 1826 are considered permanent.

1827

1828 Figure 3-71: Areas of Potential Effects (APEs)



1830 **3.9.2 Affected Environment**

1831 **3.9.2.1 Historic Architectural Resources**

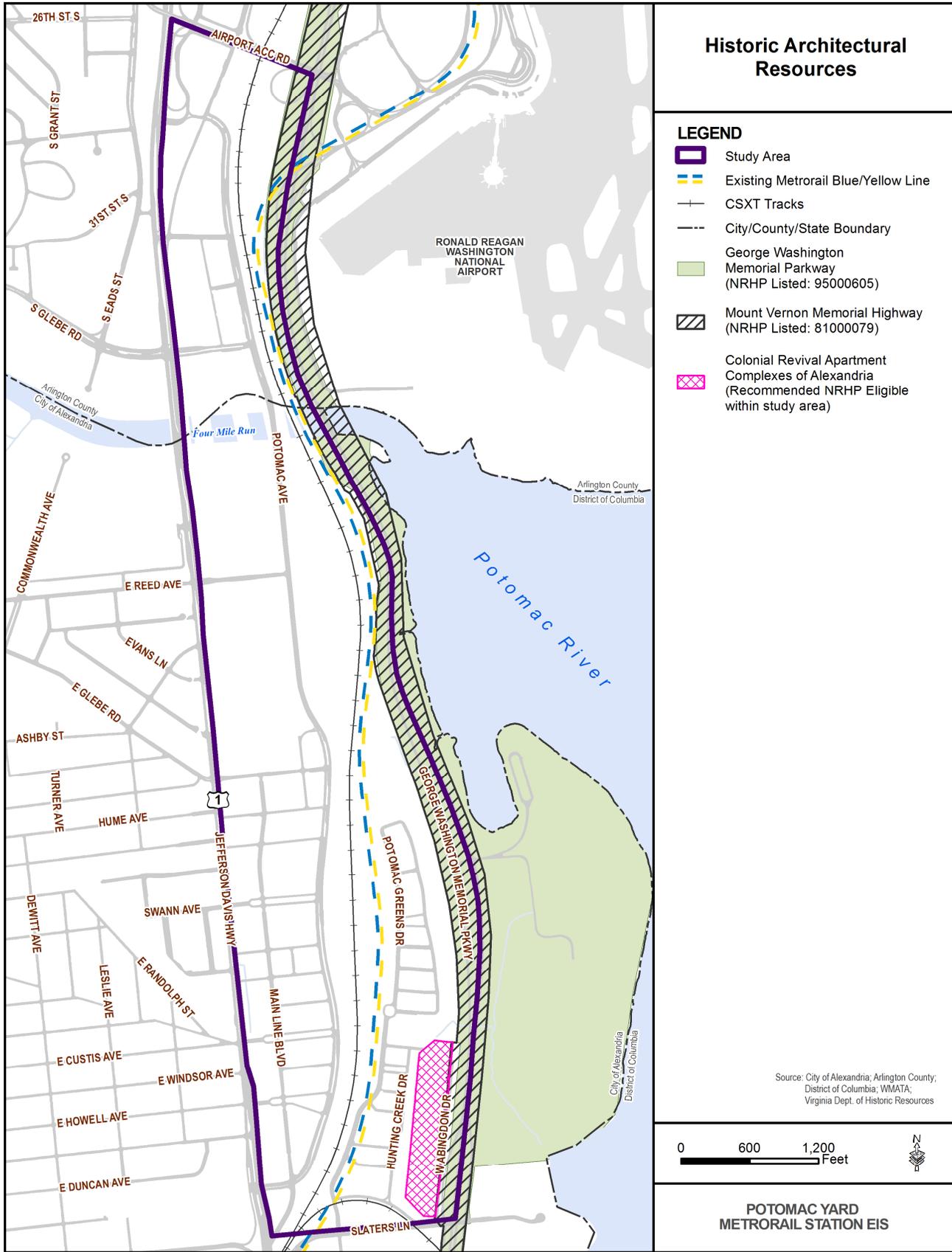
1832 Documentary research identified two known historic architectural properties in the APE listed in the NRHP, the
 1833 Mount Vernon Memorial Highway (MVMH) (VDHR ID# 029-0218) and George Washington Memorial Parkway
 1834 (GWMP) (VDHR ID# 029-0228). A third potentially eligible resource was identified in the APE which is referred
 1835 to as the Colonial Revival Apartment Complexes of Alexandria (CRACA). **Figure 3-72** shows the locations of
 1836 historic architectural resources identified in the APE. **Table 3-22** summarizes the historic architectural resources
 1837 in the APE.

1838 **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 of 1930.	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.

1839 Source: NRHP, VLR, City of Alexandria, and AECOM field research (March 2012).

1840 Figure 3-72: Historic Architectural Resources



1841

1842 **Resources Related to the George Washington Memorial Parkway**

1843 Both the MVMH and GWMP are listed in the NRHP and the VLR. The MVMH covers the extent of the original
 1844 memorial highway between Arlington Memorial Bridge to the north of the study area and the Mount Vernon
 1845 Estate to the south. The GWMP includes all Capper-Cramton Act acquired property which consists of MVMH
 1846 and adjacent lands, the extent of the GWMP north of Arlington Memorial Bridge to its current northern terminus
 1847 in Virginia at Interstate 495, and the Clara Barton Parkway in Montgomery County, Maryland (outside the APE).
 1848 **Table 3-23** summarizes the major attributes and differences between the two historic properties.

1849 **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

1850 Source: National Register of Historic Places

1851 **Mount Vernon Memorial Highway**

1852 In 1922 Congress appropriated funds for the planning of Arlington Memorial Bridge, and in 1924 it created the
 1853 *United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George*
 1854 *Washington*. Construction of the Arlington Memorial Bridge began in 1926 which provided an impetus to plans
 1855 for a road linking the bridge to Mount Vernon. On May 23, 1928, Congress approved and directed the survey
 1856 and construction of a suitable memorial highway linking the two locations. The act ordered the Secretary of
 1857 Agriculture, who had jurisdiction over the Bureau of Public Roads, to survey routes for selection by the
 1858 commission and prepare plans for the highway.

1859 Two routes were chosen as alternatives. The commission ultimately selected the route nearest the Potomac,
 1860 which offered views of the river and an exceptional vista of the Washington Monument for traffic northbound
 1861 from Alexandria. Construction of the MVMH was begun by the Bureau of Public Roads on September 17, 1929;
 1862 the road was opened on January 16, 1932, the bicentennial year of Washington's birth.

1863 The design of the MVMH was led by the landscape architects Wilbur Simonson and Gilmore Clarke. Simonson
 1864 created a landscape in which motorists passed through places of distinct character. Over time more vegetation
 1865 has been added, changing Simonson's original design.

1866 Both the 1987 *Cultural Landscape Report Mount Vernon Memorial Highway* (1987 CLR) and 2009 *Cultural*
 1867 *Landscape Report for the George Washington Memorial Parkway* (2009 CLR) serve as primary references for
 1868 cultural landscape information and history described in this section.

1869 *Historical Significance*

1870 The MVMH is nationally significant as the first parkway built and maintained by the U.S. government. The
 1871 intended purpose of the MVMH was to provide an appropriately designed commemorative pilgrimage route to
 1872 Mount Vernon as a memorial to George Washington. Its purpose as a commemorative pilgrimage route is its
 1873 most significant historic characteristic. Integral to its character and significance, numerous national monuments,
 1874 historic sites, parks, and other landscaped green spaces are visible along the corridor. The MVMH links Mount
 1875 Vernon, in Fairfax County, with the Arlington Memorial Bridge. The original 15.2-mile segment was designed
 1876 and landscaped to maximize scenic, aesthetic and commemorative qualities along its route.

1877 *Design Principles*

1878 The 1987 CLR provides a comprehensive description of the original design principles for the construction of the
 1879 MVMH. The CLR identifies several landscape elements that formed the character of the Parkway as it
 1880 proceeded from the Memorial Bridge to Mount Vernon:

- 1881 • **Roadway alignment:** The road's horizontal and vertical alignment served two purposes – to follow the
 1882 existing topography and to effectively control driving speeds.
- 1883 • **Topography:** Careful grading was used to ensure natural transitions between the road and existing
 1884 topography.
- 1885 • **Plantings:** The planting plans were developed to fit with the existing tree plantings and wetlands in
 1886 natural arrangements, while achieving different functional requirements, such as the as the screening of
 1887 objectionable views (including the rail yard).
- 1888 • **Viewsheds (“vistas”):** Through selective cutting, existing vegetation was cleared to expose long
 1889 framed views across the Potomac towards the monumental core of Washington, DC. Other ways
 1890 viewsheds were protected along the MVMH included the prohibition of signs and billboards and through
 1891 the execution of an MOA between the City of Alexandria and United States which restricted the use and
 1892 appearance of buildings in Old Town Alexandria.

- 1893 • **Bridges:** The most visible structures along the MVMH were the original eight stone bridges constructed.
 1894 The original stone bridge over Four Mile Run was demolished and rebuilt in 1939. The second bridge
 1895 over Four Mile Run was demolished and rebuilt in 1977.
 1896 • **Other:** Other facilities constructed along the MVMH included concession buildings, bus shelters and
 1897 lighting.
- 1898 *Cultural Landscape*
- 1899 The 1987 CLR summarizes the following general landscape architectural principles used by Clarke and
 1900 Simonson in their design of the MVMH:
- 1901 • Fitting the highway to the site with a mind toward utilizing both natural and historic features;
 - 1902 • Accommodating functional requirements in an attractive, aesthetic manner;
 - 1903 • Conserving the natural scenery as a means to quickly buffer adjacent properties, upgrade the existing
 1904 woodland, and preserve existing topsoil; and
 - 1905 • Distributing new plantings in a natural configuration.
- 1906 The “Daingerfield Island section” of the GWMP (where the project is located) is a low lying segment of the
 1907 historic MVMH adjacent to the (former) rail yards at Potomac Yard on the west side (in operation during the
 1908 twentieth century) and Daingerfield on the east. Potomac Yard was one of the largest rail yards in operation in
 1909 the eastern United States during this time period and was owned and managed by the Richmond,
 1910 Fredericksburg and Potomac Railroad (RF&P).
- 1911 The topography on either side of the highway at Daingerfield Island is lower than the road itself, and the overall
 1912 wet conditions drive the selection of plant species in this area. Plants chosen are adaptable to flooding and
 1913 sustained wet conditions. On the west side, a group of amur cork trees (*Phellodendron amurense*) with
 1914 Sargent’s crabapples (*Malus sargentii*) were planted in the foreground to mark the change from mesic to wet
 1915 soils and also makes a transition from the Alexandria approach.
- 1916 Simonson proposed a different planting scheme for the east and west sides of the MVMH. On the west side
 1917 plantings were also intended to create a thick vegetative screen of the swamp and rail yard, while on the east
 1918 side the vegetation was used to frame the views of the significant monuments and buildings in Washington, DC
 1919 across the Potomac River.
- 1920 Simonson planned four large groupings of about fifteen oaks and elms on the west side of MVMH in the
 1921 Daingerfield Island section. Simonson spaced the groupings widely apart, from two to four hundred feet,
 1922 sometimes in combination with eleagnos willow (*Salix incana*). In one example, twelve American elms (*Ulmus*
 1923 *americana*), four water oaks (*Quercus nigra*) and five red maples (*Acer rubrum*) anchor nearly three hundred
 1924 feet of roadside. Medium size trees and a mass of large shrubs are planted between the large trees, leaving few
 1925 glimpses into the swamp. Ornamental trees, such as white fringetree (*Chionanthus virginicus*), are kept in
 1926 groups in the foreground where they are closer to motorists, but they are easily outnumbered by the shade and
 1927 medium size trees.
- 1928 The thick vegetative screen Simonson intended on the west side of the MVMH has been subject to considerable
 1929 changes over the years. The loss of trees has compromised the integrity of the vegetative screen meant for the
 1930 rail yard.
- 1931 The original viewsheds identified by Simonson in 1932 (east towards Washington, DC) were significantly
 1932 impacted by the construction of Reagan National Airport. Construction of the airport also shifted the original
 1933 alignment of the MVMH west from the Potomac River in the 1940s. At the mouth of Four Mile Run the MVMH
 1934 was shifted slightly to the west. The original stone bridge built in 1931 over Four Mile Run (within the APE) was
 1935 demolished in 1939. The second bridge which replaced it was also demolished and rebuilt again in 1977.
- 1936 The marina was excavated and developed at Daingerfield Island in 1958, and in 1961 a second lane of traffic
 1937 was added along MVMH within the Daingerfield Island segment.
- 1938 Simonson identified one viewshed on the MVMH facing west towards the George Washington Masonic National
 1939 Memorial in Alexandria in the 1932 plan. This viewshed is noted in the northeast corner of the project APE. The
 1940 George Washington Masonic National Memorial is privately owned by the Freemasons and is not listed in the
 1941 National Register of Historic Places.
- 1942 The 1987 CLR does not identify any of the original concession buildings or bus shelters within the APE.

1943 **George Washington Memorial Parkway**

1944 The GWMP, which includes MVMH, also serves as a memorial to George Washington, as the Parkway was
 1945 conceived as a route connecting his home at Mount Vernon and the Patowmack Canal in Great Falls, Virginia.

1946 The MVMH was incorporated as a component of the larger GWMP, as directed by the Capper-Cramton Act of
 1947 1930, and over the subsequent 30 years the parkway was extended north through Arlington County and Fairfax
 1948 County to its present terminus at I-495 near McLean, Virginia. The Capper-Cramton Act, Public No. 284, 71st
 1949 Congress, 46 Stat. 482, approved May 29, 1930, appropriated Federal funds to the National Capital Park and
 1950 Planning Commission for the expeditious, economical and efficient development and completion, among other
 1951 projects, the George Washington Memorial Parkway to include the shores of the Potomac, and adjacent lands,
 1952 from Mount Vernon to a point above Great Falls, VA. The lands acquired as part of the MVMH were to be
 1953 managed as part of the memorial parkway under the authority conferred by the Act approved February 26,
 1954 1925. All GWMP-administered land (which includes the MVMH) within the project APE are NRHP-listed.

1955 The GWMP comprises a total of 7,146 acres and extends 38.3 miles on both sides of the Potomac River in
 1956 Virginia and Maryland. In continuation of the intent of the MVMH, the purpose of the GWMP is to commemorate
 1957 the first president, preserve the natural setting of the shoreline of the Potomac River and provide a high-quality
 1958 entryway to Washington, DC. Construction of the remainder of the GWMP (beyond the MVMH) continued after
 1959 1932 through 1965.

1960 Beyond the project study area, the northern section of the GWMP includes both sides of the Potomac River from
 1961 Arlington Memorial Bridge to the Capital Beltway/Interstate 495, a distance of 9.7 miles in Virginia, and the 6.6
 1962 mile Clara Barton Parkway in Maryland. This portion protects scenic vistas, contains numerous historical and
 1963 archeological resources, and serves as another quality entryway into Washington, D.C. All but a small portion of
 1964 the GWMP was opened by 1965.

1965 *Historical Significance*

1966 The NRHP nomination describes several reasons for the national and historic significance of the GWMP. Like
 1967 the older MVMH portion, the upper parkway commemorates the life of Washington as well as Clara Barton (in
 1968 Maryland). A major reason for the GWMP's significance involves George Washington's association with the
 1969 Potomac River corridor and the construction of canals along the river. A second reason for the GWMP
 1970 significance is the selection of the site for the nation's new capital by George Washington, and his selection of
 1971 L'Enfant to design the capital.

1972 Another area of historical significance is the planning efforts related to parkways and roadways in the region that
 1973 began with Pierre L'Enfant in the 18th century, to Frederick Law Olmstead, Jr. in the early 20th century. Specific
 1974 efforts in the early 20th century, which incorporated the GWMP, included in the Park Improvement Commission
 1975 of the District of Columbia, (commonly known as the "McMillan Plan" of 1902). Olmstead was the principal
 1976 landscape architect for the McMillan Plan. Olmsted pushed for "intensively used" parks and connections
 1977 between parks including a road network that would extend parks to the perimeters of the regional city, in
 1978 particular to Mount Vernon, and along both sides of the Potomac to Great Falls. Charles W. Eliot II (an official of
 1979 the National Capital Park and Planning Commission instrumental in the development of the GWMP) and
 1980 Olmsted stated the importance of parks and linkages between them and gave a strong endorsement to the
 1981 McMillan Commission's findings for a parkway along the Potomac.

1982 *Cultural Landscape*

1983 As described in the NRHP nomination, the landscape values for the GWMP have been to preserve the scenic
 1984 and aesthetic qualities associated with the Potomac River valley, which extends from the Coastal Plain past the
 1985 fall line to the Piedmont. The McMillan Commission was concerned with the preservation of its landscape,
 1986 including the palisades and the tree covered slopes, flowering understory, steep-sided creek valleys (runs), and
 1987 hilltop vistas. The hilltop vistas provide views of the monumental core of Washington, D.C., a central purpose for
 1988 the establishment and continuing protection of the GWMP.

1989 Eliot described the GWMP concisely as containing "grade separations, few entrances, border roads for service
 1990 of abutting property, and a right-of-way never less and often much more than two hundred feet."

1991 Planting plans exist for the Mount Vernon Memorial Highway portion, the interchanges from Route 123 to
 1992 Turkey Run, and the area near the David Taylor Naval Ship Research and Development Center of the Clara
 1993 Barton Parkway, and in the portion in proximity to the Central Intelligence Agency. Besides this description, few
 1994 other details are provided in the NRHP nomination in regards to the cultural landscape, vegetation or viewsheds

1995 in the study area. The National Park Service is currently undergoing a documentation effort to update the NRHP
1996 nomination for the GWMP.

1997 Following the McMillan Plan, the National Capital Park and Planning Commission (NCP&PC) released a report
1998 titled *Preliminary Report, Park System for the District of Columbia* in December 1926. The NCP&PC vision for
1999 parks and linkages was enabled by the Capper-Cramton Act of 1930. This act established the funding and
2000 planning for the GWMP, creating the means for design and construction between 1930 and 1966.

2001 The 2009 Cultural Landscape Report (CLR) states that two additional plantings of trees were added to the
2002 Daingerfield Island section in 1936 soon after Simonson's plantings were installed. The first planting consisted
2003 of over one thousand pines planted adjacent to the western side of the GWMP, further screening it from the
2004 railroad activity at Potomac Yard. The plan used four species of pines, the first major planting of evergreens
2005 along the central section of the Parkway. Red pine (*Pinus resinosa*) dominates, along with Scots pine (*P.*
2006 *sylvestris*), white pine (*P. strobus*) and Virginia pine (*P. virginiana*). They are planted in large groupings along
2007 the entire western side of this stretch.

2008 The second set of plantings added about 250 deciduous trees and 400 more pines to the previous plantings to
2009 further increase the buffer. The species mixture is similar to Simonson's—maples, elms, oaks, and sycamores—
2010 but it also includes more white pine (*P. strobus*). Most of these trees are planted in groups of a single species.
2011 The CLR states that these were the last plantings along the western edge of Daingerfield Island.

2012 Per the CLR, the plantings that remain today are a mixture of 1932 and 1936 plants. Currently, the portion of the
2013 western side of the GWMP within the APE has scarce remnants of the 1932 and 1936 plantings. The majority of
2014 the 1930's-era trees though have succumbed to mortality due to mature age or the high surface water due to a
2015 former beaver dam in the area which has since been removed. Very few of the pine trees remain along this
2016 stretch of the GWMP.

2017 Other species from later planting plans are still found among the vegetation along the western side of the
2018 GWMP. The plantings that are currently present have returned to a more natural state through ecological
2019 succession. Species present include mulberry (*Morus alba*), sycamore (*Platanus* spp.), privet (*Ligustrum* spp.),
2020 multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Lonicera* spp.),
2021 sumac (*Rhus* spp.), porcelainberry (*Ampelopsis brevipedunculata*), and trumpet creeper (*Campsis radicans*). A
2022 variety of volunteer herbaceous and woody plants have also naturally established.

2023 Colonial Revival Apartment Complex of Alexandria (CRACA)

2024 In addition to the NRHP-listed properties in the APE, one additional historic architectural resource, the
2025 Potowmack Crossing at Old Town Condominiums (over 50 years of age), was identified by the City of
2026 Alexandria as eligible for listing in the NRHP. The Potowmack Crossing complex is located in the City of
2027 Alexandria on West Abingdon Drive near the intersection of Slaters Lane and the GWMP. The complex was
2028 evaluated and not recommended as individually eligible for listing in the NRHP. However, this apartment
2029 complex is a contributing resource to a recommended NRHP-eligible multiple property submission for post-
2030 World War II Colonial Revival apartment complexes along the GWMP in Alexandria called the Colonial Revival
2031 Apartment Complexes of Alexandria (CRACA).

2032 Potential Resources Under Evaluation

2033 The Greens Scenic Area easement was established in 2000. The easement comprises 15.27 acres that are
2034 administered by the National Park Service (NPS), located on land owned by the City of Alexandria to the north
2035 and east of the Potomac Greens neighborhood along the GWMP. The purpose of the easement, as stated in the
2036 title documents, is to conserve and preserve the natural vegetation, topography, habitat, and other natural
2037 features within its area. This easement is currently being evaluated for NRHP eligibility by the Keeper of the
2038 National Register. See **Appendix G** for additional background information, terms and conditions, and the title
2039 instruments related to the Greens Scenic Area easement.

2040 3.9.2.2 Archaeological Resources

2041 Five archaeological resources were identified within the APE that are potentially eligible for inclusion in the
2042 NRHP and VLR (see **Table 3-24**). None of the five resources has been evaluated for NRHP and VLR eligibility.
2043 Background research conducted at the VDHR archives in Richmond, Virginia identified the Alexandria Canal
2044 portion of the Chesapeake and Ohio/Alexandria Canal (44AX0028) and Campsite Number 1 of the American
2045 Wagon Train, September, 1781 (44AX0207) within the APE. Subsequent Phase I archaeological testing
2046 identified three new sites (44AX0220, 44AX0221, and 44AX0222) within the APE for archaeology. The three
2047 new sites are located within the boundaries of the GWMP parkland.

2048 Phase II archaeological evaluations (field investigations) are recommended to determine whether any of these
 2049 archaeological resources are eligible for inclusion in the NRHP or VLR. The Phase II evaluation would occur
 2050 after the selection of the Preferred Alternative and before construction begins.

2051 **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

2052 Source: VDHR; AECOM field research (October 2012).

2053 **3.9.3 Environmental Consequences**

2054 This section describes preliminary findings of adverse effects to cultural resources in accordance with Section
 2055 106 only. FTA will make a determination of effect for the project after the preferred alternative is selected by the
 2056 City of Alexandria. Under Section 106, effects to cultural resources lead to a general finding of either *No*

2057 *Adverse Effect* or an *Adverse Effect*. No differentiation is made between permanent and temporary impacts
 2058 under Section 106 regulations. Under NEPA, more specific detailed impact determinations are made which
 2059 include both temporary and permanent impacts, as well as possible benefits of a project. The concept of
 2060 *significance* of an impact is also evaluated under NEPA, i.e., the context and intensity of the impact from a
 2061 project. For each alternative, this section states preliminary determinations of effect under Section 106 and then
 2062 describes in detail the specific effects, providing relevant information necessary for evaluation under both
 2063 Section 106 and NEPA.

2064 Please refer to the following sections that are also relevant to effects under Section 106 and impacts under
 2065 NEPA to cultural resources:

- 2066 • **3.3 Land Acquisitions and Displacements**
- 2067 • **3.8 Visual Resources**
- 2068 • **3.24 Construction Impacts**

2069 **3.9.3.1 Historic Architectural Resources**

2070 Effects of the Build Alternatives on MVMH and GWMP property include permanent land transfers, temporary
 2071 construction access and staging areas, temporary and permanent visual effects, and temporary and permanent
 2072 loss of vegetation and plantings. For some of the Build Alternatives, permanent transfers would be necessary for
 2073 the permanent operation of the Metrorail station facility. NPS permits would be required for any temporary
 2074 construction access or staging activities on MVMH and GWMP property. Areas of effects for each alternative
 2075 are summarized in **Table 3-25**. The permanent and temporary impact areas are shown in **Figure 3-73** through
 2076 **Figure 3-76** on the following pages, which illustrate where temporary staging and access roads may occur, as
 2077 well as the permanent footprints of the station facility and associated trackwork.

2078 **Table 3-25: Temporary Construction Areas on and Permanent Land Transfers from Historic Architectural**
 2079 **Resources**

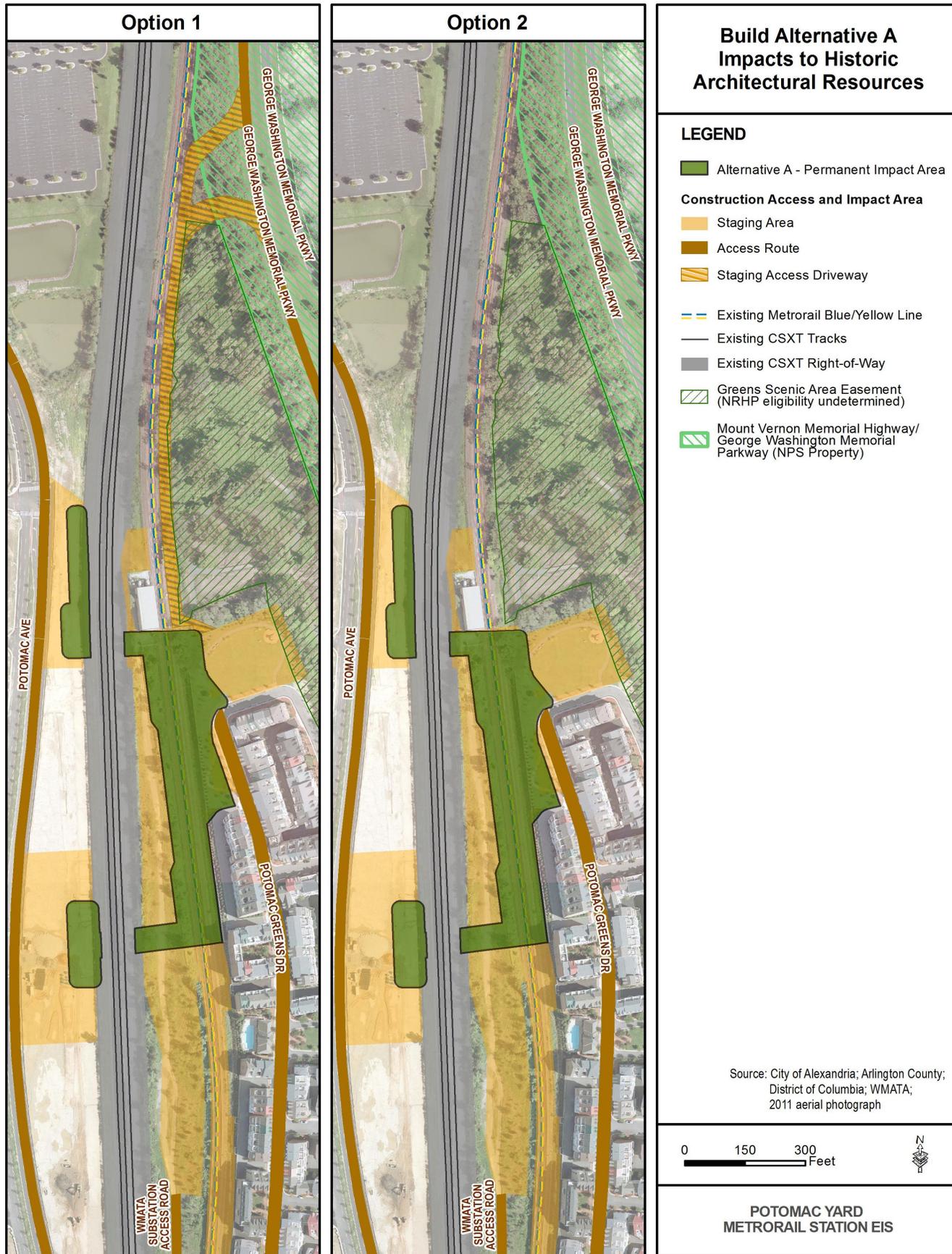
Resource	No Build Alternative	Alternative A		Alternative B		B-CSX Design Option	Alternative D
		Option 1 Construction Access	Option 2 Construction Access	Option 1 Construction Access	Option 2 Construction Access		
Temporary Construction Areas (acres)							
GWMP ¹	0.00	0.30	0.00	0.78	0.55	0.00	2.40
MVMH 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

2080 ¹The boundaries of the MVMH and GWMP are the same for the purpose of this analysis; therefore, the land transfer estimates are the
 2081 same.

2082 For the alternatives which require a permanent land transfer, a land exchange with NPS would need to be
 2083 approved by NPS and completed subject to an equal value in property or interest in property as required by
 2084 federal law (54 U.S.C. 102901). For any temporary construction activities on NPS parklands and requiring an
 2085 NPS permit, these areas would be restored based on an NPS-approved planting plan. Regrowth of some areas
 2086 of vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its
 2087 current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued
 2088 by NPS. In assessing effects on historic properties, FTA, in consultation with VDHR, NPS, and other consulting
 2089 parties, will consider the opportunity for adequate and legally enforceable conditions on land transfers to ensure
 2090 the long-term preservation of the property's historic significance.

2091

2092 **Figure 3-73: Build Alternative A Impacts to Historic Architectural Resources**



2093

2094 Commercial vehicles are prohibited from the GWMP under *NPS Management Policies 2006* (9.2.1.2.1) and
 2095 Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads
 2096 within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private
 2097 lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial
 2098 vehicles. The proposed construction project areas for Build Alternatives A and B and B-CSX Design Option are
 2099 accessible from locations other than the GWMP. However, since potential impacts would occur to residential
 2100 communities at these other locations, construction access from the GWMP was also studied as an option in the
 2101 Draft EIS.

2102 Additional detail for temporary construction impacts to NPS parkland is provided in **Section 3.24**.

2103 **No Build Alternative**

2104 Adverse effects are not anticipated as a result of the No Build Alternative. Planned development within North
 2105 Potomac Yard by others is anticipated to cause visual effects to the MVMH and GWMP through the introduction
 2106 of non-historic visual elements to the properties' setting that contributes to their historic significance.

2107 **Build Alternative A**

2108 FTA has preliminarily determined that Build Alternative A (both construction access options) would have
 2109 adverse effects on the MVMH and GWMP. Build Alternative A (both construction access options) would have
 2110 temporary and permanent visual effects. Option 1 Construction Access would also involve temporary
 2111 construction activities within MVMH and GWMP property requiring a permit from NPS and a long-term loss of
 2112 vegetation in areas that were part of the original landscape design for MVMH and GWMP. For the portions of
 2113 these resources within the APE, these effects would result in some diminishment of the landscape architecture
 2114 area of significance included in their NRHP nominations:

- 2115 • MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route
 2116 between Washington, DC and Mount Vernon.
- 2117 • GWMP – landscaped to preserve the scenic and aesthetic qualities associated with the Potomac River
 2118 valley.

2119 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
 2120 Preliminary staging areas have been identified. More detail on construction staging would become available as
 2121 discussions with property owners continue through the Final EIS and through final engineering design prior to
 2122 construction.

2123 Build Alternative A would have no adverse effect on CRACA because of the distance of this property from the
 2124 proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

2125 MVMH and GWMP impacts and the two construction staging and access options are analyzed in more detail in
 2126 the following sections and shown in **Figure 3-73**. Additional analysis for construction impacts is provided in
 2127 **Section 3.24 Construction Impacts**.

2128 **Effects to MVMH and GWMP: Option 1 Construction Access**

2129 *Cultural Landscape*

2130 Construction of temporary access driveways on MVMH and GWMP property would require the clearance of 0.30
 2131 acre of treed area (treed upland and forested wetland), which would remove roughly five to ten trees over two
 2132 inches diameter at breast height (DBH), in areas planted as part of the original landscape design of the MVMH
 2133 and GWMP. These locations have since returned to a more naturally vegetated state, although some of the
 2134 species from the planting plans are still present.

2135 The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to
 2136 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm
 2137 (*Ulmus americana*), and pin oak (*Quercus palustris*). Additionally, other landscape plan vegetation proposed for
 2138 removal includes privet (*Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera*
 2139 *japonica*), bush honeysuckle (*Lonicera* spp.), sumac (*Rhus* spp.), porcelainberry (*Ampelopsis*
 2140 *brevipedunculata*), and trumpet creeper (*Campsis radicans*).

2141 The proposed activities associated with construction of the temporary access driveways would include removing
 2142 contributing features (trees) of NRHP-listed resources. NPS parklands used for construction activities would be
 2143 restored based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40

2144 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily
 2145 impacted areas would be a condition of any permit issued by NPS.

2146 *Visual Effects*

2147 In addition to the vegetation and resulting visual impacts described above related to the cultural landscape
 2148 within the MVMH and GWMP, trees and shrubs would be removed for the construction of temporary access
 2149 driveways and a portion of the staging area within 0.18 acre of the Greens Scenic Area easement and would
 2150 have visual effects to the MVMH and GWMP as a result.

- 2151 • Removal of the vegetation in the location of the temporary access driveways would introduce visual
 2152 elements into the properties' setting that would compromise their historic significance. The gap in
 2153 vegetation created by the access roads temporarily would open up views to the proposed Potomac Yard
 2154 Metrorail Station, Metrorail tracks, and the Potomac Yard Shopping Center. While the rail yard is no
 2155 longer extant, removing the trees at this location temporarily would introduce views to the west that were
 2156 never intended as part of the design. These temporary views would not perpetuate a scenic quality and
 2157 contemplative experience for travelers, an important characteristic of the parkway experience. NPS
 2158 parklands used for construction activities would be restored based on an NPS-approved planting plan.
 2159 Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar
 2160 to its current state. Restoration of the GWMP temporarily impacted areas would be a condition of any
 2161 permit issued by NPS.

- 2162 • Immediately north of the development, a piece of land that is currently occupied by a modern loop road,
 2163 parking, and open park space (Potomac Greens Park), would be used for construction staging. As part
 2164 of the effort to prepare the area for construction access, vegetation and trees would be removed on the
 2165 east side of the Potomac Greens Park lawn and playground area. Approximately ten to thirty woody
 2166 stemmed trees and shrubs would be removed for the construction of this option within the Greens
 2167 Scenic Area easement. Although some trees would be removed for construction, the proposed removal
 2168 of vegetation does not appear to make the station more visible from the MVMH and GWMP. As
 2169 designed, the top floor of the proposed station would be permanently visible from the MVMH and
 2170 GWMP, adding a low horizontal line to the viewshed of vehicular traffic traveling northbound on the
 2171 MVMH and GWMP in select areas. NPS parklands used for construction activities would be restored
 2172 based on an NPS-approved planting plan. Vegetative screening would require approximately 20-40
 2173 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily
 2174 impacted areas would be a condition of any permit issued by NPS.

2175 The Metrorail Station would introduce permanent non-historic built elements visible from the MVMH and GWMP
 2176 at two viewsheds. Although the intent of the original 1929 MVMH landscaping plan was to buffer the view of the
 2177 rail yard from the MVMH, the integrity of the setting of the western side of the MVMH and GWMP has been
 2178 compromised by the construction of the Potomac Greens development in 2005-2006. Nonetheless, the
 2179 permanent addition of the low horizontal line of the station under this option would have an effect on the corridor
 2180 viewshed.

2181 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative
 2182 A.

2183 *Land Transfers*

2184 Under this option, no MVMH or GWMP property would be permanently transferred from NPS to the project.

2185 *Construction Areas*

2186 0.30 acre of MVMH and GWMP property would be required temporarily for construction access under this
 2187 option. For temporary construction activities permitted by NPS on MVMH and GWMP property, consultation
 2188 would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable
 2189 restrictions or conditions to ensure long-term preservation of the property's historic significance.

2190 Restoration of NPS property temporarily used for construction activities to a condition equal to or better than
 2191 current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are
 2192 prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR
 2193 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the
 2194 purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not
 2195 available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed

2196 construction project areas for Build Alternative A are accessible from locations other than the GWMP. However,
 2197 since potential impacts would occur to residential communities at these other locations, construction access
 2198 from the GWMP was also studied as an option in the Draft EIS.

2199 **Effects to MVMH and GWMP: Option 2 Construction Access**

2200 *Cultural Landscape*

2201 No permanent or temporary construction effects to vegetation would occur within MVMH or GWMP property.

2202 *Visual Effects*

2203 Trees and shrubs would be removed for construction staging within 0.09 acre of the Greens Scenic Area
 2204 easement. Immediately north of the development, a piece of land that is currently occupied by a modern loop
 2205 road, parking, and open park space (Potomac Greens Park), would be used for construction staging. As part of
 2206 the effort to prepare the area for construction access, vegetation and trees would be removed on the east side
 2207 of the Potomac Greens Park lawn and playground area. Approximately ten to thirty woody stemmed trees and
 2208 shrubs would be removed for the construction of this option within the Greens Scenic Area easement. Although
 2209 some trees would be removed, the proposed removal of vegetation does not appear to make the station more
 2210 visible from the MVMH and GWMP. As designed, the top floor of the proposed station would be visible from the
 2211 MVMH and GWMP, adding a low horizontal line to the viewshed of vehicular traffic traveling northbound on the
 2212 MVMH and GWMP in select areas. NPS parklands used for construction activities would be restored based on
 2213 an NPS-approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to
 2214 be re-established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a
 2215 condition of any permit issued by NPS.

2216 The Metrorail Station would introduce permanent non-historic built elements visible from the MVMH and GWMP
 2217 at two viewsheds. Although the intent of the original 1929 MVMH landscaping plan was to buffer the view of the
 2218 rail yard from the MVMH, the integrity of the setting of the western side of the MVMH and GWMP has been
 2219 compromised by the construction of the Potomac Greens development in 2005-2006. Nonetheless, the
 2220 permanent addition of the low horizontal line of the station under this option would have an effect on the corridor
 2221 viewshed.

2222 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative
 2223 A.

2224 *Land Transfers*

2225 No permanent land transfers from MVMH and GWMP property are required for this option.

2226 *Construction Areas*

2227 No temporary construction access or other activities on MVMH and GWMP property are required for this option.

2228 **Build Alternative B**

2229 FTA has preliminarily determined that Build Alternative B (both construction access options) would have
 2230 adverse effects on the MVMH and GWMP resulting from permanent land transfers, temporary construction
 2231 activities within MVMH and GWMP property requiring a permit from NPS, and temporary and permanent visual
 2232 effects. Option 1 Construction Access would also have effects on the MVMH and GWMP resulting from long-
 2233 term loss of vegetation in areas that were part of the original landscape design. For the portions of these
 2234 resources within the APE, these effects would result in some diminishment of the landscape architecture area of
 2235 significance included in their NRHP nominations:

- 2236 • MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route
- 2237 between Washington, DC and Mount Vernon.
- 2238 • GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River
- 2239 valley.

2240 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
 2241 Preliminary staging areas have been identified. More detail on construction staging would become available as
 2242 discussions with property owners continue through the Final EIS and through final engineering design prior to
 2243 construction.

2244 Build Alternative B would have no adverse effect on CRACA because of the distance of this property from the
 2245 proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

2246 MVMH and GWMP impacts and the two construction staging and access options are analyzed in more detail in
 2247 the following sections and shown in **Figure 3-74**. Additional analysis for construction impacts is provided in
 2248 **Section 3.24 Construction Impacts**.

2249 ***Effects to MVMH and GWMP: Option 1 Construction Access***

2250 *Cultural Landscape*

2251 Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original
 2252 landscape design of the MVMH and GWMP:

- 2253 • Construction of temporary access driveways and staging areas on MVMH and GWMP property would
 2254 require clearance of 0.77 acre of treed area and associated herbaceous vegetation (treed upland and
 2255 forested wetland areas), which would remove roughly 15 to 20 trees over two inches DBH.
- 2256 • Permanent station facilities and realigned track would require clearance of 0.16 acre of treed area and
 2257 associated herbaceous vegetation (treed upland and forested wetland areas), which would remove
 2258 roughly up to five trees over two inches DBH.

2259 These locations have since returned to a more naturally vegetated state, although some of the species from the
 2260 planting plans are still present.

2261 The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and
 2262 GWMP for construction staging and permanent facilities for Build Alternative B Option 1 is 0.93 acre including
 2263 the removal of a total of 15 to 20 trees over two inches DBH.

2264 The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to
 2265 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm
 2266 (*Ulmus americana*), and pin oak (*Quercus palustris*). Additionally, other landscape plan vegetation proposed for
 2267 removal includes privet (*Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera*
 2268 *japonica*), bush honeysuckle (*Lonicera* spp.), sumac (*Rhus* spp.), porcelainberry (*Ampelopsis*
 2269 *brevipedunculata*), and trumpet creeper (*Campsis radicans*).

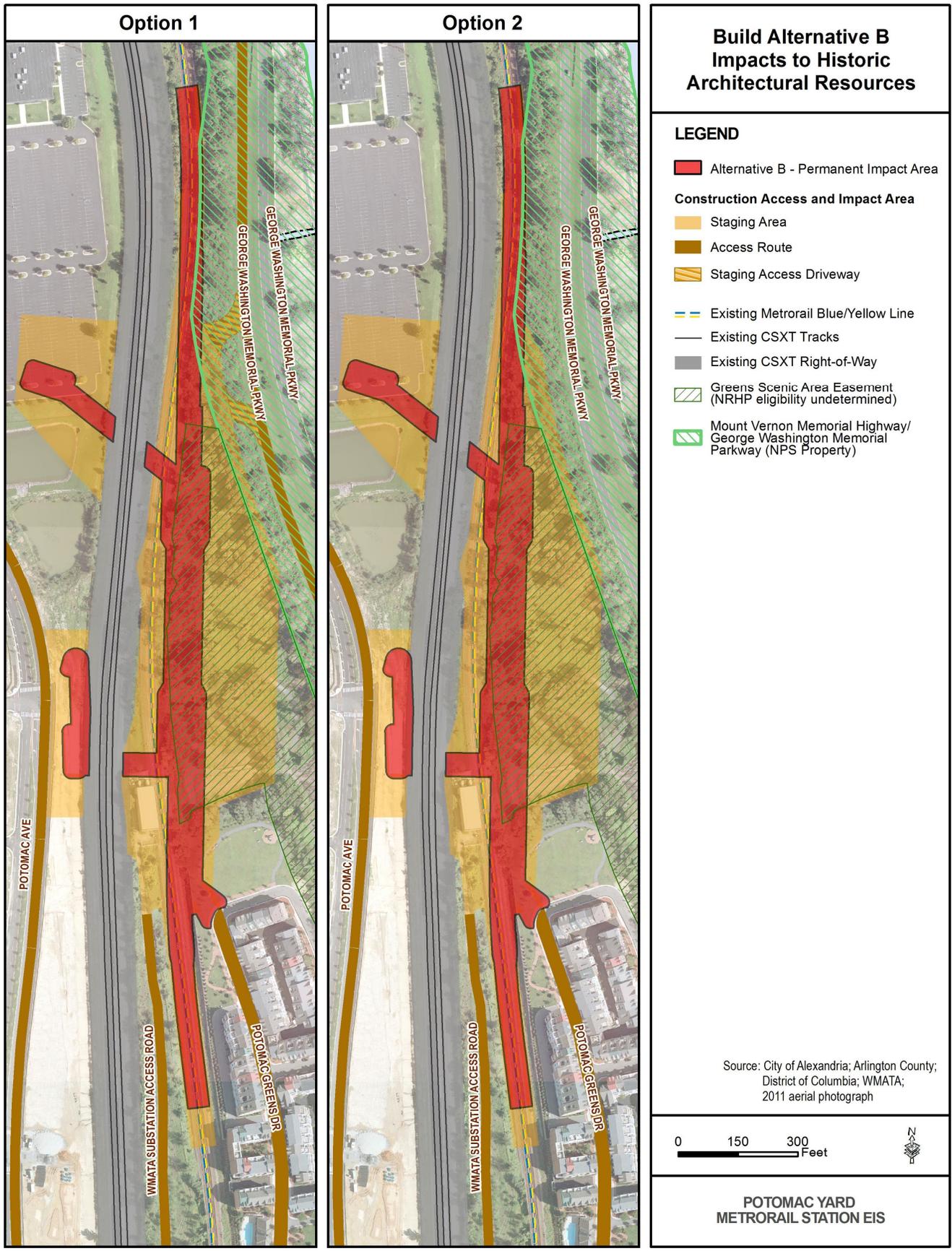
2270 The proposed activities associated with construction of the temporary access driveways and staging areas and
 2271 permanent station and track facilities would include removing contributing features (trees) of NRHP-listed
 2272 resources. NPS parklands used for construction activities would be restored based on an NPS-approved
 2273 planting plan. Vegetative screening in areas temporarily cleared for construction would require approximately
 2274 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily
 2275 impacted areas would be a condition of any permit issued by NPS.

2276 *Visual Effects*

2277 In addition to the vegetation and resulting visual impacts described above related to the cultural landscape
 2278 within the MVMH and GWMP, 1.51 acres of trees and shrubs would be removed from the Greens Scenic Area
 2279 easement consisting of 0.83 acre for the temporary construction staging area and 0.68 acre for the permanent
 2280 station and track facilities. This removal of trees and shrubs would cause visual effects to the MVMH and
 2281 GWMP as a result. NPS parklands used for construction activities would be restored based on an NPS-
 2282 approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-
 2283 established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a
 2284 condition of any permit issued by NPS.

2285 Removal of the vegetation in the location of the temporary access driveways and adjacent construction staging
 2286 areas within the MVMH and GWMP and the Greens Scenic Area easement and in the locations of permanent
 2287 station facilities and realigned track would introduce visual elements into the properties' setting that would
 2288 compromise their historic significance. The gap in vegetation created by the access roads and staging area
 2289 would open up views to non-historic elements: the proposed Potomac Yard Metrorail Station, Metrorail tracks,
 2290 and the Potomac Yard Shopping Center. While the rail yard is no longer extant, removing the trees at this
 2291 location would introduce views to the west that were never intended as part of the design. The Metrorail Station
 2292 would also introduce permanent non-historic built elements visible from the GWMP at three viewsheds and
 2293 affect the continuous view corridor. These views would not perpetuate a scenic quality and contemplative
 2294 experience for travelers, an important characteristic of the parkway experience.

2295 **Figure 3-74: Build Alternative B Impacts to Historic Architectural Resources**



2297 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative
2298 B.

2299 *Land Transfers*

2300 0.16 acre of MVMH and GWMP property would be permanently transferred from NPS to the project. Per 36
2301 CFR 800.5(a)(2)(vii), transfer, lease, or sale of property out of Federal ownership or control without adequate
2302 and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic
2303 significance is an example of an adverse effect. The land transfer from MVMH and GWMP and permanent use
2304 of the property for a Metrorail station and realigned track would contribute to FTA's adverse effect determination
2305 for the alternative. Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an
2306 equal value exchange in property or interest in property and need to be approved by NPS and completed as
2307 required by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land**
2308 **Acquisitions and Displacements.**

2309 *Construction Areas*

2310 0.77 acre of MVMH and GWMP property would be required temporarily for the construction of this option.
2311 Discussions are ongoing regarding the location of construction areas and have yet to be resolved. Preliminary
2312 areas have been identified. More detail on construction areas would become available as discussions with
2313 property owners continue through the Final EIS and through final engineering design prior to construction.

2314 For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation
2315 would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable
2316 restrictions or conditions to ensure long-term preservation of the property's historic significance.

2317 Restoration of NPS property temporarily used for construction activities to a condition equal to or better than
2318 current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are
2319 prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR
2320 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the
2321 purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not
2322 available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed
2323 construction project areas for Build Alternative B are accessible from locations other than the GWMP. However,
2324 since potential impacts would occur to residential communities at these other locations, construction access
2325 from the GWMP was also studied as an option in the Draft EIS.

2326 ***Effects to MVMH and GWMP: Option 2 Construction Access***

2327 *Cultural Landscape*

2328 Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original
2329 landscape design of the MVMH and GWMP:

- 2330 • Construction staging areas on MVMH and GWMP property would require clearance of 0.55 acre of
2331 treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which
2332 would remove roughly 10 to 15 trees over two inches DBH.
- 2333 • Permanent station facilities and realigned track would require clearance of 0.16 acre of treed area and
2334 associated herbaceous vegetation (treed upland and forested wetland areas), which would remove
2335 roughly five to ten trees over two inches DBH.

2336 These locations have since returned to a more naturally vegetated state, although some of the species from the
2337 planting plans are still present.

2338 The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and
2339 GWMP for construction staging and permanent facilities for Build Alternative B Option 2 is 0.71 acre including
2340 the removal of a total of 10 to 15 trees over two inches DBH.

2341 The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to
2342 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm
2343 (*Ulmus americana*), and pin oak (*Quercus palustris*). Additionally, other landscape plan vegetation proposed for
2344 removal includes privet (*Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera*
2345 *japonica*), bush honeysuckle (*Lonicera* spp.), sumac (*Rhus* spp.), porcelainberry (*Ampelopsis*
2346 *brevipedunculata*), and trumpet creeper (*Campsis radicans*).

2347 The proposed activities associated with construction of the temporary access driveways and staging areas and
 2348 permanent station and track facilities would include removing contributing features (trees) of NRHP-listed
 2349 resources. NPS parklands used for construction activities would be restored based on an NPS-approved
 2350 planting plan. Vegetative screening in areas temporarily cleared for construction would require approximately
 2351 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily
 2352 impacted areas would be a condition of any permit issued by NPS.

2353 *Visual Effects*

2354 In addition to the vegetation and resulting visual impacts described above related to the cultural landscape
 2355 within the MVMH and GWMP, 1.51 acres of trees and shrubs would be removed from the Greens Scenic Area
 2356 easement consisting of 0.83 acre for the temporary construction staging area and 0.68 acre for the permanent
 2357 station and track facilities. This removal of trees and shrubs would cause visual effects to the MVMH and
 2358 GWMP as a result. NPS parklands used for construction activities would be restored based on an NPS-
 2359 approved planting plan. Vegetative screening would require approximately 20-40 years of regrowth to be re-
 2360 established similar to its current state. Restoration of the GWMP temporarily impacted areas would be a
 2361 condition of any permit issued by NPS.

2362 Removal of the vegetation in the construction staging areas within the MVMH and GWMP and the Greens
 2363 Scenic Area easement and in the locations of permanent station facilities and realigned track would introduce
 2364 visual elements into the properties' setting that would compromise their historic significance. The gap in
 2365 vegetation created by the access roads and staging area would open up views to non-historic elements: the
 2366 proposed Potomac Yard Metrorail Station, Metrorail tracks, and the Potomac Yard Shopping Center. While the
 2367 rail yard is no longer extant, removing the trees at this location would introduce views to the west that were
 2368 never intended as part of the design. The Metrorail Station would also introduce permanent non-historic built
 2369 elements three viewsheds along the GWMP and affect the continuous view corridor. These views would not
 2370 perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the
 2371 parkway experience.

2372 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative
 2373 B.

2374 *Land Transfers*

2375 0.16 acre of MVMH and GWMP property would be permanently transferred from NPS for the project. Land
 2376 transfer from the MVMH and GWMP qualifies as an adverse effect under Section 106 (36 CFR 800.5(a)(2)(vii)).
 2377 Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an equal value
 2378 exchange in property or interest in property and need to be approved by NPS and completed as required by
 2379 federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions**
 2380 **and Displacements**.

2381 *Construction Areas*

2382 0.55 acre of MVMH and GWMP property would be required temporarily for the construction of this option.
 2383 Discussions are ongoing regarding the location of construction areas and have yet to be resolved. Preliminary
 2384 areas have been identified. More detail on construction areas would become available as discussions with
 2385 property owners continue through the Final EIS and through final engineering design prior to construction.

2386 For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation
 2387 would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable
 2388 restrictions or conditions to ensure long-term preservation of the property's historic significance.

2389 Restoration of NPS property temporarily used for construction activities to a condition equal to or better than
 2390 current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are
 2391 prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR
 2392 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the
 2393 purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not
 2394 available, the park Superintendent has the discretion to issue permits for commercial vehicles. The proposed
 2395 construction project areas for Build Alternative B are accessible from locations other than the GWMP. However,
 2396 since potential impacts would occur to residential communities at these other locations, construction access
 2397 from the GWMP was also studied as an option in the Draft EIS.

2398 **B-CSX Design Option**

2399 FTA has preliminarily determined that B-CSX Design Option would have adverse effects on the MVMH and
 2400 GWMP resulting from temporary and permanent visual effects. No construction access roads or staging are
 2401 proposed within the MVMH and GWMP under the B-CSX Design Option. For the portions of these resources
 2402 within the APE, these effects would result in some diminishment of the landscape architecture area of
 2403 significance included in their NRHP nominations:

- 2404 • MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route
 2405 between Washington, DC and Mount Vernon.
- 2406 • GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River
 2407 valley.

2408 B-CSX Design Option would have no adverse effect on the CRACA because of the distance of this property
 2409 from the proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

2410 **Figure 3-75** shows the location of B-CSX Design Option permanent impact areas and construction access and
 2411 staging areas relative to the MVMH and GWMP. Additional analysis for construction impacts is provided in
 2412 **Section 3.24 Construction Impacts**. See **Section 3.8 Visual Resources** for additional analysis relating to the
 2413 permanent viewshed impacts of B-CSX Design Option.

2414 **Effects to MVMH and GWMP**

2415 *Cultural Landscape*

2416 No vegetation would be removed from the GWMP or MVMH under the B-CSX Design Option.

2417 *Visual Effects*

2418 B-CSX Design Option construction staging would require the removal of a layer of vegetation west of the
 2419 existing Metrorail line, between the Metrorail tracks and the CSXT tracks, that currently is part of the visual
 2420 screen between the MVMH and GWMP and the proposed location of the Metrorail station. The layer of
 2421 vegetation within the MVMH and GWMP west of the parkway would remain, maintaining some vegetative
 2422 screening.

2423 The Metrorail Station would be visible from three viewsheds along the GWMP and affect the continuous view
 2424 corridor. The location of permanent station facilities in proximity to the MVMH and GWMP would introduce non-
 2425 historic visual elements into the properties' setting that would compromise their historic significance. These
 2426 views would not perpetuate a scenic quality and contemplative experience for travelers, an important
 2427 characteristic of the parkway experience.

2428 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of B-CSX Design
 2429 Option.

2430 *Land Transfers*

2431 No permanent land transfers from MVMH and GWMP property are anticipated under the B-CSX Design Option.

2432 *Construction Areas*

2433 No temporary construction activities on MVMH and GWMP property are anticipated under the B-CSX Design
 2434 Option.

2435 **Build Alternative D**

2436 FTA has preliminarily determined that Build Alternative D would have adverse effects on the MVMH and GWMP
 2437 resulting from permanent land transfers, temporary construction activities within MVMH and GWMP property
 2438 requiring a permit from NPS, temporary and permanent visual effects, and temporary and permanent loss of
 2439 vegetation. Construction access would also cause effects to the MVMH and GWMP resulting from long-term
 2440 loss of vegetation in areas that were part of the original landscape design. For the portions of these resources
 2441 within the APE, these effects would result in some diminishment of the landscape architecture area of
 2442 significance included in their NRHP nominations:

- 2443 • MVMH – landscaped to maximize scenic, aesthetic and commemorative qualities along its route
 2444 between Washington, DC and Mount Vernon.
- 2445 • GWMP – landscaped to preserve the scenic and esthetic qualities associated with the Potomac River
 2446 valley.

2447 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
2448 Preliminary staging areas have been identified. More detail on construction staging would become available as
2449 discussions with property owners continue through the Final EIS and through final engineering design prior to
2450 construction.

2451 Build Alternative D would have no adverse effect on CRACA because of the distance of CRACA from the
2452 proposed project activities and the visual buffer created by the Potomac Greens neighborhood.

2453

2454 Figure 3-75: B-CSX Design Option Impacts to Historic Architectural Resources



B-CSX Design Option Impacts to Historic Architectural Resources

LEGEND

- B-CSX Design Option - Permanent Impact Area

Construction Access and Impact Area

- Staging Area
- Access Route
- Existing Metrorail Blue/Yellow Line
- Existing CSXT Tracks
- Existing CSXT Right-of-Way
- Greens Scenic Area Easement (NRHP eligibility undetermined)
- Mount Vernon Memorial Highway/ George Washington Memorial Parkway (NPS Property)

Source: City of Alexandria; Arlington County; District of Columbia; WMATA; 2011 aerial photograph

0 150 300
Feet

**POTOMAC YARD
METRO RAIL STATION EIS**

2455

2456 MVMH and GWMP impacts are analyzed in more detail below and shown in **Figure 3-76**. Additional analysis for
 2457 construction impacts is provided in **Section 3.24 Construction Impacts**. See **Section 3.8 Visual Resources**
 2458 for additional analysis relating to the permanent viewshed impacts of Build Alternative D.

2459 **Effects to MVMH and GWMP**

2460 *Cultural Landscape*

2461 Temporary and permanent clearance of vegetation and trees would occur in areas planted as part of the original
 2462 landscape design of the MVMH and GWMP:

- 2463 • Construction of temporary access driveways and staging areas would require clearance of 2.40 acres of
 2464 treed area and associated herbaceous vegetation (treed upland and forested wetland areas), which
 2465 would remove roughly 45-50 trees over two inches DBH.
- 2466 • Permanent realigned track and associated structures would require clearance of 1.14 acres of treed
 2467 area and associated herbaceous vegetation (treed upland and forested wetland areas), which would
 2468 remove roughly 20-25 trees over two inches DBH.

2469 These locations have since returned to a more naturally vegetated state, although some of the species from the
 2470 planting plans are still present.

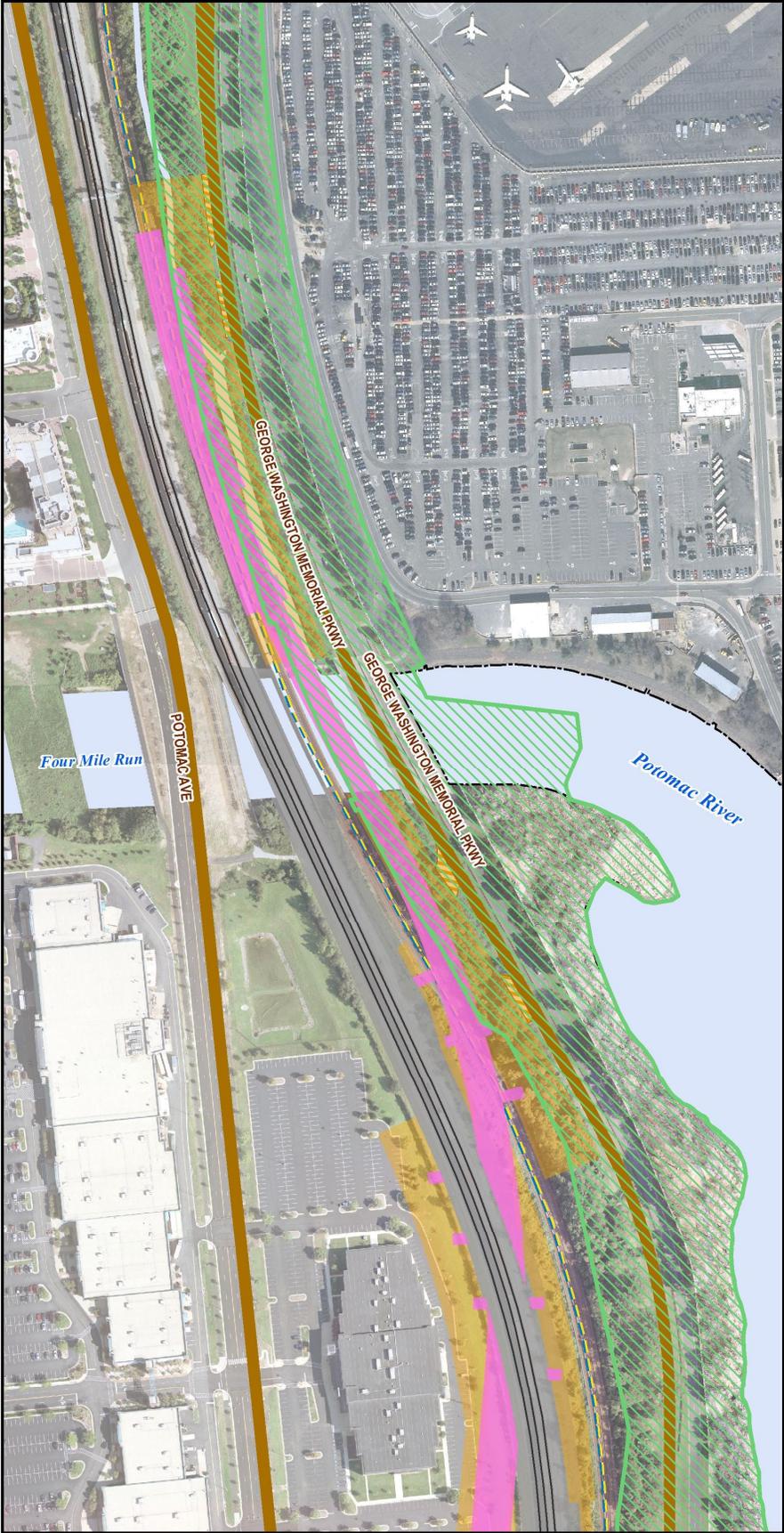
2471 The total area cleared of vegetation in areas planted as part of the original landscape design of the MVMH and
 2472 GWMP for construction staging and permanent facilities for Build Alternative D is 3.54 acres including the
 2473 removal of a total of 70 to 75 trees over two inches DBH.

2474 The areas of MVMH and GWMP property to be cleared of vegetation include trees that are approximately 20 to
 2475 70 years old of various species, such as mulberry (*Morus alba*), sycamore (*Platanus* spp.), American Elm
 2476 (*Ulmus americana*), and pin oak (*Quercus palustris*). Additionally, other landscape plan vegetation proposed for
 2477 removal includes privet (*Ligustrum* spp.), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera*
 2478 *japonica*), bush honeysuckle (*Lonicera* spp.), sumac (*Rhus* spp.), porcelainberry (*Ampelopsis*
 2479 *brevipedunculata*), and trumpet creeper (*Campsis radicans*).

2480 The area north of Four Mile Run is an area referred to as the Airport segment of the MVMH and GWMP and
 2481 stretches to the northern end of Ronald Reagan Washington National Airport. This section was realigned in
 2482 1940 when the airport was constructed on the site of the original alignment. Trees located on the west side of
 2483 the MVMH and GWMP in this area were largely planted during the 1963 planting plan, but the area has since
 2484 returned to its natural woodland state, filling out the vegetation among the earlier plantings. The plantings in this
 2485 area were intended to shield views of the Potomac Yard rail yard and the railroad, and, while the plantings have
 2486 lost some integrity, they still function as intended. The proposed activities associated with realignment of track
 2487 would include removing contributing features (trees) of a NRHP-listed resource. NPS parklands used for
 2488 construction activities would be restored based on an NPS-approved planting plan. Vegetative screening would
 2489 require approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the
 2490 GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

2491 Construction staging and temporary access roads south of Four Mile Run would also cause damage to part of
 2492 the NRHP-listed MVMH and GWMP, requiring removal of trees and other vegetation that were planted in 1936
 2493 and contribute to the significance of the MVMH and GWMP. NPS parklands used for construction activities
 2494 would be restored based on an NPS-approved planting plan. Vegetative screening would require approximately
 2495 20-40 years of regrowth to be re-established similar to its current state. Restoration of the GWMP temporarily
 2496 impacted areas would be a condition of any permit issued by NPS.

2497 Figure 3-76: Build Alternative D Impacts to Historic Architectural Resources



Build Alternative D Impacts to Historic Architectural Resources

LEGEND

- Alternative D - Permanent Impact Area

Construction Access and Impact Area

- Staging Area
- Access Route
- Staging Access Driveway
- Existing Metrorail Blue/Yellow Line
- Existing CSXT Tracks
- Existing CSXT Right-of-Way
- Mount Vernon Memorial Highway/
George Washington Memorial Parkway (NPS Property)

Source: City of Alexandria; Arlington County;
District of Columbia; WMATA;
2011 aerial photograph

0 150 300
Feet

**POTOMAC YARD
METRO RAIL STATION EIS**

2498

2499 *Visual Effects*

2500 Removal of the vegetation in the location of the temporary construction staging areas and access driveways
 2501 would introduce visual elements into the properties' setting that would compromise their historic significance.
 2502 The gap in vegetation created by the temporary construction staging areas and access driveways would open
 2503 up views to non-historic elements: the Metrorail tracks and Potomac Yard Shopping Center. While the rail yard
 2504 is no longer extant, removing the trees at this location temporarily would introduce views to the west that were
 2505 never intended as part of the design. These temporary views would not perpetuate a scenic quality and
 2506 contemplative experience for travelers, an important characteristic of the parkway experience. NPS parklands
 2507 used for construction activities would be restored based on an NPS-approved planting plan. Vegetative
 2508 screening would require approximately 20-40 years of regrowth to be re-established similar to its current state.
 2509 Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

2510 The Metrorail Station, realigned track, and associated structures would be permanently visible from three
 2511 viewsheds along the GWMP and affect the continuous view corridor. As previously discussed, Wilbur
 2512 Simonson's original design intent (which was perpetuated in subsequent planting plans) for the western side of
 2513 the MVMH between Four Mile Run and Slaters Lane was to thickly screen the western side of the GWMP with
 2514 vegetation to obscure views of the rail yard. While the loss of trees in this area has compromised the integrity of
 2515 the MVMH, the western side of the GWMP has since returned to its natural woodland state and still functions as
 2516 intended: to shield views of uses in Potomac Yard from the parkway. The views of these non-historic elements,
 2517 (Metrorail Station, realigned track, and associated structures) would not perpetuate a scenic quality and
 2518 contemplative experience for travelers, an important characteristic of the parkway experience.

2519 See **Section 3.8 Visual Resources** for additional analysis relating to the viewshed impacts of Build Alternative
 2520 D.

2521 *Land Transfers*

2522 1.43 acres of MVMH and GWMP property would be permanently transferred from Build Alternative D. Per 36
 2523 CFR 800.5(a)(2)(vii), transfer, lease, or sale of property out of Federal ownership or control without adequate
 2524 and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic
 2525 significance is an example of an adverse effect. The land transfer from MVMH and GWMP and permanent use
 2526 of the property for realigned Metrorail track would contribute to FTA's adverse effect determination for the
 2527 alternative. Permanent transfers of MVMH and GWMP property owned by NPS would be subject to an equal
 2528 value exchange in property or interest in property and need to be approved by NPS and completed as required
 2529 by federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions**
 2530 **and Displacements**.

2531 *Construction Areas*

2532 2.40 acres of MVMH and GWMP property would be required temporarily for the construction of Build Alternative
 2533 D. Discussions are ongoing regarding the location of construction areas and have yet to be resolved.
 2534 Preliminary areas have been identified. More detail on construction areas would become available as
 2535 discussions with property owners continue through the Final EIS and through final engineering design prior to
 2536 construction.

2537 For areas of temporary construction activities permitted by NPS on MVMH and GWMP property, consultation
 2538 would be conducted with the Section 106 consulting parties to develop adequate and legally enforceable
 2539 restrictions or conditions to ensure long-term preservation of the property's historic significance.

2540 Restoration of NPS property temporarily used for construction activities to a condition equal to or better than
 2541 current and planned conditions would be a condition of any permit issued by NPS. Commercial vehicles are
 2542 prohibited from the GWMP under *NPS Management Policies* 2006 (9.2.1.2.1) and Federal regulations (36 CFR
 2543 5.6). The NPS policies state that "commercial traffic will be prohibited on roads within parks, except for the
 2544 purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private lands is otherwise not
 2545 available, the park Superintendent has the discretion to issue permits for commercial vehicles.

2546 **3.9.3.2 Archaeological Resources**

2547 Potential archaeological effects are being determined by ongoing and concurrent Section 106 studies. The
 2548 assessment of effects to archaeological resources assumes that the resources are eligible for listing in the
 2549 NRHP or VLR. If the archaeological resources are determined by VDHR and NPS to be not eligible, then there
 2550 would be no adverse effects.

2551 **No Build Alternative**

2552 No effect to archaeological resources is anticipated as a result of the No Build Alternative.

2553 **Build Alternative A**

2554 FTA has preliminarily determined that, without design-based avoidance, Build Alternative A Option 1
2555 Construction Access would have an adverse effect on two archaeological resources if these properties are
2556 eligible for the NRHP. The effects of Build Alternative A are described further below for the two construction
2557 access options.

2558 **Option 1 Construction Access**

2559 Build Alternative A Option 1 Construction Access is anticipated to have effects on Sites 44AX0221 and
2560 44AX0222. Specifically, if Sites 44AX0221 and 44AX0222 are determined to be eligible for NRHP listing and
2561 avoidance of these sites is not possible, construction of temporary access roads would have effects resulting
2562 from damage to all or part of the property. Effects to both resources would result from superficial soil
2563 disturbance and soil compression caused by the construction of temporary access roads. Other effects may be
2564 caused by subsequent soil erosion and restoration efforts.

2565 Design-based avoidance for effects to NRHP and VLR-eligible archaeological resources would be developed in
2566 later project design phases based on further Phase II archaeological evaluations and in accordance with the
2567 ongoing Section 106 review process. Additionally, any investigations associated with the Phase II
2568 archaeological evaluations would require an ARPA permit from NPS.

2569 **Option 2 Construction Access**

2570 Build Alternative A Option 2 Construction Access is not anticipated to have effects on archaeological resources.
2571 Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking.
2572 Build Alternative A Option 2 Construction Access is not anticipated to cause the deterioration of potentially
2573 eligible archaeological resources, or transfer, lease or sale of resources on federally-owned property.

2574 **Build Alternative B**

2575 FTA has preliminarily determined that, without design-based avoidance, Build Alternative B Option 1
2576 Construction Access would have an adverse effect on two archaeological resources if these properties are
2577 eligible for the NRHP. The effects of Build Alternative B are described further below for the two construction
2578 access options.

2579 **Option 1 Construction Access**

2580 Build Alternative B Option 1 Construction Access, without avoidance measures, is anticipated to have effects on
2581 Sites 44AX0221 and 44AX0222. Specifically, if Sites 44AX0221 and 44AX0222 are determined to be eligible for
2582 NRHP listing and avoidance of these sites is not possible, construction of temporary access roads would have
2583 effects resulting from damage to all or part of the property. Without avoidance measures, other effects on both
2584 resources would result from superficial soil disturbance and soil compression caused by the construction of
2585 temporary access roads. Without avoidance measures, other effects may be caused by subsequent soil erosion
2586 and restoration efforts.

2587 Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in
2588 later project design phases based on further Phase II archaeological evaluations and in accordance with the
2589 ongoing Section 106 review process. Additionally, any investigations associated with the Phase II
2590 archaeological evaluations would require an ARPA permit from NPS.

2591 **Option 2 Construction Access**

2592 Build Alternative B Option 2 Construction Access is not anticipated to have effects on archaeological resources.
2593 Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking.
2594 Build Alternative B Option 2 Construction Access is not anticipated to cause the deterioration of potentially
2595 eligible archaeological resources, or transfer, lease or sale of resources on federally-owned property.

2596 **B-CSX Design Option**

2597 B-CSX Design Option would not have effects on archaeological resources, because no construction staging
2598 areas, temporary access roads, or transfers of land for the design option would occur at the sites.
2599 Archaeological resources would not be demolished, damaged, altered, or removed as part of this undertaking.

2600 B-CSX Design Option is not anticipated to cause the deterioration of potentially eligible archaeological
2601 resources, or transfer, lease or sale of resources on federally-owned property.

2602 **Build Alternative D**

2603 FTA has preliminarily determined that, without design-based avoidance, Build Alternative D would have an
2604 adverse effect on one archaeological resource if this property is eligible for the NRHP.

2605 Specifically, if avoidance of 44AX0220 is not possible, construction staging and access roads would have
2606 effects resulting from damage to all of the property. Other effects to 44AX0220 would result from superficial soil
2607 disturbance, erosion and compression caused by the construction of temporary access roads as well as planting
2608 restoration efforts.

2609 Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in
2610 later project design phases based on further Phase II archaeological evaluations and in accordance with the
2611 ongoing Section 106 review process. Additionally, any investigations associated with the Phase II
2612 archaeological evaluations would require an ARPA permit from NPS.

2613 **3.9.4 Mitigation**

2614 **3.9.4.1 Historic Architectural Resources**

2615 Mitigation measures for adversely affected historic architectural resources would include avoidance of impacts
2616 in accordance with 40 CFR 1508.20(a) and 36 CFR 800.6(a). If a property is restored, rehabilitated, repaired,
2617 maintained, stabilized, remediated or otherwise changed in accordance with the Secretary of Interior's
2618 Standards and agreement by VDHR, then it will not be considered an adverse effect (36 CFR 800.5(a)(2)).
2619 VDHR may suggest changes in a project or impose conditions so that adverse effects can be avoided and thus
2620 result in a no adverse effect determination (36 CFR 800.5(b)).

2621 In addition, mitigation measures determined in coordination with VDHR, NPS, and all other Section 106
2622 consulting parties could include the following:

- 2623 • Implementation of a Section 106 MOA or PA that includes the following stipulations:
 - 2624 ○ Development of landscape and visual screening plans for the GWMP and Greens Scenic Area
2625 easement consistent with the *Vegetation CLR* and the U.S. Department of Agriculture, Bureau
2626 of Public Roads, *Plan for Development, Mount Vernon Memorial Highway, Washington, DC to*
2627 *Mount Vernon, VA. (1930)*;
 - 2628 ○ New landscaping for Potomac Greens Park and the GWMP. A primary goal of the
2629 mitigation/landscape plan will be to develop a landscape planting strategy that is consistent with
2630 the historic character and design principles of the GWMP, as documented in the *Mount Vernon*
2631 *Memorial Highway Cultural Landscape Report, Vol. I, p. 72-74 (NPS, 1987)*. The planting
2632 strategy ideally will utilize native plant and tree species described and used for the MVMH
2633 construction in the 1930s;
- 2634 • Preparation of an interpretive exhibit for installation at the Potomac Yard Metrorail Station or local library
2635 discussing the history and context of the MVMH and GWMP; and
- 2636 • Implementation of a public artwork project illustrating history and context of the MVMH and GWMP; and
- 2637 • Selection of building design and materials that could minimize visual effects (see **Section 3.8.4 Visual**
2638 **Resources, Mitigation**, for more details).

2639 **3.9.4.2 Archaeological Resources**

2640 Mitigation for any unavoidable effects to NRHP and VLR eligible archaeological resources would first include
2641 avoidance of impacts to historic properties in accordance with 40 CFR 1508.20(a) and 36 CFR 800.6(a) and
2642 completion of Phase III archaeological data recovery efforts, as appropriate. Phase III archaeological data
2643 recovery includes large-scale excavations to be developed in consultation with VDHR and other consulting
2644 parties, formalized in an MOA or PA and completed prior to the initiation of construction. Mitigation could also
2645 include the execution of an Archeological Overview and Assessment for the GWMP (MVMH) South of
2646 Alexandria. Alteration or destruction of an archaeological site is an adverse effect; data recovery or Phase III
2647 investigations constitute mitigation of those adverse effects (36 CFR 800.5(a)(2)).

2648 3.10 Parklands

2649 This section assesses potential impacts to publicly owned and publicly accessible parkland, recreational areas,
 2650 and open space areas that exist within the study area or are to exist by the opening year (2016). Parkland
 2651 includes properties owned by local, state, or Federal agencies, as well as public or private properties with
 2652 preservation or open space easements or that otherwise provide for public access for passive or active
 2653 recreational uses. Additional discussion of related parkland impacts and mitigation measures are discussed in
 2654 **Section 3.8 Visual Resources** and **Section 3.24 Construction Impacts**.

2655 Separate evaluations of parklands and related resources regulated under Section 4(f) of the U.S. Department of
 2656 Transportation Act of 1966, as amended, and under Section 6(f) of the Land and Water Conservation Fund Act
 2657 of 1965 are included in **Appendix D** and **Appendix E**, respectively.

2658 3.10.1 Methodology

2659 Existing publicly owned or leased parks and recreation areas within the study area were identified using
 2660 information provided by the City of Alexandria, Arlington County, and NPS, and property deed and title
 2661 document searches. Future planned parks and recreational facilities were identified using the following local
 2662 plans and policies:

- 2663 • City of Alexandria:
 - 2664 ○ *North Potomac Yard Small Area Plan*, June 2010;
 - 2665 ○ *Alexandria Commission for Arts Report*, 2007;
 - 2666 ○ *Athletic Field Master Plan*, 2006;
 - 2667 ○ *Dog Parks Master Plan*, 2000 (updated 2011);
 - 2668 ○ *Four Mile Run Restoration Final Master Plan*, 2006;
 - 2669 ○ *Open Space Plan*, 2003;
 - 2670 ○ *Strategic Master Plan for Open Space, Parks & Recreation*, 2002; and
 - 2671 ○ *Potomac Yard/Potomac Greens Small Area Plan and CDD Concept Plan* (1992, Amended
 2672 1999, 2005, 2007, 2008, 2009, 2010).
- 2673 • Arlington County:
 - 2674 ○ *Public Spaces Master Plan*, 2005; and
 - 2675 ○ *Land Acquisition and Preservation Policy*, May 2010.

2676 Parklands assessed include existing parklands and those anticipated to be open to the public by 2016 based on
 2677 current property information and development approvals provided by the City of Alexandria. Potential impacts of
 2678 the alternatives to parklands were determined by assuming a minimum 20-foot setback from proposed
 2679 permanent facilities and structures.

2680 For Build Alternative A, the Metrorail Reservation easement was excluded from potential parkland impacts. The
 2681 easement was established as part of the plans and development agreements that created the parks and allows
 2682 a future station facility at the location. However, the Metrorail Reservation easement includes 3.6 acres of land
 2683 in the Rail Park and Potomac Yard Park. Existing park amenities within the Metrorail Reservation easement
 2684 include pedestrian paths, playgrounds, and seating areas. Build Alternatives B and D and B-CSX Design Option
 2685 have a portion of realigned track within the Metrorail Reservation but not station facilities, so the Metrorail
 2686 Reservation area was not excluded from the parkland impacts for these alternatives.

2687 3.10.2 Affected Environment

2688 **Figure 3-77** shows publicly accessible parkland, recreation areas, and open space within the study area, which
 2689 are described in **Table 3-26**.

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2691

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)

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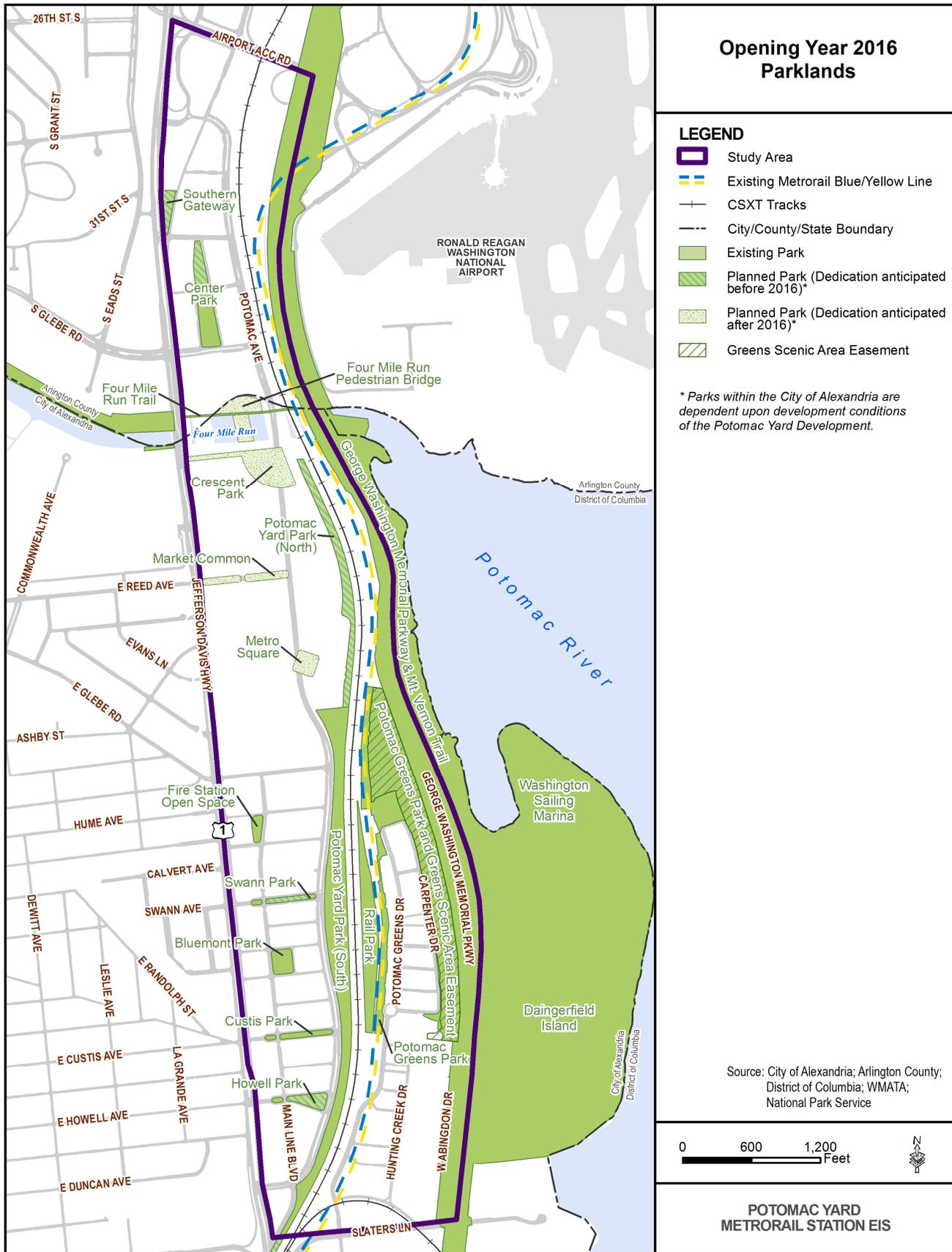
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¹ Area within the Study Area.² Area in parentheses refers to the Greens Scenic Area easement.³ Area includes land within the Metrorail Reservation area.⁴ Area is estimated based on current plans.

* Planned parks within the City of Alexandria are dependent upon the development conditions of the Potomac Yard development.

2698 **Figure 3-77: Opening Year 2016 Parklands**



2700 **3.10.3 Environmental Consequences**

2701 **3.10.3.1 No Build Alternative**

2702 No impact to parkland is anticipated as a result of the No Build Alternative.

2703 **3.10.3.2 Build Alternatives**

2704 **Figure 3-78** shows the three Build Alternatives and B-CSX Design Option in relation to parklands, and **Table 3-**
 2705 **27** summarizes potential parkland impacts by each alternative. Types of potential impacts to parklands include
 2706 permanent impacts by project facilities located within park property. Temporary impacts due to construction are
 2707 discussed in **Section 3.24 Construction Impacts**.

2708 All three Build Alternatives and B-CSX Design Option would impact Potomac Yard Park (southern portion) and
 2709 Potomac Greens Park, which were required as part of the South Potomac Yard development approvals. The
 2710 parks were implemented through Development Special Use Permits (DSUP). Therefore, any significant
 2711 alterations to either park (including the construction of station pedestrian bridge landings) would require an
 2712 amendment to its DSUP by the City of Alexandria. This process would involve the input of several City advisory
 2713 groups, including the Park and Recreation Commission, which would convey its recommendations to the
 2714 Planning Commission and City Council for approval.

2715 **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

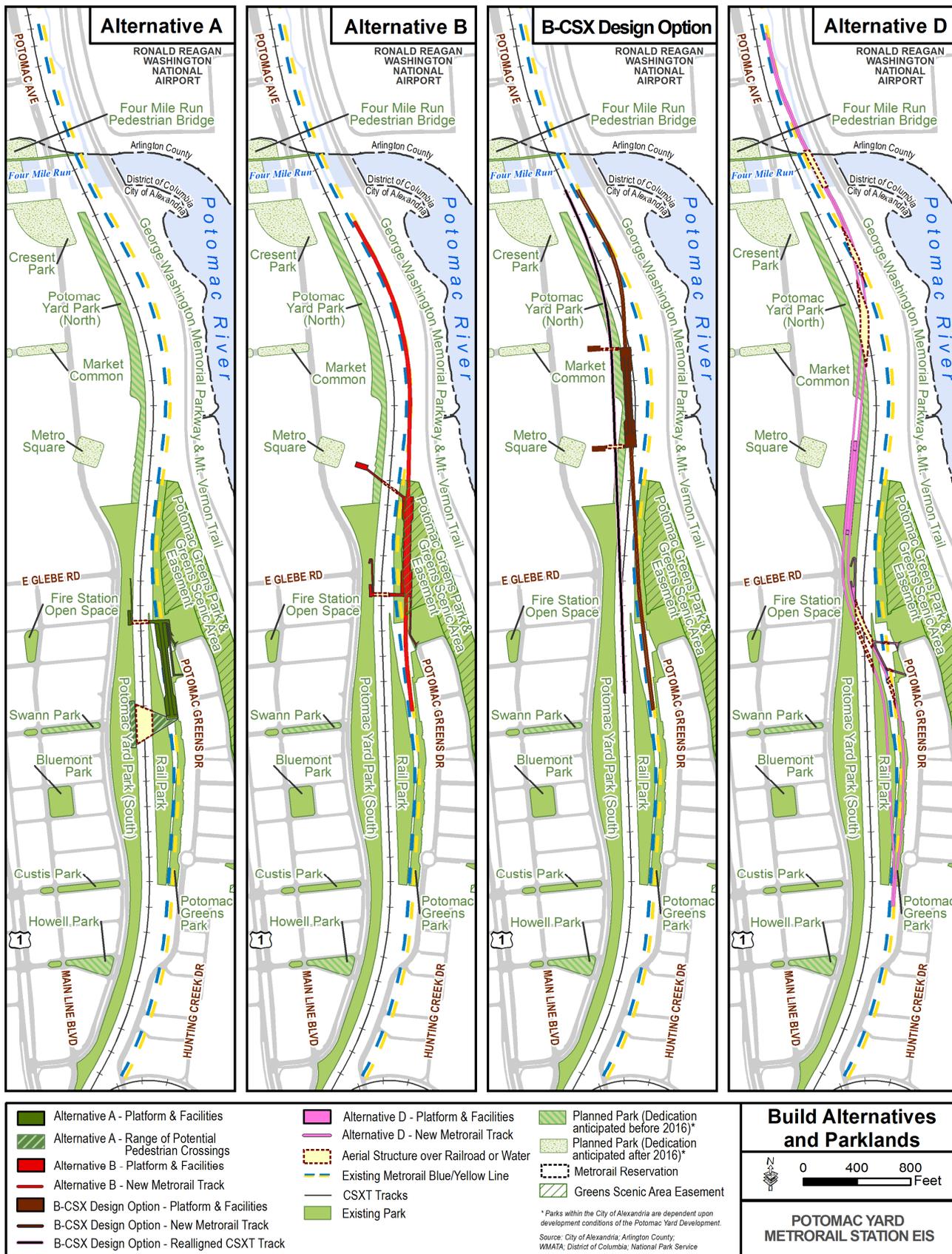
2716 ¹ Area in parentheses refers to impacts to the Greens Scenic Area easement.

2717 ² Estimated acreage is approximate, as the configuration and location of the southern pedestrian bridge landing and entrance pavilion will be
 2718 determined at a later design phase.

2719 ³ Total NPS parkland property acquisitions do not include the Greens Scenic Area easement acreages.

2720

2721 **Figure 3-78: Build Alternatives and Parklands**



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2723

2724 3.10.3.3 Build Alternative A

2725 Build Alternative A would require the acquisition of 0.71 acre of Potomac Greens Park, 0.45 acre of the southern
2726 portion of Potomac Yard Park, and less than 0.01 acre of Rail Park. These acreages do not include land within
2727 the Metrorail Reservation area.

2728 For Build Alternative A, impacts related to the acquisition of Potomac Greens Park property include the removal
2729 of existing vegetation, pedestrian paths, open space, and a seating area. Impacts related to the acquisition of
2730 the southern portion of Potomac Yard Park to accommodate the pedestrian bridges include removing areas that
2731 contain pedestrian paths, playgrounds, and seating areas. Impacts related to the acquisition of the Rail Park
2732 include the removal of existing vegetation.

2733 3.10.3.4 Build Alternative B

2734 Build Alternative B would require the acquisition of 0.16 acre of the GWMP, 2.54 acres of Potomac Greens
2735 Park, 1.71 acres of the Greens Scenic Area easement, and a total of 0.47 acre across the southern and
2736 northern portions of Potomac Yard Park.

2737 For Build Alternative B, impacts related to the acquisition of GWMP property include the removal of existing
2738 vegetation. Impacts related to the acquisition of Potomac Greens Park and Greens Scenic Area easement
2739 property include the removal of existing vegetation, pedestrian paths, open space, and a seating area. Impacts
2740 related to the acquisition of the northern and southern portions of Potomac Yard Park to accommodate aerial
2741 bridge include the pedestrian bridges include removing areas that contain pedestrian paths, playgrounds, and
2742 seating areas.

2743 3.10.3.5 B-CSX Design Option

2744 B-CSX Design Option would require the acquisition of 0.10 acre of Potomac Greens Park and a total of 3.76
2745 acres across the southern and northern portions of Potomac Yard Park.

2746 For B-CSX Design Option, impacts related to the acquisition of Potomac Greens Park property to accommodate
2747 the pedestrian bridges include the removal of existing vegetation and pedestrian paths. Impacts related to the
2748 acquisition of the southern and northern portions of Potomac Yard Park to accommodate realigned CSXT tracks
2749 include removing areas that contain pedestrian paths, playgrounds, and seating areas. Impacts related to the
2750 acquisition of the Rail Park include the removal of existing vegetation.

2751 3.10.3.6 Build Alternative D

2752 Build Alternative D would require the acquisition of 1.43 acres of the GWMP, 1.21 acres of Potomac Greens
2753 Park, 1.55 acres of the Rail Park, and a total of 2.62 acres across the southern and northern portions of
2754 Potomac Yard Park.

2755 For Build Alternative D, impacts related to the acquisition of GWMP property include the removal of existing
2756 vegetation. Impacts related to the acquisition of Potomac Greens Park property include the removal of existing
2757 vegetation, pedestrian paths, open space, and a seating area. Impacts related to the acquisition of the Rail Park
2758 include the removal of existing vegetation. Impacts related to the acquisition of the northern and southern
2759 portions of Potomac Yard Park to accommodate the pedestrian bridges include removing areas that contain
2760 pedestrian paths, playgrounds, and seating areas.

2761 3.10.4 Mitigation Measures

2762 3.10.4.1 Build Alternative A

2763 The partial acquisition of the Rail Park and Potomac Greens Park could be mitigated by replacing impacted park
2764 features, vegetation, and landscaping. The station elements could be designed to integrate with the parks, and
2765 park facilities could be redesigned as necessary in conjunction with the replacement of park infrastructure in Rail
2766 Park, Potomac Greens Park, and Potomac Yard Park. The property deed for the existing southern portion of
2767 Potomac Yard Park includes language that stipulates that Metrorail station uses within the specified pedestrian
2768 bridge landing site are permitted. Alterations to Potomac Greens Park and Potomac Yard Park would require an
2769 amendment to its DSUP.

2770 The visual impacts to GWMP and Mount Vernon Trail, Potomac Greens Park and the Greens Scenic Area
2771 easement, Rail Park, and Potomac Yard Park could be partially mitigated through landscaping and vegetation
2772 plans. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual Resources**.

2773 3.10.4.2 Build Alternative B

2774 Build Alternative B would partially acquire the GWMP and Greens Scenic Area easement and could not proceed
 2775 unless the easement and land is released by NPS. Since Build Alternative B requires a land exchange with NPS
 2776 or impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal
 2777 value exchange in property or interest in property and need to be approved by NPS and completed as required
 2778 by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions**
 2779 **and Displacements** and **Section 3.9 Cultural Resources**.

2780 The partial acquisition of Potomac Yard Park could be mitigated by designing station elements to integrate with
 2781 the parks and replace park facilities. The property deed for the existing southern portion of Potomac Yard Park
 2782 includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site
 2783 are permitted, and the planned northern portion of the park is anticipated to include a similar provision in the
 2784 property dedication to the City of Alexandria. The permanent use of Potomac Greens Park could be mitigated by
 2785 redesigning park facilities as necessary in conjunction with the replacement of park infrastructure. Alterations to
 2786 Potomac Yard Park and Potomac Greens Park would require an amendment to its respective DSUP.

2787 The visual impacts to the GWMP and Mount Vernon Trail, Potomac Greens Park and Greens Scenic Area
 2788 easement, and Potomac Yard Park could be partially mitigated through landscaping and vegetation plans.
 2789 Impacts to the GWMP and Mount Vernon Trail and Greens Scenic Area easement would be partially mitigated
 2790 through plans in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties*
 2791 and *Guidelines for the Treatment of Cultural Landscapes*. Additional discussion of visual impacts and mitigation
 2792 are discussed in **Section 3.8 Visual Resources**.

2793 3.10.4.3 B-CSX Design Option

2794 B-CSX Design Option would require the acquisition of most of the land area being allocated to the northern
 2795 portion of Potomac Yard Park. Only 0.35 acre of park land associated with northern portion of Potomac Yards
 2796 Park would not be impacted, but the remaining acreage would be separated into non-contiguous segments due
 2797 to the CSXT and Metrorail corridors bisecting the park. The acquisition of Potomac Yard Park could be mitigated
 2798 by designing station elements to integrate with the parks and replacing park facilities and park land. The
 2799 property deed for the existing southern portion of Potomac Yard Park includes language that stipulates that
 2800 Metrorail station uses within the specified pedestrian bridge landing site are permitted, and the planned northern
 2801 portion of the park is anticipated to include a similar provision in the property dedication to the City of
 2802 Alexandria. Alterations to Potomac Yard Park and Potomac Greens Park would require an amendment to its
 2803 respective DSUP.

2804 The visual impacts to Potomac Greens Park and Potomac Yard Park could be partially mitigated through
 2805 landscaping and vegetation plans. Additional discussion of visual impacts and mitigation are discussed in
 2806 **Section 3.8 Visual Resources**.

2807 3.10.4.4 Build Alternative D

2808 Build Alternative D would partially acquire the GWMP and could not proceed unless the land is released by
 2809 NPS. Since Build Alternative D requires a land exchange with NPS, the transfer would be subject to an equal
 2810 value exchange in property or interest in property and need to be approved by NPS and completed as required
 2811 by Federal law (54 U.S.C. 102901). The land exchange process is described in **Section 3.3 Land Acquisitions**
 2812 **and Displacements** and **Section 3.9 Cultural Resources**. The partial acquisition of Potomac Yard Park could
 2813 be mitigated by redesigning the park. The property deed for the existing southern portion of Potomac Yard Park
 2814 includes language that stipulates that Metrorail station uses within the specified pedestrian bridge landing site
 2815 are permitted, and the planned northern portion of the park is anticipated to include a similar provision in the
 2816 property dedication to the City of Alexandria. The partial acquisition of Potomac Greens Park and Rail Park
 2817 could be mitigated by designing station elements to integrate into the parks and redesigning park facilities as
 2818 necessary in conjunction with the replacement of park infrastructure. Alterations to Potomac Yard Park and
 2819 Potomac Greens Park would require an amendment to its respective DSUP.

2820 The visual impacts to GWMP, Potomac Greens Park and Greens Scenic Area easement, Rail Park, and
 2821 Potomac Yard Park could be partially mitigated through landscaping and vegetation plans. Impacts to GWMP
 2822 and Greens Scenic Area easement would be partially mitigated through plans in accordance with the Secretary
 2823 of the Interior's *Standards for Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural*
 2824 *Landscapes*. Additional discussion of visual impacts and mitigation are discussed in **Section 3.8 Visual**
 2825 **Resources**.

2826 3.11 Air Quality

2827 This section assesses the potential impacts to air quality resulting from the construction and operation of the
 2828 alternatives. “Air pollution” is a general term that refers to one or more chemical substances that degrade the
 2829 quality of the atmosphere. The pollutants that are most relevant to the project are those principally traceable to
 2830 motor vehicle engines and electrical power plants. The air quality assessment identified pollutant exceedances
 2831 as well as the potential changes in greenhouse gas (GHG) emissions measured by Vehicle Miles Traveled
 2832 (VMT) from vehicular trips under each of the alternatives. The reduction in VMT indicates the degree to which
 2833 the alternatives would contribute positively to air quality. The analysis is described in more detail in the *Air*
 2834 *Quality Technical Memorandum*, in Volume II.

2835 The air quality assessment was prepared in accordance with NEPA and guidelines set forth in the *Clean Air Act*
 2836 (CAA). The Virginia State Implementation Plan (SIP), developed in accordance with the CAA, contains the major
 2837 state-level requirements with respect to transportation in general. Any project constructed in the Commonwealth
 2838 of Virginia must comply with the National Ambient Air Quality Standards (NAAQS), a set of standards
 2839 established by USEPA under the authority of the CAA for various “criteria” air pollutants.

2840 The CAA requires USEPA to specify geographic areas of the country that have measured pollutant
 2841 concentrations exceeding the levels prescribed by the NAAQS, termed “non-attainment areas”. The study area
 2842 is located in the USEPA-defined Metropolitan Washington Air Quality Designation Area, which is currently
 2843 designated as a moderate non-attainment area for 8-hour ozone (O₃) and non-attainment area for annual
 2844 average particulate matter less than 2.5 microns (PM_{2.5}). However, the metropolitan Washington area is in
 2845 attainment for all other criteria pollutants including carbon monoxide (CO), particulate matter less than 10
 2846 microns (PM₁₀), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb).

2847 3.11.1 Methodology

2848 Opening year conditions were evaluated using data from Virginia Department of Environmental Quality (VDEQ)
 2849 air quality monitoring stations identified in the study area vicinity. VDEQ maintains an area-wide network of
 2850 monitoring stations that routinely measure pollutant concentrations in the ambient air. These stations provide
 2851 data to assess air quality compliance with the NAAQS proximate to the project study area and to evaluate the
 2852 effectiveness of pollution control strategies. The closest monitoring stations include:

- 2853 • **Site M1:** Pentagon City area (Station Number 47-T; USEPA ID 51-013-0020; Aurora Hills Visitor Center,
 2854 Arlington County);
- 2855 • **Site M2:** Old Town Alexandria area (Station Number L-126-C; USEPA ID 51-510-0009; City of Alexandria
 2856 Health Department); and
- 2857 • **Site M3:** Eastern Fairfax County (Station Number 46-B9; USEPA ID 51-059-0030; Lee District Park, Fairfax
 2858 County).

2859 To estimate changes in GHG emissions from vehicular trips under the No Build Alternative, the three Build
 2860 Alternatives, and B-CSX Design Option, the numbers of vehicle trips and VMT were estimated using the
 2861 MWCOG regional travel model (Version 2.3) as part of the separate travel demand analysis for the project (see
 2862 the *Transportation Technical Memorandum*, Volume II). By using an average per-mile emission factor, changes
 2863 to CO₂ emissions can be estimated from the difference in VMT. Relative differences in VMT were compared to
 2864 the regional total to determine if the effects of the project on regional GHG emissions would be substantial.

2865 3.11.2 Affected Environment

2866 The eight-hour O₃ concentrations at Site M1 (Pentagon City) exceeded the limit of 0.075 ppm in 2011 and 2012
 2867 but did not exceed the limit in 2013 and 2014. Although the region is also currently in non-attainment for PM_{2.5},
 2868 concentrations at Site M1 did not exceed the 24-hour criterion limit of 35 µg/m³ or the annual average limit of 15
 2869 µg/m³ in any of the previous three years. Similarly, recent concentrations of PM₁₀, CO, and all of the other
 2870 pollutants are reported to be well below their respective standards for the three most recent years for which data
 2871 are available. These trends are expected to continue for the foreseeable future through the 2016 opening year.

2872 3.11.3 Environmental Consequences

2873 3.11.3.1 No Build Alternative

2874 The No Build Alternative is anticipated to have air quality conditions similar to existing conditions in the short
 2875 term.

2876 **3.11.3.2 Build Alternatives**

2877 Because none of the three Build Alternatives or B-CSX Design Option is expected to degrade overall
 2878 intersection LOS within the study area, the Potomac Yard Metrorail Station is not a project of local air quality
 2879 concern under 40 CFR 93.123(b)(1), and no potential beneficial or adverse impacts are expected on regional air
 2880 quality. The project is included in the National Capital Region Transportation Planning Board 2012 Financially
 2881 Constrained Long-Range Transportation Plan. Therefore, the project meets statutory and regulatory
 2882 transportation conformity requirements without a hot-spot analysis.

2883 **Greenhouse Gas Emissions**

2884 **Table 3-28** lists the opening year regional average weekday VMT for the No Build Alternative, the three Build
 2885 Alternatives, and B-CSX Design Option. At the regional level, the Build Alternatives would result in slight
 2886 decreases in VMT (approximately 2,500 fewer weekday VMT out of 106,258,400 total regional VMT) and in
 2887 vehicle trips (600 fewer weekday vehicle trips out of 13,553,000 total regional trips), relative to the No Build
 2888 Alternative as a result of personal automobile trips diverted to transit. As the difference in total vehicle trips and
 2889 VMT at the regional level is insignificant, there would be no substantial impact on GHG emissions by the three
 2890 Build Alternatives or B-CSX Design Option.

2891 **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)

2892 Source: Project travel demand forecasting, Potomac Yard Metrorail Station EIS Transportation Technical Memorandum, 2012.

2893 **3.11.4 Mitigation Measures**

2894 As no additional air pollutant emissions are expected beyond the No Build opening year conditions, no
 2895 mitigation is proposed.

2896

2897 3.12 Noise & Vibration

2898 This section describes potential noise and vibration impacts of the alternatives. Noise is “unwanted sound” and,
 2899 by this definition, the perception of noise is a subjective process; however, Federal guidelines for noise
 2900 assessment exist and are described in the following methodology section. Several factors affect the actual level
 2901 and quality of sound (or noise) as perceived by the human ear and can generally be described in terms of
 2902 loudness, pitch (or frequency), and time variation. The loudness, or magnitude, of noise determines its intensity
 2903 and is measured in decibels (dB) that can range from below 40 dB (e.g. the rustling of leaves) to over 100 dB
 2904 (e.g. a rock concert).

2905 Unlike noise, which travels in air, transit vibration typically travels along the surface of the ground. Ground-borne
 2906 vibration associated with vehicle movements is usually the result of uneven interactions between wheels and the
 2907 road or rail surfaces. Examples of such interactions (and subsequent vibrations) include train wheels over a
 2908 jointed rail, rail car wheel with “flats,” and a motor vehicle wheel hitting a pothole, a manhole cover, or any other
 2909 uneven surface.

2910 The noise and vibration assessment was prepared in accordance with NEPA and guidelines set forth in the
 2911 following guidance:

- 2912 • **Transit Noise and Vibration Impact Assessment (FTA, 2006):** The future predicted noise and vibration
 2913 levels from the project were evaluated using both the FTA guidelines; and
- 2914 • **Manual of Design Criteria for Maintaining and Continued Operation of Facilities and Systems**
 2915 **(WMATA, 2010):** While the FTA criteria are used to evaluate cumulative noise exposure (such as the day-
 2916 night noise level over 24-hours), the WMATA criteria are used to evaluate instantaneous levels from single
 2917 events (such as a single Metrorail pass-by).

2918 The analysis is described in more detail in the *Noise and Vibration Technical Memorandum*, in Volume II.

2919 3.12.1 Methodology

2920 3.12.1.1 Noise

2921 For each of the three Build Alternatives, both the FTA criterion and WMATA criterion were applied to assess
 2922 potential impacts. The reference noise levels for each of the proposed noise sources (such as Metrorail pass-
 2923 bys) and other operating characteristics (such as average train dwell times at the station and height of the noise
 2924 source) were used to predict future project noise levels at nearby sensitive receptors. These levels are based on
 2925 default FTA data as well as information included in recent WMATA projects (such as the *Dulles Corridor Rapid*
 2926 *Transit Project, Phase II*, May 2012). A total of 34 noise-sensitive receptors were identified in the project area
 2927 that could be affected by the project (see **Figure 3-79**).

2928 To determine the existing background noise levels at sensitive receptors in the vicinity of the proposed Metrorail
 2929 Station, a noise-monitoring program was conducted at four representative locations shown in **Figure 3-73** and
 2930 described in **Table 3-29**. Sites for noise monitoring stations were chosen to cover existing residential
 2931 neighborhoods (Potomac Greens and Lynhaven), existing parks (Potomac Greens Park), and planned/under
 2932 construction residential neighborhoods (South Potomac Yard) near the proposed project site.

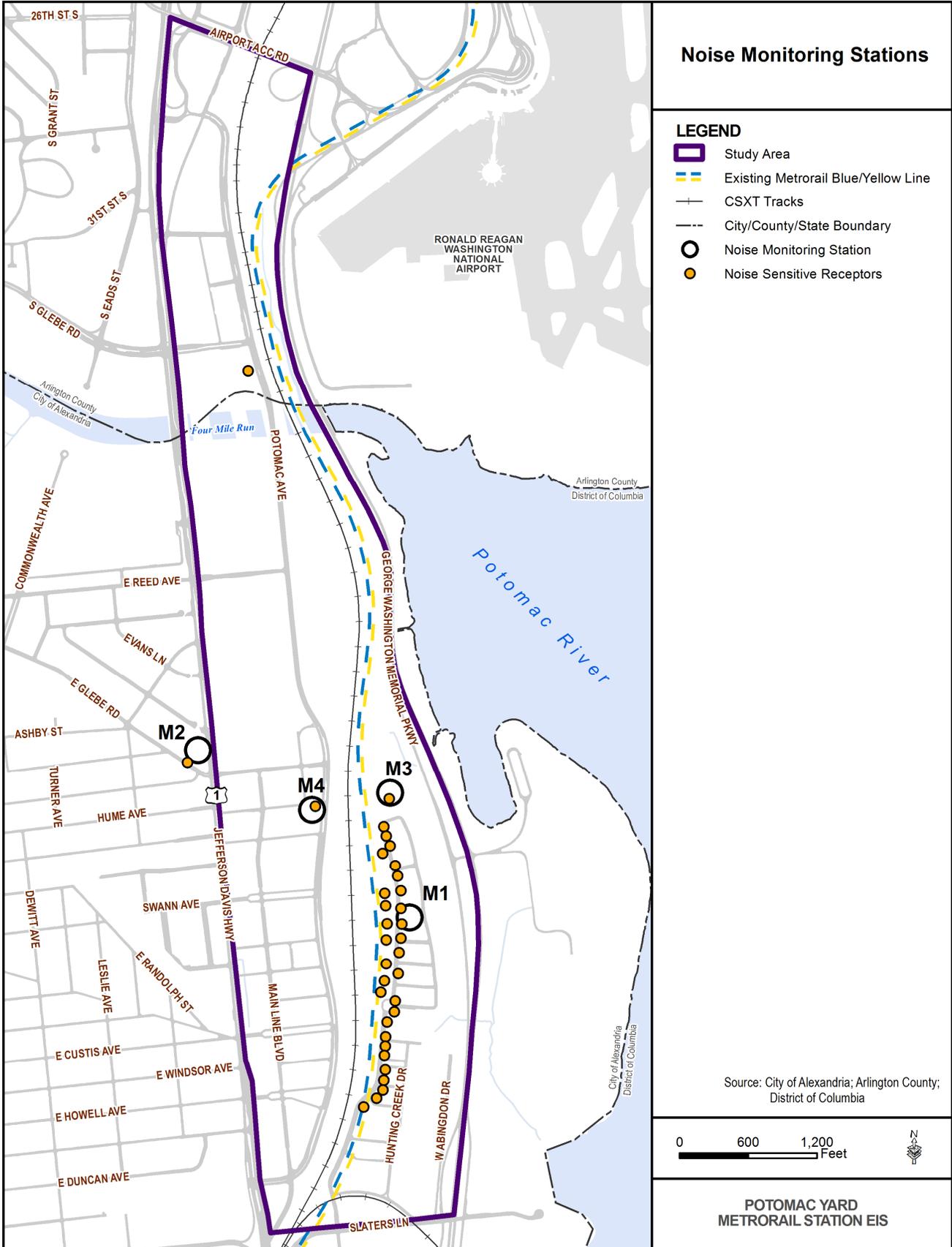
2933 Project elements of B-CSX Design Option (relocated Metrorail and freight rail tracks, new Metrorail track
 2934 crossover, and the station facility) would be moved farther away from sensitive noise and vibration receptors
 2935 than those of the other Build Alternatives. Thus, B-CSX Design Option would have no additional noise or
 2936 vibration impacts above the No Build Alternative as measured by FTA and WMATA criteria.

2937 **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

2938

2939 Figure 3-79: Noise Monitoring Stations



2940

2941 **FTA Criteria:** Transit noise impacts are assessed based on land use categories and sensitivity to noise from
 2942 transit sources under the FTA guidelines. The FTA land use categories and required noise metrics are
 2943 described in **Table 3-30**. The FTA noise criteria are delineated into two categories: *moderate* and *severe*
 2944 impact. The *moderate* impact threshold defines areas where the change in noise is noticeable but may not be
 2945 sufficient to cause a strong, adverse community reaction. The *severe* impact threshold defines the noise limits
 2946 above which a significant percentage of the population would be highly annoyed by new noise.

2947 **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 amphitheatres, 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.

2948 ¹ $L_{eq}(h)$ = Average hourly equivalent noise level;

2949 ² L_{dn} = 24-hour day-night noise level.

2950 Source: FTA, 2006.

2951 **WMATA Criteria:** Noise limits for transit lines are based on the maximum level that would not cause significant
 2952 intrusion or alteration of the pre-existing noise environment and represent noise levels which are considered
 2953 acceptable for the type of land use in each area (see **Table 3-26**). Residential receptors in the study area
 2954 consist of multi-family residences in high-density or mixed-use commercial development; therefore, the WMATA
 2955 criterion of 80 A-weighted decibel (dBA) was used to evaluate maximum pass-by noise impacts from train pass-
 2956 bys.

2957 3.12.1.1 Vibration

2958 Unlike noise, which is assessed using cumulative noise levels over one-hour and 24-hour periods, transit
 2959 vibration impacts are assessed based on individual events, such as a train pass-by. All predicted vibration levels
 2960 were compared with the FTA significant increase criterion of 3 VdB and the WMATA vibration criteria to assess
 2961 the onset of impact. Based on the land uses identified in the vicinity of the proposed project, the maximum
 2962 acceptable level under the WMATA design criterion for evaluating ground-borne vibration impacts from train
 2963 pass-bys at all residences is 75 VdB. For consistency, transit vibration levels were predicted at the same
 2964 receptor locations as for the noise analysis. The appropriate vibration criteria for maximum ground-borne
 2965 vibration for various types of residential buildings apply to measurements of vertical vibration of floor surfaces
 2966 within the buildings.

2967 3.12.2 Affected Environment

2968 3.12.2.1 Noise

2969 Existing background noise levels are dominated by roadway and rail sources as well as aircraft take-offs and
 2970 landings at Ronald Reagan Washington National Airport. The existing peak-hour average noise levels (L_{eq})
 2971 measured in the vicinity of the project range from 60 dBA within South Potomac Yard to 72 dBA at single- and
 2972 multi-family residences along East Glebe Road near U.S. Route 1. Similarly, the 24-hour day-night noise levels
 2973 (L_{dn}) range from 62 dBA to 72 dBA at these sites. As no major new sources of noise will be introduced between
 2974 now and 2016, the future noise levels are expected to remain approximately the same in the Opening Year of
 2975 2016 as the current conditions.

2976 3.12.2.2 Vibration

2977 Current ambient vibration levels are from existing CSXT freight train operations, Metrorail pass-bys and
 2978 vehicular traffic, particularly heavy trucks. In accordance with accepted FTA practice, a General Assessment of
 2979 vibration did not include vibration measurements. Instead, the general assessment identified existing vibration
 2980 sources, plus new vibration sources that would be introduced as part of the project. As no new sources of
 2981 vibration will be introduced between now and 2016, the future vibration levels in the Opening Year of 2016 are
 2982 expected to remain the same as the current conditions.

2983 3.12.3 Environmental Consequences

2984 3.12.3.1 No Build Alternative

2985 Noise

2986 Future noise levels under the No Build Alternative are anticipated to be similar to those under existing conditions
 2987 (see **Figure 3-74**). Predicted exceedances under the No Build Alternative do not represent a change in noise
 2988 levels from current conditions because there is no change in Metrorail operations between existing condition
 2989 and No Build Alternative.

- 2990 • **FTA Criteria:** No FTA noise impacts are expected under the No Build Alternative.
- 2991 • **WMATA Criteria:** Modeled maximum noise levels from Metrorail pass-bys would exceed the WMATA
 2992 criterion of 80 dBA at seven multi-family residences in the Potomac Greens development under the No Build
 2993 Condition.

2994 Vibration

2995 Because no project components or design elements are proposed under the No Build Alternative, the alternative
 2996 would not cause any new vibration impacts. No exceedance of the FTA vibration significant increase criterion of
 2997 3 VdB or WMATA vibration criterion of 75 VdB is predicted under the No Build Alternative (see **Figure 3-81**).

2998 3.12.3.2 Build Alternatives

2999 **Table 3-31** summarizes the noise impacts for Build Alternatives A, B and D using the FTA Criteria, and **Table 3-**
 3000 **32** summarizes the results using the WMATA Criteria. The tables show the existing ambient noise level,
 3001 estimated noise level for the No Build condition, estimated noise level for the Build Alternative, the change in
 3002 noise level compared to the No Build, and the threshold values for assessing impacts.

3003 Noise modeling was not conducted for B-CSX Design Option; however, this option would be located farther
 3004 away from sensitive noise and vibration receptors than all of the Build Alternatives, including Build Alternative B,
 3005 which would have no additional impacts than the No Build Alternative. Thus, B-CSX Design Option is expected
 3006 to have no additional noise or vibration impacts at sensitive receptors above the No Build Alternative as
 3007 measured by FTA and WMATA criteria.

3008 For the three Build Alternatives and B-CSX Design Option, other ancillary noise sources associated with the
 3009 proposed station, such as Metrorail door chimes, train conductor announcements, station public address
 3010 announcements, and brake noise, may be audible in the community as a new noise source but are not expected
 3011 to contribute to any exceedance or noise impact, as the ambient noise levels are significantly higher. As a result,
 3012 these ancillary sources were not included in the noise assessment but would be evaluated more closely during
 3013 final design when the station features are finalized, and would be mitigated, as appropriate.

3014 The noise and vibration impacts associated with each build alternative are further summarized in **Figures 3-80**
 3015 and **3-81** and described in Sections 3.12.3.3 through 3.12.3.6.

3016

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 Alternative		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

¹Land use types include single- or multi-family residences (Res) and parks (Park).

²FTA moderate impacts are bold and underlined.

³Since 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.

⁴Since 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.

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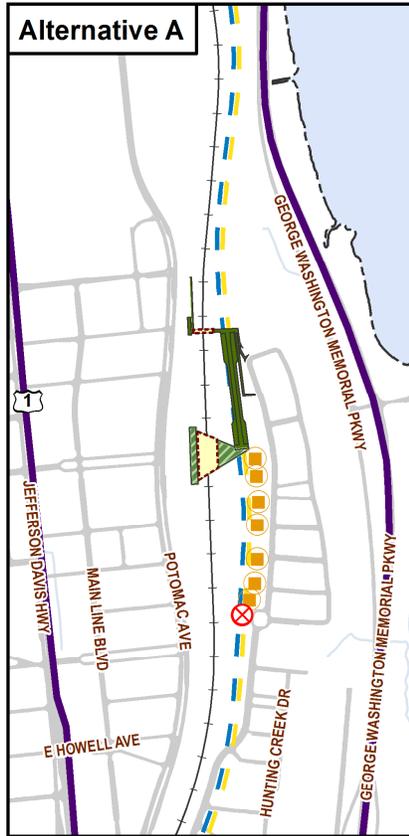
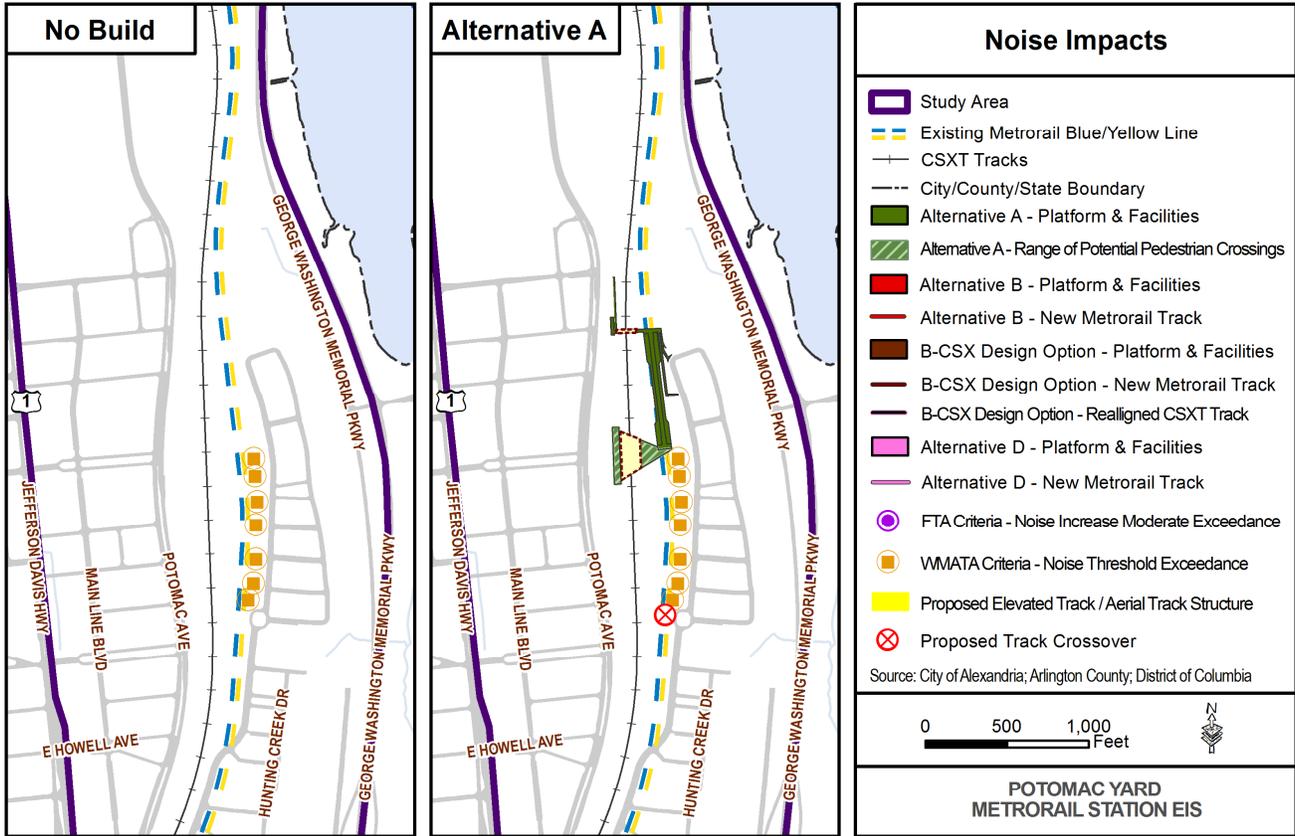
Table 3-32: Predicted Maximum Noise Levels from Metrorail Pass-bys at Representative Receptors Compared to WMATA Criteria for Impacts

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.

3026

3027 Figure 3-80: Noise Impacts



Noise Impacts

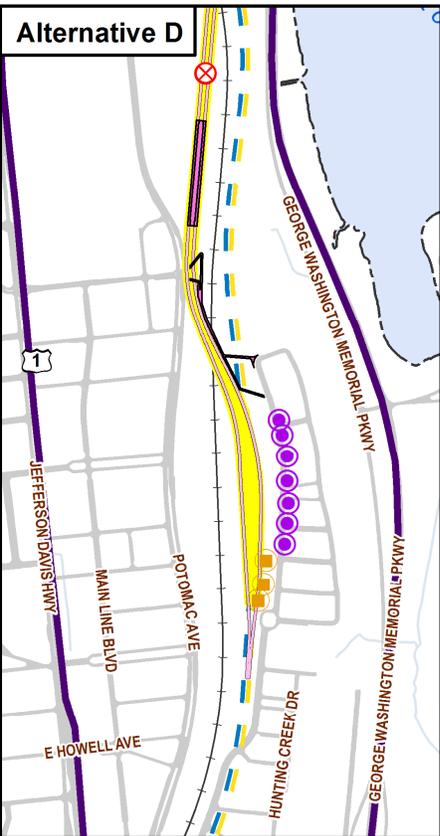
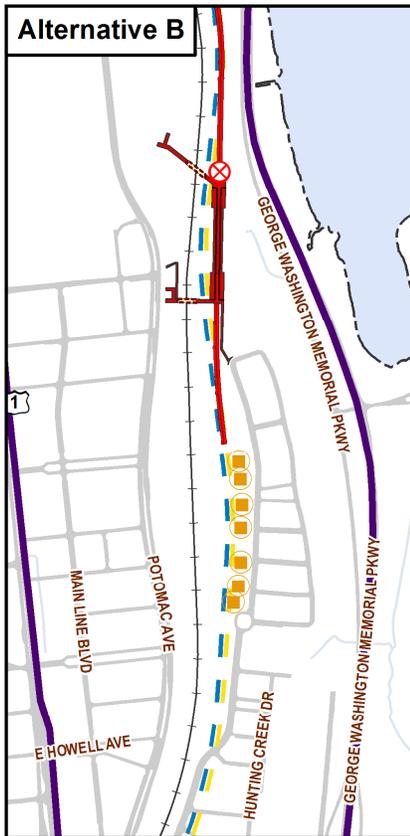
- Study Area
- Existing Metrorail Blue/Yellow Line
- CSXT Tracks
- City/County/State Boundary
- Alternative A - Platform & Facilities
- Alternative A - Range of Potential Pedestrian Crossings
- Alternative B - Platform & Facilities
- Alternative B - New Metrorail Track
- B-CSX Design Option - Platform & Facilities
- B-CSX Design Option - New Metrorail Track
- B-CSX Design Option - Realigned CSXT Track
- Alternative D - Platform & Facilities
- Alternative D - New Metrorail Track
- FTA Criteria - Noise Increase Moderate Exceedance
- WMATA Criteria - Noise Threshold Exceedance
- Proposed Elevated Track / Aerial Track Structure
- Proposed Track Crossover

Source: City of Alexandria; Arlington County; District of Columbia

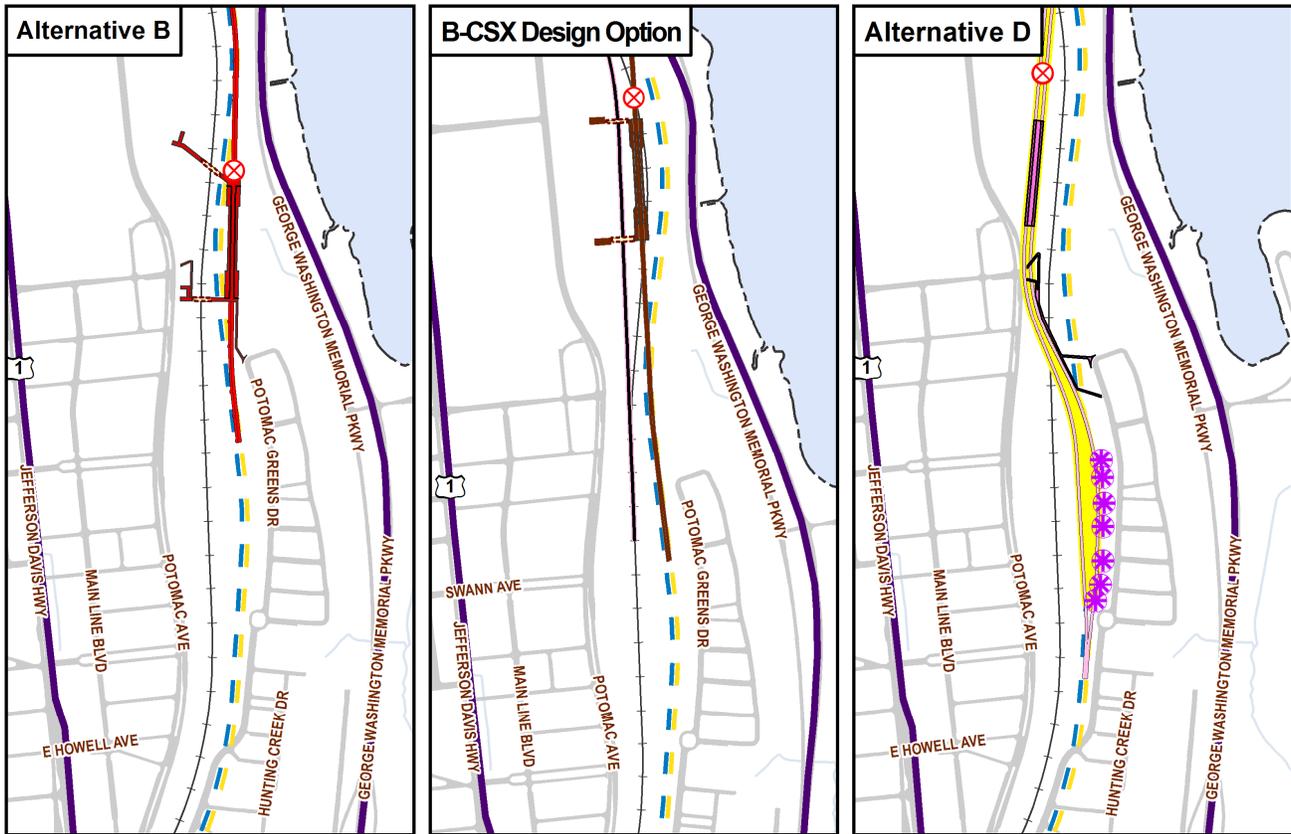
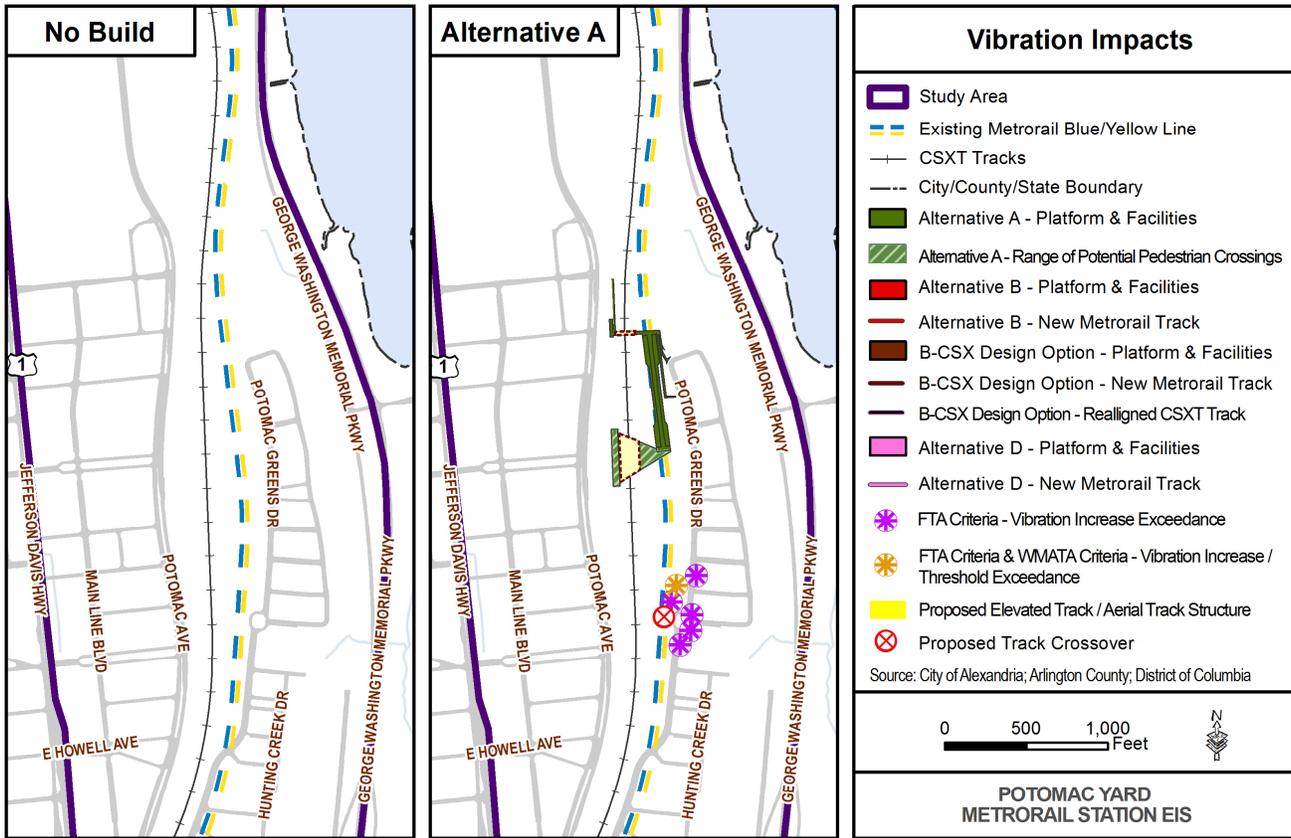
0 500 1,000 Feet

POTOMAC YARD METRORAIL STATION EIS

3028



3029 **Figure 3-81: Vibration Impacts**



3030

3031 **3.12.3.3 Build Alternative A**3032 **Noise**

- 3033 • **FTA Criteria:** No exceedances of the FTA *moderate* or *severe* impact criteria are predicted.
- 3034 Additionally, none of the project noise levels under Build Alternative A would exceed the FTA impact
- 3035 criteria at any FTA Category 3 receptors (parks and schools).
- 3036 • **WMATA Criteria:** Same as the No Build Alternative. Maximum pass-by noise levels from Metrorail
- 3037 operations are predicted to exceed the WMATA criterion of 80 dBA at seven multi-family residences in
- 3038 the Potomac Greens development under Build Alternative A. However, station and train public address
- 3039 announcements have the potential to impact residences in the Potomac Greens neighborhood.

3040 **Vibration**

- 3041 • **FTA Criteria:** Although none of the vibration levels at the representative receptors would exceed the
- 3042 FTA criteria, vibration levels from Metrorail pass-bys over switches would exceed the FTA significant
- 3043 increase criterion of 3 VdB and minimum frequent criterion threshold of 72 VdB at six residences in
- 3044 Potomac Greens.
- 3045 • **WMATA Criteria:** Vibration levels from Metrorail operations under Build Alternative A are also
- 3046 predicted to exceed the WMATA design criterion of 75 VdB at one residence.

3047 **3.12.3.4 Build Alternative B**3048 **Noise**

- 3049 • **FTA Criteria:** No exceedances of the FTA *moderate* or *severe* impact criteria are predicted.
- 3050 Additionally, none of the project noise levels under Build Alternative B would exceed the FTA impact
- 3051 criteria at any FTA Category 3 receptors (parks and schools).
- 3052 • **WMATA Criteria:** Same as the No Build Alternative. Maximum pass-by noise levels from Metrorail
- 3053 operations are predicted to exceed the WMATA criterion of 80 dBA at seven multi-family residences in
- 3054 the Potomac Greens development under Build Alternative B.

3055 **Vibration**

- 3056 • **FTA Criteria:** Maximum vibration levels from Metrorail pass-bys under Build Alternative B would range
- 3057 from well below background levels to 62 VdB. None of the vibration levels at the representative
- 3058 receptors or elsewhere in the study area would exceed the FTA significant increase criterion of 3 VdB
- 3059 under Build Alternative B (see **Figure 3-80**).
- 3060 • **WMATA Criteria:** Vibration levels from Metrorail operations under Build Alternative B are also not
- 3061 predicted to exceed the WMATA design criterion of 75 VdB at any receptor locations.

3062 **3.12.3.5 B-CSX Design Option**

3063 Project elements of B-CSX Design Option (relocated Metrorail and freight rail tracks, new Metrorail track
 3064 crossover, and the station facility) would be moved farther away from sensitive noise and vibration receptors
 3065 than all of the Build Alternatives, including Build Alternative B, which would have no additional impacts than the
 3066 No Build Alternative. Thus, B-CSX Design Option is expected to have no additional noise or vibration impacts at
 3067 sensitive receptors above the No Build Alternative as measured by FTA and WMATA criteria.

3068 **3.12.3.6 Build Alternative D**3069 **Noise**

- 3070 • **FTA Criteria:** Seven exceedances of the FTA Category 2 (residential areas) *moderate* criteria are
- 3071 predicted under Build Alternative D; these residential sites would potentially be affected by the change
- 3072 in noise levels due to the elevated Metrorail alignment shifted closer to the Potomac Greens
- 3073 development. No exceedances of the FTA *severe* impact criteria are predicted. Additionally, none of the
- 3074 project noise levels under Build Alternative D would exceed the FTA impact criteria at any FTA Category
- 3075 3 (parks and schools) receptors.
- 3076 • **WMATA Criteria:** Build Alternative D is predicted to have three exceedances of the WMATA criterion.
- 3077 The Metrorail noise levels at these three sites were adjusted upward to reflect an aerial track alignment
- 3078 (+4 dBA) and adjusted downward to reflect shielding due to the solid trackside parapet wall (-7 dBA).
- 3079 The net difference in noise resulted in no impacts for these four sites.

3080 **Vibration**

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- **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.

3091 **3.12.4 Mitigation Measures**

3092 The proposed mitigation measures described below were investigated to determine their effectiveness in
3093 reducing the impacts. All proposed mitigation measures were found to reduce all project related impacts.

3094 For the three Build Alternatives and B-CSX Design Option, the potential noise impacts from station public
3095 address announcements and train announcements would be minimized by the following station design features:

- 3096
- 3097
- 3098
- 3099
- 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.

3100 **3.12.4.1 Build Alternative A**

3101 Both noise and vibration impacts are predicted for Build Alternative A. The following mitigation measures are
3102 proposed to eliminate noise and vibration criteria exceedances:

- 3103
- 3104
- 3105
- 3106
- 3107
- 3108
- 3109
- 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.

3110 **3.12.4.2 Build Alternative B**

3111 The following mitigation measure is proposed to eliminate noise impacts in the study area:

- 3112
- 3113
- Locating on-street bus stops for the station away from new residences to minimize noise impacts from idling buses.

3114 Since no vibration impacts are predicted, no vibration control measures are required.

3115 **3.12.4.3 B-CSX Design Option**

3116 Since no noise or vibration impacts are predicted, no noise or vibration control measures are required.

3117 **3.12.4.4 Build Alternative D**

3118 Both noise and vibration impacts are predicted for Build Alternative D. The following mitigation measures are
3119 proposed to eliminate noise and vibration impacts in the study area:

- 3120
- 3121
- 3122
- 3123
- 3124
- 3125
- 3126
- 3127
- 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.

3128 **3.13 Water Quality**

3129 This section identifies the study area water bodies and evaluates the potential impacts resulting from the project.
 3130 This water quality assessment identifies existing impaired waters, as defined by the Federal Clean Water Act
 3131 and state regulatory agencies, and calculates the increase in impervious surface from each of the alternatives.
 3132 The analysis of water resources was developed consistent with the following laws and regulations:

- 3133 • Clean Water Act of 1972;
- 3134 • Virginia Stormwater Management Act;
- 3135 • City of Alexandria, Environmental Management Ordinance (Article XIII of the Zoning Ordinance);
- 3136 • City of Alexandria Code, Erosion and Sediment Control (Sec. 5-4);
- 3137 • City of Alexandria Master Plan, Water Quality Management Supplement, 2001;
- 3138 • Arlington County Code, Erosion and Sediment Control (Chapter 57); and
- 3139 • Arlington County Code, Stormwater Detention (Chapter 60).

3140 The analysis is described in more detail in the *Water Resources Technical Memorandum*, in Volume II.

3141 **3.13.1 Methodology**

3142 The water quality analysis identified designated impaired streams in the study area using the Virginia
 3143 Department of Environment Quality (VDEQ) 305(b)/303(d) Water Quality Assessment Integrated Report. The
 3144 Clean Water Act (CWA) requires states to identify and develop a list of water bodies that are both impaired and
 3145 are not in attainment of water quality standards. The analysis reviewed existing water quality testing data within
 3146 the study area using National Pollutant Discharge Elimination System (NPDES) and Virginia Pollutant Discharge
 3147 Elimination System (VPDES) information for permit holders. The analysis also qualitatively assessed the
 3148 capacity for water resources with NPDES and VPDES permits to accommodate the project. Project impacts to
 3149 water quality were assessed by identifying anticipated point and non-point sources and operational impacts
 3150 such as oil or lubricant leakage, deicing chemicals, and long-term stormwater runoff.

3151 Impervious surface calculations were based on proposed impervious structures, which include the station
 3152 structures and platforms, aerial track structures, and pedestrian bridges. Areas of existing impervious surface,
 3153 such as asphalt parking lots, were subtracted from the estimate. The at-grade freight railroad track is not
 3154 considered an impervious surface and is not included in the calculation. Metrorail railroad track is considered an
 3155 impervious surface for the purposes of this analysis.

3156 **3.13.2 Affected Environment**

3157 **3.13.2.1 Designated Impaired Waters**

3158 Both the Potomac River and Four Mile Run are designated as impaired waters by USEPA and VDEQ. The
 3159 causes of impairments in Four Mile Run are high levels of *Escherichia coli* and polychlorinated biphenyl (PCB).
 3160 The section of the Potomac River adjacent to the study area contains elevated levels of bacteria and organic
 3161 compounds and adverse pH conditions. A water quality monitoring station is located on Four Mile Run, directly
 3162 west of the project study area, which monitors both the general quality of Four Mile Run and discharges from the
 3163 Arlington County Water Pollution Control Plant.

3164 A Total Maximum Daily Load (TMDL) plan was developed to regulate the total amount of pollutants that a water
 3165 body can assimilate and still adhere to USEPA's standards. TMDLs were approved for both Four Mile Run and
 3166 the Potomac River. Discharges of water to both water bodies are permitted through NPDES permits that
 3167 regulate the amount of pollutants discharged. Virginia regulates discharges to Four Mile Run using the VPDES;
 3168 while USEPA Region 3 regulates discharges directly into the Potomac River within the study area.

3169 Within the project study area, three major NPDES permits are applicable: GWMP, City of Alexandria storm
 3170 sewer, and Arlington County storm sewer. Additionally, individual sediment and erosion control plans for
 3171 construction within the study area would fall under the Construction Stormwater General Permit, which Virginia
 3172 holds for construction-related NPDES permits.

3173 **3.13.2.2 Stormwater Management**

3174 For the redevelopment of the Potomac Yard, the City of Alexandria requires the developer to provide a Water
 3175 Management Master Plan (WMMP) to coordinate water supply, stormwater, and wastewater systems for the
 3176 completed development. As parcels develop, the site plans are also required to employ small on-site Low
 3177 Impact Design (LID) techniques such as green roofs, rainwater harvesting, and bioretention to reduce the
 3178 amount of stormwater generated and reuse the remaining stormwater to the greatest extent possible.

3179 Developers of parcels within Potomac Yard have already begun implementing large-scale stormwater
 3180 management techniques, such as retention ponds and structural Best Management Practices (BMPs). The City
 3181 of Alexandria Department of Transportation and Environmental Services is responsible for approving all
 3182 proposed WMMPs. The stormwater runoff is treated to meet the water quality standards of the City of
 3183 Alexandria and Arlington County. All BMP facilities for Potomac Yard will be maintained privately, in accordance
 3184 with the provisions of Potomac Yard CDD #10 and CDD #19. WMATA will own and maintain any BMPs
 3185 constructed as part of the Metrorail station.

3186 Impervious surface calculations were based on proposed impervious structures, which include the station
 3187 structures and platforms, aerial track structures, and pedestrian bridges. Areas of existing impervious surface,
 3188 such as asphalt parking lots, were subtracted from the estimate. The at-grade railroad track is not considered an
 3189 impervious surface and was not included in the calculation. The impervious surface for Alternative D includes
 3190 new elevated tracks that would replace the existing tracks.

3191 **3.13.2.3 Water Quality Management**

3192 To guide City development policies, the *Water Quality Management Supplement* (2001) of the *City of Alexandria*
 3193 *Master Plan* classifies areas of the City with “constraints to development” based on potential impacts to water
 3194 quality that could occur as a result of development in these areas. Wetlands and stream buffer areas are
 3195 considered to be generally unsuitable for development, and floodplains and floodplain soils are considered to
 3196 have limited development potential that requires special consideration. The project study area contains
 3197 wetlands, floodplains, and stream buffer areas; these resources are described in their respective sections:
 3198 **Section 3.14, Waters of the United States (Wetlands), Section 3.15 Floodplains; and Section 3.16**
 3199 **Navigable Waterways and Coastal Zones** (this section addresses stream buffer areas, which are included in
 3200 Chesapeake Bay Preservation Areas).

3201 **3.13.3 Environmental Consequences**

3202 **3.13.3.1 No Build**

3203 No further impact or degradation to the quality of surface waters within the study area is anticipated beyond the
 3204 existing and planned projects.

3205 **3.13.3.2 Build Alternatives**

3206 The project is not anticipated to impact or degrade the quality of surface waters within the study area. The
 3207 station would connect to the existing municipal sanitary sewer system, which serves the Potomac Yard area.
 3208 Potential pollutants resulting from project activities include point and non-point sources, such as sewerage
 3209 generated by the station and operational impacts such as oil or lubricant leakage, and deicing chemicals. These
 3210 pollutants would be captured and treated using stormwater management techniques approved by the City of
 3211 Alexandria and Arlington County.

3212 **Table 3-33** lists the estimated net new impervious surface for each Build Alternative. The three Build
 3213 Alternatives would increase the amount of impervious surface and resulting stormwater runoff at the site beyond
 3214 the No Build condition. B-CSX Design Option would result in a slight net decrease in impervious surface from
 3215 the No Build condition. Although additional impervious surface and runoff would result from the three Build
 3216 Alternatives, the project would adhere to water quality performance management criteria set by the City of
 3217 Alexandria in accordance with Sec. 13-109(5) of the City Zoning Ordinance or by Arlington County in
 3218 accordance with Chapter 60 of the Arlington County Code, which control the rate and water quality of
 3219 stormwater runoff. These existing stormwater management plans and practices in the City of Alexandria and
 3220 Arlington County would minimize potential impacts from increases in impervious surface.

3221 **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

3222 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
 3223 replacement with freight railroad right-of-way for at-grade ballasted tracks.

3224 3.13.4 Mitigation

3225 As no water quality impact is anticipated beyond the No Build opening year conditions, no mitigation is
3226 proposed.

3227 3.14 Waters of the United States (Wetlands)

3228 This section assesses potential impact to Waters of the U.S. (WOUS) within the study area. WOUS include all
3229 waters, such as intrastate rivers, streams (including intermittent streams), wetlands, and natural ponds. WOUS
3230 are regulated by the United States Army Corps of Engineers (USACE) pursuant to Section 400/401 of the CWA.
3231 Virginia Department of Environmental Quality (VDEQ) regulates activities in state waters and wetlands under
3232 Section 401 of the CWA and Title 62.1 of the Code of Virginia. The Virginia Marine Resources Commission
3233 (VMRC) regulates activities on state-owned submerged lands, tidal wetlands, and dunes/beaches in accordance
3234 with Chapters 12, 13, and 14 of Title 28.2 of the Code of Virginia. NPS regulates WOUS on NPS property under
3235 NPS Director's Order 77-1; within the study area, this property includes the George Washington Memorial
3236 Parkway and the Greens Scenic Area easement.

3237 Both the USACE and NPS delineation methodologies were used to identify wetlands for the project area. As a
3238 result, wetlands were identified and categorized as follows:

- 3239 • **USACE Only:** WOUS and wetlands areas meet the criteria for wetlands consistent with USACE
3240 methodology and are not located on NPS parkland or land on which the NPS has a property interest.
- 3241 • **NPS Only:** Wetlands areas meet the criteria for wetlands consistent with the NPS methodology only,
3242 and are located on NPS parkland or land on which the NPS has a property interest.
- 3243 • **USACE and NPS:** Wetlands areas meet the criteria for wetlands consistent with both the USACE and
3244 NPS methodologies and are located on NPS parkland or land on which the NPS has a property interest.

3245 The analysis is described in more detail in the *Water Resources Technical Memorandum*, in Volume II.

3246 3.14.1 Methodology

3247 Wetlands within the study area were delineated by qualified environmental scientists through field reviews and
3248 GIS analysis. The wetland analysis methodology consisted of the following tasks:

- 3249 • **Regulatory agency coordination:** Regulatory agencies for the project include USACE, NPS, and
3250 VDEQ.
- 3251 • **Background research and preliminary field walk:** Available federal, state and local natural
3252 environmental data were used to assist in identification of study area wetlands and WOUS prior to the
3253 field delineation.
- 3254 • **WOUS and wetlands field delineation:** A delineation report for WOUS and wetlands was prepared
3255 consisting of soil sampling, vegetation surveys, and hydrologic indicator studies consistent with both
3256 USACE and NPS wetland delineation methodologies. While the USACE uses a three parameter
3257 approach where a wetland must have hydrophytic vegetation, hydric soils, and wetland hydrology to
3258 qualify as a wetland, NPS uses the Cowardin classification of wetlands. Under the Cowardin definition,
3259 a wetland must have one or more of the following three attributes:
 - 3260 ○ At least periodically, the land supports predominantly hydrophytes (wetland vegetation);
 - 3261 ○ The substrate is predominantly undrained hydric soil; or
 - 3262 ○ The substrate is non-soil and is saturated with water or covered by shallow water at some time
3263 during the growing season of each year.

3264 These three attributes encompass wetland areas that fall into five categories:

- 3265 1. Areas with hydrophytes and hydric soils, such as those commonly known as marshes, swamps,
3266 and bogs;
- 3267 2. Areas without hydrophytes but with hydric soils - for example, flats where drastic fluctuations in
3268 water level, wave action, turbidity, or high concentration of salts may prevent the growth of
3269 hydrophytes;
- 3270 3. Areas with hydrophytes but non-hydric soils, such as margins of impoundments or excavations
3271 where hydrophytes have become established but hydric soils have not yet developed;
- 3272 4. Areas without soils but with hydrophytes such as the seaweed-covered portion of rocky shores;
3273 and

- 3274 5. Wetlands without soil and without hydrophytes, such as gravel beaches or rocky shores without
 3275 vegetation.
- 3276 • **Preparation of a Jurisdictional Determination (JD) application package:** The JD application
 3277 includes site descriptions, procedural descriptions for the delineation, study findings, proposed wetland
 3278 boundaries, background information, map exhibits, and completed USACE data sheets.
 - 3279 • **Wetlands impact assessment:** The impact analysis was completed using GIS mapping by overlaying
 3280 the delineated wetland areas with the proposed temporary limits of construction (LOC) and permanent
 3281 limits of disturbance (LOD) for the three Build Alternatives and B-CSX Design Option.

3282 3.14.2 Affected Environment

3283 The WOUS and wetlands identified during the investigation are shown in **Figure 3-82**. The wetland delineation
 3284 using USACE criteria identified three wetlands on NPS lands or land on which NPS has a property interest, and
 3285 two WOUS in the study area outside of NPS land or land on which NPS has a property interest; the delineation
 3286 using NPS criteria identified eight wetlands in the study area within NPS land or land on which the NPS has a
 3287 property interest. **Table 3-34** summarizes the total area of study area WOUS and wetland areas under the
 3288 jurisdiction of USACE and NPS.

3289 The predominant types of wetlands identified within the study area are Palustrine Forested/Shrub Wetlands
 3290 (PFO) and Palustrine Emergent Wetlands (PEM) as defined by the guidance in *Classification of Wetlands and*
 3291 *Deepwater Habitats of the United States* (Cowardin et al. 1979). 11.5 acres of PEM wetlands and 4.2 acres of
 3292 PFO wetlands are located within the study area. A Palustrine system can generally be defined as all non-tidal
 3293 wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands
 3294 that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent.

3295 Based on a desktop review, a preliminary, qualitative assessment of wetland services and functions was
 3296 performed. The wetlands on-site likely provide some degree of flood protection from surface water detention and
 3297 the wetlands have some potential to abate a small degree of storm surge. The developed nature of the
 3298 surrounding landscape may increase the relative value of these storm-related services. The emergent wetlands
 3299 appear to serve some recreational function, evidenced by the existing walking path. The historical contamination
 3300 of the site combined with a known history of beaver activity, lends itself to poor recreational fishing services. The
 3301 fragmented nature of the site and its situation near major infrastructure contribute to poor wildlife habitat and
 3302 poor wildlife diversity aside from potential waterfowl and waterbirds using the nearby Potomac River. The
 3303 pervasive invasive species coverage throughout the PEM and PFO wetlands, combined with the continual
 3304 disturbance along the edge conditions of the ecosystem, contributes to a low likelihood of unique, uncommon, or
 3305 highly diverse wetland plant communities. No commercial products are provided from the wetlands. The PFO
 3306 and PEM wetlands likely serve some functions of nutrient transformation and retention of sediments and other
 3307 particulates. Once a preferred alternative is determined, the alternative will undergo a Function and Value
 3308 Assessment as required by NPS for the Wetlands Statement of Findings per Director's Order 77-1 and will also
 3309 be included in the Final EIS.

3310

3311 **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

3312 N/A = Not Applicable

3313 *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.

3314 **3.14.3 Environmental Consequences**

3315 **3.14.3.1 No Build Alternative**

3316 No effect to wetlands or WOUS is anticipated as a result of the No Build Alternative.

3317 **3.14.3.2 Build Alternatives**

3318 **Table 3-35** summarizes permanent wetland impacts for USACE, NPS, and USACE/NPS regulated WOUS and
 3319 wetlands. Temporary impact to wetlands is described in **Section 3.24 Construction Impacts**.

3320 **Table 3-35: Permanent Impacts to NPS and USACE Regulated Wetlands**

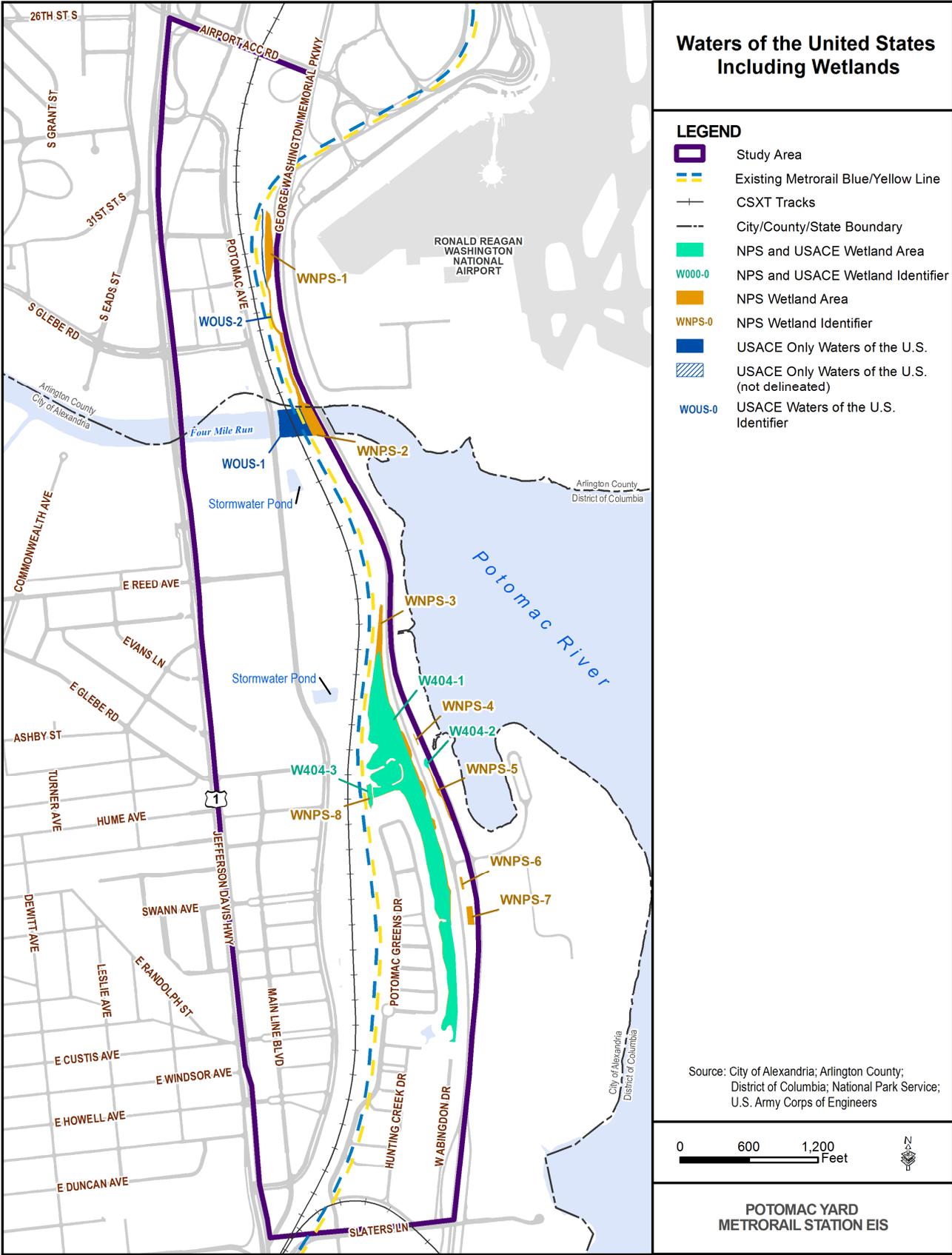
Alternative	USACE-only WOUS	NPS-only Wetlands (acres)	USACE and NPS Wetlands (acres) ¹	USACE Wetlands TOTAL (acres)	NPS Wetlands TOTAL (acres)
No Build	0.00	0.00	0.00	0.00	0.00
Build Alternative A	0.00	0.00	0.02	0.02	0.02
Build Alternative B	0.00	0.06	1.22	1.22	1.28
B-CSX Design Option	0.00	0.00	0.00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

3321 ¹Areas that are classified as wetlands by both USACE and NPS.

3322 ²WOUS impacts only.

3323

3324 Figure 3-82: Waters of the United States Including Wetlands



3325

3326 **Table 3-36** summarizes permanent impact to wetland and WOUS for each Build Alternative and Design Option.
 3327 Temporary impact to wetlands is described in **Section 3.24 Construction Impacts**. Based on a desktop review,
 3328 a preliminary qualitative assessment of impacts to wetland services and functions was performed. For wetland
 3329 impacts on NPS parkland and the Greens Scenic Area easement, the preferred alternative will undergo a
 3330 Function and Value Assessment as required for the Statement of Findings per DO 77-1 and will also be included
 3331 in the Final EIS.

3332 **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

3333 **Build Alternative A**

3334 Build Alternative A would impact 0.02 acre of delineated wetlands regulated by both USACE and NPS east of
 3335 the Metrorail tracks (see **Figure 3-83**).

3336 The impact of 0.02 acre of wetlands would not significantly alter the services or functions the wetlands on-site
 3337 due to the small impact footprint proposed.

3338 **Build Alternative B**

3339 Build Alternative B would permanently impact 1.28 acres of the wetland areas delineated east of the Metrorail
 3340 tracks, including 1.22 acres of wetland regulated by both USACE and NPS. Of the proposed permanent impacts
 3341 to wetlands regulated by both the USACE and the NPS, 0.88 acre are PEM and 0.34 acre are PFO. Build
 3342 Alternative B would not impact delineated WOUS. Alternative B would fill wetland areas and require a retaining
 3343 wall to accommodate the eastward shift of the Metrorail track alignment (see **Figure 3-83**).

3344 A preliminary, qualitative assessment of impacts to wetland services and functions was performed. The walking
 3345 path providing recreational services through the emergent wetlands would be eliminated. Through hydrology
 3346 and hydraulics modeling, appropriate BMPs would be installed to mitigate or improve the water retention,
 3347 nutrient transformation, and retention of sediments and other particulates. Impacts to waterfowl usage to this
 3348 particular section of wetlands are anticipated, but in the greater scheme of the watershed, the loss is likely
 3349 small.

3350 **B-CSX Design Option**

3351 B-CSX Design Option would not permanently impact any wetland regulated by either USACE or NPS or any
 3352 delineated WOUS (see **Figure 3-84**).

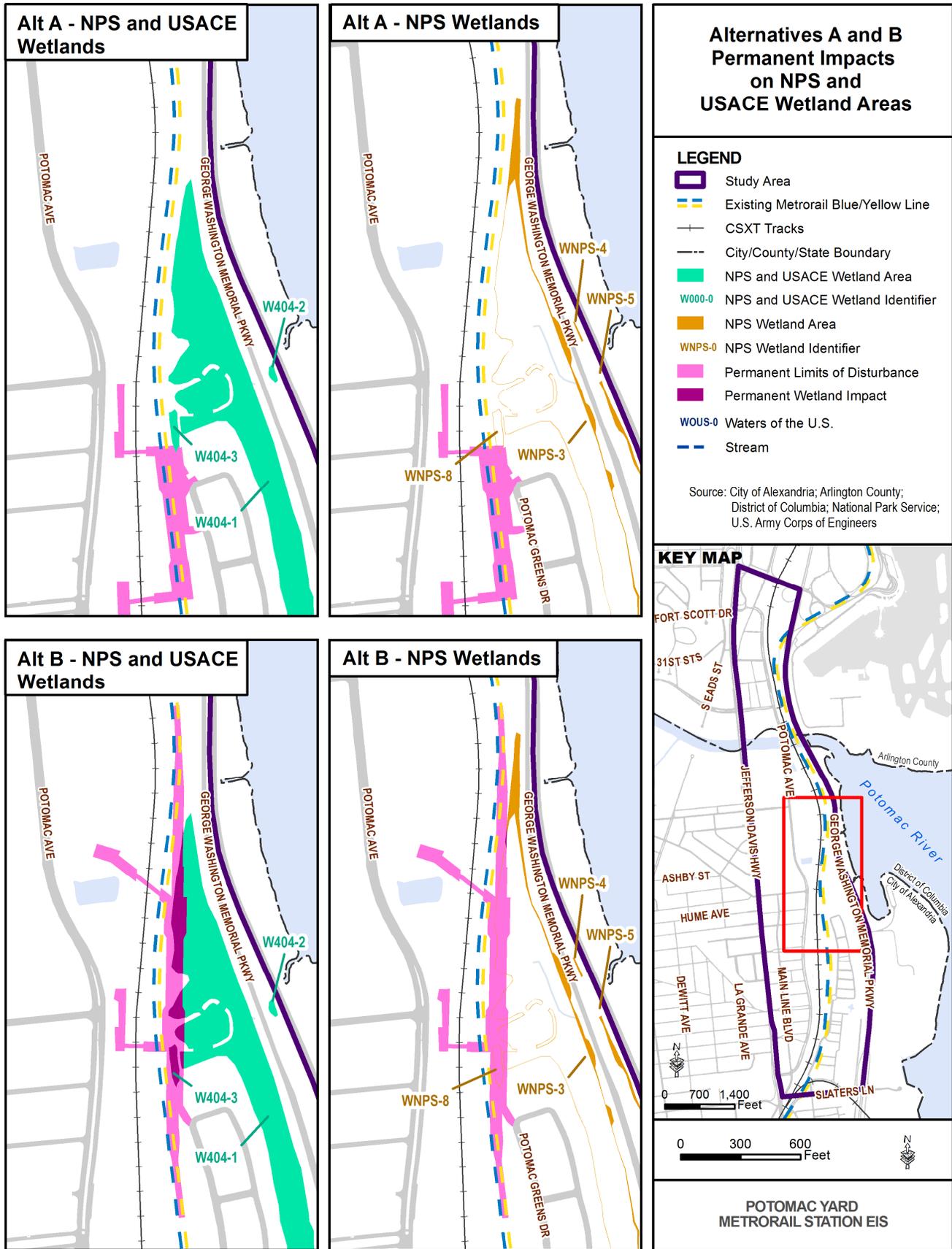
3353 **Build Alternative D**

3354 Build Alternative D would impact 0.56 acre of wetlands, including 0.52 acre of WOUS identified in the northern
 3355 part of the study area. The alternative would require a new bridge over Four Mile Run, placing new bridge piers
 3356 in the stream. Build Alternative D would require fill and piers within the tributary channel where the tracks tie
 3357 back to the existing Metrorail alignment in Arlington (at the northern end of the study area). Build Alternative D
 3358 would not impact any wetlands delineated east of the Metrorail tracks and south of Four Mile Run (see **Figure 3-
 3359 85**).

3360 A preliminary, qualitative assessment of impacts to wetland services and functions was performed. The
 3361 impacted wetland area north of Four Mile Run is generally confined within the disturbed area between the
 3362 existing Metrorail and CSXT railroad tracks and the GWMP and likely provides very poor wildlife habitat.
 3363 Therefore, no significant impacts to wildlife habitat are expected. Through hydrology and hydraulics modeling,
 3364 appropriate BMPs would be installed to mitigate or improve the water retention, nutrient transformation, and
 3365 retention of sediments and other particulates.

3366

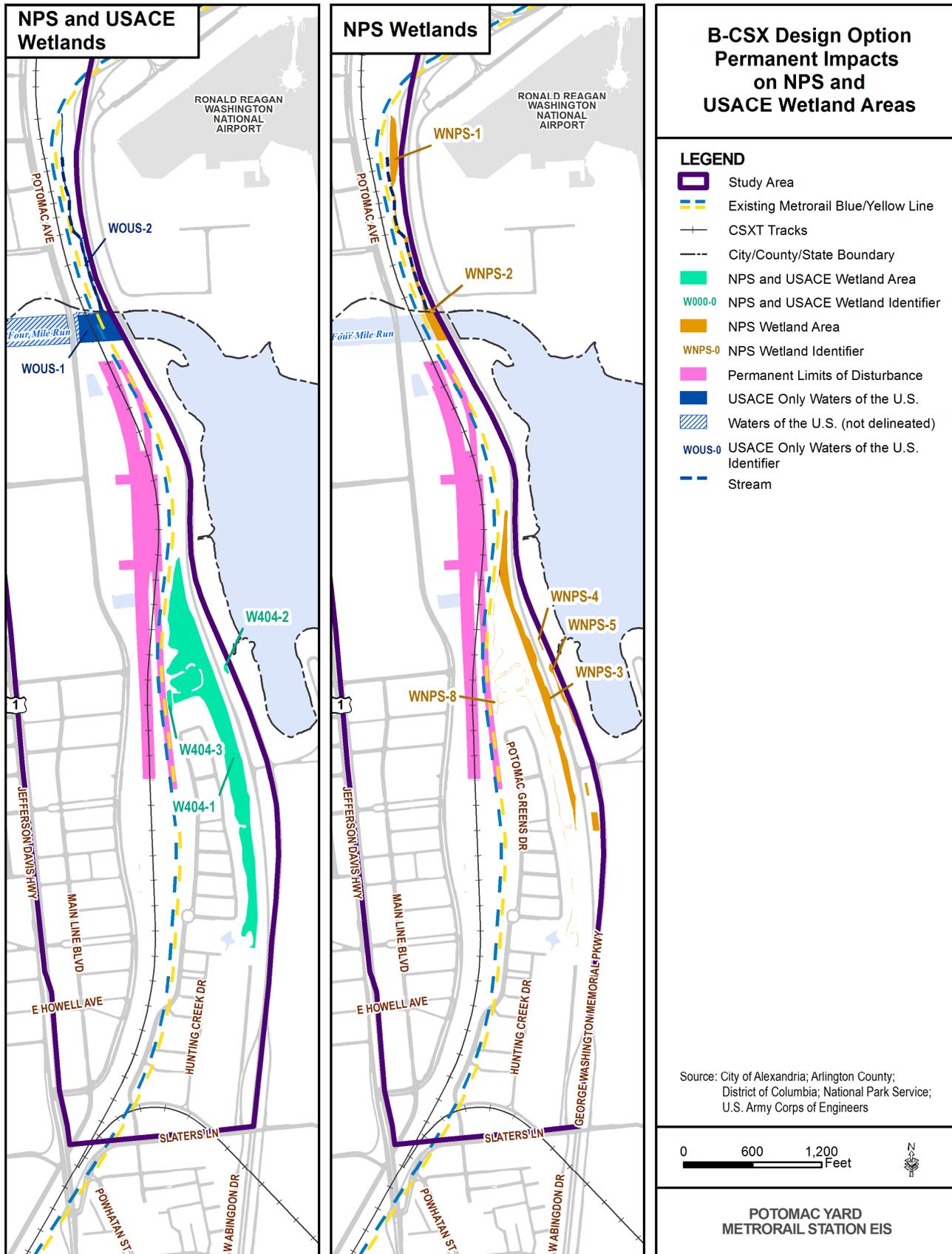
3367 **Figure 3-83: Alternatives A and B Permanent Impacts on NPS and USACE Wetland Areas**



3368

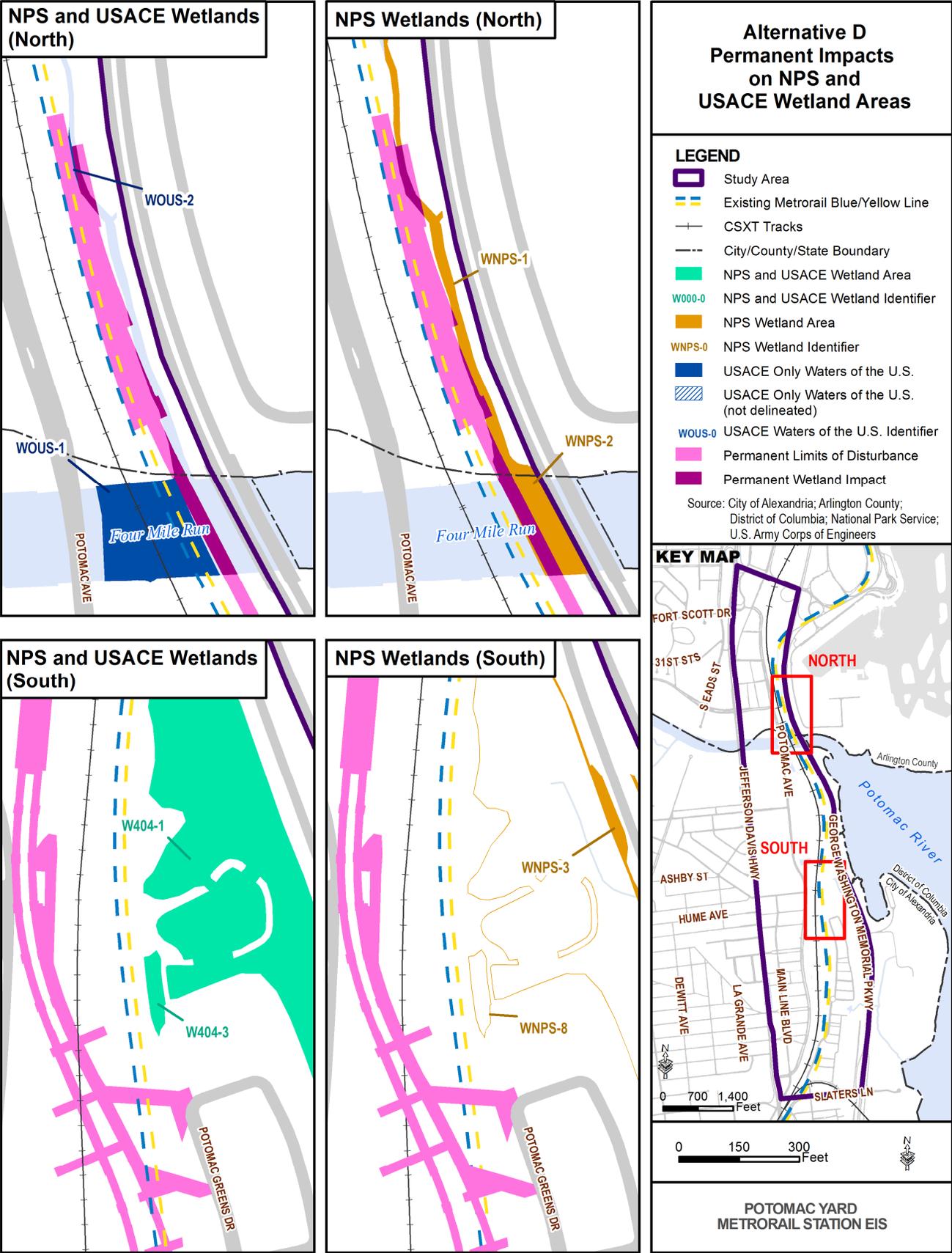
3369

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



3370
3371

3372 Figure 3-85: Alternative D Permanent Impacts on NPS and USACE WOUS and Wetland Areas



3373

3374 3.14.4 Mitigation

3375 A Joint Permit Application (JPA) would be developed for both permanent and temporary project-related wetland
 3376 impacts in compliance with Section 404 of the CWA. The permitting process would be initiated with USACE,
 3377 VDEQ, and NPS. If wetlands are deemed tidal wetlands, the permitting process would also be initiated with
 3378 VMRC. All NPS actions with the potential to have adverse impacts on wetlands must also comply with Director's
 3379 Order 77-1. In the case where both NPS and USACE procedures apply, coordination with the appropriate
 3380 USACE office will be initiated early in the process to reduce potential duplication of effort, and the JPA and NPS
 3381 processes would be initiated at the design phase of the project. The USACE will review the permit application for
 3382 the preferred alternative. Thereafter, the USACE may conduct an Alternatives Analysis to determine the Least
 3383 Environmentally Damaging Practicable Alternative (LEDPA) prior to completion of the Final EIS. Furthermore,
 3384 the NPS will require a Statement of Findings with the Final EIS before the Record of Decision is signed. The
 3385 Statement of Findings will require its own public review period.

3386 Specific wetland mitigation strategies would be determined through the JPA and NPS processes for unavoidable
 3387 impacts to WOUS and wetlands resulting from the preferred alternative. USACE, VDEQ, VMRC, and NPS
 3388 would determine mitigation measures, as part of the JPA process and NPS Director's Order 77-1, where
 3389 appropriate. If wetland compensation is necessary, the wetland restoration proposal will meet the compensation
 3390 requirements of both the USACE and the NPS processes as well as EO 11990 for no net loss. Typical wetland
 3391 mitigation measures include on-site or off-site wetland compensation according to specified ratios of acres of
 3392 created or restored wetland to be provided for each acre of impacted wetland; ratios are based on the size and
 3393 function of existing wetland impacted and the type of wetland compensation (on-site, off-site, fee-in-lieu) as
 3394 determined during the JPA process.

3395 3.15 Floodplains

3396 This section assesses the potential impact of the alternatives to Federal Emergency Management Agency
 3397 (FEMA) designated flood hazard zones. Floodplains are protected under EO 11988 Floodplain Management
 3398 and USDOT Order 5650.2 Floodplain Management and Protection. The analysis is described in more detail in
 3399 the *Water Resources Technical Memorandum*, in Volume II. Temporary impacts to floodplains due to
 3400 construction are described in **Section 3.24 Construction Impacts**.

3401 3.15.1 Methodology

3402 Floodplains were analyzed using Flood Insurance Rate Maps (FIRMs) developed by the FEMA. The FIRMs
 3403 depict 100-year and 500-year flood zones within the study area. The impact analysis was completed in GIS by
 3404 overlaying the 100-year and 500-year flood zone areas with the proposed LOC and LOD for the three Build
 3405 Alternatives and B-CSX Design Option. Referenced elevations of flood zones and proposed structures are in
 3406 relation to current sea level as measured by the North American Vertical Datum 1988 (NAVD), which is the
 3407 standard reference elevation for sea level.

3408 3.15.2 Affected Environment

3409 **Figure 3-86** illustrates 100-year and 500-year flood zones within the study area. The Base Flood Elevation for
 3410 100-year flood zones within the study area is 10 feet NAVD88 (FIRM datum). The average elevation for the 500-
 3411 year flood zone is estimated at 12 feet NAVD88.

3412 The 100-year floodplain extends from the Potomac River to the eastern edge of the Potomac Greens
 3413 neighborhood and to the eastern side of the Metrorail tracks north of the Potomac Greens neighborhood. 39.88
 3414 acres of the project area are located within the 100-year floodplain.

3415 The 500-year floodplain covers an additional 6.29 acres of the study area (excluding the area also within the
 3416 100-year floodplain), mostly along the edges of the Potomac Greens neighborhood and along the existing
 3417 Metrorail tracks near the northern edge of the Potomac Greens neighborhood.

3418

3419

3422 Study area floodplains generally serve multiple functions relating to flood and erosion control, surface water
 3423 quality maintenance, groundwater recharge, and biological productivity. The following is a summary of the
 3424 general functional values of the floodplain areas:

- 3425 • Natural Flood & Erosion Control – provide flood storage and conveyance; reduce flood velocities, flood peaks
 3426 and sedimentation;
- 3427 • Surface Water Quality Maintenance – filter nutrients and impurities from runoff; process organic wastes, and
 3428 moderate temperature of water;
- 3429 • Groundwater Recharge – promote infiltration and aquifer recharge; reduce frequency and duration of low
 3430 surface flows;
- 3431 • Biological Productivity – support high rate of plant growth; maintain biodiversity and integrity of ecosystem; and
- 3432 • Fish and Wildlife Habitats – provide breeding and feeding grounds; and create and enhance waterfowl habitat.

3433 **3.15.3 Environmental Consequences**

3434 **3.15.3.1 No Build Alternative**

3435 No effect to floodplains is anticipated as a result of the No Build Alternative.

3436 **3.15.3.2 Build Alternatives**

3437 Floodplain impacts for each Build Alternative are summarized in **Table 3-37**. 100-year flood zones have a one
 3438 percent chance of flooding in any given year, and 500-year flood zones have a 0.2 percent chance of flooding in
 3439 any given year. Based on discussions with the City of Alexandria and Arlington County’s engineering staff, none
 3440 of the three Build Alternatives or B-CSX Design Option is expected to raise the 100-year Base Flood Elevation
 3441 within the study area if constructed within the flood zones. This statement is based on the location of the large
 3442 surface area of the Potomac River relative to the station area. Impacts to the habitat function of the floodplain
 3443 areas are described in **Section 3.15 Waters of the U.S. and Wetlands** and **Section 3.18 Ecosystems and**
 3444 **Endangered Species**.

3445 **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

3446 ¹Acreage excludes areas in 100-year floodplain.

3447 Specific impacts to floodplain areas within NPS parkland and the Greens Scenic Area easement for each Build
 3448 Alternative are summarized in **Table 3-38**.

3449 **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

3450 ¹Acreage excludes areas in 100-year floodplain.

3451 For construction within 100-year flood zones, the project would be subject to local development approvals and
 3452 Federal approvals for any activities on NPS land. Approvals would be obtained in accordance with Sec. 6-300 of

3453 the *City of Alexandria Zoning Ordinance*, Chapter 48 of the *Arlington County Code* and NPS Director's Order
 3454 #77-2: Floodplain Management, which includes the development of a Floodplain Assessment and Floodplain
 3455 Statement of Findings. As part of the City of Alexandria and Arlington County development review processes,
 3456 the project would quantify how the preferred alternative would change the 100-year Base Flood Elevation
 3457 through a hydrologic engineering analysis. The *City of Alexandria Zoning Ordinance* also requires that
 3458 structures built within the 100-year flood zones be "flood-proof." The City of Alexandria defines flood-proofing as
 3459 "any combination of structural and non-structural additions, changes, or adjustments to structures which reduce
 3460 or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and
 3461 their contents" (Section 6-200, *City of Alexandria Zoning Ordinance*).

3462 Impacts to regulated floodplains on NPS land are subject to the policies of *NPS Director's Order 77-2 Floodplain*
 3463 *Management*, which requires the preparation of a Statement of Findings. The general procedures for the
 3464 development of a Statement of Findings are further detailed in *NPS Procedural Manual 77-2*. The Statement of
 3465 Findings must be completed before the Record of Decision (ROD) is issued for the Final EIS.

3466 The *Procedural Manual* requires that a proposed action be classified into one of three "Action Classes":

- 3467 • *Class I Actions* include location or construction of administrative, residential, warehouse, and maintenance
 3468 buildings; non-excepted parking lots; or other man-made features which by their nature entice or require
 3469 individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values.
 3470 Class I Actions are subject to the floodplain policies and procedures if they lie within the 100-year floodplain.
- 3471 • *Class II Actions* include any activity for which even a slight chance of flooding is too great. Class II Actions are
 3472 subject to the floodplain policies and procedures if they lie within the 500-year floodplain.
- 3473 • *Class III Actions* include Class I or Class II Actions in high hazard areas, which include coastal high hazard
 3474 areas and areas subject to flash flooding.

3475 After the Action Class is determined, the Statement of Findings is prepared. The Statement of Findings includes
 3476 the following information:

- 3477 • *Preliminary Floodplain Assessment* uses existing data sources such as FIRMs and an analysis of ecological
 3478 functions and value, and associated hydrologic factors such as the rate of flood water rise, duration of flooding,
 3479 likely sediment and debris loads, potential pollution hazards, and hazards associated with ice and/or debris
 3480 jams;
- 3481 • *Delineation of the Regulatory Floodplain* within the proposed action area;
- 3482 • *Information on Flood Conditions and Hazards* which describes flooding frequency at the proposed activity site,
 3483 the probability of flooding over the planned project life, and the hydraulic attributes associated with the
 3484 regulatory floodplain including flood depth and velocity; and
- 3485 • *Design Actions to Manage Flood Conditions* which will be taken to manage floodplain conditions including
 3486 selection of an alternative (non-floodplain) site, structural or other forms of mitigation, and/or flood warning and
 3487 evacuation plans.

3488 **Build Alternative A**

3489 Build Alternative A would not impact 100-year flood zones but would impact the 500-year flood zone, east of the
 3490 existing Metrorail tracks.

3491 **Build Alternative B**

3492 Build Alternative B would impact both 100-year and 500-year flood zones, east of the existing Metrorail tracks.
 3493 The impacted flood zones span the GWMP from the Potomac River. The station platform and realigned track
 3494 would be constructed on retained or graded fill for a segment approximately 1,400 feet in length. The fill and
 3495 retaining walls would be constructed within the 100-year flood zone. The station and track would be built at
 3496 approximately the same elevation as the existing Metrorail tracks, 25 feet above sea level NAVD88, which is
 3497 above the 100-year Base Flood elevation of 10 feet NAVD88 (FIRM datum).

3498 **B-CSX Design Option**

3499 B-CSX Design Option would not impact either the 100-year or 500-year flood zones.

3500 **Build Alternative D**

3501 Build Alternative D would impact 100-year and 500-year flood zones associated with Four Mile Run. A section of
 3502 fill is necessary for the segment of track north of Four Mile Run where the aerial structure touches down before
 3503 tying back into the existing Metrorail alignment. The fill would be placed within the 100-year flood zone. The
 3504 track segment to be constructed on fill would extend approximately 600 feet in length at an elevation of
 3505 approximately 25 feet NAVD88, which is above the Base Flood Elevation of 10 feet NAVD88 (FIRM datum).

3506 **3.15.4 Mitigation**

3507 Mitigation would include flood-proofing and other design techniques that would prevent the structure from
 3508 collapsing or being damaged during a flood. The local, state, and Federal agencies are expected to offer project
 3509 specific design recommendations to mitigate floodplain impacts at the permitting stage. Proposed mitigation
 3510 would be consistent with permitting requirements, and local, state, and Federal regulatory requirements.

3511 **3.16 Navigable Waterways and Coastal Zones**

3512 This section discusses the potential impacts on navigable waterways and the coastal zone status of and
 3513 regulations applicable to the study area. Both the City of Alexandria and Arlington County are subject to
 3514 compliance with the requirements the Coastal Zone Management Act and Chesapeake Bay Preservation Act. A
 3515 Coastal Zone Consistency Statement was prepared and submitted to the Virginia Department of Environmental
 3516 Quality (VDEQ) for review and determination.

3517 Federal regulations define navigable waterways as “waters that are subject to the ebb and flow of the tide and/or
 3518 are presently used, or have been used in the past, or may be susceptible for use to transport interstate or
 3519 foreign commerce. Once made, a determination of navigability applies laterally over the entire surface of the
 3520 waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity” (33
 3521 CFR Part 329.4). In other words, once a waterway is designated as a navigable waterway (meaning that it is
 3522 sufficiently wide, deep, and free from obstructions to allow travel by vessels), the designation is not allowed to
 3523 be violated or changed by current or future actions or events that interfere with vessel movement.

3524 Under Virginia’s Chesapeake Bay Preservation Act, both the City of Alexandria and Arlington County have
 3525 designated Resource Protection Areas (RPAs) as 100-foot buffer area around tributaries, shore line, and
 3526 delineated wetlands where development is restricted. This section assesses impacts to RPAs due to the
 3527 construction and operation of the alternatives.

3528 The following Federal and local guidance and policies are applicable to the resource:

- 3529 • *Coastal Zone Management Act of 1972;*
- 3530 • *Rivers and Harbors Appropriations Act of 1899;*
- 3531 • *Navigation and Navigable Waterways;*
- 3532 • *Code of Virginia, Waters of the State, Ports and Harbors;*
- 3533 • *Chesapeake Bay Preservation Act of 1988;*
- 3534 • *City of Alexandria Zoning Ordinance, Article XIII, Environmental Management;* and
- 3535 • *Arlington County Code, Chesapeake Bay Preservation Ordinance.*

3536 The analysis is described in more detail in the *Water Resources Technical Memorandum*, in Volume II.

3537 **3.16.1 Methodology**

3538 **3.16.1.1 Navigable Waterways**

3539 FTA coordinated with the U.S. Coast Guard (USCG) to verify whether Four Mile Run is considered a Navigable
 3540 Water of the United States. To further verify the navigability of Four Mile Run, National Oceanic and
 3541 Atmospheric Administration (NOAA) navigation charts were also reviewed and the USACE-Norfolk District
 3542 provided guidance on “Navigable Waters of the U.S.”

3543 **3.16.1.2 Coastal Zone**

3544 To ensure project consistency with the Coastal Zone Management Act (CZMA), a Coastal Zone Consistency
 3545 Determination for the project was submitted to VDEQ and is currently under review. The consistency
 3546 determination demonstrates the project’s compliance with “enforceable policies” in Virginia’s coastal zone.

3547 To assess the impacts to RPAs, GIS mapping was used to identify the portion of RPAs that overlap with the
 3548 proposed temporary LOC and permanent LOD for the three Build Alternatives and B-CSX Design Option.

3549 **3.16.2 Affected Environment**

3550 **3.16.2.1 Navigable Waterways**

3551 Through consultations with the FTA for the project, the USCG confirmed that Four Mile Run is considered both a
3552 Navigable Water of the U.S. and tidal water body within the study area.

3553 **3.16.2.2 Coastal Zones**

3554 **Figure 3-87** illustrates RPAs in the study area that are associated with the Potomac River and Four Mile Run.
3555 Existing RPAs are designated in Chesapeake Bay Preservation Area Overlay District maps adopted by the City
3556 and County. RPAs in the study area include areas identified on the City and County’s adopted RPA maps,
3557 USACE-regulated wetlands delineated for the project, and 100-foot buffers around the delineated wetlands.

3558 RPAs were identified for the project in accordance with the Virginia *Chesapeake Bay Preservation Act*, and Sec.
3559 13-105(B) of the *City of Alexandria Zoning Ordinance*. The Coastal Zone Consistency Certification for the
3560 project is provided in Appendix C of the *Water Resources Technical Memorandum*, Volume II.

3561 **3.16.3 Environmental Consequences**

3562 **3.16.3.1 Navigable Waterways**

3563 **Build Alternative A**

3564 Build Alternative A would not impact or cross any navigable waterways in the study area.

3565 **Build Alternative B**

3566 Build Alternative B would not impact or cross any navigable waterways in the study area.

3567 **B-CSX Design Option**

3568 B-CSX Design Option would not impact or cross any navigable waterways in the study area.

3569 **Build Alternative D**

3570 Build Alternative D would require the construction of a new bridge approximately 75 feet east of the existing
3571 Metrorail bridge over Four Mile Run. The horizontal clearance of the replacement bridge is expected to be
3572 similar to the existing Metrorail bridge, and the vertical clearance would be higher. The bridge would not
3573 adversely affect the existing navigability of Four Mile Run. If Build Alternative D is selected as the preferred
3574 alternative and is advanced to design, a bridge permit or waiver would be sought through the U.S. Coast Guard
3575 in accordance with Section 10 of the Rivers and Harbors Act.

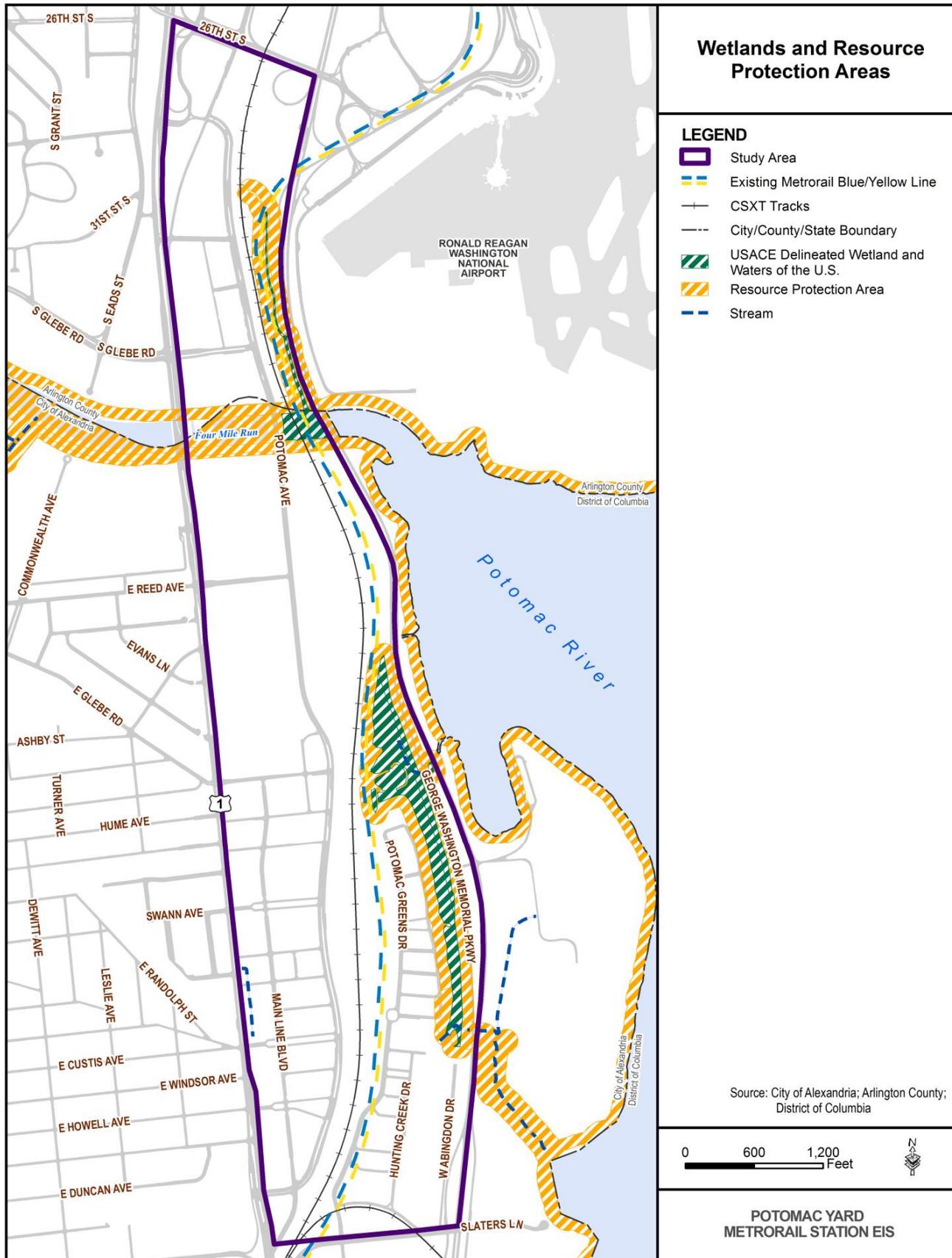
3576 **3.16.3.2 Chesapeake Bay Preservation Areas**

3577 **Table 3-39** summarizes the estimated permanent impacts to RPAs. These impact estimates include RPAs
3578 identified on the City’s adopted RPA map, wetlands delineated for the project, and 100-foot buffers around the
3579 delineated wetlands consistent with Sec. 13-105(B) of the City zoning ordinance.

3580 **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

3581 **Figure 3-87: Wetlands and Resource Protection Areas**



3582

3583 **Build Alternative A**

3584 Build Alternative A would impact 0.41 acre of RPAs around the proposed platform areas where wetlands have
3585 been delineated east of the Metrorail tracks.

3586 **Build Alternative B**

3587 Build Alternative B would impact 3.36 acres of RPAs around the proposed platform areas where wetlands have
3588 been delineated east of the Metrorail tracks.

3589 **B-CSX Design Option**

3590 B-CSX Design Option would impact 1.12 acres of RPAs around the proposed platform areas where wetlands
3591 have been delineated east of the Metrorail tracks.

3592 **Build Alternative D**

3593 Build Alternative D would impact 2.07 acres of RPAs buffering Four Mile Run with a new bridge crossing the
3594 waterway.

3595 **3.16.3.3 Coastal Zone Consistency**

3596 The project is expected to be consistent with the enforceable policies of Virginia's Coastal Zone Management
3597 Program as described in the draft Consistency Determination (pending review by VDEQ), which is included in
3598 the *Water Resources Technical Memorandum* in Volume II. To comply with the City of Alexandria and Arlington
3599 County's Chesapeake Bay Preservation Ordinances, the project would disturb no more land than is necessary,
3600 preserve indigenous vegetation, develop a project-specific landscape plan, and minimize impervious surface
3601 cover.

3602 **3.16.4 Mitigation**

3603 **3.16.4.1 Navigable Waterways**

3604 As no effect to the navigability of Four Mile Run is anticipated under the three Build Alternatives and B-CSX
3605 Design Option, no mitigation is proposed.

3606 **3.16.4.2 Coastal Zones and Chesapeake Bay Preservation Areas**

3607 Mitigation would be developed in accordance with VDEQ Chesapeake Bay Local Assistance Department
3608 (CBLAD), *Riparian Buffers Modification & Mitigation Manual* planting recommendations or other mitigation
3609 deemed appropriate to the satisfaction of the City of Alexandria Director of the Department of Transportation
3610 and Environmental Services. Contribution to the City of Alexandria Water Quality Improvement Fund may be
3611 acceptable in combination with mitigation strategies.

3612 **3.17 Wild and Scenic Rivers**

3613 The Wild and Scenic Rivers Act of 1968 protects rivers designated by Congress or the Secretary of Interior as
3614 wild, scenic, or recreational rivers. No Federal or state designated scenic river is located in the study area,
3615 based on a review of the Interagency Wild & Scenic Rivers Council, Designated Wild & Scenic Rivers for
3616 Virginia and Washington, DC (National Wildlife and Scenic River System, 2012). No scenic river designated by
3617 the Commonwealth of Virginia is located in the study area. Therefore, no impact to this resource is anticipated
3618 and no further analysis is necessary.

3619 **3.18 Ecosystems and Endangered Species**

3620 This section describes the potential impacts of the alternatives to study area ecosystems (terrestrial and aquatic
3621 biological resources and habitats), including ecologically sensitive areas, and Federally listed or state listed rare,
3622 threatened and endangered species.

3623 In the context of the EIS, ecologically sensitive areas refer to natural areas that the state or Federal government
3624 has designated for conservation purposes. At the Federal level, ecologically sensitive areas include designated
3625 National Wildlife Refuges and "critical habitat" areas. National Wildlife Refuges are designated public lands and
3626 waters that are managed by U.S. Fish and Wildlife Service (USFWS) to conserve fish, wildlife, and plants.
3627 USFWS also formally designates certain areas as "critical habitat" for Federally listed threatened or endangered
3628 species. USFWS defines critical habitat as "geographic area(s) that contains features essential for the
3629 conservation of a threatened or endangered species and that may require special management and protection."

3630 At the state level, ecologically sensitive areas include those designated by VDCR as Natural Area Preserves
 3631 and Natural Community areas. Biological resources within the study area are protected by Federal and state
 3632 law, as well as local regulation. The analysis is described in more detail in the *Ecosystems and Endangered*
 3633 *Species Technical Memorandum*, Volume II.

3634 **3.18.1 Methodology**

3635 **3.18.1.1 Ecosystems**

3636 Study area ecosystems were assessed using findings from this project's water resources and wetlands
 3637 analyses, including the *Waters of the U.S. (Including Wetlands) Delineation Report* (February 2012). Other
 3638 relevant studies of natural resources in the study area included the City of Alexandria, *Water Quality*
 3639 *Management Supplement* (2001), and NPS, *Final Environmental Impact Statement, George Washington*
 3640 *Memorial Parkway, Potomac Greens* (1991). Study area ecosystems were identified through aerial imagery and
 3641 field observations. Potential impacts on existing habitat were assessed using GIS mapping overlays of the
 3642 project limits of disturbance for each Build Alternative. Ecologically sensitive areas (apart from documented
 3643 habitat of Federally or state-listed rare, threatened or endangered species described below) were identified
 3644 using the USFWS list of National Wildlife Refuges and the Virginia Department of Conservation and Recreation
 3645 (VDCR) Natural Heritage database.

3646 **3.18.1.2 Threatened and Endangered Species**

3647 The USFWS Threatened and Endangered Species Database System was used to identify Federal and state
 3648 species listed within the study area for the City of Alexandria and Arlington County. VDCR and Virginia
 3649 Department of Game and Inland Fisheries (VDGIF) provided written determinations regarding whether the
 3650 project would impact any Federally listed or state listed species.

3651 **3.18.2 Affected Environment**

3652 **3.18.2.1 Ecosystems**

3653 Habitat is utilized by plant and animal species for food, shelter, and water. Within the study area, existing habitat
 3654 is divided into the following four general categories (see **Figure 3-88**):

- 3655 • **Emergent wetlands:** Generally characterized by erect, rooted herbaceous hydrophytic vegetation. The
 3656 ecosystem functions of Emergent wetlands include floodflow protection, sediment trapping, nutrient
 3657 retention and removal, and valuable habitat for many animal and plant species.
- 3658 • **Riverine habitat:** Generally characterized by floating and sub-emergent herbaceous vegetation, insect,
 3659 fish, amphibian and reptile species.
- 3660 • **Forested wetlands:** Dominated by woody species that are adapted to tolerate saturation of their roots
 3661 for long periods during the growing season. The ecosystem functions of Forested wetlands include flood
 3662 flow alteration, sediment trapping, nutrient retention and removal, and wildlife habitat.
- 3663 • **Treed uplands:** Generally dominated by hardwood tree species. Ecosystem functions of Treed Uplands
 3664 include moisture retention, flood flow protection, soil stabilization, and habitat for many small mammals,
 3665 local nesting birds, and migratory birds.

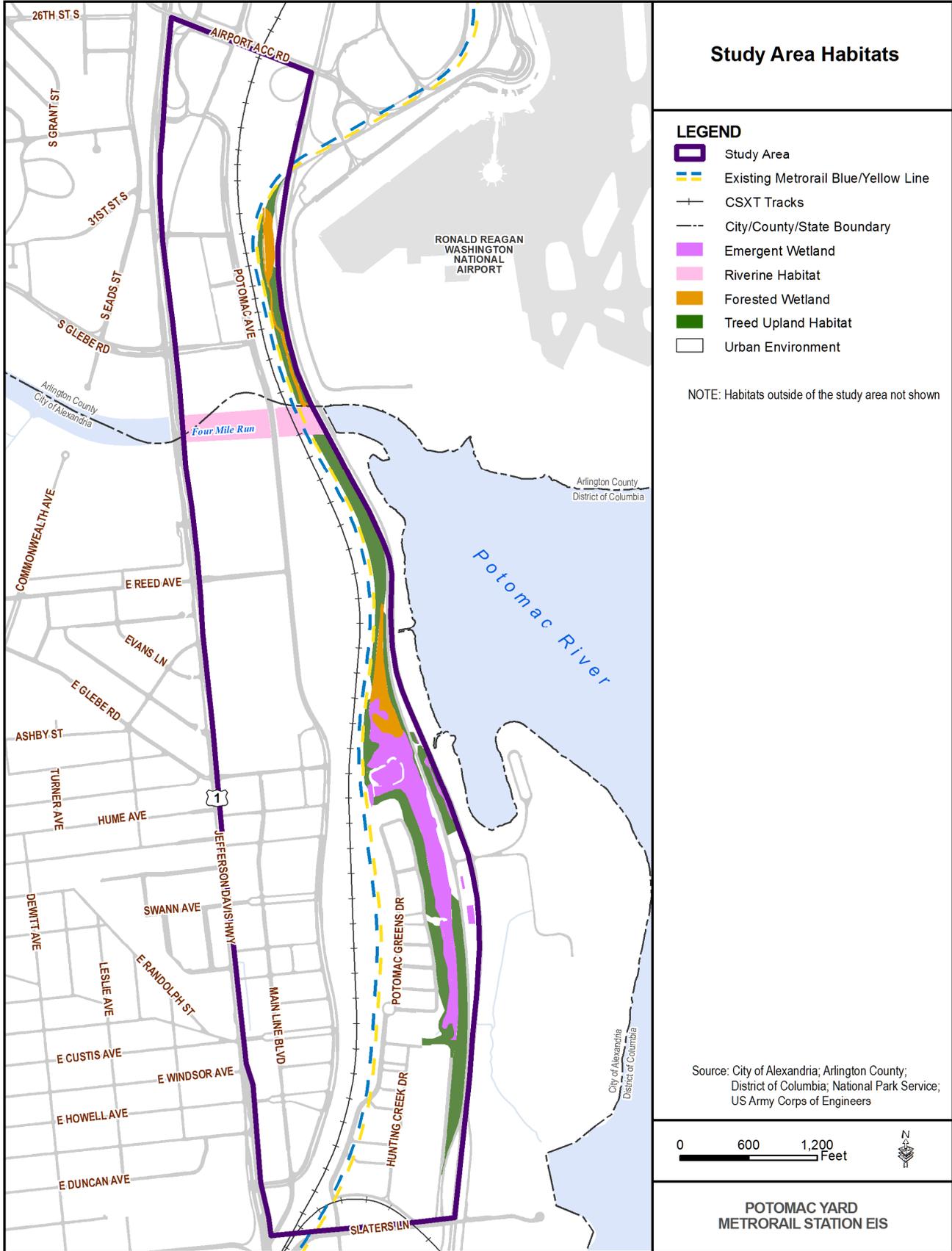
3666 The functions and values of the study area wetland and riverine habitats are described in **Section 3.14**
 3667 **Wetlands**. For the treed upland habitat, the fragmented nature and urbanized location of the study area habitat
 3668 contribute to poor wildlife habitat, though the existing treed upland habitat may provide a refuge for species
 3669 adapted to urbanized environments. The pervasive invasive species coverage, combined with the continual
 3670 disturbance along the edge conditions of the ecosystem, contribute to a low likelihood of unique, uncommon, or
 3671 highly diverse plant communities. No commercial products are provided from the treed uplands. The vegetation
 3672 within the treed uplands likely provides some sediment and nutrient retention through runoff reduction. Partially
 3673 due to the aggressive growth habit of the invasive species, the vegetation of the treed uplands also serve as a
 3674 visual screen of adjacent land uses for residential areas and parklands.

3675 **3.18.2.2 Ecologically Sensitive Areas**

3676 No National Wildlife Refuge exists in the study area, nor is there any Federally designated critical habitat within
 3677 the study area (*Critical Habitat Portal*, 2012). VDCR did not identify any state-designated Natural Communities
 3678 within the study area in the agency's project determination (see *Ecosystems & Endangered Species Technical*
 3679 *Memorandum*, Volume II, Appendix C). Invasive species were identified in the study area.

3680

3681 Figure 3-88: Study Area Habitats



3682

3683 **3.18.2.3 Threatened and Endangered Species**

3684 **Table 3-40** summarizes the Federally listed and state listed species that have the potential to occur within the
 3685 study area.

3686 **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 (<i>Aeschynomene virginica</i>)	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 (<i>Haliaeetus leucocephalus</i>)	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 (<i>Fontigens bottimeri</i>)	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 (<i>Glyptemys insculpta</i>)	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."

3687 USFWS has proposed that the Northern Long-Eared Bat (*Myotis septentrionalis*) be listed as Threatened under
 3688 the Endangered Species Act. USFWS anticipates a final decision by April 2, 2015. The project study area is
 3689 included in the bat's White-Nose Syndrome Buffer Zone under the proposed rule. Should the proposed listing be
 3690 adopted, the project would undergo additional analysis as required by the Endangered Species Act.

3691 **3.18.3 Environmental Consequences**

3692 **3.18.3.1 No Build Alternative**

3693 Under the No Build Alternative, no impact to Federally listed or state listed species, Federally designated critical
 3694 habitat for protected species, or study area ecosystems is projected.

3695 **3.18.3.2 Build Alternatives**

3696 **Table 3-41** provides estimates of permanent and temporary impact for each type of habitat and Build
 3697 Alternative.

3698 **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

3699

3700

3701 For just the portions of the study area within NPS parkland and the Greens Scenic Area easement, **Table 3-42**
 3702 provides estimates of permanent and temporary impact for each type of habitat and Build Alternative.

3703 **Table 3-42: Permanent Wetland, Riverine, and Upland Habitat Impacts (NPS Parkland and Greens Scenic**
 3704 **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

3705 *Includes wetlands delineated with both USACE and NPS methodologies. For information on delineated wetland areas, including the separately
 3706 delineated wetland areas using the USACE and NPS methodologies, see the Potomac Yard Metrorail Station EIS, Waters of the U.S. (Including
 3707 Wetlands) Delineation Report, February 2012.

3708 For habitat impacts on NPS parkland and the Greens Scenic Area easement, the preferred alternative will
 3709 undergo a Function and Value Assessment as required for the Statement of Findings per DO 77-1 and will also
 3710 be included in the Final EIS.

3711 None of the three Build Alternatives or B-CSX Design Option is anticipated to impact Federally listed or state
 3712 listed threatened or endangered species based on available data. A field survey for the presence of the
 3713 Sensitive Joint-Vetch plant was completed on August 15, 2012, and no specimen was found within the project
 3714 study area. An additional survey for the Sensitive Joint-Vetch will be conducted after selection of the preferred
 3715 alternative and during the seasonal periods specified by the USFWS Virginia Field Office. No Federally
 3716 designated National Wildlife Refuge or Critical Habitat exists in the study area; therefore, no impact is
 3717 anticipated to these resources. Additionally, VDCR did not identify any state-designated Natural Communities in
 3718 the study area, and no impact is anticipated to these resources.

3719 3.18.4 Mitigation Measures

3720 As no National Wildlife Refuges, Critical Habitat or state-designated Natural Communities, or Threatened or
 3721 Endangered species would be impacted, no mitigation is proposed.

3722 The development and implementation of an Invasive Species Management Plan, which addresses the removal
 3723 and management of invasive species, is proposed to improve the quality of natural habitat and mitigate
 3724 reduction in natural habitat within the study area due to the three Build Alternatives and B-CSX Design Option.
 3725 The plan can serve as a reference for best practices and can support decisions and problem solving as
 3726 progress is made in reaching vegetative condition goals. A management plan can help ensure consistency
 3727 among several cooperating agencies, maintain continuity through project personnel changes, educate and
 3728 engage stakeholders and citizens, and support efforts to obtain additional resources for invasive species
 3729 management.

3730

3731 **3.19 Sustainability**

3732 This section identifies existing plans and policies that address sustainability in the study area and that are
 3733 potentially applicable to the project. As defined in the Federal Executive Orders (EO) listed below, sustainability
 3734 focuses on creating and maintaining conditions “under which humans and nature can exist in productive
 3735 harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of
 3736 Americans.”

3737 The following Federal and local guidance and policies are applicable to the resource:

- 3738 • EO 13423 Strengthening Federal Environmental, Energy, and Transportation Management;
- 3739 • EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance;
- 3740 • City of Alexandria 2008 Eco-City Charter;
- 3741 • City of Alexandria Environmental Action Plan 2030;
- 3742 • City of Alexandria Green Building Policy; and
- 3743 • WMATA’s Policy on Leadership in Energy and Environmental Design (LEED) Certification.

3744 **3.19.1 Methodology**

3745 Local plans and policies were reviewed for sustainability criteria that would be applicable to the project
 3746 alternatives, including local transportation and green building objectives.

3747 **3.19.2 Affected Environment**

3748 **3.19.2.1 Local Sustainability Plans**

3749 The City of Alexandria’s *2008 Eco-City Charter* reflects the goals established in Alexandria’s *2015 Strategic*
 3750 *Plan*. The charter includes a network of guiding principles and policies related to land use, open space, water
 3751 resources, transportation, building design, and construction. The City of Alexandria’s *Environmental Action Plan*
 3752 *2030* (EAP) serves as the road map to implement the sustainability visions and principles set forth in
 3753 Alexandria’s *Eco-City Charter*. Relevant goals of the EAP to the project are concerned with expanding and
 3754 promoting the mass transit system and using green building practices. Relevant action steps include adding a
 3755 Metrorail station at Potomac Yard, construction and renovation of City buildings to LEED Gold or equivalent
 3756 standard, promoting pedestrian and bicycle modes, and implementing the recommendations of adopted City
 3757 plans.

3758 **3.19.2.2 Local Green Building Policies**

3759 The City of Alexandria’s *Green Building Policy* states that the City will take a leadership role by mandating
 3760 sustainable design for all public buildings. The policy also sets development standards for public and private
 3761 development permitted under a Development Site Plan (DSP) or Development Special Use Permit (DSUP),
 3762 requiring new non-residential buildings to achieve LEED Silver building standards.

3763 WMATA’s *Policy on LEED Certification* (2008) established that all new and substantially rehabilitated Metro
 3764 facilities be designed and built with the goal of receiving LEED Silver Certification.

3765 **3.19.3 Environmental Consequences**

3766 **3.19.3.1 No Build Alternative**

3767 The No Build Alternative would be generally consistent with local sustainability requirements. Although the No
 3768 Build Alternative does not include the City of Alexandria’s specific action step to construct a Metrorail station at
 3769 Potomac Yard, it includes other projects that support the City’s EAP goals to expand the mass transit system
 3770 and support pedestrian and bicycle modes.

3771 **3.19.3.2 Build Alternatives**

3772 The three Build Alternatives and B-CSX Design Option would be consistent with the local sustainability
 3773 requirements. Station building designed to comply with green building policies and objectives, such as LEED
 3774 Silver Certification, would be developed during detailed design phases of the project.

3775 **3.19.4 Mitigation**

3776 The three Build Alternatives and B-CSX Design Option would have no adverse impact so no mitigation is
 3777 proposed.

3778 3.20 Hazardous and Contaminated Materials

3779 This section identifies hazardous and contaminated materials potentially present within the study area and their
 3780 potential to be encountered by the project alternatives. The presence of these materials in Potomac Yard,
 3781 primarily as a result of former rail yard activities, has been previously documented, including extensive remedial
 3782 investigations and reports. The current analysis was prepared consistent with the requirements of the American
 3783 Society of Testing and Materials (ASTM) Phase I Environmental Site Assessment (ESA) procedures. The Phase
 3784 I ESA is a due diligence task that includes the review of previous analyses and reports, provides confirmation of
 3785 this information, and provides additional information as needed. The contaminated materials analysis and Phase
 3786 I ESA was prepared in accordance with the following guidance documents:

- 3787 • ASTM E1527-05 *Standard Practice for Environmental Site Assessments*; Phase I Environmental Site
 3788 Assessment Process.; and
- 3789 • USEPA All Appropriate Inquiries (AAI).

3790 The analysis is described in more detail in the *Phase I Environmental Assessment and Hazardous &*
 3791 *Contaminated Materials Technical Memorandum*, in Volume II.

3792 3.20.1 Methodology

3793 The Phase I ESA for hazardous and contaminated materials included the following tasks:

- 3794 • Review of historical documentation, including historic aerial photographs and historic topographic maps;
- 3795 • Review of Federal and state online database records and publications for known contaminated sites
 3796 and for sites containing or generating hazardous substances;
- 3797 • Review of Potomac Yard's Comprehensive Environmental Response, Compensation, and Liability Act
 3798 (CERCLA) investigation records and reports acquired through the Freedom of Information Act (FOIA),
 3799 the EPA's on-line administrative record, VDEQ, and the City of Alexandria Office of Environmental
 3800 Quality;
- 3801 • Meetings with VDEQ and City of Alexandria staff regarding past investigations; and
- 3802 • Site reconnaissance which focused on potential Recognized Environmental Condition Sites (RECs).

3803 RECs are defined by ASTM as "the presence or likely presence of any hazardous substances or petroleum
 3804 products on a property under conditions that indicate an existing release, a past release, or a material threat of a
 3805 release of any hazardous substances or petroleum products into structures on the property or into the ground,
 3806 ground water, or surface water of the property".

3807 3.20.1.1 Environmental Data Resources Project Report

3808 The first step in the Phase I ESA process was to obtain a project-specific report from the Environmental Data
 3809 Resources (EDR) Incorporated. The EDR Report satisfies ASTM E1527-05 and EPA's All Appropriate Inquiry
 3810 rule. EDR maintains a proprietary database, referred to as the National Environmental Data Information System
 3811 (NEDIS), which integrates environmental records and land use information from thousands of Federal, state,
 3812 tribal, local, and private sources. The EDR project report provides a variety of data sources for the purpose of
 3813 identifying potential RECs, including historic aerial photographs and maps, and city directory abstracts.

3814 3.20.1.2 Review of Prior Remedial Actions and Reports

3815 Prior remedial actions and reports were reviewed for the analysis. Extensive remedial investigations and reports
 3816 have been completed for Potomac Yard in compliance with Federal, state and local laws. In September 1992,
 3817 EPA and the RF&P Railroad signed a CERCLA Administrative Order by Consent requiring RF&P to study the
 3818 extent of contamination at the Potomac Rail Yard. Reports and remediation documents were obtained from the
 3819 EPA Administrative Record, VDEQ, and the City of Alexandria. **Table 3-43** lists the most relevant reports to the
 3820 study area.

3821 As part of redevelopment activities, property owners have summarized the environmental conditions, conducted
 3822 additional voluntary site assessments, and developed site construction management plans to ensure
 3823 compliance with Virginia solid waste management regulations and City of Alexandria planning requirements.
 3824 Multiple assessment reports are available from the City of Alexandria or the VDEQ Voluntary Remediation
 3825 Program (VRP) office locations. Assessment reports have been completed for Landbay D, Landbay E, Landbay
 3826 F, and Landbay G within Potomac Yard.

3827

3828 **Table 3-43: Potomac Yard Remedial Investigations and Reports**

Published Date	Report Name
July 21, 1995	<i>Potomac Yard Extent of Contamination Study</i>
October 14, 1995	<i>Potomac Yard Human Health Risk Assessment and On-Site Ecological Risk Assessment</i>
June 19, 1996	<i>Potomac Yard Engineering Evaluation/Cost Analysis</i>
March 20, 1997	<i>Potomac Yard Off-Site Ecological Risk Assessment</i>
November 13, 1998	<i>Potomac Yard Removal Response Action</i>
August 4, 1999	<i>Site Characterization Report Addendum, Potomac Yard, Central Operations Area</i>
October 9, 2000	<i>Potomac Yard Central Operations Area Closure Report for Corrective Action Plan Implementation</i>
October 15, 2003	<i>Phase I Environmental Site Assessment Retail Center – North Yard, Potomac Yard</i>
February 15, 2011	<i>Site Characterization Report, Potomac Yard Landbay D</i>
February 15, 2011	<i>Site Characterization Report, Potomac Yard Landbay E</i>
October 18, 2011	<i>Remedial Action Plan, Potomac Yard Landbay G</i>

3829 **3.20.2 Affected Environment**

3830 Potomac Yard is a former rail yard, which was operated by the Richmond Fredericksburg and Potomac (RF&P)
3831 railroad from approximately 1906 to 1990. Historic operations at the site were characterized by reports obtained
3832 from the EPA CERCLA Administrative Record, VDEQ and the City of Alexandria Office of Environmental
3833 Quality. The 1995 *Extent of Contamination Study* (ECS) is the primary source of historic site operations
3834 information and soil and groundwater sample laboratory analysis and results.

3835 RECs within the study area have been remediated or mitigated by risk management methods during previous
3836 EPA, VDEQ, and City of Alexandria oversight of historic remedial activities and during more recent subsequent
3837 redevelopment activities. Risk management methods of contaminants encountered during redevelopment
3838 activities have included measures such as removal of contaminated soils. **Figure 3-89** shows the locations of
3839 potential and former RECs.

3840 **3.20.2.1 Fill Material**3841 **Ballast**

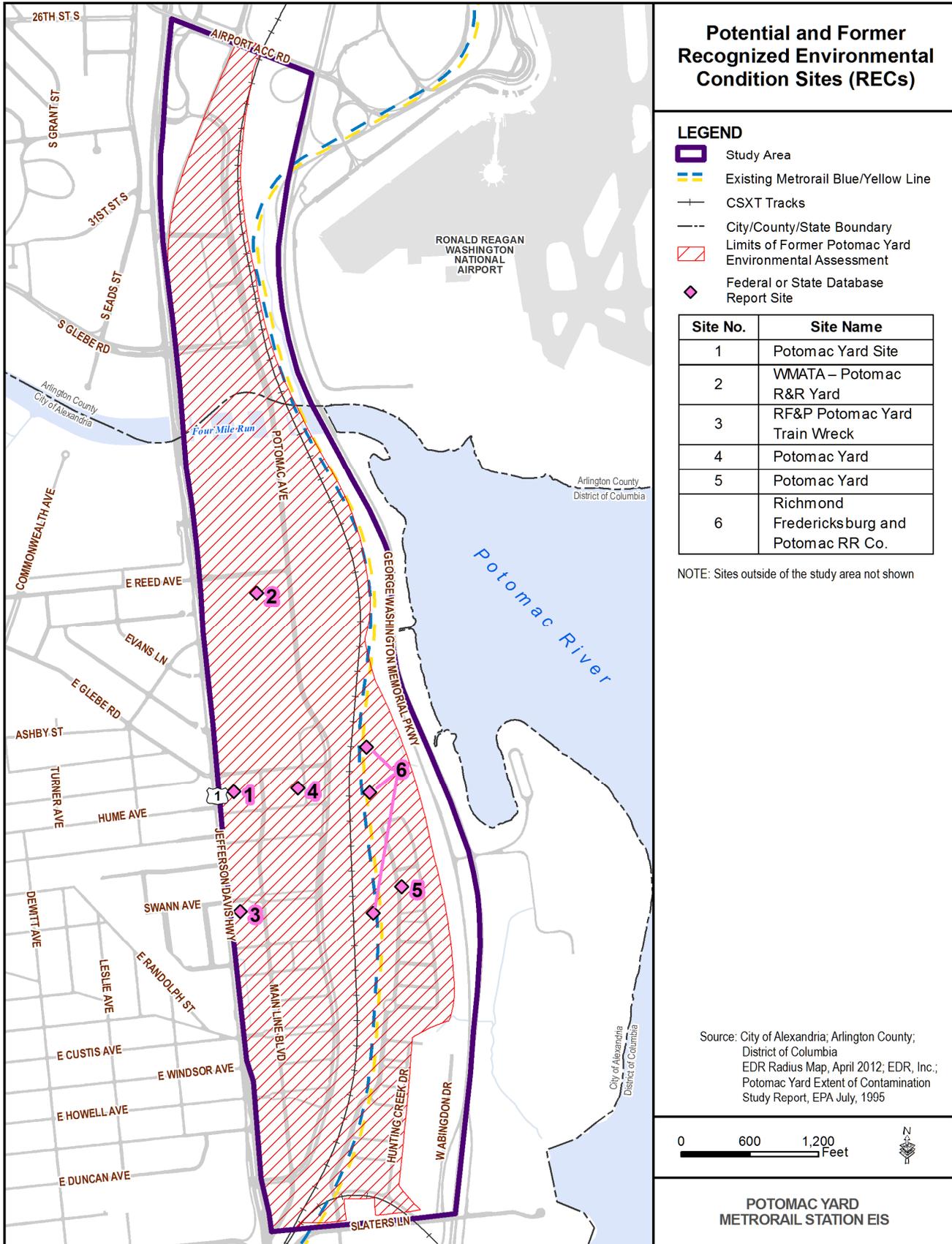
3842 Based upon multiple environmental assessment reports completed for the former Potomac Yard rail yard site,
3843 much of the shallow fill used to level the rail yard appears to have been cinder ballast potentially containing
3844 elevated levels of petroleum products or elevated concentrations of metals. Cinder ballast, the bottom ash left
3845 over from coal burning, was used as fill material throughout large portions of the former Potomac Yard. Much of
3846 the ballast material at the former Potomac Yard has been removed from areas no longer occupied by track
3847 during on-going redevelopment activities. However, ballast can still be sporadically encountered in previously
3848 undisturbed areas and/or at undisturbed depths. Ballast within the study area commonly contains elevated
3849 levels of arsenic, lead, and copper, and therefore is a potential REC. Based on previous studies, the ballast is
3850 usually encountered to an average thickness of three feet, but has been encountered up to a depth of 12 feet
3851 below ground surface (bgs) in the study area.

3852 **Potential Construction Debris Landfill**

3853 The 1995 CERCLA Study identified a construction debris landfill in the area west of the Metrorail tracks near the
3854 current site of the movie theater. The construction debris landfill is noted to have been removed to an off-site
3855 landfill during redevelopment in 1977. Subsurface debris were encountered during construction of a sewer line
3856 for Landbay F (the Potomac Yard Retail Center) in the former historic “stock pen” area, also located in this
3857 portion of the property.

3858

3859 **Figure 3-89: Potential and Former Recognized Environmental Condition Sites (RECs)**



3860

3861 **Potential Fly Ash Area**

3862 Previous geotechnical investigations identified a potential widespread layer of fly ash 5 to 20 feet thick deposited
 3863 throughout the Potomac Greens Sub-Area between the mid-1950s and 1963. Detectable concentrations of the
 3864 metals arsenic, lead, and copper were found within the fly ash areas over the course of the CERCLA analyses
 3865 in 1995. Following the CERCLA analyses, additional soil borings were completed in 2011 for Landbay D. The
 3866 2011 soil borings found concentrations of Total Petroleum Hydrocarbons Diesel-Range Organics (TPH-DRO) in
 3867 the soils, as well as silver and lead concentrations above the VDEQ Tier II Risk Based Screening Level (RBSL)
 3868 for industrial and commercial property reuse. One soil boring tested in the analysis exceeded USEPA's
 3869 hazardous soil designation level of 5 mg/L for lead.

3870 **3.20.2.2 Groundwater**

3871 The CERCLA analyses detected contaminants in ground water. The groundwater analyses focused on the
 3872 metals most commonly associated with ballast; arsenic, copper, and lead. The 1995 CERCLA analysis identified
 3873 metals and petroleum hydrocarbons present in the groundwater at the property. Recent groundwater sampling
 3874 conducted at Landbay G in 2004 and 2006 also detected concentrations of metals and petroleum hydrocarbons.

3875 **3.20.2.3 Soil**

3876 The CERCLA analyses detected contaminants in soil. The 1995 CERCLA analysis identified metals and
 3877 petroleum hydrocarbons present in the soil at the property. Recent soil sampling conducted at Landbay G in
 3878 2004 and 2006 also detected concentrations of metals and petroleum hydrocarbons.

3879 **3.20.3 Environmental Consequences**

3880 **3.20.3.1 No Build Alternative**

3881 The No Build Alternative would not disturb potential residual contaminants at RECs.

3882 **3.20.3.2 Build Alternatives**

3883 The three Build Alternatives and B-CSX Design Option have the potential to encounter contaminated fill
 3884 material, soils, and groundwater related to RECs identified within the study area. However, the three Build
 3885 Alternatives and B-CSX Design Option would not result in long-term or permanent adverse effects due to risk
 3886 mitigation and engineering controls and measures that would be used during construction. Temporary impacts
 3887 are described in **Section 3.24 Construction Impacts**.

3888 **Contaminated Fill Material and Soil Excavation and Disposal**

3889 Subsurface soil and fill material consisting of fly ash, metals and petroleum-impacted soils, construction debris,
 3890 and ballast material, have been identified within the LOD for Alternative A, Alternative B, B-CSX Design Option,
 3891 and to a lesser extent at Alternative D. Residual oil may also be present in subsurface soil at the former oil/water
 3892 separator ponds within the LOD for Alternative B and B-CSX Design Option.

3893 **Contaminated Groundwater Dewatering**

3894 Based on CERCLA, VDEQ, and other environmental assessment reports, shallow groundwater in the vicinity of
 3895 the three Build Alternatives and B-CSX Design Option is likely contaminated with residual levels of petroleum
 3896 hydrocarbons, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. The
 3897 groundwater depth should be evaluated at the project design phase to identify the necessity of dewatering,
 3898 groundwater control requirements (if dewatering is required), and disposal or treatment requirements of
 3899 contaminated groundwater.

3900 **U.S. DOT Brownfields Policy**

3901 Construction of the project would be consistent with the U.S. DOT Brownfields Policy, adopted in 1998, which
 3902 encourages participation in transportation projects that include the use and redevelopment of potentially
 3903 contaminated sites, when appropriate, in support of the EPA's Brownfields Initiative. The project site is not a
 3904 registered EPA Brownfield; however, the former Potomac Rail Yard has been the subject of extensive Federal
 3905 and state regulated remedial actions.

3906 **3.20.4 Mitigation**

3907 The potential impacts of the three Build Alternatives and B-CSX Design Option on RECs would occur during
 3908 construction activities. Soil disturbance could be lessened by use of driven piles, shafts, or sheeting, rather than
 3909 drilled shafts to accommodate any excavations. In areas of the site where pile foundations may need to be

3910 installed by alternative methods due to geotechnical and/or vibration concerns, impacts from the generation of
 3911 potentially contaminated fill, soil, and groundwater would be mitigated in accordance with a Site Management
 3912 Work Plan developed for the project construction process. Management of contaminated soils and groundwater
 3913 on the site and disposal off-site would be conducted in accordance with applicable Virginia solid waste
 3914 management regulations. These BMPs and construction mitigation methods are intended to lessen impacts
 3915 from contaminated materials wherever possible and comply with the law where applicable.

3916 **3.21 Safety and Security**

3917 This section assesses safety and security issues associated with the operation of a new Metrorail station and
 3918 associated facilities. Safety refers to providing safe conditions for passengers, employees, and pedestrians
 3919 within the Metrorail system. Security refers to the enforcement of laws and protection measures for passengers,
 3920 employees, and pedestrians within the Metrorail system.

3921 The following Federal and local guidance and policies are applicable to the resource:

- 3922 • *Rail Fixed Guideway Systems State Safety Oversight* – The FTA created a state-managed oversight
 3923 program for rail transit safety and security under the *State Safety Oversight Rule*. The program is
 3924 applicable to all states that have, within their boundaries, a fixed guideway rail system not regulated by
 3925 the FRA. The rule requires that transit agencies address the personal safety and security of their
 3926 passengers and employees by preparing a System Safety Program Plan and a System Security Plan.
- 3927 • Federal Transit Administration, *An Introduction to All Hazards Preparedness Training for Transit*
 3928 *Agencies*, May 2010.
- 3929 • Transportation Research Board, *Transit Cooperative Research Program, TCRP Synthesis 80, Transit*
 3930 *Security Update*, 2009.
- 3931 • Federal Transit Administration, *The Public Transportation System Security and Emergency*
 3932 *Preparedness Planning Guide*, January 2003.
- 3933 • National Fire Protection Association, *NFPA 130: Standard for Fixed Guideway Transit and Passenger*
 3934 *Rail Systems*, 2010 Edition.
- 3935 • WMATA, *System Safety Program Plan*, January 2011.
- 3936 • WMATA, *Manual of Design Criteria*, Release 9, 2008.

3937 **3.21.1 Methodology**

3938 Current safety and security measures within the Metrorail system are contained in WMATA's *System Safety*
 3939 *Program Plan* (SSPP). Safety and security issues were identified as they related to the facilities to be
 3940 constructed for each alternative.

3941 **3.21.2 Affected Environment**

3942 WMATA's SSPP identifies the procedures and design features which are intended to ensure the safety and
 3943 security of employees and patrons of the WMATA system. In addition, WMATA design criteria specify that the
 3944 design of facilities be consistent with National Fire Protection Association (NFPA) 130, which is an industry
 3945 standard intended to ensure the safety of passengers and employees in the event of an emergency. WMATA
 3946 ensures compliance with its safety and security procedures and policies through training, coordination, and
 3947 periodic audits.

3948 **3.21.2.1 Stations and Facilities**

3949 All Metrorail facilities are designed and built in accordance with applicable laws, building codes and accessibility
 3950 guidelines at the time of construction. Stations have clearly marked escalators, stairs, and elevators that provide
 3951 vertical circulation between street, fare collection, and platform levels. Lights are installed along the granite
 3952 edges of station platforms and flash to alert passengers when a train is arriving, thereby decreasing the
 3953 tendency for passengers to stand at the platform edge to watch for the train. In many stations, detectable tiles
 3954 are located on station platforms adjacent to the granite edges to alert passengers that they are approaching the
 3955 edge of the platforms. Safety zones under the platforms provide space for passengers who fall off the platform
 3956 to avoid an incoming train.

3957 Metrorail stations are required to adhere to NFPA 130 and provide areas of refuge. As defined by NFPA, an
 3958 area of refuge is "a space located in a path of travel leading to a public way that is protected from the impacts of
 3959 fire, either by means of separation from other spaces in the same building or by virtue of location, thereby
 3960 permitting a delay in egress travel from any level."

3961 Metrorail stations are designed to eliminate recessed or hidden areas and provide unimpeded lines of sight for
 3962 station users, station managers, and Metro Transit Police Department (MTPD) personnel. In addition, all
 3963 passenger stations and elevators are equipped with closed-circuit television (CCTV) cameras. Station manager
 3964 kiosks are located adjacent to the fare gates and are equipped with direct phone lines to the Rail Operations
 3965 Control Center (ROCC). Emergency Trip Stations (ETS) are located at both ends of every platform for
 3966 emergency removal of traction power if a person falls onto the tracks or any other emergency occurs. These trip
 3967 stations include emergency telephones that connect directly to the ROCC. In addition, two call boxes are
 3968 located approximately 200 feet from the ends of station platforms and enable passengers or staff to report
 3969 emergency situations to the station manager. Stations are also equipped with fire alarm control panels and other
 3970 features to minimize risk from fires.

3971 **3.21.2.2 Trains**

3972 Each Metrorail train car contains standard safety features designed to maintain a safe passenger and employee
 3973 environment.

3974 **3.21.2.3 Law Enforcement**

3975 MTPD performs law enforcement and public safety services on the Metrorail and Metrobus systems. The MTPD
 3976 has an authorized strength of 420 sworn police officers, 106 security special police, and 24 civilian personnel.
 3977 MTPD officers have jurisdiction and arrest powers for crimes that occur in or against WMATA facilities
 3978 throughout the 1,500-square mile Transit Zone.

3979 **3.21.2.4 Emergency Management**

3980 Emergency management within WMATA focuses on the preparedness, response, recovery, and mitigation of
 3981 incidents and regional special events that impact transit operations. The WMATA Office of Emergency
 3982 Management (OEM), which is part of MTPD, runs the Emergency Operations Center (EOC) and has the primary
 3983 responsibility to respond to the incident scene and coordinate with on-scene rescue personnel and WMATA
 3984 officials.

3985 WMATA also works closely with and relies on jurisdictional fire and emergency management services (EMS)
 3986 departments to respond to emergencies that result in the need for assessing fire or hazmat hazards, providing
 3987 medical assistance, and performing extraction, recovery, and triage tasks at the incident scene. Fire protection,
 3988 life safety requirements, procedures and training are coordinated by MTPD/OEM with jurisdictional emergency
 3989 services departments through several MWCOC committees and subcommittees.

3990 **3.21.3 Environmental Consequences**

3991 **3.21.3.1 No Build Alternative**

3992 Under the No Build Alternative, there would be no safety and security related impacts from the Potomac Yard
 3993 Metrorail Station project. However, there could be impacts from the other improvements assumed under this
 3994 alternative. Identification of these impacts would be the responsibility of the agencies and jurisdictions
 3995 responsible for implementing the improvements.

3996 **3.21.3.2 Build Alternatives**

3997 The three Build Alternatives and B-CSX Design Option can be expected to result in safety and security concerns
 3998 similar to those at existing Metrorail stations. Potential safety or security events include: fire, derailment, loss of
 3999 power, flooding, hazardous materials incidents, criminal or terrorist acts, extreme weather, and medical
 4000 emergencies. The ability for first responders to access the station, and for employees and passengers to safely
 4001 evacuate the station, are the primary concern should any of these events occur. In emergency situations,
 4002 operations along the Blue and Yellow Lines would follow the existing plans and procedures outlined in the
 4003 SSPP. Evacuation and other first response actions would be performed by the local jurisdiction (the City of
 4004 Alexandria and Arlington County). Each Build Alternative would be constructed according to existing WMATA
 4005 standards and would include the safety features described above, including NFPA 130 standards. Access for
 4006 emergency personnel would be designed in accordance with applicable codes and standards, and in
 4007 consultation with City of Alexandria and Arlington County emergency services departments.

4008 In addition, passengers and employees at Metrorail stations are concerned with threats of personal crime.
 4009 Station design would include elements intended to minimize the potential for personal crime on platforms and
 4010 within station access facilities.

4011 WMATA requires completion of the Safety and Security Certification (SSC) process prior to entering the pre-
 4012 revenue demonstration phase of a new rail line segment or rail-related facility, ensuring that hazards and
 4013 security vulnerabilities are addressed, safety and security critical elements are working, and all systems are
 4014 operationally safe and secure.

4015 No impacts to safety and security are anticipated as a result of any of the three Build Alternatives or B-CSX
 4016 Design Option. The existing practices and procedures for safety and security and requirements for facility design
 4017 would adequately avoid and minimize the identified safety and security issues.

4018 **3.21.4 Mitigation**

4019 The three Build Alternatives and B-CSX Design Option would have no adverse effect, so no mitigation is no
 4020 proposed.

4021 **3.22 Utilities**

4022 This section identifies utilities within the study area in the vicinity of the project site and assesses potential
 4023 impacts of the alternatives on utilities.

4024 **3.22.1 Methodology**

4025 The inventory of existing surface and subsurface utilities was performed using available documentation and field
 4026 observations. A subarea of the project study area along the locations of the three Build Alternatives and B-CSX
 4027 Design Option was assessed, focusing on the area along and immediately adjacent to the WMATA and CSXT
 4028 railroad corridor, bound on the north by Four Mile Run, to the west by Potomac Avenue, and to the east and
 4029 south by Potomac Greens Drive.

4030 **3.22.2 Affected Environment**

4031 Utilities present within the project area include existing and planned stormwater, sanitary sewer, water, gas,
 4032 petroleum pipeline, electric, communications (includes telephone, cable television, and fiber optic), street
 4033 lighting, traffic signals, and railroad utilities.

4034 **3.22.3 Environmental Consequences**

4035 **3.22.3.1 No Build Alternative**

4036 The No Build Alternative would not affect existing utilities in the study area.

4037 **3.22.3.2 Build Alternatives**

4038 The proposed locations of new track and station structures for the three Build Alternatives and B-CSX Design
 4039 Option would require portions of existing and planned utilities to be re-routed around planned structures. To re-
 4040 route affected utilities, new segments of utility line would be built and installed up to the new connection points.
 4041 During a short service disruption the old utility line would be connected to the new utility line. All utility re-routing
 4042 would be conducted under compliance with applicable laws, codes and service agreements. Potential adverse
 4043 effects could be avoided or minimized during later design phases of the project. Each Build Alternative would
 4044 impact utility services as follows:

4045 **Build Alternative A**

4046 Build Alternative A would require portions of existing stormwater and water utilities to be re-routed around
 4047 proposed Metrorail station structures.

4048 **Build Alternative B**

4049 Build Alternative B require portions of existing stormwater and water utilities to be re-routed around proposed
 4050 Metrorail station structures. Portions of a planned electrical utility line may also need to be realigned to avoid
 4051 impacts from the Metrorail Station.

4052 **B-CSX Design Option**

4053 B-CSX Design Option would require portions of stormwater, water, sanitary, petroleum pipeline, railroad utilities,
 4054 and Metrorail ductbank utilities to be re-routed around proposed Metrorail station structures. Portions of a
 4055 planned electrical utility line may also need to be realigned to avoid impacts from the Metrorail Station.

4056 **Build Alternative D**

4057 Build Alternative D would require portions of stormwater, water, sanitary, petroleum pipeline, and Metrorail
 4058 ductbank utilities to be re-routed around proposed Metrorail station structures. The petroleum pipeline and other
 4059 utilities could be affected by the locations of piers for the aerial structures over the CSXT tracks. Portions of a
 4060 planned electrical utility line may also need to be realigned to avoid impacts from the Metrorail Station.

4061 **3.22.4 Mitigation**

4062 Utility impacts would be reduced by refining the station design or the location of structural members. Service
 4063 disruptions would be minimized by installing new utility lines first and scheduling a single service disruption to
 4064 connect all new lines to existing lines. Scheduling each utility's work at non-peak hours would also lessen the
 4065 impacts of any utility disruptions.

4066 **3.23 Secondary and Cumulative Effects**

4067 This section describes the potential secondary and cumulative effects of the No Build Alternative, the three Build
 4068 Alternatives, and B-CSX Design Option. The secondary and cumulative effects analysis was prepared pursuant
 4069 to the following Federal regulation and guidance:

- 4070 • Council on Environmental Quality (CEQ), Considering Cumulative Effects Under the National
 4071 Environmental Policy Act (NEPA), January 1997;
- 4072 • Federal Highway Administration, Interim Guidance: Indirect and Cumulative Impacts in NEPA, January
 4073 31, 2003;
- 4074 • National Academy of Sciences, Transportation Research Board, Desk Reference for Estimating Indirect
 4075 Effects of Transportation Projects (NCHRP 466), 2002;
- 4076 • National Academy of Sciences, Transportation Research Board, Forecasting Indirect Land Use Effects
 4077 of Transportation Projects (NCHRP Project 25-25), January 5, 2008;
- 4078 • CEQ, Federal Greenhouse Gas Accounting and Reporting Guidance, October 6, 2010; and
 4079 • City of Alexandria Energy and Climate Change Action Plan 2012-2020, May 2011.

4080 **3.23.1 Methodology**

4081 **3.23.1.1 Secondary Effects**

4082 The analysis of secondary effects evaluated the project's potential to induce land development and travel
 4083 demand. The analysis assumed land development scenarios both with and without a Metrorail station, and
 4084 variations of development intensity dependent on whether one of the three Build Alternatives or B-CSX Design
 4085 Option is selected as the preferred alternative. Assumptions regarding the level of development under each
 4086 alternative were developed in consultation with City of Alexandria staff, based on adopted land use plans for
 4087 Potomac Yard.

4088 **3.23.1.2 Cumulative Effects**

4089 The cumulative effects analysis evaluated the longer-term effects to natural resources in a larger context that
 4090 included past, present, and future "reasonably foreseeable" activities within the project area. The analysis
 4091 process involved identifying sensitive resources and their areas of effect; identifying potential sources of effects;
 4092 and identifying potential effects. Resources directly affected by any of the project alternatives, as well as those
 4093 resources that are particularly susceptible to cumulative effects, were included in the analysis.

4094 The cumulative effects assessment also addressed the potential effects of climate change on the project. The
 4095 City of Alexandria's *Energy and Climate Change Action Plan 2012-2020* identifies potential effects of climate
 4096 change on the city, including sea level rise, increases in annual rainfall, increases in air and water temperature,
 4097 ecological disruptions to ecosystems, effects on quality of life, and other impacts. The cumulative impacts
 4098 analysis included a qualitative assessment of the impacts of climate change on the environmental effects
 4099 identified for the project alternatives. The assessment also identified refinements to the design of the project to
 4100 reduce vulnerability to climate change impacts, adapt to changes in the environment, and mitigate the potential
 4101 impacts of the project that would be exacerbated by climate change. The potential contribution of the project to
 4102 greenhouse gas emissions related to automobile trips and VMT is assessed in **Section 3.11 Air Quality**.

4103 3.23.2 Potential Sources of Effects

4104 Potential sources of secondary and cumulative effects include recent and planned development within the City
4105 of Alexandria and Arlington County portions of Potomac Yard, as well as recent and planned infrastructure
4106 projects within the study area.

4107 3.23.2.1 Recent and Planned Development in Alexandria Potomac Yard

4108 Recent and planned development within the Alexandria portion of Potomac Yard includes the Old Town Greens
4109 and Potomac Greens neighborhoods, which have been completed, as well as the existing and planned
4110 development in South Potomac Yard and North Potomac Yard.

4111 The *North Potomac Yard Small Area Plan* and Coordinated Development District (CDD) #19 allow for different
4112 levels of development, depending on whether the City of Alexandria decides to build a Metrorail station in
4113 Potomac Yard, and where that station is located. In total, a maximum of 7.5 million square feet of development
4114 is permitted in North Potomac Yard if a Metrorail station is built at approximately the location of Build Alternative
4115 B. If a Metrorail station is not built, only 3.7 million square feet of development is permitted. The approved plan
4116 was developed based on a station in the vicinity of the location of Build Alternative B, and therefore would treat
4117 only Build Alternative B as a “Build” situation – both Build Alternative A and Build Alternative D would be treated
4118 as a “No Build” situation. However, if Build Alternative A or D is selected as the preferred alternative, the City of
4119 Alexandria would initiate a process to review the *North Potomac Yard Small Area Plan* (NPYSAP) to consider
4120 additional development that could be supported by the Metrorail station location. Therefore, the secondary
4121 effects analysis assumed additional levels of development for the three Build Alternatives and B-CSX Design
4122 Option. Note that any changes to permitted development levels would require amendment of the North Potomac
4123 Yard Plan and CDD #19 zoning provisions as part of a community process.

4124 **Table 3-44** lists the development assumptions for each alternative. Build Alternative B includes the additional
4125 development that allowed under current plans in North Potomac Yard if a Metrorail Station is constructed in the
4126 location of Build Alternative B and documented in the NPYSAP. Total development is listed in square feet,
4127 without reference to type of land use (for example, office, residential, or commercial), because plans
4128 recommend mixed-use development, and the exact development volumes for each specific use have yet to be
4129 determined.

4130 **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

4131 Source: City of Alexandria *North Potomac Yard Small Area Plan*.

4132 3.23.2.2 Recent and Planned Development in Arlington Potomac Yard

4133 Since 2005, redevelopment of the Arlington County portion of Potomac Yard has resulted in the addition of
4134 approximately 175,000 square feet of retail space, 1 million square feet of office space, and 850 dwelling units.
4135 The area is expected to add another 74,000 square feet of retail space, 1 million square feet of office space, and
4136 700 dwelling units (Arlington County, *Development in the Metro Corridors* report, 2011).

4137 3.23.2.3 Infrastructure Projects

4138 A number of improvements to transportation infrastructure are either planned or have been recently completed
4139 to facilitate the redevelopment of Potomac Yard. The projects include the recently completed realignment of the
4140 Monroe Avenue Bridge, as well as completion of the planned street network within Potomac Yard and the
4141 completion of the first phase of the CCPY Transitway.

4142 Dominion Power is also planning a new electrical power line connecting the existing Glebe Power Substation,
4143 located just north of Four Mile Run and west of U.S. Route 1, to the Potomac River Substation, located east of
4144 the George Washington Memorial Parkway and south of Slaters Lane. The project is considering several routing

4145 options that traverse the Potomac Yard Metrorail Station EIS Study Area. The project is scheduled to be
4146 constructed by 2018.

4147 **3.23.3 Secondary Effects**

4148 This section describes the secondary effects of the No Build Alternative, the three Build Alternatives, and B-CSX
4149 Design Option. For the Potomac Yard Metrorail Station project, secondary effects are those effects related to
4150 the increased amount of development that would occur under various alternatives.

4151 **3.23.3.1 No Build Alternative**

4152 Under the No Build Alternative, 9.25 million square feet of development would be permitted in the Alexandria
4153 portion of Potomac Yard by the year 2040. Potential secondary effects due to this development include traffic,
4154 impacts to community facilities, and visual impacts.

4155 Under the No Build Alternative, no new Metrorail station would be constructed, and thus relatively little of the
4156 travel demand generated by the development is expected to be served by Metrorail. A certain portion of trips
4157 would be expected to use surface transit options in the corridor, including the CCPY Transitway, but transit
4158 mode share would not be maximized.

4159 The No Build Alternative would result in additional population and employment in Potomac Yard, which could
4160 place a strain on community facilities. However, small area plans of the City of Alexandria (*North Potomac Yard
4161 Plan* and *Potomac Yard/Potomac Greens Small Area Plan*) and Arlington County (*Potomac Yard Phased
4162 Development Site Plan*) address the adequate provision of community facilities for the population within
4163 Potomac Yard and surrounding areas.

4164 The No Build Alternative would include the construction of several tall buildings in North Potomac Yard (up to
4165 250 feet maximum height; 100 to 180 feet maximum height along the eastern portion of the site), which could be
4166 visible from the GWMP and the Potomac Greens neighborhood.

4167 **3.23.3.2 Build Alternatives**

4168 The construction of a Metrorail station in Build Alternatives A, D, and B-CSX Design Option locations would
4169 each allow a total of 9.25 million square feet of development within Potomac Yard. Build Alternative B would
4170 allow a total of 13.075 million square feet of development in Potomac Yard. The increased development in
4171 Potomac Yard under Build Alternative B would provide more opportunities for housing and commercial uses
4172 close to the region's core in a location with Metrorail access, resulting in fewer and shorter automobile trips than
4173 if the same development were to occur farther from the core in a site without walkable Metrorail access.

4174 To varying degrees, the additional development for Build Alternative B would result in secondary effects on
4175 transportation, community facilities and services, and visual resources.

- 4176 • The increased development in Potomac Yard under Build Alternative B would result in additional trips,
4177 including peak-period trips. However, the provision of a Metrorail station under the Build Alternative B would
4178 help to offset the additional trips in both the peak- and off-peak periods. The provision of a Metrorail station in
4179 addition to a pedestrian- and bicycle-friendly environment with a strong local transit network would be
4180 expected to result in higher non-auto mode splits. The highest percentage of transit trips would be to or from
4181 development adjacent to or within ¼ mile of the Metrorail station. For residential uses, a high transit mode split
4182 would be expected within ½ mile of the Metrorail station.
- 4183 • Ridership projections that include the additional development permitted under Build Alternative B (see **Table**
4184 **3-44**) would be expected to result in higher transit ridership. Build Alternative B is projected to result in the
4185 highest Metrorail ridership, with 13,200 daily boardings at the Potomac Yard Metrorail station, as compared to
4186 10,000 boardings under the other Build Alternatives and B-CSX Design Option.
- 4187 • With the increase in permitted development for Build Alternative B, the model shows an increase in the
4188 number of automobile trips. However, the share of trips taken using modes other than the automobile would
4189 increase, compared to the No Build scenario. Under each Build Alternative, the non-auto mode share would
4190 be expected to be 34 percent, compared to 29 percent under the No Build Alternative.
- 4191 • The additional development permitted under Build Alternative B is projected to result in increases in population
4192 and employment within Potomac Yard. The small area plans of the City of Alexandria (*North Potomac Yard
4193 Plan* and *Potomac Yard/Potomac Greens Small Area Plan*) and Arlington County (*Potomac Yard Phased
4194 Development Site Plan*) address the adequate provision of community facilities for the population within
4195 Potomac Yard and surrounding areas.

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- 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.
- 4199
- 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.
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4203 3.23.4 Cumulative Effects

4204 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.

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4210 3.23.4.1 No Build Alternative

4211 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.

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4219 3.23.4.2 Build Alternatives

4220 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:

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- 4227 • 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.
 - 4237 • 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
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4249 depth that would consistently block views of the station and facilities, although they would serve to screen
4250 views of the station and facilities.

- 4251 • Construction of any of the three Build Alternatives or B-CSX Design Option would likely occur in tandem with
4252 construction of development within Potomac Yard. Therefore, cumulative effects are likely to occur from noise,
4253 vibration, dust, and traffic due to construction activity. Potential mitigation measures are discussed in detail in
4254 **Section 3.24 Construction Impacts.**

4255 **Build Alternative A**

4256 No additional cumulative impacts, other than listed above, are likely to occur due to the construction of Build
4257 Alternative A.

4258 **Build Alternative B**

4259 Portions of Build Alternative B have the potential to be affected by sea-level rise during the design life of the station,
4260 based on projections contained in the City of Alexandria's *Climate Change Action Plan 2012-2020*. The plan identifies
4261 areas of the City along the Potomac River and its tributaries that are vulnerable to sea-level rise by the year 2100. The
4262 plan cites a range of sea level-rise projections based on several global climate models that result in a rise in the
4263 median sea level during high tide from the current high tide level of approximately 2 feet NAVD88 in the year 2012 to
4264 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
4265 during high tide cited in the plan is approximately 2.6 to 3.6 feet NAVD88 by the year 2066. As described in **Section**
4266 **3.15 Floodplains**, portions of Build Alternative B would be built on retained fill within the 100-year floodplain; the
4267 alternative has realigned track at an elevation of 25 feet NAVD88, and the Build Alternative B station platform is also at
4268 an elevation of 25 feet NAVD88, which are above the current 100-year Base Flood Elevation of 10 feet NAVD88
4269 (FIRM datum). The *Climate Change Action Plan* anticipates flood events with more intense tidal storm surges related
4270 to sea level rise. Potential mitigation measures related to flood zones are discussed in **Section 3.15 Floodplains.**

4271 Build Alternative B is potentially affected by one of the nine alignment options under consideration for the planned new
4272 Dominion Power electrical line.

4273 **B-CSX Design Option**

4274 B-CSX Design Option is potentially affected by three of the nine alignment options under consideration for the
4275 planned new Dominion Power electrical line. No other cumulative impacts, other than listed above, are likely to
4276 occur due to the construction of B-CSX Design Option.

4277 **Build Alternative D**

4278 Portions of Build Alternative D have the potential to be affected by sea-level rise during the design life of the station,
4279 based on projections contained in the City of Alexandria's *Climate Change Action Plan 2012-2020*. The plan identifies
4280 areas of the City along the Potomac River and its tributaries that are vulnerable to sea-level rise by the year 2100. The
4281 plan cites a range of sea level-rise projections based on several global climate models that result in a rise in the
4282 median sea level during high tide from the current high tide level of approximately 2 feet NAVD88 in the year 2012 to
4283 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
4284 during high tide cited in the plan is approximately 2.6 to 3.6 feet NAVD88 by the year 2066. As described in **Section**
4285 **3.15 Floodplains**, portions of Build Alternative D would be built on retained fill within the 100-year floodplain; the
4286 alternative has realigned track at an elevation of 25 feet NAVD88. The *Climate Change Action Plan* anticipates flood
4287 events with more intense tidal storm surges related to sea level rise. Potential mitigation measures related to flood
4288 zones are discussed in **Section 3.15 Floodplains.**

4289 Build Alternative D is potentially affected four of the nine alignment options under consideration for the planned new
4290 Dominion Power electrical line.

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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.

4292 3.24 Construction Impacts

4293 This section describes the potential temporary construction impacts that could result from the construction of the
 4294 three Build Alternatives and B-CSX Design Option. The duration of project construction is estimated to be
 4295 approximately two years. Construction activities would include clearing, grubbing, and leveling for realigned
 4296 tracks, station facilities and pedestrian bridge entrance pavilions; construction of new embankments for track;
 4297 construction of piers or bents for aerial sections of track and platforms; drilling shafts and driving piles for
 4298 structural foundations; fill activities, and the delivery and storage of equipment and materials. Proposed
 4299 construction staging and access for the three Build Alternatives and B-CSX Design Option are described in
 4300 detail in **Section 2.4 Build Alternatives** and summarized in this section under **3.24.3.2 Build Alternatives**.

4301 The assessment of temporary construction impacts is preliminary and based on the current conceptual level of
 4302 design developed at the EIS phase of the project. The types and levels of potential impacts from the three Build
 4303 Alternatives and B-CSX Design Option are subject to revision through the design and development review
 4304 processes, with a goal to further avoid or minimize impacts to the maximum extent practicable. Any impact that
 4305 cannot be avoided, including temporary impacts during construction, would be mitigated.

4306 3.24.1 Methodology

4307 Construction impacts of the three Build Alternatives and B-CSX Design Option were assessed by reviewing
 4308 existing site conditions and proposed construction staging areas, access points and transportation routes and
 4309 consulting WMATA and CSXT regarding their procedures for construction activities occurring near or within
 4310 track right-of-way.

4311 3.24.2 Affected Environment

4312 **Figure 3-86** illustrates the locations of construction staging and access points specific to the three Build
 4313 Alternatives and B-CSX Design Option. Existing resources within these areas are described in **Section 3.2**
 4314 through **Section 3.22**.

4315 3.24.3 Environmental Consequences

4316 This subsection is organized as follows:

- 4317 • 3.24.3.1 No Build Alternative
- 4318 • 3.24.3.2 Build Alternatives
 - 4319 ○ Construction Access Options and Staging Areas

4320 For the Build Alternatives and B-CSX Design Option, impacts are described for the following resources:

- 4321 ○ Transportation
- 4322 ○ Property Impacts
- 4323 ○ Visual Resources
- 4324 ○ Cultural Resources
- 4325 ○ Parklands
- 4326 ○ Air Quality
- 4327 ○ Noise and Vibration
- 4328 ○ Water Resources – Wetlands, Water Quality, Floodplains, Coastal Zones and Chesapeake Bay
- 4329 Preservation Areas, and Groundwater
- 4330 ○ Ecosystems
- 4331 ○ Soils
- 4332 ○ Hazardous and Contaminated Materials
- 4333 ○ Safety and Security

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4335 **3.24.3.1 No Build Alternative**

4336 Construction activities associated with development in Potomac Yard would occur under the No Build
4337 Alternative. Anticipated effects include noise, vibration, dust, and traffic due to construction activity.

4338 **3.24.3.2 Build Alternatives**4339 **Construction Access Options and Staging Areas**

4340 Construction access options for the alternatives are summarized as follows:

- 4341 • **Build Alternatives A and B:** two options for construction access from areas east of the existing
4342 Metrorail tracks (with and without GWMP roadway access) are provided and the impacts assessed for
4343 each.
- 4344 • **B-CSX Design Option:** no construction access would be needed from the GWMP roadway and a single
4345 construction access option is provided and assessed.
- 4346 • **Build Alternative D:** construction access from the GWMP roadway is needed for the northern part of
4347 Build Alternative D near Four Mile Run, because access is precluded from the west due to the existing
4348 Metrorail Line and the Four Mile Run waterway. A single construction access option is provided and
4349 assessed. Access points from the GWMP roadway would be required approximately several hundred
4350 feet north of Four Mile Run and approximately several hundred feet south of Four Mile Run.

4351 Construction activities would occur within staging areas and access routes for the three Build Alternatives and
4352 B-CSX Design Option, as shown in **Figure 3-90**. A staging area is a designated area where vehicles, supplies,
4353 and construction equipment are positioned for access and use adjacent to or nearby the immediate construction
4354 site. Areas designated for staging would be cleared of all trees and other natural vegetation and filled in or
4355 leveled as necessary to make construction activities possible. After the completion of construction activities, the
4356 areas would be replanted and landscaped according to their prior uses and wetlands would be restored in
4357 coordination with associated stakeholders and federal and state regulations.

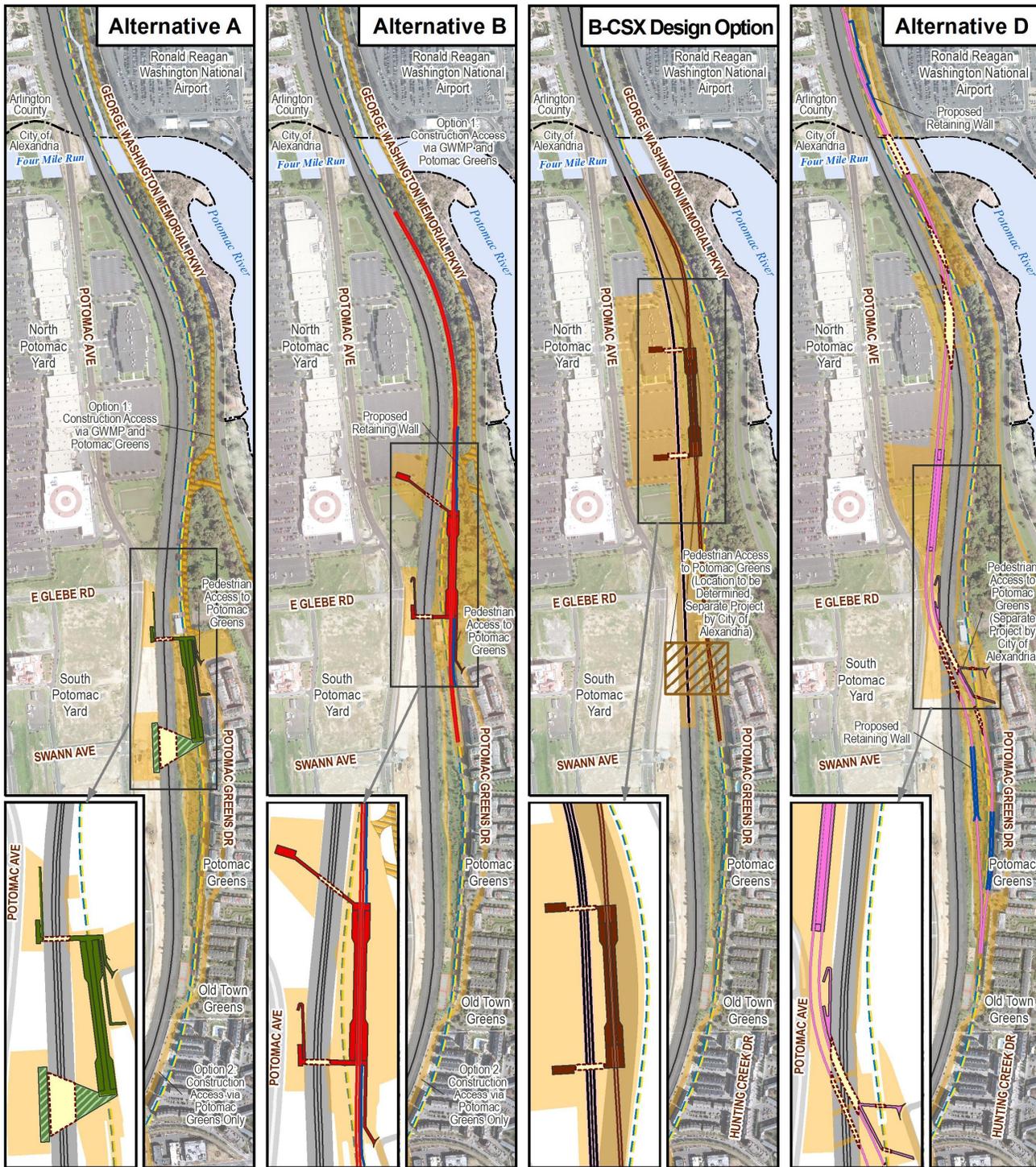
4358 Acreages of temporary construction impact areas exclude permanent impact areas and include only those areas
4359 that would be temporarily occupied or otherwise affected by construction activities during the duration of project
4360 construction. Temporary impact areas would be restored or returned to their former use or condition upon
4361 completion of construction activities. **Figures 3-91** through **3-96** provide close-up views of construction access
4362 and staging areas for Build Alternative A, Build Alternative B, B-CSX Design Option, and Build Alternative D.

4363 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
4364 Preliminary staging areas have been identified. More detail on construction staging would become available as
4365 discussions with property owners continue through the Final EIS and through final engineering design prior to
4366 construction.

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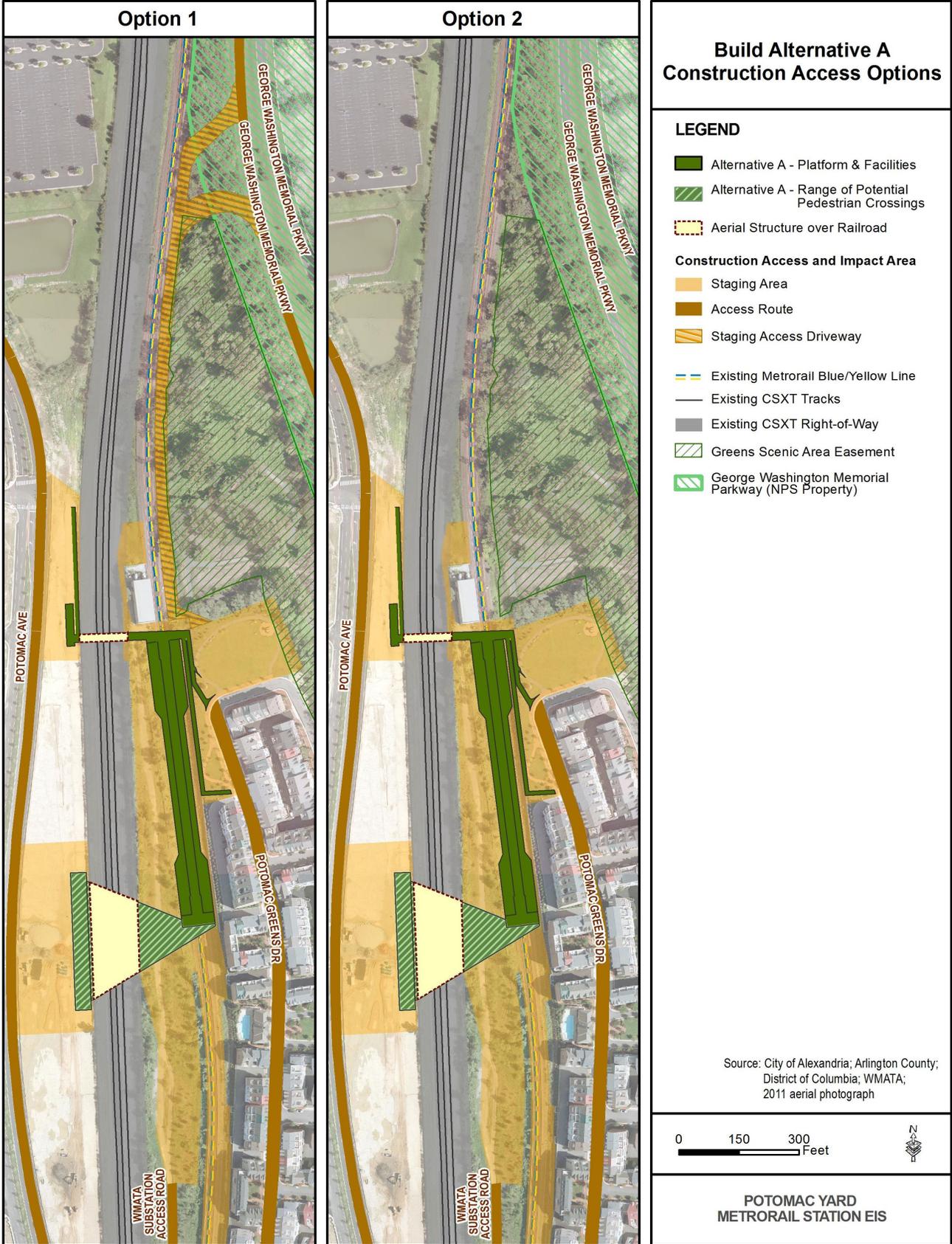
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4369 Figure 3-90: Build Alternatives



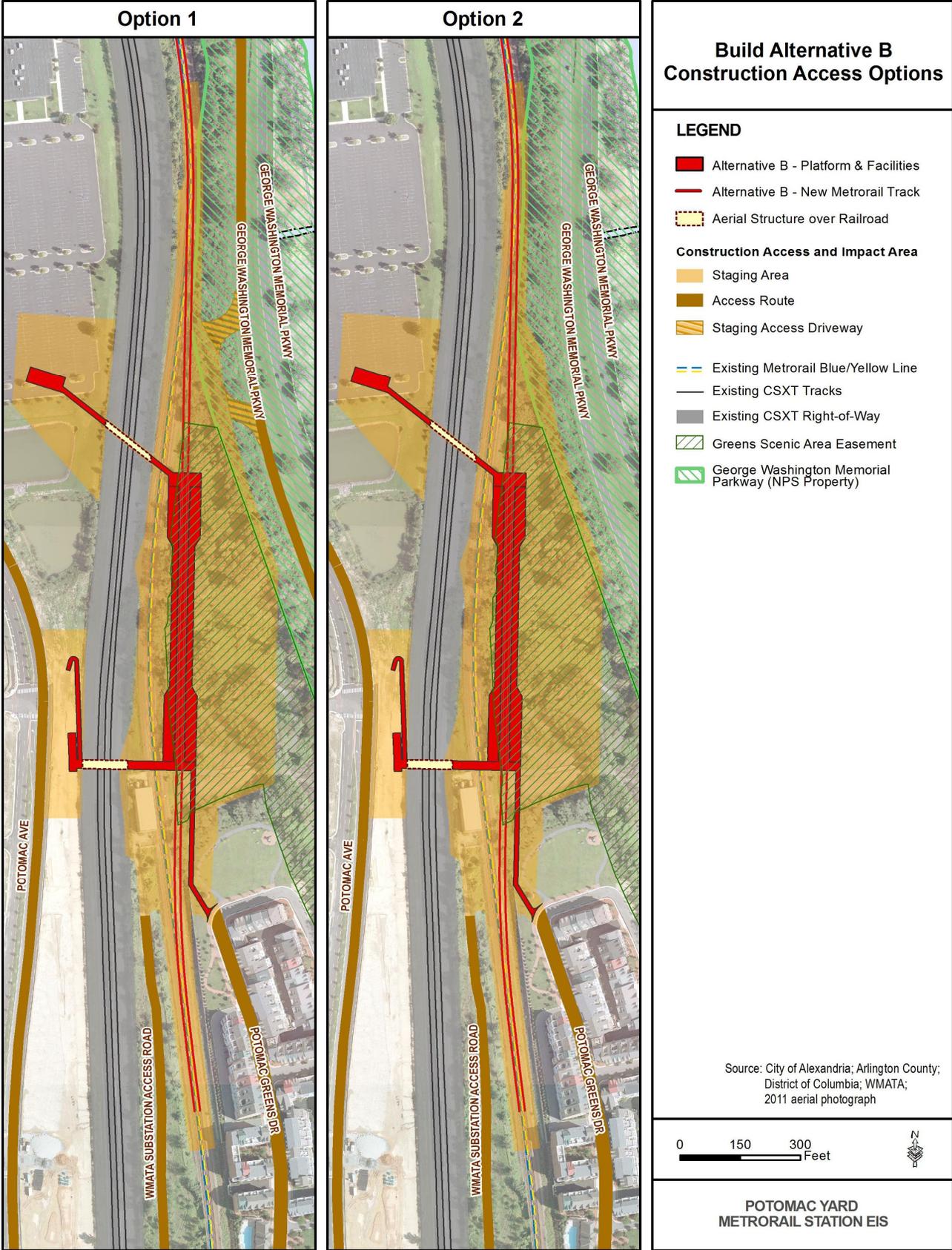
<ul style="list-style-type: none"> Alternative A - Platform & Facilities Alternative A - Range of Potential Pedestrian Crossings Alternative B - Platform & Facilities Alternative B - New Metrorail Track B-CSX Design Option - Platform & Facilities B-CSX Design Option - New Metrorail Track B-CSX Design Option - Realigned CSXT Track 	<ul style="list-style-type: none"> Alternative D - Platform & Facilities Alternative D - New Metrorail Track Aerial Structure over Railroad or Water Construction Access and Impact Area Alternative A and B - Option 1: Additional Construction Access and Impact Area Existing Metrorail Blue/Yellow Line Existing CSXT Tracks Existing CSXT Right-of-Way 	<p>Source: City of Alexandria; Arlington County; District of Columbia; WMATA</p>
<p>0 300 600 Feet (INSETS)</p>		
<p>0 450 900 Feet</p>		
<p>POTOMAC YARD METRORAIL STATION EIS</p>		

4371 Figure 3-91: Build Alternative A Construction Access Options



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4374 Figure 3-92: Build Alternative B Construction Access Options



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4377 Figure 3-93: B-CSX Design Option (North) Construction Staging and Access



B-CSX Design Option (North) Construction Staging and Access

LEGEND

- B-CSX Design Option - Platform & Facilities
- B-CSX Design Option - New Metrorail Track
- B-CSX Design Option - Realigned CSXT Track
- Aerial Structure over Railroad
- Construction Access and Impact Area**
- Staging Area
- Access Route
- Existing Metrorail Blue/Yellow Line
- Existing CSXT Tracks
- Existing CSXT Right-of-Way
- Greens Scenic Area Easement
- George Washington Memorial Parkway (NPS Property)

Source: City of Alexandria; Arlington County; District of Columbia; WMATA; 2011 aerial photograph

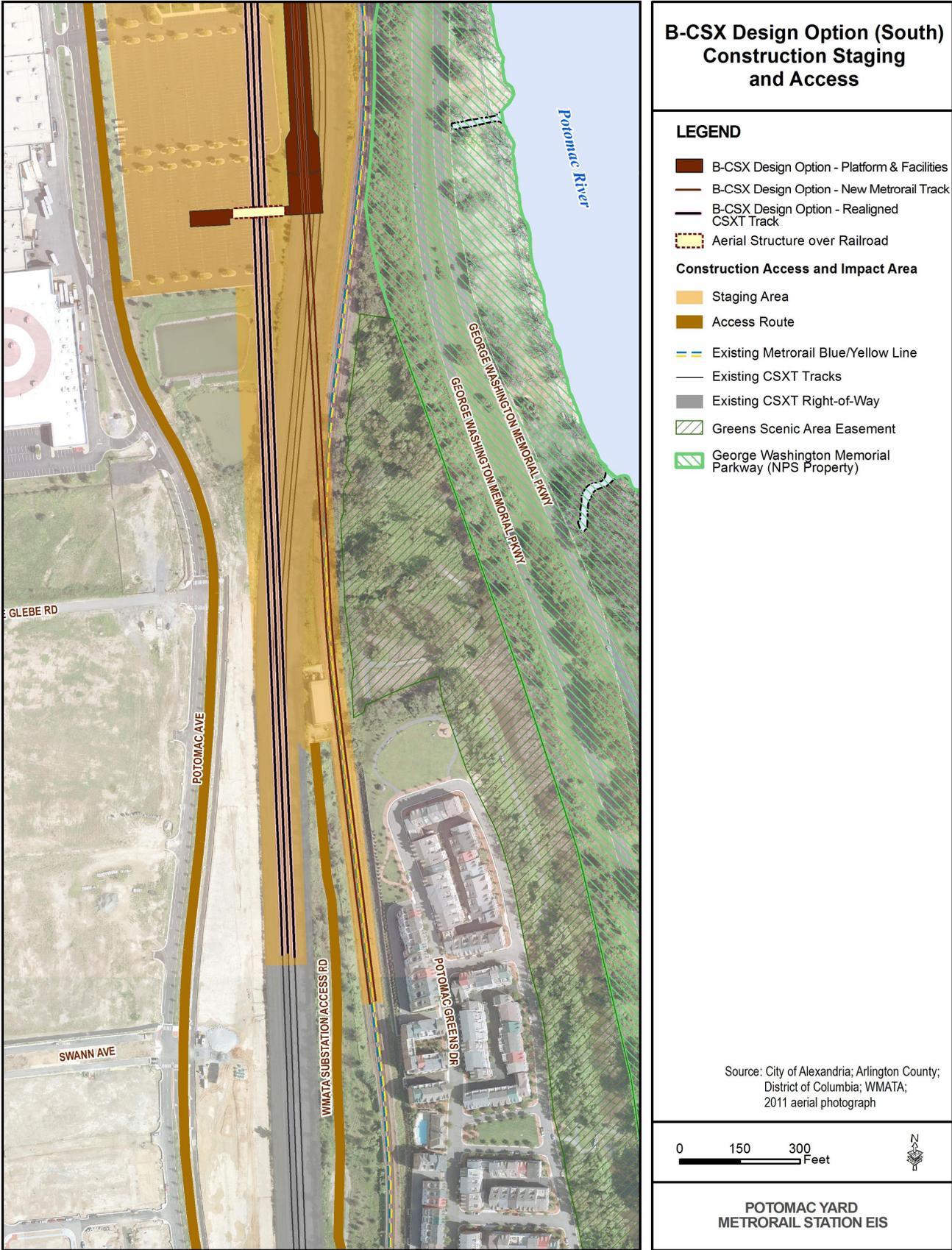
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POTOMAC YARD
METRORAIL STATION EIS

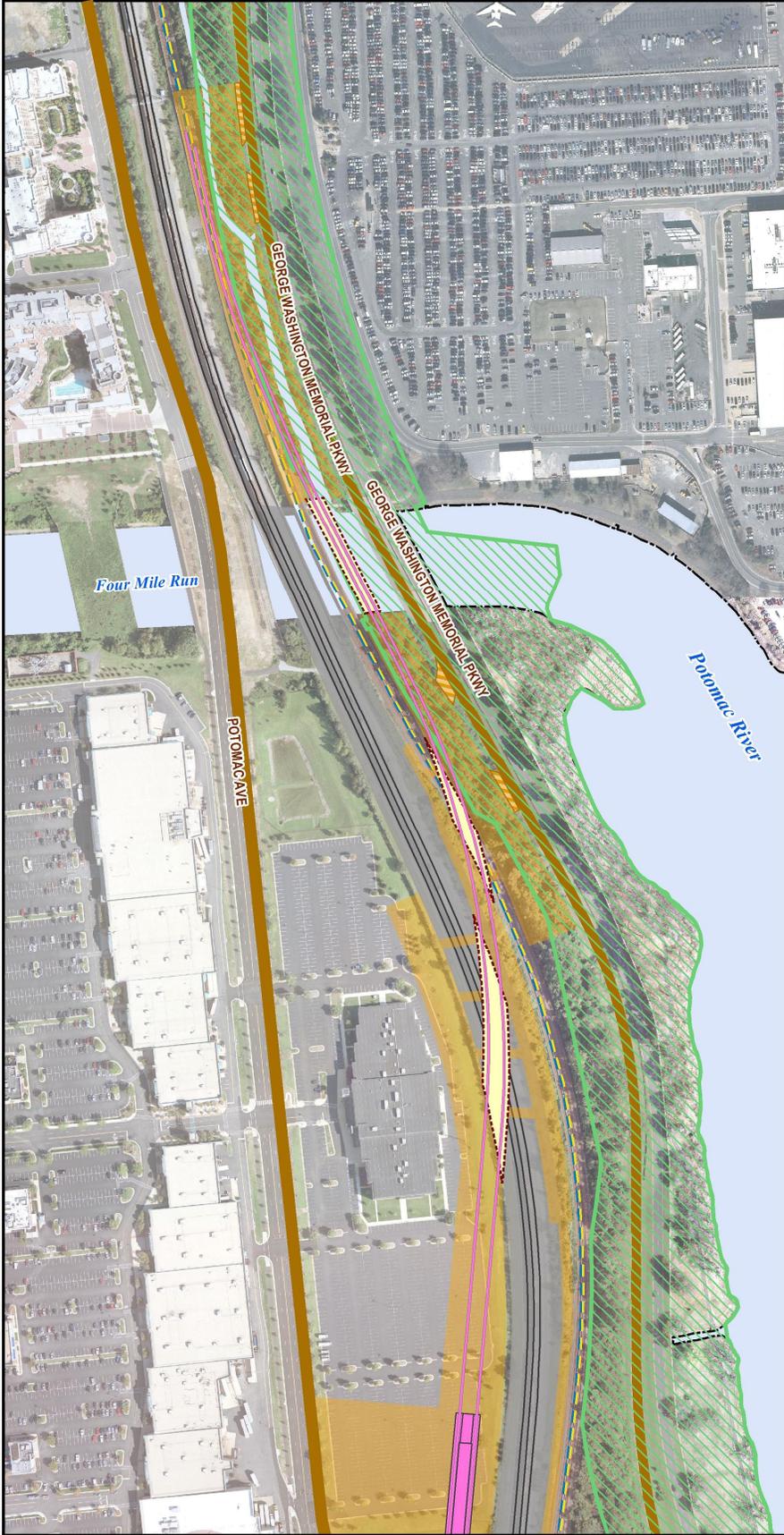
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4380 Figure 3-94: B-CSX Design Option (South) Construction Staging and Access



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4382 Figure 3-95: Build Alternative D (North) Construction Staging and Access



Build Alternative D (North) Construction Staging and Access

LEGEND

- Alternative D - Platform & Facilities
- Alternative D - New Metrorail Track
- Aerial Structure over Railroad or Water

Construction Access and Impact Area

- Staging Area
- Access Route
- Staging Access Driveway
- Existing Metrorail Blue/Yellow Line
- Existing CSXT Tracks
- Existing CSXT Right-of-Way
- George Washington Memorial Parkway (NPS Property)

Source: City of Alexandria; Arlington County; District of Columbia; WMATA; 2011 aerial photograph

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**POTOMAC YARD
METRORAIL STATION EIS**

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4384 Figure 3-96: Build Alternative D (South) Construction Staging and Access



Build Alternative D (South) Construction Staging and Access

LEGEND

- Alternative D - Platform & Facilities
- Alternative D - New Metrorail Track
- Aerial Structure over Railroad

Construction Access and Impact Area

- Staging Area
- Access Route
- Existing Metrorail Blue/Yellow Line
- Existing CSXT Tracks
- Existing CSXT Right-of-Way
- Greens Scenic Area Easement
- George Washington Memorial Parkway (NPS Property)

Source: City of Alexandria; Arlington County; District of Columbia; WMATA; 2011 aerial photograph

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**POTOMAC YARD
METRO RAIL STATION EIS**

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4386 **Transportation**4387 **Metrorail Operations**

4388 Temporary track shutdowns would be necessary during specific construction activities for the three Build
 4389 Alternatives and B-CSX Design Option. Shutdowns would close Metrorail service between the Ronald Reagan
 4390 Washington National Airport station and Braddock Road station, require the use of temporary bus shuttle
 4391 service to transport riders between the two stations, and be limited to a maximum outage of 76 hours at a time
 4392 per WMATA standards. All necessary single-tracking, shutdowns, and testing would be conducted in
 4393 compliance with WMATA policies. To minimize these impacts, construction efforts would be scheduled and
 4394 coordinated to minimize their occurrences, for example, by scheduling single-tracking and shutdowns during
 4395 nighttime periods or special weekend maintenance periods on the line.

4396 The construction of B-CSX Design Option would be phased to accommodate the realignment of both the
 4397 Metrorail and CSXT rail corridors with minimal disruption to rail operations. B-CSX Design Option requires the
 4398 construction of the new CSXT alignment followed by the demolition of the existing CSXT tracks before
 4399 constructing the new Metrorail station and track.

4400 **CSXT Right-of-Way and Operations**

4401 Installation of any element over the CSXT track clearance area requires a pre-planned outage on CSXT track.
 4402 At the end of the outage, all structural elements must be secured such that they will not dislodge and become a
 4403 hazard to rail operations. In addition, construction access for the three Build Alternatives and B-CSX Design
 4404 Option proposes to use the existing WMATA power substation service road. To allow construction equipment
 4405 access to the north of the substation, a temporary construction access easement around the west side of the
 4406 substation would be required due to the narrow width between CSXT property and the substation building.

4407 Construction activities which occur on CSXT property, or within 25 feet of CSXT track, or which involve
 4408 construction equipment or activities that in the event of a structural or mechanical failure or other type of
 4409 accident could result in disturbances within 25 feet of CSXT track would be considered by CSXT to “foul the
 4410 track.” When construction activities involve fouling of track, CSXT would require one or more CSXT flagmen on
 4411 site to verify that the railroad is clear for safe passage of trains. Construction activities which cannot be stopped,
 4412 moved in the clear, and secured within a few minutes’ notice would require a pre-planned outage of railroad
 4413 operations.

4414 B-CSX Design Option would require temporary track shutdowns during construction to accommodate realigned
 4415 track segments. The new CSXT track alignment would be constructed as much as possible before connecting to
 4416 the existing track segments. Once the new track alignment is operational, the original CSXT track alignment
 4417 would be demolished and construction on the new WMATA right-of-way would ensue. To minimize impacts to
 4418 CSXT operations, construction efforts would be scheduled and coordinated with CSXT to minimize their
 4419 occurrences.

4420 **Public Roadways and Private Driveways**

4421 The three Build Alternatives and B-CSX Design Option would impact public roadways and private drives due to
 4422 temporary construction access and routing of construction vehicles. The roadway operations of Potomac
 4423 Avenue, Potomac Greens Drive, Slaters Lane, U.S. Route 1, and the WMATA traction power substation access
 4424 road would be affected during construction. In addition, construction of Build Alternative A (Option 1
 4425 Construction Access), Build Alternative B (Option 1 Construction Access), and Build Alternative D would use
 4426 temporary access from the GWMP roadway, which would involve effects on roadway operations in the vicinity of
 4427 the access points. Temporary lane closures would be required on public roads that have more than two lanes,
 4428 including the GWMP roadway and Potomac Avenue. Flagmen would be used on smaller two-lane roads to
 4429 direct vehicle movements and allow construction vehicles to access the building sites. Routes for the
 4430 construction vehicle access by each alternative are described in more detail in **Chapter 2, Alternatives**
 4431 **Considered**.

4432 During construction, the number of vehicles accessing the site would vary daily. For the three Build Alternatives
 4433 and B-CSX Design Option, the number of vehicles on each access route would fluctuate depending on the
 4434 activities associated with construction and time of day. At this early stage of project design, proposed
 4435 construction techniques, types of equipment, and precise locations and durations of different activities within the
 4436 project construction areas have not yet been defined sufficiently to quantitatively assess and compare the
 4437 potential traffic effects of the three Build Alternatives and B-CSX Design Option.

4438 Commercial vehicles are prohibited from the GWMP under *NPS Management Policies 2006* (9.2.1.2.1) and
 4439 Federal regulations (36 CFR 5.6). The NPS policies state that "commercial traffic will be prohibited on roads
 4440 within parks, except for the purpose of serving park visitors and park operations (9.2.1.2.1)." If access to private
 4441 lands is otherwise not available, the park Superintendent has the discretion to issue permits for commercial
 4442 vehicles. The proposed construction project areas for Build Alternatives A and B and B-CSX Design Option are
 4443 accessible from locations other than the GWMP. However, since potential impacts would occur to residential
 4444 communities at the other access locations, construction access from the GWMP was also studied as an option
 4445 in the Draft EIS. NPS correspondence regarding use of the GWMP roadway for project construction access is
 4446 included in **Appendix H, Agency Correspondence**.

4447 Construction would also be completed in accordance to the City of Alexandria's noise ordinance, which limits
 4448 construction to business hours on weekdays and limited hours on Saturdays. A permit from the City's
 4449 Department of Transportation and Environmental Services is necessary to haul construction materials on city
 4450 streets (*City of Alexandria Code of Ordinances Section 5-2-27*).

4451 To minimize potential impacts from construction traffic, site access by construction vehicles could be
 4452 strategically scheduled to minimize its occurrence, and access times to the GWMP roadway would occur only
 4453 during non-rush hours and traffic plans would be coordinated with and approved by the proper authorities. For
 4454 Build Alternative A (Option 1 Construction Access), Build Alternative B (Option 1 Construction Access), and
 4455 Build Alternative D, construction vehicles accessing the site from the GWMP roadway would be limited to using
 4456 the southbound GWMP roadway between the Airport Access Road and Slaters Lane.

4457 For each of the three Build Alternatives or B-CSX Design Option, when construction is complete, any road
 4458 infrastructure damaged by construction activity would be restored to its former condition.

4459 GWMP Access

4460 **Option 1 Construction Access for Build Alternatives A and B** would require two temporary driveways for
 4461 construction vehicle access from the GWMP roadway; driveway areas would be cleared of all trees and other
 4462 natural vegetation and filled in or leveled as necessary to make construction activities possible. The access
 4463 driveways from the GWMP southbound lanes to the construction staging areas would be 0.30 acre in total area
 4464 (two driveways, each approximately 50 to 75 feet in width by 100 feet in length, providing one-way access off of
 4465 and onto the GWMP southbound roadway). Parkway facilities in the vicinity, including the Mount Vernon Trail
 4466 and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway
 4467 would remain open to general vehicular traffic in both directions of travel during the duration of construction,
 4468 although a temporary lane closure of a portion of one southbound lane in the vicinity of the construction access
 4469 areas would be required. Construction vehicles would use the southbound GWMP roadway from the Airport
 4470 Access Road to Slaters Lane (1.7 miles). Users of the GWMP would experience additional vehicular traffic on
 4471 the southbound roadway due to the inclusion of construction vehicles, which may impede traffic at certain times
 4472 and would diminish the scenic quality of the GWMP. The additional traffic of construction vehicles may also
 4473 damage the roadway pavement, which would eventually need to be replaced as part of the project.

4474 **Option 2 Construction Access for Build Alternatives A and B** would not require any access roadways from
 4475 the GWMP. All construction vehicles accessing the eastside of the site would travel through the Potomac
 4476 Greens and Old Town Greens neighborhoods along Potomac Greens Drive (see "Potomac Greens Drive
 4477 Access" below).

4478 **B-CSX Design Option** would not require any access from the GWMP.

4479 **Build Alternative D** construction staging would require the removal of 2.40 acres of vegetation along the
 4480 GWMP roadway in the vicinity of Four Mile Run. Construction activity would be located relatively close to the
 4481 parkway with little visual barrier, noticeably altering the appearance of the vegetated area proposed for
 4482 construction. The access driveways from the GWMP southbound lanes to the construction staging areas consist
 4483 of short access points into the construction staging areas, due to the narrow dimensions of the GWMP parkland
 4484 west of the roadway in this area (two driveways, providing one-way access off of and onto the GWMP
 4485 southbound roadway approximately several hundred feet north of Four Mile Run; and two driveways providing
 4486 one-way access off of and onto the GWMP southbound roadway approximately several hundred feet south of
 4487 Four Mile Run; dimensions of each driveway are approximately 50 to 75 feet in width by 20-30 feet in length). All
 4488 parkway facilities would remain open for public use, and the roadway would remain open to general vehicular
 4489 traffic in both directions of travel during the duration of construction, although temporary lane closure of a portion
 4490 of one southbound lane of in the vicinity of Four Mile Run would be required. Construction vehicles would use
 4491 the southbound GWMP roadway from the Airport Access Road to Slaters Lane (1.7 miles). Users of the GWMP

4492 would experience additional vehicular traffic on the southbound roadway due to the inclusion of construction
 4493 vehicles, which may impede traffic at certain times and would diminish the scenic quality associated of the
 4494 GWMP. The additional traffic of construction vehicles may also damage the roadway pavement, which would
 4495 eventually need to be replaced.

4496 Potomac Greens Drive Access

4497 **Build Alternatives A and B** would both require access through the residential areas of Potomac Greens and
 4498 Old Town Greens via the entire length of Potomac Greens Drive (0.7 mile); construction vehicles would access
 4499 this area from U.S. Route 1.

- 4500 • **Option 1 Construction Access** would also provide access to the area east of the existing Metrorail
 4501 tracks via a temporary construction access driveway from the GWMP through Potomac Greens Park,
 4502 resulting in lower overall construction traffic volumes on Potomac Greens Drive than Option 2.
- 4503 • **Option 2 Construction Access** would not provide access to the area east of the existing Metrorail
 4504 tracks from the GWMP, and the access would be provided entirely via Potomac Greens Drive, resulting
 4505 in higher overall volumes of construction traffic on Potomac Greens Drive than Option 1.

4506 Both options would require access on the west side of the existing Metrorail alignment; temporary construction
 4507 access would be provided utilizing the access road through the Rail Park to the WMATA traction power
 4508 substation (0.5 mile), crossing over the existing Metrorail alignment at the tennis court area of Old Town Greens
 4509 (where Metrorail begins to travel in a tunnel below-grade).

4510 Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would
 4511 experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles,
 4512 which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the
 4513 roadway pavement, which would eventually need to be replaced as part of the project.

4514 **B-CSX Design Option** would require access on the west side of the existing Metrorail alignment; temporary
 4515 construction access would be provided utilizing the access road through the Rail Park to the WMATA traction
 4516 power substation (0.5 mile), crossing over the existing Metrorail alignment at the tennis court area of Old Town
 4517 Greens (where Metrorail begins to travel in a tunnel below-grade). No construction access from Potomac
 4518 Greens Drive would be required north of Old Town Greens.

4519 Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would
 4520 experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles,
 4521 which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the
 4522 roadway pavement, which would eventually need to be replaced as part of the project.

4523 **Build Alternative D**

4524 For construction activities in the vicinity of the Potomac Greens and Old Town Greens neighborhoods, access
 4525 would be provided via the entire length of Potomac Greens Drive; construction vehicles would access this area
 4526 from U.S. Route 1. Access to the area between the existing Metrorail tracks and CSXT right-of-way would be
 4527 provided through Potomac Greens Drive (0.7 mile) and via the access road through the Rail Park to the WMATA
 4528 traction power substation (0.5 mile). Additional construction access would be required at locations where
 4529 proposed Metrorail aerial structures cross over the CSXT right-of-way, including locations north and south of the
 4530 proposed station and locations west of the Potomac Greens and Old Town Greens neighborhoods.

4531 Potomac Greens and Old Town Greens residents and patrons of neighborhood businesses and parks would
 4532 experience additional vehicular traffic on Potomac Greens Drive due to the inclusion of construction vehicles,
 4533 which may impede traffic at certain times. The additional traffic of construction vehicles may also damage the
 4534 roadway pavement, which would eventually need to be replaced as part of the project.

4535 **Property Impacts**

4536 The three Build Alternatives and B-CSX Design Option would require temporary easements or permits for
 4537 construction activities, including vehicular access, staging and material laydown areas. For construction
 4538 activities on GWMP property, Build Alternatives B and D would require a National Park Service Special Use
 4539 Permit – form 10-114. Temporary property acreage impacts to NPS parkland are described further below in this
 4540 section under **Parklands**. All temporary easements necessary for the project would be consistent with the
 4541 Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as Amended. **Figure 3-97**
 4542 shows existing property ownership within areas proposed for construction access, staging, and material laydown

4543 for the three Build Alternatives and B-CSX Design Option. Temporary construction easements would be needed
 4544 for the three Build Alternatives and B-CSX Design Option.

4545 **Table 3-45** lists construction impacts to the Greens Scenic Area easement. As described in **Section 3.3 Land**
 4546 **Acquisitions and Displacements**, clearing of vegetation is not permitted within the Greens Scenic Area
 4547 easement. The scenic easement prohibits most improvements, clearing, tree removal, and grading, except for
 4548 uses such as light passive recreation and underground utilities, for which any improvements require prior written
 4549 approval of the United States. However, the three Build Alternatives as designed would temporarily impact the
 4550 scenic easement to varying degrees. None of the three Build Alternatives could proceed unless the easement is
 4551 released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.
 4552 The land exchange process is described in **Section 3.3 Land Acquisitions and Displacements**. Due to the
 4553 relatively small areas of impact to the scenic easement, re-design of the proposed construction staging areas for
 4554 Build Alternatives A and D to avoid the scenic easement would be pursued if either is selected as the preferred
 4555 alternative; this refinement involves more detailed project design that would occur as part of the preparation of
 4556 the Final EIS. B-CSX Design Option would not impact the Greens Scenic Area easement.

4557 **Table 3-45: Potential Construction Impacts to the Greens Scenic Area Easement**

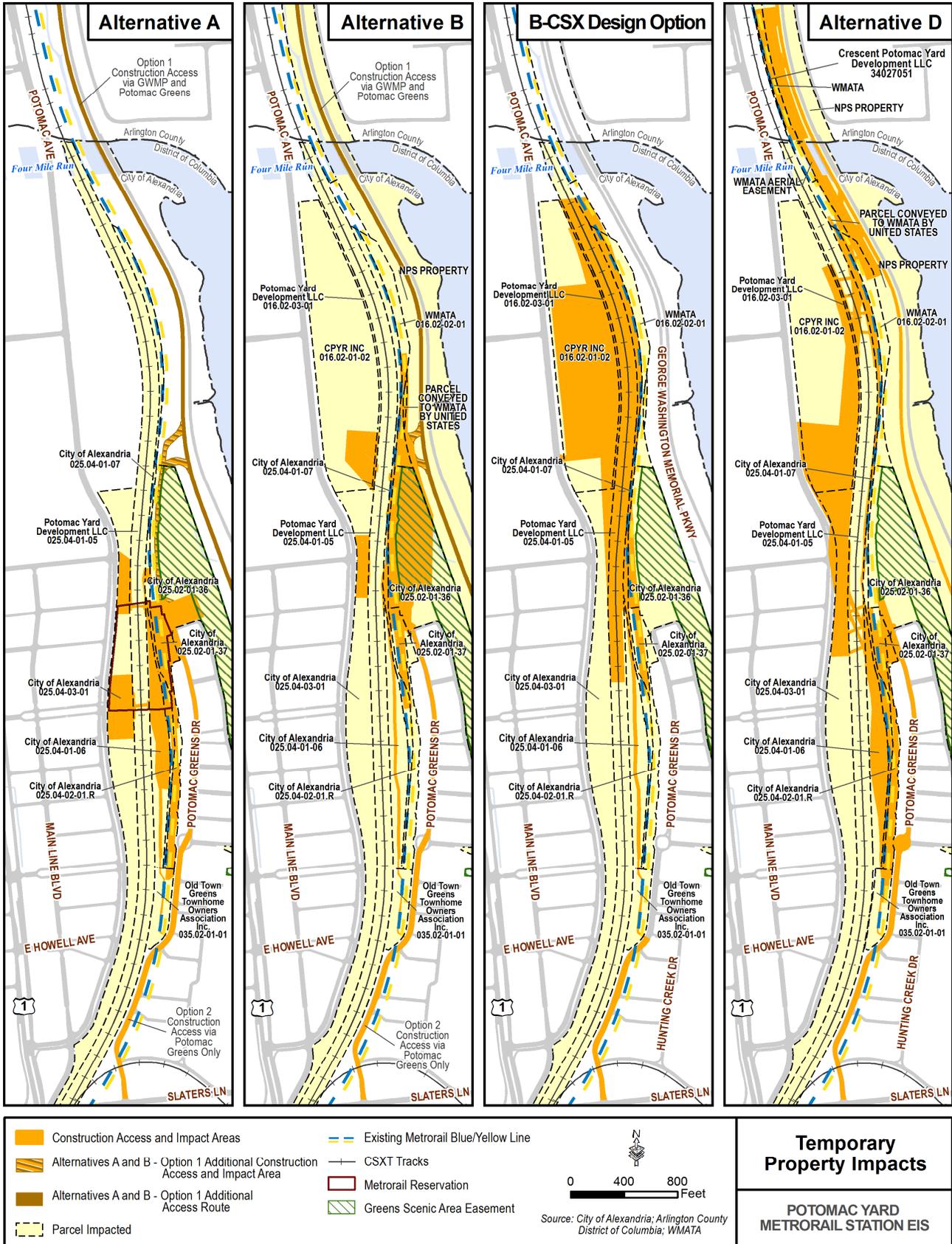
Type of Impact	Build Alternative A		Build Alternative B		B-CSX Design Option (acres)	Build Alternative D (acres)
	Option 1 Construction Access (acres)	Option 2 Construction Access (acres)	Option 1 Construction Access (acres)	Option 2 Construction Access (acres)		
Temporary ¹	0.25	0.13	3.09	3.09	0.00	0.02

4558 ¹ Acreage excludes areas with permanent property impacts.

4559 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
 4560 Preliminary staging areas have been identified. More detail on construction staging would become available as
 4561 discussions with property owners continue through the Final EIS and through final engineering design prior to
 4562 construction.

4563

4564 **Figure 3-97: Temporary Property Impacts**



4566 **Visual Resources**

4567 Temporary impacts to visual resources would result from the removal of vegetation for construction staging, the
 4568 location of construction equipment, and the provision of temporary vehicular access to GWMP roadway for
 4569 Alternatives A, B, and D. Standard Best Management Practices (BMPs) would be used to minimize visual
 4570 impacts during construction activities, and efforts would be made to minimize vegetation loss. Vegetated areas
 4571 cleared for construction activities would be replanted.

4572 For vegetation cleared from NPS parkland, the relationship of vegetation to historic planting plans and time
 4573 required for re-growth are described in **Section 3.9 Cultural Resources**. Vegetation clearance within GWMP
 4574 property, as described below for the Build Alternatives, would occur within areas planted as part of the original
 4575 landscape design of the MVMH and GWMP. These locations have since returned to a more naturally vegetated
 4576 state, although some of the species from the planting plans are still present and further described in Section 3.9.
 4577 Further description of the natural character, acreages, and time required for re-growth of the vegetation that
 4578 would be impacted is provided further below under **Ecosystems** (see page 3-225) temporary construction
 4579 impacts.

4580 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
 4581 Preliminary staging areas have been identified. More detail on construction staging would become available as
 4582 discussions with property owners continue through the Final EIS and through final engineering design prior to
 4583 construction.

4584 The assessment of temporary visual impacts references the analysis of existing conditions described in detail in
 4585 **Section 3.8 Visual Resources** that was prepared in accordance with Federal Highway Administration (FHWA)
 4586 *Visual Impact Assessment Methodology for Highway Projects* (1981). For reference, existing visual character
 4587 and quality ratings for views described below are summarized as follows:

- 4588 • GWMP viewsheds – the current visual character of the continuous GWMP corridor within the study area
 4589 is described as a tree-lined roadway with intermittent views of Potomac Greens neighborhood to the
 4590 west and the Potomac River and Washington to the east; its visual quality rating is Very High. Individual
 4591 viewshed ratings (#1 through #6) are generally Very High, with some High and Moderately High ratings
 4592 where existing development is visible through breaks in the trees.
- 4593 • Potomac Greens neighborhood viewsheds – the current visual character looking west toward South
 4594 Potomac Yard and the Rail Park is described as intermittent views of landscape vegetation and low
 4595 horizontal wall, with South Potomac Yard development visible in background; its visual quality rating is
 4596 Moderate. The current visual character looking north toward Potomac Greens Park is described as a
 4597 landscaped neighborhood park, with transportation facilities in the background; its visual quality rating is
 4598 Moderate.
- 4599 • South Potomac Yard viewshed – the current visual character looking east toward the Potomac Yard
 4600 Park and the Potomac Greens neighborhood and Potomac Greens Park in the distance is described as
 4601 layered views of vegetation, with transportation infrastructure and development in the background; its
 4602 visual quality rating is Moderately Low.

4603 **Build Alternative A**

4604 Build Alternative A temporary construction impacts would occur due clearing of construction staging areas and
 4605 the storage of construction equipment within Potomac Greens Park and Potomac Yard Park; additional impacts
 4606 by Option 1 Construction Access would occur due to removal of vegetation from the GWMP.

- 4607 • Under Option 1 Construction Access, the construction access point from the parkway would interrupt the
 4608 continuous visual line created by the roadway, requiring clearing of treed area and associated
 4609 herbaceous vegetation consisting of 0.30 acre along the GWMP and 0.88 acre along the eastern side of
 4610 the existing Metrorail tracks, removing some of the visible barrier between the GWMP and the tracks.
- 4611 • Under both construction access options, construction would also remove 0.09 acre of treed area and
 4612 associated herbaceous vegetation along the eastern edge of the Potomac Greens neighborhood by the
 4613 park, removing some vegetation within the Greens Scenic Area easement that currently provides a
 4614 visual barrier between GWMP and the proposed location of the Metrorail station.

4615 NPS parklands used for construction activities would be restored based on an NPS-approved planting plan.
 4616 Vegetative screening would require approximately 20-40 years of regrowth to be re-established similar to its
 4617 current state. Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued
 4618 by NPS.

4619 Both construction access options would use 1.61 acres of Potomac Greens Park as a staging area, altering the
 4620 viewshed of the park from the neighborhood by removing landscape plantings and visitor use facilities, such as
 4621 the existing gazebo, playground, lawn and associated paths.

4622 The temporary construction impacts to Potomac Yard Park by both options would include the removal of
 4623 landscaped vegetation and park facilities such as the paths, lawn, playground, and event stage within 1.40
 4624 acres of parkland. Construction equipment would be placed within viewsheds, thereby introducing new features
 4625 not previously present. As a result of changes to the views from Potomac Greens and South Potomac Yard,
 4626 Build Alternative A would have short-term visual impacts.

4627 **Build Alternative B**

4628 Build Alternative B construction staging and equipment storage areas would remove much of the vegetation that
 4629 currently provides a visual barrier between GWMP and the proposed location of the Metrorail station.

- 4630 • Under Option 1 Construction Access, the construction access point from the GWMP roadway would
 4631 interrupt the continuous visual line created by the roadway. Temporary driveways would require clearing
 4632 of 0.22 acre of treed area and associated herbaceous vegetation.
- 4633 • Under both construction access options, construction activity would be located relatively close to GWMP
 4634 within the Greens Scenic Area easement, with little visual barrier to the GWMP, altering the vegetated
 4635 appearance of the area due to the clearance of treed area and associated herbaceous vegetation within
 4636 0.55 acre of the GWMP, 0.83 acre of the Greens Scenic Area easement, and 0.31 acre along the east
 4637 side of the Metrorail tracks. Construction equipment would be placed within GWMP viewsheds, thereby
 4638 introducing new features not previously present. NPS parklands used for construction activities would
 4639 be restored based on an NPS-approved planting plan. Vegetative screening would require
 4640 approximately 20-40 years of regrowth to be re-established similar to its current state. Restoration of the
 4641 GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

4642 Outside of the Greens Scenic Area easement, 3.43 acres Potomac Greens Park would be used as a staging
 4643 area, altering the layered vegetated elements and removing landscape plantings and some visitor use facilities,
 4644 such as the existing gazebo. Construction staging and equipment storage areas would remove much of the
 4645 landscaped vegetation and park amenities within 1.09 acres of Potomac Yard Park in the vicinity of East Glebe
 4646 Road.

4647 Construction equipment would be placed within viewsheds, thereby introducing new features not previously
 4648 present. As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard,
 4649 Build Alternative B would have short-term visual impacts.

4650 **B-CSX Design Option**

4651 B-CSX Design Option construction staging would require the removal of an approximately 50-foot wide layer of
 4652 thin, mostly low-lying vegetation with widely spaced trees west of the existing Metrorail line, between the
 4653 Metrorail tracks and the CSXT tracks, that currently is part of the visual screen between GWMP and the
 4654 proposed location of the Metrorail station. The vegetation within the GWMP would not be removed, leaving
 4655 some of the visual barrier between the roadway and the station. Construction equipment would be placed along
 4656 the existing Metrorail tracks within GWMP viewsheds, thereby introducing new features not previously present.

4657 Construction activities would occur within 0.01 acre of Potomac Greens Park outside of the Greens Scenic Area
 4658 easement, altering the layered vegetated elements and removing landscape plantings.

4659 As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard, B-CSX
 4660 Design Option would have short-term visual impacts.

4661 **Build Alternative D**

4662 Build Alternative D construction staging would require clearing of 2.40 acres of treed area and associated
 4663 herbaceous vegetation that serves as a visual barrier along the GWMP roadway, most notably in the vicinity of
 4664 Four Mile Run. In addition, the construction access points from the GWMP roadway would interrupt the
 4665 continuous visual line created by the roadway. Construction activity would be located relatively close to the
 4666 GWMP roadway with little visual barrier, noticeably altering the green appearance of the areas. NPS parklands
 4667 used for construction activities would be restored based on an NPS-approved planting plan. Vegetative
 4668 screening would require approximately 20-40 years of regrowth to be re-established similar to its current state.
 4669 Restoration of the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

4670 A portion of Potomac Greens Park would be used as a staging area, altering the layered vegetated elements
4671 within 0.40 acre of parkland.

4672 A portion of Potomac Yard Park would be used for staging and would remove vegetation and park facilities
4673 within 3.42 acres of parkland. From Potomac Yard, the construction staging would alter views of existing asphalt
4674 parking lots, park vegetation, and the stormwater management pond to that of a construction zone.

4675 As a result of changes to the views along GWMP and views from Potomac Greens and Potomac Yard, Build
4676 Alternative D would have short-term visual impacts.

4677 **Cultural Resources**

4678 Temporary construction impacts to Cultural Resources are described in **Section 3.9 Cultural Resources**, which
4679 analyzes project effects under Section 106 of the National Historic Preservation Act and considers temporary as
4680 well as permanent effects.

- 4681 • **Historic Architectural Resources:** The three Build Alternatives and B-CSX Design Option would have
4682 temporary construction effects to the MVMH and GWMP related to clearing vegetation within cultural
4683 landscapes, visual effects related to vegetation clearance and construction staging, and construction
4684 access and staging areas, requiring a permit from NPS. Potential effects for Build Alternatives A and B
4685 vary based on the construction access option. These potential impacts to the MVMH and GWMP are
4686 described in detail in Section 3.9.
- 4687 • **Archaeological Resources:** Build Alternatives A and B Option 1 Construction Access and Build
4688 Alternative D would have potential construction effects to archaeological sites that are potentially eligible
4689 for listing on the NRHP. These potential effects to archaeological resources are described in detail in
4690 Section 3.9.

4691 Related temporary impacts to public roadways, visual resources, parklands, water resources, ecosystems
4692 (including general vegetation), and soils associated with areas within the MVMH and GWMP are described
4693 elsewhere in this section.

4694 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
4695 Preliminary staging areas have been identified. More detail on construction staging would become available as
4696 discussions with property owners continue through the Final EIS and through final engineering design prior to
4697 construction.

4698 **Parklands**

4699 The areas of temporary impacts to parklands due to construction staging and access are summarized in **Table**
4700 **3-46**. The listed acreages of temporary construction impacts do not include acreage that would be permanently
4701 displaced by the three Build Alternatives and B-CSX Design Option. See **Section 3.10 Parklands** for
4702 permanent parkland impacts. Standard BMPs would be used for construction, and efforts would be made to
4703 minimize vegetation loss during construction and minimize impacts to park facilities.

4704 For each of the three Build Alternatives or B-CSX Design Option, vegetation, soils, infrastructure, and facilities in
4705 parkland areas temporarily used for construction activities would be restored. Temporary construction impacts to
4706 the Greens Scenic Area easement that violate the terms of the easement, such as clearing of vegetation, would
4707 require an easement modification subject to an equal value exchange in property or interest in property and
4708 need to be approved by NPS and completed as required by federal law (54 U.S.C. 102901). The land exchange
4709 process is described in **Section 3.3 Land Acquisitions and Displacements**.

4710 Specific construction staging and access areas with parks and the effects on visitor use and experience for each
4711 alternative are described in more detail below. Temporary construction impacts to other resources within
4712 parklands are described in the following other subsections of Section 3.24, including noting specific impacts to
4713 GWMP and Greens Scenic Area:

- 4714 • Traffic impacts to parks are described above under **Transportation, Public Roadways and Private**
4715 **Driveways** (see page 3-208);
- 4716 • Visual impacts to specific viewsheds within parks are described above under **Visual Resources** (see
4717 page 3-213);
- 4718 • Impacts to wetlands, floodplains, and groundwater (see page 3-221);
- 4719 • Impacts to habitat and vegetation impacts are described below under **Ecosystems** (see page 3-225);
- 4720 • Impacts to **Soils** (see page 3-226); and
- 4721 • Potential to encounter **Hazardous and Contaminated Materials** (see page 3-226).

4722 **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.

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4727 Discussions are ongoing regarding the location of construction staging areas and have yet to be resolved.
4728 Preliminary staging areas have been identified. More detail on construction staging would become available as
4729 discussions with property owners continue through the Final EIS and through final engineering design prior to
4730 construction.

4731

4732 **Build Alternative A**4733 **Option 1 Construction Access**4734 Construction Staging and Access Areas

4735 Under Build Alternative A Option 1 Construction Access, temporary access driveways and construction staging
 4736 would impact 5.46 acres of parkland in Potomac Greens Park, Rail Park, and Potomac Yard Park (South) not
 4737 including the Metrorail Reservation easement area. Impacted park facilities in Potomac Greens Park include the
 4738 gazebo, paths, lawn, and playground. Impacted park facilities in Potomac Yard Park include the lawn, paths,
 4739 playground, stage, event space, and park vegetation.

4740 Option 1 Construction Access would impact 0.30 acre of GWMP, requiring clearance of vegetated areas along
 4741 the western side of the southbound roadway to construct temporary access driveways.

4742 Option 1 Construction Access would impact 0.25 acre of the Greens Scenic Area easement. To accommodate
 4743 the construction access, staging, and laydown areas, 0.18 acre of trees and shrubs would be removed from the
 4744 Greens Scenic Area easement. If the proposed construction staging area could not be redesigned to avoid the
 4745 scenic easement, Build Alternative A Option 1 Construction Access could not proceed unless the easement is
 4746 released by NPS, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

4747 Visitor Use and Experience

4748 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4749 throughout the two-year project construction duration related to:

- 4750 • Vegetation clearance and construction equipment in staging areas near the station and access areas;
 4751 and
- 4752 • Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles,
 4753 which may impede traffic at certain times and would diminish the scenic quality associated of the
 4754 GWMP.

4755 GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational
 4756 fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both
 4757 directions of travel during the duration of construction, although the temporary lane closure of a portion of one
 4758 southbound lane in the vicinity of the construction access areas would be required.

4759 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4760 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4761 areas as well as closures of specific park facilities in the construction staging and access areas.

4762 **Option 2 Construction Access**4763 Construction Staging and Access Areas

4764 Under Build Alternative A Option 2 Construction Access, temporary access driveways and construction staging
 4765 would impact 4.80 acres of parkland in Potomac Greens Park, Rail Park, and Potomac Yard Park (South) not
 4766 including the Metrorail Reservation easement area. Impacted park facilities in Potomac Greens Park include the
 4767 gazebo, paths, lawn and playground. Impacted park facilities in Potomac Yard Park include the lawn, paths,
 4768 playground, stage, event space, and park vegetation.

4769 No construction activities would occur on the GWMP for Build Alternative A Option 2 Construction Access.

4770 Under Build Alternative A Option 2 Construction Access, 0.13 acre of the Greens Scenic Area easement would
 4771 be affected during construction, requiring the clearing of 0.09 acre of vegetation. If the proposed construction
 4772 staging area could not be redesigned to avoid the scenic easement, Build Alternative A Option 2 Construction
 4773 Access could not proceed unless the easement is released by NPS under the stipulation of a construction
 4774 access permit, subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901.

4775 Visitor Use and Experience

4776 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4777 related to vegetation clearance and construction equipment in staging areas located off of GWMP property near
 4778 the station. GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and
 4779 recreational fields, would remain open for public use, and the roadway would remain open to general vehicular
 4780 traffic in both directions of travel during the duration of construction.

4781 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4782 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4783 areas as well as closures of specific park facilities in the construction staging and access areas.

4784 ***Build Alternative B***

4785 **Option 1 Construction Access**

4786 Construction Staging and Access Areas

4787 Under Build Alternative B Option 1 Construction Access, temporary construction-related activities would impact
 4788 5.48 acres of parkland in Potomac Greens Park, Rail Park, Potomac Yard Park (South), and Potomac Yard Park
 4789 (North). Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn, and vegetation.
 4790 Impacted park facilities in Potomac Yard Park include park plazas, lawn, paths, stormwater management pond,
 4791 and park vegetation.

4792 Build Alternative B Option 1 Construction Access would impact 0.78 acre of GWMP, requiring clearance of
 4793 vegetated areas along the western side of the southbound roadway to construct temporary access driveways
 4794 and use for construction staging areas. Construction would require the removal of trees in areas planted as part
 4795 of the original landscape design of the GWMP and MVMH. These locations have since returned to a more
 4796 naturally vegetated state, although some of the species from the planting plans are still present. Vegetation
 4797 proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various
 4798 species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural*
 4799 *Landscape Report – The Vegetation of the George Washington Memorial Parkway*. Discussions are ongoing
 4800 regarding the location of construction staging areas and have yet to be resolved. Preliminary staging areas have
 4801 been identified. More detail on construction staging would become available as discussions with property
 4802 owners continue through the Final EIS and through final engineering design prior to construction.

4803 3.09 acres of the Greens Scenic Area easement would also be affected during construction, requiring the
 4804 clearing of 1.51 acres of vegetation. Build Alternative B Option 1 Construction Access could not proceed unless
 4805 the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54
 4806 U.S.C. 102901.

4807 Visitor Use and Experience

4808 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4809 throughout the two-year project construction duration related to:

- 4810 • Vegetation clearance and construction equipment in staging areas on GWMP property and adjacent
 4811 areas near the station and realigned track and access areas on GWMP property; and
- 4812 • Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles,
 4813 which may impede traffic at certain times and would diminish the scenic quality associated of the
 4814 GWMP.

4815 GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational
 4816 fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both
 4817 directions of travel during the duration of construction, although temporary lane closure of a portion of one
 4818 southbound lane in the vicinity of the construction access areas would be required.

4819 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4820 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4821 areas as well as closures of specific park facilities in the construction staging and access areas.

4822 **Option 2 Construction Access**

4823 Construction Staging and Access Areas

4824 Under Build Alternative B Option 2 Construction Access, temporary construction-related activities would impact
 4825 5.48 acres of parkland in Potomac Greens Park, Rail Park, Potomac Yard Park (South), and Potomac Yard Park
 4826 (North). Impacted park facilities in Potomac Greens Park include the gazebo, paths, lawn, and vegetation.
 4827 Impacted park facilities in Potomac Yard Park include park plazas, lawn, paths, stormwater management pond,
 4828 and park vegetation.

4829 Build Alternative B Option 2 Construction Access would impact 0.55 acre of GWMP. Option 2 Construction
 4830 Access would require temporary construction staging areas on the GWMP, but would not result in temporary

4831 access roads on the GWMP. Construction would require the removal of trees in areas planted as part of the
 4832 original landscape design of the GWMP and MVMH. These locations have since returned to a more naturally
 4833 vegetated state, although some of the species from the planting plans are still present. Vegetation proposed for
 4834 removal from the GWMP includes trees that are approximately 20 to 70 years old of various species and are
 4835 identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The*
 4836 *Vegetation of the George Washington Memorial Parkway*. Discussions are ongoing regarding the location of
 4837 construction staging areas and have yet to be resolved. Preliminary staging areas have been identified. More
 4838 detail on construction staging would become available as discussions with property owners continue through the
 4839 Final EIS and through final engineering design prior to construction.

4840 3.09 acres of the Greens Scenic Area easement would also be affected during construction, requiring the
 4841 clearing of 1.51 acres of vegetation. Build Alternative B Option 2 Construction Access could not proceed unless
 4842 the easement is released by NPS, subject to an equal value exchange in property or interest in property per 54
 4843 U.S.C. 102901.

4844 Visitor Use and Experience

4845 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4846 throughout the two-year project construction duration related to vegetation clearance and construction
 4847 equipment in staging areas on GWMP property and adjacent areas near the station and realigned track. GWMP
 4848 facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational fields,
 4849 would remain open for public use, and the roadway would remain open to general vehicular traffic in both
 4850 directions of travel during the duration of construction.

4851 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4852 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4853 areas as well as closures of specific park facilities in the construction staging and access areas.

4854 **B-CSX Design Option**

4855 Construction Staging and Access Areas

4856 Temporary construction-related activities would impact 0.97 acre of parkland in Potomac Greens Park and Rail
 4857 Park. Impacted park facilities include park vegetation.

4858 B-CSX Design Option was developed to minimize temporary as well as permanent impacts to NPS properties,
 4859 including the GWMP and the Greens Scenic Area easement, and no construction activities would occur on
 4860 these properties.

4861 Visitor Use and Experience

4862 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4863 related to vegetation clearance and construction equipment in staging areas located off of GWMP property near
 4864 the realigned track and station. The vegetation within the GWMP would not be removed, leaving some of the
 4865 visual barrier between the roadway and the station. GWMP facilities in the vicinity, including the Mount Vernon
 4866 Trail and Daingerfield Island marina and recreational fields, would remain open for public use, and the roadway
 4867 would remain open to general vehicular traffic in both directions of travel during the duration of construction.

4868 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4869 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4870 areas as well as closures of specific park facilities in the construction staging and access areas.

4871 **Build Alternative D**

4872 Construction Staging and Access Areas

4873 Construction-related activities would impact 5.53 acres of parkland in Potomac Greens Park, Rail Park,
 4874 Potomac Yard Park (South), and Potomac Yard Park (North) and 2.40 acres of GWMP. Impacted park facilities
 4875 in Potomac Greens Park include the gazebo, lawn, paths, and vegetation. Impacted park facilities in Potomac
 4876 Yard Park include planned park plazas, lawn, paths, the stormwater management pond, and park vegetation.

4877 Construction activities would result in temporary impacts to 2.40 acres of the GWMP requiring clearance of
 4878 vegetated areas along the western side of the southbound roadway to construct temporary access driveways
 4879 and use for construction staging areas. Construction would require the removal of trees in areas planted as part
 4880 of the original landscape design of the GWMP and MVMH. These locations have since returned to a more
 4881 naturally vegetated state, although some of the species from the planting plans are still present. Vegetation

4882 proposed for removal from the GWMP includes trees that are approximately 20 to 70 years old of various
 4883 species and are identified in **Section 3.9 Cultural Resources**, with reference to the 2009 NPS *Cultural*
 4884 *Landscape Report – The Vegetation of the George Washington Memorial Parkway*.

4885 0.02 acre of the Greens Scenic Area easement would also be affected during construction, requiring clearing of
 4886 vegetation. If the proposed construction staging area could not be redesigned to avoid the scenic easement,
 4887 Build Alternative D could not proceed unless the easement is released by NPS, subject to an equal value
 4888 exchange in property or interest in property per 54 U.S.C. 102901.

4889 Visitor Use and Experience

4890 Users of the GWMP roadway and the Mount Vernon Trail would experience temporary visual and noise effects
 4891 throughout the two-year project construction duration related to:

- 4892 • Vegetation clearance and construction equipment in staging areas on GWMP property and adjacent
 4893 areas near the station and realigned track and access areas on GWMP property; and
- 4894 • Additional vehicular traffic on the southbound roadway due to the inclusion of construction vehicles,
 4895 which may impede traffic at certain times and would diminish the scenic quality associated of the
 4896 GWMP.

4897 GWMP facilities in the vicinity, including the Mount Vernon Trail and Daingerfield Island marina and recreational
 4898 fields, would remain open for public use, and the roadway would remain open to general vehicular traffic in both
 4899 directions of travel during the duration of construction, although temporary lane closure of a portion of one
 4900 southbound lane in the vicinity of the construction access areas would be required.

4901 Users of Potomac Greens Park, Rail Park, and Potomac Yard Park would experience temporary visual and
 4902 noise effects of vegetation clearance and construction equipment in staging areas near the station and access
 4903 areas as well as closures of specific park facilities in the construction staging and access areas.

4904 **Air Quality**

4905 Potential air quality impacts from construction of the three Build Alternatives and B-CSX Design Option would be
 4906 similar and would include direct emissions from construction equipment and trucks, increased emissions from
 4907 motor vehicles on the streets due to disruption of traffic flow, as well as fugitive dust emissions resulting from
 4908 demolition, ground excavation, material handling and storage, movement of equipment at the site, and transport
 4909 of material to and from the site. These impacts would be temporary, and would affect only the immediate vicinity
 4910 of the construction sites and their access routes. Emissions from project-related construction equipment and
 4911 trucks would be much less than the total emissions from other industrial and transportation sources in the
 4912 region, and therefore are expected to be insignificant with respect to compliance with National Ambient Air
 4913 Quality Standards (NAAQS). During final design, when details of the final alignment are determined, a closer
 4914 review of the potential construction impacts would be re-evaluated to better gauge the likelihood of impact.

4915 For each of the three Build Alternatives or B-CSX Design Option, to minimize construction-related effects on air
 4916 quality, project construction activities would comply with Virginia Department of Environmental Quality (VDEQ)
 4917 requirements for fugitive dust and emissions, as well as any local regulations.

4918 **Noise and Vibration**

4919 The bulk of the construction would normally occur during daylight hours when most residents are not at home,
 4920 when residents who are at home are less sensitive to construction activities, and when other community noise
 4921 sources contribute to higher ambient noise levels. However, some construction activities would also occur
 4922 during the nighttime and on weekends to complete the project sooner and reduce the overall duration of impact
 4923 on the community. Whenever possible, construction activities would be conducted during the daytime and
 4924 during weekdays in accordance with local noise ordinances (such as the City of Alexandria's Noise Control
 4925 Code, Section 11-5 and Arlington County's Noise Control Code, Chapter 15).

4926 Construction activities are expected to impact only the closest residences and park users in adjacent
 4927 neighborhoods (Potomac Greens and Potomac Yard) and any commercial properties in the vicinity of the station
 4928 construction and Metrorail track realignment. Potential impacts to the community will be minimized by requiring
 4929 contractors to implement appropriate noise and vibration control measures for extended disruption of normal
 4930 activities. The use of impact pile drivers would be avoided whenever possible to eliminate the potential for
 4931 vibration impacts (such as minor cosmetic damage to structures) at nearby sensitive receptors.

4932 At this early stage of project design, proposed construction techniques, types of equipment, and precise
 4933 locations and durations of different activities within the project construction areas have not yet been defined
 4934 sufficiently to quantitatively assess and compare the potential noise and vibration effects of the three Build
 4935 Alternatives and B-CSX Design Option. The three Build Alternatives and B-CSX Design Option would have
 4936 some adverse impacts during construction in specific locations, due to activities at the project site as well as at
 4937 staging and/or material laydown areas if they take place in noise-sensitive areas. Similarly, the three Build
 4938 Alternatives and B-CSX Design Option would have the potential for noise increases along detour routes and
 4939 truck haul routes. This analysis made conservative assumptions regarding construction noise in order to ensure
 4940 that potential maximum adverse impacts are analyzed and disclosed consistent with NEPA requirements. In
 4941 later stages of project design when a detailed construction plan is available, this analysis, including mitigation,
 4942 will be refined.

4943 **Water Resources**

4944 **Wetlands**

4945 Temporary construction impacts to USACE and NPS wetlands are summarized in **Table 3-47**. The listed
 4946 acreages of temporary construction impacts exclude wetland acreage that would also be permanently displaced
 4947 by the three Build Alternatives. The composition, functions, and values of these wetlands are described in
 4948 **Section 3.14 Waters of the United States**. B-CSX Design Option would not temporarily impact any wetland
 4949 regulated by either USACE or NPS or delineated WOUS.

4950 **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

4951 ¹Areas that are classified as wetlands by both USACE and NPS.

4952 Temporarily impacted wetlands would be restored after construction is completed through a variety of BMPs.
 4953 Existing drainage patterns to or from wetlands would be maintained through the use of engineering controls
 4954 such as culverts under temporary access driveways. After construction is complete, all temporary impact areas,
 4955 including access roads, will be restored. The restoration will include removal of fill to prior grade, amelioration of
 4956 soil compaction, and revegetation. Within the project site, surface water and near surface water flow for
 4957 recharge and drainage of wetlands are not expected to be significantly altered or diverted by soil compaction
 4958 associated with establishment of access driveways for construction equipment and vehicles.

4959 If a Build Alternative that impacts wetlands is chosen as the preferred alternative, a hydrologic and hydraulic
 4960 (H&H) study would be conducted to establish baseline conditions that would model surface and near-surface
 4961 flows so that more quantitative impacts could be established. Surface water recharge and discharge patterns
 4962 would be identified such that existing drainage patterns would be maintained during construction.

4963 Through the H&H modeling, appropriate BMPs would be installed to mitigate or improve the water retention,
 4964 nutrient transformation, and retention of sediments and other particulates. While these mitigation strategies are
 4965 intended to eliminate or minimize the temporary impacts to wetlands on-site, the following impacts to wetland

4966 services and functions may occur during construction based on the qualitative assessment described in **Section**
4967 **3.14:**

- 4968 • **Build Alternate A Option 1 Construction Access:** This alternative would temporarily impact 0.30 acre
4969 of USACE regulated wetlands and 0.35 acre of NPS regulated wetlands, a majority of which are
4970 forested. The temporary impacts to this ecosystem during construction may include reduced wildlife
4971 habitat quality as well as sediment and nutrient retention due to vegetation removal. Mobile wildlife,
4972 such as birds, squirrels, and deer, would be able to easily relocate to adjacent, undisturbed habitat. This
4973 impact is unlikely to affect the adjacent, undisturbed wetlands associated with this wetland complex. As
4974 described above, mitigation strategies would be included to reduce the temporary impacts and the
4975 wetlands will be restored to existing conditions.
- 4976 • **Build Alternative A Option 2 Construction Access:** This alternative would temporarily impact 0.01
4977 acre of USACE and NPS regulated wetlands. This impact is unlikely to have any significant impacts to
4978 this ecosystem due to the small size. Impacts to the nutrient and flood abatement services of the
4979 adjacent, undisturbed wetlands are unlikely. Wildlife in the adjacent wetlands may experience some
4980 nuisance-level disturbance from nearby construction activities but would not be significantly higher than
4981 the existing daily activity of the urbanized habitat location.
- 4982 • **Build Alternative B Option 1 Construction Access:** This alternative would temporarily impact 3.61
4983 acres of USACE regulated wetlands and 3.68 acres of NPS regulated wetlands, a majority of which are
4984 emergent. The impacts would likely displace wildlife during construction activities. Temporary impacts
4985 could occur to flood abatement and sediment and nutrient retention in the areas of construction. This
4986 impact is unlikely to affect the adjacent, undisturbed areas associated with this wetland complex due to
4987 the proposed hydrology management systems described above. Mitigation strategies would be included
4988 to reduce the temporary impacts, and the wetlands would be restored to existing conditions.
- 4989 • **Build Alternative B Option 2 Construction Access:** This alternative would temporarily impact 3.54
4990 acres of USACE regulated wetlands and 3.57 acres of NPS regulated wetlands, a majority of which are
4991 emergent. Impacts to the wetland ecosystem services and functions would be similar to Build Alternative
4992 B Option 2 Construction Access.
- 4993 • **B-CSX Design Option:** This alternative would not directly impact wetlands. Due to the proximity of
4994 construction activities, wildlife in the adjacent wetlands may experience some nuisance-level
4995 disturbance from nearby construction activities but would not be significantly higher than the existing
4996 daily activity of the urbanized habitat location.
- 4997 • **Build Alternative D:** This alternative would temporarily impact 0.41 acre of USACE regulated wetlands
4998 and 0.48 acre of NPS regulated wetlands. These wetlands are located near Four Mile Run and are not
4999 in the same drainage as those potentially impacted by Build Alternative A and B. Areas impacted
5000 include both forested and emergent wetlands. These areas are generally confined within the disturbed
5001 area between the existing Metrorail and CSXT railroad tracks and the GWMP and likely provide very
5002 poor wildlife habitat. Therefore, no significant temporary impacts to wildlife habitat in wetlands near Four
5003 Mile Run are expected. Temporary impacts could occur to flood abatement and nutrient and sediment
5004 retention services in the areas of construction. This impact is unlikely to affect the adjacent, undisturbed
5005 wetlands associated with this wetland complex due to the proposed hydrology management systems as
5006 described above. Mitigation strategies would be included to reduce the temporary impacts, and the
5007 wetlands will be restored to existing conditions.

5008 Once a preferred alternative is determined, the alternative will undergo a Function and Value Assessment as
5009 required by NPS for the Wetlands Statement of Findings per Director's Order 77-1 (see below). Following this
5010 assessment and the completion of construction activities, the existing ecological functions and values would be
5011 restored. These measures to ensure restoration have yet to be defined at this stage of project planning;
5012 following the selection of the preferred alternative, the mitigation and restoration measures will be developed
5013 and included in the Final EIS and Statement of Findings.

5014 Joint Permit Application and Statement of Findings

5015 A Joint Permit Application (JPA) would be developed for temporary, as well as permanent, project-related
5016 wetland impacts in compliance with Section 404 of the CWA. The permitting process would be initiated with
5017 USACE, VDEQ, and NPS. If wetlands are deemed tidal wetlands, the permitting process would also be initiated
5018 with VMRC. All NPS actions with the potential to have adverse impacts on wetlands must also comply with DO

5019 77-1. Any alteration of wetlands on GWMP property or the Greens Scenic Area easement would be included in
 5020 the description of impacts in the JPA, Final EIS, and Statement of Findings required by the NPS. In the case
 5021 where both NPS and USACE procedures apply, coordination with the appropriate USACE office will be initiated
 5022 early in the process to reduce potential duplication of effort, and the JPA and NPS processes would be initiated
 5023 at the design phase of the project.

5024 Mitigation Strategies

5025 Specific wetland mitigation strategies would be determined through the JPA and NPS processes for unavoidable
 5026 impacts to WOUS and wetlands resulting from the preferred alternative. USACE, VDEQ, VMRC, and NPS
 5027 would determine mitigation measures, as part of the JPA process and NPS Director’s Order 77-1, where
 5028 appropriate.

5029 Impacts would be minimized through the use, to the maximum extent practicable, of raised temporary driveways
 5030 constructed of crushed gravel, culverts, and erosion controls to maintain surface water drainage and quality.
 5031 The boundaries of the temporary access driveways would be clearly delineated to prevent vehicles and
 5032 equipment from operating outside the limits of disturbance. In addition to the H&H study, monitoring of
 5033 groundwater will be performed to establish baseline conditions prior to construction. After the construction is
 5034 complete, groundwater monitoring will be performed to show restoration consistent with baseline conditions.

5035 Therefore, short-term impacts on surface water and near surface water recharge and drainage from the
 5036 temporary access driveways would be minor in the context of the project site and surrounding area. In the long
 5037 term, wetlands disturbed during construction activities would be restored to pre-construction conditions.

5038 Water Quality

5039 Potential effects on water quality from construction of the three Build Alternatives and B-CSX Design Option
 5040 would be similar and would be primarily the result of erosion and sedimentation occurring at the construction site
 5041 and washing into surface waterways. BMPs, as outlined in guidance, policies, standards, and specifications, and
 5042 all other applicable requirements, would be used to minimize construction-related impacts to water quality.

5043 Floodplains

5044 Temporary construction impacts within the 100-year and 500-year floodplains are listed in **Table 3-48**. All
 5045 construction activities would comply with flood zone regulations of the City of Alexandria, Arlington County, and
 5046 NPS.

5047 **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.

5048
 5049

5050 Within NPS parkland and the Greens Scenic Area easement, temporary construction impacts within the 100-
 5051 year and 500-year floodplains are listed in **Table 3-49**.

5052 **Table 3-49: Temporary 100-Year and 500-Year Floodplain Impacts (NPS Parkland and Greens Scenic**
 5053 **Area Easement)**

Alternative		100-year Floodplain (acres)	500-year Floodplain ¹ (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

5054 ¹ Acreage excludes areas in 100-year floodplain.

5055 Based on discussions with the City of Alexandria and Arlington County’s engineering staff, none of the three
 5056 Build Alternatives or B-CSX Design Option is expected to raise the 100-year Base Flood Elevation within the
 5057 study area if constructed within the flood zones. This statement is based on the location of the large surface
 5058 area of the Potomac River relative to the station area. Temporary impacts to the habitat function of the
 5059 floodplain are described in **Wetlands** (see page 3-221) and in **Ecosystems** (see page 3-225).

5060 Impacts to regulated floodplains on NPS land are subject to the policies of *NPS Director’s Order 77-2 Floodplain*
 5061 *Management*, which requires the preparation of a Statement of Findings. See **Section 3.15 Floodplains** for
 5062 further description of the Statement of Findings.

5063 **Coastal Zones and Chesapeake Bay Preservation Areas**

5064 Temporary construction impacts to water resource buffer areas regulated by local Chesapeake Bay ordinances
 5065 and related environmental protection ordinances would result from construction staging and laydown areas.
 5066 Within the study area, these Resource Protection Areas (RPAs) extend 100 feet from streams and delineated
 5067 wetlands. Estimates of temporary impacts to water resource buffers are provided in **Table 3-50**.

5068 **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

5069 **Navigable Waterways**

5070 Build Alternatives A and B and B-CSX Design Option would have no construction effects on navigable
 5071 waterways. Build Alternative D would temporarily encroach into Four Mile Run for the purpose of constructing a
 5072 new Metrorail bridge. If Build Alternative D is selected as the preferred alternative, a bridge permit from the U.S.
 5073 Coast Guard would be required. The permit application would describe the techniques and duration of bridge
 5074 construction activities which could temporarily impact the navigability of Four Mile Run.

5075 **Groundwater**

5076 Within the project site, subsurface groundwater flows and recharge within the water table aquifer or underlying
 5077 regional aquifers would not be altered or diverted by the proposed construction activities. Any alteration of
 5078 groundwater on GWMP property would require a permit from USACE. Localized alteration of the shallow
 5079 seasonal perched aquifer, where present, could occur due to excavations, building construction, or soil
 5080 compaction associated with project activities. However, this construction impact to the perched aquifer would be
 5081 anticipated to be temporary and localized in the area of subsurface disturbance and minor in the context of the
 5082 project site and surrounding area.

5083 **Ecosystems**

5084 Temporary construction impacts to natural habitats, including specific impacts to the GWMP and Greens Scenic
 5085 Area, are listed in **Table 3-51**.

5086 **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

5087 For Treed Upland and Forested Wetland areas, vegetation proposed for removal from the GWMP includes trees
 5088 that are approximately 20 to 70 years old of various species and are identified in **Section 3.9 Cultural**
 5089 **Resources**, with reference to the 2009 NPS *Cultural Landscape Report – The Vegetation of the George*
 5090 *Washington Memorial Parkway*. Numerous shrubs and herbaceous plants would be disturbed, but the effect on
 5091 the vegetative cover would be temporary; shrubs and herbaceous plants would be planted shortly after
 5092 construction activities have ceased.

5093 The project study area was surveyed for the federally listed threatened species Sensitive Joint-Vetch
 5094 (*Aeschynomene virginica*) between August and October 2012, and no specimens were identified (see additional
 5095 information in **Section 3.18 Ecosystems and Endangered Species**). Thus, no impact to Sensitive Joint-Vetch
 5096 is anticipated. The study area will be re-inventoried following selection of the preferred alternative; the field
 5097 survey will be conducted during the seasonal period specified by the USFWS Virginia Field Office.

5098 Any clearing of vegetation on GWMP property would require a permit from NPS. Project limits of disturbance
 5099 would be clearly delineated prior to the start of driveway construction, thereby ensuring that impacts on
 5100 vegetation would not occur beyond the project boundaries. The need for conducting additional vegetation
 5101 surveys will be further assessed as project planning and design continues, and upon the selection of the
 5102 preferred alternative.

5103 The soils in areas where the temporary access driveways and construction staging areas are established would
 5104 be restored (see **Soils** below) and the areas would be planted and seeded to restore them to a vegetated
 5105 condition following the completion of construction activities. NPS parklands used for construction activities would
 5106 be restored based on an NPS-approved planting plan. Forest vegetation in areas temporarily cleared for
 5107 construction would require approximately 20-40 years of regrowth to be re-established with functions similar to
 5108 its current state as a disturbed, intermediate aged forest, based on the species currently present. Restoration of
 5109 the GWMP temporarily impacted areas would be a condition of any permit issued by NPS.

5110 Construction activities may temporarily displace wildlife, either due to direct use of habitat areas for construction
 5111 staging areas or due to indirect effects on adjacent habitat, such as noise and visual impacts. Upon completion
 5112 of construction activities and restoration of temporarily impacted areas, wildlife would be expected to return.

5113 **Soils**

5114 The proposed excavation, construction, and establishment of temporary construction access driveways would
 5115 result in shallow soil disturbance, soil exposure and compaction that could cause potential adverse effects on
 5116 shallow soil permeability, and soil erosion from water and wind.

5117 Construction activities for the Build Alternatives would result in temporary impacts to soils on the GWMP and
 5118 Greens Scenic Area easement; the areas of these impacts are listed above in **Table 3-38, Acreage of**
 5119 **Temporary Construction Impacts to Parklands**. Any disturbance to soils on GWMP property would require a
 5120 permit from NPS.

5121 To minimize these effects, a sediment and erosion control plan would be developed as part of the construction
 5122 documents for the site and would require measures needed to minimize impact to the site and surrounding
 5123 water bodies. Once graded and established, access driveways are typically covered with stone or rock used to
 5124 disperse storm water sheet flows and minimize soil erosion from wind. These measures include engineering
 5125 controls such as drainage culverts and filter fabric to protect the integrity of the temporary access driveways and
 5126 minimize impacts to the existing site drainage patterns and water quality. Silt fence would also be required as
 5127 part of the soil and erosion plan to prevent stormwater run-off. The soil erosion and control measures would be
 5128 inspected periodically and replenished as necessary throughout the project's construction phase. After
 5129 construction is complete, all temporary impact areas, including access driveways, will be restored. The
 5130 restoration will include removal of fill to prior grade, amelioration of soil compaction, and revegetation; measures
 5131 to ensure soils are restored have yet to be defined and will be included in the Final EIS. Therefore, short-term
 5132 impacts on soils from excavation and fill activities would be minor.

5133 **Hazardous and Contaminated Materials**

5134 Recognized Environmental Conditions sites (RECs) are most likely to be encountered during construction
 5135 activities associated with the three Build Alternatives and B-CSX Design Option. RECs are located on the
 5136 former Potomac Yard rail yard and include areas within the Greens Scenic Area easement area but not on the
 5137 GWMP. Temporary measures taken during construction, such as construction worker health and safety
 5138 practices, management of excavated contaminated soil, and construction dewatering management and
 5139 permitting would be implemented during construction to prevent exposure to potential contaminants at RECs.

5140 The avoidance measures will be outlined in a Site Management Work Plan or in equivalent site plans. The Site
 5141 Management Work Plan will be site specific and will include pre-emergency planning and coordination with
 5142 outside parties, personnel roles, lines of authority, and communication, emergency recognition and prevention,
 5143 safe distances and places of refuge, site security and control, evacuation routes and procedures,
 5144 decontamination procedures, emergency medical treatment and first aid, emergency alerting and response
 5145 procedures, critique of response and follow-up.

5146 **Safety and Security**

5147 For each of the three Build Alternatives or B-CSX Design Option, construction-related safety and security
 5148 measures would be provided by the contractor for both construction workers and the general public. During
 5149 construction, measures that may be used to address safety and security issues would include: temporary
 5150 construction fencing and security staff to protect the public and the worksite from unauthorized entry of vehicles,
 5151 people, and animals; temporary signage to direct motorists and pedestrians around construction areas; and on-
 5152 going communication with neighboring property owners and the surrounding community regarding construction
 5153 activities. WMATA would update its Safety and Security Program for the project with elements required by
 5154 CSXT and other agencies as needed.

5155 For each of the three Build Alternatives or B-CSX Design Option, mutual aid agreements for emergency
 5156 response during construction would be developed among the City of Alexandria, Arlington County, and WMATA.
 5157 These agreements would identify the roles and responsibilities of each jurisdiction in responding to
 5158 emergencies, general policing and security, and emergency access.

5159 **3.24.4 Mitigation**

5160 **3.24.4.1 Noise and Vibration**

5161 For each of the three Build Alternatives or B-CSX Design Option, all construction activities would comply with
 5162 WMATA's design criteria to ensure that noise impacts are minimized during construction. Although WMATA, as
 5163 a federally chartered agency, is exempt from local noise ordinances, project construction activities would comply
 5164 with local construction noise and vibration limits whenever feasible and reasonable in accordance with WMATA
 5165 construction specifications. For example, to reduce temporary construction noise and vibration impacts that are
 5166 expected under the three Build Alternatives and B-CSX Design Option, several "good housekeeping" practices
 5167 are recommended. The following control measures could be incorporated into the construction process to
 5168 effectively minimize noise and vibration impacts in the community:

- 5169 • Whenever possible, conducting all construction activities during the daytime and during weekdays in
 5170 accordance with local noise ordinances (such as the City of Alexandria's Noise Control Code, Section
 5171 11-5 and Arlington County's Noise Control Code, Chapter 15);
- 5172 • Where practical, erecting temporary noise barriers between noisy activities and noise-sensitive
 5173 receptors;
- 5174 • Locating construction equipment and material staging areas away from sensitive receptors;
- 5175 • Routing construction traffic and haul routes along roads in non-noise-sensitive areas where possible;
- 5176 • Using construction equipment with effective noise-suppression devices;
- 5177 • Using noise control measures, such as enclosures and noise barriers, as necessary to protect the public
 5178 and achieve compliance with WMATA's design criteria;
- 5179 • Adequately notifying the public of construction operations and schedules. Methods such as
 5180 construction-alert publications or a Noise Complaint Hotline could be used to handle complaints quickly;
- 5181 • Utilizing construction methods that minimize vibration and complying with any local regulations
 5182 governing vibration; and
- 5183 • Conducting all operations in a manner that will minimize, to the greatest extent feasible, disturbance to
 5184 the public in areas adjacent to the construction activities and to occupants of nearby buildings.

5185 All mitigation measures would be confirmed during the final design phase of the project when the details of the
 5186 project components and the construction scenarios would be finalized.

5187 Although NPS has several policies regarding noise impacts on federal parks such as the GWMP included in the
 5188 *2006 Management Policies*, including the "NPS Cultural Soundscape Management Policy 5.3.1.7", none of
 5189 these policies specifically addresses impacts on heavily traveled roadways. Since GWMP visitors using the
 5190 parkway generate noise due to the resulting automobile traffic, the parkway is not a sensitive land use as
 5191 defined by the FTA guidelines and would not be adversely affected by noise from the construction or operation
 5192 of the project under the FTA guidelines. However, NPS and the project team would identify measures to

5193 minimize any additional adverse noise impacts to passive uses (such as walking and bird-watching) along the
5194 parkway during construction.

5195 **3.24.4.2 Ecosystems**

5196 For each of the three Build Alternatives or B-CSX Design Option, restoration for temporary impacts to wetland
5197 habitat areas is described above under Environmental Consequences for **Wetlands** (see page 3-221).
5198 Temporary impacts to upland habitat areas, including functions and values, would be mitigated through
5199 restoration of vegetation, as described above under Environmental Consequences for **Ecosystems** (see page
5200 3-225). Restoration of habitats to their prior state would include the removal of temporary access roads and
5201 construction staging areas to prior grade, amelioration of soil compaction, and revegetation; measures to ensure
5202 they return to existing ecological function have yet to be defined and will be included in the Final EIS and the
5203 Statement of Findings.

5204

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

47 **4.1.2 Participating Agencies**

48 As required by Section 6002 of SAFETEA-LU and 23 U.S.C. 139(d), the lead agencies also identified Federal
49 and non-Federal agencies that, because of their regulatory role or technical expertise, may have had an interest
50 in the project.

51 Any Federal agency invited to participate in the environmental review process was designated as a participating
52 agency unless the invited agency informed the lead agency, in writing, by the deadline specified in the invitation
53 that the invited agency (1) had no jurisdiction or authority with respect to the project, (2) had no expertise or
54 information relevant to the project, and (3) did not intend to submit comments on the project. The U.S.
55 Department of Homeland Security declined the invitation to be a participating agency. A state, tribal, or local
56 agency was required to respond affirmatively to the invitation to be designated as a participating agency.

57 The final list of 20 cooperating and participating agencies is included in **Appendix B**.

58 **4.1.3 Agency Consultation**

59 Agency consultation and review of the project is also being conducted concurrently from the NEPA process
60 under the following regulations:

- 61 • Section 4(f) of the U.S. Department of Transportation Act of 1966 – protects public parks and recreational
62 lands, wildlife and waterfowl refuges, and historic sites of national, state, or local significance from acquisition
63 and conversion to transportation use;
- 64 • Section 106 of the National Historic Preservation Act of 1966 – requires Federal agencies to consider effects
65 of their undertakings on historic architectural and archaeological resources;
- 66 • Coastal Zone Management Act of 1972 – requires a Coastal Zone Consistency Determination by the Virginia
67 Department of Environmental Quality;
- 68 • Clean Air Act – requires consultation with the Metropolitan Washington Council of Governments and inclusion
69 of the project in the Transportation Improvement Program for the region;
- 70 • Clean Water Act – requires consultation with the U.S. Army Corps of Engineers for the establishment of a
71 Jurisdictional Determination for Wetlands and Waters of the U.S.;
- 72 • Section 7 of the Endangered Species Act – requires consultation with the U.S. Fish and Wildlife Service,
73 Virginia Field Office regarding impacts to threatened or endangered species;
- 74 • Section 6(f) of the Land and Water Conservation Fund Act – requires consultation with the Virginia
75 Department of Conservation and Recreation regarding potential impacts to parkland acquired using Land and
76 Water Conservation funds; and
- 77 • Rivers and Harbors Appropriations Act – requires consultation with the U.S. Coast Guard regarding potential
78 impacts to navigable waterways and bridges over navigable waterways.
- 79 • Archaeological Resources Protection Act – requires consultation with NPS and VDHR regarding
80 archaeological resources.

81 The Section 4(f) consultation process is described in **Appendix D**, and the Section 106 consultation process is
82 described in **Appendix F**.

83 **4.1.4 Agency Scoping Meeting**

84 Potential cooperating and participating agencies were invited to attend an interagency scoping meeting held on
85 February 10, 2011, at the Cora Kelly Recreation Center, 25 West Reed Avenue, Alexandria, Virginia. In addition
86 to presenting an overview of the project, the meeting provided an opportunity for the early identification of
87 significant issues related to the project.

88 FTA, the City of Alexandria, WMATA, NPS, the Potomac and Rappahannock Transportation Commission, the
89 National Capital Planning Commission, Virginia Department of Transportation, and Arlington County staff
90 representatives attended the agency scoping meeting. Comments and responses from the agency scoping
91 meeting are summarized in the Scoping Report, which is included in Volume II.

92 **4.1.5 Additional Agency Outreach and Briefings**

93 Between January 2012 and September 2012, agency briefings were conducted to provide an overview of the
94 project status, including the scoping and screening processes that led to the development of the three project

95 alternatives. The intent of the individual meetings was to enable in-depth discussions about the resources that
 96 were of interest to each agency and discuss proposed methodologies for the assessment of potential effects.
 97 **Table 4-1** lists agency outreach meetings.

98 **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

99 Additional communication with the following local, state and Federal agencies on specific areas of expertise or
 100 areas within their reviewing purview included:

- 101 • **U.S. Coast Guard:** correspondence for the review of navigable waters status of Four Mile Run;
- 102 • **National Park Service and Virginia Department of Historic Resources:** correspondence related to the
 103 Archaeological Resource Protection Act;
- 104 • **U.S. Fish and Wildlife Service:** online project review certification to identify Federally listed species and
 105 habitat, specifically the potential occurrence of bald eagle nesting areas and the threatened sensitive joint-
 106 vetch plant species within the study area; and
- 107 • **Virginia Department of Conservation and Recreation:** correspondence regarding the potential use of Land
 108 and Water Conservation Fund Section 6(f) funds to develop the portion of the Four Mile Run Trail within the
 109 study area.
- 110 • **Advisory Council on Historic Preservation (ACHP):** the Virginia Department of Historic Resources
 111 requested ACHP advice regarding the status of the Greens Scenic Area Easement as a historic property
 112 under Section 106 of the National Historic Preservation Act. The ACHP advised that whether or not the
 113 Greens Scenic Area Easement is a historic property is more of an eligibility question better answered by the
 114 Keeper of the National Register.
- 115 • **Keeper of the National Register:** the Federal Transit Administration sent a letter to the Keeper of the
 116 National Register requesting advice on the status of the Greens Scenic Easement as a historic property under
 117 Section 106 of the National Historic Preservation Act. The Keeper of the National Register has not yet
 118 responded to the letter.

119 4.2 Public Involvement

120 This section describes public involvement events and activities held during the Potomac Yard Metrorail Station
 121 EIS process to date. Ongoing public outreach was conducted throughout the process, and specific public
 122 meetings were held to present project information and solicit public comments on project scoping, alternatives
 123 considered, and preliminary environmental effects.

124 Informational materials at all public meetings, including project newsletters and comment sheets, were available
 125 in Spanish as well as English. In addition, a Spanish-speaking staff member was present at all meetings for
 126 participants who needed to ask questions or give comments verbally in Spanish.

127 4.2.1 Public Scoping Meetings

128 Two public scoping meetings were held on February 10, 2011, at the Cora Kelly Recreation Center, 25 West
 129 Reed Avenue, Alexandria, Virginia, at 4:30 pm and 6:00 pm. Public input was sought on the purpose and need

130 for the project, alternatives being considered, key environmental considerations, and the public involvement and
131 agency coordination process.

132 Meeting participants were asked to register and were given a handout and a copy of the scoping information
133 booklet. Members of the public who wanted to give oral comments were asked to sign-up on a separate
134 speaker sign-in sheet at the check-in desk, or with any project staff member in the meeting room. The meetings
135 used an "open house" format in which participants were able to review display boards and hand-out information
136 on the project. Project staff was available to answer any questions. Following the open house portion of the
137 meetings, a presentation was given to summarize the purpose of the project, the initial set of alternative station
138 locations, and key environmental considerations. Participants were then given an opportunity to make oral
139 comments. A court reporter was present to record all comments during this time. Participants were also able to
140 provide comments directly to the court reporter, on comment sheets, or on one of the sketch pads located
141 around the room. Participants could submit completed comment sheets at the meeting, mail them to the project
142 post office box, or submit them via email after the meeting.

143 A total of 65 members of the public attended the scoping meetings. Of these, ten members of the public offered
144 oral comments at the meetings, and seven comments were provided on the sketch pads. One comment sheet
145 from the public was submitted. Public comments and responses are included in the Scoping Report, which is
146 included in Volume II of the Draft EIS.

147 **4.2.2 Public Meeting – Project Alternatives**

148 On April 19, 2012, the project team held a public meeting at the Cora Kelly Recreation Center, 25 West Reed
149 Avenue, Alexandria, Virginia. As with the public scoping meetings, display boards around the room provided an
150 overview and project staff was present to answer questions. This open house portion of the meeting was
151 followed by a brief presentation and a formal public comment session. The presentation reviewed the project to
152 date, the environmental review process, refinement of EIS alternatives, the functionality and appearance of the
153 alternatives, preliminary cost drivers, overall project schedule, and next steps.

154 Approximately 75 members of the public attended this meeting. Of these, 18 members of the public offered oral
155 comments at the meeting, and 16 written comments were provided. Between April 5 and April 24, 2012, nine
156 comments were received via the project e-mail address. Comments were reviewed by the project team so that
157 materials for subsequent public meetings and the Draft EIS incorporated additional explanation, where needed,
158 to address questions from the public.

159 **4.2.3 Public Meeting – Environmental Effects**

160 A series of public meetings will be held in April 2015. The meetings will be held to provide an opportunity for the
161 public to learn more about technical analyses in the Draft EIS and ask questions of project staff in advance of
162 the public hearing. For more information on these meetings, please visit www.alexandriava.gov/potomacyard.

163 **4.2.4 Draft EIS Public Comment Period and Public Hearing**

164 After the April 3, 2015 publication of the Draft EIS, a public comment period on the Draft EIS will be open until
165 May 18, 2015. Electronic copies of the Draft EIS are available to the public on the project website, and paper
166 copies are available for public review at the City of Alexandria City Hall and public libraries. During the comment
167 period, written comments may be submitted in the following ways:

- 168 • Via email: comments@potomacyardmetro.com and/or writtentestimony@wmata.com
- 169 • Via U.S. mail:

170	Potomac Yard Metrorail Station EIS	and/or	Office of the Secretary
171	P.O. Box 16531		Washington Metropolitan Area Transit Authority
172	Alexandria, VA 22302		600 Fifth Street, NW
173			Washington, DC 20001

174 A public hearing on the Draft EIS under the NEPA process is being held on Thursday, April 30, 2015 at 6:30pm
175 at Cora Kelly Recreation Center, 25 W. Reed Avenue, Alexandria, VA 22305. The public hearing is an
176 opportunity for interested parties to provide oral and written comments on the Draft EIS. The comments
177 presented at the hearing will be recorded by a court reporter and entered into the public record. Responses will
178 be prepared for the comments, and the comments and responses will be presented in the Final EIS. The

179 hearing is separate from any other public hearings that may be held by the City of Alexandria on matters related
180 to the project to fulfill its internal legislative requirements separate from the NEPA process.

181 **WMATA Compact Process Requirements**

182 The WMATA Compact also requires a public hearing. WMATA's public hearing process allows for public
183 comment and customarily keeps the public comment period open for ten days after the hearing. Following the
184 hearing, a staff report will be circulated summarizing comments received and WMATA staff's responses to those
185 comments. Members of the public then have an opportunity to comment on this staff report. Once finalized, the
186 public hearing staff report and public hearing report supplement are submitted to the WMATA Board of
187 Directors.

188 **4.2.5 On-Going Public Outreach Activities and Information Exchange**

189 A number of different approaches were used over the course of the environmental review process to ensure that
190 the public remained informed of project developments and was provided an opportunity to comment throughout
191 the project planning and design process. A project website, e-mail list, and newsletters were developed and
192 maintained; project materials were distributed at City of Alexandria libraries and community centers; and project
193 presentations were made at local civic association meetings and in coordination with the City of Alexandria's
194 Potomac Yard Metrorail Implementation Work Group (PYMIG). These activities are listed in more detail below:

- 195 • **Project Website (<http://www.potomacyardmetro.com>):** The project website has been updated on an
196 ongoing basis to provide information about the project, including project overview, schedule, description of the
197 NEPA process, alternatives under consideration, public involvement opportunities, publications, maps,
198 photographs, frequently asked questions, and other related materials. The website has also offered a link to
199 contact the project team directly through the project e-mail address for those who have questions, suggestions
200 and comments.
- 201 • **City of Alexandria Website (<http://www.alexandriava.gov/potomacyard>):** The City of Alexandria's
202 Potomac Yard Development website includes a section on the New Potomac Yard Metrorail Station. The site
203 includes responses to frequently asked questions, announcements, meeting dates, project information,
204 access to key reports and documents, and a link to provide comments via the project website.
- 205 • **Project E-mail List:** A project e-mail list was developed, maintained and used to distribute newsletters,
206 updates, meeting notices, and other project materials.
- 207 • **Project Newsletters:** To update the public and to obtain public comment, a project newsletter was posted
208 online, emailed to the project e-mail list, and printed copies were distributed at the public meeting in April 2012.
- 209 • **Project E-mail Address (comments@potomacyardmetro.com):** The address has been included on all
210 publicly distributed project materials, and has offered a convenient way for the public to provide comments,
211 ask questions, and request additional information on the project. Over the course of the EIS process, over 200
212 e-mail comments and questions have been received and responded to by the project team.

213 **4.3 Other Outreach and Coordination**

214 In addition to the scoping and general public meetings, the City of Alexandria, with support from the project
215 team, has conducted briefings of City officials and community associations.

216 **4.3.1 Section 106 Cultural Resources Consulting Parties Meetings**

217 As part of the Section 106 process, FTA has invited certain organizations and individuals who have a
218 demonstrated interest in the project to participate in the process. These organizations and individuals are
219 referred to as Section 106 consulting parties, and review information relevant to the identification, evaluation
220 and assessment of effects to historic properties that could result from the project. The following agencies and
221 organizations agreed to serve as consulting parties for the project.

- 222 • Alexandria Federation of Civic Associations
- 223 • Alexandria Historical Restoration and Preservation Commission
- 224 • Alexandria Historical Society
- 225 • Arlington County Department of Community Planning- Housing and Development- Neighborhood
226 Services Division
- 227 • City of Alexandria – Alexandria Archeology

- 228 • City of Alexandria – Historic Preservation Office- Department of Planning and Zoning
- 229 • City of Alexandria – Office of Historic Alexandria
- 230 • Lynhaven Civic Association
- 231 • National Park Service – George Washington Memorial Parkway
- 232 • National Park Service – National Capital Region
- 233 • Northeast Citizens’ Association
- 234 • Old Town Business and Professional Association
- 235 • United States Army Corps of Engineers – Norfolk District

236 Two consulting party meetings have been held to date: February 20, 2013, and March 27, 2013. The first
 237 consulting parties meeting included and overview of the project, role of the consulting parties, the Area of
 238 Potential Effect (APE) for archaeological and historic resources, and the historic and archaeological resources
 239 located within the APEs for each resource type, It was noted that the three archaeological sites located within
 240 the APE are potentially eligible for listing on the National Register of Historic Places (NRHP). The second
 241 consulting parties meeting included a review of the preliminary effects evaluation for historic architectural
 242 resources for the Build Alternatives.

243 **4.3.2 Potomac Yard Metrorail Implementation Work Group (PYMIG)**

244 The Alexandria City Council created PYMIG to assist in the EIS process, by informing City officials, including
 245 representatives of the City Council and Transportation Commission, and providing a venue for them to give
 246 input on the project to City of Alexandria staff and WMATA staff. Additionally, PYMIG meetings have served as
 247 a venue for interested members of the public to stay informed of the EIS process. The public is invited to attend
 248 all PYMIG meetings.

249 Twelve meetings have been held to date: June 30, 2011; October 26, 2011; February 6, 2012; May 16, 2012;
 250 October 10, 2012; January 30, 2013; June 10, 2013; January 6, 2014; May 15, 2014; June 26, 2014; October
 251 23, 2014; and January 29, 2015.

252 **4.3.3 Presentations at Neighborhoods and Civic Association Meetings**

253 The City of Alexandria held meetings in April 2012 to discuss the alternatives being evaluated in the EIS with
 254 neighborhood associations in the vicinity of the project site. Meetings were held with the following groups:

- 255 • Old Town Civic Association, April 11, 2012; and
- 256 • Potomac Greens Homeowners Association, April 12, 2012.

257 The City of Alexandria held additional follow up meetings to discuss the project status in 2013 and 2014 with
 258 neighborhood associations in the vicinity of the project site. Meetings were held with the following groups:

- 259 • Old Town Civic Association, May 8, 2013;
- 260 • NorthEast Citizens’ Association, September 18, 2013;
- 261 • North Old Town Independent Citizens Association, September 26, 2013;
- 262 • Lynhaven Civic Association, November 4, 2013; and
- 263 • West Old Town Citizens Association, January 9, 2014.

264 **4.3.4 CSX Transportation**

265 The City of Alexandria held a meeting with CSX Transportation (CSXT) staff on March 8, 2012 to discuss the
 266 initial set of alternatives being evaluated in the Draft EIS. A follow up meeting with CSXT staff was held on
 267 November 13, 2013 to review the conceptual plans for B-CSX Design Option. CSXT staff responded to the
 268 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.

- 46 • **Build Alternative B** – estimated capital costs between \$149 million and \$293 million. Compared to
47 Build Alternative A, the costs for Build Alternative B reflect additional guideway and track construction.
- 48 • **B-CSX Design Option** – estimated capital costs between \$193 million and \$358 million. Compared to
49 Build Alternative B, the costs for the B-CSX Design Option reflect the additional site work for relocation
50 of CSXT tracks and additional right-of-way acquisition.
- 51 • **Build Alternative D** – estimated capital costs between \$277 million and \$539 million. The alternative
52 has an aerial station design and two bridge structures and is located north and slightly west relative to
53 Build Alternatives A and B. This location across the CSXT tracks results in significantly higher guideway
54 and track element costs, as well as substantially higher real estate acquisition costs than Build
55 Alternatives A and B and the B-CSX Design Option.

56 **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

57

58 **5.1.2 Capital Funding Sources**

59 The City of Alexandria will manage the capital funding plan. The City of Alexandria's plan has been to fund the
60 station using revenue generated by new development in Potomac Yard. To account for and manage the
61 revenues collected for the station, the City has created the Potomac Yard Metrorail Station Fund ("Station
62 Fund"). Proceeds from the Station Fund are to be used solely for the design, construction, and financing of the
63 station and will be accounted for separately from other City revenues. The Station Fund collects revenue from
64 two special tax districts, developer contributions, and net new tax revenues generated by Potomac Yard
65 development. These revenue sources are described in more detail below.

66 **Net New Taxes**

67 This category of funding includes revenue from growth related taxes and fees on real property, sales, transient
68 lodging, meals, business licenses, and business personal property. Current tax revenues generated (with 2010
69 defined as the base tax year) at Potomac Yard will continue to go to the City's General Fund and are not
70 counted as available for Metrorail station financing. For new tax revenues generated by new development at
71 Potomac Yard, fixed percentages based on development type (60 percent of residential, 13 percent of retail, 17
72 percent of office, and 6 percent of hotel taxes) would go to the General Fund to pay for City and school services
73 that the new residents and businesses in Potomac Yard are likely to generate. The remainder of the new tax
74 revenues would go to the Station Fund.

75 **Special Tax Districts**

76 Two different special tax districts have been established to generate further revenue for the Station Fund. All
77 taxable real property in both districts is to be taxed with the exception of affordable housing units owned by a
78 nonprofit organization. A Tier I special tax of 20 cents per \$100 of valuation applies to portions of North Potomac
79 Yard as well as Landbays of G, H, and a small portion of Landbay I of South Potomac Yard. A Tier II special tax
80 of 10 cents per \$100 of valuation applies to most all of South Potomac Yard. Collections for Tier I began in
81 2011 while Tier II collections will begin the calendar year after the station opening.

82 **Developer Contributions**

83 The third source of revenue is from developer contributions made by the various owners of the different
84 landbays. The owner of North Potomac Yard (Landbay F, owner CPYR, Inc.) has agreed with the City of
85 Alexandria to contribute \$10 per square foot (in 2010 dollars) of new development for up to 4.9 million square
86 feet of development, indexed to inflation, for Alternative B or a location similar to Alternative B (see *City of
87 Alexandria Potomac Yard Memoranda of Understanding*, Volume II of the Draft EIS).

88 Total developer contributions will vary based on timing and amount of development. The North Potomac Yard
89 developer contributions are not applicable to Alternative A and B-CSX Design Option, as the developer has
90 indicated that they would not provide contributions for Alternative A and B-CSX Design Option since the station
91 would not be close enough to the North Potomac Yard development site. In addition, the North Potomac Yard
92 developer contributions are not applicable to Alternative D at this time, as the developer has indicated that it
93 would likely only provide a "meaningfully less" contribution for Alternative D due to the loss of significant
94 development potential and negative impact on the redevelopment value of North Potomac Yard. The amount of
95 the contribution for Alternative D would need to be negotiated with the developer.

96 Additionally, the owners of portions of South Potomac Yard have agreed to provide \$2 million to the City
97 towards the construction of a pedestrian bridge and have already made several payments towards this agreed
98 upon amount.

99 **5.1.3 Other Potential Federal Capital Funding Sources**

100 The project funding also includes a \$1 million FTA grant ("FTA Project VA-95-X112 (RSTP)") that was used to
101 fund the NEPA study for the project. The City will also continue to evaluate potential opportunities for Federal or
102 state funds, including Surface Transportation Program (STP) funds. These funds, which are typically used for
103 highway projects, would need to be allocated by the Virginia Department of Transportation (VDOT) to the project
104 and "flexed" (or transferred) into an eligible grant program.

105 In addition to potential Federal funding sources, the City of Alexandria may pursue financing assistance through
106 the Transportation Infrastructure Financing Innovation Act (TIFIA). This loan program has been expanded under

107 MAP-21 and could offer attractive financing terms such as lower interest rates or the ability to defer principal and
 108 interest payments until five years after operations commence. A TIFIA direct loan could be used to finance up to
 109 50 percent of the project's capital costs. TIFIA can be used on a subordinate basis to the City's general
 110 obligation bonds and might provide a credit enhancement that would reduce financing costs or risk to the City.

111 The City of Alexandria plans to request funding from the Northern Virginia Transportation Authority's (NVTA) "70
 112 percent" funding stream for local projects. While NVTA has not yet developed a multi-year long-range funding
 113 plan, the City of Alexandria has notified NVTA that it intends to request funding for the Potomac Yard Metrorail
 114 Station project. The City of Alexandria's planned request is consistent with NVTA's authorizing statutes that
 115 require NVTA to allocate a portion of its funding to local jurisdiction projects in proportion to the NVTA tax and
 116 fee revenue generated in the jurisdiction.

117 **5.1.4 Other Potential State Capital Funding Sources**

118 The project has been approved for a \$50 million loan through the Virginia Transportation Infrastructure Bank
 119 (VTIB). The VTIB is a special revolving loan fund established by the state to assist localities and other eligible
 120 borrowers to finance transportation projects. Revenue from the Tier 1 Special Tax District is anticipated to be
 121 used for the repayment of the VTIB loan. The VTIB loan lowers the amount that will need to be borrowed for the
 122 project from other higher cost sources.

123 **5.2 Operating and Maintenance Cost and Funding Strategy**

124 **5.2.1 Operating Costs**

125 The Potomac Yard Metrorail Station would add system-wide operating costs to Metrorail. Currently, the majority
 126 of Metrorail systems operating funds come from the annual operating subsidy provided by member jurisdictions
 127 of the WMATA Compact. The WMATA Compact is an agreement among jurisdictions in Virginia, Maryland, and
 128 the District of Columbia that governs the management and operation of the Washington region's Metrorail,
 129 Metrobus, and MetroAccess systems. WMATA's operating revenue from passenger fares and related sources
 130 covers 55 percent of the bus and rail system operating expenses. The remaining 45 percent is subsidized by
 131 local and state governments, including the City of Alexandria. The annual incremental Metrorail subsidy is
 132 allocated among its members using an established and approved formula.

133 The City provides an annual contribution to WMATA's capital improvement program based on the same Board-
 134 approved formulas. The City's total WMATA operating subsidy for Metrorail operating and capital rehabilitation
 135 is approximately \$10 million in FY 2013. The City has currently allocated 5.1 percent of WMATA's total subsidy
 136 under this subsidy allocation formula. The addition of one station and an estimated 5,000 additional City
 137 residents would increase the City's share to 5.3 percent requiring an additional \$1.39 million annual contribution
 138 from the City. The subsidy increase will be approximately the same for each Build Alternative.

139 **5.2.2 Operating Funding Sources**

140 Along with ongoing debt service, the city plans to fund the additional WMATA subsidy required to cover the
 141 operations cost for the Potomac Yard Metrorail Station with the Potomac Yard Metrorail Station Fund, which
 142 would include net new growth-related tax revenue and special tax district revenue, as described in **Section**
 143 **5.1.2.**