POTOMAC YARD METRORAIL STATION

ENVIRONMENTAL IMPACT STATEMENT

Administrative Review Draft

Transportation Technical Memorandum

February 2013

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1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

This technical memorandum identifies the potential transportation effects of the No Build and Build Alternatives. The memorandum describes the following:

- Project alternatives
- Methodology
- Opening year conditions
- Potential effects of each alternative

Transportation elements analyzed at both the opening year (2016) and horizon year (2040) in this memorandum include roadways, traffic conditions, rail operations, rail ridership projections, surface transit network, bicycle and pedestrian facilities, and parking and access facilities. **Figure 1-1** shows the major transportation facilities in the project study area including the street system, Metrorail Blue and Yellow Lines, the Crystal City/Potomac Yard (CCPY) Transitway (scheduled to open by 2014), and the CSX Transportation (CSXT) rail corridor, which accommodates freight, intercity passenger rail, and commuter rail services. The Ronald Reagan Washington National Airport is located adjacent to the study area. Temporary construction effects to transportation systems are described separately in the *Construction Impacts Technical Memorandum*.

The findings of this analysis are incorporated into the Draft EIS.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail through the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-2**.

Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Figure 1-1: Key Transportation Facilities

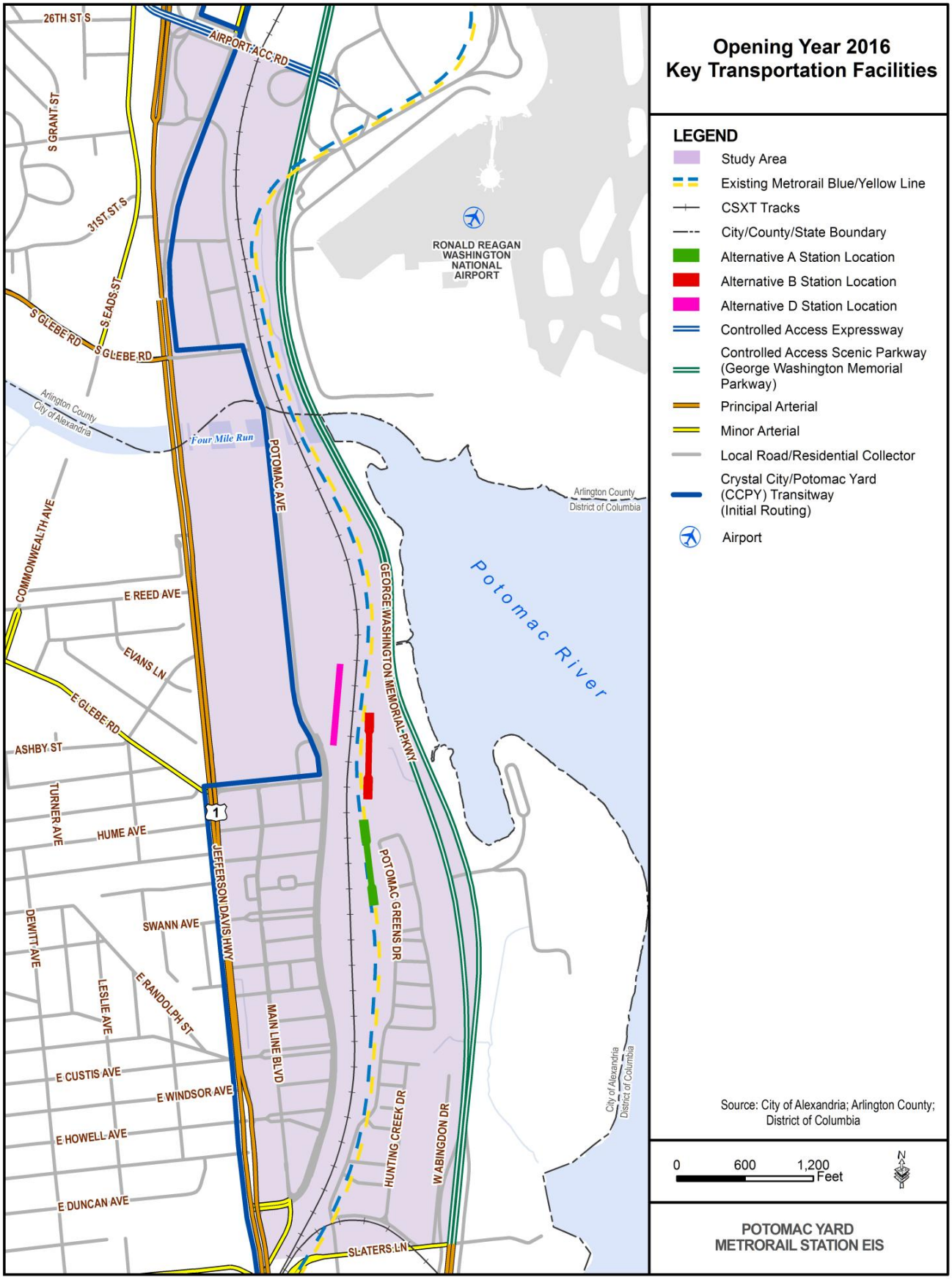
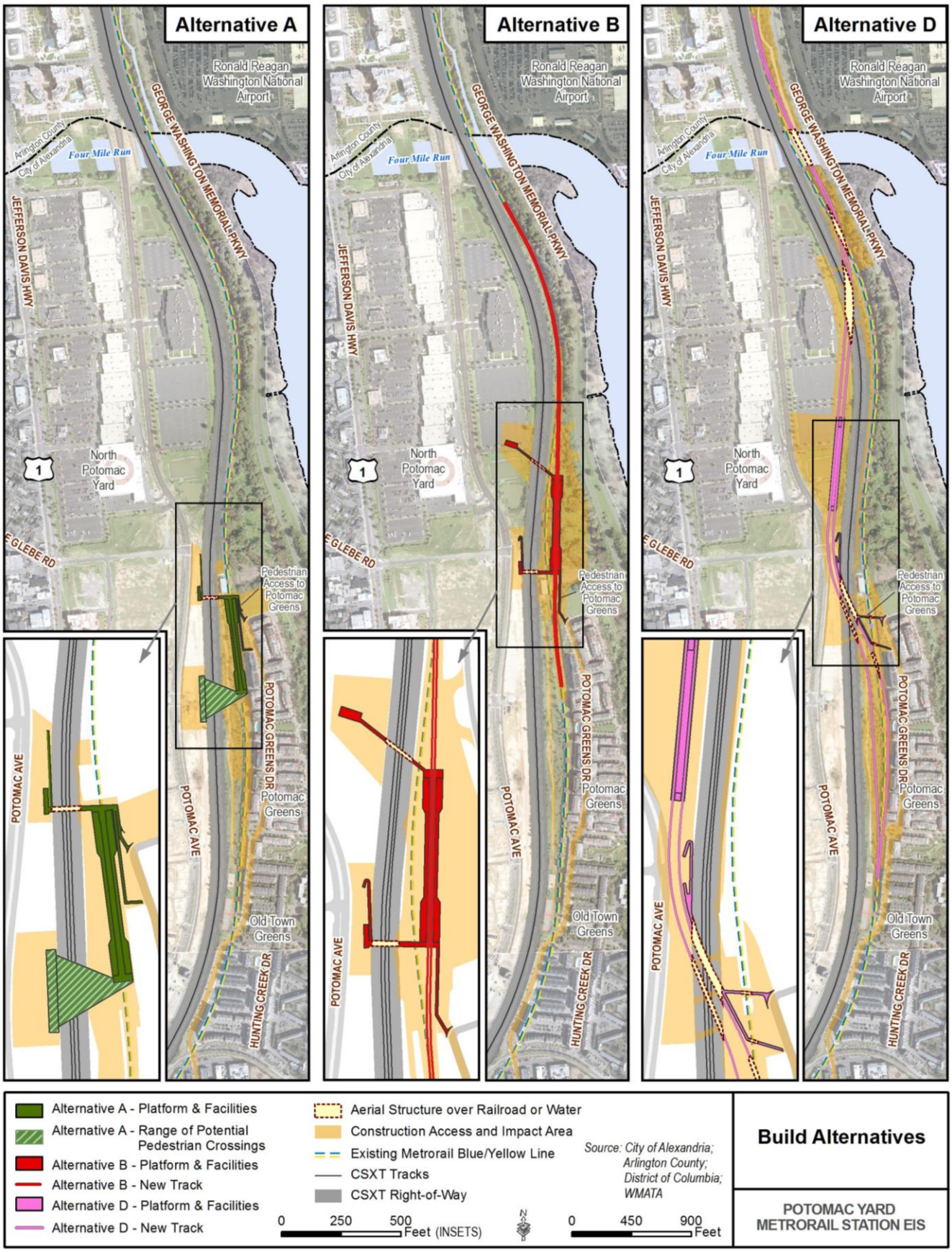


Figure 1-2: Build Alternatives



Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track that is replaced would be removed.

1.2 Applicable Plans and Studies

Opening year (2016) transportation conditions were identified and documented based on current transportation plans, base mapping, field reviews, and data collected for the analysis. The following local and regional planning documents were used to characterize opening year conditions and transportation improvements that would be implemented by 2016 within the study area as well as additional improvements planned to occur beyond 2016.

1.2.1 City of Alexandria Plans

Comprehensive Transportation Master Plan (April 2008)
This plan covers all elements of the City's transportation system, with special emphasis on dedicated surface transit corridors. The *Transportation Master Plan* states that any amendment to the *Potomac Yard/Potomac Greens Small Area Plan* (1999) that results in an increase in density beyond what is currently approved will include reasonable provisions to address the development and funding of an additional Metrorail Station.

City of Alexandria Pedestrian and Bicycle Mobility Plan (June 2008)
This plan provides a ten-year blueprint for implementing the pedestrian and bicycle policies and objectives outlined in the City's *Comprehensive Transportation Master Plan*, geared to make walking and bicycling more attractive transportation choices in the City. For bicycles, the plan recommends shared-use paths, new bicycle lanes, and new lane markings for bicycles. For pedestrians, the plan recommends new sidewalks, crosswalks, medians, and signal updates.

Potomac Yard Multimodal Transportation Study (June 2010)
This study was prepared as an input to the *North Potomac Yard Small Area Plan* (June 2010). The 2030 future conditions analysis assumes the operations of a future Metrorail station in the area, specifically to the east of the existing tracks.

Potomac Yard Metrorail Station Concept Development Study (February 2010)
The City of Alexandria and WMATA initiated this study to identify several potential locations for a Potomac Yard Metrorail Station. The planning process included an initial screening of each potential location to narrow the number of locations to be carried forward in subsequent review processes. Two alternatives were recommended to be carried forward, generally corresponding with Build Alternatives A and B presented in this memorandum.

North Potomac Yard Small Area Plan (May 2010)
The plan requires a Metrorail station to support the level of development recommended in North Potomac Yard. The station location is recommended on the east side of the CSXT right-of-way, north of the existing traction power substation. This is the location of Build Alternative B.

Potomac Yard / Potomac Greens Small Area Plan and CDD Concept Plan (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010)
The *CDD Concept Plan* required a Metrorail reservation in the Potomac Greens portion of the study area in the location of Build Alternative A. However, portions of the plan are superseded by the *North Potomac Yard Small Area Plan* (2010), which mandates a Metrorail station at the approximate location of Build Alternative B,

1.2.2 Arlington County Plans

Master Transportation Plan (June 2007, Transit Element adopted July 2009)
This plan covers all elements of the County's transportation system. The Transit Element includes the planned CCPY Transitway, although the planning area does not extend into the Alexandria portion of Potomac Yard and does not include the Potomac Yard Metrorail Station.

Crystal City Multimodal Transportation Plan (August 2008)
This plan covers both Crystal City and the Arlington County portion of Potomac Yard, including recommended transportation improvements for the roadway network, transit system, and bicycle and pedestrian accommodations. The plan's discussion of the CCPY Transitway references the earlier alternatives analysis for the Pentagon City to Braddock Road Metrorail Station corridor that considered a new Potomac Yard Metrorail Station as one of the alternatives.

1.2.3 WMATA Plans

Crystal City/Potomac Yard Transitway Operations Plan (January 2012)
This plan establishes detailed transit service operations, transitway access policies, and implementation plans to prepare for the opening of the transitway and premium Metrobus service. The transitway will be constructed in phases, with the initial phase open for service in late 2013/early 2014.

1.2.4 Regional Plans

National Capital Region's Financially Constrained Long-Range Transportation Plan (CLRP) (November 2011)

The CLRP was developed and adopted by the National Capital Region Transportation Planning Board (TPB) and identifies all regionally significant transportation projects and programs that are planned in the Washington metropolitan area between 2011 and 2040. The plan includes a new Metrorail station at Potomac Yard in 2017. The City of Alexandria is adding the project to the next update of the TPB six-year Transportation Improvement Program (TIP).

1.3 Methodology

The potential effects of the No Build and Build Alternatives were analyzed in relation to rail operations, rail ridership projections, the roadway network, traffic conditions, the surface transit network, bicycle and pedestrian facilities, and parking and access facilities for the opening year (2016) and horizon year (2040). Potential indirect regional impacts of the alternatives are discussed in the Secondary and Cumulative Impacts Technical Memorandum.

1.3.1 Roadway Network

The roadway network within the study area and in its vicinity was identified through existing GIS roadway mapping provided by the City of Alexandria and Arlington County. Roadway classifications were determined from City of Alexandria's *Transportation Master Plan* (2008) and the Virginia Department of Transportation's (VDOT) Virginia Highway Functional Classification maps (2005) for the City of Alexandria and Arlington County. Planned roads were identified from applicable planning documents such as the *North Potomac Yard Small Area Plan* and *Potomac Yard/Potomac Greens Small Area Plan*.

1.3.2 Traffic Conditions

The anticipated traffic effects of the No Build Alternative and the three Build Alternatives in the opening year and horizon year were evaluated by assessing the performance of 20 key intersections in the study area. For the existing conditions and future No Build and Build conditions in 2016 and 2040, the intersections were modeled using VISSIM, a microsimulation model. Future traffic growth was estimated for the No Build Alternative, and additional traffic due to the proposed Potomac Yard Metrorail Station was estimated for the Build Alternatives and incorporated into the intersection simulations.

Intersection performance is typically measured by the average time a vehicle is stopped (delayed) at an intersection. This quantified delay is referred to as Level of Service (LOS). Levels of Service are designated LOS A through LOS F, from best to worst. **Table 1-2** defines LOS based on observed delay per vehicle. The City of Alexandria and Arlington County have a standard of LOS "D" or better at signalized intersections. For the purpose of this analysis, a traffic effect is defined as a change in overall intersection LOS either by two grade levels (for example, from LOS B to LOS D) or any change from LOS D or above (acceptable) to LOS E or LOS F (poor or failing).

The methodologies for quantifying existing conditions, projecting future background traffic growth, estimating vehicle trips generated by new development in Potomac Yard, and estimating vehicle trips generated by a new Metrorail station at Potomac Yard are described below. The assessment of traffic effects used local City of Alexandria and Arlington County considerations for traffic analyses and accepted LOS, consistent with FTA recommendations.[1]

[1] FTA Environmental Resources Information, Transportation Impacts, Traffic, http://www.fta.dot.gov/12347_2231.html, accessed September 2012.

Table 1-2: LOS Criteria at Signalized and Unsignalized Intersections

Signalized			Unsignalized		
Delay (sec/veh)	LOS	Description	Delay (sec/veh)	LOS	Description
<= 10	A	Free Flow	<= 10	A	Free Flow
> 10 – 20	B	Stable Flow (slight delays)	> 10 – 15	B	Stable Flow (slight delays)
> 20 – 35	C	Stable Flow (acceptable delays)	> 15 – 25	C	Stable Flow (acceptable delays)
> 35 – 55	D	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal before proceeding)	> 25 – 35	D	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal before proceeding)
> 55 – 80	E	Unstable flow (intolerable delay)	> 35 – 50	E	Unstable flow (intolerable delay)
> 80	F	Forced flow (jammed)	> 50	F	Forced flow (jammed)

Source: Highway Capacity Manual, 2000.

Existing Conditions

Manual traffic movement counts were collected on Tuesday, April 24, 2012. The counts were collected in 15-minute intervals between 6:30-9:15 AM and 4:30-6:30 PM. Lane configurations in the study area (see **Appendix C**) and travel times along U.S. Route 1 were assessed during field visits. Bus volume and schedule information was obtained from published WMATA Metrobus and Alexandria Transit DASH schedules. Signal timing plans were obtained from Arlington County and the City of Alexandria. Existing 2012 intersection operations were modeled with VISSIM microsimulations based on the data collected.

Future Conditions

To simulate the future growth in traffic volumes and calculate the LOS of study area intersections in the current opening year (2016) and horizon year (2040), the project forecasted future growth in traffic volumes in 2016 and 2040. Potential increases in study area traffic volume from existing conditions are attributed to the following reasons:

- Regional traffic growth; and
- Trips generated by approved developments in Potomac Yard that are expected to be built by the future horizon years.

Both background regional traffic growth (i.e., traffic that would occur regardless of increased development) and proposed, new development are inputs to calculate the total traffic volume and represent the future No Build Condition in 2016 and 2040. New lane and intersection configurations for the CCPY Transitway, both initial alignment and long-term alignment through the North Potomac Yard mixed-use development, are incorporated into the traffic modeling for 2016 and 2040.

Background Regional Traffic Growth

To assess the background regional growth, daily traffic counts were reviewed from 2007 (VDOT traffic count data, *Potomac Yard Multimodal Study*, June 2010) and compared with field counts conducted in April 2012. The review showed that traffic volumes in the study area have not increased since 2007. Concurrently, the Metropolitan Washington Council of Government (MWCOG) regional travel model was used to compare traffic volumes between the years 2010 and 2030, which also showed no regional traffic growth in the study area. Although both methods suggested regional traffic would not grow substantially, for consistency with the *Potomac Yard Multimodal Transportation Study* and as a conservative assumption, a one percent annual growth factor was assumed for regional traffic between 2012 and 2016 and between 2016 and 2040.

Additional Trip Generation: Future Potomac Yard Land Use

To determine additional trip generation, the analysis made assumptions about the volume and type of future land use present in Potomac Yard by 2016 and 2040 (see **Appendix B**). Vehicular trips generated by the future development in Potomac Yard were estimated using the same assumptions and methodology as the *Potomac Yard Multimodal Transportation Study*.

Opening Year (2016)

The following volumes of additional development above existing conditions were assumed to occur in Potomac Yard by 2016[2]:

- South Potomac Yard – The City of Alexandria estimated that there would be 1,885,000 square feet of development in South Potomac Yard (out of a total approved development volume of 6,757,575 square feet in Landbays G, H, I, J, K and L). Therefore, for South Potomac Yard trips, a ratio of 0.28 (1,885,000 square feet of development anticipated by 2016 divided by 6,757,575 square feet of development at build out) was applied to the site-generated trips for South Potomac Yard estimated in the *Potomac Yard Multimodal Transportation Study*.
- North Potomac Yard – No development in addition to the existing 600,000 square-foot retail center is planned to occur in North Potomac Yard by 2016.

Horizon Year (2040)

The following total development volumes were assumed to be built in Potomac Yard by 2040[3]:

- South Potomac Yard – 5,050,000 square feet of development was assumed based on current City of Alexandria development projections for the year 2040 (which is less than the year 2030 development volume of 6,757,575 square feet assumed in the *Potomac Yard Multimodal Transportation Study*, based on updated development projections), resulting in a 0.75 development ratio applied to trip generation forecasts from the *Potomac Yard Multimodal Transportation Study*.
- North Potomac Yard – 3,700,000 square feet of development was assumed based on current City of Alexandria development projections for the year 2040 (which is less than the year 2030 development volume of 9,795,000 assumed in the *Potomac Yard Multimodal Transportation Study*, based on updated development projections), resulting in a 0.38 development ratio applied to trip generation forecasts from the *Potomac Yard Multimodal Transportation Study*.

Trip Generation Due to the Proposed Future Metrorail Station (Traffic Forecasts for 2040)

For the Build Alternatives, trip generation would occur due to the Metrorail station in addition to the background regional traffic growth and trips generated by the base level of expected development in Potomac Yard. The Metrorail station would affect trip generation in Potomac Yard in the following ways:

- New vehicle trips traveling solely to and from the proposed Metrorail station consisting of:
    - Automobile drop-offs on streets adjacent to the station;
    - Taxi drop-offs on streets adjacent to the station;
    - People who drive and park their car on future streets in Potomac Yard and ride Metrorail, including people who carpool with them; and
- Reductions in vehicular trips due to people switching from cars or buses to Metrorail (Potomac Yard Metrorail transit mode share).

New Vehicle Trips solely to and from the proposed Metrorail Station

The new vehicle trips to and from the proposed Metrorail station were estimated using station access data[4] from selected stations with similar design features (e.g., no on-site Park & Ride or off-street Kiss & Ride facility) and in similar dense, mixed-use areas. **Table 1-3** summarizes estimated automobile trip generation that was assumed for the proposed Potomac Yard Metrorail Station during the AM and PM peak hours based on data from the Clarendon and Court House Metrorail Stations (see **Appendix C** for detailed station data). The trips comprise Metrorail passenger drop-off and pick-up activity and drivers parking off-site near the station to use Metrorail. As

[2] All development assumptions were provided by the City of Alexandria.
[3] All development assumptions were provided by the City of Alexandria.
[4] WMATA 2007 Metrorail Passenger Survey.

each of the Build Alternatives would have the same features with regards to vehicular access, the vehicular trip generation was assumed to be the same for all three Build Alternatives.

Table 1-3: Automobile Trip Generation Assumptions for Proposed Potomac Yard Metrorail Station

AM Peak Hour			PM Peak Hour		
In	Out	Total	In	Out	Total
138	40	178	69	155	224

Source: 2007 Metrorail Rider Survey; results for Clarendon and Court House Metrorail Stations, highest numbers of the two stations assumed for the proposed Potomac Yard Metrorail Station.

Additional development in Potomac Yard, above the base land use, that would be permitted by City zoning regulations due to the Metrorail station or that would be induced in the vicinity of Potomac Yard due to the Metrorail station is considered a secondary effect of the station. The potential additional vehicle trips generated by this additional development and the effects on study area traffic conditions were not included in the quantitative traffic analysis included in this memorandum, but are instead analyzed as secondary effects in the *Secondary and Cumulative Effects Technical Memorandum* for the project.

Reductions in Vehicular Trips

Consistent with the *Potomac Yard Multimodal Transportation Study*, the proposed Metrorail station and planned mixed-use developments in its vicinity are assumed to increase the transit mode share of trips within the study area by approximately 7 percent in 2016 and by approximately 24 percent in 2040.

Trip Distribution Process

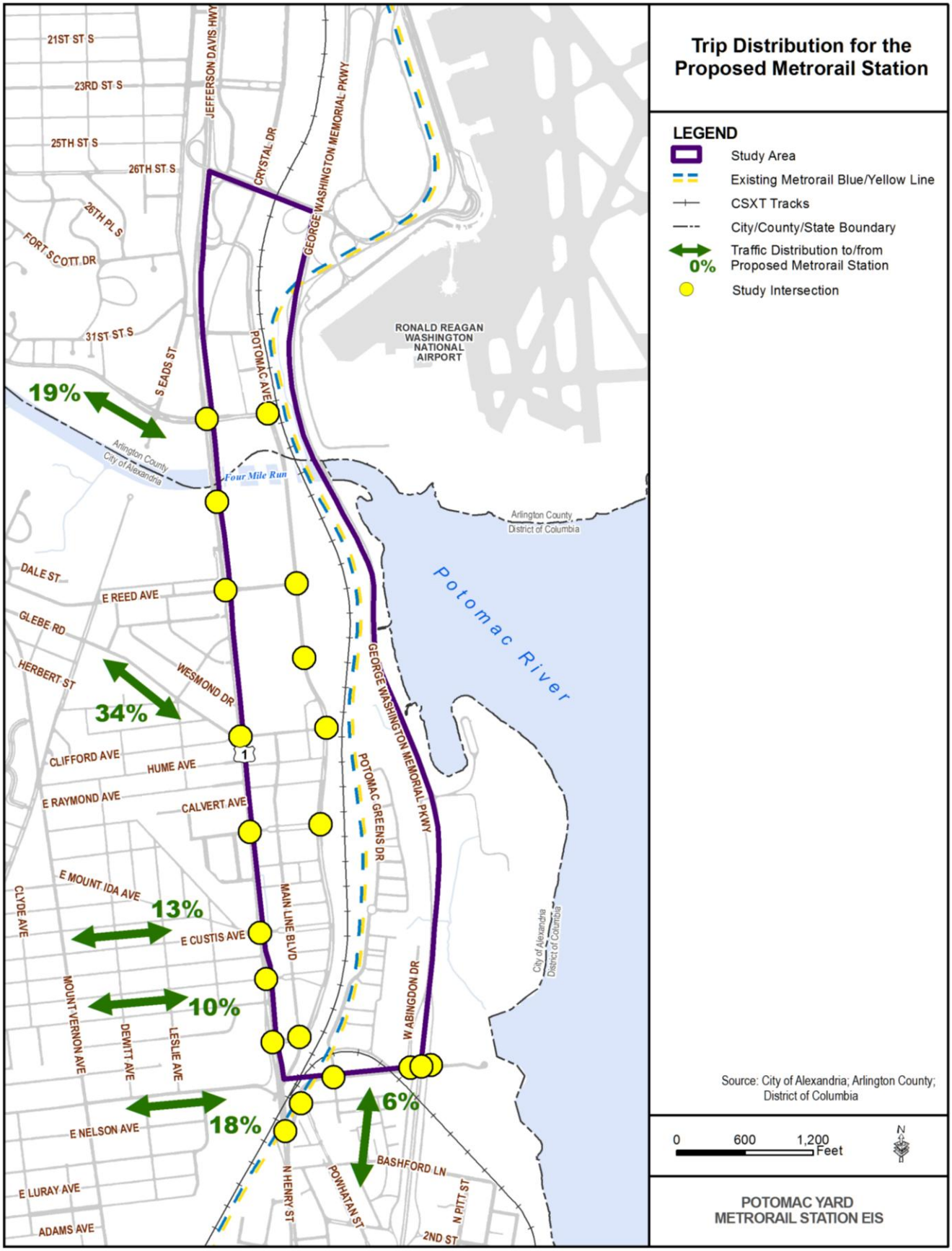
For the assumed numbers of vehicle trips that would be generated by the proposed Metrorail station, the trips were distributed to general origin/destination areas outside of the study area based on relative populations of these areas and proximity to other Metrorail stations (see **Figure 1-3**).[5] Due to the close proximity of the access points for the different station locations under the Build Alternatives and also due to the overall low number of new automobile trips generated by the station, the trip distribution assumed that there would be no discernible differences among the Build Alternatives. Thus, the same trip distribution was used for the three Build Alternatives.

Intersection Simulations

Traffic conditions at the study intersections were modeled based on the existing traffic data, additional estimated traffic growth, and distribution of trips assumed. To accurately reflect existing traffic conditions, the simulation model was calibrated using travel times and observed queues along U.S. Route 1 and Slaters Lane. Bus transit routes serving the area, including the planned Crystal City/Potomac Yard Transitway, were included in the models for both the 2016 and 2040 conditions. Using the simulations, average vehicle delay for the study intersections was measured and LOS determined.

[5] It was assumed that people living in Arlington County generally north of the South Glebe Road and U.S. Route 1 intersection would use either the Crystal City Metrorail Station or the Ronald Reagan Washington National Airport Metrorail Station, and the people living west of U.S. Route 1 and south of East Monroe Avenue would generally use the Braddock Road Metrorail Station. Due to this assumption, a limited amount of Metrorail generated traffic would travel to and from north and south of the study area.

Figure 1-3: Trip Distribution for the Proposed Metrorail Station



1.3.3 Rail Operations

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

Run Time Estimates

Changes in run times associated with the additional station result from the additional time required to decelerate into the station; boarding and alighting times at the station, also known as dwell time; and acceleration out of the station back to full operating speed. The additional time to perform these functions result in increased travel time for existing riders and has the potential to impact existing ridership levels. The additional station also has the potential to impact existing passenger loads, particularly during peak travel periods.

Station-to-Station Travel Distances and Time

Run time estimates for Metrorail service between the Ronald Reagan Washington National Airport station and the Braddock Road station were developed for three different potential station and track configurations supporting a Metrorail station at Potomac Yard. Track distances, alignment curvature and elevation, and station location were derived from plan and profile drawings for the three Build Alternatives and entered into the run time model. Run times were based on existing Metrorail vehicle performance, track alignment, and system operating criteria along with alignment curvature and elevation characteristics derived from general plans prepared for the project Build Alternatives. All run times were constructed to be consistent with the WMATA *Manual of Design Criteria, Release 9* (2008) and the *Transit Capacity and Quality of Service Manual*, 2nd Edition (2003).

End-to-End Travel Distances and Times

The run time model was used to simulate travel times for the three Build Alternatives. Dwell time at the new Potomac Yard Metrorail Station was assumed to be 30 seconds in all cases, consistent with current Metrorail assumptions and actual observations at other stations. Running times were adjusted to conform to the alternatives' track topology and vehicle acceleration/deceleration characteristics coming into and out of the new station. Additional travel time to access the Potomac Yard Metrorail Station was added to the planned Blue and Yellow Line patterns in 2016 and 2040. Each alternative assumed to add one minute to the end-to-end travel time, and two minutes to the end-to-end round trip (or loop) time.

Operating Travel Time and Train Car Requirements

Additional run time can be accommodated through reductions in existing vehicle layover times at end-of-line stations or through the lengthening of roundtrip cycle times. The need for lengthening the overall round trip cycle time was assessed in relation to the resultant end-of-line layover time required to maintain safety and service reliability. If layover times are inadequate, the overall cycle times would be increased and an additional train set would be required to maintain existing service frequencies. This assessment was conducted concurrently with travel demand modeling ridership analysis that examined changes in demand levels. The determination from this assessment was re-examined after travel demand modeling to ensure train vehicle capacity would meet the projected demand identified by the model runs. The projected increased Metrorail ridership due to the proposed new Potomac Yard station (see **Section 1.3.4**) was assessed using data from the on-going WMATA Regional Transit System Plan (RTSP) study to determine if capacity on the Blue and Yellow Lines would be sufficient to accommodate the additional demand. Station capacity was assessed by comparing projected ridership with existing ridership at nearby Metrorail stations (for example, Braddock Road and King Street stations).

Commercial Rail Network

Freight rail operations information for average numbers of trains per day was provided by CSXT. Passenger and commuter rail service information was collected using published timetables for Amtrak and Virginia Railway Express services along the corridor. Potential effects of the alternatives on commercial rail operations were assessed for vertical and horizontal track clearance requirements and train signals based on information provided by CSXT staff and design plans for the project.

1.3.4 Rail Ridership Projections

Travel demand forecasting for the proposed Metrorail station was conducted using the MWCOG regional travel demand model and employed the current WMATA transit post-processor application (Version 2.3, 2012), which was developed to support the WMATA Regional Transit System Plan. The MWCOG model estimates trip generation and trip distribution patterns, and the WMATA transit post-processor works in combination with the MWCOG model to enhance its estimation of transit utilization in the region. The key factors influencing transit ridership in the model are travel time, walkability (estimated at a broad level by the density of the street network), and land use.

For areas outside of the City of Alexandria portion of Potomac Yard, the land use was based on the regionally adopted land use forecasts (MWCOG's Round 8.0 Cooperative Land Use projections for 2016 and 2040), and, for the City of Alexandria portion of Potomac Yard, the land use was based on approved development volumes (see **Appendix B**). The model included a pedestrian and environmental variable to account for the relationship between walkability and transit utilization.

The potential additional station ridership generated by additional development was not included in the quantitative traffic analysis included in this memorandum, but are instead analyzed as secondary effects in the *Secondary and Cumulative Effects Technical Memorandum* for the project.

1.3.5 Surface Transit Network

Evaluating the planning framework for bus transit service at the future Potomac Yard Metrorail Station focused on station access (routing), peak hour service levels, and conceptual design of bus boarding/embarking points. The primary resources relied upon include the *CCPY Transitway Transit Operations Plan* (January 2012) and the *North Potomac Yard Small Area Plan* (May 2010).

The existing bus transit network was assessed as it relates to both opening year and horizon year conditions. The existing network, which forms the No Build Alternative, included projects financially committed to open by 2016, such as the CCPY Transitway. The network developed for the Build Alternatives was advanced beyond the existing network based on coordination with local transit operators to include any additional modifications.

1.3.6 Pedestrian and Bicycle Facilities

Pedestrian Facilities

The analysis included an inventory of existing facilities as well as planned pedestrian facilities that would serve the future station. Resources for the pedestrian facilities analysis include:

- *Pedestrian and Bicycle Mobility Plan*, City of Alexandria, 2008
- Traffic speeds and traffic volumes within the study area

The inventory identified the locations and conditions of sidewalks and pedestrian crossings and assigned qualitative rankings of pedestrian access to the alternative station locations. Locations where there was a higher potential for pedestrian-vehicle conflicts (for example, multiple crossings at U.S. Route 1) were highlighted. The analysis was completed through field reviews and inventories and supplemented by reviews of aerial photography and planning documents for the Potomac Yard development.

Bicycle Facilities

The analysis assessed connections between bicycle infrastructure (existing and planned) and the proposed Build Alternatives. The bicycle plans of the City of Alexandria and neighboring Arlington County were reviewed, and all bicycle routes, trails, and on- and off-street bicycle facilities in the study area were identified. Existing plans were assessed to identify any conflicts between proposed or existing bicycle infrastructure and each Build Alternative. The analysis reviewed plans proposals for expanding Capital Bikeshare into the study area.

Additional resources for the bicycle facilities analysis include:

- *Pedestrian and Bicycle Mobility Plan*, City of Alexandria, 2008
- Arlington County Bike Map, 2012
- Plans for Alexandria Capital Bikeshare expansion (under development)
- *Arlington County Bikeshare Transit Development Plan*, Arlington County Commuter Services, 2012 (under development)

- Traffic speeds and traffic volumes within the study area
- Bicycle accident statistics and/or reports within the study area for the last 24 months (if available)

1.3.7 Parking and Access

No parking is to be developed as part of the project itself. Therefore, the assessment identified existing and planned future parking conditions in the station vicinity, and qualitatively discussed potential effects of the station on parking demand. A field investigation was conducted to determine availability and location of existing parking in the vicinity. Parking provisions in planning and zoning documents for South and North Potomac Yard were reviewed to determine the general types of on-street and off-street parking that are planned in the future as the developments are built out.

1.3.8 Airport Facilities and Operations

The heights of proposed structures were submitted for review by the Metropolitan Washington Airports Authority (MWAA) to determine if they complied with height regulations for the flight approaches and vicinity of Ronald Reagan Washington National Airport. Additional information regarding airport operations was collected from the MWAA website (http://mwaa.com/reagan/1279.htm, accessed July 2012).

2.0 ROADWAY NETWORK

This section describes the opening year roadway network, and describes potential effects to this network for the No Build Alternative and each of the Build Alternatives.

2.1 Opening Year Conditions

Figure 1-1 shows the opening year roadway network. By 2016, the South Potomac Yard roadway network will be completed, and North Potomac Yard will still have the internal driveway configuration of the existing strip shopping center.

The other change to the 2016 study area roadway network from existing conditions will be the CCPY Transitway, which will be constructed in phases and open for service in 2013 and 2014. The transitway will have a dedicated right-of-way along some sections of the corridor to separate buses from traffic congestion. Along U.S. Route 1, buses will run in dedicated lanes between Potomac Avenue and East Glebe Road. North of East Glebe Road, buses will leave U.S. Route 1 and run through the existing shopping center and then into Arlington County via Potomac Avenue in general traffic lanes.

With the CCPY Transitway, the intersection layout at certain intersections will be modified to accommodate the transitway and stops in the median. The left turn for southbound traffic at the intersection of U.S. Route 1 and Potomac Avenue will be restricted. The intersections of U.S. Route 1 with Fannon Street, Hume Avenue, East Raymond Avenue, and Calvert Avenue will be converted to right-in/right-out intersections, eliminating left turns to/from U.S. Route 1.

2.2 Potential Effects

2.2.1 No Build Alternative

The roadway network in 2040 would be the same as the 2016 transportation network, with the addition of the urban public street grid within the redeveloped North Potomac Yard and the extension of the CCPY Transitway dedicated lanes several blocks further north along U.S. Route 1. The CCPY Transitway turn into North Potomac Yard from U.S. Route 1 would shift from the East Glebe Road intersection to the new Diamond Road intersection where it would enter the North Potomac Yard development, which would change intersection signal phases and cycle times at several U.S. Route 1 intersections.

2.2.2 Build Alternatives

The roadway network in 2040 would be the same as the No Build roadway network. The Build Alternatives would not alter the planned layout of public roadways in the vicinity of the proposed Metrorail station locations.

2.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects to the roadway network, so no mitigation measures are proposed.

3.0 TRAFFIC CONDITIONS

This section describes the existing and opening year traffic conditions and potential effects of the No Build Alternative and each of the Build Alternatives. Traffic conditions were assessed based on intersection LOS of the twenty study intersections studied using simulation models. The City of Alexandria and Arlington County generally consider a LOS D or above to be acceptable while LOS E or F are considered to be poor or failing.

3.1 Existing Conditions

Simulation results showed that during the AM peak hour, all study intersections operate with LOS C and better, except for the intersections of South Glebe Road at U.S. Route 1 and George Washington Memorial Parkway at Slaters Lane, which currently operate at LOS D. Figures showing turning movement counts and intersection LOS under existing conditions are included in **Appendix C**.

3.2 Opening Year Conditions

Opening year traffic conditions are expected to be largely similar to existing conditions. Simulation results showed that generally most intersections are estimated to experience slight increases in average vehicular delay due to regional traffic growth between 2012 and 2016. This increase resulted in changes in LOS at a few intersections from the existing condition. During the AM peak hour, only the intersections of South Glebe Road at U.S. Route 1 and George Washington Memorial Parkway at Slaters Lane are projected to operate with LOS D; all other intersections are projected to operate with LOS C or better. During the PM peak hour, the delay at the intersection of South Glebe Road at U.S. Route 1 is projected to increase by approximately ten seconds; however, the intersection will still perform at LOS D as in the existing 2012 condition. Detailed tables and figures of intersection LOS for 2016 are included in **Appendix C**.

3.3 Potential Effects

For the purpose of this analysis, a traffic effect is defined as a change in overall intersection LOS either by two grade levels (e.g., from LOS B to LOS D) or any change from LOS D or above (i.e., acceptable) to LOS E or LOS F (i.e., poor or failing).

Table 3-1 and **Table 3-2** summarize traffic simulation results for intersection LOS in the AM and PM peak hours, respectively, for the No Build and Build conditions in both 2016 and 2040. Particularly for this analysis, a traffic effect can be either positive or negative, depending on whether the projected Build LOS improves or decreases, compared to the No Build. Any projected change in overall intersection LOS, even if not a substantial enough to constitute a traffic effect, is highlighted in yellow in Tables 3-1 and 3-2. None of the projected changes is substantial (i.e., a change greater than one grade level LOS or a change to LOS E or F from LOS D or above) and none would be considered a traffic effect of the project. There would be no discernible differences in the traffic performance of the Build Alternatives due to the low number of new automobile trips within the study area as a result of a new station, the relatively close proximity of the different station locations under the Build Alternatives. Detailed LOS and delay data by intersection approach are provided in **Appendix C**.

Table 3-1: AM Peak Hour Intersection Level of Service (LOS)

No.	Intersection	2016 LOS AM Peak Hour		2040 LOS AM Peak Hour	
		No Build	Build*	No Build	Build*
1	S. Glebe Rd and U.S. Route 1	D	D	D	D
2	S. Glebe Rd and Potomac Ave	A	B	A	A
3	Shopping Ctr. N. Entrance and U.S. Route 1	A	A	A	A
4	E. Reed Ave and U.S. Route 1	C	C	C	C
5	E. Reed Ave and Potomac Ave	A	A	A	A
6	Evans Ln and Potomac Ave	A	A	A	A
7	E. Glebe Rd and U.S. Route 1	C	C**	E	E
8	E. Glebe Rd and Potomac Ave	A	A	A	B
9	Swann Ave and U.S. Route 1	A	B	C	C
10	Swann Ave and Potomac Ave	A	A	A	A
11	E. Custis Ave and U.S. Route 1	A	A	B	B
12	E. Howell Ave and R U.S. Route 1	A	A	A	A
13	Potomac Ave and U.S. Route 1	A	A	B	B
14	Main Line Blvd and Potomac Ave	A	A	A	A
15	Portner/Potomac Greens Dr and Slaters Ln	A	A	A	A
16	Powhatan St and Slaters Ln	A	A	A	A
17	Slaters Ln and U.S. Route 1	B	B	B	B
18	W. Abingdon Dr and Slaters Ln	D	D	D	D
19	George Washington Pkwy and Slaters Ln				
20	E. Abingdon and Slaters Ln				

* For the Build condition, any projected change in overall intersection LOS from the No Build is highlighted in yellow. However, among the results, none of these projected changes in overall intersection LOS was by more one grade level, and thus none is considered a traffic effect.
** Although the overall LOS remained the same in the Build condition as in the No Build, the eastbound approach experienced a substantial LOS downgrade, from LOS D in the No Build to LOS F in the Build.

Table 3-2: PM Peak Hour Intersection Level of Service (LOS)

No.	Intersection	2016 LOS PM Peak Hour		2040 LOS PM Peak Hour	
		No Build	Build*	No Build	Build*
1	S. Glebe Rd and U.S. Route 1	D	D	D	D
2	S. Glebe Rd and Potomac Ave	A	A	A	A
3	Shopping Ctr. N. Entrance and U.S. Route 1	B	B	C	B
4	E. Reed Ave and U.S. Route 1	C	C	D	D
5	E. Reed Ave and Potomac Ave	A	A	A	A
6	Evans Ln and Potomac Ave	A	A	A	A
7	E. Glebe Rd and U.S. Route 1	C	C**	E	E
8	E. Glebe Rd and Potomac Ave	A	A	A	B
9	Swann Ave and U.S. Route 1	A	B	C	C
10	Swann Ave and Potomac Ave	A	A	A	A
11	E. Custis Ave and U.S. Route 1	A	A	B	B
12	E. Howell Ave and R U.S. Route 1	A	A	B	B
13	Potomac Ave and U.S. Route 1	A	A	B	B
14	Main Line Blvd and Potomac Ave	B	B	B	B
15	Portner/Potomac Greens Dr and Slaters Ln	A	A	B	B
16	Powhatan St and Slaters Ln	A	A	B	B
17	Slaters Ln and U.S. Route 1	A	A	B	B
18	W. Abingdon Dr and Slaters Ln	C	C	C	C
19	George Washington Pkwy and Slaters Ln				
20	E. Abingdon and Slaters Ln				

* For the Build condition, any projected change in overall intersection LOS from the No Build is highlighted in yellow. However, among the results, none of these projected changes in overall intersection LOS was by more one grade level, and thus none is considered a traffic effect.
** Although the overall LOS remained the same in the Build condition as in the No Build, the eastbound approach experienced a substantial LOS downgrade, from LOS D in the No Build to LOS E in the Build.

3.3.1 Opening Year 2016 Effects

No Build Alternative

The No Build traffic conditions are the same as the Opening Year traffic conditions.

Build Alternatives

The simulation results showed that during the 2016 AM and PM peak hours, most intersections would maintain the same overall LOS in the Build condition as in the No Build condition. The Build Alternatives had no substantial effects on overall intersection performance.

The overall intersection LOS for the intersection of East Glebe Road and U.S. Route 1 would remain LOS C in the 2016 Build condition as in the No Build condition; however, the eastbound approach would experience substantial additional delay in the 2016 Build condition. Eastbound East Glebe Road has only one travel lane and has a short left-turn lane at the intersection with U.S. Route 1. For the eastbound approach in the AM peak hour, the LOS is projected to downgrade from LOS D in the No Build condition to LOS F in the Build Condition; in the PM peak hour, the LOS is projected to downgrade from LOS D in the No Build condition to LOS E in the Build condition. The future traffic growth from the developments in the area and the new Potomac Yard Metrorail Station are projected to exceed the capacity of eastbound East Glebe Road.

3.3.2 Year 2040 Effects

No Build Alternative

Simulation results showed that most intersections are estimated to experience slight increases in average vehicular delay due to regional traffic growth in 2040.

The only substantial decline in overall intersection LOS would be at East Glebe Road and U.S. Route 1, which is projected to operate at LOS E during the AM and PM peak hours, a downgrade in service from LOS C in 2016. The poor LOS is due to the limitation of the roadway capacity, particularly the eastbound approach which has a single lane, and also partly due to the extension of the CCPY Transitway after 2016 further north to Diamond Road, which will change the traffic signal phases at East Glebe Road.

The eastbound approach of the intersection of Swann Avenue at U.S. Route 1 is projected to operate at LOS F in the AM peak hour, and the westbound approach of the intersection of East Custis Avenue at U.S. Route 1 is projected to experience LOS F during the PM peak hour. The excessive delays were caused by the long traffic signal cycle lengths at the two intersections for vehicles waiting on the side streets at U.S. Route 1. The overall intersection performance is projected to be LOS C.

Build Alternatives

Simulation results showed that none of the study intersections would experience substantial downgrades in overall LOS due to the new trips from the new Potomac Yard Metrorail Station, although many intersections are estimated to experience slight increases in average vehicular delay. As in the No Build condition, the intersection of East Glebe Road at U.S. Route 1 is projected to experience LOS E, and the eastbound approach of East Glebe Road at U.S. Route 1 is projected to experience LOS F during the AM and PM peaks hours.

3.4 Potential Mitigation

The Build Alternatives would have no permanent adverse effects to traffic operations, so no mitigation measures are proposed.

4.0 RAIL OPERATIONS

This section describes the opening year and horizon year rail operations, and describes potential effects to operations for the No Build Alternative and each of the Build Alternatives.

4.1 Opening Year Conditions

4.1.1 Metrorail Services

WMATA operates the Metrorail Yellow and Blue Lines through the study area along an alignment parallel to, and just east of, the CSXT Railroad (**Figure 1-1**). The closest Metrorail stations to the study area are Ronald Reagan Washington National Airport (National Airport) Station north of the study area and Braddock Road Station to the south. The distance between these two existing stations is approximately three miles.

Prior to the Potomac Yard Metrorail Station opening year of 2016, the Metrorail Silver Line will be open to Wiehle Avenue as part of Dulles Corridor Metrorail Project. To create system capacity for the opening of the Silver Line, the following operational changes, called "Rush+," were implemented by WMATA in June 2012:

- **Blue/Yellow Realignment**. To balance capacity and demand, some Blue Line trains have been replaced by Yellow Line service from Franconia/Springfield to Greenbelt. Some Orange Line service has been rerouted from New Carrollton to Largo Town Center as part of the change.
- **7-Minute Headway Standard**. On all lines but the Red Line, peak period headways increase from 6-minutes to 7-minutes.
- **900 Peak Vehicles Required**. The Peak Vehicle Requirement (PVR) will be held at 900 vehicles including gap trains by limiting the average number of cars per train.

The Blue and Yellow Lines operate along the same tracks in the vicinity of Potomac Yard and provide combined 3.5-minute headways during the peak period and 6-minute headways during the off-peak period. The Blue Line provides service from Franconia-Springfield Metrorail Station in Virginia to Largo Town Center Metrorail Station in Maryland. The Yellow Line provides service from Huntington Metrorail Station in Virginia to Fort Totten Metrorail Station in the District of Columbia. During peak hours, some Yellow Line trains provide service from Franconia-Springfield in Virginia to Greenbelt Metrorail Station in Maryland and some terminate at Mount Vernon Square Metrorail Station in the District of Columbia**. Table 4-1** shows the peak and off-peak frequencies for Blue and Yellow Line service through the Potomac Yard study area.

Table 4-1: Metrorail Headways for 2016

From	To	Peak Headway (minutes)	Off-Peak Headway (minutes)
Yellow Line			
Huntington	Fort Totten	-	12
Franconia-Springfield	Greenbelt	14	-
Huntington	Mount Vernon Square	7	-
Blue Line			
Franconia-Springfield	Largo Town Center	14	12

Source: WMATA Operating Plan, 2012.

In the Opening Year, Blue and Yellow Line trains will use a mix of 6-car and 8-car train sets in the peak period and all 6-car trains during off-peak periods. Each of the railcars used for the Metrorail System are 75 feet long and have a capacity of 175 seated and standing passengers. The number of average daily boardings in 2011 at the two stations closest to the study area, Braddock Road and National Airport, are 4,559 and 6,739, respectively. The average travel time on Metrorail between the Braddock Road and National Airport Stations is approximately 4.7 minutes including station dwell times.

A run time model was calibrated to existing conditions between National Airport and Braddock Road Metrorail Stations. Alignment curves and distances for the entire segment were estimated using WMATA Metrorail system track charts. Track mileage between the Ronald Reagan Washington National Airport and Braddock Road Metrorail Stations is 2.94 miles.

Actual run times and station dwell times were taken from observations collected in March 2012 for Metrorail trains travelling between the two stations. Observed data were taken during the PM peak period and yielded a range of

times spent in motion from 4.07 minutes to 4.40 minutes, averaging 4.20 minutes. Station dwell times ranged from 18 seconds to 53 seconds, averaging 32 seconds.

The existing total station-to-station run time between National Airport and Braddock Road Metrorail Stations was estimated to average 4.73 minutes. WMATA's online trip planner estimates this trip as between 5-6 minutes depending on the time of day.

4.1.2 Commercial Rail Network

The CSXT freight and intercity passenger rail corridor, formerly known as the Richmond, Fredericksburg & Potomac (RF&P) Railroad, is located adjacent to and immediately west of the Metrorail tracks within the study area. Four providers of rail service operate along these tracks. These operators and the average weekday train volumes that they operate are as follows:

- **CSXT** operates up to 30 through trains and local freight trains per day through the study area;
- **Norfolk Southern (NS) Railroad** operates over trackage rights on a 2.2-mile section of the CSXT line for delivery of coal to a power plant in Alexandria and access to the Northeast Corridor. NS has operated not more than one train per day for the service; however, operations of the power plant are planned to end by October 2012 with no anticipated coal deliveries in the future;
- **Amtrak** operates a total of 36 intercity passenger trains per weekday between Washington and Richmond. Amtrak does not provide a station to access the service in the Potomac Yard area. The closest station is at King Street in Alexandria; and
- **Virginia Railway Express (VRE)** operates 14 daily commuter trains between Fredericksburg and Washington and an additional 16 trains per day between Manassas and Washington (both figures bi-directional). Both lines pass through the study area. VRE does not provide a station to access the service in the Potomac Yard area. The closest station is at Crystal City in Arlington County.

Based on available data for these train services, the current maximum volume of trains on the CSXT tracks is approximately 97 trains per day.

4.2 Potential Effects

4.2.1 No Build Alternative

Metrorail Services

By the horizon year of 2040, the Metrorail Silver Line is expected to be open to Dulles Airport and Loudoun County. In addition, several other changes are anticipated that become part of the 2040 No Build Alternative rail plan:

- **100 Percent 8-Car Trains**. To accommodate future demand, it is anticipated that 8-car trains will be run on all lines during the peak periods. Off-peak service will still utilize 6-car trains.
- **Red Line and Green Line Simplification**. Tripper trains (additional peak-period and peak-direction trains) and shortened line patterns on the Red Line and Green Line are expected to be eliminated in favor of intensified peak-period service, up to 2.5-minute headways on the Red Line and 5-minute headways on the Green Line.

Beyond the planned 2040 Metrorail service changes, the No Build Alternative is not anticipated to have any direct effects to the Metrorail network in either the opening or horizon years.

Commercial Rail Network

The No Build Alternative is not anticipated to have any direct effects to the commercial rail network in either the opening or horizon years.

4.2.2 Build Alternatives

Metrorail Services

Table 4-2 lists the operating statistics for the No Build and Build Alternatives for the 2016 Opening year, including Metrorail service patterns, headways, travel distances, and travel times. The Build Alternatives would not require any additional peak-period trains or cars above the No Build Alternative. In the off-peak, the Build Alternatives would require one additional train in service to accommodate the increased cycle time needed on the Yellow Line from Huntington to Fort Totten. The slight changes to run time and distance for each Build Alternative compared to the No Build Alternative would lead to very minimal increases in revenue miles and hours.

Table 4-2: 2016 Metrorail Operating Plan Summary Statistics

Alternative	Weekday Trains		Weekday Train Cars		Total Annual		
	Peak	Base	Peak	Total	Train Car-Miles	Train-Hours	Train Car-Hours
No Build	111	60	900	1,118	90,971,696	599,796	3,652,832
Build A	111	61	900	1,118	90,971,696	604,442	3,680,165
Build B	111	61	900	1,118	90,969,495	604,442	3,680,165
Build D	111	61	900	1,118	90,973,897	604,442	3,680,165
Difference from No Build							
Build A	0	1	0	0	0	4,646	27,333
Build B	0	1	0	0	(2,201)	4,646	27,333
Build D	0	1	0	0	2,201	4,646	27,333

Table 4-3 lists the operating statistics for the Build Alternatives for the 2040 horizon year, including Metrorail service patterns, headways, travel distances, and travel times. Similar to the 2016 Opening Year operating statistics, the Build Alternatives would not require any additional peak-period trains or cars above the No Build Alternative. In the off-peak, the Build Alternatives would require one additional train in service to accommodate the increased cycle time needed on the Yellow Line from Huntington to Fort Totten. The slight changes to run time and distance for each Build Alternative compared to the No Build Alternative would lead to very minimal increases in revenue miles and hours.

Table 4-3: 2040 Metrorail Operating Plan Summary Statistics

Alternative	Weekday Trains		Weekday Train Cars		Total Annual		
	Peak	Base	Peak	Total	Train Car-Miles	Train-Hours	Train Car-Hours
No Build	129	59	1,304	1,611	114,833,431	662,786	4,432,770
Build A	129	60	1,304	1,611	114,833,431	667,432	4,460,444
Build B	129	60	1,304	1,611	114,832,331	667,432	4,460,444
Build D	129	60	1,304	1,611	114,835,632	667,432	4,460,444
Difference from No Build							
Build A	0	1	0	0	0	4,646	27,675
Build B	0	1	0	0	(1,100)	4,646	27,675
Build D	0	1	0	0	2,201	4,646	27,675

Station-to-Station Travel Distances and Times

Alternative A, which adds the Potomac Yard Station onto the current track alignment, maintains the existing track distance of 2.9358 miles between National Airport station and the Braddock Road station. Alternative B adds an additional 0.0018 miles (10 feet) to the base alignment, and Alternative D adds an additional 0.0024 miles (13 feet) to the base alignment. **Table 4-4** describes the station-to-station distance for each alternative.

Table 4-4: Station-to-Station Distances by Build Alternative

From	To	No Build Track (miles)	Alternative A Track (miles)	Alternative B Track (miles)	Alternative D Track (miles)
National Airport	Potomac Yard	2.9358	1.7395	1.5655	1.4862
Potomac Yard	Braddock Road		1.1963	1.3685	1.4520
National Airport	Braddock Road	2.9358	2.9358	2.9340	2.9382
Change from Existing		n/a	0.000	-0.0018	0.0024

With each Build Alternative, adding a Potomac Yard Station would result in approximately one additional minute in run time between National Airport and Braddock Road. Approximately half of this additional run time would consist of station dwell time at the new Potomac Yard station and the remainder would be additional running time decelerating into and accelerating out of the new station. The resulting additional travel time estimates for the three alternatives are presented in **Table 4-5**.

Table 4-5: Station-to-Station Travel Time by Build Alternative

From	To	No Build Travel Time (minutes)	Alternative A Travel Time (minutes)	Alternative B Travel Time (minutes)	Alternative D Travel Time (minutes)
National Airport	Potomac Yard	4.58	3.27	3.05	3.05
Potomac Yard	Braddock Road		2.25	2.47	2.58
National Airport	Braddock Road	4.58	5.52	5.52	5.63
Change from Existing		n/a	0.93	0.93	1.05

End-to-End Travel Distances and Times

In both opening year 2016 and horizon year 2040, three Metrorail Yellow Line patterns and one Blue Line pattern are currently planned to operate within the segment between National Airport and Braddock Road Stations. End-to-end travel distances and times for these patterns were calculated for each alternative. **Table 4-6** presents the resulting change in distance to round trips for each Metrorail pattern.

Alternative A, using the same track configuration as existing, adds no extra distance to the round trip distance for each pattern. Alternative B subtracts 0.0018 miles in each direction for a total of 0.0036 in extra mileage, and Alternative D adds 0.0024 miles in each direction for a total of 0.049 in extra mileage. **Table 4-7** summarizes the round trip travel times for the Blue and Yellow Lines.

Table 4-6: Round Trip Distances for Blue/Yellow Lines by Build Alternative

Line	From	To	No Build Track (miles)	Alternative A Track (miles)	Alternative B Track (miles)	Alternative D Track (miles)
Yellow	Huntington	Mt Vernon Sq	21.2600	21.2600	21.2564	21.2649
Yellow	Franconia-Springfield	Greenbelt	57.4400	57.4400	57.4364	57.4449
Yellow	Huntington	Fort Totten	29.8600	29.8600	29.8564	29.8649
Blue	Franconia-Springfield	Largo Town Center	59.5200	59.5200	59.5164	59.5249
Difference from No Build						
Yellow	Huntington	Mt Vernon Sq	n/a	0.000	-0.0036	0.0049
Yellow	Franconia-Springfield	Greenbelt	n/a	0.000	-0.0036	0.0049
Yellow	Huntington	Fort Totten	n/a	0.000	-0.0036	0.0049
Blue	Franconia-Springfield	Largo Town Center	n/a	0.000	-0.0036	0.0049

Note: Distances are in miles.

Table 4-7: Round Trip Travel Times for Blue/Yellow Lines (all Build Alternatives)

Line	From	To	Loop Time (min)		Layover Time (min)		Cycle Time (min)	
			No Build	Build	No Build	Build	No Build	Build
Yellow (Peak)	Huntington	Mt Vernon Sq	50	52	13	11	63	63
Yellow (Peak)	Franconia-Springfield	Greenbelt	120	122	6	4	126	126
Yellow (Off-Peak)	Huntington	Fort Totten	72	74	0	10	72	84
Blue (Peak)	Franconia-Springfield	Largo Town Center	128	130	12	10	140	140
Blue (Off-Peak)	Franconia-Springfield	Largo Town Center	128	130	16	14	144	144
Difference from No Build								
Yellow (Peak)	Huntington	Mt Vernon Sq	n/a	2	n/a	-2	n/a	0
Yellow (Peak)	Franconia-Springfield	Greenbelt	n/a	2	n/a	-2	n/a	0
Yellow (Off-Peak)	Huntington	Fort Totten	n/a	2	n/a	10	n/a	12
Blue (Peak)	Franconia-Springfield	Largo Town Center	n/a	2	n/a	-2	n/a	0
Blue (Off-Peak)	Franconia-Springfield	Largo Town Center	n/a	2	n/a	-2	n/a	0

Note: Times are in minutes.

Operating Travel Time Requirements

The addition of 2 minutes to the loop time (round trip travel time) requires a reduction in layover time in order to maintain cycle time (loop time with layovers) and headways. For all Yellow and Blue Line peak patterns, this reduction would still leave sufficient layover time to turn trains, provide operator relief, and maintain schedule. However, the Yellow Line off-peak pattern from Huntington to Fort Totten does not have sufficient layover time to absorb the additional 2 minutes. Therefore, an additional midday train would be necessary to maintain 12-minute headways.

Appendix D presents detailed Metrorail operating plans and statistics by line and pattern and by day of the week for each alternative. Note that these plans were developed based on headways and number of cars per train as reported in the WMATA Metrorail Fleet Management Plan (2010).

System Capacity

The net additional Metrorail ridership due to the station at Potomac Yard would be small relative to overall Metrorail system ridership. In 2040 the Potomac Yard station would result in approximately 6,000 net additional weekday boardings (projected total boardings at Potomac Yard minus diversions from existing stations) out of 1,029,000 total weekday Metrorail system boardings (see **Section 5.0**, Rail Ridership Projections, for more detail). Projected peak-hour train car loads along the Blue and Yellow Lines in Northern Virginia between Pentagon and are projected to be within capacity (under 100 passengers per car), based on preliminary results of the WMATA *RTSP Phase I Draft Final Report* (2012).

Commercial Rail Network Effects

Each of the Build Alternatives would require crossings over the CSXT corridor on aerial structures. Alternatives A and B would each require two pedestrian bridges over the CSXT corridor, while Alternative D would require one pedestrian bridge and two aerial track structures. Coordination with CSXT would be required. Crossings will be designed to meet CSXT standards for clearance, and are not anticipated to have any impact on railroad operations. No relocation of the existing freight/intercity rail tracks is anticipated. Operation of the proposed station is physically separated from adjacent freight rail services. No pedestrians or vehicles would cross the existing tracks at grade.

4.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects to Metrorail or commercial rail operations, so no mitigation measures are proposed.

5.0 RAIL RIDERSHIP PROJECTIONS

This section describes the estimated station ridership, defined as weekday boardings, for each Build Alternative in 2016 and 2040. As the ridership projections use regional travel patterns based on land use (i.e., population and employment) densities at the Transportation Analysis Zone (TAZ) level, relatively small differences in station location and land use at the scale of one or two street blocks are not measurable. Thus, the differences in the locations of the Build Alternatives are relatively insignificant relative to the sizes of the surrounding TAZs, and there are no substantial differences in projected ridership among them.

Table 5-1 lists the opening year (2016) ridership for the Build Alternatives, which for all Build Alternatives is approximately 3,600 average weekday boardings.

Table 5-1: Weekday Metrorail Ridership for Build Alternatives (2016)

Source of Riders	Alternative A (# boardings)	Alternative B (# boardings)	Alternative D (# boardings)
Diversions from Automobile Mode (vs. No Build)	697	693	708
Diversions from Bus Mode (vs. No Build)	569	557	541
Diversions from Existing Metrorail Stations (vs. No Build)			
Braddock Road Station	*1,522*	*1,531*	*1,535*
Ronald Reagan Washington National Airport Station	*49*	*55*	*55*
Crystal City Station	*717*	*723*	*722*
Metrorail Subtotal	2,288	2,308	2,311
Total Weekday Potomac Yard Metrorail Station Boardings	**3,553**	**3,558**	**3,560**

Table 5-2 shows estimated ridership for the Build Alternatives in 2040, which for all Build Alternatives is approximately 10,000 average weekday boardings. The increase in new Metrorail riders at the station from 2016 is a result of the higher population and employment in the station area due to the new development in Potomac Yard.

Table 5-2: Weekday Metrorail Ridership for Build Alternatives (2040)

Source of Riders	Alternative A (# boardings)	Alternative B (# boardings)	Alternative D (# boardings)
Diversions from Automobile Mode (vs. No Build)	5,129	5,118	5,154
Diversions from Bus Mode (vs. No Build)	1,277	1,294	1,260
Diversions from Existing Metrorail Stations (vs. No Build)			
Braddock Road Station	*1,886*	*1,901*	*1,908*
Ronald Reagan Washington National Airport Station	*74*	*74*	*74*
Crystal City Station	*1,614*	*1,626*	*1,623*
Metrorail Subtotal	3,574	3,601	3,604
Total Weekday Potomac Yard Metrorail Station Boardings	**9,979**	**10,013**	**10,018**

The projected station ridership in 2016 and 2040 would be within the range of existing ridership at adjacent stations on the Blue and Yellow Lines, with similar station designs in terms of passenger circulation capacity (i.e., two escalators, one up and one down, providing access to platforms). FY 2011 average weekday Metrorail boardings were: Braddock Road Station (4,559), National Airport Station (6,739), King Street Station (9,306), and Crystal City Station (15,187).

6.0 SURFACE TRANSIT NETWORK

This section describes the opening year surface transit network, and describes potential effects to this network for the No Build Alternative and each of the Build Alternatives.

6.1 Opening Year Conditions

Multiple transit providers currently operate bus service in and around Potomac Yard. Transit operators include WMATA (operating Metrobus) and Alexandria Transit (DASH). Although the study area extends into Arlington County, Arlington Transit (ART) does not operate any routes within the study area.

The study area is served by several bus routes providing connections to Crystal City, Pentagon City, the Pentagon, Old Town Alexandria, and adjacent neighborhoods as shown in **Figure 6-1**. The primary routing, span of service, service frequency, and average weekday ridership for each of the existing bus routes in the study area is shown in **Table 6-1**.

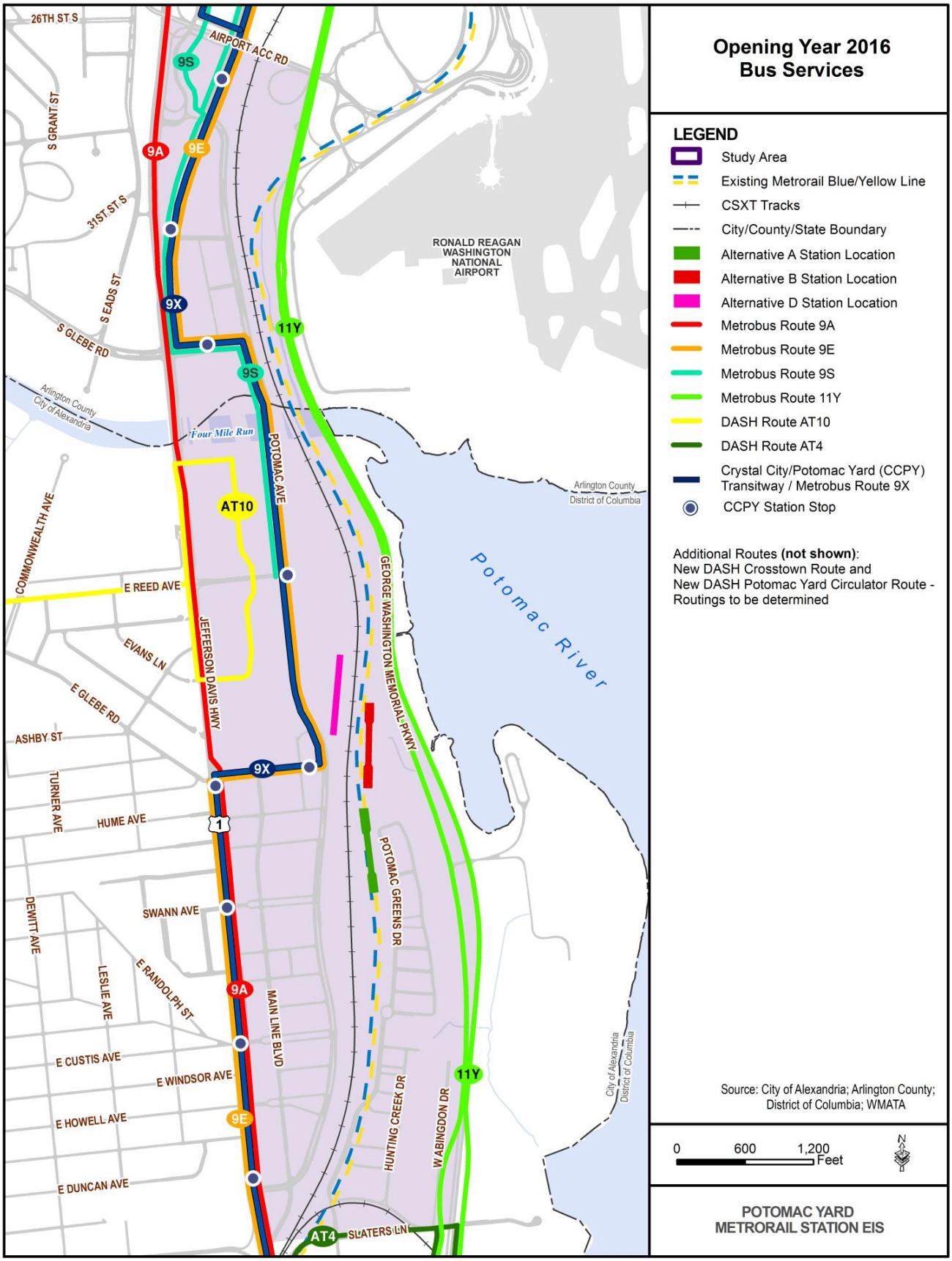
Fares for Metrobus services are $1.60 using SmarTrip cards, $1.80 cash, and $0.80 for seniors and people with disabilities. Metrobus accepts the seven-day regional bus pass. For DASH services the SmarTrip and cash fares are $1.50; children under the age of four ride free. DASH also accepts fare payment via a monthly DASH pass and the seven-day regional bus pass.

Table 6-1: Existing Bus Routes and Service

Route	Primary Alignment in Potomac Yard Area	Span of Service	Service Headway (Minutes)	Average Weekday Ridership
Metrobus Services				
9A/9E	U.S. Route 1	9A Weekdays: 4:30AM-1:30AM Saturday: 5:30AM-1:30AM Sunday: 5:00AM-1:00AM 9E Morning: 6:30AM-8:00AM Afternoon: 4:15PM-6:30PM (Weekday peak periods and reverse direction only)	9A Weekday Peak: 30 Weekday Off-Peak: 30 Saturday: 30 Sunday: 40 9E Morning: 5 trips (southbound only) Afternoon: 6 trips (northbound only)	1,543
9S	Currently operates north of Four Mile Run	Weekdays: 5:45AM-7:45PM	Weekday Peak: 6 Weekday Off-Peak: 15	1,796
11Y	Express Line along George Washington Memorial Parkway. Only one stop at Slaters Lane/ Abingdon Drive in vicinity of study area	Weekdays: 6:40AM-9:00AM 4:10PM – 7:25PM	Weekday Peak: 30	426
DASH Services				
AT4	Russell and West Glebe Roads	Weekdays: 5:45AM-10:30PM Saturday: 7:30AM-9:30PM Sunday: 9:00AM-7:00PM	Weekday Peak: 20 Weekday Off-Peak: 60 Saturday: 60 Sunday: 60	931
AT10	Mt. Vernon and Reed Avenues	Weekdays: 6:30AM-9:30PM Saturday: 8:00AM-9:45PM Sunday: 9:00AM-7:00PM	Weekdays: 30 Saturday: 30 Sunday: 60	731

Source: WMATA and Alexandria Transit Company published schedules, May 2012; ridership information from the Crystal City/Potomac Yard Transitway Operations Plan, WMATA, 2012.

Figure 6-1: Opening Year 2016 Bus Services



6.1.1 Planned Bus Services by 2016

In addition to the existing bus routes, new bus routes and route modifications are planned to accommodate existing and on-going development in the Potomac Yard area. This includes implementation of the CCPY Transitway and new DASH cross-town and circulator services. These additional and modified bus services are shown in **Figure 6-1** and **Table 6-2** and described in the following subsections.

Appendix E contains 2016 transit operating plans and maps for the planned new routes. Note that these route plans are developed with headways based on planning practice or financial considerations. They do not reflect adjustments to frequency or vehicle type to balance passenger demand from ridership model runs.

Table 6-2: New and Modified Bus Services by 2016

Route	Primary Alignment in Potomac Yard Area	Span of Service	Frequency of Service (Minutes)
Metrobus Routes			
New Route 9X	CCPY Transitway	Weekday - 5:30 AM to 1:00 AM Saturday - 6:30 AM to 1:00 AM Sunday - 7:30 AM to 11:30 PM	Weekday Peak – 12 Weekday Off-Peak - 15 Weekend - 20 (all day Saturday and Sunday)
Extended Route 9S	Potomac Avenue from South Glebe Road to Potomac Yard Shopping Center	Weekday - 5:30 AM to 1:00 AM Saturday - 6:30 AM to 1:00 AM Sunday - 7:30 AM to 11:30 PM	Weekday Peak - 6 Weekday Off-Peak - 15 Weekend - 20 (all day Saturday and Sunday)
DASH Routes			
New Cross-town Route (AT9)	Mt. Vernon and Reed Avenues	To be determined	Weekday Peak - 15 (Other time periods not available)
New Potomac Yard Circulator Route (AT15)	CCPY Transitway and Main Line Boulevard	To be determined	Weekday Peak - 10 (Other time periods not available)

Source: Crystal City/Potomac Yard Transitway Operations Plan, WMATA, 2012.

6.1.2 Crystal City/Potomac Yard Transitway

The Crystal City/Potomac Yard (CCPY) Transitway, shown in **Figure 6-1**, is a planned dedicated transitway that will extend approximately five miles from the Braddock Road Metrorail Station in the south to the Pentagon and Pentagon City in the north. The CCPY Transitway is scheduled for implementation by early 2014. Within the Arlington County part of the Potomac Yard study area, the transitway will operate along portions of Crystal Drive, U.S. Route 1, South Glebe Road, and Potomac Avenue. In the City of Alexandria portion of the study area, the transitway will initially operate along Potomac Avenue to East Glebe Road, East Glebe Road to U.S. Route 1, and U.S. Route 1 south of the study area. The U.S. Route 1 portions of the transitway will include exclusive lanes dedicated to transit service, while the portions of the transitway along Potomac Avenue and South Glebe Road will operate in mixed traffic.

Implementation of the CCPY Transitway service will involve the following modifications to the existing bus services:

- The current Metrobus 9S service will be extended to the Potomac Yard Shopping Center from its current terminal in the Arlington portion of Potomac Yard. The hours of service of the existing Route 9S will be extended, and service will run on weekends after the transitway opens;
- A new “9X” premium service extending along the entire length of the corridor between the Braddock Road Metrorail Station and the Crystal City Metrorail Station will be implemented after the opening of the Alexandria portion of the transitway; and
- The current Metrobus 9E will continue to provide service between the Braddock Road Metrorail Station and Pentagon Metrorail Station but it will be rerouted off its current alignment on U.S. Route 1 to instead run along Potomac Avenue and Crystal Drive from East Glebe Road to 15th Street South in Arlington.

All of the proposed CCPY Transitway stops will provide near-level boarding, real-time transit arrival information for services provided by WMATA and DASH, and enhanced passenger amenities, including distinctive shelters, benches, and expanded passenger information. In the long-term, the CCPY Transitway service will also incorporate off-board fare collection.

The following transitway stops are planned within the Potomac Yard study area:

- Crystal Drive at Potomac Avenue (by U.S. Environmental Protection Agency offices)
- Crystal Drive at 33rd Street South
- South Glebe Road at South Ball Street
- East Reed Avenue, in Potomac Yard Shopping Center
- East Glebe Road at Potomac Avenue
- U.S. Route 1 at East Glebe Road
- U.S. Route 1 at East Swann Avenue
- U.S. Route 1 at East Custis Avenue
- U.S. Route 1 at Potomac Avenue

6.1.3 New DASH Routes

DASH anticipates implementing two new bus routes by 2016 to supplement their existing services in the Potomac Yard area. These bus routes are shown as planned in **Table 6-2** and comprise the following:

- **Cross-town Route (AT9)** will operate between the Mark Center and Potomac Yard; it is anticipated that this route would follow the route alignment of DASH Route AT10 through the Potomac Yard area; and
- **Potomac Yard Circulator (AT15)** will operate between the Braddock Road Metrorail Station and Potomac Yard; it is anticipated that this route would operate along Main Line Boulevard to and from the CCPY Transitway, but it would serve all local stops along its route alignment.

6.2 Potential Effects

6.2.1 No Build Alternative

The No Build Alternative includes a number of changes to the bus network between 2016 and 2040. These changes are intended to serve the development envisioned for Potomac Yard beyond 2016, including the redevelopment of North Potomac Yard. Changes include:

- Following construction of the new street grid in North Potomac Yard, the CCPY Transitway will operate along a re-aligned Potomac Avenue and turn east to U.S. Route 1 along Seaton Avenue, to the north of East Glebe Road.
- DASH will introduce an additional cross-town circulator (AT14) from Potomac Yard to the Landmark area.

In the Arlington County portion of the CCPY Transitway, conversion from busway to streetcar service is planned (Arlington County 2013 – 2022 Capital Improvements Program), with operation beginning in 2019. A potential future extension of the streetcar line into the Alexandria portion of Potomac Yard will be evaluated after 2016. This potential streetcar extension would need to complete technical analysis and obtain required financial commitments. Therefore, the potential streetcar conversion is not included in the No-Build Alternative.

Figure 6-2 displays the complete bus network for the No Build Alternative; **Appendix E** includes the new and relocated routes individually.

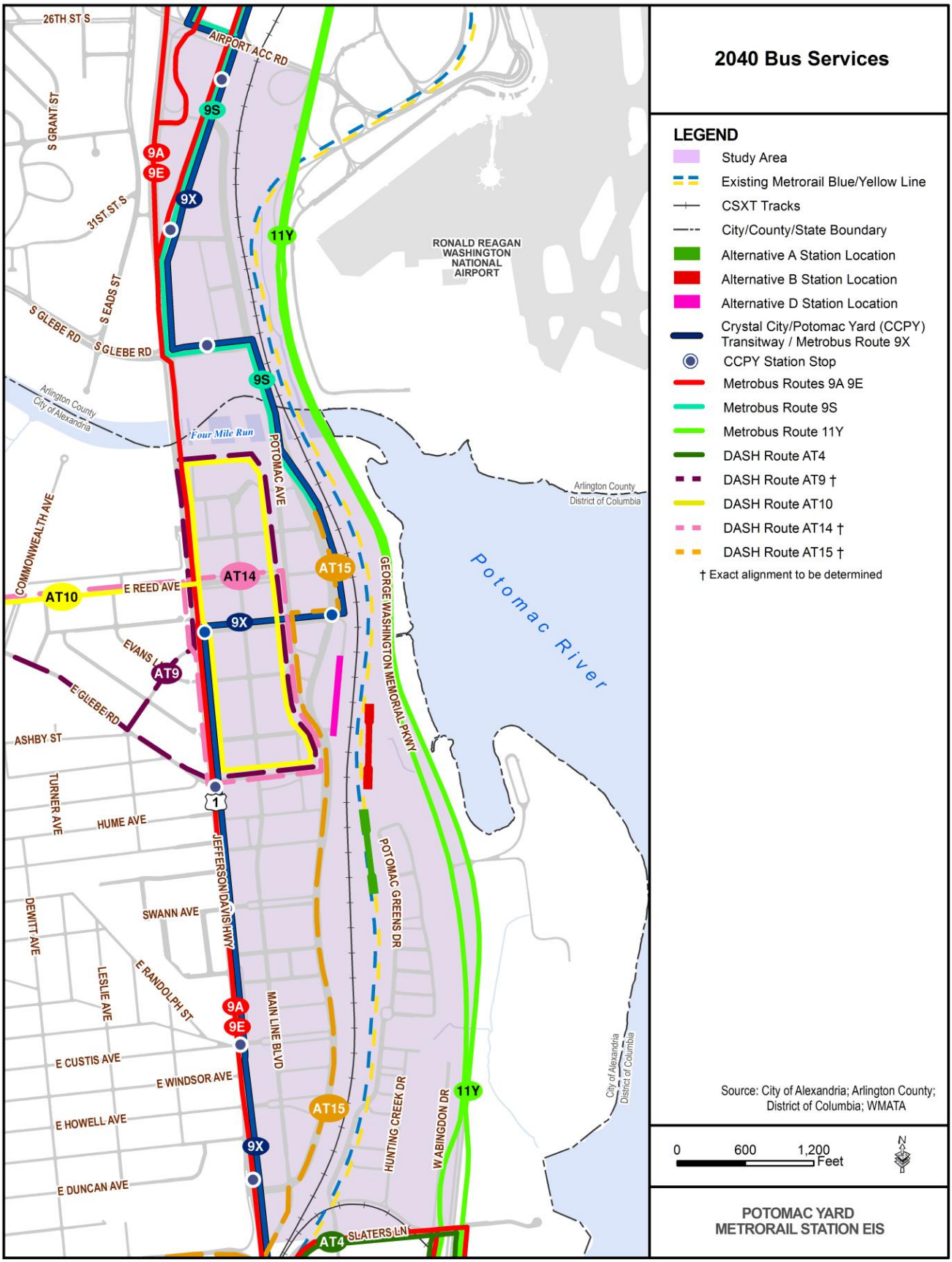
6.2.2 Build Alternatives

No additional bus service or route modifications are planned as part of any of the Build Alternatives, although transit operators may independently make modifications to existing and planned routes, including increased frequency, to serve the new Potomac Yard station. All Build Alternatives would be located within walking distance of the CCPY Transitway. Some Metrorail riders would likely shift from other routes to those that use the CCPY Transitway or to DASH routes to access the Potomac Yard station, resulting in locally increased bus ridership over the No Build Alternative.

6.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects to surface transit services, so no mitigation measures are proposed.

Figure 6-2: 2040 Bus Services



7.0 BICYCLE AND PEDESTRIAN FACILITIES

7.1 Opening Year Conditions

Study area bicycle and pedestrian facilities are shown in **Figure 7-1**. The study area has a network of sidewalks along nearly every roadway, as well as access to multi-use trails. In general the study area has a high level of pedestrian and bicycle access with the exception of connections over the existing Metrorail and CSXT tracks, separating the Potomac Greens/Old Town Greens neighborhood from the rest of Potomac Yard.

7.1.1 Pedestrian Facilities

The Potomac Greens/Old Town Greens neighborhoods contain an internal grid of streets with wide wheelchair-accessible sidewalks. Within Potomac Yard, between the CSXT tracks and U.S. Route 1, all intersections with sidewalks have curb ramps, crosswalks, and pedestrian signals. Within the South Potomac Yard development, all curb ramps are ADA compliant and the pedestrian crossings along Potomac Avenue are equipped with audible pedestrian signals for the visually impaired.

With its wide cross-section and heavy traffic volumes, U.S. Route 1 acts as a pedestrian barrier between Potomac Yard and the neighborhoods west of U.S. Route 1, with only nine pedestrian crossings between Four Mile Run and Potomac Avenue, a distance of 1.2 miles. In a number of instances, pedestrians have to travel a circuitous route to cross the street, creating additional inconveniences for those accessing transit stops or destinations to the east of U.S. Route 1. On the eastern side of U.S. Route 1, a wide multi-use path is provided in front of the existing shopping center, while south of East Glebe Road, wide new sidewalks are being implemented as part of the South Potomac Yard development. On the western side of U.S. Route 1, a narrow four foot-wide sidewalk is offset only a few feet from the roadway. Many U.S. Route 1 intersections with local residential streets lack designated crosswalks.

7.1.2 Multi-Use Trails

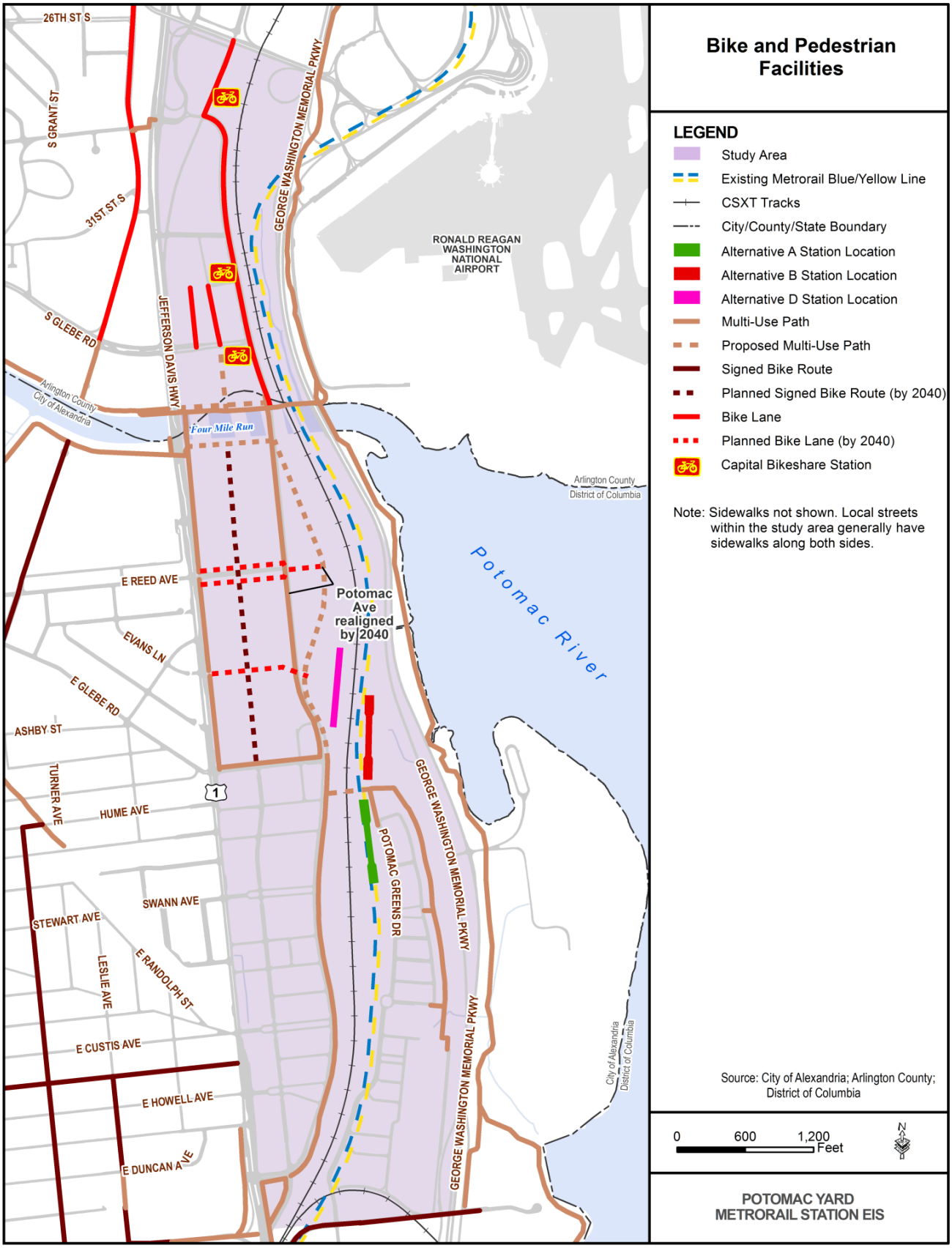
The study area has four multi-use trails that accommodate pedestrians and bicyclists:

- **Potomac Yard U.S. Route 1 temporary multi-use path** serves the eastern side of U.S. Route 1 corridor north of East Glebe Road and links with the regional Four Mile Run trail. The trail terminates just north of Four Mile Run and becomes a wide sidewalk within Arlington County. South of East Glebe Road, a temporary trail along U.S. Route 1 is being replaced with sidewalks along the new streets within South Potomac Yard. A pathway along East Glebe Road within Potomac Yard links the trail to the Potomac Avenue multi-use path;
- **Potomac Avenue multi-use path** provides north-south connections from Arlington to the Potomac Yard development and south to a sidewalk along the U.S. Route 1 bridge over the CSXT tracks; a future connection to the Braddock Road Metrorail Station is planned. In the future, when Potomac Avenue is realigned further east as North Potomac Yard develops, the multi-use path will be maintained along the new roadway alignment.;
- **Four Mile Run Trail** provides an east-west off-street path with grade separation under cross-streets along Four Mile Run in Arlington County, between the Mount Vernon Trail and western areas of Arlington County and the City of Alexandria; and
- **Mount Vernon Trail** is a heavily used regional trail that runs just east of the study area. However, most of the study area, except at Four Mile Run and Slaters Lane, has limited access to the trail due to a lack of connections across the CSXT tracks, Metrorail tracks, and George Washington Memorial Parkway.

7.1.3 Bicycle Facilities

In addition to the multi-use trails described above, the study area has on-street bicycle accommodations that provide connections to these trails and other important bicycle routes within the City of Alexandria and Arlington County. The study area has on-street marked bike lanes along several streets within the Arlington County portion of Potomac Yard and planned on-street bike lanes within the Alexandria portion. A few streets in the vicinity of the study area are signed as on-street bike routes without dedicated bike lanes.

Figure 7-1: Bicycle and Pedestrian Facilities



Two Capital Bikeshare stations are located within the Arlington portion of Potomac Yard. There are no Capital Bikeshare stations within the City of Alexandria portion of Potomac Yard. The City plans to assess potential expansion of its Capital Bikeshare station network beyond the current pilot program within Old Town in the future as funding becomes available.

7.2 Potential Effects

7.2.1 No Build Alternative

The pedestrian and bicycle network for the No Build Alternative would be comparable to the conditions in 2016. Connectivity within Potomac Yard will be enhanced through the construction of the grid network of streets and sidewalks in North Potomac Yard.

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

7.2.2 Build Alternatives

The Build Alternative station entrances would be connected to the planned sidewalk, bicycle route, and multi-use trail network in North and South Potomac Yard. The Build Alternatives facilities and infrastructure would not obstruct any existing or planned pedestrian or bicycle facilities.

The new pedestrian and bicycle bridge across the CSXT and Metrorail tracks would be provided as part of each Build Alternative and would enhance local pedestrian and bicycle connectivity similar to the No Build Alternative.

7.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects to pedestrian and bicycle accommodations and facilities, so no mitigation measures are proposed.

8.0 PARKING AND ACCESS FACILITIES

8.1 Opening Year Conditions

Parking supply in the study area varies by location. In the Arlington portion of Potomac Yard, parking is provided on-street and in private parking structures. In the Alexandria portion of Potomac Yard, the Potomac Yard Shopping Center and the movie theater include approximately 3,150 surface parking spaces. As the southern portion of Potomac Yard develops, parking will be provided in private parking structures, and most streets will include curbside parking spaces, which will be metered. In the Potomac Greens and Old Town Greens neighborhoods, private parking is provided in garages or in surface lots located behind buildings. West of U.S. Route 1, most streets have free curbside parking spaces, with no time limits or residential permit restrictions.

8.2 Potential Effects

8.2.1 No Build Alternative

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

8.2.2 Build Alternatives

The potential effects to parking of each of the Build Alternatives are described below. The Build Alternatives are planned as urban stations, primarily accessed via foot, bicycle, or bus/streetcar. Therefore, no additional parking for Metrorail patrons would be provided.

However, some Metrorail passengers may attempt to drive and park in adjoining neighborhoods, including Potomac Greens, the developing neighborhoods of South Potomac Yard, and the surface parking lots surrounding the Potomac Yard Shopping Center and the movie theater. Use of neighborhood parking facilities by station passengers could result in less parking availability for residents and patrons of commercial uses in Potomac Yard. The introduction and enforcement of parking restrictions, including time limits and residential permitting, would largely avoid and minimize the potential effects of Metrorail patrons attempting to park along public streets in adjoining neighborhoods.

In addition, Build Alternative D would be constructed over a portion of the parking lot adjoining the Regal Potomac Yard movie theater, resulting in the loss of parking spaces. Although with the planned redevelopment of North Potomac Yard between 2016 and 2040, the need for those existing spaces would be negated by new off-street parking facilities included in the new mixed-use development.

8.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects on parking conditions and facilities, so no mitigation measures are proposed.

9.0 AIRPORT FACILITIES AND OPERATIONS

9.1 Opening Year Conditions

The study area is adjacent to the Ronald Reagan Washington National Airport, which is operated by MWAA. U.S. Route 1 and the George Washington Memorial Parkway are the principal vehicular access routes to the airport. The Metrorail Blue and Yellow Lines provide direct service to the airport; however, there are no direct public transit services from the study area to the airport, as bus connections to the airport require a transfer in Crystal City. In 2011, the airport served 280,770 airplane operations (takeoffs and landings combined) and 18,823,094 passengers. The City of Alexandria and Arlington County maintain height restrictions for structures in the takeoff and landing zones, which include portions of the study area.

9.2 Potential Effects

9.2.1 No Build Alternative

No effects to airport facilities and operations are expected as a result of the No Build Alternative.

9.2.2 Build Alternatives

Based on initial coordination with MWAA, which included its review of proposed station locations and preliminary height information, the Build Alternatives would comply with applicable height restrictions and would not affect airport facilities or operations. As the station alternatives are directly under the flight path of Runway 4, there may be specific elements of the proposed facilities (such as station lighting) that would need to be evaluated during the design phase. **Appendix F** includes project correspondence with MWAA. Once a preferred alternative is selected, a Notice of Proposed Construction or Alteration would be submitted to the Federal Aviation Administration (FAA) pursuant to Federal Aviation Regulations Part 77.

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

9.3 Mitigation Measures

The Build Alternatives would have no permanent adverse effects to airport operations or facilities, so no mitigation measures are proposed.

APPENDIX A:

References

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APPENDIX B:

Land Use Assumptions

Surrounding Land Uses

The proposed project, a new Metrorail station, is located within a redeveloping intensively urbanized area. The surrounding land uses are important to consider in evaluating potential traffic effects. For modeling purposes, the project site is located within MWCOG Transportation Analysis Zones (TAZs) 1573, 1577, and 1578 (see **Figure B-1**). TAZ 1573 represents the North Potomac Yard development (Landbay F), and TAZ 1578 represents the South Potomac Yard development (Landbays G, H, I, J, K, and L). The Potomac Greens and Old Town Greens neighborhoods are within TAZ 1577.

The City of Alexandria provided the aggregate development levels for these TAZs for the opening year (2016) and horizon year (2040), which are shown in **Tables B-1** and **B-2**, respectively. The plan approvals in place for the North Potomac Yard area allow for both a base amount of development and additional development if a Metrorail station is developed in accordance with certain provisions. This additional development is not a direct effect of the station itself (i.e., it is not a part of the Metrorail station project), but is called a "secondary effect" under NEPA. Potential secondary effects are assessed separately in the Potomac Yard EIS Metrorail Station *Secondary and Cumulative Effects Technical Memorandum*.

Table B-1: Development Levels for Opening Year 2016 (in square feet)

Alternative	Potomac Greens/ Old Town Greens (TAZ 1577)	South Potomac Yard (existing and proposed) (TAZ 1578)	North Potomac Yard (existing) (TAZ 1573)	Additional in North Potomac Yard (TAZ 1573)	Total
No Build Alternative	500,000	1,885,000	600,000	0	2,985,000
Alternative A	500,000	1,885,000	600,000	0	2,985,000
Alternative B	500,000	1,885,000	600,000	500,000	3,485,000
Alternative D	500,000	1,885,000	525,000*	0	2,910,000*

Source: City of Alexandria
*For purposes of the traffic assessment, the existing North Potomac Yard development volume of 600,000 square feet was used as a conservative assumption, and the total 2016 development level assumed is accordingly slightly higher and the same as the totals for Alternatives A and B.

Table B-2: Development Levels for Horizon Year 2040 (in square feet)

Alternative	Potomac Greens/ Old Town Greens (TAZ 1577)	South Potomac Yard (existing and proposed) (TAZ 1578)	North Potomac Yard (existing) (TAZ 1573)	Additional in North Potomac Yard (TAZ 1573)	Total
No Build Alternative	500,000	5,050,000	3,700,000	0	9,250,000
Alternative A	500,000	5,050,000	3,700,000	2,025,000	11,275,000
Alternative B	500,000	5,050,000	3,700,000	3,825,000	13,075,000
Alternative D	500,000	5,050,000	3,700,000	2,125,000	11,375,000

Source: City of Alexandria

Because the City of Alexandria planning approvals for Potomac Yard provide only total development volumes and not volumes by individual land uses, it was necessary to allocate the development to types of land uses. The 2005 Potomac Yard Infrastructure Traffic Analysis (Wells & Associates, LLC, December 2005) and 2010 *Potomac Yard Multimodal Study* (City of Alexandria, 2010) were used as the basis for establishing the mix of development, assuming a homogenous and linear distribution among the various landbays in either South or North Potomac Yard, as opposed to allocation of the uses block by block. This method was chosen in keeping with the planned mixed-use character of Potomac Yard. The resulting mix from these studies is summarized in **Table B-3**. The numbers of hotel rooms and dwelling units were converted into equivalent square feet using the following conversion factors:

- Hotel Room: 650 square feet/room
- Residential Dwelling Unit: 1,500 square feet /dwelling unit

Figure B-1: Transportation Analysis Zones

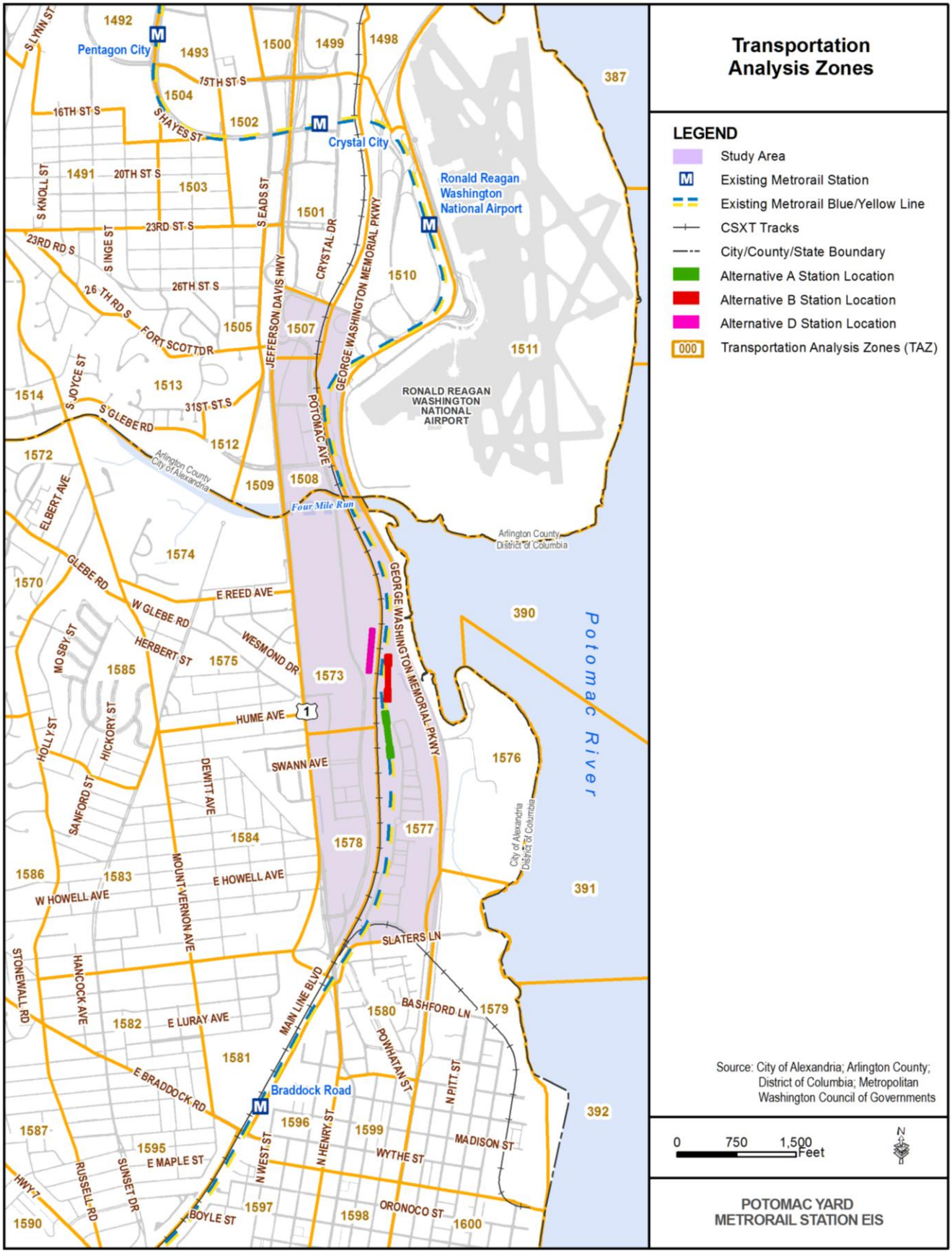


Table B-3: Land Use at Future Build-Out by Type based on the *Potomac Yard Infrastructure Traffic Analysis* (2005) and *Potomac Yard Multimodal Transportation Study* (2010)

South Potomac Yard (includes Landbay L)			
Type	**Value**	**Units**	**Equivalent SF**
Office	1,808,075	SF	1,808,075
Hotel	300	rooms	195,000
Retail	295,000	SF	295,000
Residential	2,973	DU	4,459,500
Total	-	-	6,757,575
North Potomac Yard			
Type	**Value**	**Units**	**Equivalent SF**
Office	1,475,000	SF	1,475,000
Hotel	300	rooms	195,000
Retail	1,000,000	SF	1,000,000
Residential	4,750	DU	7,125,000
Total	-	-	9,795,000

DU = Dwelling Unit; SF = square feet
Source: South Potomac Yard land use (excluding Landbay L) from *Potomac Yard Infrastructure Traffic Analysis*, 2005 (future land use and build-out assumed in year 2016 for study's traffic forecast); Landbay L and North Potomac Yard land use from *Potomac Yard Multimodal Transportation Study*, 2010 (future land use and build-out assumed in year 2030 for study's traffic forecast).

The mix of land use was established only for the North and South Potomac Yard developments. The land use for TAZ 1577, the Potomac Greens and Old Town Greens neighborhoods will not change, as the neighborhood is built out, so MWCOG projections of population, employment and households for this area were used without modification.

For the North and South Potomac Yard areas, the relative proportions of different land uses were assumed as defined in **Table B-3** and were scaled proportionately to the current development volume estimates provided by the City of Alexandria for 2016 and 2040, which are as follows:

- In 2016, the land use in North Potomac Yard is all retail for the No Build Alternative and Build Alternatives A and D.
- North Potomac Yard in Year 2016 has 600,000 square feet of retail and an additional 500,000 square feet of mixed-use development for Build Alternative B.
- Alternative D requires removal of the existing movie theater in the North Potomac Yard area and therefore will have slightly lower land use development (75,000 square feet) in the opening year. Removal of the movie theater would not create any substantial traffic effect during the AM or PM peak hour traffic condition. The 2016 traffic analysis for Alternative D used the conservative assumption of the existing 600,000 square feet of retail (no reduction for removal of movie theater).
- In Year 2016, South Potomac Yard is assumed to have a mix of land uses (**Table B-3**) for each Build Alternative.
- In Year 2040, both the South and North Potomac Yard have a mix of land uses (**Table B-3**) for each Build Alternative.

The computed land use by type for all the alternatives is shown in **Table B-4**. The regular and additional developments in North Potomac Yard that appear in some of the Build Alternatives (see **Table B-1** and **Table B-3**) are added together to simplify calculations.

Table B-4: Land Use by Type for Year 2016 and Year 2040

South Potomac Yard									
		Year 2016				Year 2040			
Type	Units	No Build	Alt A	Alt B	Alt D	No Build	Alt A	Alt B	Alt D
Office	SF	504,356	504,356	504,356	504,356	1,351,192	1,351,192	1,351,192	1,351,192
Hotel	rooms	84	84	84	84	224	224	224	224
Retail	SF	82,289	82,289	82,289	82,289	220,456	220,456	220,456	220,456
Residential	DU	829	829	829	829	2,222	2,222	2,222	2,222
North Potomac Yard									
		Year 2016				Year 2040			
Type	Units	No Build	Alt A	Alt B	Alt D	No Build	Alt A	Alt B	Alt D
Office	SF	-	-	75,294	-	301,174	606,113	877,169	621,172
Hotel	rooms	-	-	15	-	61	123	178	126
Retail	SF	600,000	600,000	651,046	525,000	204,186	410,924	594,691	421,133
Residential	DU	-	-	242	-	970	1,952	2,825	2,000

DU = Dwelling Unit; SF = square feet
Source: Land use volumes assumed in *Potomac Yard Infrastructure Traffic Analysis*, 2005, and *Potomac Yard Multimodal Transportation Study*, 2010, scaled to current City of Alexandria estimated development volumes for South and North Potomac Yard.

Once the development volumes by land use were determined, ITE Trip Generation Manual, 8th edition land use factors were used to convert the land use to population, employment, and number of households. This methodology does not optimize trip generation for transit-oriented development (TOD), which generally has higher mode shares for pedestrian and transit trips, so the methodology provides conservative (higher than expected or worst-case scenario) estimates of vehicular trip generation. The derivation of these factors is described below:

Residential: The number of dwelling units determines the population and the households. The development in North Potomac Yard is going to be denser than South Potomac Yard, with medium to high rise residences. No detailed information is available for the residences, but they are currently assumed to be apartments (ITE code 220) for both the North and South Potomac Yard areas.

- ITE Code 220 Apartments; for Weekday
- Trip generation per DU = 6.72
- Trip generation per person = 3.35
- **Population factor** = 6.72/3.35 = 2.01 persons per DU
- No. of households = No. of dwelling units
- **Household factor** = 1 per DU

Retail:

- ITE Code 820 Shopping Center; for Weekday
- Trip generation per employee = 2 employees per 1,000 SF
- **Employment factor** = 0.002 employees per SF

Office:

- ITE Code 710 General Office Building; for Weekday
- Trip generation per 1,000 SF = 11.01
- Trip generation per employee = 3.32
- **Employment factor** = (11.01/1000)/3.32 = 0.0033 employees per SF

Hotel:

- ITE Code 310 Hotel (general); for Weekday
- Trip generation per room = 8.17
- Trip generation per employee = 14.34
- **Employment factor** = 8.17/14.34 = 0.57 employees per room

Table B-5 shows the population, employment and numbers of households computed for the North and the South Potomac Yard areas for the Year 2016 and the Year 2040 using the factors computed above. These projections are compared with the MWCOG's Round 8.0 Cooperative Land Use projections for 2016 and 2040. Round 8.0

land use projections are based on older assumptions for future development in Potomac Yard than the current development estimates provided by the City of Alexandria and are consequently lower.

Table B-5: Land Use Comparison of MWCOG and City of Alexandria Forecasts

South Potomac Yard										
Type	Year 2016					Year 2040				
	MWCOG Forecast	City of Alexandria				MWCOG Forecast	City of Alexandria Forecast			
		No Build	Alt A	Alt B	Alt D		No Build	Alt A	Alt B	Alt D
Population	44	1,664	1,664	1,664	1,664	2,089	4,457	4,457	4,457	4,457
Employment	6	1,885	1,885	1,885	1,885	410	5,050	5,050	5,050	5,050
Households	21	829	829	829	829	1,014	2,222	2,222	2,222	2,222
North Potomac Yard										
Type	Year 2016					Year 2040				
	MWCOG Forecast	City of Alexandria Forecast				MWCOG Forecast	City of Alexandria Forecast			
		No Build	Alt A	Alt B	Alt D		No Build	Alt A	Alt B	Alt D
Population	336	-	-	486	-	6,177	1,946	3,915	5,666	4,013
Employment	1,483	1,200	1,200	1,561	1,050	8,758	1,442	2,902	4,200	2,974
Households	157	-	-	242	-	2,998	970	1,952	2,825	2,000
South And North Potomac Yard (Total)										
Type	Year 2016					Year 2040				
	MWCOG Forecast	City of Alexandria Forecast				MWCOG Forecast	City of Alexandria Forecast			
		No Build	Alt A	Alt B	Alt D		No Build	Alt A	Alt B	Alt D
Population	380	1,664	1,664	2,150	1,664	8,266	6,402	8,372	10,123	8,469
Employment	1,489	3,085	3,085	3,445	2,935	9,168	6,492	7,952	9,250	8,024
Households	178	829	829	1,072	829	4,012	3,192	4,174	5,047	4,222

Source: MWCOG Round 8.0 Cooperative Land Use Forecast; population, employment and households calculated based on land use volumes assumed in *Potomac Yard Infrastructure Traffic Analysis*, 2005, and *Potomac Yard Multimodal Transportation Study*, 2010, scaled to current City of Alexandria estimated development volumes for South and North Potomac Yard.

APPENDIX C:

Detailed Traffic Forecasting Assumptions and Results

Trip Generation Assumptions

The proposed Metrorail station has an urban design, similar to the Clarendon and Court House Metrorail Stations, in which there are no off-street facilities provided on the station site for Kiss & Ride, Park & Ride, or bus operations. Metrorail rider surveys from 2007 were used in estimating the drop-off activity at these comparable urban-type stations. Additionally, planned bus service was incorporated into the trip generation estimation.

Table C-1 and **Table C-2** show estimated automobile trip generation based on the 2007 Metrorail Rider Surveys at Clarendon and Court House Metrorail Stations for the morning and afternoon peak periods and hours.

Table C-1: Clarendon Metrorail Station Automobile Trip Generation

AM Peak Period / AM Peak Hour			PM Peak Period / PM Peak Hour		
Drop-Offs	Drove a car and parked	Taxi	Drop-Offs	Drove a car and parked	Taxi
78 / 39	196 / 98	0 / 0	18 / 9	79 / 40	0 / 0
Total = 274 / 137			**Total = 97 / 49**		

Source: 2007 Metrorail Rider Survey

Table C-2: Court House Metrorail Station Automobile Trip Generation

AM Peak Period / AM Peak Hour			PM Peak Period / PM Peak Hour		
Drop-Offs	Drove a car and parked	Taxi	Drop-Offs	Drove a car and parked	Taxi
80 / 40	99 / 50	0 / 0	0 / 0	102 / 51	17 / 9
Total = 177 / 89			**Total = 119 / 60**		

Source: 2007 Metrorail Rider Survey

The results show that both stations generated fewer than 140 personal vehicles per hour per direction (inbound and outbound). Also, there were more trips generated in the morning than in the afternoon. Additionally, “drove a car and parked” was the main type of activity at these Metrorail stations relative to the other types of personal vehicular access.

As a conservative estimate, the higher of the two stations for each peak period and travel mode (Clarendon in AM, Court House in PM) was used as a proxy for estimating trip generation at the proposed Potomac Yard Station. For the AM peak hour, drop-offs at Court House station were used (40 drop-offs), while “drove a car and parked” trips were obtained from Clarendon station (98 drove a car and parked). For the PM peak hour, drop-offs at Clarendon station (9 drop-offs) were considered as there are no drop-offs at Court House station during this timeframe, while “drove a car and parked” and taxi trips at Court House station were used (51 drove a car and parked and 9 taxi). There will be limited on-street parking available at Potomac Yard, which makes these assumptions conservative.

Study Intersection Lane Configuration Diagrams

Figure C-1: Study Intersections – Existing Lane Configuration Diagram (North Potomac Yard)

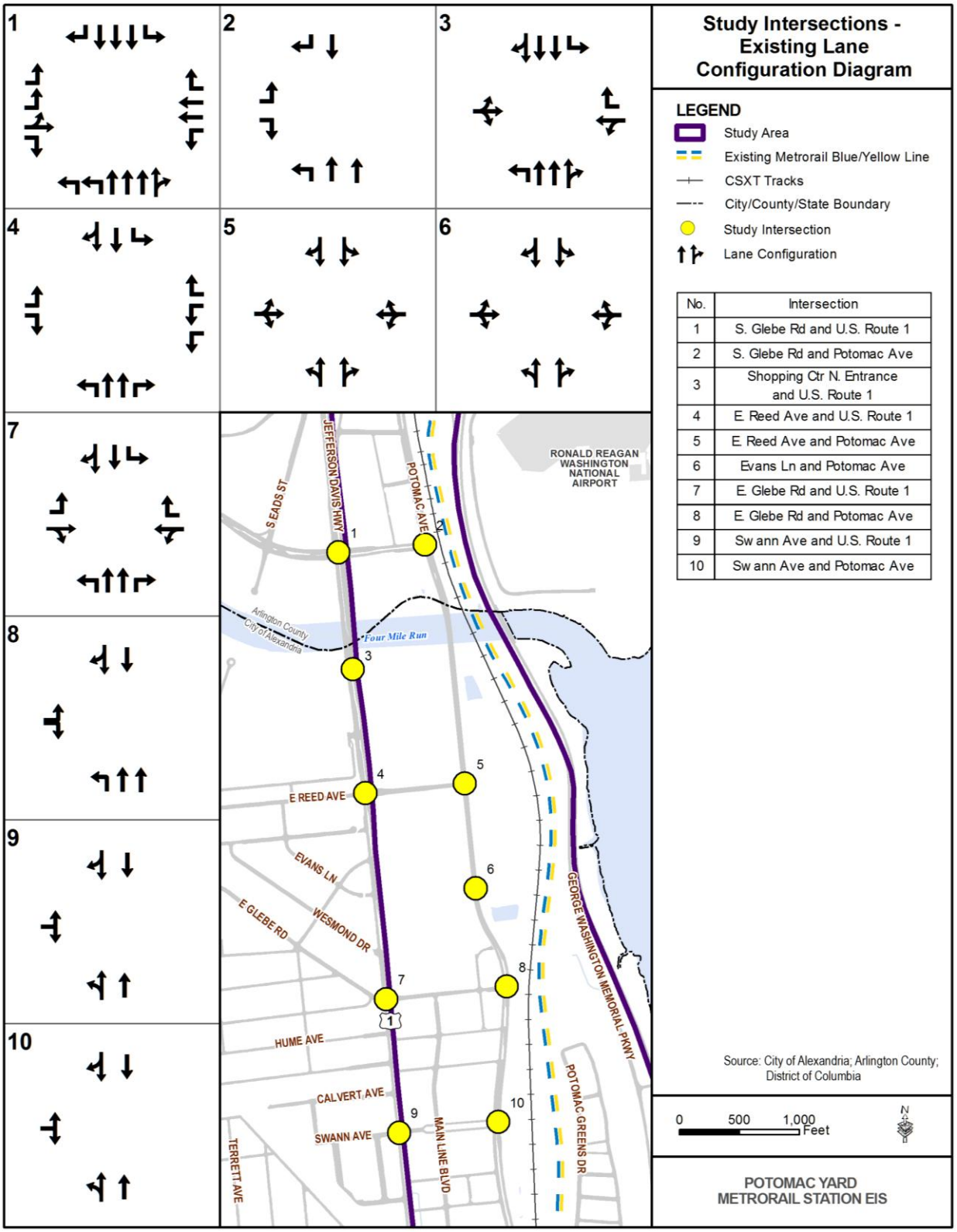


Figure C-2: Study Intersections – Existing Lane Configuration Diagram (South Potomac Yard)

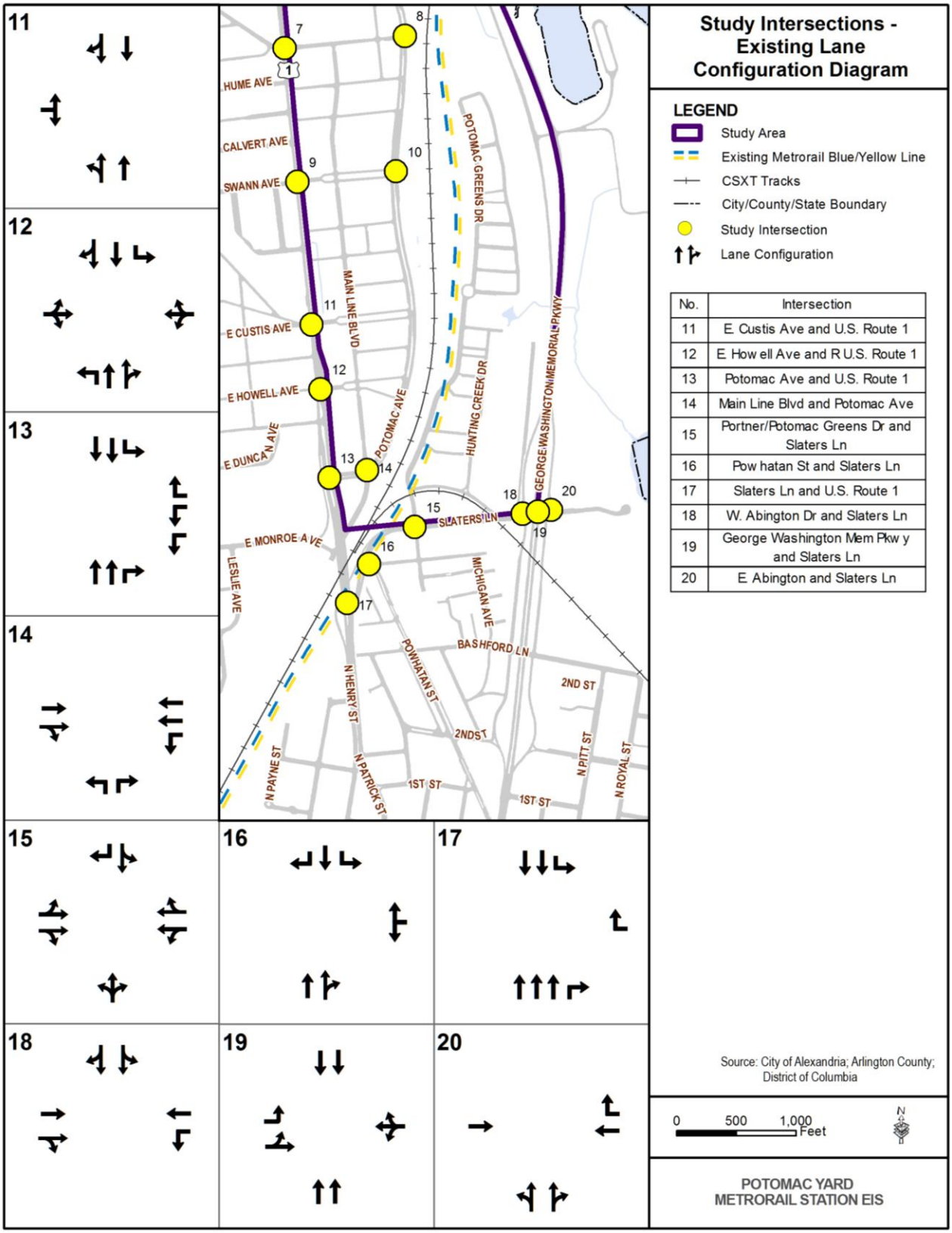


Figure C-3: Study Intersections – 2016 Lane Configuration Diagram (North Potomac Yard)

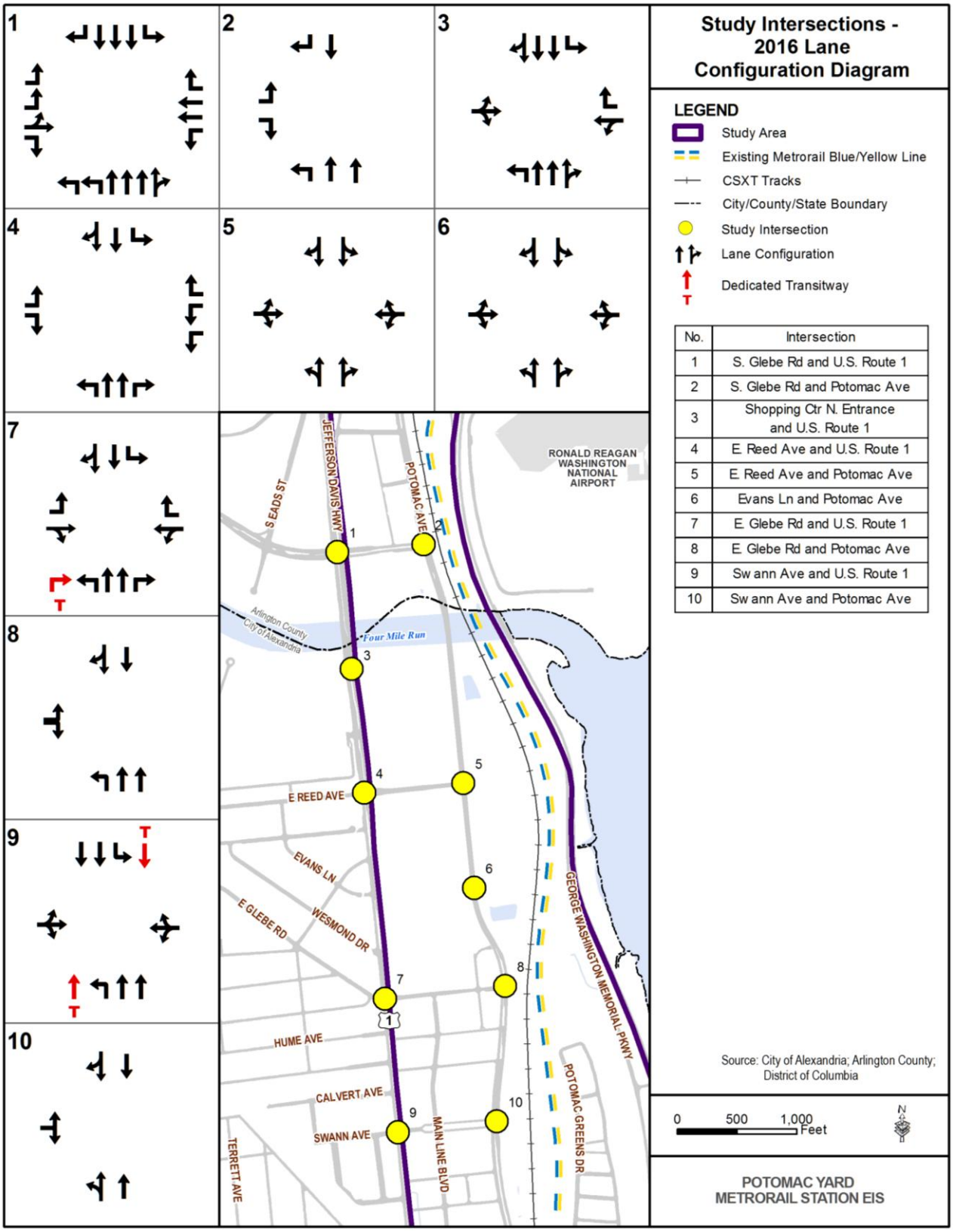


Figure C-4: Study Intersections – 2016 Lane Configuration Diagram (South Potomac Yard)

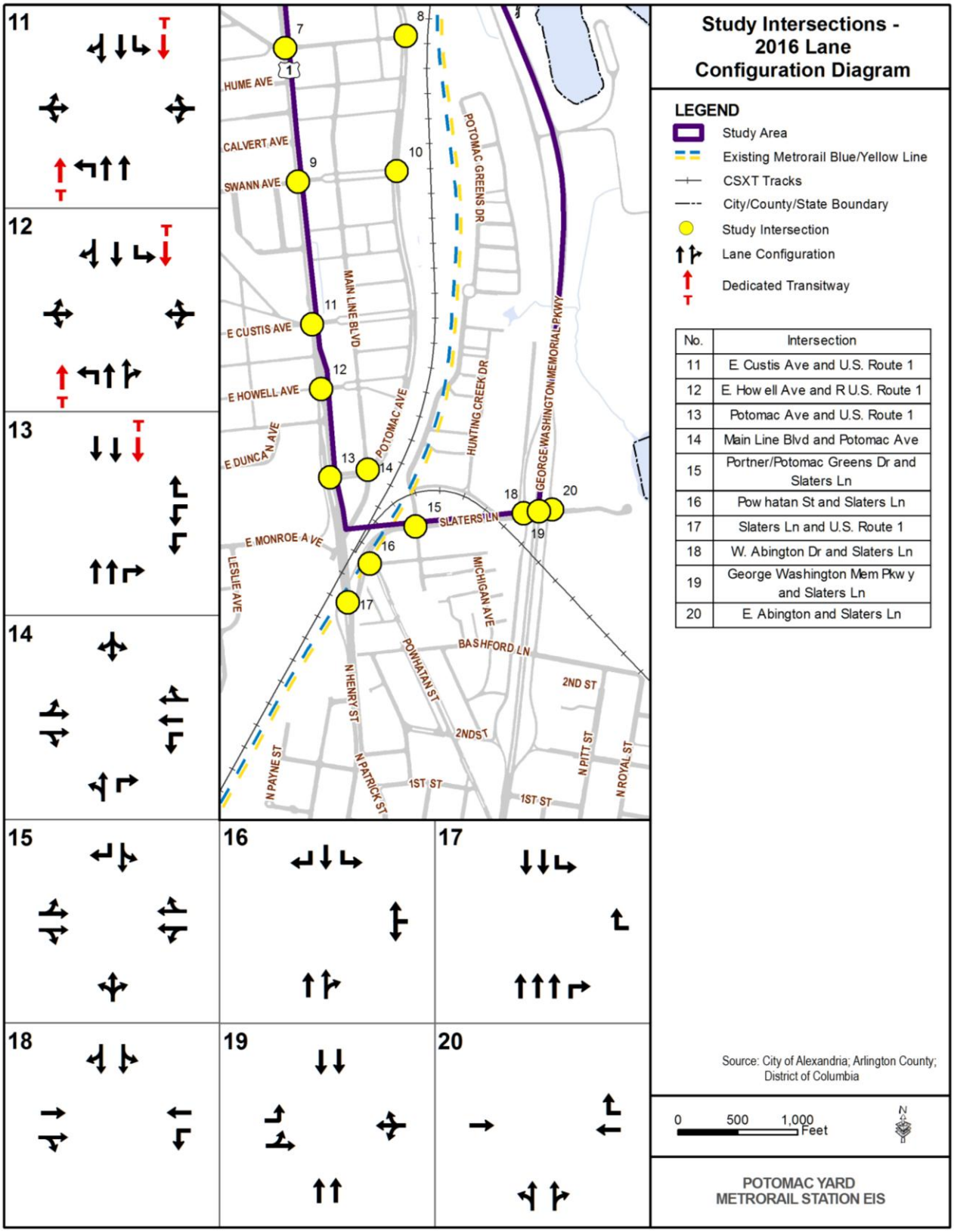


Figure C-5: Study Intersections – 2040 Lane Configuration Diagram (North Potomac Yard)

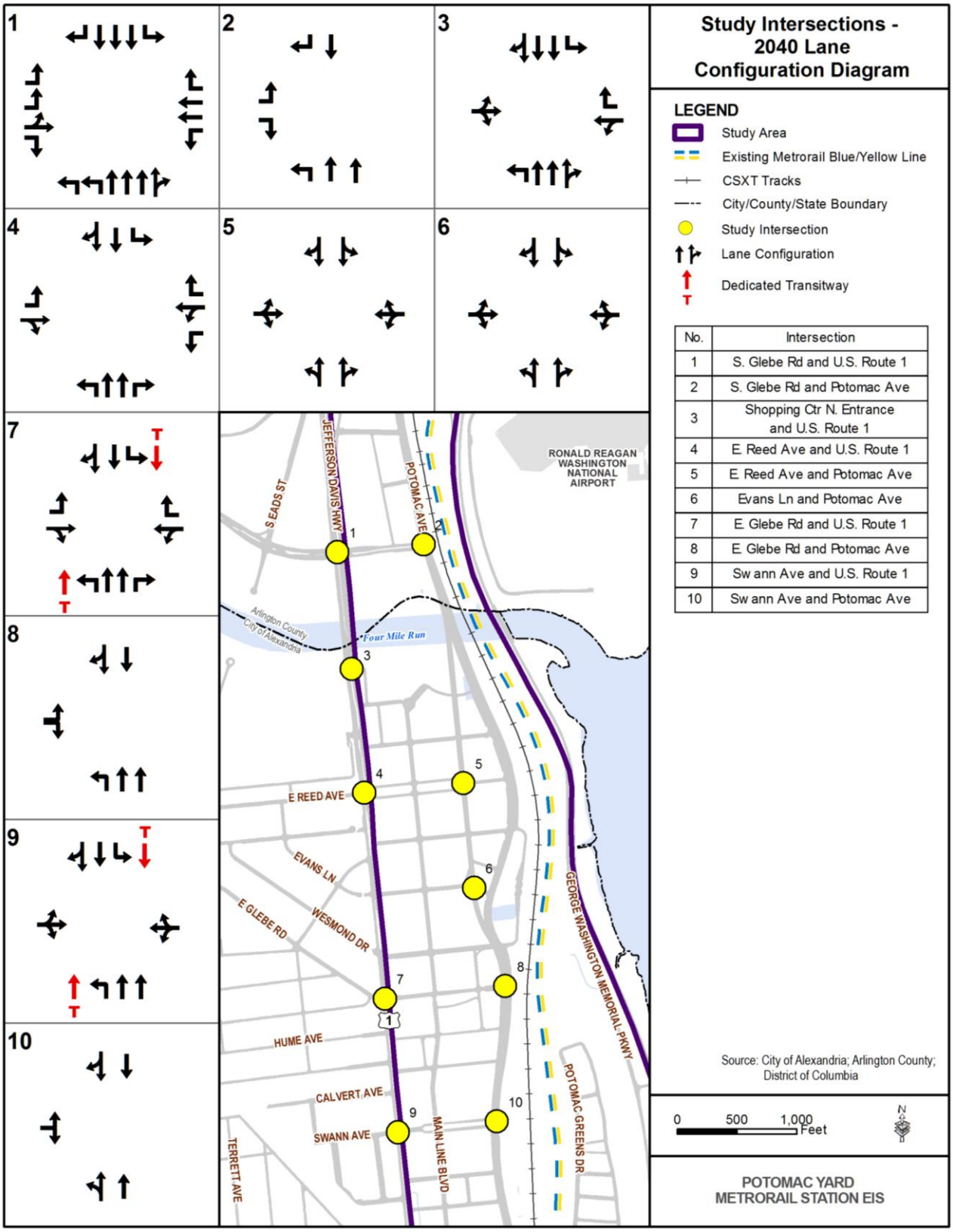
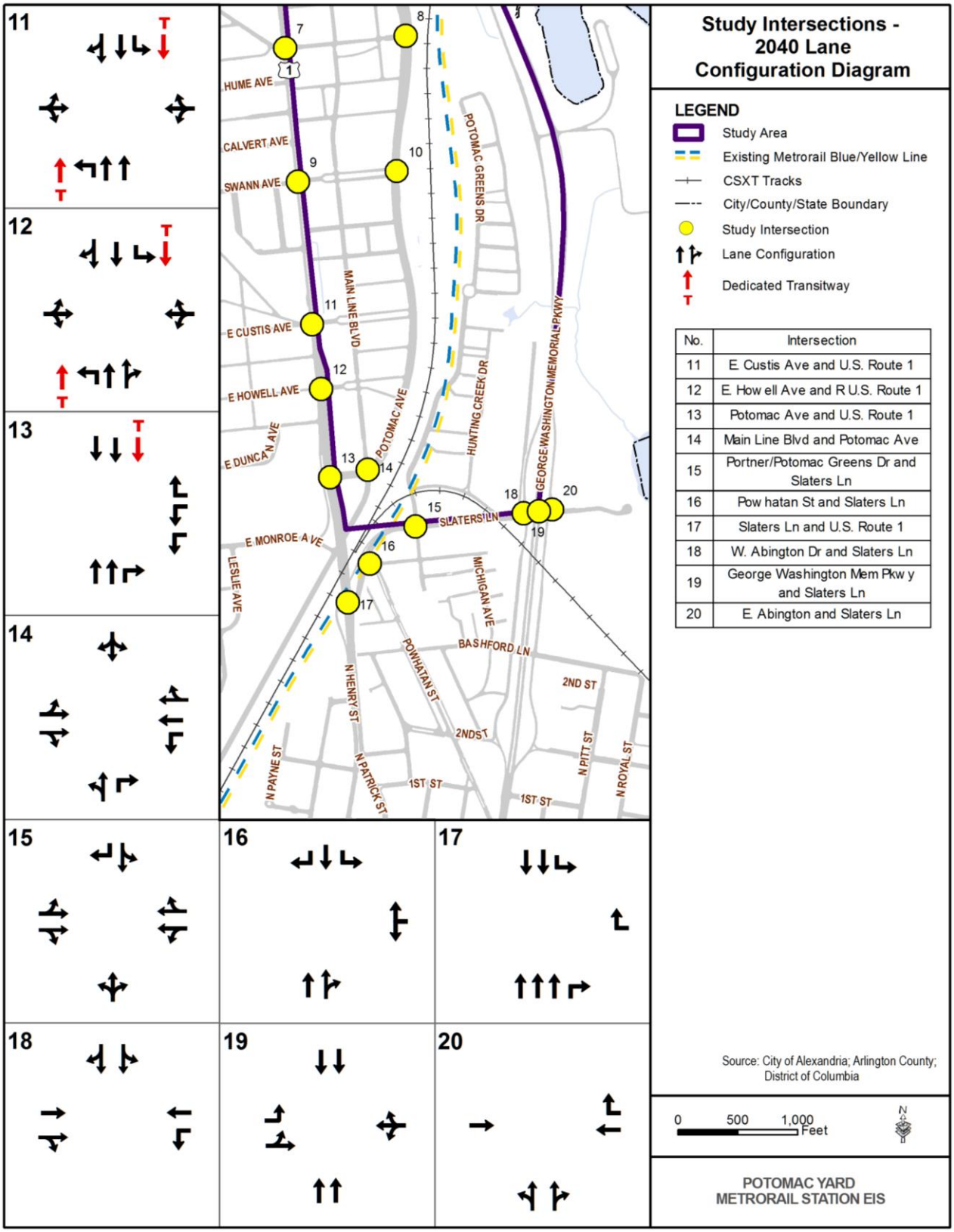


Figure C-6: Study Intersections – 2040 Lane Configuration Diagram (South Potomac Yard)



Study Intersection Traffic Volumes and Level of Service

Figure C-7: Existing Traffic Volumes (North Potomac Yard)

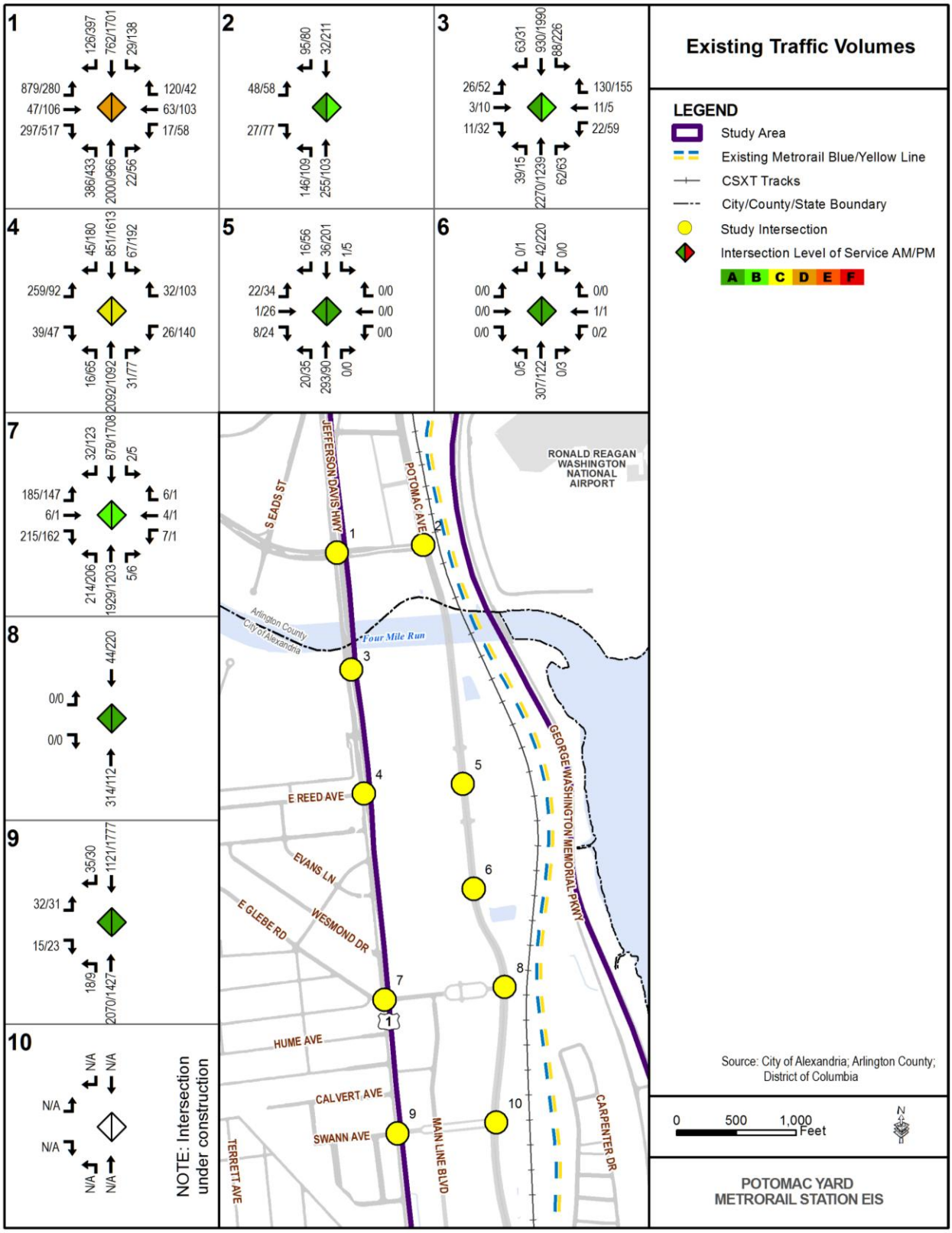


Figure C-8: Existing Traffic Volumes (South Potomac Yard)

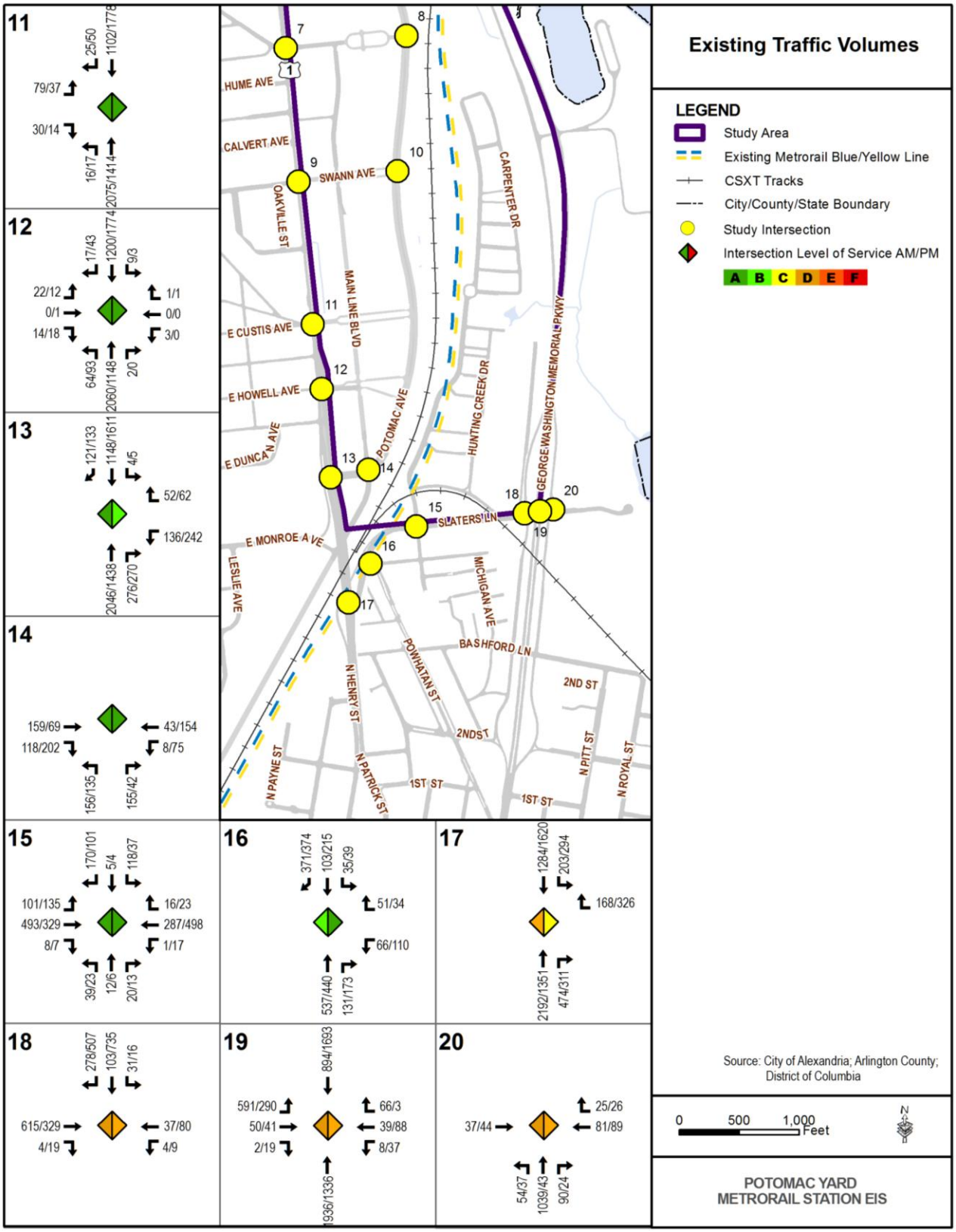


Figure C-9: Traffic Volumes Opening Year 2016 No Build Alternative (North Potomac Yard)

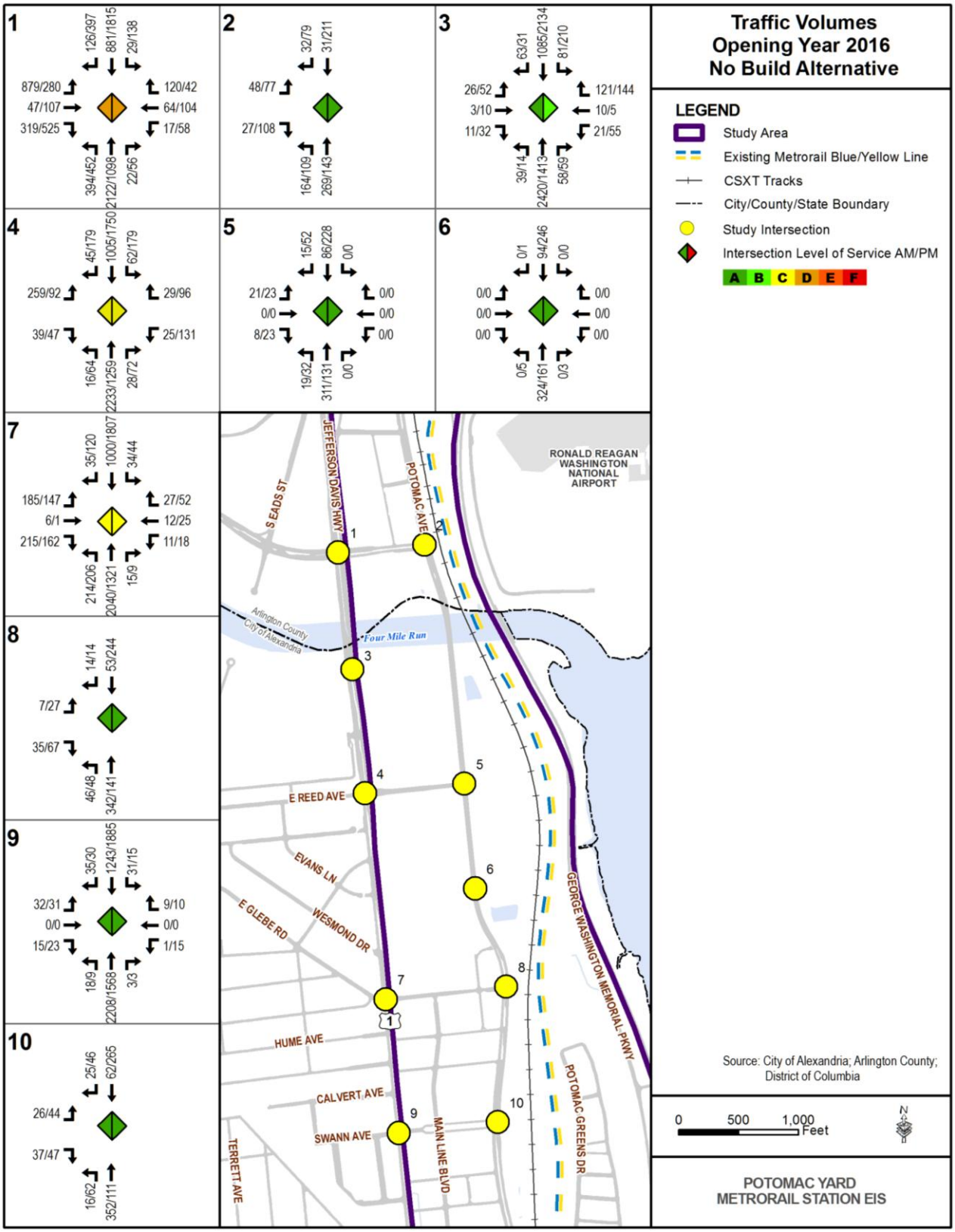


Figure C-10: Traffic Volumes Opening Year 2016 No Build Alternative (South Potomac Yard)

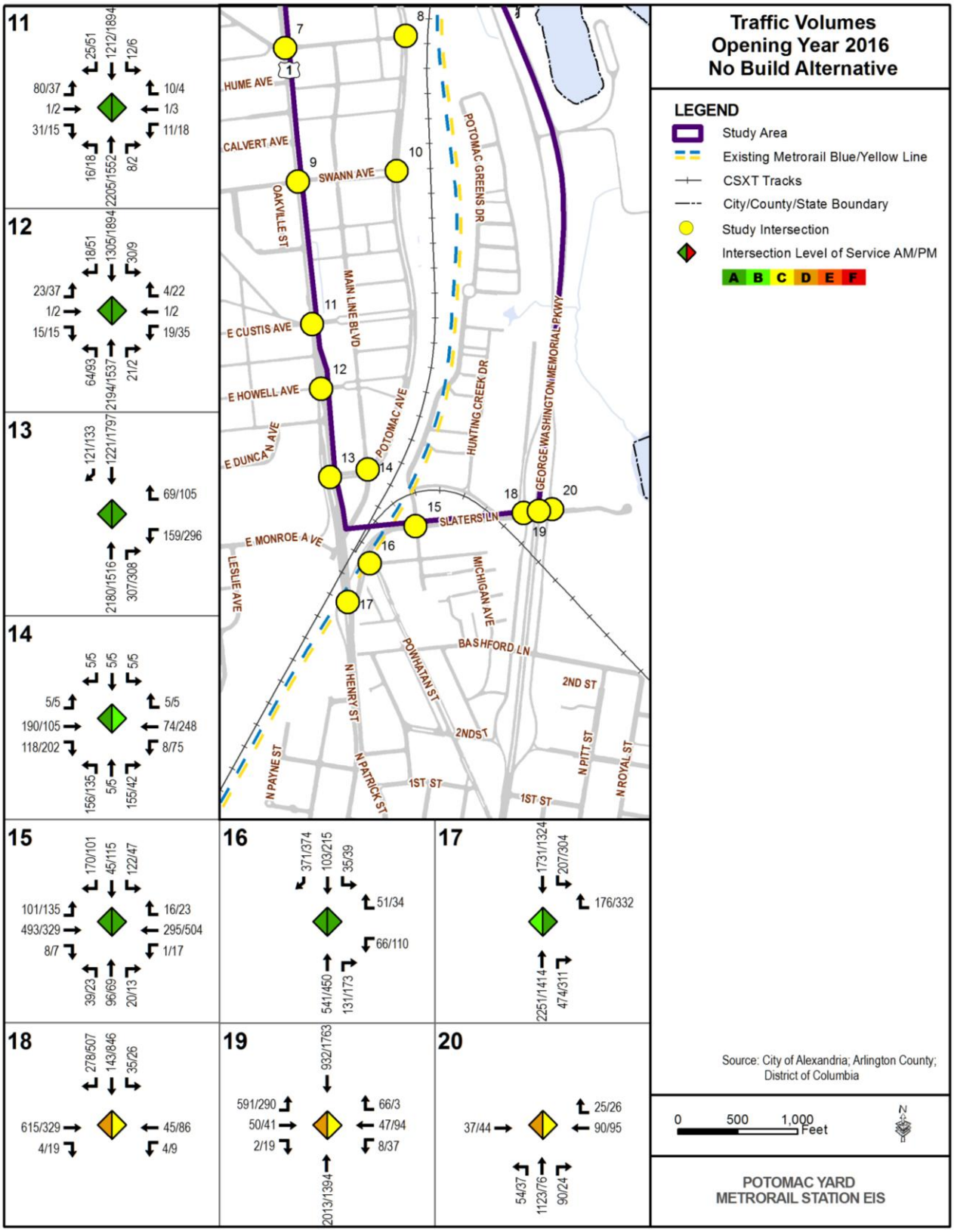


Figure C-11: Traffic Volumes Opening Year 2016 Build Alternatives (North Potomac Yard)

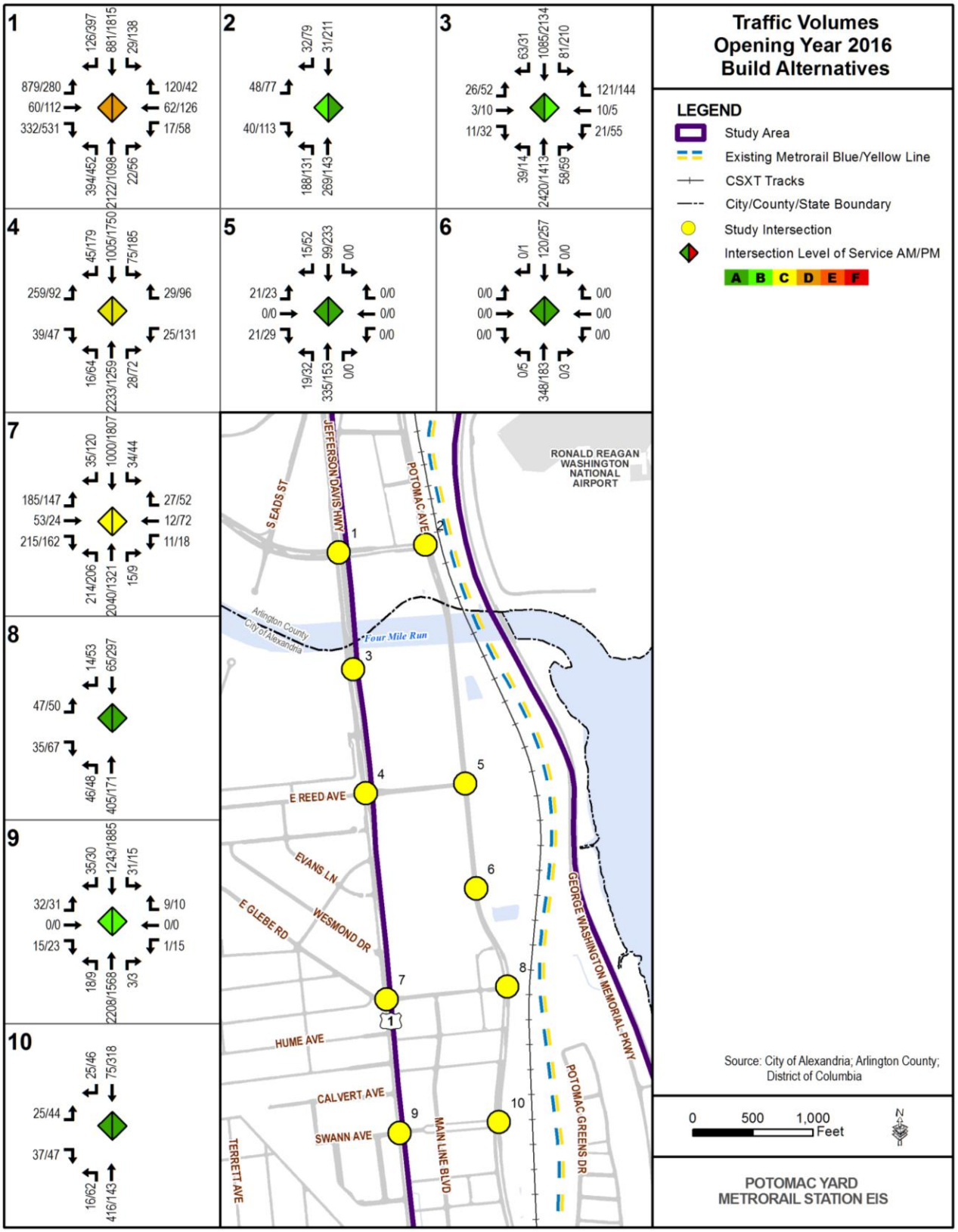


Figure C-12: Traffic Volumes Opening Year 2016 Build Alternatives (South Potomac Yard)

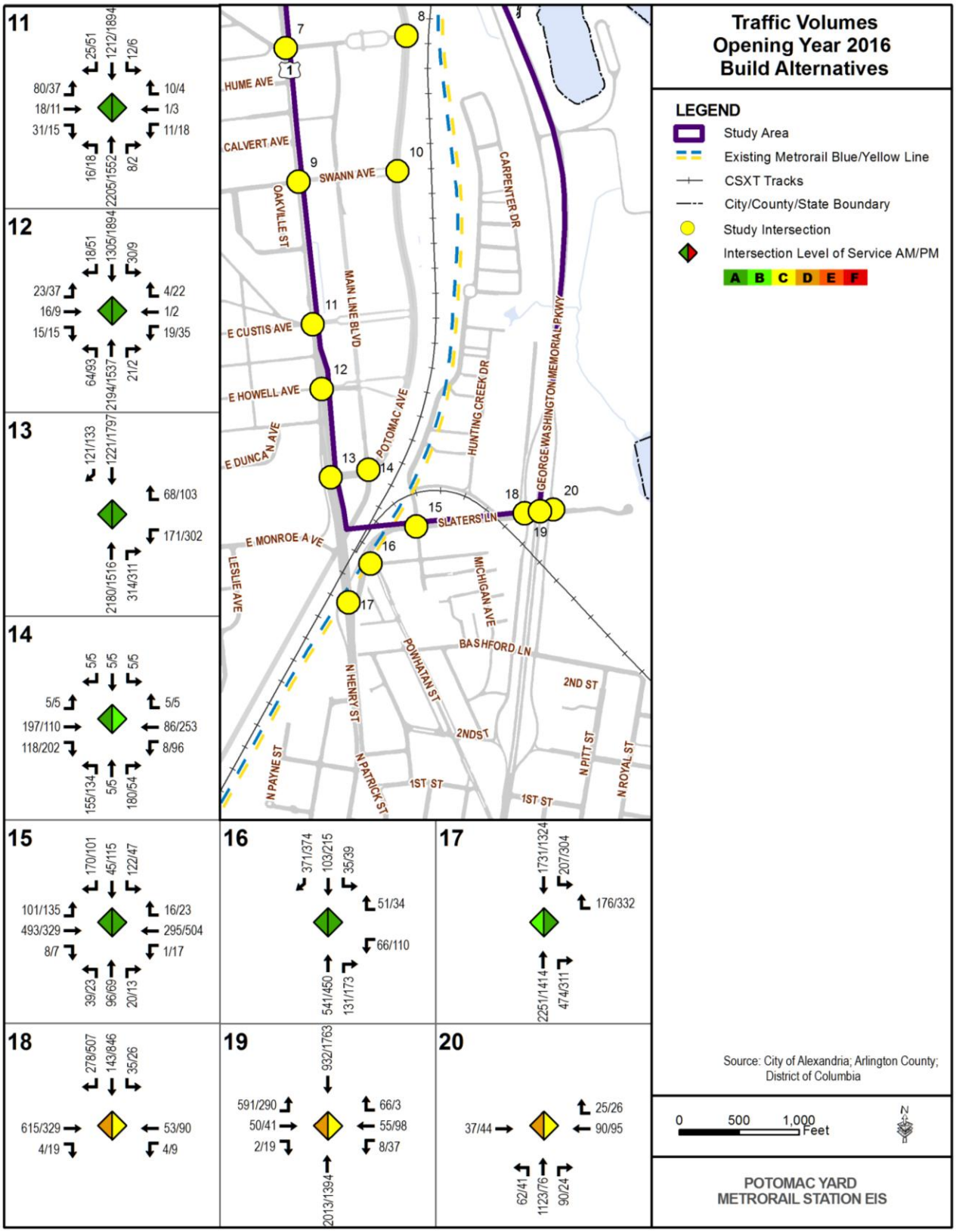


Figure C-13: Traffic Volumes 2040 No Build Alternative (North Potomac Yard)

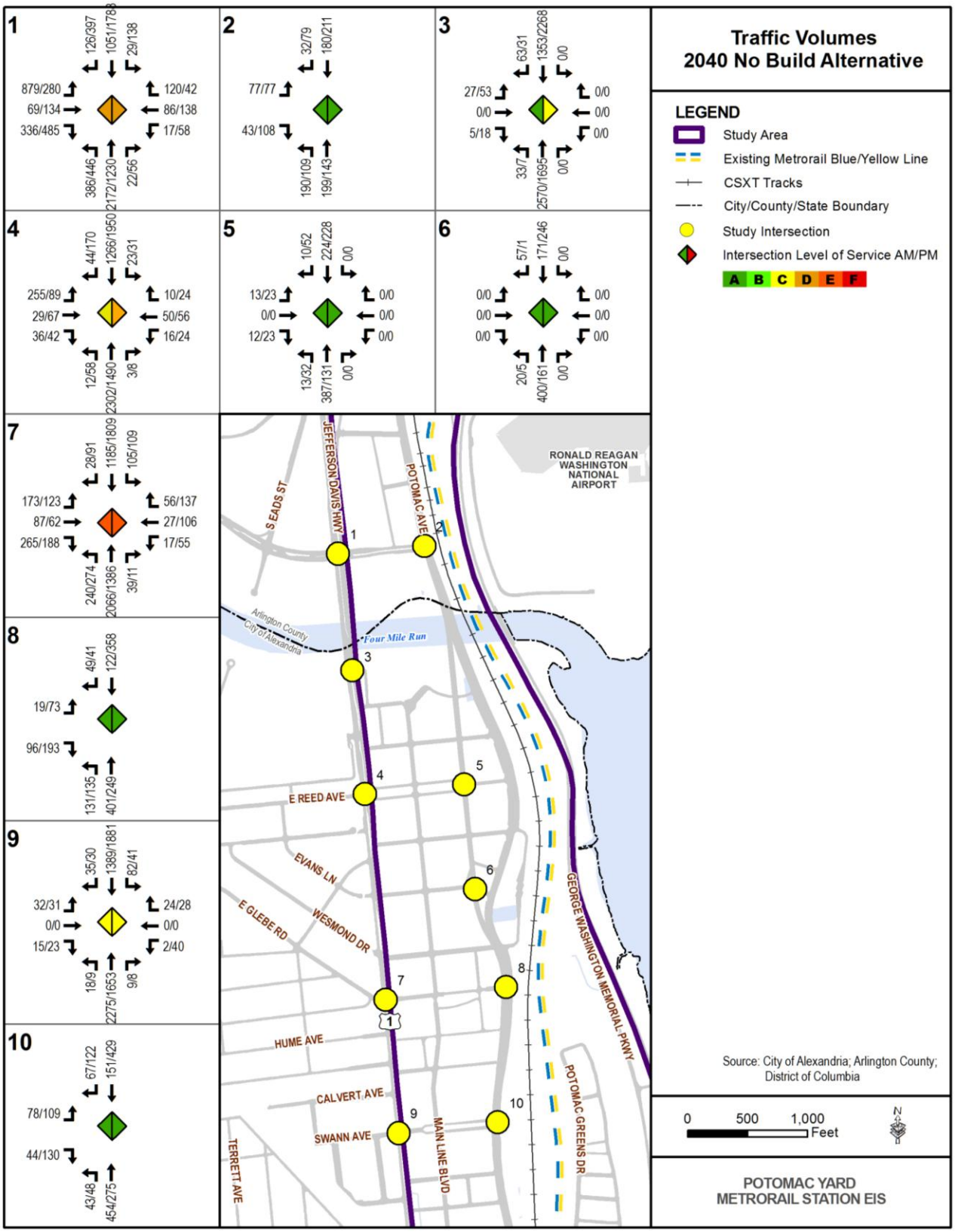


Figure C-14: Traffic Volumes 2040 No Build Alternative (South Potomac Yard)

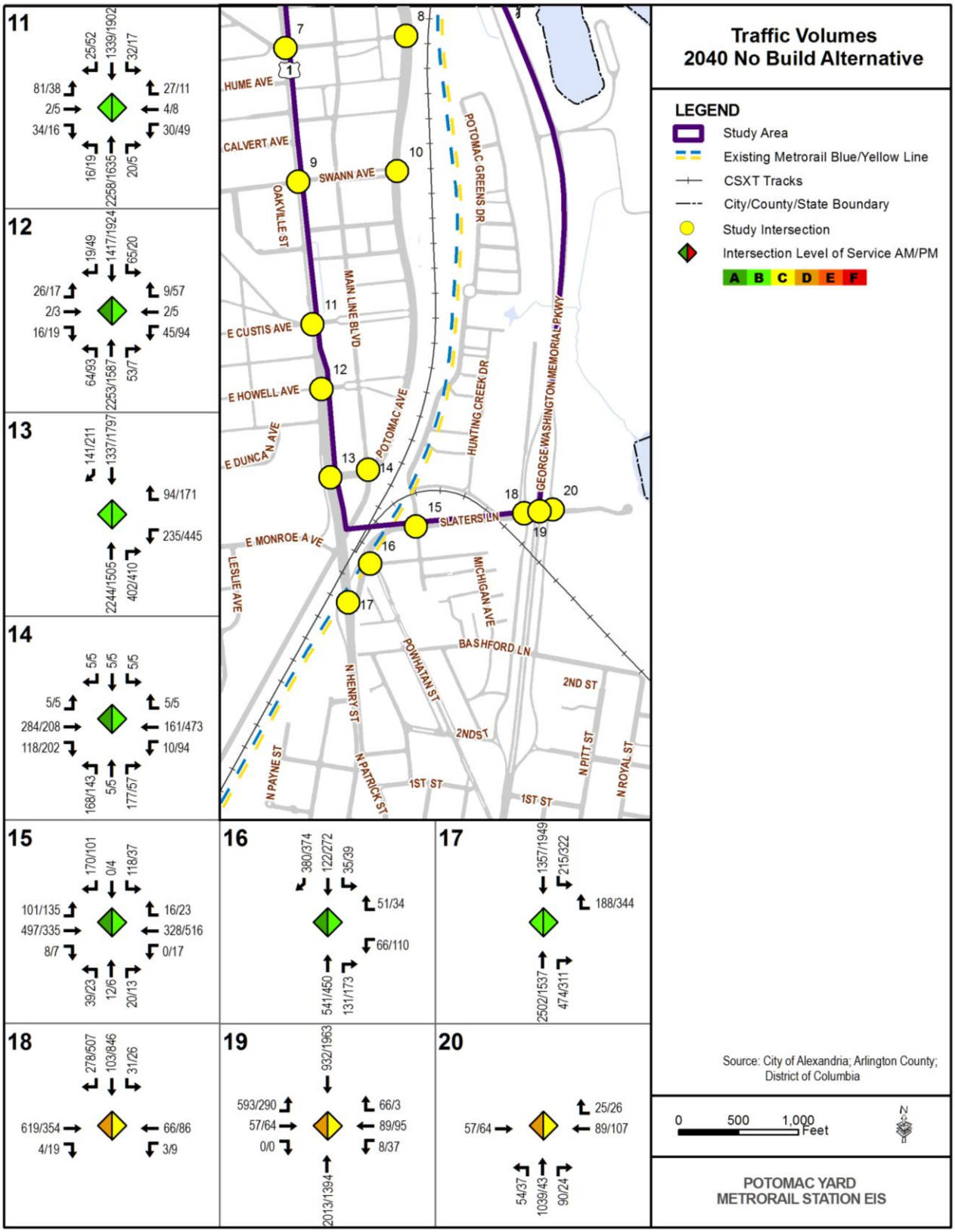


Figure C-15: Traffic Volumes 2040 Build Alternatives (North Potomac Yard)

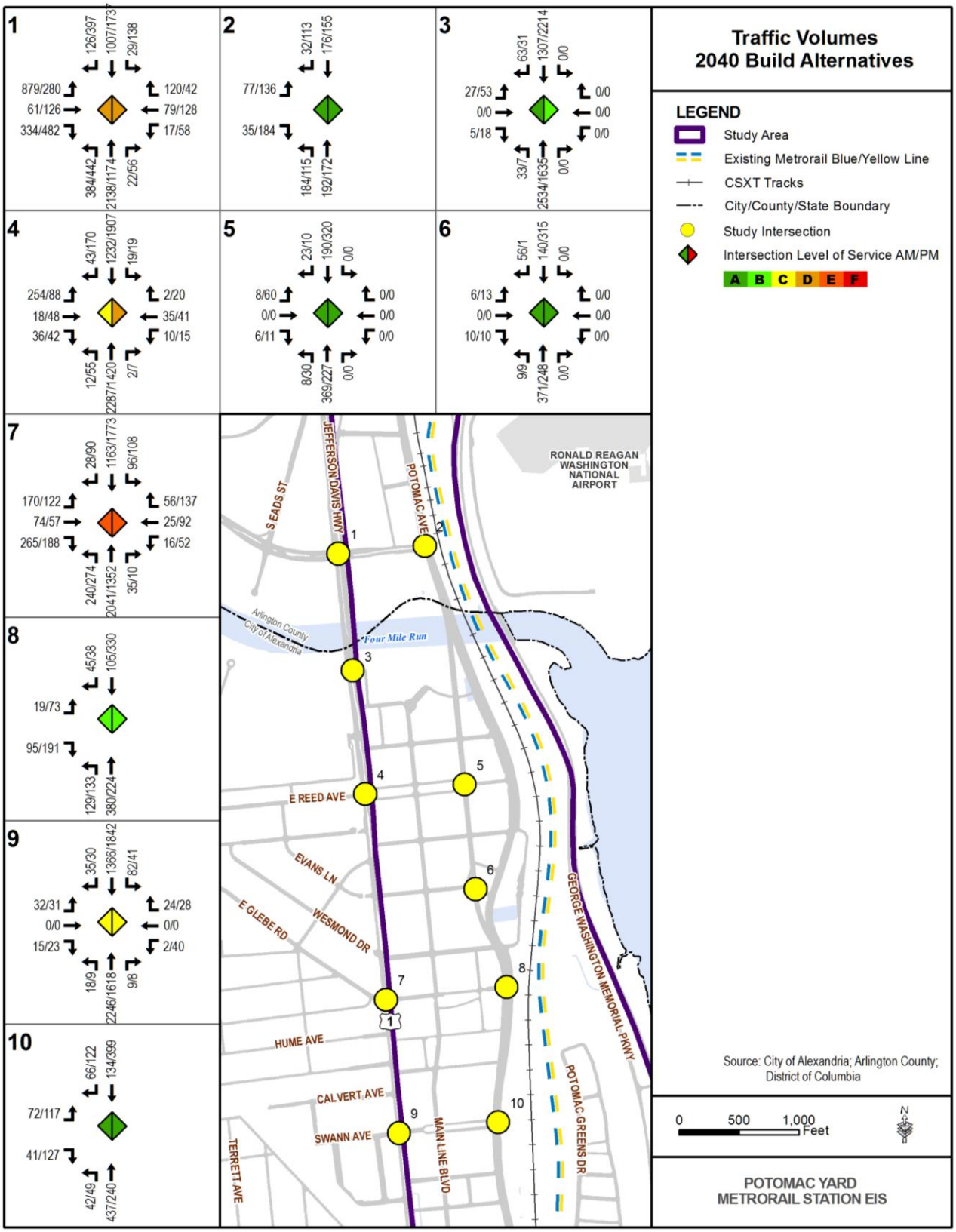


Figure C-16: Traffic Volumes 2040 Build Alternatives (South Potomac Yard)

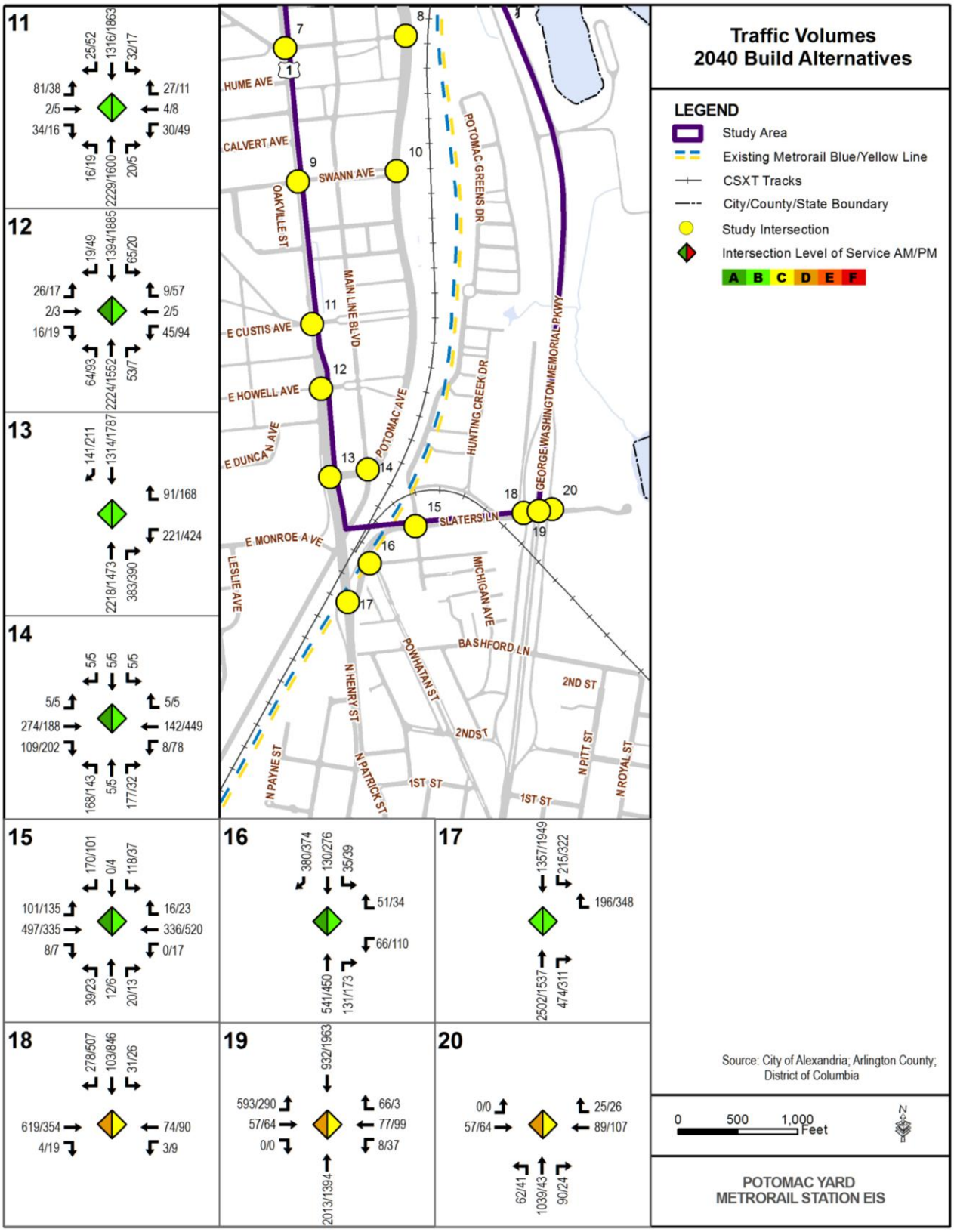


Table C-3: Vehicle Delay and LOS - Existing Conditions AM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	35.1	D	35.1	D	25.7	C	31.2	C	42.7	D
2	S. Glebe Rd and Potomac Ave	3.1	A	4.1	A	5.2	A	-	-	23.4	C
3	Shopping Center north Entrance and U.S. Route 1	5.9	A	4.1	A	6.7	A	18.1	B	46.1	D
4	E. Reed Ave and U.S. Route 1	22.2	C	20.8	C	12.7	B	36.9	D	59.3	E
5	E. Reed Ave and Potomac Ave	4.7	A	3.4	A	3.2	A	-	-	11.0	B
6	Evans Ln and Potomac Ave	0.2	A	0.8	A	0.7	A	-	-	9.8	A
7	E. Glebe Rd and U.S. Route 1	12.1	B	4.5	A	13.0	B	-	-	51.7	D
8	E. Glebe Rd and Potomac Ave	1.0	A	0.8	A	0.7	A	-	-	9.8	A
9	Swann Ave and U.S. Route 1	3.4	A	2.4	A	2.3	A	-	-	69.9	E
10	Swann Ave and Potomac Ave	5.8	A	1.7	A	8.0	A	-	-	66.0	E
11	E. Custis Ave and U.S. Route 1	2.7	A	1.8	A	2.3	A	64.8	E	64.2	E
12	E. Howell Ave and U.S. Route 1	7.2	A	5.4	A	1.1	A	50.8	D	-	-
13	Potomac Ave and U.S. Route 1	9.5	A	11.9	B	-	-	7.9	A	20.9	C
14	Main Line Blvd and Potomac Ave	5.9	A	6.4	A	5.0	A	6.2	A	-	-
15	Portner Rd/Potomac Greens Dr and Slaters Ln	6.8	A	23.5	C	-	-	4.5	A	4.5	A
16	Powhatan St and Slaters Ln	16.8	B	15.8	B	18.8	B	7.9	A	20.9	C
17	Slaters Ln and U.S. Route 1	47.5	D	-	-	26.4	C	-	-	227.1	F
18	W. Abingdon Dr and Slaters Ln	35.1	D	23.7	C	16.1	B	-	-	-	-
19	George Washington Pkwy and Slaters Ln			25.2	C	-	-	49.0	D	-	-
20	E. Abingdon and Slaters Ln			35.1	D	25.7	C	31.2	C	42.7	D

Note: Delay is seconds/vehicle.

Table C-4: Vehicle Delay and LOS - Existing Conditions PM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	36.2	D	37.3	D	33.4	C	32.9	C	32.9	C
2	S. Glebe Rd and Potomac Ave	10.8	B	18.7	B	3.3	A	-	-	14.6	B
3	Shopping Center north Entrance and U.S. Route 1	13.2	B	14.0	B	11.1	B	17.6	B	43.7	D
4	E. Reed Ave and U.S. Route 1	25.2	C	16.2	B	27.0	C	41.9	D	44.5	D
5	E. Reed Ave and Potomac Ave	4.6	A	3.5	A	3.3	A	-	-	12.6	B
6	Evans Ln and Potomac Ave	0.3	A	0.2	A	0.3	A	14.2	B	-	-
7	E. Glebe Rd and U.S. Route 1	19.4	B	13.2	B	20.3	C	-	-	41.4	D
8	E. Glebe Rd and Potomac Ave	0.3	A	0.3	A	1.5	A	-	-	9.5	A
9	Swann Ave and U.S. Route 1	3.7	A	3.7	A	1.9	A	-	-	67.2	E
10	Swann Ave and Potomac Ave	3.1	A	2.2	A	2.1	A	-	-	66.2	E
11	E. Custis Ave and U.S. Route 1	3.3	A	4.1	A	2.1	A	-	-	37.7	D
12	E. Howell Ave and U.S. Route 1	6.9	A	4.9	A	2.0	A	51.8	D	-	-
13	Potomac Ave and U.S. Route 1	12.1	B	14.8	B	-	-	10.0	A	12.1	B
14	Main Line Blvd and Potomac Ave	6.8	A	5.3	A	6.4	A	16.9	B	-	-
15	Portner Rd/Potomac Greens Dr and Slaters Ln	7.0	A	21.6	C	-	-	6.9	A	3.4	A
16	Powhatan St and Slaters Ln	6.2	A	17.6	B	8.6	A	5.6	A	5.0	A
17	Slaters Ln and U.S. Route 1	26.1	C	-	-	36.4	D	-	-	52.1	D
18	W. Abingdon Dr and Slaters Ln	36.2	D	15.7	B	18.0	B	-	-	-	-
19	George Washington Pkwy and Slaters Ln			52.9	D	-	-	51.1	D	-	-
20	E. Abingdon and Slaters Ln			37.3	D	33.4	C	32.9	C	32.9	C

Note: Delay is seconds/vehicle.

Table C-5: Vehicle Delay and LOS – 2016 No Build Alternative Opening Year AM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	36.7	D	38.3	D	27.3	C	31.9	C	41.9	D
2	S. Glebe Rd and Potomac Ave	5.7	A	2.3	A	4.4	A	-	-	21.9	C
3	Shopping Center north Entrance and U.S. Route 1	6.3	A	4.8	A	6.2	A	21.9	C	44.5	D
4	E. Reed Ave and U.S. Route 1	24.0	C	23.1	C	14.7	B	39.0	D	59.3	E
5	E. Reed Ave and Potomac Ave	3.8	A	2.8	A	3.1	A	-	-	11.2	B
6	Evans Ln and Potomac Ave	0.2	A	0.8	A	0.7	A	-	-	13.1	B
7	E. Glebe Rd and U.S. Route 1	29.2	C	29.0	C	18.6	B	39.9	D	52.3	D
8	E. Glebe Rd and Potomac Ave	4.2	A	3.1	A	3.3	A	-	-	15.2	B
9	Swann Ave and U.S. Route 1	9.1	A	9.8	A	4.9	A	78.6	E	69.2	E
10	Swann Ave and Potomac Ave	2.5	A	0.5	A	1.8	A	-	-	8.6	A
11	E. Custis Ave and U.S. Route 1	7.2	A	2.0	A	9.0	A	57.3	E	71.2	E
12	E. Howell Ave and U.S. Route 1	3.2	A	2.1	A	2.4	A	61.3	E	64.8	E
13	Potomac Ave and U.S. Route 1	7.3	A	5.7	A	1.8	A	49.8	D	-	-
14	Main Line Blvd and Potomac Ave	8.8	A	11.4	B	-	-	6.7	A	7.0	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	7.9	A	9.2	A	5.0	A	10.2	B	-	-
16	Powhatan St and Slaters Ln	8.3	A	23.9	C	-	-	4.8	A	6.4	A
17	Slaters Ln and U.S. Route 1	18.9	B	15.7	B	18.5	B	7.8	A	25.8	C
18	W. Abingdon Dr and Slaters Ln	49.1	D	-	-	27.1	C	-	-	236.1	F
19	George Washington Pkwy and Slaters Ln			25.5	C	16.4	B	-	-	-	-
20	E. Abingdon and Slaters Ln			26.8	C	-	-	43.7	D	-	-

Note: Delay is seconds/vehicle.

Table C-6: Vehicle Delay and LOS – 2016 No Build Alternative Opening Year PM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	40.3	D	35.1	D	45.6	D	47.7	D	34.6	C
2	S. Glebe Rd and Potomac Ave	6.7	A	3.3	A	4.0	A	-	-	19.9	B
3	Shopping Center north Entrance and U.S. Route 1	15.1	B	8.8	A	11.8	B	19.2	B	47.5	D
4	E. Reed Ave and U.S. Route 1	34.8	C	18.6	B	45.1	D	35.5	D	42.7	D
5	E. Reed Ave and Potomac Ave	4.4	A	3.1	A	3.2	A	-	-	11.7	B
6	Evans Ln and Potomac Ave	0.2	A	0.8	A	0.7	A	-	-	13.9	B
7	E. Glebe Rd and U.S. Route 1	30.2	C	40.6	D	18.6	B	27.2	C	46.3	D
8	E. Glebe Rd and Potomac Ave	6.3	A	5.1	A	4.4	A	-	-	16.2	B
9	Swann Ave and U.S. Route 1	7.6	A	11.7	B	2.6	A	65.2	E	67.7	E
10	Swann Ave and Potomac Ave	3.3	A	0.5	A	2.5	A	-	-	9.0	A
11	E. Custis Ave and U.S. Route 1	4.9	A	4.3	A	1.7	A	68.7	E	66.4	E
12	E. Howell Ave and U.S. Route 1	5.9	A	7.2	A	1.8	A	65.2	E	64.5	E
13	Potomac Ave and U.S. Route 1	9.9	A	8.9	A	2.5	A	49.9	D	-	-
14	Main Line Blvd and Potomac Ave	10.0	B	15.1	B	-	-	8.0	A	9.4	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	6.1	A	5.5	A	5.4	A	12.2	B	-	-
16	Powhatan St and Slaters Ln	8.7	A	24.5	C	-	-	8.7	A	5.0	A
17	Slaters Ln and U.S. Route 1	9.0	A	16.6	B	18.1	B	7.2	A	8.2	A
18	W. Abingdon Dr and Slaters Ln	31.5	C	-	-	54.8	D	-	-	57.4	E
19	George Washington Pkwy and Slaters Ln			18.9	B	20.9	C	-	-	-	-
20	E. Abingdon and Slaters Ln			37.9	D	-	-	45.9	D	-	-

Note: Delay is seconds/vehicle.

Table C-7: Vehicle Delay and LOS – 2016 Build Alternatives AM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	41.5	D	42.2	D	32.4	C	30.9	C	49.3	D
2	S. Glebe Rd and Potomac Ave	15.6	B	5.6	A	8.3	A	-	-	26.1	C
3	Shopping Center north Entrance and U.S. Route 1	5.7	A	4.1	A	5.6	A	22.4	C	44.0	D
4	E. Reed Ave and U.S. Route 1	24.7	C	22.7	C	15.9	B	35.2	D	60.0	E
5	E. Reed Ave and Potomac Ave	4.3	A	3.0	A	4.2	A	-	-	11.6	B
6	Evans Ln and Potomac Ave	0.3	A	0.4	A	0.2	A	13.5	B	-	-
7	E. Glebe Rd and U.S. Route 1	31.4	C	13.0	B	20.0	B	27.9	C	136.5	F
8	E. Glebe Rd and Potomac Ave	6.8	A	4.5	A	4.4	A	-	-	20.9	C
9	Swann Ave and U.S. Route 1	18.4	B	23.4	C	5.2	A	79.6	E	69.6	E
10	Swann Ave and Potomac Ave	2.6	A	0.0	A	1.8	A	-	-	9.2	A
11	E. Custis Ave and U.S. Route 1	9.5	A	6.2	A	8.3	A	57.4	E	71.7	E
12	E. Howell Ave and U.S. Route 1	5.4	A	4.9	A	2.7	A	61.2	E	64.6	E
13	Potomac Ave and U.S. Route 1	9.6	A	8.2	A	2.0	A	50.4	D	-	-
14	Main Line Blvd and Potomac Ave	9.2	A	11.9	B	-	-	7.4	A	7.1	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	7.8	A	8.9	A	4.8	A	12.7	B	-	-
16	Powhatan St and Slaters Ln	7.0	A	23.5	C	-	-	4.5	A	4.6	A
17	Slaters Ln and U.S. Route 1	14.2	B	15.7	B	18.1	B	7.8	A	15.9	B
18	W. Abingdon Dr and Slaters Ln	46.4	D	-	-	28.0	C	-	-	197.3	F
19	George Washington Pkwy and Slaters Ln			25.7	C	16.6	B	-	-	-	-
20	E. Abingdon and Slaters Ln			33.5	C	-	-	43.7	D	-	-

Note: Delay is seconds/vehicle.

Table C-8: Vehicle Delay and LOS – 2016 Build Alternatives PM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	38.7	D	37.8	D	39.7	D	47.4	D	35.4	D
2	S. Glebe Rd and Potomac Ave	6.8	A	3.6	A	4.1	A	-	-	19.5	B
3	Shopping Center north Entrance and U.S. Route 1	13.7	B	9.2	A	14.7	B	19.6	B	45.7	D
4	E. Reed Ave and U.S. Route 1	34.8	C	20.4	C	44.0	D	34.4	C	42.9	D
5	E. Reed Ave and Potomac Ave	5.0	A	3.5	A	3.9	A	-	-	12.9	B
6	Evans Ln and Potomac Ave	0.3	A	0.4	A	0.1	A	13.3	B	-	-
7	E. Glebe Rd and U.S. Route 1	23.6	C	18.6	B	20.7	C	36.1	D	56.4	E
8	E. Glebe Rd and Potomac Ave	7.9	A	5.6	A	6.0	A	-	-	19.3	B
9	Swann Ave and U.S. Route 1	10.2	B	17.1	B	2.0	A	66.5	E	67.5	E
10	Swann Ave and Potomac Ave	3.7	A	0.0	A	2.7	A	-	-	10.1	B
11	E. Custis Ave and U.S. Route 1	5.7	A	2.9	A	2.2	A	62.4	E	71.1	E
12	E. Howell Ave and U.S. Route 1	5.6	A	5.2	A	2.0	A	64.1	E	62.9	E
13	Potomac Ave and U.S. Route 1	9.8	A	6.5	A	2.9	A	47.4	D	-	-
14	Main Line Blvd and Potomac Ave	12.2	B	16.2	B	-	-	9.2	A	11.3	B
15	Portner Rd/Potomac Greens Dr and Slaters Ln	6.8	A	5.5	A	6.0	A	17.2	B	-	-
16	Powhatan St and Slaters Ln	8.4	A	24.4	C	-	-	8.2	A	4.9	A
17	Slaters Ln and U.S. Route 1	9.0	A	16.7	B	18.1	B	7.3	A	8.2	A
18	W. Abingdon Dr and Slaters Ln	32.1	C	-	-	55.5	E	-	-	59.2	E
19	George Washington Pkwy and Slaters Ln			19.0	B	21.0	C	-	-	-	-
20	E. Abingdon and Slaters Ln			41.3	D	-	-	47.0	D	-	-

Note: Delay is seconds/vehicle.

Table C-9: Vehicle Delay and LOS – 2040 No Build Alternative AM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	36.0	D	36.9	D	28.5	C	34.4	C	41.4	D
2	S. Glebe Rd and Potomac Ave	6.9	A	3.0	A	5.0	A	-	-	23.6	C
3	Shopping Center north Entrance and U.S. Route 1	2.3	A	1.9	A	2.2	A	-	-	46.6	D
4	E. Reed Ave and U.S. Route 1	20.8	C	17.2	B	17.0	B	54.9	D	54.9	D
5	E. Reed Ave and Potomac Ave	2.6	A	2.0	A	2.2	A	-	-	11.1	B
6	Evans Ln and Potomac Ave	0.3	A	0.3	A	0.3	A	-	-	13.7	B
7	E. Glebe Rd and U.S. Route 1	64.3	E	42.3	D	60.7	E	31.9	C	191.1	F
8	E. Glebe Rd and Potomac Ave	8.7	A	6.6	A	7.1	A	-	-	20.6	C
9	Swann Ave and U.S. Route 1	27.2	C	38.5	D	7.2	A	66.7	E	85.4	F
10	Swann Ave and Potomac Ave	4.2	A	3.2	A	2.9	A	-	-	10.4	B
11	E. Custis Ave and U.S. Route 1	14.4	B	9.9	A	15.5	B	63.1	E	66.8	E
12	E. Howell Ave and U.S. Route 1	10.1	B	11.2	B	4.9	A	63.6	E	61.2	E
13	Potomac Ave and U.S. Route 1	14.6	B	16.9	B	1.8	A	50.0	D	-	-
14	Main Line Blvd and Potomac Ave	8.9	A	11.9	B	-	-	7.1	A	7.0	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	11.5	B	14.5	B	5.4	A	14.8	B	-	-
16	Powhatan St and Slaters Ln	7.1	A	23.6	C	-	-	4.5	A	4.9	A
17	Slaters Ln and U.S. Route 1	16.8	B	15.9	B	18.5	B	7.8	A	21.4	C
18	W. Abingdon Dr and Slaters Ln	48.8	D	-	-	27.5	C	-	-	235.3	F
19	George Washington Pkwy and Slaters Ln			25.2	C	16.4	B	-	-	-	-
20	E. Abingdon and Slaters Ln			25.7	C	-	-	52.4	D	-	-

Note: Delay is seconds/vehicle.

Table C-10: Vehicle Delay and LOS – 2040 No Build Alternative PM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	42.3	D	32.1	C	50.2	D	50.7	D	37.8	D
2	S. Glebe Rd and Potomac Ave	8.8	A	4.2	A	22.0	C	-	-	2.9	A
3	Shopping Center north Entrance and U.S. Route 1	27.2	C	4.9	A	41.6	D	-	-	50.4	D
4	E. Reed Ave and U.S. Route 1	53.0	D	21.4	C	75.5	E	46.6	D	56.0	E
5	E. Reed Ave and Potomac Ave	5.3	A	4.1	A	4.0	A	-	-	12.3	B
6	Evans Ln and Potomac Ave	2.1	A	1.7	A	1.5	A	11.2	B	11.2	B
7	E. Glebe Rd and U.S. Route 1	65.7	E	78.6	E	47.5	D	52.3	D	124.5	F
8	E. Glebe Rd and Potomac Ave	9.7	A	7.8	A	9.0	A	-	-	20.8	C
9	Swann Ave and U.S. Route 1	22.4	C	43.2	D	5.0	A	2.3	A	66.9	E
10	Swann Ave and Potomac Ave	6.7	A	5.1	A	5.3	A	-	-	11.3	B
11	E. Custis Ave and U.S. Route 1	11.6	B	13.2	B	6.0	A	91.9	F	66.3	E
12	E. Howell Ave and U.S. Route 1	12.6	B	18.9	B	2.9	A	55.3	E	57.3	E
13	Potomac Ave and U.S. Route 1	15.9	B	17.8	B	3.7	A	53.9	D	-	-
14	Main Line Blvd and Potomac Ave	14.3	B	21.3	C	-	-	14.8	B	10.2	B
15	Portner Rd/Potomac Greens Dr and Slaters Ln	11.4	B	12.7	B	8.3	A	22.4	C	-	-
16	Powhatan St and Slaters Ln	14.7	B	33.8	C	-	-	19.9	B	7.3	A
17	Slaters Ln and U.S. Route 1	16.7	B	18.6	B	21.8	C	18.1	B	12.8	B
18	W. Abingdon Dr and Slaters Ln	32.7	C	-	-	58.1	E	-	-	58.9	E
19	George Washington Pkwy and Slaters Ln			19.3	B	21.3	C	-	-	-	-
20	E. Abingdon and Slaters Ln			43.5	D	-	-	58.5	E	-	-

Note: Delay is seconds/vehicle.

Table C-11: Vehicle Delay and LOS – 2040 Build Alternatives AM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	35.5	D	37.5	D	27.9	C	28.2	C	39.7	D
2	S. Glebe Rd and Potomac Ave	6.8	A	3.2	A	4.8	A	-	-	22.7	C
3	Shopping Center north Entrance and U.S. Route 1	2.2	A	1.8	A	2.0	A	-	-	45.9	D
4	E. Reed Ave and U.S. Route 1	22.7	C	19.4	B	18.4	B	56.9	E	55.8	E
5	E. Reed Ave and Potomac Ave	2.7	A	2.0	A	2.5	A	-	-	11.9	B
6	Evans Ln and Potomac Ave	1.4	A	1.2	A	0.9	A	-	-	11.2	B
7	E. Glebe Rd and U.S. Route 1	70.7	E	42.4	D	77.0	E	31.9	C	205.9	F
8	E. Glebe Rd and Potomac Ave	10.4	B	7.6	A	8.9	A	-	-	21.7	C
9	Swann Ave and U.S. Route 1	23.9	C	33.0	C	5.8	A	67.0	E	87.7	F
10	Swann Ave and Potomac Ave	4.0	A	3.3	A	2.7	A	-	-	10.2	B
11	E. Custis Ave and U.S. Route 1	13.3	B	8.2	A	14.7	B	60.5	E	67.0	E
12	E. Howell Ave and U.S. Route 1	9.7	A	9.9	A	5.2	A	63.8	E	60.6	E
13	Potomac Ave and U.S. Route 1	13.3	B	15.0	B	1.7	A	46.7	D	-	-
14	Main Line Blvd and Potomac Ave	9.1	A	12.0	B	-	-	7.0	A	7.3	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	9.5	A	11.3	B	5.3	A	14.5	B	-	-
16	Powhatan St and Slaters Ln	6.9	A	23.5	C	-	-	4.6	A	4.6	A
17	Slaters Ln and U.S. Route 1	14.6	B	15.8	B	18.3	B	7.7	A	16.7	B
18	W. Abingdon Dr and Slaters Ln	47.7	D	-	-	27.3	C	-	-	217.4	F
19	George Washington Pkwy and Slaters Ln			25.5	C	16.5	B	-	-	-	-
20	E. Abingdon and Slaters Ln			29.7	C	-	-	53.2	D	-	-

Note: Delay is seconds/vehicle.

Table C-12: Vehicle Delay and LOS – 2040 Build Alternatives PM Peak

No.	Intersection	Intersection		Northbound		Southbound		Westbound		Eastbound	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	S. Glebe Rd and U.S. Route 1	37.4	D	31.5	C	40.6	D	51.1	D	35.4	D
2	S. Glebe Rd and Potomac Ave	8.9	A	4.0	A	22.4	C	-	-	3.4	A
3	Shopping Center north Entrance and U.S. Route 1	20.3	C	5.4	A	29.3	C	-	-	48.5	D
4	E. Reed Ave and U.S. Route 1	47.9	D	20.1	C	68.8	E	39.9	D	32.2	C
5	E. Reed Ave and Potomac Ave	5.7	A	4.5	A	4.3	A	-	-	12.0	B
6	Evans Ln and Potomac Ave	1.6	A	1.6	A	1.1	A	11.8	B	11.0	B
7	E. Glebe Rd and U.S. Route 1	74.2	E	78.5	E	49.6	D	45.6	D	208.3	F
8	E. Glebe Rd and Potomac Ave	13.0	B	9.6	A	12.8	B	-	-	24.1	C
9	Swann Ave and U.S. Route 1	23.8	C	42.5	D	5.2	A	66.6	E	64.1	E
10	Swann Ave and Potomac Ave	7.1	A	5.3	A	5.6	A	-	-	12.3	B
11	E. Custis Ave and U.S. Route 1	11.1	B	10.2	B	5.2	A	107.0	F	68.1	E
12	E. Howell Ave and U.S. Route 1	10.9	B	14.2	B	2.9	A	56.9	E	55.4	E
13	Potomac Ave and U.S. Route 1	15.7	B	15.7	B	3.8	A	49.1	D	-	-
14	Main Line Blvd and Potomac Ave	10.2	B	16.3	B	-	-	7.1	A	9.2	A
15	Portner Rd/Potomac Greens Dr and Slaters Ln	11.5	B	12.7	B	8.2	A	22.9	C	-	-
16	Powhatan St and Slaters Ln	14.8	B	35.9	D	-	-	19.7	B	7.4	A
17	Slaters Ln and U.S. Route 1	16.0	B	18.4	B	21.7	C	17.3	B	12.1	B
18	W. Abingdon Dr and Slaters Ln	32.7	C	-	-	57.8	E	-	-	57.3	E
19	George Washington Pkwy and Slaters Ln			19.4	B	21.4	C	-	-	-	-
20	E. Abingdon and Slaters Ln			44.6	D	-	-	57.1	E	-	-

Note: Delay is seconds/vehicle.

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APPENDIX D:

Detailed 2016 Metrorail Operating Plans

WMATA 2016 METRORAIL OPERATING PLAN

DRAFT

Dulles Phase 1 Plan: 7-min headway / 900 PVR

MONDAY - THURSDAY

FROM	TO		Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	SH	TR	BS	EV	EL	AVERAGE CONSIST PK	SH	TR	BS	EV	EL	TRAINS Peak	Base	CARS Peak	Total	ANNUAL REVENUE Car-Miles	Train-Hrs	Car-Hrs
Shady Grove	Glenmont	(peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	6,863,000	34,330	249,900
Grosvenor-Strathmore	Silver Spring	(peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	2,092,000	14,010	84,060
Shady Grove	Silver Spring	(peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	1,710,000	10,210	61,250
Shady Grove	Glenmont	(offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	4,336,000	26,700	160,200
Shady Grove	Silver Spring	(offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	1,742,000	10,950	65,670
RED LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**16,743,000**	**96,200**	**621,080**
Huntington	Mt Vernon Sq/7th St		2	10.6	21.3	25.0	12.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	1,475,000	10,620	72,620
Franconia-Springfield	Greenbelt		2	28.7	57.4	60.0	5.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	1,749,000	10,620	63,730
Huntington	Fort Totten		2	14.9	29.9	36.0	0.0	72	24.9	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	6	-	-	2,193,000	14,690	88,120
YELLOW LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**18**	**6**	**116**	**144**	**5,417,000**	**35,930**	**224,470**
Branch Ave	Greenbelt		2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	6,661,000	40,090	255,360
Branch Ave	Greenbelt		1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	109,000	800	4,780
GREEN LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**6,770,000**	**40,890**	**260,140**
Franconia-Springfield	Largo Town Center		2	29.8	59.5	64.0	11.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	1,995,000	11,800	77,940
Franconia-Springfield	Largo Town Center		2	29.8	59.5	64.0	16.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	4,371,000	29,370	176,230
BLUE LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**6,366,000**	**41,170**	**254,170**
Vienna/Fairfax	New Carrollton		2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	7,728,000	48,110	308,090
West Falls Church	Largo Town Center		2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	1,303,000	9,440	56,650
ORANGE LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**9,031,000**	**57,550**	**364,740**
Wiehle Avenue	Stadium-Armory		2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	6,580,000	48,110	290,310
SILVER LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**6,580,000**	**48,110**	**290,310**
MONDAY-THURSDAY TOTAL							11.0	9.5%		Potomac Passengers/Car =						-	-					**129**	**71**	**858**	**1066**	**50,907,000**	**319,850**	**2,014,910**

FRIDAY

FROM	TO		Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	SH	TR	BS	EV	EL	AVERAGE CONSIST PK	SH	TR	BS	EV	EL	TRAINS Peak	Base	CARS Peak	Total	ANNUAL REVENUE Car-Miles	Train-Hrs	Car-Hrs
Shady Grove	Glenmont	(peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	1,793,000	8,970	65,300
Grosvenor-Strathmore	Silver Spring	(peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	547,000	3,660	21,960
Shady Grove	Silver Spring	(peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	447,000	2,670	16,010
Shady Grove	Glenmont	(offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	1,370,000	8,430	50,600
Shady Grove	Silver Spring	(offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	455,000	2,860	17,160
RED LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**4,612,000**	**26,590**	**171,030**
Huntington	Mt Vernon Sq/7th St		2	10.6	21.3	25.0	12.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	385,000	2,780	18,980
Franconia-Springfield	Greenbelt		2	28.7	57.4	60.0	5.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	457,000	2,780	16,650
Huntington	Fort Totten		2	14.9	29.9	36.0	0.0	72	24.9	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	6	-	-	643,000	4,310	25,830
YELLOW LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**18**	**6**	**116**	**144**	**1,485,000**	**9,870**	**61,460**
Branch Ave	Greenbelt		2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	1,847,000	11,160	70,810
Branch Ave	Greenbelt		1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	28,000	210	1,250
GREEN LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**1,875,000**	**11,370**	**72,060**
Franconia-Springfield	Largo Town Center		2	29.8	59.5	64.0	11.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	521,000	3,080	20,370
Franconia-Springfield	Largo Town Center		2	29.8	59.5	64.0	16.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	1,281,000	8,610	51,670
BLUE LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**1,802,000**	**11,690**	**72,040**
Vienna/Fairfax	New Carrollton		2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	2,142,000	13,390	85,400
West Falls Church	Largo Town Center		2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	341,000	2,470	14,800
ORANGE LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**2,483,000**	**15,860**	**100,200**
Wiehle Avenue	Stadium-Armory		2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	1,830,000	13,390	80,760
SILVER LINE TOTAL										**Maximum Passengers/Car =**						**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**1,830,000**	**13,390**	**80,760**
FRIDAY TOTAL							11.0	9.5%		Potomac Passengers/Car =						-	-					**129**	**71**	**858**	**1066**	**14,087,000**	**88,770**	**557,550**

WMATA 2016 METRORAIL OPERATING PLAN

DRAFT

Dulles Phase 1 Plan: 7-min headway / 900 PVR

SATURDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	18.0	144	26.3			12	12	15	15			6	6	6	6		12		72	2,000,000	12,670	76,000
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	0.0	108	29.5			n/a	12	15	n/a			6	6	6	6		9		54	1,061,000	6,000	36,020
Huntington	Fort Totten	2	14.9	29.9	36.0	12.0	84	21.3			15	12	15	20			6	6	6	6		7		42	873,000	6,820	40,920
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	12	15	20			6	6	6	6		10		60	1,330,000	9,740	58,460
Franconia-Springfield	Largo Town Center	2	29.8	59.5	64.0	16.0	144	24.8			15	12	15	20			6	6	6	6		12		72	1,740,000	11,690	70,160
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	18.0	132	23.9			15	12	15	20			6	6	6	6		11		66	1,535,000	10,720	64,310
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	18.0	132	21.6			15	12	15	20			6	6	6	6		11		66	1,387,000	10,720	64,310
SATURDAY TOTAL																						**72**		**432**	**9,926,000**	**68,360**	**410,180**

SUNDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	24.0	150	25.3			12	15	15	15			6	6	6	6		10		60	1,501,000	9,900	59,420
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	27.0	135	23.6			n/a	15	15	n/a			6	6	6	6		9		54	871,000	6,160	36,940
Huntington	Fort Totten	2	14.9	29.9	36.0	18.0	90	19.9			15	15	15	20			6	6	6	6		6		36	684,000	5,730	34,370
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	15	15	20			6	6	6	6		8		48	1,043,000	7,640	45,830
Franconia-Springfield	Largo Town Center	2	29.8	59.5	64.0	22.0	150	23.8			15	15	15	20			6	6	6	6		10		60	1,364,000	9,550	57,290
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	21.0	135	23.3			15	15	15	20			6	6	6	6		9		54	1,203,000	8,590	51,560
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	21.0	135	21.1			15	15	15	20			6	6	6	6		9		54	1,087,000	8,590	51,560
SUNDAY TOTAL																						**61**		**366**	**7,753,000**	**56,160**	**336,970**

NOTES:

PK - Peak; SH - Peak Shoulder; TR - Transition; BS - Base; EV - Evening; EL - Early/Late

Peak Hour, Peak Direction Potomac Trains at Rosslyn = **26**

Shoulder Hour, Peak Dir.Potomac Trains at Rosslyn = **26**

Peak Hour, Peak Direction Potomac Trains at 14th St. = **13**

Shoulder Hour, Peak Dir.Potomac Trains at 14th St. = **13**

Total Scheduled	858	1,066	82,673,000	533,140	3,319,610
Gap	42	52	n/a	n/a	n/a
Contingency	n/a	n/a	4,151,623	26,773	166,702
Special Events	n/a	n/a	2,399,687	15,475	96,356
Total Revenue	900	1,118	89,224,311	575,388	3,582,668
Non-Revenue	n/a	n/a	1,747,385	24,408	70,164
ANNUAL TOTAL	900	1,118	90,971,696	599,796	3,652,832

WMATA 2016 METRORAIL OPERATING PLAN

Potomac Yard Alt A (incl Dulles Phase 1 / 900 PVR)

DRAFT

MONDAY - THURSDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	SH	TR	BS	EV	EL	AVERAGE CONSIST PK	SH	TR	BS	EV	EL	TRAINS Peak	Base	CARS Peak	Total	ANNUAL REVENUE Car-Miles	Train-Hrs	Car-Hrs
Shady Grove	Glenmont (peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	6,863,000	34,330	249,900
Grosvenor-Strathmore	Silver Spring (peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	2,092,000	14,010	84,060
Shady Grove	Silver Spring (peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	1,710,000	10,210	61,250
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	4,336,000	26,700	160,200
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	1,742,000	10,950	65,670
RED LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**16,743,000**	**96,200**	**621,080**
Huntington	Mt Vernon Sq/7th St	2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	1,475,000	10,620	72,620
Franconia-Springfield	Greenbelt	2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	1,749,000	10,620	63,730
Huntington	Fort Totten	2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	2,193,000	17,130	102,800
YELLOW LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**5,417,000**	**38,370**	**239,150**
Branch Ave	Greenbelt	2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	6,661,000	40,090	255,360
Branch Ave	Greenbelt	1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	109,000	800	4,780
GREEN LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**6,770,000**	**40,890**	**260,140**
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	1,995,000	11,800	77,940
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	4,371,000	29,370	176,230
BLUE LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**6,366,000**	**41,170**	**254,170**
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	7,728,000	48,110	308,090
West Falls Church	Largo Town Center	2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	1,303,000	9,440	56,650
ORANGE LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**9,031,000**	**57,550**	**364,740**
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	6,580,000	48,110	290,310
SILVER LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**6,580,000**	**48,110**	**290,310**
MONDAY-THURSDAY TOTAL						10.4	8.9%							Potomac Passengers/Car =	-	-					**129**	**72**	**858**	**1066**	**50,907,000**	**322,290**	**2,029,590**

FRIDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	SH	TR	BS	EV	EL	AVERAGE CONSIST PK	SH	TR	BS	EV	EL	TRAINS Peak	Base	CARS Peak	Total	ANNUAL REVENUE Car-Miles	Train-Hrs	Car-Hrs
Shady Grove	Glenmont (peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	1,793,000	8,970	65,300
Grosvenor-Strathmore	Silver Spring (peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	547,000	3,660	21,960
Shady Grove	Silver Spring (peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	447,000	2,670	16,010
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	1,370,000	8,430	50,600
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	455,000	2,860	17,160
RED LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**4,612,000**	**26,590**	**171,030**
Huntington	Mt Vernon Sq/7th St	2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	385,000	2,780	18,980
Franconia-Springfield	Greenbelt	2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	457,000	2,780	16,650
Huntington	Fort Totten	2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	643,000	5,020	30,140
YELLOW LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**1,485,000**	**10,580**	**65,770**
Branch Ave	Greenbelt	2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	1,847,000	11,160	70,810
Branch Ave	Greenbelt	1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	28,000	210	1,250
GREEN LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**1,875,000**	**11,370**	**72,060**
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	521,000	3,080	20,370
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	1,281,000	8,610	51,670
BLUE LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**1,802,000**	**11,690**	**72,040**
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	2,142,000	13,390	85,400
West Falls Church	Largo Town Center	2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	341,000	2,470	14,800
ORANGE LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**2,483,000**	**15,860**	**100,200**
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	1,830,000	13,390	80,760
SILVER LINE TOTAL														**Maximum Passengers/Car =**	**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**1,830,000**	**13,390**	**80,760**
FRIDAY TOTAL						10.4	8.9%							Potomac Passengers/Car =	-	-					**129**	**72**	**858**	**1066**	**14,087,000**	**89,480**	**561,860**

SATURDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	18.0	144	26.3			12	12	15	15			6	6	6	6		12		72	2,000,000	12,670	76,000
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	0.0	108	29.5			n/a	12	15	n/a			6	6	6	6		9		54	1,061,000	6,000	36,020
Huntington	Fort Totten	2	14.9	29.9	37.0	22.0	96	18.7			15	12	15	20			6	6	6	6		8		48	873,000	7,800	46,770
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	12	15	20			6	6	6	6		10		60	1,330,000	9,740	58,460
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8			15	12	15	20			6	6	6	6		12		72	1,740,000	11,690	70,160
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	18.0	132	23.9			15	12	15	20			6	6	6	6		11		66	1,535,000	10,720	64,310
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	18.0	132	21.6			15	12	15	20			6	6	6	6		11		66	1,387,000	10,720	64,310
SATURDAY TOTAL																						73		438	9,926,000	69,340	416,030

SUNDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	24.0	150	25.3			12	15	15	15			6	6	6	6		10		60	1,501,000	9,900	59,420
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	27.0	135	23.6			n/a	15	15	n/a			6	6	6	6		9		54	871,000	6,160	36,940
Huntington	Fort Totten	2	14.9	29.9	37.0	16.0	90	19.9			15	15	15	20			6	6	6	6		6		36	684,000	5,730	34,370
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	15	15	20			6	6	6	6		8		48	1,043,000	7,640	45,830
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	20.0	150	23.8			15	15	15	20			6	6	6	6		10		60	1,364,000	9,550	57,290
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	21.0	135	23.3			15	15	15	20			6	6	6	6		9		54	1,203,000	8,590	51,560
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	21.0	135	21.1			15	15	15	20			6	6	6	6		9		54	1,087,000	8,590	51,560
SUNDAY TOTAL																						61		366	7,753,000	56,160	336,970

NOTES:

PK - Peak; SH - Peak Shoulder; TR - Transition; BS - Base; EV - Evening; EL - Early/Late

Peak Hour, Peak Direction Potomac Trains at Rosslyn = **26**

Shoulder Hour, Peak Dir.Potomac Trains at Rosslyn = **26**

Peak Hour, Peak Direction Potomac Trains at 14th St. = **13**

Shoulder Hour, Peak Dir.Potomac Trains at 14th St. = **13**

Total Scheduled	858	1,066	82,673,000	537,270	3,344,450
Gap	42	52	n/a	n/a	n/a
Contingency	n/a	n/a	4,151,623	26,980	167,950
Special Events	n/a	n/a	2,399,687	15,595	97,077
Total Revenue	900	1,118	89,224,311	579,845	3,609,476
Non-Revenue	n/a	n/a	1,747,385	24,597	70,689
ANNUAL TOTAL	900	1,118	90,971,696	604,442	3,680,165

WMATA 2016 METRORAIL OPERATING PLAN

Potomac Yard Alt B (incl Dulles Phase 1 / 900 PVR)

DRAFT

MONDAY - THURSDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	AVERAGE CONSIST PK	AVERAGE CONSIST SH	AVERAGE CONSIST TR	AVERAGE CONSIST BS	AVERAGE CONSIST EV	AVERAGE CONSIST EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	6,863,000	34,330	249,900
Grosvenor-Strathmore	Silver Spring (peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	2,092,000	14,010	84,060
Shady Grove	Silver Spring (peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	1,710,000	10,210	61,250
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	4,336,000	26,700	160,200
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	1,742,000	10,950	65,670
RED LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**16,743,000**	**96,200**	**621,080**
Huntington	Mt Vernon Sq/7th St	2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	1,475,000	10,620	72,620
Franconia-Springfield	Greenbelt	2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	1,749,000	10,620	63,730
Huntington	Fort Totten	2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	2,192,000	17,130	102,800
YELLOW LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**5,416,000**	**38,370**	**239,150**
Branch Ave	Greenbelt	2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	6,661,000	40,090	255,360
Branch Ave	Greenbelt	1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	109,000	800	4,780
GREEN LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**6,770,000**	**40,890**	**260,140**
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	1,995,000	11,800	77,940
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	4,370,000	29,370	176,230
BLUE LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**6,365,000**	**41,170**	**254,170**
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	7,728,000	48,110	308,090
West Falls Church	Largo Town Center	2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	1,303,000	9,440	56,650
ORANGE LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**9,031,000**	**57,550**	**364,740**
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	6,580,000	48,110	290,310
SILVER LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**6,580,000**	**48,110**	**290,310**
MONDAY-THURSDAY TOTAL						10.4	8.9%					Potomac Passengers/Car =			-	-					**129**	**72**	**858**	**1066**	**50,905,000**	**322,290**	**2,029,590**

FRIDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	AVERAGE CONSIST PK	AVERAGE CONSIST SH	AVERAGE CONSIST TR	AVERAGE CONSIST BS	AVERAGE CONSIST EV	AVERAGE CONSIST EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	1,793,000	8,970	65,300
Grosvenor-Strathmore	Silver Spring (peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	547,000	3,660	21,960
Shady Grove	Silver Spring (peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	447,000	2,670	16,010
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	1,370,000	8,430	50,600
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	455,000	2,860	17,160
RED LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**4,612,000**	**26,590**	**171,030**
Huntington	Mt Vernon Sq/7th St	2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	385,000	2,780	18,980
Franconia-Springfield	Greenbelt	2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	457,000	2,780	16,650
Huntington	Fort Totten	2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	643,000	5,020	30,140
YELLOW LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**1,485,000**	**10,580**	**65,770**
Branch Ave	Greenbelt	2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	1,847,000	11,160	70,810
Branch Ave	Greenbelt	1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	28,000	210	1,250
GREEN LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**1,875,000**	**11,370**	**72,060**
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	521,000	3,080	20,370
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	1,281,000	8,610	51,670
BLUE LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**1,802,000**	**11,690**	**72,040**
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	2,142,000	13,390	85,400
West Falls Church	Largo Town Center	2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	341,000	2,470	14,800
ORANGE LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**2,483,000**	**15,860**	**100,200**
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	1,830,000	13,390	80,760
SILVER LINE TOTAL												**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**1,830,000**	**13,390**	**80,760**
FRIDAY TOTAL						10.4	8.9%					Potomac Passengers/Car =			-	-					**129**	**72**	**858**	**1066**	**14,087,000**	**89,480**	**561,860**

WMATA 2016 METRORAIL OPERATING PLAN

Potomac Yard Alt B (incl Dulles Phase 1 / 900 PVR)

DRAFT

SATURDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	18.0	144	26.3			12	12	15	15			6	6	6	6		12		72	2,000,000	12,670	76,000
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	0.0	108	29.5			n/a	12	15	n/a			6	6	6	6		9		54	1,061,000	6,000	36,020
Huntington	Fort Totten	2	14.9	29.9	37.0	22.0	96	18.7			15	12	15	20			6	6	6	6		8		48	873,000	7,800	46,770
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	12	15	20			6	6	6	6		10		60	1,330,000	9,740	58,460
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8			15	12	15	20			6	6	6	6		12		72	1,740,000	11,690	70,160
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	18.0	132	23.9			15	12	15	20			6	6	6	6		11		66	1,535,000	10,720	64,310
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	18.0	132	21.6			15	12	15	20			6	6	6	6		11		66	1,387,000	10,720	64,310
SATURDAY TOTAL																						**73**		**438**	**9,926,000**	**69,340**	**416,030**

SUNDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	24.0	150	25.3			12	15	15	15			6	6	6	6		10		60	1,501,000	9,900	59,420
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	27.0	135	23.6			n/a	15	15	n/a			6	6	6	6		9		54	871,000	6,160	36,940
Huntington	Fort Totten	2	14.9	29.9	37.0	16.0	90	19.9			15	15	15	20			6	6	6	6		6		36	684,000	5,730	34,370
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	15	15	20			6	6	6	6		8		48	1,043,000	7,640	45,830
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	20.0	150	23.8			15	15	15	20			6	6	6	6		10		60	1,364,000	9,550	57,290
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	21.0	135	23.3			15	15	15	20			6	6	6	6		9		54	1,203,000	8,590	51,560
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	21.0	135	21.1			15	15	15	20			6	6	6	6		9		54	1,087,000	8,590	51,560
SUNDAY TOTAL																						**61**		**366**	**7,753,000**	**56,160**	**336,970**

NOTES:

PK - Peak; SH - Peak Shoulder; TR - Transition; BS - Base; EV - Evening; EL - Early/Late

Peak Hour, Peak Direction Potomac Trains at Rosslyn = **26**

Shoulder Hour, Peak Dir.Potomac Trains at Rosslyn = **26**

Peak Hour, Peak Direction Potomac Trains at 14th St. = **13**

Shoulder Hour, Peak Dir.Potomac Trains at 14th St. = **13**

Travel Demand Model:

Forecast Year: 2016

Total Scheduled	858	1,066	82,671,000	537,270	3,344,450
Gap	42	52	n/a	n/a	n/a
Contingency	n/a	n/a	4,151,523	26,980	167,950
Special Events	n/a	n/a	2,399,629	15,595	97,077
Total Revenue	900	1,118	89,222,152	579,845	3,609,476
Non-Revenue	n/a	n/a	1,747,343	24,597	70,689
ANNUAL TOTAL	900	1,118	90,969,495	604,442	3,680,165
Change from: '2016 NB'	*0*	*0*	*(2,201)*	*4,646*	*27,333*

WMATA 2016 METRORAIL OPERATING PLAN

Potomac Yard Alt D (incl Dulles Phase 1 / 900 PVR)

DRAFT

MONDAY - THURSDAY

FROM	TO		Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	AVERAGE CONSIST PK	AVERAGE CONSIST SH	AVERAGE CONSIST TR	AVERAGE CONSIST BS	AVERAGE CONSIST EV	AVERAGE CONSIST EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont	(peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	6,863,000	34,330	249,900
Grosvenor-Strathmore	Silver Spring	(peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	2,092,000	14,010	84,060
Shady Grove	Silver Spring	(peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	1,710,000	10,210	61,250
Shady Grove	Glenmont	(offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	4,336,000	26,700	160,200
Shady Grove	Silver Spring	(offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	1,742,000	10,950	65,670
RED LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**16,743,000**	**96,200**	**621,080**
Huntington	Mt Vernon Sq/7th St		2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	1,476,000	10,620	72,620
Franconia-Springfield	Greenbelt		2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	1,749,000	10,620	63,730
Huntington	Fort Totten		2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	2,193,000	17,130	102,800
YELLOW LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**5,418,000**	**38,370**	**239,150**
Branch Ave	Greenbelt		2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	6,661,000	40,090	255,360
Branch Ave	Greenbelt		1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	109,000	800	4,780
GREEN LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**6,770,000**	**40,890**	**260,140**
Franconia-Springfield	Largo Town Center		2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	1,995,000	11,800	77,940
Franconia-Springfield	Largo Town Center		2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	4,371,000	29,370	176,230
BLUE LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**6,366,000**	**41,170**	**254,170**
Vienna/Fairfax	New Carrollton		2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	7,728,000	48,110	308,090
West Falls Church	Largo Town Center		2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	1,303,000	9,440	56,650
ORANGE LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**9,031,000**	**57,550**	**364,740**
Wiehle Avenue	Stadium-Armory		2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	6,580,000	48,110	290,310
SILVER LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**6,580,000**	**48,110**	**290,310**
MONDAY-THURSDAY TOTAL							10.4	8.9%					Potomac Passengers/Car =			-	-					**129**	**72**	**858**	**1066**	**50,908,000**	**322,290**	**2,029,590**

FRIDAY

FROM	TO		Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	AVERAGE CONSIST PK	AVERAGE CONSIST SH	AVERAGE CONSIST TR	AVERAGE CONSIST BS	AVERAGE CONSIST EV	AVERAGE CONSIST EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont	(peak)	2	31.6	63.2	65.0	8.0	138	27.5	6	6	6	-	-	-	7.6	7.6	6.0	-	-	-	23	-	180	224	1,793,000	8,970	65,300
Grosvenor-Strathmore	Silver Spring	(peak)	2	19.9	39.8	44.0	8.0	96	24.9	6	10	-	-	-	-	6.0	6.0	-	-	-	-	14	-	84	104	547,000	3,660	21,960
Shady Grove	Silver Spring	(peak)	2	26.5	53.0	57.0	0.0	114	27.9	-	20	6	-	-	-	-	6.0	6.0	-	-	-	3	-	18	22	447,000	2,670	16,010
Shady Grove	Glenmont	(offpeak)	2	31.6	63.2	63.0	14.0	140	27.1	-	-	-	12	10	15	-	-	-	6.0	6.0	6.0	-	12	-	-	1,370,000	8,430	50,600
Shady Grove	Silver Spring	(offpeak)	2	26.5	53.0	54.0	12.0	120	26.5	-	-	-	12	-	-	-	-	-	6.0	-	-	-	10	-	-	455,000	2,860	17,160
RED LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**40**	**22**	**282**	**350**	**4,612,000**	**26,590**	**171,030**
Huntington	Mt Vernon Sq/7th St		2	10.6	21.3	26.0	10.8	63	20.3	7	7	-	-	-	-	6.8	6.8	-	-	-	-	9	-	62	77	386,000	2,780	18,980
Franconia-Springfield	Greenbelt		2	28.7	57.4	61.0	3.6	126	27.4	14	14	-	-	-	-	6.0	6.0	-	-	-	-	9	-	54	67	457,000	2,780	16,650
Huntington	Fort Totten		2	14.9	29.9	37.0	10.0	84	21.3	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	7	-	-	643,000	5,020	30,140
YELLOW LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**7**	**116**	**144**	**1,486,000**	**10,580**	**65,770**
Branch Ave	Greenbelt		2	22.8	45.5	47.0	10.7	105	26.1	7	7	7.5	12	12	20	6.8	6.8	6.0	6.0	6.0	6.0	15	9	102	127	1,847,000	11,160	70,810
Branch Ave	Greenbelt		1	22.8	45.5	47.0	26.0	120	22.8	30	-	-	-	-	-	6.0	-	-	-	-	-	2	-	12	15	28,000	210	1,250
GREEN LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**17**	**9**	**114**	**142**	**1,875,000**	**11,370**	**72,060**
Franconia-Springfield	Largo Town Center		2	29.8	59.5	65.0	9.5	140	25.6	14	14	-	-	-	-	6.6	6.6	-	-	-	-	10	-	68	84	521,000	3,080	20,370
Franconia-Springfield	Largo Town Center		2	29.8	59.5	65.0	14.0	144	24.8	-	-	12	12	12	20	-	-	6.0	6.0	6.0	6.0	-	12	-	-	1,281,000	8,610	51,670
BLUE LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**10**	**12**	**68**	**84**	**1,802,000**	**11,690**	**72,040**
Vienna/Fairfax	New Carrollton		2	26.3	52.5	57.0	11.6	126	25.1	7	7	7.5	12	12	20	6.8	6.8	6.5	6.0	6.0	6.0	18	11	122	152	2,142,000	13,390	85,400
West Falls Church	Largo Town Center		2	21.4	42.8	51.0	9.6	112	23.0	14	14	-	-	-	-	6.0	6.0	-	-	-	-	8	-	48	60	341,000	2,470	14,800
ORANGE LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**26**	**11**	**170**	**212**	**2,483,000**	**15,860**	**100,200**
Wiehle Avenue	Stadium-Armory		2	23.7	47.4	57.0	11.6	126	22.7	7	7	7.5	12	12	20	6.0	6.0	6.5	6.0	6.0	6.0	18	11	108	134	1,830,000	13,390	80,760
SILVER LINE TOTAL													**Maximum Passengers/Car =**			**-**	**-**	**-**	**-**	**-**	**-**	**18**	**11**	**108**	**134**	**1,830,000**	**13,390**	**80,760**
FRIDAY TOTAL							10.4	8.9%					Potomac Passengers/Car =			-	-					**129**	**72**	**858**	**1066**	**14,088,000**	**89,480**	**561,860**

WMATA 2016 METRORAIL OPERATING PLAN

DRAFT

Potomac Yard Alt D (incl Dulles Phase 1 / 900 PVR)

SATURDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	18.0	144	26.3			12	12	15	15			6	6	6	6		12		72	2,000,000	12,670	76,000
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	0.0	108	29.5			n/a	12	15	n/a			6	6	6	6		9		54	1,061,000	6,000	36,020
Huntington	Fort Totten	2	14.9	29.9	37.0	22.0	96	18.7			15	12	15	20			6	6	6	6		8		48	873,000	7,800	46,770
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	12	15	20			6	6	6	6		10		60	1,330,000	9,740	58,460
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	14.0	144	24.8			15	12	15	20			6	6	6	6		12		72	1,740,000	11,690	70,160
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	18.0	132	23.9			15	12	15	20			6	6	6	6		11		66	1,535,000	10,720	64,310
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	18.0	132	21.6			15	12	15	20			6	6	6	6		11		66	1,387,000	10,720	64,310
SATURDAY TOTAL																						**73**		**438**	**9,926,000**	**69,340**	**416,030**

SUNDAY

FROM	TO	Dir	DISTANCE (MI) 1-Way	DISTANCE (MI) Loop	TIME (MIN) 1-Way	TIME (MIN) Layovr	TIME (MIN) Loop	SPEED (MPH)	HEADWAY (MIN) PK	HEADWAY (MIN) SH	HEADWAY (MIN) TR	HEADWAY (MIN) BS	HEADWAY (MIN) EV	HEADWAY (MIN) EL	CONSISTS PK	CONSISTS SH	CONSISTS TR	CONSISTS BS	CONSISTS EV	CONSISTS EL	TRAINS Peak	TRAINS Base	CARS Peak	CARS Total	ANNUAL REVENUE Car-Miles	ANNUAL REVENUE Train-Hrs	ANNUAL REVENUE Car-Hrs
Shady Grove	Glenmont (offpeak)	2	31.6	63.2	63.0	24.0	150	25.3			12	15	15	15			6	6	6	6		10		60	1,501,000	9,900	59,420
Shady Grove	Silver Spring (offpeak)	2	26.5	53.0	54.0	27.0	135	23.6			n/a	15	15	n/a			6	6	6	6		9		54	871,000	6,160	36,940
Huntington	Fort Totten	2	14.9	29.9	37.0	16.0	90	19.9			15	15	15	20			6	6	6	6		6		36	684,000	5,730	34,370
Branch Ave	Greenbelt	2	22.8	45.5	47.0	26.0	120	22.8			15	15	15	20			6	6	6	6		8		48	1,043,000	7,640	45,830
Franconia-Springfield	Largo Town Center	2	29.8	59.5	65.0	20.0	150	23.8			15	15	15	20			6	6	6	6		10		60	1,364,000	9,550	57,290
Vienna/Fairfax	New Carrollton	2	26.3	52.5	57.0	21.0	135	23.3			15	15	15	20			6	6	6	6		9		54	1,203,000	8,590	51,560
Wiehle Avenue	Stadium-Armory	2	23.7	47.4	57.0	21.0	135	21.1			15	15	15	20			6	6	6	6		9		54	1,087,000	8,590	51,560
SUNDAY TOTAL																						**61**		**366**	**7,753,000**	**56,160**	**336,970**

NOTES:

PK - Peak; SH - Peak Shoulder; TR - Transition; BS - Base; EV - Evening; EL - Early/Late

Peak Hour, Peak Direction Potomac Trains at Rosslyn =	**26**
Shoulder Hour, Peak Dir,Potomac Trains at Rosslyn =	**26**
Peak Hour, Peak Direction Potomac Trains at 14th St. =	**13**
Shoulder Hour, Peak Dir.Potomac Trains at 14th St. =	**13**

Travel Demand Model:

Forecast Year: 2016

Total Scheduled	858	1,066	82,675,000	537,270	3,344,450
Gap	42	52	n/a	n/a	n/a
Contingency	n/a	n/a	4,151,724	26,980	167,950
Special Events	n/a	n/a	2,399,745	15,595	97,077
Total Revenue	900	1,118	89,226,469	579,845	3,609,476
Non-Revenue	n/a	n/a	1,747,428	24,597	70,689
ANNUAL TOTAL	900	1,118	90,973,897	604,442	3,680,165
Change from: '2016 NB'	*0*	*0*	*2,201*	*4,646*	*27,333*

APPENDIX E:

2016 New Transit Routes

In opening year 2016, several new and modified bus routes are planned.

Figure E-1 shows the new Metrobus Route 9X, which is planned to follow the entire length of the CCPY Transitway between Pentagon City and Braddock Road Metrorail Stations.

Figure E-2 shows a modified Metrobus Route 9S, which will extend along the CCPY Transitway alignment on Potomac Avenue

Figure E-3 shows a modified DASH Route AT10, which will be aligned along the CCPY Transitway on Potomac Avenue.

Figure E-4 shows two new DASH Routes, AT9 and AT14, that will connect to Potomac Yard. AT9 will travel between Mark Center and Potomac Yard, while AT14 will travel between Landmark and Potomac Yard. Both will utilize the CCPY Transitway along Potomac Avenue.

Figure E-1: New Metrobus Route 9X

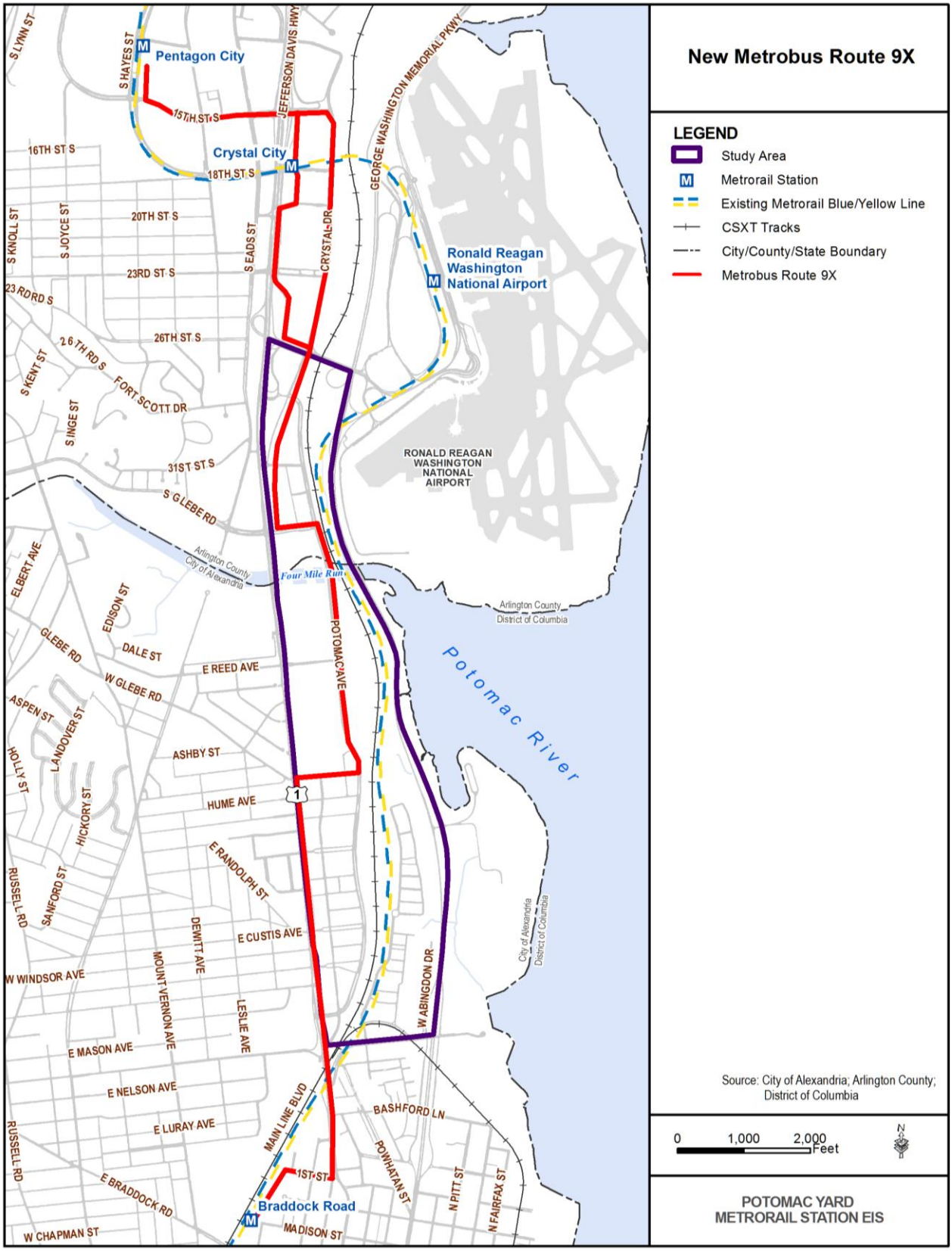


Figure E-2: Modified Metrobus Route 9S

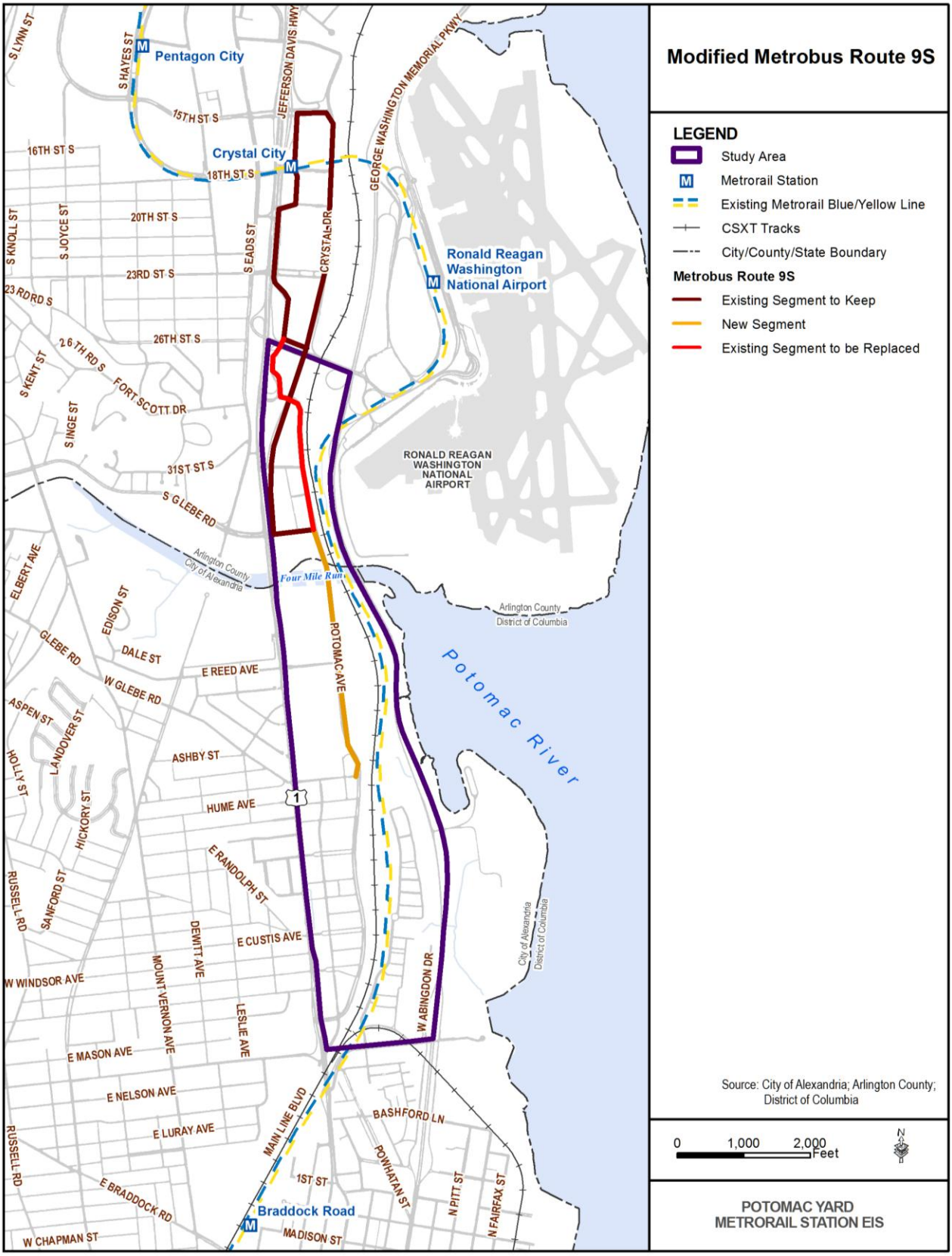


Figure E-3: Modified ATC Route AT10

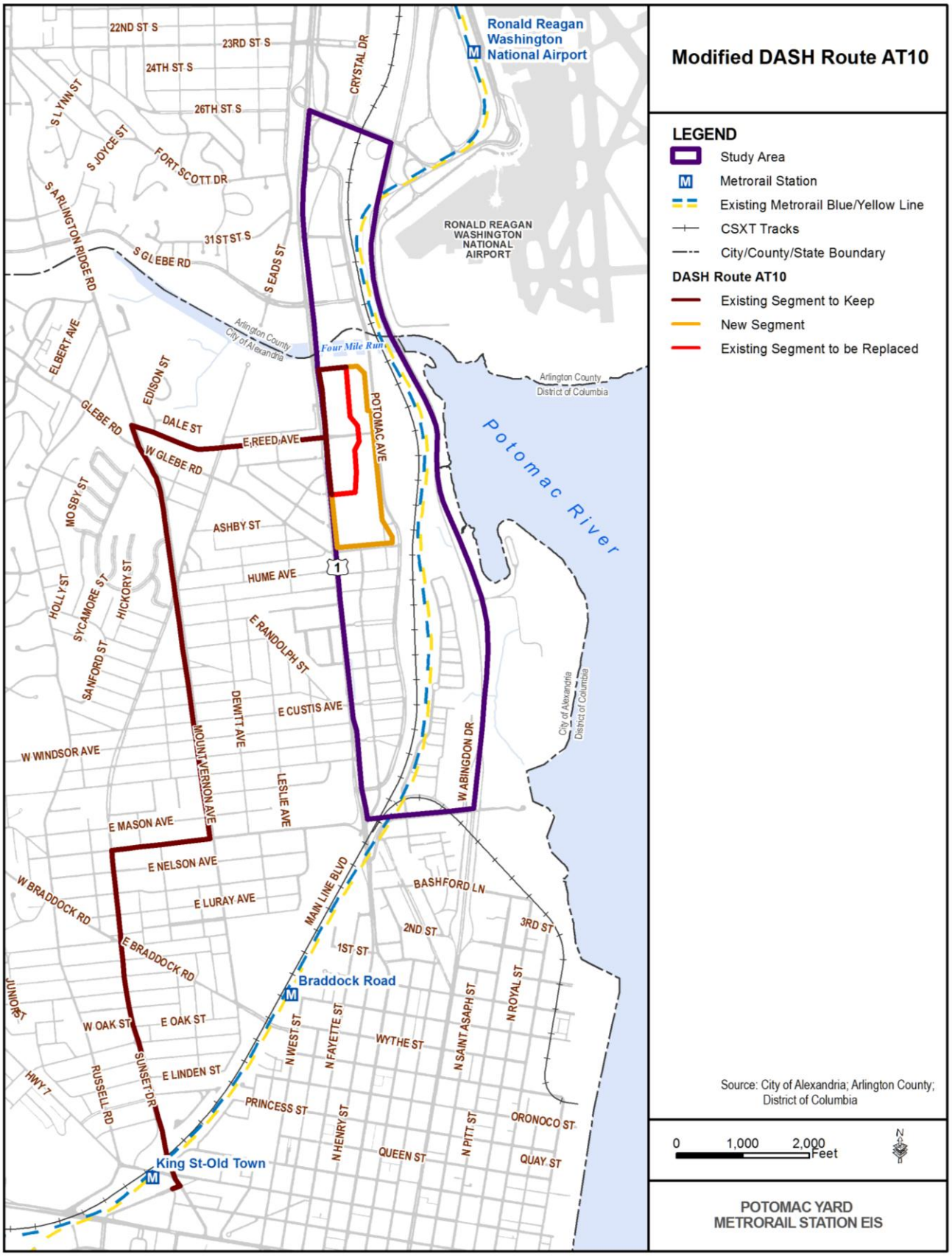
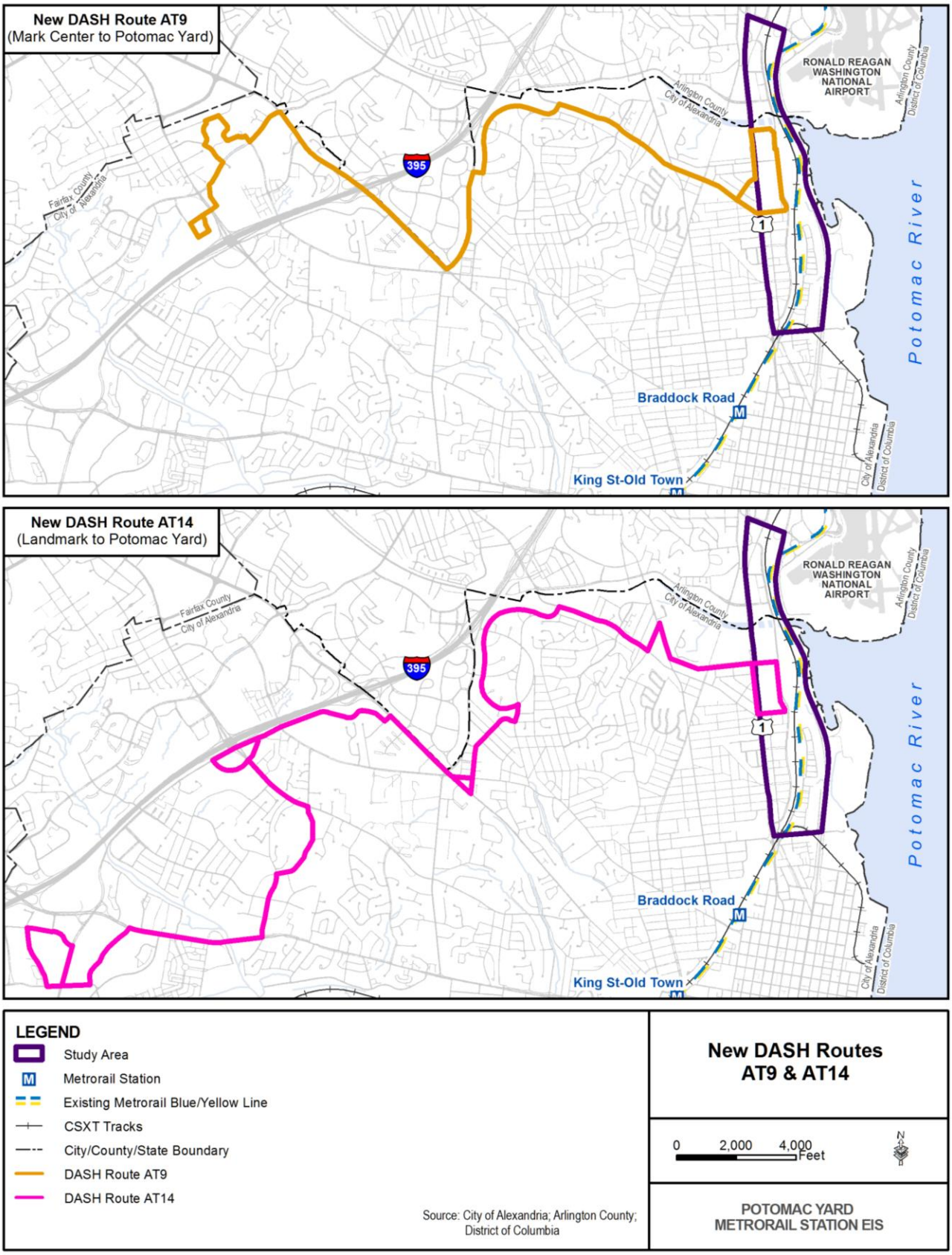


Figure E-4: New ATC Route AT9 and AT14



APPENDIX F:

Metropolitan Washington Airports Authority Correspondence

May 17, 2012

Mr. Mark Niles
Associate Vice-President
AECOM, Inc.
2101 Wilson Blvd, Suite 800
Arlington, VA 22201

RE: Potomac Yard Metrorail Station Alternatives

Dear Mr. Niles:

Thank you for providing the Metropolitan Washington Airports Authority an opportunity to evaluate the Potomac Yard Metrorail Station alternatives. The purpose of the evaluation was to determine if any of the proposed station locations would impact aircraft operations at Ronald Reagan Washington National Airport. The attached graphic depicts the location of the station alternatives and the proposed bridge over 4-Mile Run. These were plotted based on the latitude and longitude information provided by your office. You also provided the maximum proposed height above mean sea level for each alternative.

Based on this information we concluded that the alterative locations will not impact existing or future airspace that is required for flight operations. Since the station alternatives are directly under the flight path to Runway 4, there may be other elements of the facility (such as lighting) that will need to be evaluated during the design phase. We do not believe that this would influence the selection of a preferred alternative.

Once a preferred alternative is selected, you will be a required to submit form 7460-1, Notice of Proposed Construction or Alteration, with the FAA. In addition to the airspace surfaces, the FAA will evaluate the potential effect of the proposed structure on; ATC radar, ATC tower line-of-sight visibility, physical or electromagnetic impacts on air navigation, communication facilities, and other surveillance systems. We do not believe that any of the alternatives will create an adverse affect to any of these elements; however, the FAA is ultimately responsible for making these determinations.

If you have any questions or require additional information please do not hesitate to contact me at mike.hines@mwaa.com or (703) 572-0262.

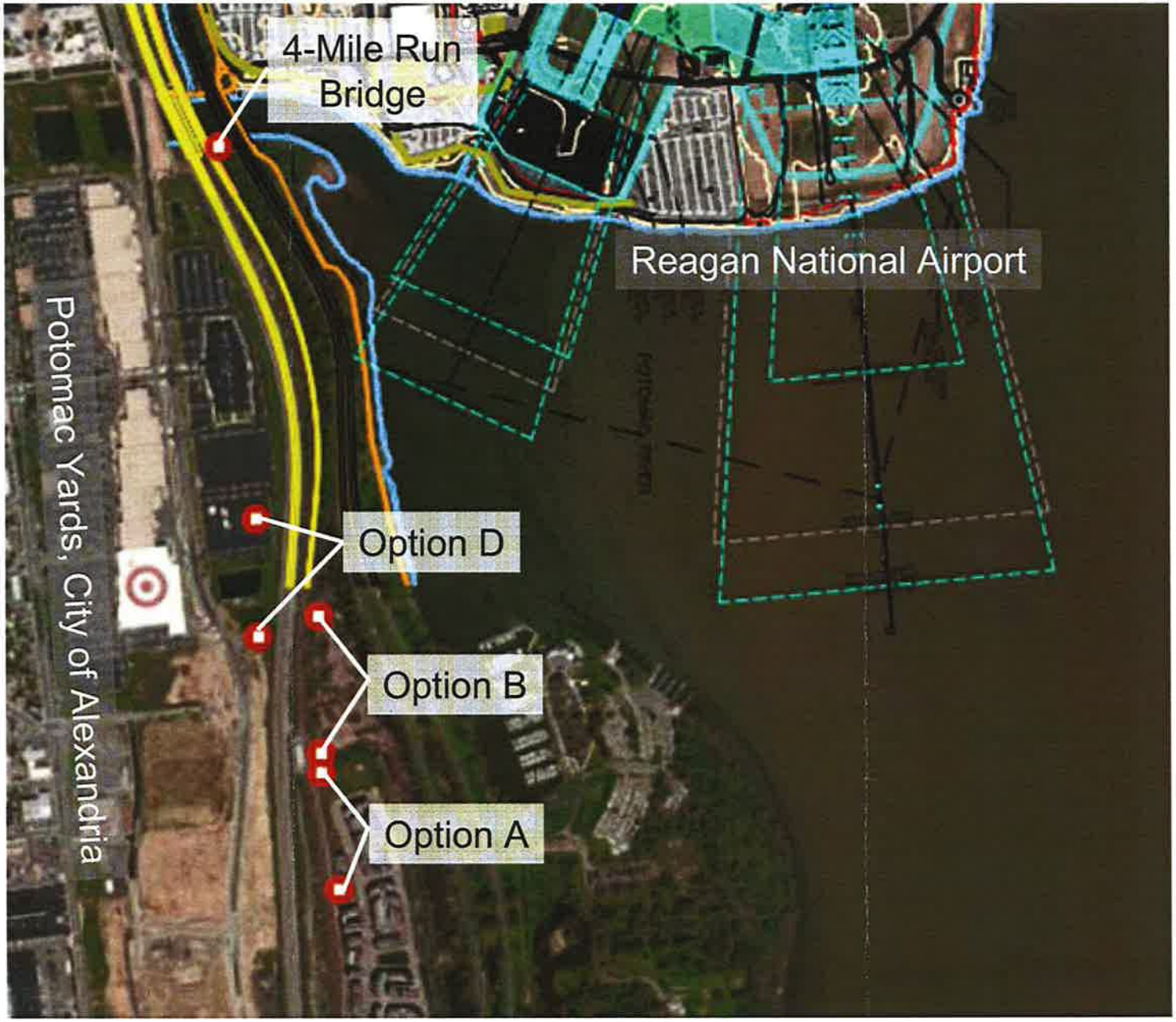
Sincerely,

Mike Hines
Project Manager, Airport / Airspace Planner

MH:dbc

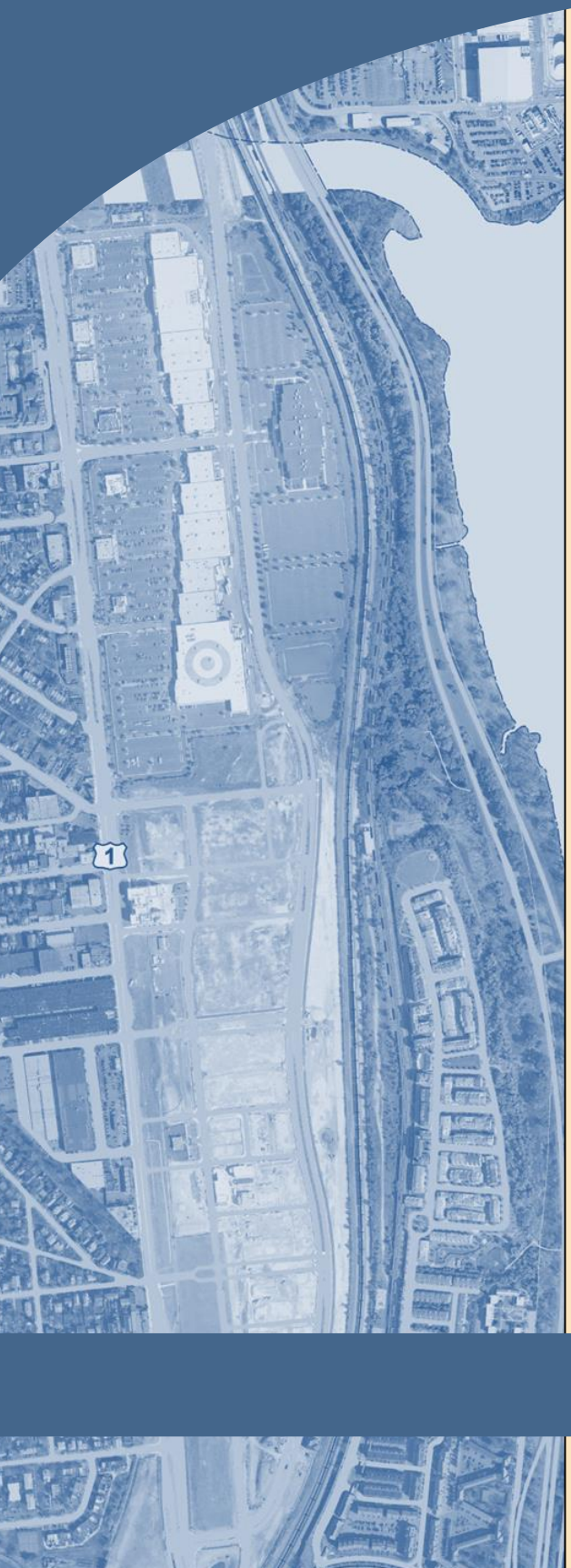
Enclosures

cc: Stephan G. Smith, Bill Lebegern



Potomac Yard Metrorail Station Alternatives Analysis

POTOMAC YARD METRORAIL STATION
ENVIRONMENTAL IMPACT STATEMENT



PMT Review Draft

Land Use, Zoning, and Consistency with Local Plans Technical Memorandum

Feburary 2013

Updated December 2015

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1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

This technical memorandum identifies the potential effects to land use and zoning, and consistency with local plans of the No Build and three Build Alternatives. The memorandum describes the following:

- Project alternatives
- Applicable regulations and guidance
- Methodology
- Opening year conditions
- Potential effects of each alternative (note that construction effects are described separately in the Construction Impacts Technical Memorandum)
- Mitigation measures

The initial findings of this analysis were incorporated into the Draft EIS. The Draft and Final EIS contain updated reviews of technical information conducted since preparation of the technical memorandum. This technical memorandum has been updated to reflect the full list of plans and consistency findings contained in the Final EIS, Section 3.5 Consistency with Local Plans and NPS Policies.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include completion of the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail (now completed) through the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

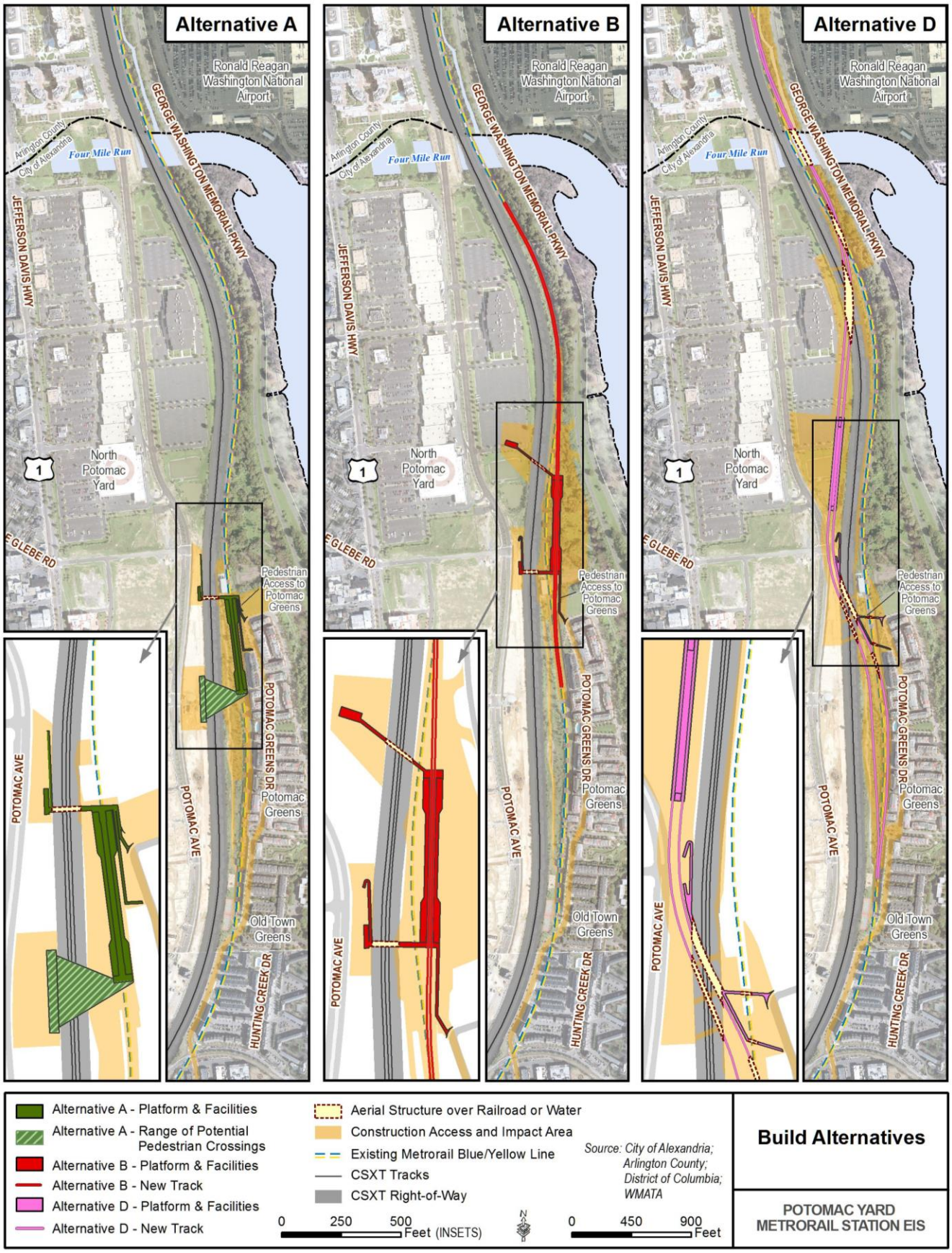
The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Figure 1-1: Build Alternatives



Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned

Applicable Regulation and Guidance

The land use, zoning, and consistency with local plans analyses were prepared pursuant to NEPA regulations for analyzing "direct effects" of projects (40 CFR 1508.8).

1.2 Methodology

The study area for land use, zoning, and local plans was expanded to include neighborhoods to the west of U.S. Route 1 (Jefferson Davis Highway), because of the inter-relationships between Potomac Yard and adjoining neighborhoods. A portion of the neighborhoods west of U.S. Route 1 would be within ¼-mile walking distance of the proposed Metrorail station, and the neighborhoods could experience some effects from the proposed alternatives on land use, zoning, and local plans. Mount Vernon Avenue served as a rational western border, as it allowed the analysis to consider the potential for effects at a neighborhood scale. Within Arlington County, the land to the west of U.S. Route 1 is primarily light industrial. South Eads Street served as the study area boundary, in order to capture all land within ¼-mile of the proposed improvements. The study area was also expanded east to the Potomac River to encompass local plans and recreational areas relevant to the Alternatives.

The expanded analysis area is bound by Mount Vernon Avenue, Four Mile Run and South Eads Street to the west, the Airport Access Road to the north, the Potomac River to the east, and Slaters Lane and East Monroe Avenue to the south. The information from the expanded analysis area will also be used to inform the analysis of secondary and cumulative effects, which assesses indirect effects such as land use impacts from additional development that may occur as a result of a project alternative. The analysis area is shown in **Figure 2-1**.

1.2.1 Land Use

Existing land use was analyzed based on aerial imagery and site visits to the analysis area. Anticipated land use changes by 2020 were determined based on existing plans and information provided by the City of Alexandria Planning and Zoning Department regarding redevelopment expected to occur by 2020. The anticipated impacts of each alternative on land use were determined by comparing the alternative facilities and associated structures to the opening year land uses (existing and 2020 planned uses) in those locations and noting any possible conflicts.

1.2.2 Zoning

Existing zoning within the study area was analyzed through review of City of Alexandria and Arlington County zoning maps, ordinances, and geographic information system (GIS) data. The impacts of the No Build and Build alternatives on zoning were identified by first confirming whether each alternative would conform to the zoning code. Each alternative was compared to the zoning to identify any conflicts with permitted land uses and building density.

1.2.3 Local Plans

Adopted local and regional plans and policy documents from the City of Alexandria, Arlington County, the Northern Virginia Regional Commission (NVRC), the Metropolitan Washington Council of Governments (MWCOG), and the National Park Service (NPS) were reviewed. Those plans considered applicable to the study area were identified and summarized in regard to overall content and provisions relevant to the study area and the project. Relevant plans included both citywide/countywide comprehensive plans and small area plans that overlapped with portions of the study area. Consistency of each alternative with relevant plans was determined based on whether the project would meet the goals, policies, and specific recommendations outlined in the plan. Information and analyses regarding local plans in this technical memorandum have been updated to reflect those in the Draft EIS (April 2015) and Final EIS (draft as of December 2015).

The following plans were reviewed as part of this analysis:

- City of Alexandria
  - *City of Alexandria Master Plan* (1992);
  - *Potomac West Small Area Plan* (1992);
  - *City of Alexandria Master Plan Water Quality Management Supplement* (2001);
  - *Upper Potomac West Task Force Report* (2001);
  - *Arlandria Neighborhood Plan* (2003);

- *Mount Vernon Avenue Business Area Plan* (2005);
- *Potomac West Small Area Plan* (1992, amended 2005);
- *City of Alexandria Environmental Action Plan 2030* (2009);
- *Potomac Yard / Potomac Greens Small Area Plan* (1992, amended 1999, 2005, 2007, 2008, 2009, 2010);
- *North Potomac Yard Small Area Plan* (2010);
- *Waterfront Small Area Plan* (2012);
- *Zoning Ordinance* (2012);
- *Comprehensive Transportation Master Plan* (2013);
- *Oakville Triangle and Route 1 Corridor Vision Plan* (2015);
- *City of Alexandria Pedestrian and Bicycle Master Plan Update* (Draft, November 2015);

- Arlington County
  - *Potomac Yard Phased Development Site Plan* (2000);
  - *Crystal City Sector Plan* (2010);
  - *General Land Use Plan* (2011);
  - *Zoning Ordinance* (2012);
- Regional Plans and NPS Policies
  - *Four Mile Run Restoration Master Plan* (2006);
  - *VRE System Plan 2040 Study* (2014);
  - *National Park Service Organic Act of 1916;*
  - *Capper-Cramton Act of 1930*;
  - *Mount Vernon Memorial Highway Cultural Landscape Report* (1987);
  - *GWMP-Potomac Greens Final EIS* (1991);
  - *Resource Management Plan: George Washington Memorial Parkway* (1994);
  - *GWMP Corridor Management Program* (2005); and
  - *GWMP Foundation Document* (2014).

2.0 OPENING YEAR CONDITIONS

2.1 Land Use

Figure 2-1 illustrates opening year land use in the land use analysis area and vicinity.

2.1.1 Existing Land Use

Railroad Corridor (City of Alexandria and Arlington County)

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

North Potomac Yard (City of Alexandria)

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

South Potomac Yard (City of Alexandria)

South of East Glebe Road, Potomac Yard is a mixture of vacant land approved for re-development and new moderate to medium-density residential (townhouses, apartments condominiums), office and retail uses, as well as some neighborhood institutional uses. Between Potomac Avenue and the CSXT tracks is a linear park and multi-use trail. The deed for dedication of this portion of the Potomac Yard Park property to the City stipulates that Metrorail station uses within the specified landing sites are permitted.

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

Areas west of U.S. Route 1 are largely residential in use, with a mix of single family homes, row houses, and apartments, with a few religious institutions and small green spaces. Along the major arterials, a variety of commercial establishments can be found including car dealerships, restaurants, automotive repair, strip shopping centers, gas stations, and regional parks. A few light industrial uses are located along U.S. Route 1 in the southwest portion of the analysis area.

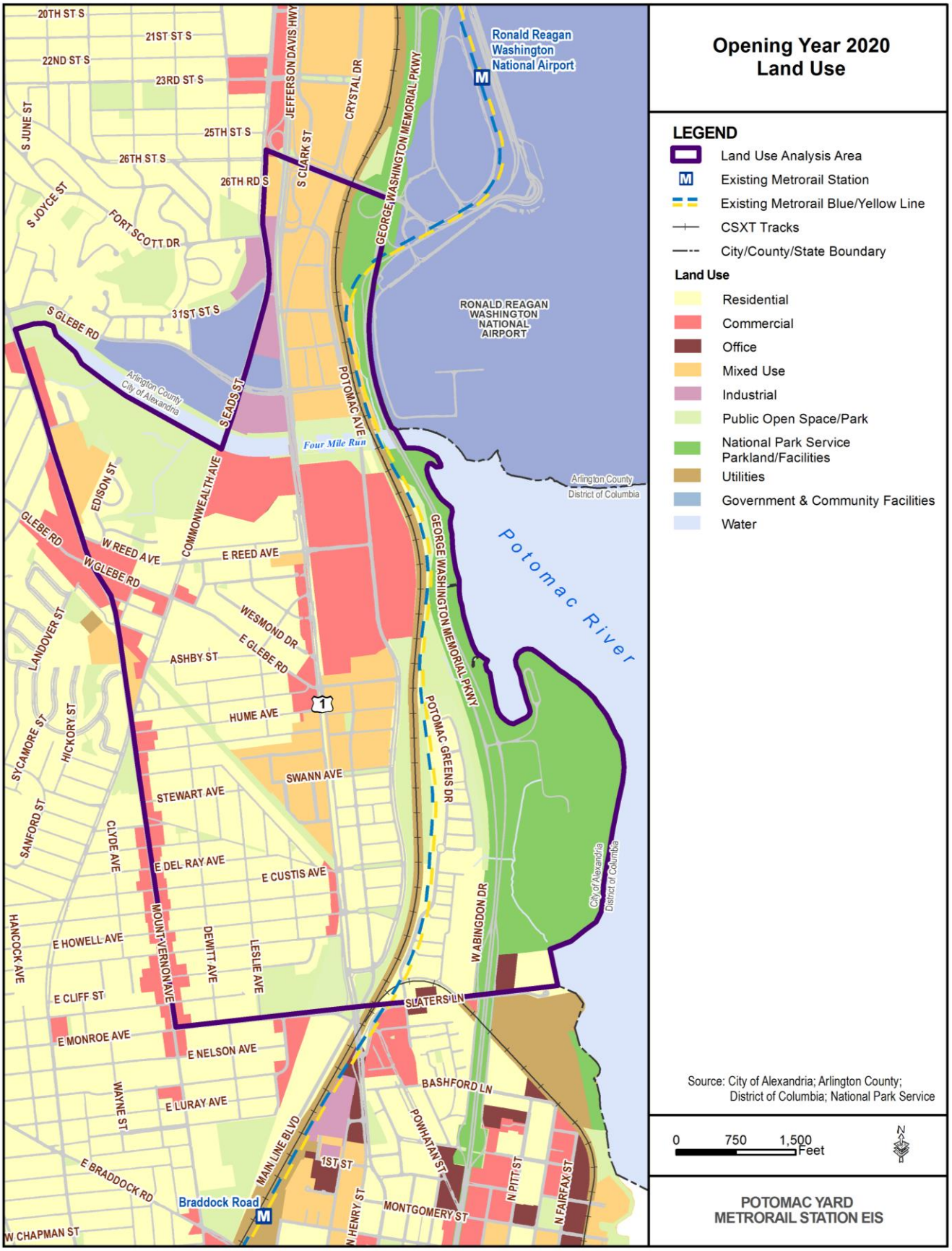
East of the Metrorail/CSXT Tracks (City of Alexandria)

The southeast corner of the analysis area has small- to medium-scale commercial and office development along Slaters Lane and moderate-density residential development including the Potomac Greens and Old Town Greens townhome neighborhoods, and the Potowmack Crossing Condominiums. The eastern edge of the analysis area comprises Potomac Greens Park and the open space and memorial highway of the GWMP. Potomac Greens Park is covered by a scenic easement, which is administered by NPS.

Potomac Yard and Crystal City (Arlington County)

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

Figure 2-1: Opening Year 2020 Land Use



2.1.2 Anticipated Land Use Changes by 2020

Railroad Corridor

The land between the CSXT and WMATA rights-of-way is planned to be converted to a public park, known as the Rail Park, by 2020.

North Potomac Yard (City of Alexandria)

North Potomac Yard comprises the portion of Potomac Yard within the City of Alexandria that is currently occupied by the Potomac Yard Shopping Center and a movie theater. Between 2015 and 2020, the City of Alexandria anticipates that no redevelopment will take place in North Potomac Yard, and that the existing 600,000 square foot retail center and movie theater will remain operational.

South Potomac Yard (City of Alexandria)

The area known as South Potomac Yard is covered by the *Potomac Yard/Potomac Greens Small Area Plan* (City of Alexandria, 1992) and is currently undergoing development. South Potomac Yard includes the portion of Potomac Yard south of the existing shopping center and west of the CSXT right-of-way. The City of Alexandria anticipates that 1.885 million square feet of the permitted development in South Potomac Yard will be completed by 2020. Based on adopted City plans and zoning, the area's land use will be predominantly moderate-density residential and mixed use (residential with neighborhood-serving retail, office and hotel), consisting predominantly of townhomes and mid-rise buildings. Higher density commercial and office uses will be located between East Glebe Road and Swann Avenue, adjacent to the existing Potomac Yard Shopping Center.

The land between CSXT and Potomac Avenue, north of East Glebe Road is planned to be converted to a an extension of Potomac Yard Park by 2020. Swann Avenue Park and Howell Avenue Park, linear parks in the middle of Swann Avenue, Custis Avenue, and Howell Avenue, respectively, are anticipated to be complete in 2020.

2.2 Zoning

Existing zoning for the analysis area is shown in **Figure 2-2**. The zoning primarily consists of three Coordinated Development Districts (CDDs): CDD 7, CDD 10, and CDD 19. CDD 7 covers a portion of the Lynhaven neighborhood to the west of U.S. Route 1. CDD 10 and CDD 19 cover the Alexandria portion of Potomac Yard. Other analysis area zoning comprises a mix of low-, medium-, and high-density residential districts, as well as low-density commercial, public open space, and industrial districts. The majority of the analysis area within Arlington County is included in the *Potomac Yard Phased-Development Site Plan*, which allows for a high-density mix of uses.

2.2.1 Coordinated Development Districts

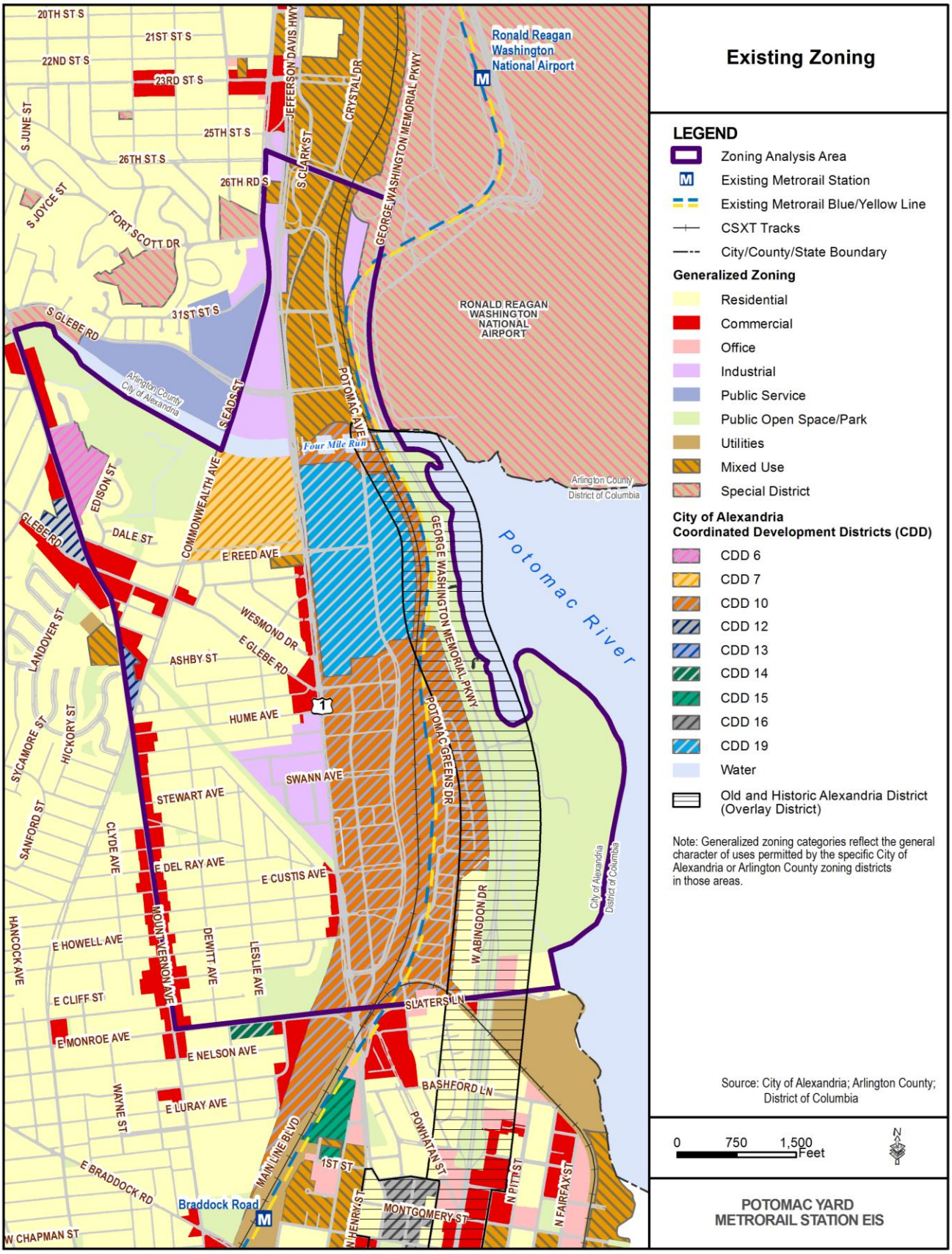
CDDs are established by the City of Alexandria for larger re-development sites that require coordination among various property owners, such as Potomac Yard. Development within a CDD requires approval of a Development Special Use Permit (DSUP). The intent of the CDD and DSUP process is to:

- Create a mixture of uses, which may include combinations of office, residential, retail, hotel, or other uses with appropriate open space and recreational amenities to serve the project users as well as city residents in general;
- Encourage land assemblage and/or joint planning where there are multiple owners of the area; and
- Establish a review process to ensure a proper integration of land uses, high-quality urban and architectural design, and harmony with the surrounding areas of the city.

CDD 19 – North Potomac Yard

CDD 19 permits a total of 7.525 million square feet of development in North Potomac Yard if a Metrorail station is built at the approximate location depicted in the *North Potomac Yard Small Area Plan* (approximately the location of Build Alternative B). This location is slightly to the east of the existing Metrorail alignment and north of the existing traction power substation near Potomac Greens. If a Metrorail station is not built at this location, including if a station is built at an alternate location such as Build Alternative A or Build Alternative D, CDD 19 permits 3.700 million square feet of development in North Potomac Yard, subject to a future planning process.

Figure 2-2: Existing Zoning



CDD 19 includes a “Flexible Metrorail Zone,” which is adjacent to the northern Metrorail station entrance shown in the North Potomac Yard Small Area Plan. The design of streets, blocks, buildings, and open space in this zone may change as the details regarding the Metrorail station are finalized. The final site plan for the Flexible Metrorail Zone will be processed as an amendment to the CDD Conceptual Design Plan.

The *North Potomac Yard Urban Design Standards* augment the North Potomac Yard Small Area Plan, the CDD 19 Concept Plan, and the CDD conditions by providing specific requirements for spaces and buildings within North Potomac Yard. These requirements are intended to ensure that development within North Potomac Yard fulfills the spirit of the North Potomac Yard Small Area Plan.

CDD 10 - Potomac Yard/Potomac Greens

CDD 10 is zoned predominantly for medium-density residential uses but also includes a mix of office, retail, hotel, park, open space, and community facility uses. CDD 10 occupies the southern portion of Potomac Yard and is bound by U.S. Route 1 on the west, the CSXT corridor on the east and south, and East Glebe Road on the north (including the properties on the north side of East Glebe Road). The district also includes a triangle of land west of U.S. Route 1 and the CSXT corridor, at the southern end of the analysis area.

CDD 7 – Route 1 Properties

CDD 7 is based on the *Potomac West Small Area Plan* and allows a mix of office, residential, retail, hotel, and open space uses. CDD 7 is located in the northwest portion of the analysis area, at the northern end of the Lynhaven neighborhood and along the border with Arlington County. The district is bordered by U.S. Route 1 to the east, Reed Avenue to the south, and Commonwealth Avenue to the west.

Old and Historic Alexandria District

The Old and Historic Alexandria District extends into eastern portions of the study area adjacent to the GWMP in accordance with Article X of the City of Alexandra Zoning Ordinance. As described in the zoning ordinance, the purpose of the Historic District is to “promote the education, prosperity and general welfare of the public through the identification, preservation, and enhancement of buildings, structures, landscapes, settings, neighborhoods, places and features with special historical, cultural, artistic, and architectural significance.” The boundary of the historic district includes areas 500 feet east and west of the centerline of the GWMP. Any development within the District requires review by the City Board of Architectural Review. The ordinance requires that new development receive a *Certificate of Appropriateness* which is approved by the Board of Architectural Review. The Board will consider the architectural design, form and style of a new structure before issuing a certificate. Construction within 500 feet of the GWMP roadway is subject to the *Old and Historic Alexandria District Design Guidelines* (1993) and the *Washington Street Guidelines and Standards* (2000), which provide specific requirements for the design of buildings along the historic roadway.

Height Districts

The City of Alexandria is divided into six height districts; each district allows a maximum height of buildings and structures. Although zoning districts set the maximum heights within each zone, the height specified may not exceed the maximum height allowed by the height district. In addition, the regulations of a particular zone may allow an increase in height to be authorized by special use permit, but the height authorized by the special use permit cannot exceed the maximum height set by the height district. The study area is covered by two height districts: HD1 – Old and Historic Alexandria Height District, and HD6, which includes all parts of the city not included in one of the other height districts. The Old and Historic Alexandria Height District restricts heights to 50 feet, and covers all of the area within 500 feet of the GWMP. Within HD6, the maximum height is set by the zoning district. In CDD 10, the maximum height without a special use permit is 50 feet. Height limits in CDD 19 vary by block. In the blocks potentially affected by the project, height limits are 50 feet and 100 feet.

Other Analysis Area Zoning Districts

To the west of Potomac Yard, the neighborhoods between U.S. Route 1 and Mount Vernon Avenue are zoned low- or medium-density residential, with low-density commercial zoning along the Mount Vernon Avenue and the west side of U.S. Route 1. The triangle of land (Oakville Triangle) between Mount Jefferson Park and U.S. Route 1 is zoned for light industrial use.

Within Arlington County, the underlying zoning allows for medium- or high-density commercial office, hotel, and residential uses. The majority of the analysis area within Arlington County is included in the Potomac

Yard Phased-Development Site Plan (PDSP), which allows for a high-density mix of uses. The portion of the analysis area between U.S. Route 1 Jefferson Davis Highway and Crystal Drive is part of the Crystal City Coordinated Redevelopment District, which focuses on providing a mix of high-density uses. The boundaries of the PDSP and the Crystal City Sector Plan (which encompasses the Crystal City Coordinated Redevelopment District) are shown in **Figure 2-3**.

2.3 Consistency with Local Plans and NPS Policies

This section identifies current local and regional comprehensive or small area plans that are applicable to the analysis area for local plans and summarizes the provisions of the plans that are relevant to the project. Local and regional plans specifically related to transportation, open space and parks, National Park Service policies and plans related to the GWMP, and other plans related to local sustainability goals and policies are reviewed separately in the respective technical memoranda related to transportation and parklands and in the resource section of the Draft EIS related to sustainability.

2.3.1 Summary of Applicable Local Plans

Table 2-1 summarizes local plans applicable to the analysis area and proposed project. The major plans relevant to Potomac Yard are described in more detail below. **Figure 2-3** shows the locations of the planning areas of the relevant small area plans.

North Potomac Yard Small Area Plan (2010)

This small area plan developed by the City of Alexandria guides public and private investment and development decisions in the northern portion of Potomac Yard, at the site of the existing retail center. The plan includes a complementary mix of land uses, community amenities, and a range of housing opportunities and envisions North Potomac Yard area as an environmentally and economically sustainable, transit-oriented, and mixed-use community. The plan envisions three distinct neighborhoods: the Crescent Gateway Neighborhood, the Market District Neighborhood, and the Metro Square Neighborhood. The concentration of residential, office, and commercial uses would vary among neighborhoods, with the highest intensity of office uses in the Metro Square Neighborhood, which would focus on a new Metrorail station.

The transportation element of the plan requires a new Metrorail station, among other strategies, to support the proposed density and accommodate increased travel demand. The plan defines a “Flexible Metrorail Zone,” envisioned as an urban place centered on the Metrorail station. The plan identifies a recommended Metrorail station location to the north of the existing traction power substation to the east of the CSXT right-of-way.

Potomac Yard / Potomac Greens Small Area Plan (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010)

This small area plan covers the area generally bound by U.S. Route 1 to the west, Four Mile Run to the north, the Potomac River to the east, and Slaters Lane and the northern property lines of Potowmack Crossing Condominium/Towngate Office Development /Marina Tower to the south. However, the *North Potomac Yard Small Area Plan* supersedes this plan in the area currently occupied by the Potomac Yard Retail Center (known as North Potomac Yard). The *Potomac Yard / Potomac Greens Small Area Plan* continues to apply to the area referred to as South Potomac Yard, as well as the Potomac Greens and Old Town Greens neighborhoods. The plan recommends mixed-use development that is predominantly residential, with public open space, but includes significant commercial uses, providing for a maximum of 625 hotel rooms, 735,000 square feet of retail, 2,200 residential units, and 1.9 million square feet of office space. The plan designates the Potomac Greens and Old Town Greens neighborhoods as residential, except for the possible Metrorail station, and notes that residential development should not preclude the possible future station.

Figure 2-3: Land Use Plans and Other Local Plans (Boundaries)

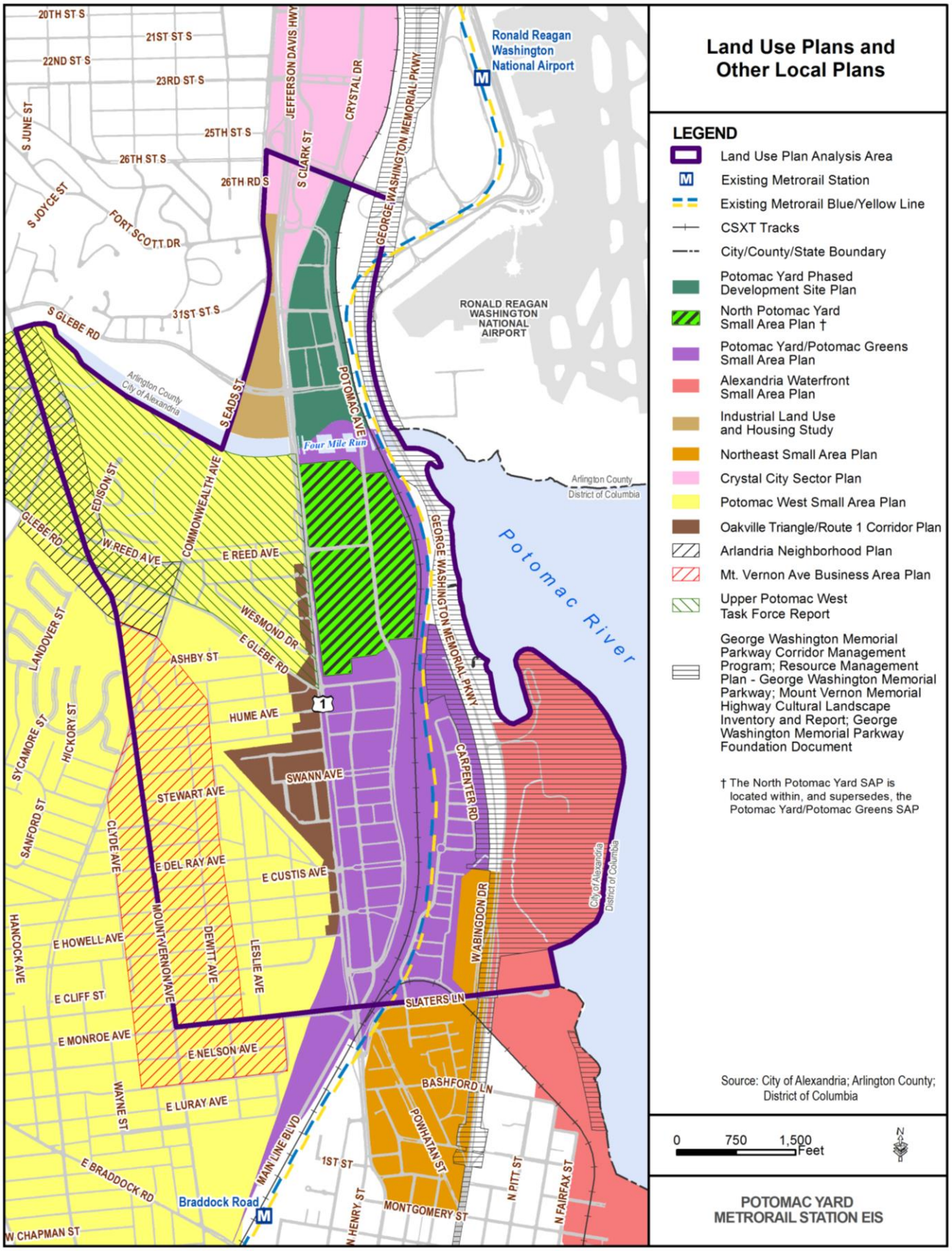


Table 2-1: Summary of Local Plans

Plan	Analysis Area Provisions	Metrorail Station Provisions
City of Alexandria Plans		
North Potomac Yard Small Area Plan (2010)	Envisions a transit-oriented, mixed use development. Concentrations of residential, office, and retail uses would vary among neighborhoods, with the highest intensity of office uses in the Metro Square Neighborhood, which would be focused on a new Metrorail station. The plan defines a "Flexible Metrorail Zone," envisioned as an urban place centered on the Metrorail station.	Requires a Metrorail station to support the level of development planned. Station location recommended on the east side of the CSXT right-of-way, north of the existing traction power substation. The station location recommended in the plan is in the general location of Build Alternative B.
Potomac Yard / Potomac Greens Small Area Plan and CDD Concept Plan (1992, Amended 1999, 2005, 2007, 2008, 2009, 2010)	Recommends a mix of land uses, with residential uses concentrated towards the southern part of Potomac Yard, public open space on the eastern edge, and higher-density office, residential, and retail uses in the central portion of Potomac Yard.	The CDD Concept Plan requires a Metrorail reservation in the Potomac Greens portion of the analysis area. The location in the plan is the approximate location of Build Alternative A. However, portions of plan are superseded by the *North Potomac Yard Small Area Plan*, which mandates a Metrorail station in the vicinity of the location of Build Alternative B.
Waterfront Small Area Plan (2012)	The portion of the waterfront adjacent to the analysis area is under NPS ownership.	Plan references need to connect Daingerfield Island (GWMP, NPS) with a possible Metrorail station.
Oakville Triangle and Route 1 Corridor Vision Plan (2015)	Recommends a mix of land uses and concentrates planned development near transit stops and in proximity to the planned Potomac Yard Metrorail Station.	The plan anticipates the construction of a Metrorail station in Potomac Yard and facilitates better connectivity through new pedestrian and bicycle accommodations.
City of Alexandria Comprehensive Transportation Master Plan (2013)	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 U.S. Route 1, and a new bicycle/pedestrian bridge over the CSXT Railroad and the Metrorail Line.	The plan seeks to establish superior transit service connection with local and regional transit service including Metrorail.
City of Alexandria Pedestrian & Bicycle Master Plan Update (Draft, 2015)	Updates the pedestrian and bicycle chapters of the City Transportation Master Plan. Recommends additional bicycle accommodations within Potomac Greens and Potomac Yard with expanded connections to areas west of U.S. Route 1.	Includes strategies to improve pedestrian and bicycle access through and across rail corridors to connect key destinations such as existing and future Metrorail stations, and prioritizes the installation of bicycle parking at transit stops/stations.
City of Alexandria Environmental Action Plan 2030 (2009)	Supports Small Area Plans that increase density in and around Metro Stations.	Plan calls for construction of a Metrorail station in Potomac Yard by the time occupancy of the development reaches 70%
City of Alexandria Master Plan (1992)	Recommends mixed-use development in Potomac Yard. Specific recommendations are included in the City small area plans.	Plan recommends a new Metrorail station as part of any potential development in Potomac Yard, but does not specify a location.

Plan	Analysis Area Provisions	Metrorail Station Provisions
City of Alexandria Master Plan Water Quality Management Supplement (2001**)**	Classifies the development suitability of areas within the City based on potential impacts to water quality. Wetlands and stream buffer areas are classified as "generally unsuitable for development." Floodplains and floodplain soils are classified as having "limited development potential that requires special consideration." Small area plans will consider the general recommendations and apply them appropriately.	Neither assumes nor precludes a Metrorail station at Potomac Yard.
Northeast Small Area Plan (1992)	Focuses on preserving and protecting existing neighborhoods, with compatible redevelopment. Discourages non-local traffic.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Arlington County Plans		
Potomac Yard Phased Development Site Plan (2000)	Provides for a mix of uses in the Arlington County portion of Potomac Yard, to include residential, hotel, office, and retail uses.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Arlington County General Land Use Plan (2011)	Incorporates the recommendations of the Potomac Yard Phased Development Site Plan into the overall County land use policy.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Crystal City Sector Plan (2010)	Provides for redevelopment of Crystal City, with increased densities, open space, and pedestrian-oriented streetscape.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Industrial Land Use and Zoning Study (2000)	Examines appropriate locations for industrial land uses within Arlington County.	Neither assumes nor precludes a Metrorail station in Potomac Yard.
Regional Plans and NPS Policies		
VRE System Plan 2040 Study (VRE, 2014)	Recommends expanding the capacity of the Long Bridge Railroad Corridor (between the VRE Alexandria Station and southwest Washington DC) from three tracks to four tracks – two for passenger trains and two for freight trains.	No mention of a Metrorail station at Potomac Yard.
GWMP Foundation Document (NPS, 2014)	Describes the purpose of the GWMP, its significance, its fundamental resources and values, and its policy requirements, special mandates, and administrative commitments.	No mention of a Metrorail station at Potomac Yard.
Four Mile Run Restoration Master Plan (NVRC, 2006)	Envisions a park along Four Mile Run in the analysis area, including converting the former railroad bridge over Four Mile Run west of Potomac Avenue into open space and removing an additional former railroad bridge.	No mention of a Metrorail station at Potomac Yard or near Four Mile Run in the plan recommendations.
GWMP Corridor Management Program (NPS, 2005)	Purpose of the GWMP includes protecting and managing natural, cultural, and recreational resources and scenic values.	No mention of a Metrorail station at Potomac Yard. The program addresses the preservation of the historic character and scenic views along the parkway.
Resource Management Plan: George Washington Memorial Parkway (NPS, 1994)	Role of the GWMP includes preserving Potomac River shoreline, providing recreational opportunities, and providing a scenic roadway as a memorial to George Washington. Plan guides NPS natural resource management for the GWMP.	No mention of a Metrorail station at Potomac Yard. However, the plan emphasizes the protection of scenic views along the parkway.
GWMP- Potomac Greens Final EIS (NPS, 1991)	The Final EIS analyzed the potential impacts of the Potomac Greens development to the GWMP and identified alternatives that might eliminate or mitigate those impacts.	One of the six alternatives (Alternative 1A) references a location of a future Metrorail station at the proposed location of Alternative A.
Mount Vernon Memorial Highway (MVMH) Cultural Landscape Inventory and Report (NPS, 1987)	Describes past planning efforts for the MVMH (now part of the GWMP), which focused on design and landscaping of areas along the roadway "to maximize scenic, esthetic, and commemorative qualities." The report (Vol. I, pp. 72-74) documents the original design principles of the	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.

Plan	Analysis Area Provisions	Metrorail Station Provisions
	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.'"	
Capper-Cramton Act of 1930 (46-Stat. 482)	Lands of the GWMP were and continue to be acquired under the Capper-Cramton Act of 1930 (46-Stat. 482), for conservation, environmental, and recreational purposes consistent with the provisions of this act.	The Capper Cramton Act was established long before the Metrorail System was planned and constructed. However, GWMP/MVMH took obvious efforts to block undesired views of "rail transport" from the roadway, particularly in the area of Potomac Yard.
National Park Service Organic Act of 1916 (39-Sta. 535)	Directs NPS to regulate the use of national parks by such means and measures as to conform to the fundamental purpose of the parks, which is to conserve the scenery, natural and historic objects, and wildlife therein.	No mention of a Metrorail station at Potomac Yard. However, commits NPS to ensure that any action taken by the agency in conjunction with the project must be consistent with the Organic Act,

Waterfront Small Area Plan (2012)

The City of Alexandria's *Waterfront Small Area Plan*, adopted in 2012, recommends that the City explore connections from the waterfront to areas west of the GWMP, including to new development in Potomac Yard. The intent is to improve transportation linkages between Potomac Yard and areas east of the GWMP, particularly multi-use access to the Mount Vernon Trail.

Oakville Triangle and Route 1 Corridor Vision Plan (2015)

The *Oakville Triangle and Route 1 Corridor Vision Plan* covers the area defined by Jefferson Davis Highway (U.S. Route 1) to the east, Mount Jefferson Park to the southwest, Oakville Street to the northwest, and Ruby Tucker Park to the north. The plan recommends a mix of land uses and concentrates planned development near transit stops and in proximity to the planned Potomac Yard Metrorail Station. The plan suggests a pedestrian and bicycle connection between Swann Avenue and Stewart Avenue "to provide connectivity between the neighborhoods and the future Potomac Yard Metrorail station" and an "additional signalized pedestrian crossing across Route 1 between East Curtis Avenue and East Glebe Road to improve pedestrian access between Oakville Triangle and Del Ray/Lynhaven and the future Potomac Yard Metrorail station."

City of Alexandria Comprehensive Transportation Master Plan (2013)

The *City of Alexandria Comprehensive Transportation Master Plan* addresses the potential development of a new Metrorail Station at Potomac Yard. The plan states, "The City expects that any amendment to the Potomac Yard/ Potomac Greens Small Area Plan which results in an increase in density beyond what is currently approved will include reasonable provisions to address the development and funding of an additional Metrorail Station. " The plan also states, "The City will develop and implement comprehensive guidelines and requirements for transit-oriented development (TOD) that support the principles of TOD and include maximum parking ratios, unbundled parking infrastructure, and parking cash-out programs as parking management strategies for development/redevelopment of properties proximate to Metrorail stations."

City of Alexandria Pedestrian & Bicycle Master Plan Update (Draft, November 2015)

The *City of Alexandria Pedestrian and Bicycle Master Plan Update* was drafted as an update to the pedestrian and bicycle chapters of the 2008 *City of Alexandria Transportation Master Plan.* The final plan update is expected by the end of 2015. The draft recommends a number of citywide policies and strategies to enhance pedestrian and bicycle travel and safety. Within the project study area, the update recommends additional bicycle accommodations within Potomac Greens and Potomac Yard with expanded connections to areas west of U.S. Route 1.

City of Alexandria Environmental Action Plan 2030 (2009)

The *City of Alexandria Environmental Action Plan,* adopted in 2009, supports increased density in and around Metro stations. The plan includes the goal to "improve and expand an integrated rapid transportation system that includes intercity passenger rail, heavy rail, trolleys, streetcars, and buses." Adding a Metrorail station at Potomac Yard when the development's occupancy reaches 70% is listed as a mid-term action under this goal.

City of Alexandria Master Plan, Citywide Chapters (1992)

The *City of Alexandria Master Plan* is the city's comprehensive plan. The City has updated the specific geographic sections over time through separate small area plans. The plan contains a number of land use objectives and transportation policies. One land use objective relates specifically to the identified redevelopment areas, of which Potomac Yard is one. The objective is to "promote mixed use development in most major development or redevelopment areas." Additionally, one of the transportation policies relates directly to Potomac Yard: "In the Potomac Yard area, which overall will be low to medium density, a portion of the development should be constructed at high densities immediately adjacent to the proposed Metrorail station. This will enable lower densities throughout the remainder of that large parcel."

City of Alexandria Master Plan Water Quality Management Supplement (2001)

The master plan supplement classifies the development suitability of areas within the City based on potential effects 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. The supplement does not mention a Metrorail station at Potomac Yard. Portions of the study area include wetlands, stream buffers, and floodplains. The supplement states that when impacts do occur to wetlands, mitigation measures could include wetland creation or enhancement, improvements to riparian areas, or the use of Best Management Practices to treat stormwater. Mitigation for development in floodplains can include design and construction practices to protect users from flood risk.

Potomac West Small Area Plan (1992, Amended 2005)

The City of Alexandria's *Potomac West Small Area Plan* covers the area defined by U.S. Route 1 on the east, Russell Road and West Glebe Road to the west, Alexandria Union Station to the south, and Four Mile Run to the north. Updates to the plan since 1992 include the *Arlandria Neighborhood Plan*, the *Upper Potomac West Task Force Report*, and the *Mount Vernon Avenue Business Area Plan*. These plans identified several vacant and underutilized sites and encouraged coordinated mixed-use pedestrian friendly redevelopment of these properties. While the Potomac Yard Metrorail Station is not mentioned, the *Potomac West Small Area Plan* notes that low-intensity commercial uses located on the west side of U.S. Route 1 may be subject to redevelopment pressures as the Potomac Yard development is implemented and the character of the area changes. The *Potomac West Small Area Plan* recommends further study of the future uses and design of properties along the U.S. Route 1 corridor to create a cohesive landscape with the Potomac Yard development.

Policies and Plans for the GWMP (Various)

A variety of documents have guided the development and maintenance of the GWMP throughout its history. As documented in the *Mount Vernon Memorial Highway (MVMH) Cultural Landscape Report* (NPS, 1987), past planning efforts for the MVMH, now encompassed by the GWMP, focused on design and landscaping of areas along the roadway "to maximize scenic, esthetic, and commemorative qualities."

The 1991 *GWMP – Potomac Greens Final EIS* evaluated four alternative development scenarios. The first alternative included the development proposals. Alternatives 2, 3 and 4 assumed, respectively, purchase of the interchange rights at the Parkway intersection with the Daingerfield Island access road, purchase of a visual buffer to protect the Parkway, and purchase of the entire site. The EIS addressed methods of eliminating or mitigating impacts.

The 1994 *Resource Management Plan, George Washington Memorial Parkway* noted that the role of the GWMP includes preserving the Potomac River shoreline, providing recreational opportunities, and providing a scenic roadway as a memorial to George Washington. The plan notes that urban development adjacent to the GWMP creates challenges for maintenance and preservation of the GWMP. Recommendations focus on

plantings and the management of larger natural areas to provide a visual buffer between the GWMP and developed areas.

The 2005 *GWMP Corridor Management Program* describes the purpose of the GWMP as including protection and management of natural, cultural, and recreational resources and scenic values of the GWMP. The goals for recreational resource management include prevention of unacceptable impacts to park resources and values; the document also notes that the GWMP is mandated with the strictest scenic resource protection. In order to anticipate, avoid, or resolve potential conflicts or actions on property adjacent to the GWMP that would negatively affect park resources, the document notes that NPS works closely with the local communities.

National Park Service Organic Act of 1916

The *NPS Organic Act of 1916* directs the NPS to regulate national parks to conform to their fundamental purpose of conserving scenery, natural and historic objects, and wildlife therein. NPS must ensure that any action taken by the agency is consistent with the Organic Act,

Capper-Cramton Act of 1930

Lands of the GWMP, including the MVMH, were acquired by the NPS under the Capper-Cramton Act of 1930 for conservation, environmental, and recreational purposes. The act also established funding and planning for the GWMP, creating the means for design and construction between 1930 and 1966. Proposed activities or development must be consistent with this act.

3.0 POTENTIAL EFFECTS

The following section discusses the potential effects each alternative has on land use and zoning, as well as their conformance to local plans. Impacts are summarized by respective topic.

3.1 Land Use

The potential direct effects of the No Build and the Build Alternatives on land use (in relation to their individual impacts on existing and planned land use) are described below. Conformity with existing land use plans is discussed in **Section 3.3**. Potential effects to parklands are assessed in more detail separately in the Section 4(f) and Section 6(f) evaluations (see Appendices D and E of the Draft and Final EIS, respectively). Potential indirect effects related to additional development that may occur as a result of a new Metrorail station are assessed separately in the Draft and Final EIS as secondary and indirect effects. See **Table 3-1** for a summary of impacts.

3.1.1 No Build Alternative

The No Build Alternative has no anticipated land use impacts.

3.1.2 Build Alternatives

Build Alternative A

Build Alternative A would occupy the existing Metrorail right-of-way and portions of existing and planned parks. However, most of the station facilities would be within the Metrorail Reservation easement. The northern and southern station entrance pavilions on the west side of the CSXT right-of-way would occupy planned public open space in Potomac Yard Park.

Build Alternative B

Build Alternative B would occupy existing public open space (Potomac Greens Park) north of the Potomac Greens neighborhood, which is covered by the Greens Scenic Area easement administered by NPS, as well as a portion of national parkland (GWMP). Proposed actions and resulting impacts would depend on agreement by NPS for release of the scenic easement and an equal value land exchange for affected NPS property and interests in property. As Build Alternative B requires a land exchange with NPS and impacts an easement owned by NPS, the transfer or easement modification would be subject to an equal value exchange in property or interest in property and need to be approved by NPS and completed as required by Federal law (54 U.S.C. 102901).

Within Potomac Yard, Build Alternative B would not displace the existing shopping center or residential uses. The proposed southern station entrance would touch down on existing open space (Potomac Yard Park near East Glebe Road), and the northern station entrance would touch down on the southeast corner of the parking lot by the movie theater. As part of the City of Alexandria's adopted *North Potomac Yard Small Area Plan*, this area of the shopping center parking lot is planned for redevelopment and open space as part of a future dense mixed-use development that will incorporate the northern Metrorail station entrance.

Build Alternative D

Build Alternative D would occupy existing commercial development, which is comprised mostly of a parking lot and movie theater. In addition, Build Alternative D would affect planned streets, including the realigned Potomac Avenue, and the Potomac Yard Park and other open spaces. At the northern end, realigned tracks for the alternative would occupy existing open space between the GWMP and the existing Metrorail right-of-way, from Ronald Reagan Washington National Airport to North Potomac Yard in Alexandria. At the southern end, realigned tracks and the pedestrian bridge to Potomac Greens would occupy public open space in the planned Rail Park at the northern end of Potomac Greens, as well as a portion of the Potomac Yard Park on the west side of the CSXT right-of-way.

Table 3-1: Anticipated Land Use Impacts by Alternative

Alternative	Anticipated Impact on Land Use
No Build	• No impact.
Build Alternative A	• The northern and southern station entrance pavilions on the west side of the CSXT right-of-way would occupy planned public open space in Potomac Yard Park. • Station facilities would occupy planned public open space in the Rail Park.
Build Alternative B	• Station would occupy existing public open space (Potomac Greens Park) north of Potomac Greens, which is covered by the Greens Scenic Area easement administered by NPS. Build Alternative B could not proceed unless the easement is released by NPS. • Northern and southern station entrance pavilions would occupy planned/existing open space in Potomac Yard Park.
Build Alternative D	• Station and facilities would occupy existing commercial development, encompassing a parking lot and movie theater. • Would affect planned streets, including Potomac Avenue. • Would affect Potomac Yard Park, and other open spaces. • Realigned tracks at the northern end would occupy existing open space between the George Washington Memorial Parkway and existing Metrorail right-of-way. • Realigned tracks at the southern end would occupy planned public open space in the Rail Park.

3.2 Zoning

The potential effects of the No Build and the Build Alternatives on zoning are described below. The zoning impacts are primarily limited to CDD 19 (North Potomac Yard), as each alternative is generally consistent with all other zoning districts within the study area. Compliance with the *North Potomac Yard Urban Design Standards*, as applicable, will be addressed during final design. See **Table 3-2** for a summary of impacts.

3.2.1 No Build Alternative

The No Build Alternative would impact the existing zoning of CDD 19. CDD 19's development conditions reduce the permitted amount of development from 7.525 million square feet to 3.700 million square feet if no Metrorail Station is built, subject to a future planning process and zoning approval.

The No Build Alternative would not be inconsistent with other City of Alexandria zoning districts or on zoning in Arlington County.

3.2.2 Build Alternatives

The consistency of each Build Alternative with existing zoning is described below. CDD 19 permits 7.525 million square feet of development if a new Metrorail station is in the general location of Build Alternative B. If a new Metrorail station is located elsewhere, CDD 19 permits 3.700 million square feet of development, subject to the requirements outlined above.

None of the Build Alternatives would affect zoning in Arlington County or in the City of Alexandria zoning districts outside of Potomac Yard. Each alternative would occupy portions of land designated as open space in the plans which govern CDD 10 and CDD 19. Build Alternatives A and D would comply with the Height District restrictions, while Build Alternative B, at 56 feet, would exceed the height limit, although this exceedance is anticipated to be minimized or removed during final design.

Build Alternative A

The approved zoning for CDD 19 would limit the amount of development in North Potomac Yard to 3.700 million square feet under Build Alternative A. Based on the future planning process and zoning approval required for CDD 19, the mix of uses would likely change, and density may be greater than the otherwise allowed 3.700 million square feet. Build Alternative A is located entirely in Height District 6, and its proposed design complies with the district's applicable height limit of 50 feet.

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

Build Alternative B

Build Alternative B is predominantly consistent with the existing zoning of the study area. If the station is built at this location, CDD 19 would permit up to 7.525 million square feet of development in North Potomac Yard.

Build Alternative B is located within Height District 1, which limits the height of buildings to 50 feet. As currently designed, Build Alternative B would exceed the height limit. During final design, further refinement would reduce the station height to comply with the height limit.

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

Build Alternative D

The approved zoning for CDD 19 would limit the amount of development in North Potomac Yard to 3.700 million square feet under Build Alternative D. Based on the future planning process and zoning approval required for CDD 19, the mix of uses would likely change, and density may be greater than the otherwise allowed 3.7 million square feet. In addition, the new tracks would occupy land designated as open space in both CDD 10 and CDD 19, as well as developable land within CDD 19. Therefore, amendments to CDD 10 and CDD 19 would be required for Build Alternative D. The proposed design complies with the height limits of 50 feet and 100 feet.

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

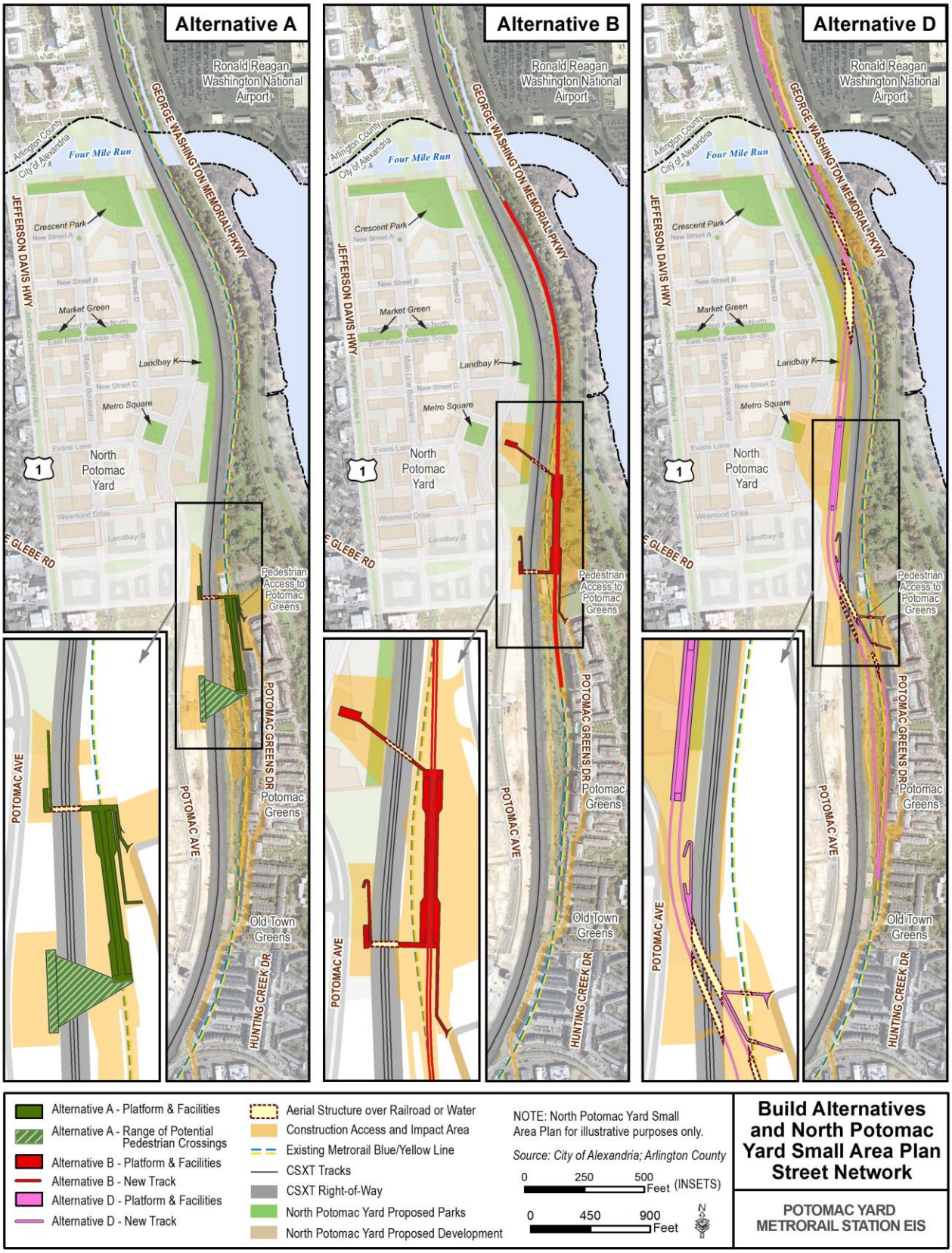
Table 3-2: Anticipated Zoning Impacts by Alternative

Alternative	Anticipated Impacts to Zoning
No Build	• CDD 19 would permit up to 3.7 million sf of development, since no Metrorail station would be provided. A future planning process and zoning approval would determine redevelopment parameters.
Build Alternative A	• Metrorail station would not be in the location stipulated in the *North Potomac Yard Small Area Plan*. Would reduce amount of development permitted in CDD 19 from 7.525 million sf to 3.7 million sf under current zoning. A future planning process and zoning approval would determine redevelopment parameters. Based on required future planning process and zoning approval, mix of uses may change and density may be greater than 3.7 million sf. • Based on required future planning process and zoning approval, mix of uses may change and density may be greater than 3.700 million sf. • Would occupy areas designated as open space in the plans which govern CDD 10 and CDD 19.
Build Alternative B	• Exceeds 50-foot height limit as currently designed. • Would occupy areas designated as open space in the plans which govern CDD 10 and CDD 19.
Build Alternative D	• Metrorail station would not be in the location stipulated in the *North Potomac Yard Small Area Plan*. Would reduce amount of development permitted in CDD 19 from 7.525 million sf to 3.7 million sf under current zoning. A future planning process and zoning approval would determine redevelopment parameters. Based on required future planning process and zoning approval, mix of uses may change and density may be greater than 3.7 million sf. • Would occupy areas designated as open space in the plans which govern CDD 10 and CDD 19.

3.3 Consistency with Local Plans

The following sections describe the extent to which the No Build and the Build Alternatives are consistent with local plans. **Table 3-3** summarizes the findings. **Figure 3-1** shows the relationship of the Build Alternatives with the North Potomac Yard Plan street network, development blocks, and planned parks.

Figure 3-1: Build Alternatives and North Potomac Yard Plan Street Network



3.3.1 No Build Alternative

The No Build Alternative would be inconsistent with the *North Potomac Yard Small Area Plan*, because the plan recommends a high-density, transit-oriented development anchored by a future Metrorail station. The exclusion of the station would substantially impact the development density and character of North Potomac Yard. The Metrorail station is a central element of the plan and is necessary to support the level of development approved for the site, given the constraints of existing roadways and approved zoning.

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

Under the No Build Alternative, development in Potomac Yard would be visible from the GWMP, reducing the quality of the continuous viewshed from very high to high.

3.3.2 Build Alternatives

The Build Alternatives would be consistent with existing local plans to varying degrees. The majority of plans reference a Metrorail station without identifying or recommending a specific location for the station, although a potential station location at approximately Build Alternative A was identified during the design of the Metrorail line in the 1970s, as well as shown in the *Potomac Yard/Potomac Greens Small Area Plan*. The *North Potomac Yard Small Area Plan* is designed around a specific station location, approximately at the location of Build Alternative B. The consistency of the Build Alternatives with local plans is described in the following sections.

Build Alternative A

Build Alternative A would locate the station south of where it is envisioned in the *North Potomac Yard Small Area Plan*. The majority of the dense development in North Potomac Yard would be more than one-quarter mile from the Metrorail station under Build Alternative A. Therefore, Build Alternative A would not adequately support the planned density of development in the *North Potomac Yard Small Area Plan*.

The *Potomac Yard/Potomac Greens Small Area Plan* (1992, amended 1999) identifies a Metrorail station in the approximate location of Build Alternative A, and the CDD concept plan requires a reservation for a potential Metrorail station approximately at the location of Build Alternative A. The reservation was implemented as part of the approval of Potomac Greens. However, the *North Potomac Yard Small Area Plan* (2010) supersedes portions of the *Potomac Yard Small Area Plan* and assumes a station location in the vicinity of Build Alternative B.

GWMP plans and NPS policies do not address the addition of a Metrorail Station at Potomac Yard. Build Alternative A would not be inconsistent with plans for the GWMP, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Build Alternative A would not require the use of GWMP land. Some views from the GWMP roadway and parkland would be affected. In 2020, the existing character of the views from GWMP, of a curving roadway framed by vegetation with intermittent views of built elements to the west and views of the river to the east, would be changed through the introduction of new build elements and the removal of vegetation from areas west of the GWMP. By 2040, restored vegetation would grow to filter views of built elements from the GWMP. In 2020, the visual quality would be very high, and in 2040, the visual quality of the GWMP would be high, as in the No Build Alternative. See the *Visual Resources Technical Memorandum* for more detail.

Build Alternative B

Build Alternative B is generally consistent with the station location identified in the *North Potomac Yard Small Area Plan*. The alternative would provide direct access to the core of the planned development and would support the approved development densities in North Potomac Yard.

Build Alternative B is located north of where the station was identified in the *Potomac Yard Small Area Plan* (1992, amended 1999); however, the *North Potomac Yard Small Area Plan* (2010) supersedes the earlier plan.

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

GWMP plans and NPS policies do not address the addition of a Metrorail Station at Potomac Yard. The Preferred Alternative would not be inconsistent with plans for the GWMP and NPS policies, as described in the *George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987), Capper-Cramton Act of 1930, and the Organic Act of 1916. The Preferred Alternative would also require the use of national parkland, as well as 1.71 to 1.94 acres of the Greens Scenic Area easement, the intention of which is to preserve and enhance the visual quality of the GWMP. The Preferred Alternative could not proceed unless the scenic easement is released by NPS subject to an equal value exchange in property or interest in property per 54 U.S.C. 102901. If the Preferred Alternative is able to proceed, some views from the GWMP roadway and parkland would be affected. In 2020, the visual character of the corridor would be changed from a divided four-lane roadway consistently framed by vegetation (with intermittent views of rail transportation and built elements to the west and river to the east) to that of a roadway framed by vegetation but more frequently interrupted with views of transportation facilities and built elements. By 2040, restored vegetation would grow to filter views of the Metrorail station from the GWMP roadway and park, although the trees would unlikely reach a height and depth that would consistently block views of the station. The visual quality of the continuous view corridor would be very high in 2020 and high in 2040, as in the No Build Alternative. See the *Visual Resources Technical Memorandum* for more detail.

Build Alternative D

Build Alternative D is located within North Potomac Yard. The alternative would provide direct access to "Metro Square," one of the primary nodes of development identified in the *North Potomac Yard Small Area Plan*. However, as Alternative D places the station platform west of the existing CSXT/Metrorail tracks, the alternative would impact the planned open space (Potomac Yard Park) and reduce the amount of development currently planned within North Potomac Yard by occupying developable land.

Build Alternative D is located north of where the station was identified in the *Potomac Yard Small Area Plan* (1992, amended 1999); however, the *North Potomac Yard Small Area Plan* (2010) supersedes the earlier plan.

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

GWMP plans and NPS policies do not address the addition of a Metrorail Station at Potomac Yard. Build Alternative D would not be inconsistent with plans for the GWMP, as described in *the George Washington Memorial Parkway Corridor Management Program* (2005), the *Resource Management Plan: George Washington Memorial Parkway* (1994), and the *Mount Vernon Memorial Highway Cultural Landscape Report* (1987). Build Alternative D would require the use of GWMP land. Some views from the parkway would be affected. In 2020, the character of the corridor would change from a consistent four-lane roadway framed by vegetation with intermittent views of transportation facilities and built elements to the west and the river to the east, to that of a roadway partially framed by vegetation with views of transportation facilities and built elements. By 2040, replacement vegetation would have grown to filter much of the Metrorail facilities

from the GWMP. In 2020 and 2040, the visual quality of the GWMP would decline from high to moderately high. See the See the Visual Resources Technical Memorandum for more detail.

Table 3-3: Conformity with Local Plans by Alternative

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

4.0 MITIGATION

4.1 Land Use

For all Build Alternatives, the station elements proposed within parks would be designed to integrate with park facilities, and any affected park infrastructure would be replaced. The City has requested a provision in the deed for dedication of the northern portion of the Potomac Yard Park property to the City which stipulates that Metrorail station uses within the specified landing sites are permitted.

4.2 Zoning

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

4.3 Consistency with Local Plans

No mitigation is proposed.

APPENDIX:

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POTOMAC YARD METRORAIL STATION

ENVIRONMENTAL IMPACT STATEMENT

Administrative Review Draft

Neighborhoods and Environmental Justice Technical Memorandum

February 2013

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APPENDIX: REFERENCES

1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

This technical memorandum identifies the potential effects to neighborhoods, demographics, and community resources, as well as environmental justice populations in the No Build and three Build Alternatives. The memorandum describes the following:

- Project alternatives
- Applicable regulations and guidance
- Methodology
- Opening year conditions
- Potential effects of each alternative (note that construction effects are described separately in the Construction Impacts Technical Memorandum)

The findings of this analysis will be incorporated into the Draft EIS.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail through the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

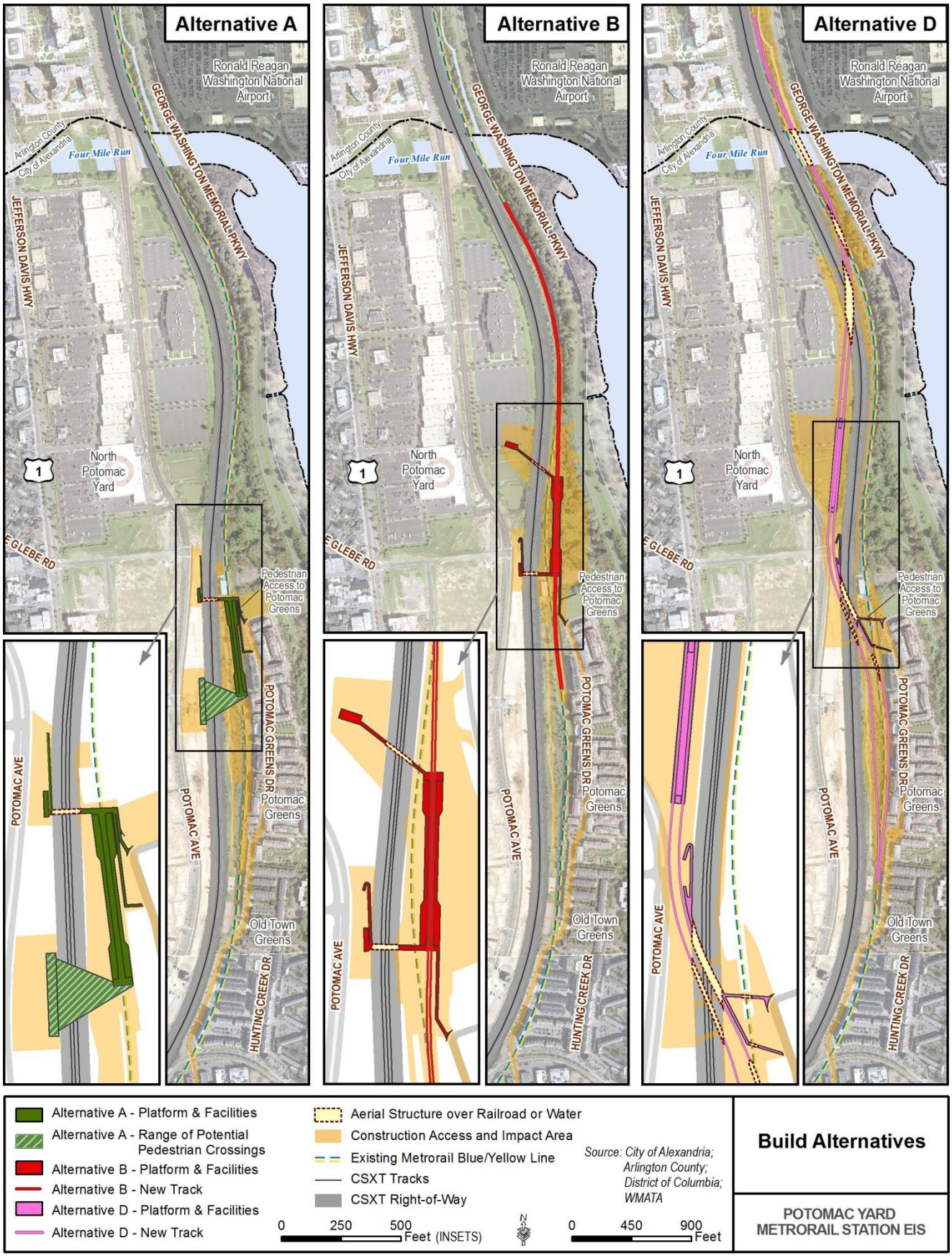
The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Figure 1-1: Build Alternatives



Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned

1.2 Applicable Regulations and Guidance

1.2.1 Neighborhoods, Demographics, and Community Resources

In addition to general NEPA regulations and guidance, the neighborhoods, demographics and community resources analysis was developed consistent with the following federal regulations and guidance:

- Executive Order 13045*: Protection of Children from Environmental Health Risks and Safety Risks*, 62 FR 19883, April 23, 1997.

In addition to general NEPA regulations and guidance, the environmental justice analysis was prepared in accordance with the following federal guidance documents:

- Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 FR 7629, February 11, 1994;
- U.S. Department of Transportation (USDOT), Order 5610.2(a), *Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 77 FR 27534, May 10, 2012;
- Federal Transit Administration Circular 4703.1, *Environmental Justice Policy Guidance for Federal Transit Administration Recipients*, August 15, 2012; and
- Council on Environmental Quality, *Environmental Justice – Guidance under the National Environmental Policy Act*, December 10, 1997.

1.3 Methodology

1.3.1 Neighborhoods, Demographics, and Community Resources

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

The analysis area for neighborhoods, demographics, and community resources was expanded beyond the project study area to include neighborhoods to the west of U.S. Route 1, because of the interrelationships between Potomac Yard and adjoining neighborhoods. The expanded analysis area is bound by Mt. Vernon Avenue, Four Mile Run and Eads Street to the west, the Airport Access Road to the north, the George Washington Memorial Parkway to the east, and Slaters Lane to the south. See **Figure 2-1** for an outline of the study area.

Neighborhood characteristics that were evaluated included demographics, community services, and housing types. The analysis utilized the following data sources:

- U.S. Census Bureau, 2010 Decennial Census;
- U.S. Census Bureau, 2006-2010 American Community Survey Metropolitan Washington Council of Governments (MWCOG) Cooperative Land Use Forecasts (Round 8.1);
- City of Alexandria, *North Potomac Yard Small Area Plan, Chapter 5 – Community Facilities,* June 2010; and
- City of Alexandria, *North Potomac Yard Small Area Plan, Chapter 8 – Existing Neighborhoods*, June 2010.

Community resources analyzed included libraries, schools, community centers, places of worship, and emergency response facilities (such as fire stations and police stations). Community resource impacts may include increases in emergency or police response times as a result of the project; changes in access to community facilities; or direct impacts, such as an acquisition of a property that results in the displacement of the community facility.

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

demographics of the analysis area to the demographic characteristics of the City of Alexandria, Arlington County, and the WMATA Compact Area. The WMATA Compact Area includes all of the jurisdictions that are current members of the WMATA Compact in Maryland, Virginia, and the District of Columbia. The use of comparison areas provides a sense of how the demographic characteristics of the analysis area neighborhoods differ from those of the overall municipalities and region in which the project is located.

Pursuant to *Executive Order 13045: Protection of Children from Environmental Health and Safety Risks*, the evaluation of community facilities highlighted community resources within the analysis area that would be expected to serve high concentrations of children, including schools, community/recreational facilities, and daycare centers.

Potential effects to neighborhoods, such as noise and vibration, visual impacts, economic impacts, traffic, were assessed using the findings of the specific analyses conducted separately for those environmental resources as part of the project EIS. The methodologies used in those resource analyses and their complete findings are reported in the individual technical memoranda.

1.3.2 Environmental Justice

An analysis of the presence of low-income and minority (Environmental Justice) populations within the analysis area was conducted pursuant to Executive Order 12898*, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.*

A one-half mile radius, the typical walking distance to high-quality, high-frequency transit, around the build alternatives (platforms and construction easements) was determined to be the appropriate boundary to analyze the presence of environmental justice populations, and census blocks and tracts that fell within the boundary were included. Census blocks and tracts to the west of U.S. Route 1 were included in the environmental justice analysis area, because these neighborhoods could be affected by construction of the Metrorail station, and portions of these neighborhoods are within a one-half mile radius of the Build Alternatives. Three comparison areas were selected for the environmental justice analysis: Arlington County, the City of Alexandria, and the WMATA Compact Area jurisdictions. The analysis identifies minority status, defined as all residents other than Non-Hispanic Whites, at the census block level geography using data from the 2010 Decennial Census.

The 2010 Census did not collect information on the socio-economic characteristics needed to determine the presence of low-income and minority low-income individuals. As a result, the 2006-2010 five-year American Community Survey estimates, available only at the census tract level, were used for this purpose. The presence of low-income residents in the analysis area was evaluated by comparing the Area Median Income (AMI) of the six selected census tracts with the comparison areas. AMI was used to provide an appropriate comparison of relative income levels in the analysis area. Poverty status, the percentage of households in poverty over the past 12 months, was also documented for the census tracts selected. The analysis reports poverty for the general population as well as the rates among the two largest minority groups in the analysis area: African American and Hispanics. Notably, poverty status as determined by the Census Bureau uses a fixed dollar income value that varies by family size and type, but not by location. As a result, the proportion of households experiencing poverty in higher-cost metropolitan regions may be underreported by this measure.

Potential effects to minority and low-income populations, such as noise and vibration, visual impacts, economic impacts, traffic, were assessed using the findings of the specific analyses conducted separately for those environmental resources as part of the project EIS. The methodologies used in those resource analyses and their complete findings are reported in the individual technical memoranda.

2.0 OPENING YEAR CONDITIONS

2.1 Neighborhoods, Demographics, and Community Resources

Figure 2-1 illustrates neighborhoods and community resources in the analysis area. Neighborhoods and community resources are described separately in the subsections below.

2.1.1 Neighborhoods

Potomac Greens

The Potomac Greens townhome community is located to the north of Slaters Lane and the Old Town Greens neighborhood, to the west of the George Washington Memorial Parkway and directly adjacent to the current Blue and Yellow line Metrorail track alignment. The development is on the site of the former Potomac Yard, which was once the largest yard for freight interchange on the east coast. Potomac Greens was constructed in 2007 and has approximately 300 residents.

Alexandria Potomac Yard

The planned development for the Alexandria section of Potomac Yard is discussed in the local plans section. The development is on the site of the former Potomac Yard, which was once the largest yard for freight interchange on the east coast. The only existing community facility in the Alexandria portion of Potomac Yard is Fire Station 209, a mixed-use development that includes a small amount of ground-level retail space with 44 affordable housing units and 20 workforce housing rental units located above the fire station. Development of townhomes and condominiums is currently underway of a community. By 2016, it is anticipated that there will be new mixed-use and residential neighborhoods in South Potomac Yard.

Old Town Greens

Old Town Greens is a townhome and condominium community located to the west of the George Washington Memorial Parkway and east of the current Blue and Yellow Line Metrorail track alignment. Neighborhood-serving retail is located at the intersection of Potomac Greens Drive and Slaters Lane. Old Town Greens was constructed in the late 1990s and early 2000s. The development is on the site of the former Potomac Yard, which was once the largest yard for freight interchange on the east coast. The neighborhood has approximately 350 residents.

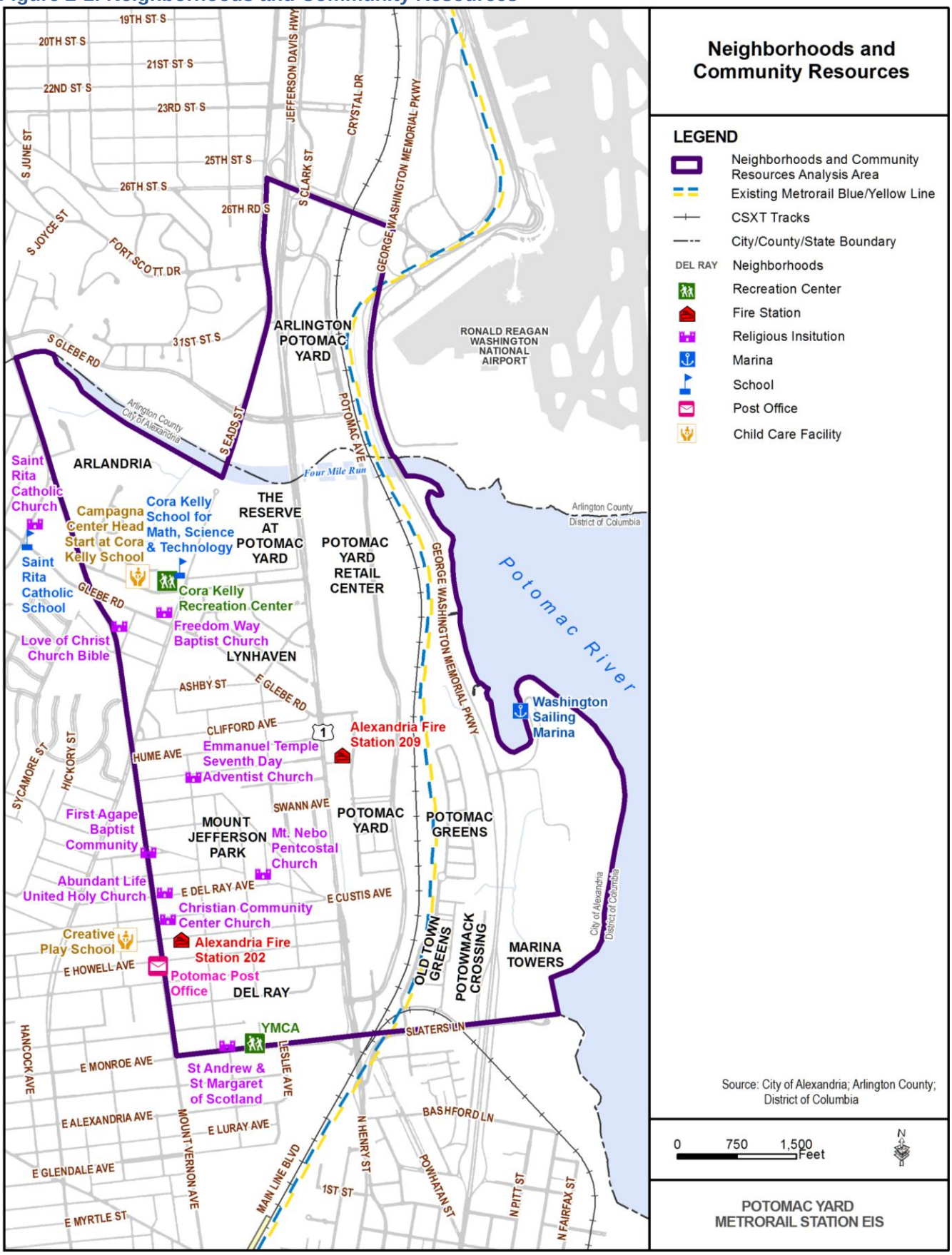
Arlington Potomac Yard

The Eclipse is a high-rise, mixed-use community comprised of 465 units (a mix of condominiums and apartments) built above an 80,000 square foot retail center. The development is located directly on Four Mile Run in the Arlington portion of Potomac Yard. Several other office, hotel, and short-term residential/apartment buildings currently occupy the Arlington portion of Potomac Yard. The area has approximately 1,160 residents. The development is on the site of the former Potomac Yard.

Arlandria

Arlandria, also known as Chirilagua, is roughly located to the north of East Glebe Road and West Glebe Road, and to the west of Commonwealth Avenue. Arlandria has a concentration of mid-century garden-style apartment complexes, as well as a variety of other residential housing types, including mid-century and more newly constructed townhomes, single-family homes, and one mid-rise residential building. Community-oriented commercial uses are located along Mount Vernon Avenue and at the intersection of Mount Vernon Avenue and Glebe Road. Arlandria has a far higher proportion of renter households (over 80 percent) than other neighborhoods within the analysis area, and contains 46 percent of all minors within the analysis area, according to 2010 Decennial Census data. The neighborhood has relatively high population densities compared to other analysis area neighborhoods. The combined population of Arlandria, Lynhaven, and Del Ray is approximately 25,000 people.

Figure 2-1: Neighborhoods and Community Resources



Del Ray

The Del Ray neighborhood is bound to the north by East Glebe Road, to the west by Russell Road, to the south by Braddock Road, and to the east by U.S. Route 1. The section of the Del Ray neighborhood that is east of Mount Vernon Avenue is captured in the analysis area. Beginning in 1894, Del Ray was developed as a planned community consisting primarily of single-family homes. Del Ray later incorporated mid-century garden-style apartment complexes and condominium units, as well as neighborhood-serving retail primarily located along Mount Vernon Avenue. The Del Ray neighborhood includes the area referred to as "Mount Jefferson Park," which is located near U.S. Route 1. The combined population of Arlandria, Lynhaven, and Del Ray is approximately 25,000 people.

Lynhaven

Lynhaven is located just north of Del Ray, across U.S. Route 1 from the Potomac Yard Shopping Center. The neighborhood is bound on the north by East Reed Avenue, on the south by East Glebe Road, on the west by Commonwealth Avenue, and on the east by U.S. Route 1. Most of the Lynhaven neighborhood is comprised of townhomes and duplexes developed in the 1940s, single family homes, condominium buildings, and apartment buildings. Some neighborhood serving retail is located near the intersection of East Glebe Road and Commonwealth Avenue, while retail establishments such as auto dealerships, auto parts dealers, and gas stations are located along U.S. Route 1. The combined population of Arlandria, Lynhaven, and Del Ray is approximately 25,000 people.

Potowmack Crossing Condominiums

Potowmack Crossing Condominiums is located next to the Old Town Greens neighborhood, to the north of Slaters Lane and just to the east of the George Washington Memorial Parkway, along West Abingdon Drive. The complex includes 242 1- and 2-bedroom condominium units, and was developed in the 1940s. Population density east of U.S. Route 1 is greatest in the census block that contains the Potowmack Crossing Condominiums, which has approximately 530 residents.

Marina Towers

Marina Towers is a high-rise residential condominium building located at 501 Slaters Lane, to the east of the George Washington Memorial Parkway and overlooking the Potomac River. Marina Towers has 355 residents and 278 units according to 2010 Census data. The building was completed in 1970, and was at one time home to the Esso (Exxon) tank farm.

2.1.2 Demographics

This section documents the demographics of the expanded analysis area defined above. Demographic information for minority population and household income are described separately in the Environmental Justice section below.

Demographic characteristics were analyzed using 2010 Decennial Census block level data (the smallest level of census geography available). Analysis area demographics are similar to those found in the overall City of Alexandria and Arlington County comparison areas.

Presence of Minors

To meet the requirements of *Executive Order 13045: Protection of Children from Environmental Health and Safety Risks*, information on the age of residents in the analysis area was gathered and is shown in **Table 2-1**. In total, approximately 3,300 children under the age of 18 reside within the analysis area, and the proportion of minors within the analysis area slightly exceeds the proportion of minors found within the comparison areas. Just under half (43 percent) of all minors in the analysis area reside in Census Tract 2013.03, which includes the Arlandria neighborhood. The single public school within the analysis area, Cora Kelly School for Math, Science, and Technology, has 353 students.[1]

[1] City of Alexandria Public Schools. Accessed May 23, 2012. http://www.acps.k12.va.us/profiles/kelly.php.

Table 2-1: Potomac Yard Analysis Area Demographics

	Analysis Area	City of Alexandria	Arlington County	WMATA Compact Area
Total Population	19,876	139,966	207,627	3,878,571
Percent under 18 years	23%	17%	16%	21%
Percent 65 years and older	8%	9%	8%	10%

Source: U.S. Census Bureau, 2010 Decennial Census, Summary File 1.

Projected Population and Employment Growth

MWCOG provides long-range population and employment forecasts for the analysis area to the year 2040. The MWCOG Cooperative Forecasting Round 8.1 contains current population and employment based on jurisdictional data and is the most recent regionally adopted set of population, households, and employment growth projections. The projections are made at the Traffic Analysis Zone (TAZ) level, which differ slightly from the Census Tracts used to calculate 2010 population. The analysis area for the projections shown in **Table 2-2** includes the TAZs within the Arlington and Alexandria portions of Potomac Yard and the Alexandria neighborhoods located to the west of U.S. Route 1. **Figure 2-2** shows the location of the population and employment analysis area.

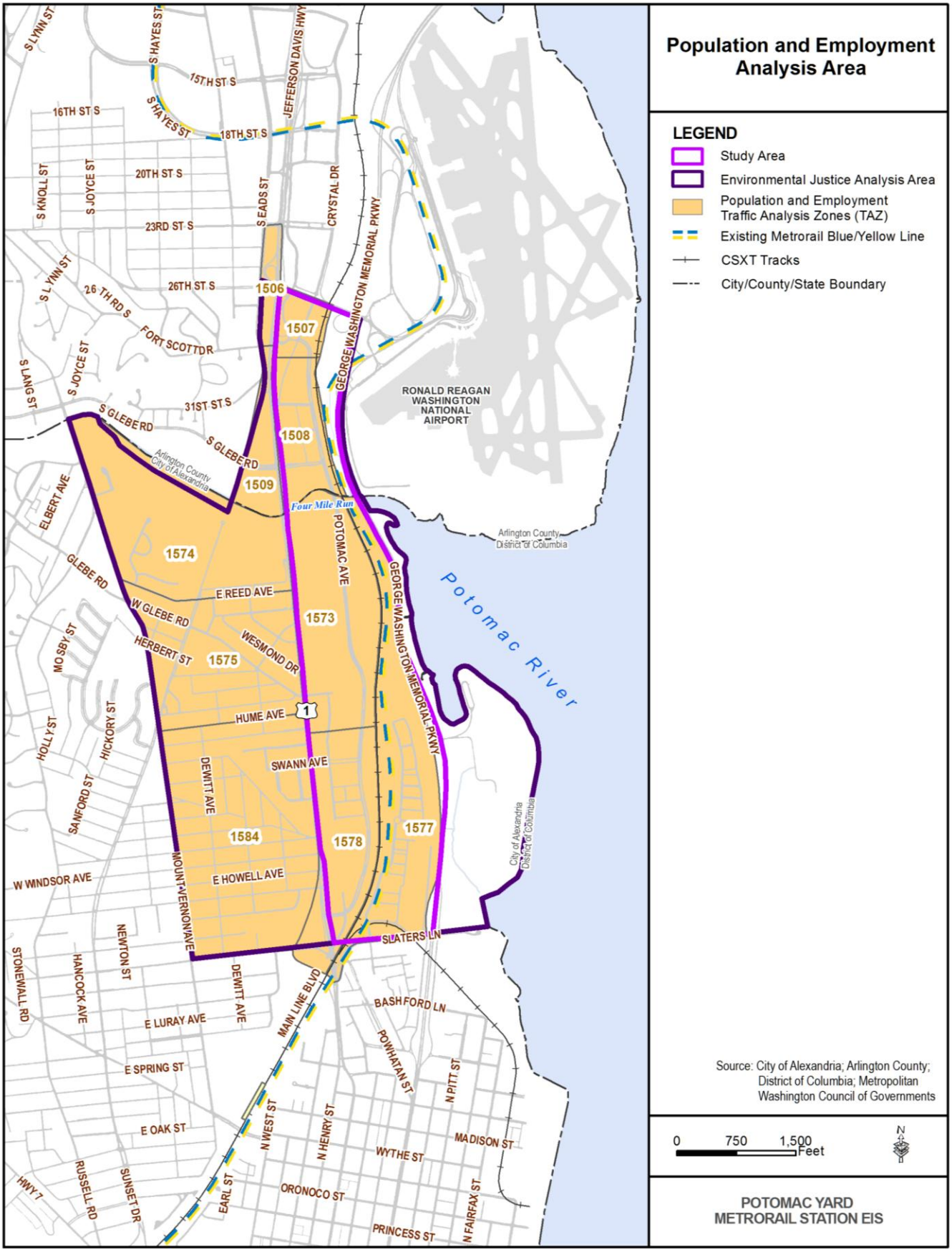
The development levels outlined in the relevant local small area plans have been incorporated into the MWCOG forecasts, and Potomac Yard (City of Alexandria and Arlington County sections) is anticipated to see a 109 percent increase in population and a 138 percent increase in employment by the year 2040. The population and employment growth within the analysis area are driven primarily by the redevelopment of Potomac Yard.

Table 2-2: Projected Population and Employment Growth

Area	Population 2010	Projected Population 2040	Projected Population Growth 2010 - 2040	Employment 2010	Projected Employment 2040	Projected Employment Growth 2010 - 2040
Analysis Area*	10,345	21,590	109%	9,681	23,082	138%
City of Alexandria	139,958	189,349	35%	106,046	155,012	46%
Arlington County	207,627	252,435	22%	223,264	308,376	38%
WMATA Compact Area	3,875,826	4,737,069	22%	2,645,534	3,616,462	37%

*Area is based on Transportation Analysis Zones (TAZ) rather than U.S. Census tract boundaries cited elsewhere in this section. Includes both Arlington and Alexandria portions of Potomac Yard covering TAZs: 1506,1507, 1508, 1509,1573, 1574, 1575,1577, and 1578, 1584.
Source: MWCOG Cooperative Forecasting Round 8.1.

Figure 2-2: Population and Employment Analysis Area



2.1.3 Community Resources

Community resources within the analysis area neighborhoods include schools, fire stations, religious institutions, childcare facilities, and state and federal employers. **Table 2-3** lists analysis area community resources and **Figure 2-1** shows their locations within the analysis area and their vicinity west of U.S. Route 1.

Table 2-3: Existing Community Facilities

Facility Type	Name	Address (Alexandria unless otherwise noted)	Ownership	Location
Recreation Center	Cora Kelly Recreation Center	25 West Reed Avenue	City of Alexandria	Arlandria
Public School	Cora Kelly School for Math, Science and Technology	3600 Commonwealth Avenue	Alexandria City Public Schools	Arlandria
Private School	Saint Rita Catholic School	3801 Russell Road	Private	Arlandria
Post Office	Potomac Post Office	1908 Mount Vernon Ave	USPS	Del Ray
Public Safety	Fire Station #202	213 East Windsor Avenue	Public	Del Ray
Public Safety	Fire Station #209	2800 Main Line Blvd	Public	Alexandria Potomac Yard
Religious Institution	Saint Rita Catholic Church	3815 Russell Road	Private	Arlandria
Religious Institution	Freedom Way Baptist Church	1 West Glebe Road	Private	Arlandria
Religious Institution	Love of Christ Church Bible	101 Leadbeater Street	Private	Del Ray
Religious Institution	Emmanuel Temple Seventh Day Adventist	2707 Dewitt Avenue	Private	Del Ray
Religious Institution	Mt Nebo Pentecostal Church	2300 Burke Avenue	Private	Del Ray
Religious Institution	First Agape Baptist Community	2423 Mount Vernon Ave	Private	Del Ray
Religious Institution	Abundant Life United Holy Church	204 East Del Ray Avenue	Private	Del Ray
Religious Institution	Christian Community Center Church	203 East Custis Avenue	Private	Del Ray
Religious Institution	St Andrew & St Margaret Of Scotland	402 East Monroe Avenue	Private	Del Ray
Childcare Facility	Creative Play School	100 East Windsor Avenue	Private	Del Ray
Childcare Facility	Campagna Center Head Start at Cora Kelly School	3600 Commonwealth Avenue	City of Alexandria	Arlandria
Marina	Washington Sailing Marina	1 Marina Drive at Daingerfield Island	National Park Service	George Washington Memorial Parkway

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

2.2 Environmental Justice

This section describes the existing minority and low-income populations within the analysis area for environmental justice populations.

2.2.1 Minority Population

Table 2-4 summarizes the minority populations of the analysis area in comparison to Alexandria, Arlington and the WMATA Compact Area. This table presents data on the presence of minorities within the environmental justice analysis area.

Minority groups make up 44.3 percent of the population in the environmental justice analysis area, which is lower than the percentage of minorities in the City of Alexandria (46.5 percent) and the WMATA Compact Area (58.1 percent). The proportion of minorities in the environmental justice analysis area exceeds that of Arlington County (36.0 percent). Within the environmental justice study area there are 20 census blocks with a higher proportion of minority residents than the WMATA Compact Area. Census blocks with a higher percentage of minority residents than the WMATA Compact Area are shown in **Figure 2-3**.

Figure 2-3: Minority Populations

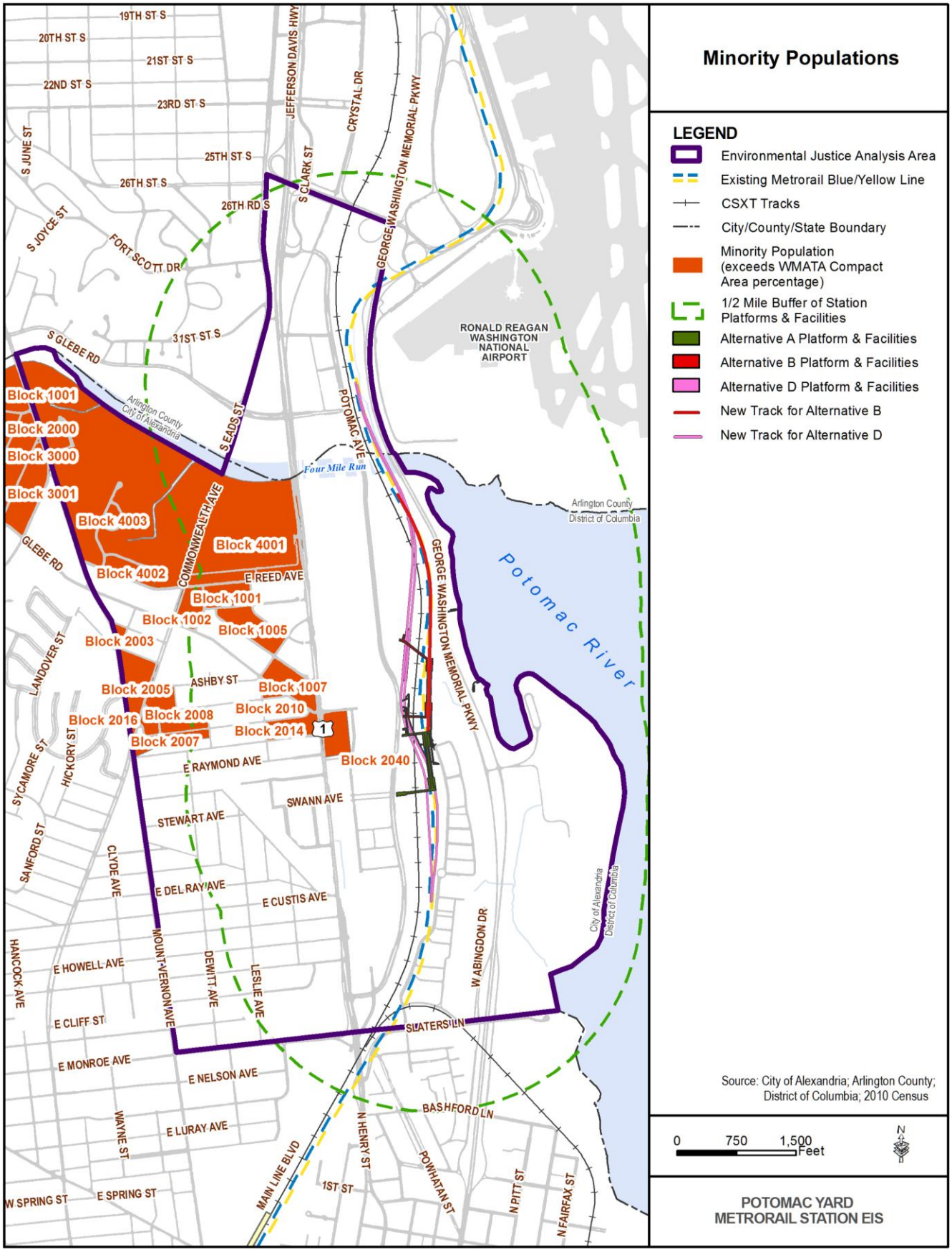


Table 2-4: Minority Population Summary Table

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

Source: U.S. Census Bureau, 2010 Decennial Census, Summary File 1.

[1]The data does not sum to the total in this column due to the use of a proportion of the total population and the population by race equal to the proportion of the block within the analysis area.

The U.S. Census Bureau categorizes Hispanic as an ethnicity, not a race. As a result, 2010 Census respondents who reported that they were White and Hispanic were subtracted from those respondents who reported their race as White, to provide an accurate representation of minority groups in the environmental justice analysis area. The proportion of residents reporting that they are Hispanic, of any race, in the environmental justice analysis area is slightly higher than that of the City of Alexandria, Arlington County, or the WMATA Compact area (**Table 2-5**).

Table 2-5: Potomac Yard Analysis Area Hispanic Population (All Races)

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

Source: U.S. Census Bureau, 2010 Decennial Census, Summary File 1.

Low-Income Population

Income data are only available at the Census tract level, and as a result income could not be analyzed at a level of geography analogous to the presence of minority communities. FTA C 4703.1 defines low-income as "a person whose median household income falls below U.S. Department of Health and Human Services (HHS) defined poverty guidelines or as a percentage of median income for the local area if that threshold is at least as inclusive as the HHS poverty guidelines." The HHS poverty guidelines are produced for the 48 contiguous states and the District of Columbia, and as such do not reflect the local cost of living. As a result, the use of the U.S. Department of Housing and Urban Development (HUD) area FY2010 median income and poverty guideline limits for Washington-Arlington-Alexandria, DC-VA-MD HUD Metro Fair Market Rent (FMR) Area[2] were employed to accurately reflect local economic conditions. HUD uses income limits that define "Low Income" as those households earning less than 80 percent of Area Median Income (AMI), with households making less than 50 percent of AMI defined as "Very Low Income," and those making 30 percent of AMI or less as "Extremely Low Income." Fiscal Year 2010 AMI for families in the Washington DC FMR Area was $103,500.[3] Like the HHS poverty guidelines, HUD's FMR income limits are defined by household size. The FY2010 AMI income limits for a "Low Income" family of four of $64,400 was used as the AMI definition for low income in this analysis.[4] Census tracts with median household incomes below $64,400 are shown in **Figure 2-4.**

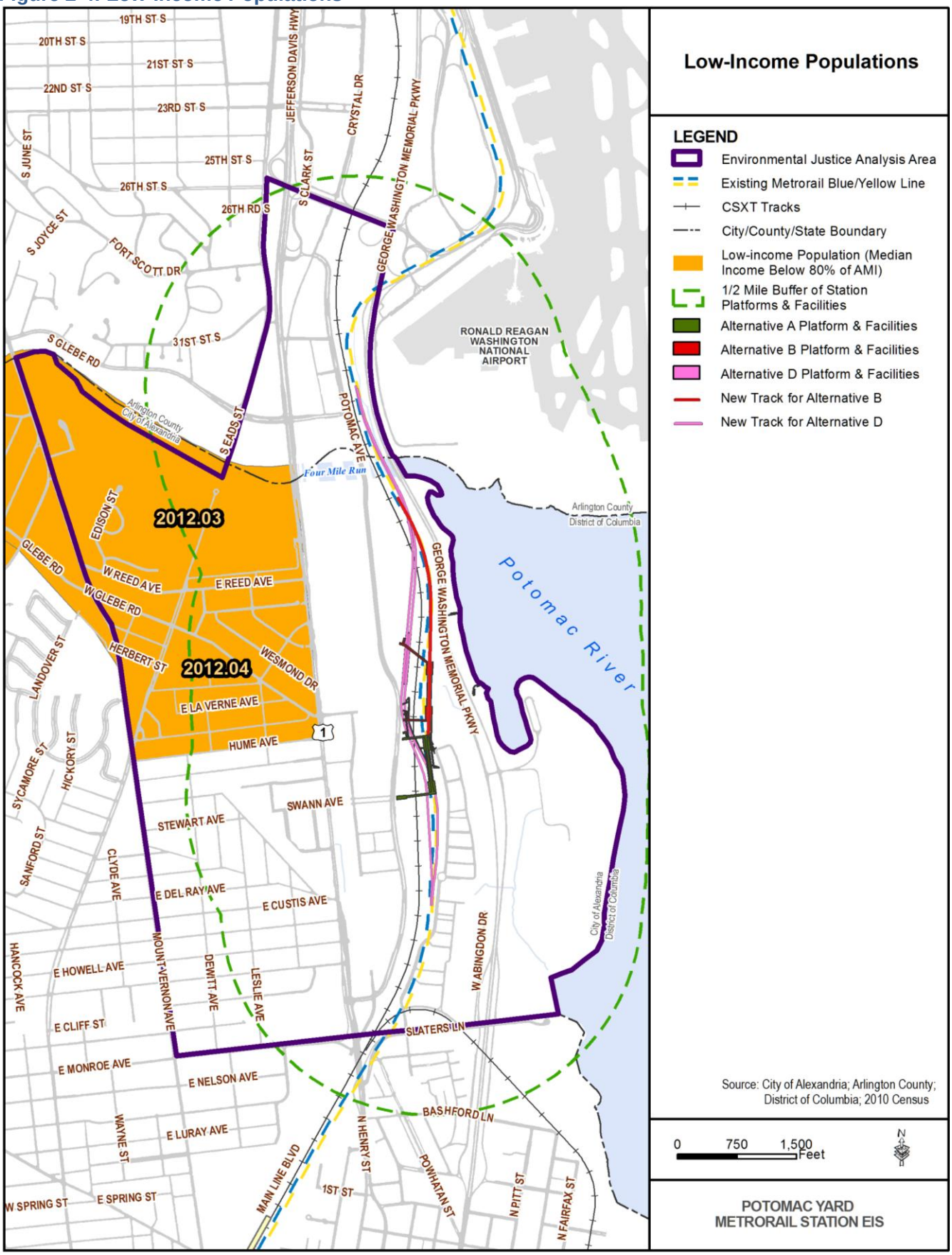
In the City of Alexandria portion of the analysis area, two census tracts fall below the $64,400 income limit for the Washington DC FMR region: Census Tract 2012.03 and Census Tract 2012.04. Tract 2012.03 covers the Arlandria and Lynhaven neighborhoods and has an AMI of $44,264. Tract 2012.04 covers the Mount Jefferson Park neighborhood and has an AMI of $60,510. No census tracts in the Arlington County portion of the analysis area fall below the $64,400 income limit.

[2] The Washington-Arlington-Alexandria, DC-VA-MD HUD Metro FMR Area contains the following areas: District of Columbia, DC; Calvert County, MD; Charles County, MD; Frederick County, MD; Montgomery County, MD; Prince George's County, MD; Arlington County, VA; Clarke County, VA; Fairfax County, VA; Fauquier County, VA; Loudoun County, VA; Prince William County, VA; Spotsylvania County, VA; Stafford County, VA; Alexandria City, VA; Fairfax City, VA; Falls Church City, VA; Fredericksburg City, VA; Manassas City, VA; and Manassas Park City, VA.

[3] Washington-Arlington-Alexandria, DC-VA-MD HUD Metro FMR Area ."FY2010 Income Limits." http://www.huduser.org/portal/datasets/fmr.html, Accessed on July 25, 2012.

[4] In regions where the 80 percent of AMI exceeds the U.S. median income, the low-income limit is capped by the United States median income, except in cases where 85 percent of the area's annual 2 bedroom fair market rent is greater than 35 percent of the United States median income. In FY2010 the Washington, DC FMR region low income limit was capped by the United States median income. Source: http://www.huduser.org/portal/datasets/il/il2010/2010summary.odn?inputname=METRO47900M47900*Washington-Arlington-Alexandria%2C+DC-VA-MD+HUD+Metro+FMR+Area&selection_type=hmfa&year=2010. Accessed on August 1, 2012.

Figure 2-4: Low-Income Populations



3.0 POTENTIAL EFFECTS

This section describes the potential effects to neighborhoods, demographics, community resources, and environmental justice populations.

3.1 Neighborhoods, Demographics, and Community Resources

USDOT Order 5610.2(a) defines adverse effects as "the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects." Potential impacts to the neighborhoods within the analysis area were considered based on the potential adverse effects listed in USDOT Order 5610.2(a):

- Human health impacts (bodily impairment, infirmity, illness or death);
- Environmental health impacts (air, noise, and water pollution and soil contamination);
- Resource impacts (destruction or disruption of natural or man-made resources);
- Destruction or diminution of aesthetic value;
- Community cohesion impacts;
- Destruction and disruption of the availability of public and private facilities and services;
- Vibration;
- Adverse employment impacts;
- Displacement of persons, businesses, farms or non-profit organizations;
- Increased traffic congestion;
- Isolation, exclusion, or separation of minority or low-income individuals within a given community from the broader community; and
- Denial or, reduction in, or significant delay in receipt of benefits of DOT programs, policies, or activities.

Many of these impacts have been analyzed in detail in other sections of the Draft EIS. **Table 3-1** summarizes the overall potential effects of the assessment areas to the individual neighborhoods identified within the analysis area. The categories in **Table 3-1** are adapted from categories listed in USDOT Order 5610.2(a). Potentially affected neighborhoods are those described in Section 2.1.1.

Table 3-1: Potential Effects to Neighborhoods, Demographics, and Community Resources Summary

Community Effects	No Build	Alternative A	Alternative B	Alternative D
Changes in population and employment	Population and employment growth primarily due to redevelopment of Potomac Yard	Additional population and employment growth due to greater amount of development allowed in North Potomac Yard	Additional population and employment growth due to greater amount of development allowed in North Potomac Yard	Additional population and employment growth due to greater amount of development allowed in North Potomac Yard
Community cohesion and interaction	Increased interaction via new pedestrian connection and amenities for Potomac Greens, Old Town Greens, Potowmack Crossing	Increased interaction via new pedestrian connection and amenities for Potomac Greens, Old Town Greens, Potowmack Crossing	Increased interaction via new pedestrian connection and amenities for Potomac Greens, Old Town Greens, Potowmack Crossing	Increased interaction via new pedestrian connection and amenities for Potomac Greens, Old Town Greens, Potowmack Crossing
Isolation effects	Isolation of Potomac Greens/Old Town Greens would decrease due to pedestrian access to Potomac Yard	Isolation of Potomac Greens/Old Town Greens would decrease due to pedestrian access to Potomac Yard via station	Isolation of Potomac Greens/Old Town Greens would decrease due to pedestrian access to Potomac Yard via station	Isolation of Potomac Greens/Old Town Greens would decrease due to pedestrian access to Potomac Yard via station
Social values – social groups valued or harmed	No Effect	No Effect	No Effect	No Effect
Barrier effects	No Effect	No Effect	No Effect	No Effect

Community Effects	No Build	Alternative A	Alternative B	Alternative D
Noise and vibration	None	No significant impacts given existing background levels	No significant impacts given existing background levels	No significant impacts given existing background levels
Physical intrusions – dust, odor, light	None	Temporary construction impacts	Temporary construction impacts	Temporary construction impacts
Consistency with Local Plans/Land Use Patterns	Inconsistent with local plans	Station is farther south than in *North Potomac Yard Small Area Plan*	Station most closely matches the location in the *North Potomac Yard Small Area Plan* Station occupies existing parkland.	Station location occupies a portion of buildable area in the *North Potomac Yard Small Area Plan*
Economic conditions	Increase in retail, employment base in Potomac Yard	Increase in retail, employment base in Potomac Yard	Increase in retail, employment base in Potomac Yard	Increase in retail, employment base in Potomac Yard
Access changes	No Effect	Increased transit access to Potomac Yard, Potomac Greens, Old Town Greens Traffic expected to exceed capacity of eastbound East Glebe Road	Increased transit access to Potomac Yard, Potomac Greens, Old Town Greens Traffic expected to exceed capacity of eastbound East Glebe Road	Increased transit access to Potomac Yard, Potomac Greens, Old Town Greens Traffic expected to exceed capacity of eastbound East Glebe Road
Community facility impacts	No Effect	Station entrances will occupy land in Potomac Yard Park	Station entrances will occupy land in Potomac Yard Park	Station facility and entrances will occupy land in Potomac Yard Park
Safety	No Effect	No Effect	No Effect	No Effect
Displacement	No Effect	No Effect	No Effect	Short-term: displacement of movie theater Long-term: no effect

The section below provides a narrative summary of the potential effects.

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

3.1.1 No Build Alternative

The No Build Alternative would not provide any mobility benefits beyond those that would be provided by planned future transportation projects and improvements, such as the Crystal City/Potomac Yard Transitway, which are included in the CLRP. Development planned for Potomac Yard would proceed, but at lower levels than have been approved. This alternative would improve community cohesion and reduce community isolation through the provision of a bicycle and pedestrian bridge connecting Potomac Greens and Potomac Yard. The No Build Alternative would not cause any residential displacements, safety impacts, or changes in property values beyond those anticipated to occur due to planned future development projects and other planned transportation projects.

3.1.2 Build Alternatives

Each Build Alternative would result in similar effects to the surrounding neighborhoods. The Potomac Greens and Old Town Greens neighborhoods, as well as Del Ray, Lynhaven, Arlandria, and South Potomac Yard, would benefit from increased access to the regional Metrorail system. The Build Alternatives would result in increased economic activity, given the desirability for Metrorail access for large employers. Neighborhoods adjacent to other Northern Virginia Metrorail stations have historically experienced increases in land and housing values due to the proximity to Metrorail; the identified neighborhoods would be expected to experience a similar effect.

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

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

3.2 Environmental Justice

FTA C 4703.1 states that both the potential for positive impacts, such as improved access to transit, and negative impacts, such as vibration or noise effects, be assessed in an environmental justice analysis. FTA C 4703.1 instructs that because many transit projects produce both negative and positive effects, the determination of what constitutes a “disproportionately” high adverse effect should be made by examining the “net results after consideration of the totality of the circumstances.” Potential impacts for the environmental justice communities identified and shown in **Figure 2-3** were examined using this guidance.

3.2.1 No Build Alternative

Under the No Build Alternative, potential effects would occur on the identified environmental justice populations. Various social and economic changes may occur in these neighborhoods due to the additional development permissible in Potomac Yard without a Metrorail station, as well as other area improvements.

To address potential effects to housing affordability from additional development, the City of Alexandria’s Potomac Yard zoning and development regulations for CDD 10 and CDD 19 (Concept Plan approval staff report CDD 99-01 and Rezoning staff report CDD 2009-0001) support maintaining a supply of affordable housing within the area. The newly constructed Station at Potomac Yard development, which provides workforce and affordable housing, and a recently approved affordable housing development across U.S. Route 1 from the Potomac Yard Shopping Center, are examples of projects in the area. The City of Alexandria maintains a Housing Opportunities Fund, which is funded by voluntary contributions from developers and is used for acquisition, rehabilitation, or new construction of affordable housing units. In addition, the City negotiates with developers to provide dedicated affordable rental or ownership units within new residential developments. In North Potomac Yard, a voluntary affordable housing contribution will be provided according to the formula set forth in the regulations for CDD 19. In the remainder of Potomac Yard, the amount of the voluntary contribution for each preliminary development plan will meet the requirements of the city-wide affordable housing policy in effect at the time the plan is submitted. Contributions may be monetary or set-aside affordable units.

3.2.2 Build Alternatives

The Build Alternative stations would be located across a busy arterial (U.S. Route 1) from the majority of the environmental justice communities in the analysis area, with the exception of the minority and low-income community at the Station at Potomac Yard, just to the east of U.S. Route 1. Any visual or noise effects would be buffered by the planned development in Potomac Yard. The community at the Station at Potomac Yard would also be buffered from visual or noise effects by other buildings. Therefore, the identified environmental justice communities would not be disproportionately affected by any Build Alternative.

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

Measures to address potential effects to housing affordability from additional development in the Potomac Yard area would be the same as in the No Build Alternative.

As part of the public engagement process, two public meetings were held at the Cora Kelly Recreation Center, which is located in a portion of the project's analysis area with a high proportion of minority and low-income residents. In addition, the project team has reached out to area civic organizations and offered to conduct community briefings regarding the project. Civic organizations contacted include the Lynhaven Citizens Association. The Lynhaven neighborhood includes minority and low-income communities. All public involvement materials were produced in Spanish and English, and a Spanish translator was available at all public meetings.

4.0 MITIGATION MEASURES

4.1 No Build Alternative

As no project elements are proposed under the No Build Alternative, no mitigation is proposed.

4.2 Build Alternatives

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

APPENDIX:
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POTOMAC YARD METRORAIL STATION

ENVIRONMENTAL IMPACT STATEMENT

Administrative Review Draft
Economic Impacts Technical Memorandum

February 2013

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APPENDIX: REFERENCES

1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

The project consists of construction of a new Metrorail Station located at Potomac Yard within the City of Alexandria along the existing Metrorail Blue and Yellow Line between the Ronald Reagan Washington National Airport Station and the Braddock Road Station in northern Alexandria. The project would serve existing neighborhoods and retail centers as well as high-density, transit-oriented development planned by the City of Alexandria. The project would provide access to the regional Metrorail system for the U.S. Route 1 corridor of north Alexandria. The Potomac Yard area is currently without direct access to the Metrorail system.

Placing a Metrorail station in Potomac Yard could impact the local economy in the following ways:

- The construction of the station would create temporary jobs for the duration of the building activity;
- The operation of the station would support recurring jobs as workers would be required to staff the station, answer questions, and maintain the station;
- The improved accessibility of the Metrorail station would impact residents within the immediate area and provide them with a greater range of transportation options than currently exist, with the potential to save them both travel time and travel costs because of the improved accessibility of having a local station;
- The Metrorail station could impact property values as the real estate market capitalizes the improved access into property values;
- As some acquisition of private land would be needed, the tax base and associated tax revenues to the City of Alexandria could be impacted;
- Additional residential, hotel, retail, and office development could be added to the tax base as the location's market responds to the improved accessibility to the broader region, and associated tax revenues to the City of Alexandria could be impacted.

This technical memorandum identifies the potential economic effects of the No Build and three Build Alternatives. The memorandum describes the following:

- Project alternative;
- Applicable regulations and guidance;
- Methodology;
- Opening year conditions;
- Potential effects of each alternative; and
- Mitigation measures.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail through

the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Figure 1-1: Build Alternatives

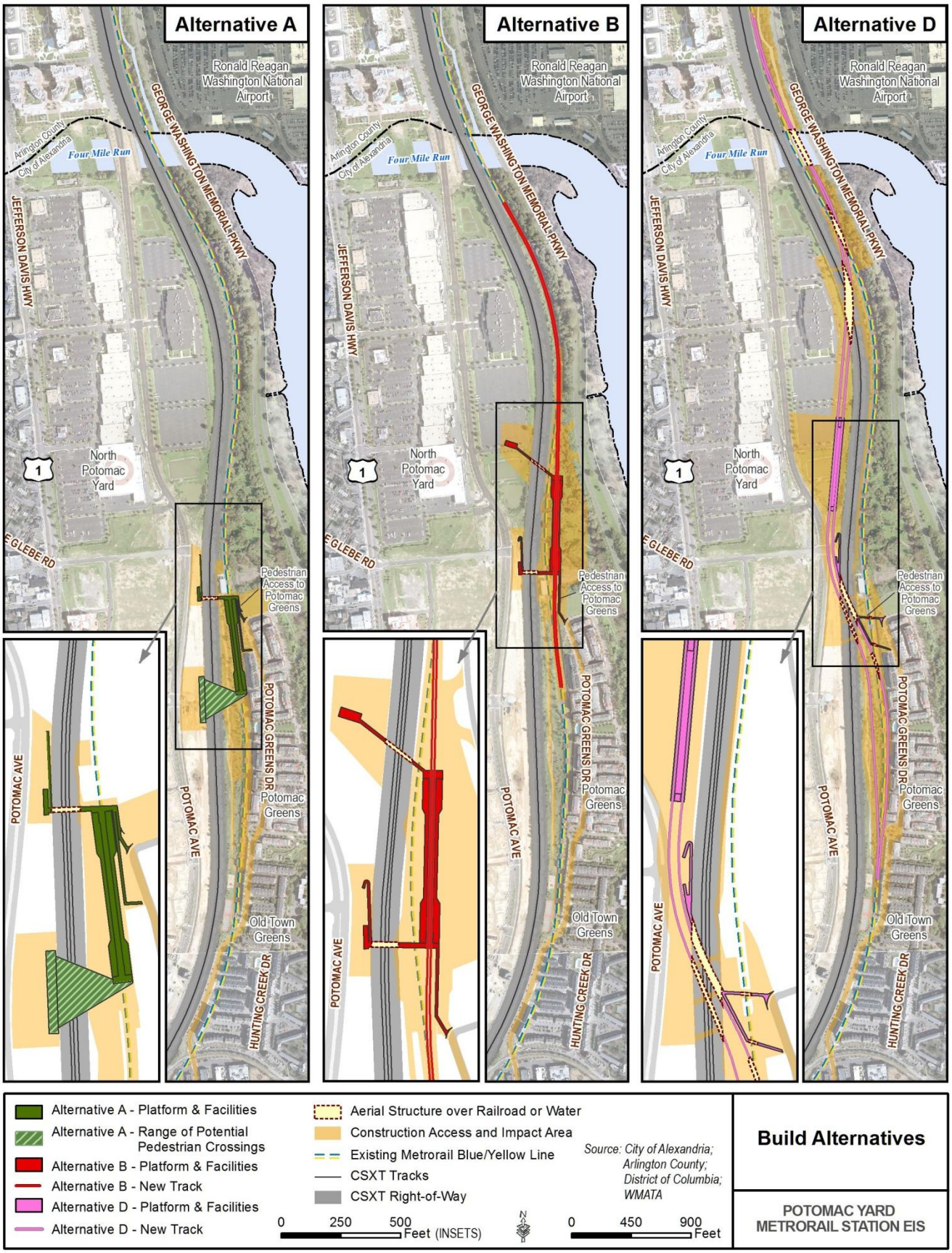

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned.

1.2 Applicable Regulations and Guidance

In addition to general NEPA regulations and guidance, the economic impacts analysis was developed using information from local land use plans and policies. Please see the *Land Use, Zoning, and Consistency with Local Plans Technical Memorandum* prepared for the project.

1.3 Methodology

This section outlines the approach for identifying the economic and fiscal impacts of the No Build and three Build Alternatives. Economic impacts include direct, indirect, and induced effects related to the alternatives.

Analysis Area

The specific analysis areas used in the assessment of economic impacts vary by the impact type. As construction and station operation workers could be drawn from multiple locations in the metropolitan labor market, the Washington-Arlington-Alexandria Metropolitan Statistical Area (MSA) was used for assessing construction and operating impacts. The accessibility impacts were based on the regional travel demand model and assessed at the expanded regional level used in the model, which is described in **Section 3.4**. Property tax losses were based on the parcels that would be acquired for the project, and include areas within the immediate footprints of the station, new sections of track and aerial structures, and associated permanent facilities in each Build Alternative. Finally, the property value impacts were estimated for a ¼-mile radius around each station, a comfortable walking distance measured from the fare gates.

1.3.1 Construction-related Employment Impacts

Construction of the Build Alternatives may have an impact on the regional and local economy due to the direct, indirect, and induced construction employment associated with building the station.

- **Direct employment** consists of the construction-related employment in industries whose jobs and services are directly purchased to build the station. For example, construction workers, supervisors, and managers of construction projects would be included in this employment impact.
- **Indirect employment impacts** are created by the secondary demand for goods and services across a broader spectrum of industrial sectors to support the industries providing the construction services. In this category fall employment that results from components of the direct purchases, such as building materials, construction equipment, and computers.

- **Induced employment impacts** are created by the tertiary demand for goods and services across an even broader spectrum of industrial sectors. This includes employment that results from purchases made by direct and indirect employees, such as retail or restaurant purchases.

Indirect and induced impacts are reflected in the economic multiplier impact for construction. The analysis estimated the number of construction jobs and earnings generated by each alternative based on construction cost estimates.

The analysis applied multipliers tailored to the structure of the Washington-Arlington-Alexandria MSA. This area was chosen because although the project is physically located in the City of Alexandria, construction workers from across the metropolitan area may travel to work on the project. The economic impacts associated with construction expenditures were measured using regional multipliers from the Bureau of Economic Analysis (BEA) within the U.S. Department of Commerce. Derived from the Regional Input-Output Modeling System (RIMS II), the 2008/2008 type II multipliers measure the total change (direct, indirect, and induced impacts) in employment and earnings that results from an incremental change to the construction industry.

1.3.2 Operations-related Employment Impacts

The operation and maintenance (O&M) of a new Metrorail station associated with the Build Alternatives may have an impact on the regional and local economy due to new direct, indirect, and induced employment that would result from the station O&M expenditures.

- **Direct employment** consists of operations-related employment in industries whose jobs and services are purchased directly to operate and maintain the alternative. For example, transit employees would fall into this category.
- **Indirect employment impacts** are those that would be created by the secondary demand for goods and services across a broader spectrum of industrial sectors to support the industries providing the O&M services. Employment that results from the purchase of tools, computers, and other goods or services needed by the O&M employees to perform the job would fall into this category.
- **Induced employment impacts** are created by households spending earnings in the local economy across a spectrum of industries. This includes employment that results from purchases made by direct and indirect employees, such as retail or restaurant purchases.

These indirect and induced impacts are reflected in the economic multiplier impact for transit and ground passenger transportation. The analysis estimated the number of O&M jobs and earnings generated by each alternative based on O&M cost estimates. The BEA's RIMS II multipliers measure the total change (direct, indirect, and induced impacts) in employment and earnings that results from an incremental change to a particular industry—transit operations in this instance.

1.3.3 Station Accessibility Impacts

The addition of a new Metrorail station would increase accessibility between the community surrounding the new station and the broader Washington metropolitan region. The availability of a new transit option would: 1) allow transit users in other locations to access the housing and commercial opportunities in the Potomac Yard vicinity using Metrorail; and 2) allow residents in the Potomac Yard area to access all the locations served by Metrorail without using a car. For those travelers who switch from driving to using transit because of its convenience, there may be travel time and cost savings. In addition, for current Potomac Yard area travelers who access the Metrorail system from another station, there would be savings, because the new station would allow them to either walk or bike to access Metrorail.

The analysis used regional travel information generated by the WMATA Transit Post-Processor of the MWCOG model (Regional Transit System Plan version 2.3) to determine the amount of time saved, vehicle miles avoided, transit fares paid, and parking costs avoided and estimate the resulting travel cost and time impacts.

1.3.4 Evaluation of Additional Tax Base Impacts

The Build Alternatives would impact the City of Alexandria's tax base in two ways: 1) construction of the Build Alternatives would require the purchase of some private land, reducing the tax base and 2) the induced or additional development that would be permitted at North Potomac Yard with the construction of the Potomac Yard Metrorail station, increasing the tax base.

The annual lost tax revenue associated with potential property acquisitions (transferring private taxable property to public non-taxable use) was determined by first identifying the potential land required for each of the Build

Alternatives. Each parcel was then researched to identify its property type and assessed value using the property records of the City of Alexandria and Arlington County. The estimated assessed value of the required acquisition was then multiplied by the current (2012) applicable real estate tax rates for the City of Alexandria, including any special district taxes when applicable, and Arlington County. The estimated assessed values were used to analyze property tax revenue impacts only, not potential acquisition costs or market values of property that would need to be acquired for each project alternative.

The total assessed value of acquisitions potentially removed from the tax base was compared to the total tax base in the City of Alexandria and Arlington County. This comparison identifies the percentage of the City's and County's total assessed value for property tax purposes that would be permanently removed and no longer generating tax revenues for each alternative considered. This comparison was used to determine whether the impacts on the tax base would be significant for the City and County. Additionally, the annual tax revenue gains associated with the potential induced development that would be permitted at North Potomac Yard with the Potomac Yard Metrorail station was analyzed. This induced development was estimated by first identifying the additional development above current zoning allowed by each of the Build Alternatives. The *Land Use, Zoning, and Consistency with Local Plans Technical Memorandum* identified the additional square footage of office, retail, residential, and hotel development permitted at North Potomac Yard for the Build Alternatives in 2016 and 2040. This additional or induced development is the difference between full build out of the area under the Build Alternatives (which assumes additional zoning due to the Potomac Yard Metrorail Station) and the No Build Alternative (which assumes full build out with current zoning by 2016). This additional development was then valued using the average construction cost per square foot from RS Means (private provider of industry cost information) for each development type for the City of Alexandria. **Table 1-2** summarizes the square foot construction costs applied. This is a conservative approach to estimating the assessed value of the induced development, because it is likely that the developers would not make the initial investment if the value of the properties did not comfortably exceed the cost of construction.

Table 1-2: Development Construction Costs per Square Foot

Property Type	2012
Office	$146.97
Hotel	$147.02
Retail	$118.77
Residential	$151.63

Source: RS Means, 2007 and applying Alexandria, VA location factor for commercial (1.06). Multi-family residential is considered commercial.
Note: 2007 values have not been escalated under the assumption that the market has not appreciated during the economic downturn. The Turner Building Cost Index, a barometer of national trends, indicates that building costs have actually declined by 3.3% between 2007 and 2012. However, the Washington, DC area has fared better than the nation during the downturn.

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The estimated assessed value of the induced development was then multiplied by the current (2012) applicable real estate tax rates for the City of Alexandria and any special district taxes when applicable to estimate the potential property tax gains for the City.

1.3.5 Property Premium Impacts

Property values within a ¼-mile radius of the Metrorail fare gates are expected to increase due to the improved access provided by a Metrorail station and a more walkable community. A ¼-mile radius was chosen based on empirical evidence in previous studies, which found that property values within this distance are the most greatly impacted by the presence of a rail transit station.[1, 2] For each of the alternatives, an eight-percent premium was applied to Fiscal Year 2012 tax assessed values to capture the increased values associated with this improved access and walkability. This is a conservative estimate that is consistent with empirical findings for the WMATA Compact Area,[3] This increase in property values would generate additional tax revenues for the City of Alexandria compared to the No Build Alternative.

[1] Gary Pivo and Jeffrey Fischer. 2011. "The Walkability Premium in Commercial Real Estate investments," Real Estate Economics, Vol. 39, issue 2, pages 185-219.
[2] WMATA, "Making the Case for Transit: WMATA Regional Benefits of Transit Technical Report," 2011.
[3] Ibid.

2.0 OPENING YEAR CONDITIONS

The economic context for the project can be characterized by the existing and projected land uses, development, and neighborhoods in its immediate vicinity.

The project study area includes the City of Alexandria and Arlington County portions of Potomac Yard, which encompasses the proposed sites of the Metrorail station in the Build Alternatives and surrounding area (see **Figure 1-2**). Existing land use, zoning, development and neighborhoods within the immediate study area, and anticipated conditions in the 2016 opening year, are described below. The areas highlighted below are included because they are most relevant to the economic impacts (jobs, earnings, and tax base impacts) discussed in this technical memorandum. Details on additional areas, including the Department of Interior, National Airport, Air Rights, and the Resource Protection Area can be found in the *Land Use, Zoning and Consistency with Local Plans Technical Memorandum*, *Transportation Technical Memorandum*, *Cultural Resources Technical Memorandum*, and Parklands resource section of the Draft EIS.

2.1 Land Use

2.1.1 Commercial Areas

Potomac Yard Shopping Center

The Potomac Yard Shopping Center currently occupies North Potomac Yard, which is located between U.S. Route 1 and the CSXT tracks, north of East Glebe Road and south of Four Mile Run, within the City of Alexandria. The shopping center has a wide variety of big box and smaller retailers. Some of the larger retailers include Target, Old Navy, Best Buy, Staples, PetSmart, TJ Maxx, Barnes & Noble, and the Regal Movie Theater. The shopping center has large areas of surface parking to accommodate patrons.

Neighborhood Retail

Additional retail exists in several other places within the study area as small pockets of generally neighborhood-serving retail uses (e.g., Slaters Lane, South Potomac Yard, Arlington County portion of Potomac Yard).

2.1.2 Residential Areas

Potomac Greens

The Potomac Greens townhome community is located to the north of Slaters Lane and the Old Town Greens neighborhood, to the west of the George Washington Memorial Parkway and directly adjacent to the current Blue and Yellow Line Metrorail track alignment. Potomac Greens was constructed in 2007 and has approximately 300 residents.

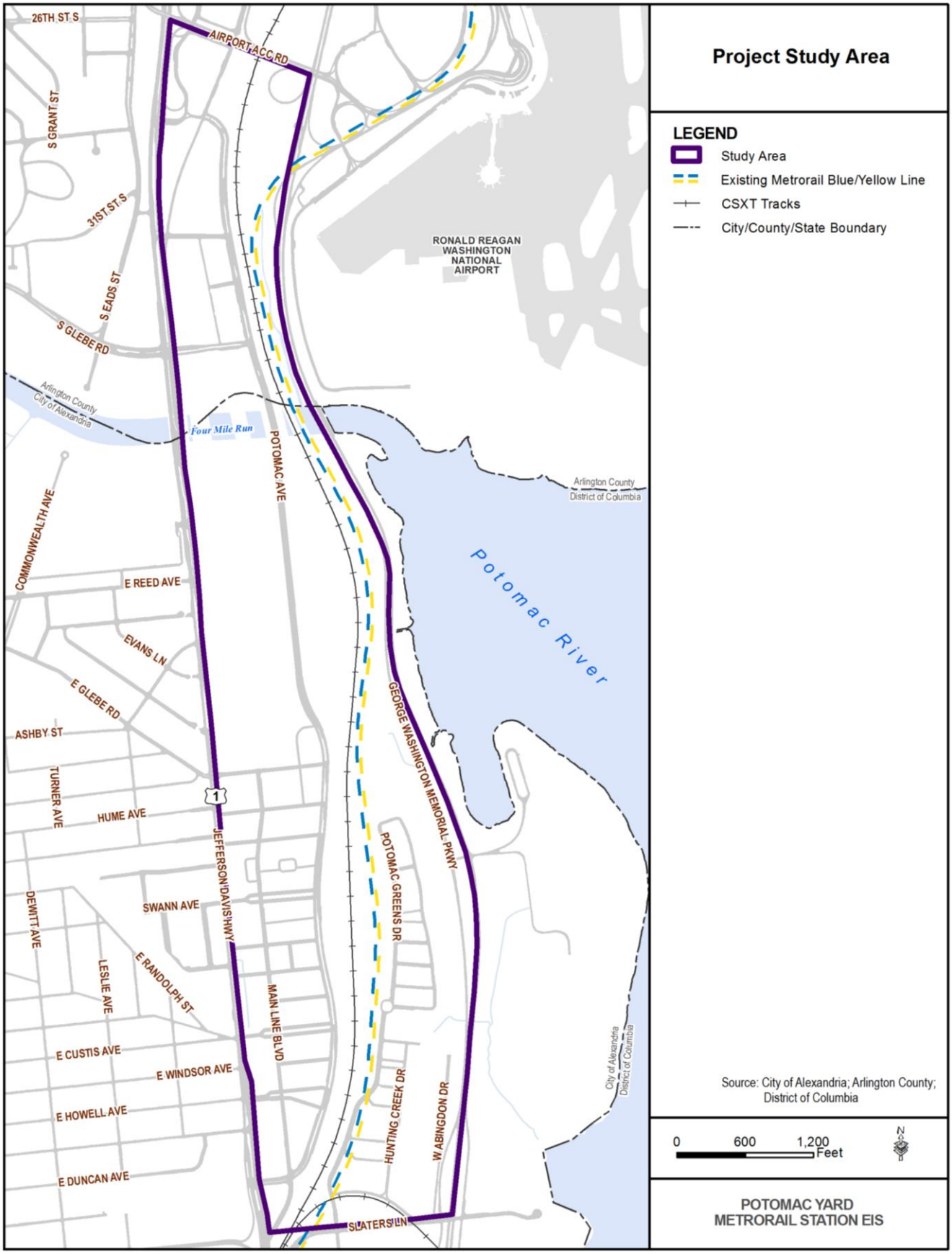
Alexandria Potomac Yard

Most of the area south of East Glebe Road between U.S. Route 1 and the CSXT tracks is currently under development. The area has an existing mixed-use development with a small amount of ground-level retail space with 44 affordable housing units and 20 workforce housing rental units located above a fire station. Development is currently underway of a community of townhomes and condominiums. By 2016, it is anticipated that there will be new mixed-use and residential neighborhoods in South Potomac Yard.

Old Town Greens

Old Town Greens is a townhome and condominium community located to the west of the George Washington Memorial Parkway and east of the current Blue and Yellow Line Metrorail track alignment. Neighborhood-serving retail is located at the intersection of Potomac Greens Drive and Slaters Lane. The neighborhood has approximately 350 residents.

Figure 2-1: Project Study Area



Arlington Potomac Yard

The Eclipse is a high-rise, mixed-use community comprised of 465 units (a mix of condominiums and apartments) built above an 80,000 square foot retail center, that is located immediately north of Four Mile Run in the Arlington portion of Potomac Yard. Several other office, hotel, and other short-term residential/apartment buildings currently occupy the Arlington portion of Potomac Yard. The area has approximately 1,160 residents.

Potowmack Crossing Condominiums

Potowmack Crossing Condominiums is located next to the Old Town Greens neighborhood, to the north of Slaters Lane and just to the east of the George Washington Memorial Parkway, along West Abingdon Drive. The complex includes 242 1- and 2-bedroom condominium units, and was developed in the 1940s. Population density east of U.S. Route 1 is greatest in the census block that contains the Potowmack Crossing Condominiums, which has approximately 530 residents.

2.1.3 Other Uses

The remainder of the study area comprises parkland, with recreational areas and open space, and the transportation uses associated with the CSXT and Metrorail railroad corridors. Parkland includes Potomac Greens Park, Potomac Yard Park (under construction), Rail Park (planned), and the George Washington Memorial Parkway and Mount Vernon Trail, which are used for hiking, biking, and bird watching.

2.2 Zoning and Development

The study area encompasses two jurisdictions, the City of Alexandria and Arlington County, which oversee zoning and development.

2.2.1 City of Alexandria

North Potomac Yard

Approximately 7.5 million square feet of development in North Potomac Yard is permitted if a Metrorail station is built in the vicinity of the location depicted in the North Potomac Yard Small Area Plan.(City of Alexandria 2010). If a Metrorail station is not built at the location, 3.7 million square feet of development in this area of North Potomac Yard is permitted. The City could revisit the applicable zoning regulations if Alternative A or Alternative D stations were built. Land use economics would determine if, how much, and when this development might occur without a Metrorail station. The details are described in the Secondary and Cumulative chapter.

South Potomac Yard

This area is predominately being developed for medium-density residential uses but also includes a mix of office, retail, hotel, park, open space, and community facility uses. This area is located in the southern portion of Potomac Yard, and is bound by U.S. Route 1 on the west, the CSXT corridor on the east and south, and East Glebe Road on the north (including the properties on the north side of East Glebe Road).

Open Spaces, Parks, and Residential

The area east of North Potomac Yard and west of George Washington Memorial Parkway is zoned for open space. The Potowmack Crossing Condominiums are in an area adjacent to the green space, bound by Slaters Lane to the south, Massey Lane to the southwest, Catts Tavern Drive to the west, and West Abingdon Drive to the north and east. This area is zoned specifically for residential uses.

2.2.2 Arlington County

The portion of the study area within Arlington County is primarily zoned for medium-density mixed-use, office and residential development, with some ground-floor retail and hotel uses. Other areas are zoned for open space and light industrial uses.

3.0 POTENTIAL EFFECTS

This section outlines the impacts associated with the construction and operation of the Potomac Yard Metrorail Station alternatives.

3.1 Construction-related Employment Impacts

3.1.1 Expenditures

The capital expenditures for the Build Alternatives are shown in **Table 3-1** and are analyzed in relation to the No Build Alternative. The total capital expenditures were estimated within a range denoted by "low" and "high" and do not include potential land acquisition costs for private property or Department of Interior/National Park Service property. The expenditures have been divided into the following general construction categories:

- Guideway and track elements;
- Stations, stops, terminals;
- Support facilities;
- Sitework and special conditions;
- Systems;
- Professional services; and
- Contingencies.

The economic impact of these expenditures would vary by activity and depend on the amount of locally produced goods and services embodied in the purchases. Construction goods and services would be purchased in the local economy. Although all building materials required for the Build Alternatives would not be produced locally, the RIMS II multipliers reflect the supplier linkages for the industry, and thus account for this leakage from the local economy.

Table 3-1: Capital Expenditures

Construction Cost Categories (costs in millions of 2012 dollars)	Build Alternative A		Build Alternative B		Build Alternative D	
	Low	High	Low	High	Low	High
Guideway & Track Elements	$1.83	$3.92	$17.00	$36.85	$96.69	$207.20
Station, Stops, Terminals, Intermodal	$46.22	$99.05	$46.82	$100.34	$31.22	$66.91
Support Facilities: Yards, Shops, Admin Buildings	$0.59	$0.75	$0.93	$1.21	$24.12	$26.58
Sitework and Special Conditions	$22.77	$47.93	$30.95	$65.46	$46.97	$99.79
Systems	$9.31	$19.42	$10.02	$20.94	$14.00	$29.47
Professional Services	$21.40	$23.93	$22.06	$25.51	$24.49	$30.84
Unallocated Contingency	$9.05	$18.21	$11.57	$23.63	$21.26	$43.15
Total Project Costs*	**$111.18**	**$213.21**	**$139.35**	**$273.95**	**$258.75**	**$503.93**

*Note: For economic analysis purposes, total project costs do not include right-of-way costs; however, total project capital costs reported in Chapter 5, Volume I, include right-of-way costs.

3.1.2 Funding Sources

The proposed Potomac Yard Metrorail Station would be funded through the City's Station Fund, which is comprised of local sources, such as net new special tax district revenues, bonds that rely on local sources, and developer contributions. These sources represent net new tax revenue generated from Potomac Yard development and would be the primary source of repayment of bonds issued by the City to pay for the Metrorail station. Additionally, developer contributions would be available to assist in paying a portion of debt service payments for Build Alternative B and possibly Build Alternative D. However, the analysis assumes that developer contributions for Metrorail debt service would not be available under Build Alternative A. It is important to note that both the special district tax revenues and developer contributions are dedicated revenues and only available for the construction and operation of the Potomac Yard Metrorail Station.

While local funding is currently the primary source of funding for the alternatives, the use of non-local funding is still being considered. Potential non-local funding includes Commonwealth of Virginia transit formula funding and

federal funding received through the Commonwealth of Virginia. Additionally, federal TIFIA financing (federal credit assistance under the Transportation Infrastructure Finance and Innovation Act) is also being explored.

The funding sources used for the alternatives impact whether the jobs and earnings created from construction of the Project are sustained or new to region. Local funding supports employment, but does not create net new jobs as it is expected that in the absence of the Project, the funds still would be spent in the Washington, DC region by the tax payers, but only a portion of these funds may be spent in the City of Alexandria. Tax revenue generation also would be largely regional in nature, with only some of those new taxes generated in the City of Alexandria. Non-local funding, by contrast, is often new to the local and regional community and would not be spent locally but for the Project. Thus, jobs supported by state and federal sources often represent net new employment gains from the local and regional perspective.

3.1.3 Impacts

RIMS II multipliers are used to translate capital expenditures for the Build Alternatives into the associated job and earnings effects. The multipliers used are Type II (includes household spending) for the Washington-Arlington-Alexandria MSA from 2008 (published in 2012) and are shown in **Table 3-2**. The bolded numbers were used directly in the calculations shown in **Table 3-3** and **Table 3-5**.

Table 3-2: RIMS II Multipliers

Industry	Final Demand Multipliers		Direct Effect Multipliers		Direct Employment Ratio
	Earnings (dollars)	**Employment (jobs)**	**Earnings (dollars)**	**Employment (jobs)**	**Employment (jobs)**
Construction	0.5247	**12.7808**	1.6050	1.6948	**7.5412**
Transit and ground passenger transportation	0.7143	34.9497	**1.3871**	**1.1879**	29.4214
Professional, scientific, and technical services	0.7437	**14.1765**	1.5270	2.0135	**7.0407**

Note: **Bolded** numbers are those used in analyses for the project.
Source: Bureau of Economic Analysis, 2008 multipliers published in 2012.

Applying the Final Demand Multipliers for the construction and professional services industries[4] to the amount of capital expenditures in each industry provides estimates of the earnings and employment impacts generated by each alternative. The results are summarized in **Table 3-3**. These are one-time impacts that last for the duration of the construction period. One job is defined as a job for one person of one year's duration. As an example, a job for one person that had a duration of three years would be defined as three person-year jobs.

In 2011, the Washington-Arlington-Alexandria MSA employed 141,500 people in construction jobs. The number of construction jobs related to the Build Alternatives was all analyzed with respect to the 2011 level of employment, the most recent annual figure at the time this analysis was prepared. The construction jobs resulting from the Project construction would account for a small percentage of the region's overall total and would constitute a manageable share of employment demand without bidding up wages or causing an imbalance in the industry.

[4] The RIMS II Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction and professional services industries.

Table 3-3: Construction Impacts for the Washington, Arlington, and Alexandria MSA

Type of Impact (in millions of 2012 dollars)	Build Alternative A		Build Alternative B		Build Alternative D	
	Low	High	Low	High	Low	High
Earnings	$63.02	$117.11	$77.95	$149.33	$141.13	$271.17
Discounted Earnings @ 3% over the construction period	$57.35	$106.57	$70.93	$135.88	$128.42	$246.76
Discounted Earnings @ 7% over the construction period	$50.82	$94.44	$62.85	$120.41	$113.80	$218.66
Direct Construction (only) Employment (1-year duration)	655	1,382	856	1,813	1,710	3,453
Employment Directly Related to Station Construction (construction jobs plus professional services supporting construction) (1-year duration)	801	1,545	1,006	1,987	1,877	3,663
Total Employment (inclusive of direct, indirect, and induced jobs) (1-year duration)	**1,404**	**2,670**	**1,754**	**3,423**	**3,234**	**6,275**

3.1.4 No Build Alternative

The capital expenditures developed for the Potomac Yard Metrorail Station alternatives are relative to the No Build Alternative. As such, no construction jobs or earnings would be required for the No Build Alternative.

3.1.5 Build Alternative A

The earnings resulting from the construction of Build Alternative A range from $63.02 million to $117.11 million in 2012 dollars. These impacts result from directly employing between 801 and 1,545 person-jobs (a job for one person that lasts one year) in construction and related professional services. The total employment, which is a function of direct, indirect, and induced impacts, would result in 1,404 to 2,670 person-jobs. In the construction sector specifically, between 655 and 1,382 jobs would directly result from the Project. Overall, this employment in the construction sector is only a fraction of the construction jobs in the metropolitan area, accounting for 0.5 - 1.0 percent of the 2011 total.

3.1.6 Build Alternative B

Build Alternative B requires more construction and track re-alignment than Build Alternative A, so the earnings resulting from its construction are higher and range from $77.95 million to $149.33 million in 2012 dollars. These impacts result from directly employing between 1,006 and 1,987 person-jobs in construction and related professional services. The total employment, which is a function of direct, indirect, and induced impacts, would result in 1,754 to 3,423 person-jobs. In the construction sector specifically, between 856 and 1,813 jobs would result from the Project. Overall, this employment in the construction sector is only a fraction of the construction jobs in the metropolitan area, accounting for 0.6 - 1.3 percent of the 2011 total.

3.1.7 Build Alternative D

The earnings resulting from the construction of Build Alternative D, which is the most construction-intensive of the alternatives, range from $141.13 million to $271.17 million in 2012 dollars and would be expected to directly employ between 1,877 and 3,663 person-jobs in construction and related professional services. The total employment would result in 3,234 to 6,275 person-jobs. In the construction sector specifically, between 1,710 and 3,453 jobs would result from the project. Overall, this employment in the construction sector is only a fraction of the construction jobs in the metropolitan area, accounting for 1.2 to 2.4 percent of the 2011 total.

3.2 Operations-related Employment Impacts

3.2.1 Expenditures

The operating expenditures include the costs of running and maintaining the Metrorail station for Build Alternative A, Build Alternative B, and Build Alternative D. However, the alternatives are not included separately in the table, because each Build Alternative would require the same labor and average wage, making the expenditures and impacts identical. **Table 3-4** summarizes the O&M costs for each Build Alternative.

Table 3-4: Direct Operating Personnel Impacts

Type of Impact	2016 (Annual)	20-year Total (2016-2035)
Wages (in millions of 2012 dollars)	$0.631	$12.61
Direct Employment (person-year jobs)	8.5	170

Source: Direct Employment estimate based on full-time Metrorail station staffing for two station entrances and one part-time station maintenance position.
Note: Table applies to Build Alternatives A, B, and D.

3.2.2 Funding Sources

The operation of the Potomac Yard Metrorail Station would be funded through fares, WMATA general operating revenues, and through the local subsidy formulae where all WMATA Compact jurisdictions pay for WMATA operating and capital maintenance costs. These added operating subsidies are also eligible for Commonwealth of Virginia transit operating assistance. If other state or federal aid becomes available, the City of Alexandria would request such funding.

Local funding supports employment, but does not create net new jobs, as it is expected that in the absence of this Project, the funds would still be spent in the local area with similar results. Non-local funding by contrast, is new to the community and often would not be spent here but for the Project. Thus jobs supported by state and federal sources represent net new employment gains from a local and regional viewpoint.

3.2.3 Impacts

RIMS II multipliers are used to translate the O&M expenditures for the Potomac Yard Metrorail Station Build Alternatives into the associated job and earnings effects. The impacts are shown for the entire Washington-Arlington-Alexandria MSA. The impacts vary by the geographic area considered; impacts are greater for the metropolitan area relative to the City of Alexandria and Arlington County, as there is less “leakage” associated with spending. In other words, a larger economy captures a greater share of the O&M spending as its greater size allows it to provide a greater share of the diverse range of services required for operation and maintenance.

Applying the Direct Effect Multipliers for the transit industry[5] to the annual O&M employment and wages provides estimates of the total earnings and employment impacts generated by the operation of the Potomac Yard Metrorail Station alternatives. The results are summarized in **Table 3-5**. These impacts are long-term annual impacts that continue for the life of the service.

Table 3-5: Total (Direct, Indirect, and Induced) Operating Personnel Impacts

Type of Impact	2016 (Annual)	20-year Total (2016-2035)
Earnings (in millions of 2012 dollars)	$0.875	$17.50
Total Employment (person-year jobs)	**10**	**202**

Note: Table applies to Build Alternatives A, B, and D.

3.2.4 No Build Alternative

Under the No Build Alternative, no additional Metrorail station jobs would be created because the new Metrorail station at Potomac Yard would not be built.

3.2.5 Build Alternatives A, B, and D

Under each of these three alternatives, expenditures are expected to be identical because the direct employment required and wages of those employed would be the same. The expected number of direct person-year jobs needed for each Build Alternative is 8.5, with annual wages/earnings totaling approximately $631,000. Total employment (direct, indirect, and induced) is expected to total 10 person-year jobs and generate $875,000 in earnings. The cumulative 20-year totals for earnings are over $17.50 million and total employment is 202 person-year jobs.

[5] The RIMS II Direct Effect Multipliers represent the total employment and dollar change in earnings of households employed by all industries for each direct job and dollar of earnings paid directly to those employed by the transit industry.

3.3 Tax Base Impacts

The Build Alternatives would impact the City of Alexandria's tax base in two ways: 1) construction of the Build Alternatives would require the purchase of some private land, and 2) the induced or additional development that is permitted at North Potomac Yard with the construction of the Potomac Yard Metrorail station.

The first impact would remove portions of property, and therefore their local property tax assessed values, from the City's property tax base. Construction of Build Alternatives A, B, and D would require the purchase of some private land for easements, right-of-way (ROW), and station facilities. This purchase would remove these properties from the existing local tax base. However, none of the losses would be significant given the size of the tax base in the City of Alexandria as a whole, which was estimated to be $33.0 billion in 2012.[6] The budgeted City property tax revenues for fiscal year 2013 amount to $333.9 million.[7]

Arlington County would also see minimal impacts to the tax base with the purchase of a small portion of private land. Its effects are described below under Build Alternative D.

Tables 3-6, **3-9**, and **3-12** list the properties from which portions would potentially be acquired for the Build Alternatives. Several of the properties are listed with a tax rate of $0.00. These properties all have tax exempt status, mostly because they are publicly owned. The 2012 basic tax rate for taxable property in the City of Alexandria is $0.998 per $100 of assessed property value with some properties having an additional tax due to their locations.[8] The commercial tax rate for Arlington County is $1.096 per $100 of assessed value.[9] All figures in the tables on the following pages for properties in the City of Alexandria and Arlington County were obtained from the jurisdictions' respective Real Estate Assessment records, and all figures reflect the assessed property values only. The assessed values were applied in the analysis in order to estimate potential tax revenue changes. The assessed values are not intended to reflect the actual value/price of the land purchases required for the Build Alternatives.

The second impact, on the other hand, would represent the potential for a significant increase in the City of Alexandria's property tax base as additional residential, retail, hotel, and office space development become possible only if the Metrorail station is built. Without the Metrorail station, this additional development in North Potomac Yard is not allowed by current zoning.

Tables 3-7, **3-10**, and **3-13** summarize the value of the additional development for the Build Alternatives in 2016, 2020, 2030, and 2040. The square footage difference between zoning for the full build out of the area under the Build Alternatives (which assumes additional zoning due to the Potomac Yard Metrorail Station) and the No Build Alternative (which assumes full build out with current zoning by 2016) were multiplied by the average construction cost per square foot from RS Means for each development type for the City of Alexandria.

Tables 3-8, **3-11**, and **3-14** summarize the tax revenues associated with the induced development at North Potomac Yard for the Build Alternatives in 2016, 2020, 2030, and 2040.The property tax increases associated with this induced development were estimated with a tax rate of $1.198 per $100 of property value. This includes the base tax rate of $0.998 per $100 of property value, plus $0.20 per $100 for the Tier I Special Services District. The tax rate was applied to the projected value of the development.

3.3.1 No Build Alternative

The No Build Alternative does not require any land to be acquired for a Metrorail station and no induced development would occur.

3.3.2 Build Alternative A

The construction of Build Alternative A would result in seven partial land acquisitions (see **Table 3-6**), which would remove property from the tax base and thereby reduce the tax revenue generated in the one jurisdiction where the acquisitions would occur—the City of Alexandria. The total area of acquisitions would be 2.67 acres, and the total assessed value of these acquisitions would be $103 in 2012 dollars. The reduction in annual property taxes would be $1 in 2012 dollars. Very little property tax revenue would be lost due to the total value of the land being acquired and the number of non-taxable properties. Of the seven parcels, only two are assessed with property values above $0 and one is a taxable property.

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[6] City of Alexandria Department of Real Estate Assessments, http://alexandriava.gov/realestate/info/default.aspx?id=1544
[7] City of Alexandria, Office of Management and Budget, FY 2013 Approved Budget, http://alexandriava.gov/budget/info/default.aspx?id=60300
[8] City of Alexandria Finance Department, http://alexandriava.gov/RealEstateTax#assessment
[9] Arlington County Department of Real Estate Assessments, http://www.arlingtonva.us/Departments/RealEstate/reassessments/scripts/DREADefault.asp

Table 3-6: Land Acquisitions under Build Alternative A

Address	Jurisdiction	Assessed Land Value	Total Parcel Area (Acres)	Area of ROW Impact (Acres)	Assessed Value of ROW Impact	Tax Rate per $100	Property Tax Values Lost with Taking
700 Carpenter Rd	Alexandria	$0	18.45	0.30	$0	$0.00	$0
700 Carpenter Rd (Umbrella Parcel)	Alexandria	$0	2.10	0.41	$0	$0.00	$0
2403 Potomac Av	Alexandria	$0	29.69	0.22	$0	$0.00	$0
2405 Potomac Av	Alexandria	$1,000	4.21	0.23	$54	$0.998	$1
2901 Potomac Av	Alexandria	$1,000	3.36	0.17	$50	$0.00	$0
1702 Potomac Greens Dr	Alexandria	$0	13.05	0.71	$0	$0.00	$0
1880 Potomac Greens Dr	Alexandria	$0	1.22	0.63	$0	$0.00	$0
Total		**$2,000**	**72.08**	**2.67**	**$103**		**$1**

Note: All dollar amounts are in year 2012 dollars; values may not total due to rounding.
Source: City of Alexandria, Department of Real Estate Assessments, 2012.

The value of the induced development that would occur for Build Alternative A was estimated for the projected land uses (property types) from the *Land Use, Zoning and Consistency with Local Plans Technical Memorandum* and their associated construction costs. The tax revenues were estimated using the projected values of induced development and the City of Alexandria and Tier I Special Services District property tax rates. **Tables 3-7** and **3-8** show the projected property values and associated tax revenues in the given years, respectively.

Table 3-7: Value of Induced Development under Build Alternative A ($2012)

Property Type	2016	2020	2030	2040
Office	$0	$7,469,424	$26,142,983	$44,816,542
Hotel	$0	$987,839	$3,457,437	$5,927,035
Retail	$0	$4,092,485	$14,323,696	$24,554,908
Residential	$0	$37,226,134	$130,291,468	$223,356,802
Total	**$0**	**$49,775,881**	**$174,215,585**	**$298,655,288**

Table 3-8: Additional Tax Revenues Due to Induced Development under Build Alternative A ($2012)

Property Type	2016	2020	2030	2040
Office	$0	$89,484	$313,193	$536,902
Hotel	$0	$11,834	$41,420	$71,006
Retail	$0	$49,028	$171,598	$294,168
Residential	$0	$445,969	$1,560,892	$2,675,814
Total	**$0**	**$596,315**	**$2,087,103**	**$3,577,890**

3.3.3 Build Alternative B

The construction of Build Alternative B would result in ten partial land acquisitions (see **Table 3-9**), which would remove property from the tax base and thereby reduce the tax revenue in the City of Alexandria. The total area of acquisitions would be 3.97 acres, and the total assessed value of these acquisitions would be $12,795,872 in 2012 dollars. The reduction in annual property taxes would be $2,875 in 2012 dollars.

Table 3-9: Land Acquisitions under Build Alternative B

Address	Jurisdiction	Assessed Land Value	Total Parcel Area (Acres)	Area of ROW Impact (Acres)	Assessed Value of ROW Impact	Tax Rate per $100	Property Tax Values Lost with Taking
700 Carpenter Rd	Alexandria	$0	18.45	2.53	$0	$0.00	$0
700 Carpenter Rd (Umbrella Parcel)	Alexandria	$0	2.10	-	$0	$0.00	$0
2403 Potomac Ave	Alexandria	$0	29.69	0.14	$0	$0.00	$0
2901 Potomac Ave	Alexandria	$1,000	3.36	0.13	$40	$0.00	$0
3601 Potomac Ave	Alexandria	$12,793,872*	18.94	0.36	$239,970	$1.198	$2,875
3701 Potomac Ave	Alexandria	$1,000	0.78	0.02	$28	$1.198	$0
1702 Potomac Greens Dr	Alexandria	$0	13.05	0.38	$0	$0.00	$0
1880 Potomac Greens Dr	Alexandria	$0	1.22	0.25	$0	$0.00	$0
George Washington Memorial Parkway, National Park Service**	Alexandria	N/A	N/A	0.16	N/A	$0.00	$0
Total		**$12,795,872**	**87.58**	**3.97**	**$240,038**		**$2,875**

Note: All dollar amounts are in year 2012 dollars; values may not total due to rounding.
N/A = Not Applicable.
* The property value for 3601 Potomac Av includes the land value only.
** National Park Service property is not assessed for tax purposes by the City of Alexandria.
Source: City of Alexandria, Department of Real Estate Assessments, 2012.

The value of the induced development that would occur for Build Alternative B was estimated for the projected land uses (property types) from the *Land Use, Zoning and Consistency with Local Plans Technical Memorandum* and their associated construction costs. The tax revenues were estimated using the projected values of induced development and the City of Alexandria and Tier I Special Services District property tax rates. **Tables 3-10** and **3-11** show the projected property values and associated tax revenues in the given years, respectively.

Table 3-10: Value of Induced Development Under Build Alternative B ($2012)

Property Type	2016	2020	2030	2040
Office	$11,065,813	$23,330,422	$53,991,946	$84,653,469
Hotel	$1,463,466	$3,085,473	$7,140,492	$11,195,511
Retail	$6,062,940	$12,782,699	$29,582,096	$46,381,493
Residential	$55,149,828	$116,274,220	$269,085,201	$421,896,182
Total	**$73,742,046**	**$155,472,815**	**$359,799,735**	**$564,126,655**

Table 3-11: Additional Tax Revenues Due to Induced Development under Build Alternative B ($2012)

Property Type	2016	2020	2030	2040
Office	$132,568	$279,498	$646,824	$1,014,149
Hotel	$17,532	$36,964	$85,543	$134,122
Retail	$72,634	$153,137	$354,394	$555,650
Residential	$660,695	$1,392,965	$3,223,641	$5,054,316
Total	**$883,430**	**$1,862,564**	**$4,310,401**	**$6,758,237**

3.3.4 Build Alternative D

The construction of Build Alternative D would result in 12 partial land acquisitions (see **Table 3-12**), which would remove property from the tax base and thereby reduce the tax revenue in the City of Alexandria and Arlington County. The total area of acquisitions in Alexandria would be 9.98 acres, and the total assessed value of these acquisitions would be $1,684,267 in 2012 dollars. The reduction in annual property taxes would be $20,175 in 2012 dollars. The total area of acquisitions in Arlington would be 0.06 acres, and the total assessed value of these acquisitions would be $14,684 in 2012 dollars. The reduction in annual property taxes would be $161 in 2012 dollars.

Table 3-12: Land Acquisitions under Build Alternative D

Address	Jurisdiction	Assessed Land Value	Total Parcel Area (Acres)	Area of ROW Impact (Acres)	Assessed Value of ROW Impact	Tax Rate per $100	Property Tax Values Lost with Taking
700 Carpenter Rd	Alexandria	$0	18.45	0.08	$0	$0.00	$0
700 Carpenter Rd (Umbrella Parcel)	Alexandria	$0	2.10	1.13	$0	$0.00	$0
2403 Potomac Av	Alexandria	$0	29.69	0.65	$0	$0.00	$0
2405 Potomac Av	Alexandria	$1,000	4.21	1.55	$367	$0.998	$4
2901 Potomac Av	Alexandria	$1,000	3.36	0.60	$180	$0.00	$0
3601 Potomac Av	Alexandria	$14,799,500*	18.94	2.15	$1,683,553	$1.198	$20,169
3701 Potomac Av	Alexandria	$1,000	0.78	0.13	$167	$1.198	$2
1690 Potomac Greens Dr	Alexandria	$0	1.68	0.07	$0	$0.998	$0
1702 Potomac Greens Dr	Alexandria	$0	13.05	1.75	$0	$0.00	$0
1880 Potomac Greens Dr	Alexandria	$0	1.22	0.44	$0	$0.00	$0
George Washington Memorial Parkway, National Park Service**	Alexandria	N/A	N/A	1.43	N/A	$0.00	$0
Total (Alexandria)		**$14,802,500**	**93.48**	**9.98**	**$1,684,267**		**$20,175**
Jefferson Davis Hwy	Arlington Co.	$46,500	0.19	0.06	$14,684	$1.096	$161
Total (Arlington Co.)		**$46,500**	**0.19**	**0.06**	**$14,684**		**$161**

Note: All dollar amounts are in year 2012 dollars; values may not total due to rounding.
N/A = Not Applicable
* The property value for 3601 Potomac Av includes both the land and improved property values
** National Park Service property is not assessed for tax purposes by the City of Alexandria.
Source: City of Alexandria, Department of Real Estate Assessments, 2012.

The value of the induced development that would occur for Build Alternative D was estimated for the projected land uses (property types) from the *Land Use, Zoning and Consistency with Local Plans Technical Memorandum* and their associated construction costs. The tax revenues were estimated using the projected values of induced development and the City of Alexandria and Tier I Special Services District property tax rates. **Tables 3-13** and **3-14** show the projected property values and associated tax revenues in the given years, respectively.

Table 3-13: Value of Induced Development under Build Alternative D ($2012)

Property Type	2016	2020	2030	2040
Office	$0	$7,838,284	$27,433,995	$47,029,705
Hotel	$0	$1,036,621	$3,628,175	$6,219,729
Retail	$0	$4,294,583	$15,031,039	$25,767,496
Residential	$0	$39,064,461	$136,725,615	$234,386,768
Total	**$0**	**$52,233,950**	**$182,818,823**	**$313,403,697**

Table 3-14: Additional Tax Revenues Due to Induced Development under Build Alternative D ($2012)

Property Type	2016	2020	2030	2040
Office	$0	$93,903	$328,659	$563,416
Hotel	$0	$12,419	$43,466	$74,512
Retail	$0	$51,449	$180,072	$308,695
Residential	$0	$467,992	$1,637,973	$2,807,953
Total	**$0**	**$625,763**	**$2,190,170**	**$3,754,576**

3.3.5 Summary of Build Alternatives

Table 3-15 summarizes the City of Alexandria's budgeted Fiscal Year 2013 property tax revenues and the tax revenue in Potomac Yard that would be lost in each Build Alternative due to property acquisitions, as compared to the No Build Alternative. Compared to the city's total property tax revenues, the lost revenues due to property acquisitions would be negligible.

Table 3-15: Annual Property Tax Revenues and Impacts for the City of Alexandria (2012 values)

Alternative	Annual City Property Tax Revenue (FY 2013 Budget)	Annual Property Tax Loss due to Acquisitions (Compared to the No Build)	Annual Property Tax Gains due to Induced Development (Compared to the No Build)
No Build	$ 333,929,291	-	-
Build A	$ 333,929,291	$1	$3,577,890
Build B	$ 333,929,291	$2,875	$6,758,237
Build D	$ 333,929,291	$20,175	$3,754,576

Note: All dollar amounts are in year 2012 dollars.
Sources: City of Alexandria, Department of Real Estate Assessments, 2012 and City of Alexandria, Office of Management and Budget, FY 2013 Approved Budget.

3.4 Station Accessibility Impacts

Build Alternatives A, B, and D would improve mobility within the station service area relative to the No Build Alternative, providing recurring benefits to travelers that would grow over time with ridership. Some travel time savings would be associated with each alternative, as well as travel cost savings associated with diverting travelers from autos to transit. The value of annual travel time savings are shown in **Table 3-16** for each alternative across the 20-year horizon, and the travel cost savings are displayed in **Table 3-17**.

3.4.1 Travel Time Savings

Travel time savings are estimated as the dollar value that passengers place on their time, no matter the mode. The Build Alternatives would provide travel time savings to the transit users, and the time saved would be valued based on the average annual wage in the Washington, DC MSA. Time spent commuting was valued at 100 percent of the average hourly wage, and all other trips were valued at half of the average hourly wage. In 2016, 70 percent of the hours saved were work-trips or commuting, while 30 percent are non-work or leisure trips; these shares nearly reverse over the analysis period and are 36 percent work and 64 percent non-work by 2040. These commuting patterns change due to changes in development patterns as assumed in the land-use modeling. Based on the travel demand model, the average vehicle occupancy rate was assumed to be 1.48 for non-work trips and 1.12 for work trips. The trend of the increasing hours saved by people who have been diverted from their automobiles onto the Metrorail line was estimated through travel demand modeling and compared to the No Build by interpolating between 2016 and 2040 for the year 2035.

Table 3-16 lists the estimated total hours saved and their value. The results were discounted at a rate of seven percent based on Office of Management and Budget (OMB) guidance[10] and at a less severe discount rate of

[10] See Circulars A-4 and A-94 at: http://www.whitehouse.gov/omb/circulars_default

three percent to provide a range for the net present value of the benefits; the three percent discount rate was selected consistent with recent USDOT guidance[11] for discount rates for transportation projects.

Table 3-16: Monetary Value of Travel Time Savings

Build Alternative	Total Hours Saved (2016-2035)	Monetary Value over 20-Year Horizon (2016-2035) (in millions of $2012)		
		Total	Discounted at 3%	Discounted at 7%
Build A	1,984,069	$63.94	$40.34	$23.11
Build B	1,988,258	$64.07	$40.43	$23.17
Build D	2,026,445	$65.33	$41.31	$23.74

3.4.2 No Build Alternative

The No Build Alternative does not implement any Metrorail system access improvements in the study area that would attract new riders to the system, improve travel times, or lower the cost of travel in the study area. Rather, the No Build Alternative serves as the basis for the evaluation of Alternatives A, B, and D.

3.4.3 Build Alternative A

Build Alternative A offers travel time savings of $63.94 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $23.11 million in 2012 dollars.

3.4.4 Build Alternative B

Build Alternative B offers travel time savings of $64.07 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $23.17 million in 2012 dollars.

3.4.5 Build Alternative D

Build Alternative D offers travel time savings of $65.33 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $23.74 million in 2012 dollars.

3.5 Travel Cost Savings

Travel cost savings are estimated by calculating the difference between the costs of driving an automobile and taking the Metrorail. The cost of driving an automobile is estimated by multiplying the number of diverted auto trips by the average trip length and the average per-mile cost of operating a vehicle (gas, maintenance, and tires)[12]. Parking costs are then added at a rate of $10 per day for commuters and $2 per day for non-work trips[13]. This total is netted with the cost of taking transit, found by multiplying the number of diversions from automobiles by the average transit fare. The average trip length is about 3.8 miles and the average transit fare, estimated through a weighted average of trip purpose and peak and off-peak pricing, is $3.39 in 2016 and falls to $2.85 by 2040 as the trip shares by purpose change[14]. This number represents a savings for transit riders over driving their vehicles.

The proposed Potomac Yard Metrorail station would attract riders from other modes and Metrorail stations, providing an additional accessibility benefit. Because of the new station, the travel demand model estimates that a small number of Metrorail riders that used to ride by car to be dropped off at the Braddock Road, Ronald Reagan Washington National Airport, and Crystal City stations would be able to walk directly to the Potomac Yard station. These users contribute to the total travel cost savings because of the reduced vehicle mileage associated with the change in station access mode of those trips.

Table 3-17 shows the travel cost savings for the three Build Alternatives, as compared to the No Build Alternative. The results were discounted at a rate of seven percent based on Office of Management and Budget (OMB) guidance[15] and at a less severe discount rate of three percent to provide a range for the net present value of the benefits; the three percent discount rate was selected consistent with recent USDOT guidance[16] for discount rates for transportation projects.

[11] See TIGER 2012 Notice of Funding Availability at: http://www.gpo.gov/fdsys/pkg/FR-2012-01-31/pdf/2012-1996.pdf
[12] AAA, "Your Driving Costs", 2012 at: http://newsroom.aaa.com/wp-content/uploads/2012/04/YourDrivingCosts2012.pdf
[13] Rate provided by project travel demand model.
[14] Trip length and average fare are provided by the project travel demand model.
[15] See Circulars A-4 and A-94 at: http://www.whitehouse.gov/omb/circulars_default
[16] See TIGER 2012 Notice of Funding Availability at: http://www.gpo.gov/fdsys/pkg/FR-2012-01-31/pdf/2012-1996.pdf

Table 3-17: Travel Cost Savings

Alternative	Savings over 20-Year Horizon (2016-2035) (in millions of $2012)		
	Total	Discounted at 3%	Discounted at 7%
Build A	$9.82	$6.46	$3.91
Build B	$9.85	$6.53	$4.00
Build D	$9.90	$6.50	$3.92

3.5.1 Build Alternative A

Build Alternative A offers travel cost savings of $9.82 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $3.91 million in 2012 dollars.

3.5.2 Build Alternative B

Build Alternative B offers travel cost savings of $9.85 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $4.00 million in 2012 dollars.

3.5.3 Build Alternative D

Build Alternative D offers travel cost savings of $9.90 million in 2012 dollars over the No Build Alternative. The impacts discounted at seven percent result in $3.92 million in 2012 dollars.

3.6 Property Premium for Existing Properties within One-Quarter Mile of the Station

Under the Build Alternatives, existing properties within ¼ mile of the Metrorail station would have greater access to the Yellow and Blue Lines as well as the broader metropolitan economy. To estimate these impacts, the ¼-mile radius was chosen due to empirical evidence that property values within this distance are the most greatly impacted by the presence of a Metrorail station. Research has shown an overall property value appreciation range of three to 26 percent for proximity to Metrorail stations.[17] For the purpose of this analysis, a conservative eight percent premium has been assumed.[18] The premium is only applied to existing properties. The build out of un/under-developed parcels is handled in Section 3.3

The increase in property values for existing development within ¼ mile[19] of each of the Build Alternative station locations would result in a one-time increase in the tax base for the City of Alexandria, which translates into an increase in annual property tax revenue. An estimate of the potential one-time increase in the City's tax base associated with existing properties and minus loss to tax base from land acquisitions (net assessed value) is listed in **Table 3-18.** The property values listed in the table are based only on existing assessed values and accordingly include values for some parcels of land that are currently vacant within Potomac Yard. Thus, the estimated parcel value appreciation is based on the current assessed value, with the premium applied to it, and does not include planned new development or large-scale redevelopment projects in the analysis area that have not yet been built and assessed for tax purposes. The estimated one-time parcel value appreciation has been spread over 3 years to reflect the time it takes for the appreciation to occur in the market. The net assessed values exclude the value of the portions of land parcels that would be acquired for the Build Alternatives.

The property value appreciation timeline assumes that property values increase equally over three years after station opening, for a total appreciation of eight percent over the three-year period. The property value appreciations for the Build Alternatives during each year after station opening are displayed in **Table 3-19**.

[17] Arlington County and Fairfax County, Virginia. Columbia Pike Return on Investment Study. July 2012.
[18] WMATA, *Making the Case for Transit: WMATA Regional Benefits of Transit*, Technical Report, 2012. This study found that Metrorail increased property values within a quarter-mile of the stations by an average of 8.9 percent for office and 9.4 percent for multi-family. Therefore, the eight percent applied in this analysis is a conservative estimate based on WMATA's empirical findings.
[19] The property premium was applied to the total assessed value of parcels that were wholly or partially within the ¼-mile buffer.

Table 3-18: Total Projected Property Appreciation Net of Land Acquisitions

Alternative	Total Assessed Value within ¼ Mile of Station	Total Lost Value Due to Acquisition	Net Assessed Value within ¼ Mile of Station	Parcel Value Appreciation
Build A	$490,819,251	$103	$490,819,148	$39,265,532
Build B	$318,857,575	$240,038	$318,617,537	$25,489,403
Build D	$291,633,825	$1,684,267	$289,949,558	$23,195,965

Source: City of Alexandria, Department of Real Estate Assessments, 2012

Table 3-19: Projected Property Value Appreciation Timeline

Alternative	2016	2017	2018	3-Year Total
Build A	$13,088,511	$13,088,511	$13,088,511	$39,265,532
Build B	$8,496,468	$8,496,468	$8,496,468	$25,489,403
Build D	$7,731,988	$7,731,988	$7,731,988	$23,195,965

3.6.1 No Build Alternative

The No Build Alternative does not include a new Metrorail station at Potomac Yard, and, therefore, property values within the area would not be impacted by the premium associated with a new rail transit station.

3.6.2 Build Alternative A

Build Alternative A would have a total of 404 parcels within ¼ mile of the Metrorail station. Using a conservative assumption of an eight percent property appreciation rate, the total appreciation of property values surrounding the station would be $39,265,5302 in 2012 dollars over the first three years of operation. **Figure 3-1** shows the parcels within ¼ mile of the station that would be affected.

3.6.3 Build Alternative B

Build Alternative B would have a total of 307 parcels within ¼ mile of the Metrorail station. Using a conservative assumption of an eight percent property appreciation rate, the total appreciation of property values surrounding the station would be $25,489,403 in 2012 dollars over the first three years of operation. **Figure 3-2** shows the parcels within ¼ mile of the station that would be affected.

3.6.4 Build Alternative D

Build Alternative D would have a total of 124 parcels within ¼ mile of the Metrorail station. Using a conservative assumption of an eight percent appreciation rate, the total appreciation of property values surrounding the station would be $23,195,965 in 2012 dollars over the first three years of operation. **Figure 3-3** shows the parcels within ¼ mile of the station that would be affected.

Figure 3-1: Build Alternative A Parcels within ¼ Mile of the Station

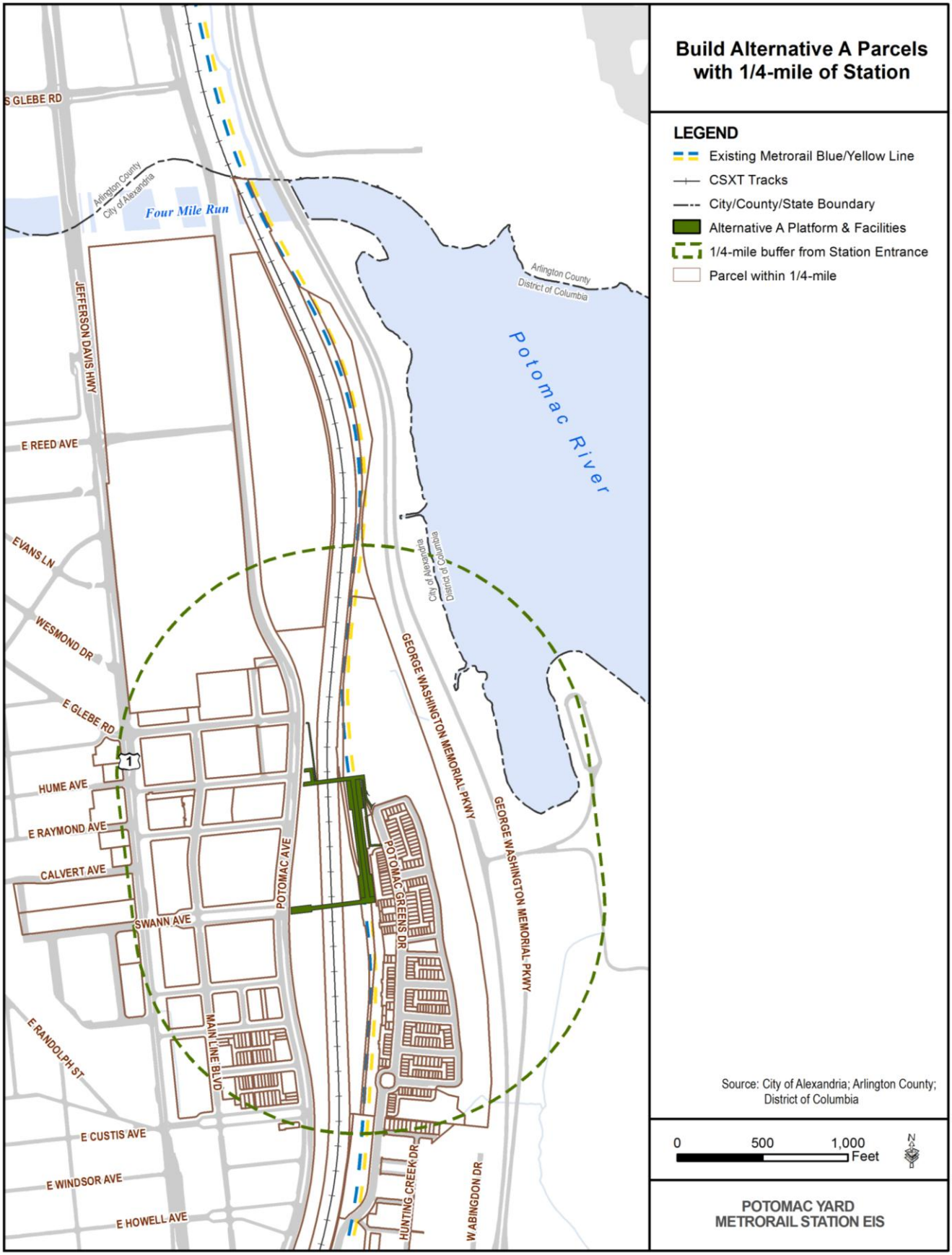


Figure 3-2: Build Alternative B Parcels within ¼ Mile of the Station

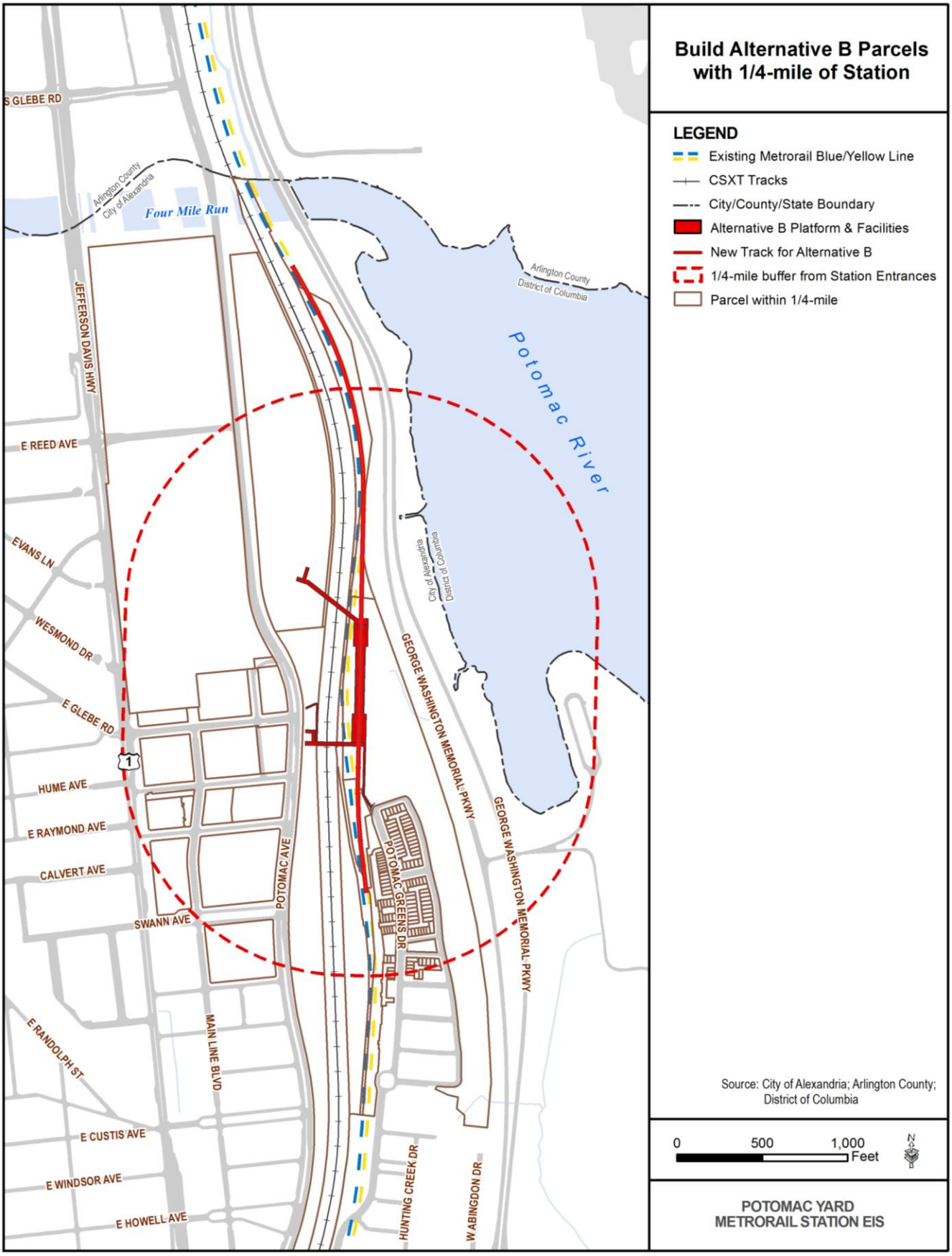
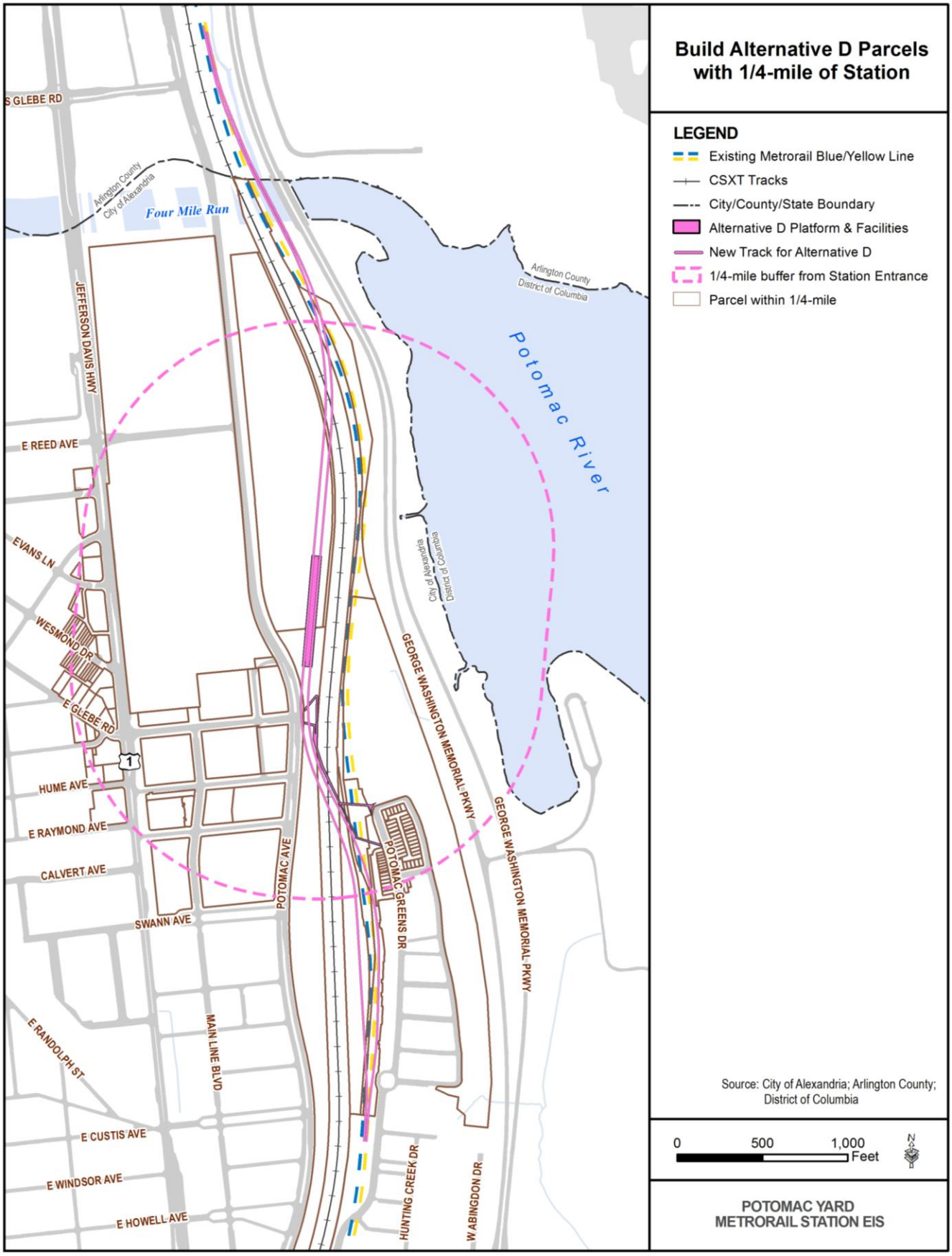


Figure 3-3: Build Alternative D Parcels within ¼ Mile of the Station



APPENDIX:
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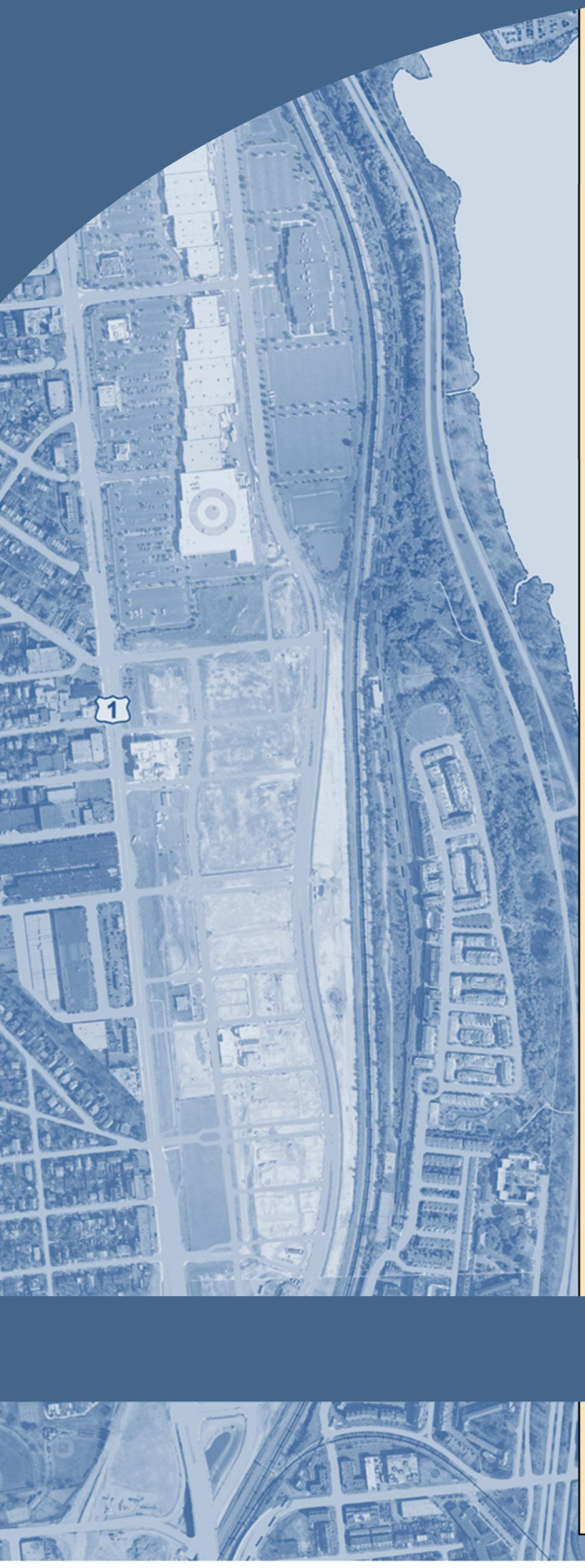
POTOMAC YARD METRORAIL STATION
ENVIRONMENTAL IMPACT STATEMENT



Administrative Review DRAFT

Visual Resources Technical Memorandum

February 2013

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1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

This technical memorandum identifies the potential permanent effects to existing, opening year, and year 2040 visual conditions of the No Build and three Build Alternatives. Visual resources are the visible physical features, both natural and man-made, of a given landscape that give it its aesthetic values. Visual resources contribute to the public's appreciation and enjoyment of the natural and man-made environment. The technical memorandum also analyzes the environmental effects of the project on visual resources.

The memorandum describes the following:

- Project alternatives
- Applicable regulations and guidance
- Methodology
- Opening year conditions
- Potential effects of each alternative (note that construction effects are described separately in the Construction Impacts Technical Memorandum)
- Mitigation measures

Temporary construction effects are described separately in the *Construction Impacts Technical Memorandum*. The findings of this analysis are incorporated in the Draft EIS.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year of 2040, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service.

1.1.2 Build Alternatives

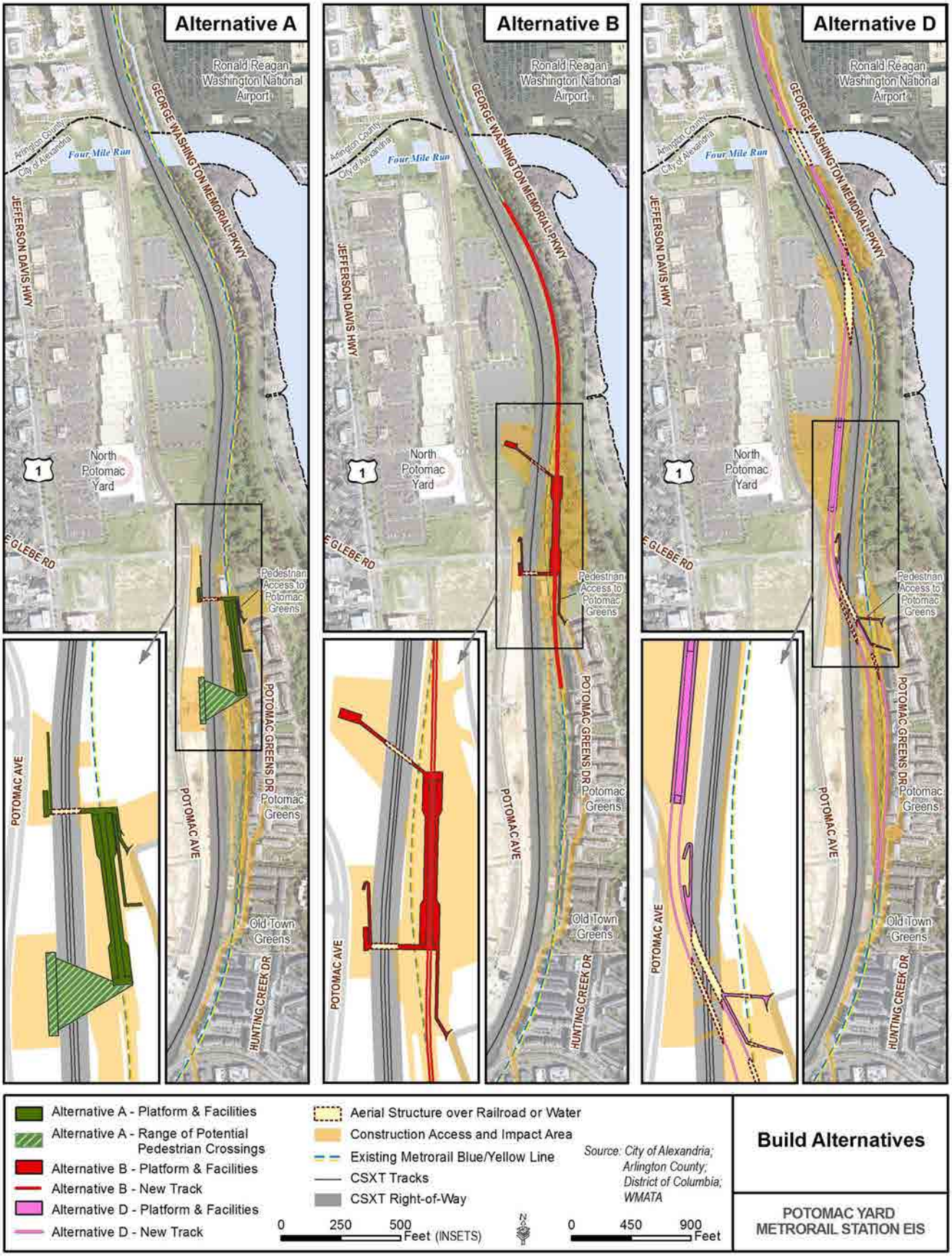
The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Build Alternative A

Build Alternative A would be located on the existing Metrorail tracks between the CSXT right-of-way and the north end of the Potomac Greens neighborhood, generally within the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would include construction of a double crossover located approximately 900 feet south of the station.

Figure 1-1: Build Alternatives



Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood and east of the south end of the existing Potomac Yard Shopping Center in North Potomac Yard. The station would be located within the Greens Scenic Area easement administered by NPS. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center in North Potomac Yard. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian/bicycle bridge would be parallel to the new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new Metrorail bridge over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned

1.2 Applicable Regulations and Guidance

Visual and aesthetic impacts are regulated by both federal and local law and guidance.

1.2.1 Federal

NEPA puts regulatory responsibility on the federal government to "use all practicable means" to "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings." In addition to NEPA, the following federal laws and guidance are applicable to this analysis:

- Section 4(F) of the USDOT Act of 1966 / Parks, Recreation Areas, Wildlife and Waterfowl Refuges and Historic Sites (23 CFR 774)
- National Historic Preservation Act of 1966
- Protection of Historic Properties (36 CFR 800)
- Federal Highway Administration (FHWA), Visual Impact Assessment Methodology for Highway Projects (Publication No. FHWA-HI-88-Q54)

1.2.2 State and Local

The City of Alexandria regulates development in historic districts. The following local laws and guidance are applicable to this analysis:

- *City of Alexandria Zoning Ordinance*, Sec. 10-100 Old and Historic Alexandria District
- *Old and Historic Alexandria District Board of Architectural Review Design Guidelines*, including Section 10-105(A)(3), Additional Standards-Washington Street

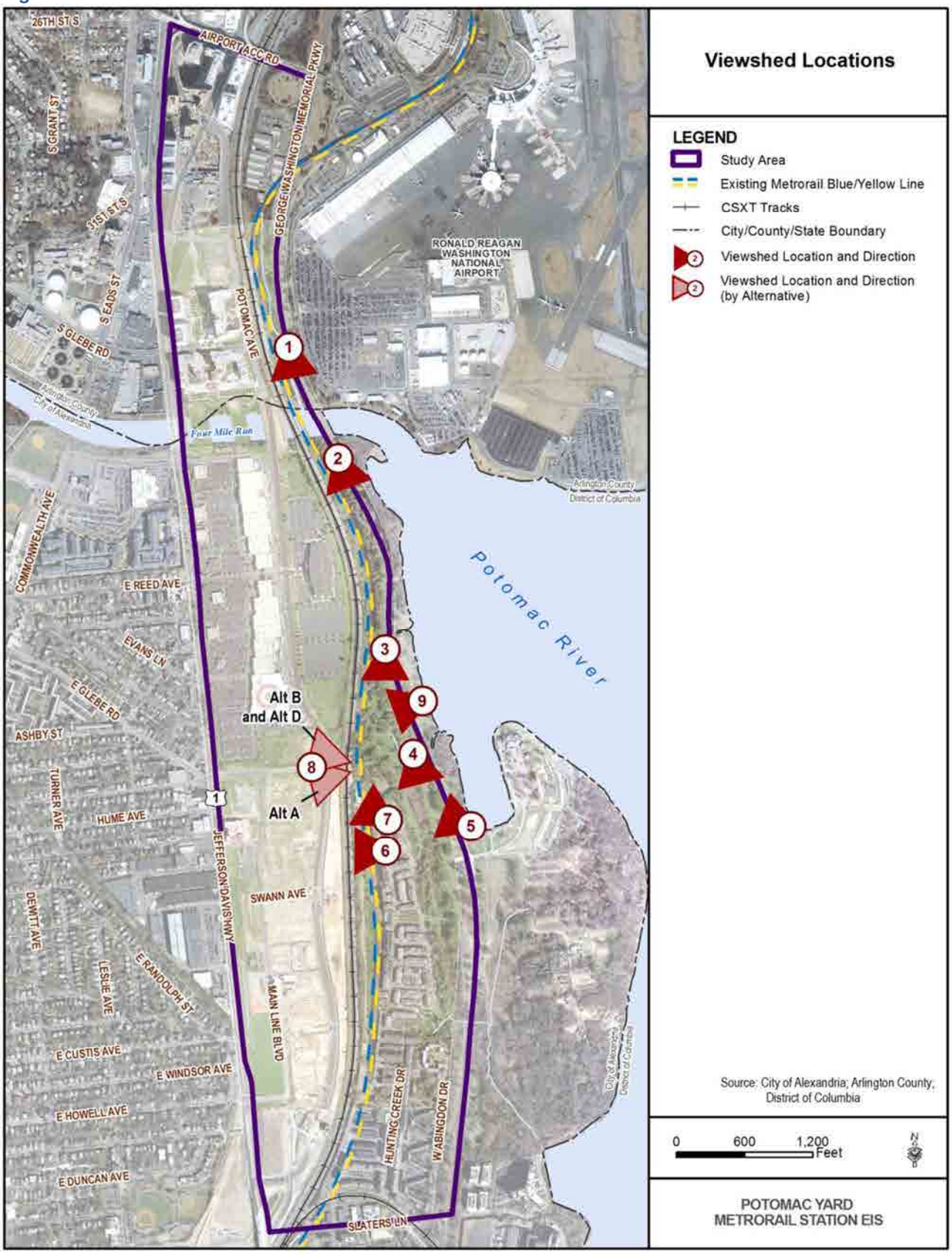
1.3 Methodology

Documentation of existing and opening year visual quality and viewsheds was based FHWA's *Visual Impact Assessment Methodology for Highway Projects* (1981), which is also commonly used by FTA to assess transit projects.The study area is the area in which potential visual impacts would occur. As illustrated in **Figure 1-2**, the study area extends from approximately Slaters Lane to the Airport Access Road, north of Four Mile Run. The inventory characterizes selected viewsheds using the concepts of visual character, visual quality, and viewer sensitivity. These concepts are described in more detail in the following sections. The inventory was developed through field review and photography, the examination of project maps, and from data contained within earlier planning studies, including the *George Washington Memorial Parkway Potomac Greens Final Environmental Impact Statement* (NPS 1991). To depict proposed station and aerial guideway structures as seen from the viewpoints, photograph digital renderings were prepared. The locations and heights of proposed station and aerial guideway structures as shown in the photograph renderings were verified with a "balloon test" that placed large balloons at specific points and heights of the proposed structures (see **Appendix B**). The analysis also considered summer and winter conditions, between which the vegetative foliage would vary. The Final EIS for the Potomac Greens neighborhood characterized the natural and cultural landscape of the Parkway and possible viewshed locations, which are also relevant to the current project.

1.3.1 Viewshed Identification

Nine existing viewsheds, defined as the surface area visible from a given viewpoint or series of viewpoints, were selected for analysis and include locations where the project may be visible from GWMP, Potomac Greens, or Potomac Yard. The viewpoints were selected because of their proximity to the proposed alternatives, including both station locations and relocated track structure, and are intended to be representative of the series of viewsheds along GWMP, Potomac Greens, and Potomac Yard. Specifically, Viewsheds 2 and 4 represent views identified in NPS's *Vegetation of the George Washington Memorial Parkway Cultural Landscape Report* (*Vegetation CLR*) (NPS 2009). The other viewsheds represent views experienced by motorists, visitors, and residents within the study area. **Figure 1-2** illustrates the nine selected viewpoints and their associated viewsheds (Note: the red triangles in **Figure 1-2** are indicators of direction, and are not intended to note the entire area of the viewshed). Additionally, the continuous visual experience along GWMP is considered a viewshed.

Figure 1-2: Viewshed Locations



1.3.2 Visual Character

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

1.3.3 Visual Quality

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

- Vividness (distinctiveness) refers to the memorable quality or distinctiveness of the landscape components. Vividness is composed of four elements - landform, vegetation, water features, and human-made elements - that usually influence the degree of vividness.
- Intactness is a measure of the visual integrity of the natural and human-built landscape and the extent to which the landscape is free from visual encroachment. This factor can be present in well-kept urban and rural landscapes, as well as in natural settings. High intactness means that the landscape is not broken up by features that appear to be out of place. Intactness is composed of two primary elements - development and encroachment - that influence the degree of intactness.
- Unity refers to the degree with which visual resources of the landscape join together in a coherent, harmonious visual pattern. High unity frequently attests to the careful design of individual components and their relationship in the landscape.

These characteristics are then evaluated on a scale of 1-7, with 1 being "very low" and 7 being "very high" (see **Table 1-12**). The average of these visual quality characteristics indicates the overall visual quality of the viewshed.

Table 1-2: Visual Quality 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).

1.3.4 Viewer Sensitivity

Viewers can be categorized as having low, average, or high sensitivity to changes in the visual environment. Viewer sensitivity is strongly influenced by a viewer's activity, awareness of their surroundings, frequency, and length of time using a resource (a resident or park user, for example).

1.3.5 Impact Assessment

This document identifies the impacts on visual resources in the 2016 opening year and in 2040. Impacts to visual quality include the visual resource change and the viewer response. Adverse impacts result from visible changes in a viewshed that alter its visual character and diminish its visual quality through changes to vividness, intactness, and unity. In 2016 (opening year), visual impacts include the removal and replacement of vegetation, which would not have matured, and new development in South Potomac Yard. The analysis of visual impact in 2040 assumes the maturation of much of the replaced vegetation, and new development in North Potomac Yard.

2.0 OPENING YEAR CONDITIONS

Independent of the proposed action, viewsheds within Potomac Yard and from Potomac Greens would likely be altered by 2016. Changes to the visual environment would include up to 1.885 million square feet of development in South Potomac Yard. Planned development for 2016 would include the construction of residential townhomes and Potomac Yard Park.

2.1 George Washington Memorial Parkway

Overall, the viewshed along GWMP in the study area is characterized by a divided four-lane roadway framed by vegetation. The National Register of Historic Places (NRHP) nomination for GWMP notes – "The parkway commemorates the first president, preserves the natural setting, and provides a quality entryway for visitors to the nation's capital." The nomination goes on to say – "The landscape values for GWMP have always been the preservation of scenic and esthetic qualities associated with the Potomac River valley."

The *Mount Vernon Memorial Highway Cultural Landscape Report (Mount Vernon Memorial Highway CLR)* describes the history, design, and context of the creation of the Mount Vernon Memorial Highway, which is now part of GWMP (NPS 1986). The Mount Vernon Memorial Highway extended from Arlington Memorial Bridge at Columbia Island to Mount Vernon. As stated in the *Mount Vernon Memorial Highway CLR,* "From the panoramic views of monumental Washington afforded near Gravelly Point and Columbia Island, to the framed vista of the Washington Monument from the road north of Alexandria, to the glimpses of the Masonic Memorial, Fort Washington, and Mount Vernon along the southern parkway, the Parkway journey revealed the beauty of the region to its travelers [sic]." The roadway and landscape, and the maintenance of the vegetation were designed to reinforce the visual orientation of the Potomac River and to historic sites. Among the early objectives of the Mount Vernon Memorial Highway was the screening of objectionable views and to block out the railroad, including efforts to prohibit the owners and operators of Potomac Yard from cutting trees without government authorization. Regulatory efforts, such as prohibiting billboards, and limiting development in the area were also considered important elements to maintain the desired views. As described in the *Mount Vernon Memorial Highway CLR*, the final long range plan for the Mount Vernon Memorial Parkway included the following goals:

- Controlling all property east of the railroad "to limit industrial encroachments and to prevent the introductions of new intersections in the future;
- Coordinating the development of adjacent western lands to reduce the number of intersections, to provide for adequate border roads and to ensure small areas for public uses along the river corridor;
- Coordinating a system of paths for walking and horseback riding along the Highway right of way.

In addition to the overall continual visual experience along the roadway, the *Vegetation CLR* identifies a number of views that were noted in the original 1932 landscape design for the parkway. Not all of these views currently exist due to development, such as construction of Ronald Reagan Washington National Airport, or alterations to the natural landscape. The following current views from the roadway within the study area are identified in the *Vegetation CLR*:

<u>Northbound Views (see **Figure 2-1**)</u>

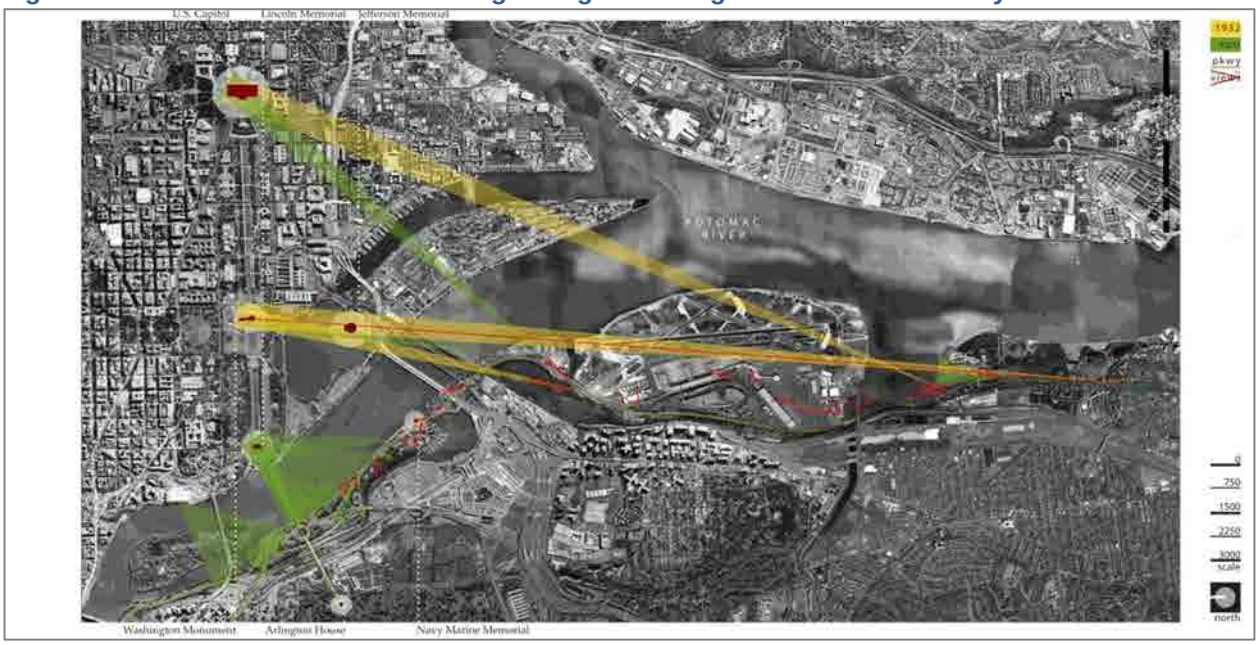
- View north from Slaters Lane to the Washington Monument1 (in the vicinity of Viewshed 5)
- View northeast at Daingerfield Island to Washington Marina (in the vicinity of Viewshed 5)
- View northeast at Daingerfield Island to U.S. Capitol (in the vicinity of Viewshed 4)
- Continual northbound view (in the vicinity of Viewsheds 1, 2, 3, 4, and 5)

<u>Southbound Views (see **Figure 2-2**)</u>

- View south, south of Four Mile Run to Daingerfield Island (Viewshed 2)
- View south at Daingerfield Island to large willow oaks (Viewshed 4)
- Continual southbound view (Viewsheds 1, 2, 3, 4, and 5)

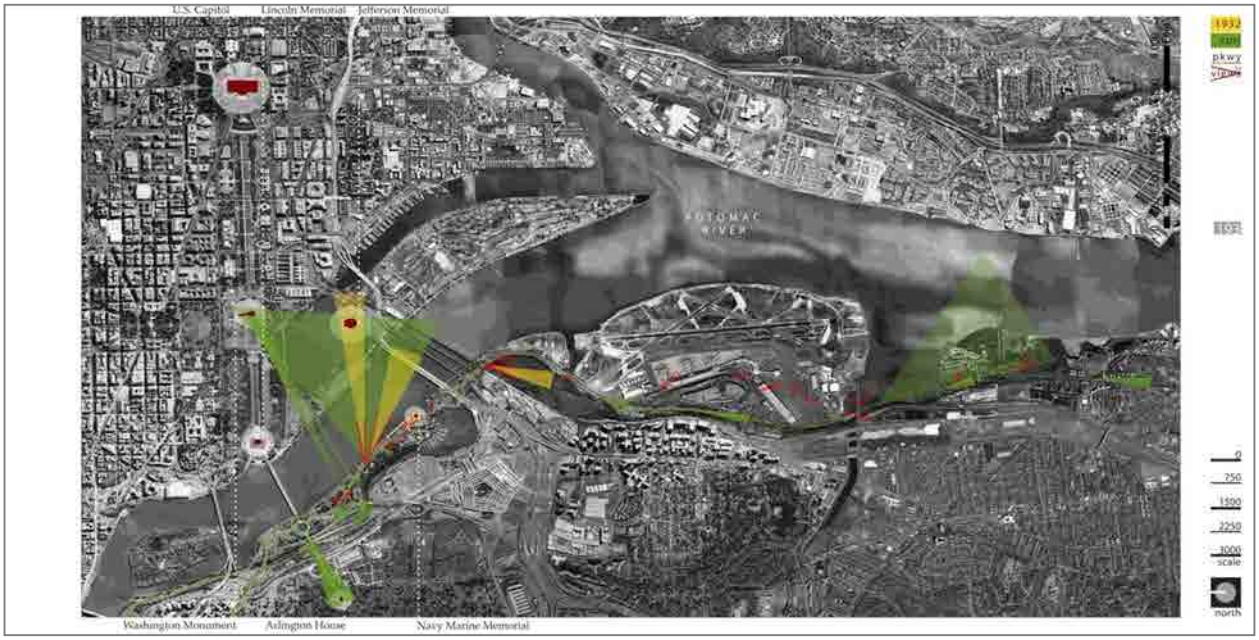
[1] In the Vegetation CLR, this viewshed originates at intersection of King Street and Washington Street and extends north into the study area. For the purposes of this analysis, only the portion of the view within the study area is considered.

Figure 2-1: Northbound Views along George Washington Memorial Parkway



Source: NPS 2009.

Figure 2-2: Southbound Views along George Washington Memorial Parkway



Source: NPS 2009.

Also identified as part of the original plan for GWMP is the Mount Vernon Trail, which is part of the Potomac Heritage National Scenic Trail (Potomac Heritage Trail). Among the purposes of the Potomac Heritage Trail, which stretches from Pennsylvania to Virginia, is to connect people with places, providing opportunities for people to explore connections and contrasts between and among landscapes and the history in the area. The desired trail experiences and future conditions identified in the foundation statement of the Potomac Heritage Trail include the conservation of the natural, historical, cultural, recreational, and scenic qualities of the trail. The interpretive themes identified include natural and ecological considerations, therefore placing importance on the visual resources of the trail (NPS 2012).

Redevelopment of a portion of Potomac Yard in the 1990s and 2000s required the federal government to release the owner from a 1938 indenture which restricted the use of portions of Potomac Yard to rail purposes. Additional past agreements in the area of Potomac Greens also clouded title for re-development. In return for lifting this

restriction over a portion of Potomac Yard and clearing the title for Potomac Greens, the National Park Service received a building restriction over a portion of Potomac Yard, a development restriction on Potomac Greens, and the Greens Scenic Area scenic easement.

As part of the development of the Potomac Greens neighborhood in the 1990s, NPS was granted a scenic easement, referred to as the Greens Scenic Area. The scenic easement is located in the area between the neighborhood and the GWMP, extending north and east of the neighborhood within portions of Potomac Greens Park. This easement is designed to prohibit development in the area that would potentially adversely alter viewsheds along GWMP and shield GWMP from the development allowed once the indenture was removed.

2.1.1 Specific Views

The *Vegetation CLR* identifies the view north from Slaters Lane as noteworthy due to its alignment with the Washington Monument. GWMP affords a long, straight view north to the Washington Monument within the study area from Slaters Lane because the road aligns directly with the Washington Monument. The trees planted alongside the roadway have matured and frame the view. As noted in the *Vegetation CLR*, this view is "one of the remaining views indicated on the 1932 plan, and remains one of the more dramatic views along the Parkway" (NPS 2009).

The *Vegetation CLR* also identifies views north along GWMP from Daingerfield Island although not specified in the original 1932 landscape design. When passing Daingerfield Island, there are limited, filtered views of the marina, primarily in the winter, when foliage is diminished. Much of GWMP at Daingerfield Island has a nearly continuous line of trees and tall shrubs that block views of the river, but there is a noticeable gap near the vehicular entrance to Daingerfield Island that allows for this filtered view.

Continuing north along GWMP, the river is visible between shrubs and beneath trees immediately north of the marina. Before the construction of the airport, this had been a wide view from GWMP north across the mouth of Four Mile Run, the first view of the U.S. Capitol traveling north along GWMP. Today airport runways dominate the foreground, although glimpses of the U.S. Capitol are possible. The *Vegetation CLR* notes that as one of only two views to the U.S. Capitol along GWMP still possible today, this view is important to retain.

Potomac Greens Park lies in the periphery of the view south from GWMP to Daingerfield Island (see **Figure 2-4**). The *Vegetation CLR* states that this view "affords the first view of the river since the wide panorama along Lady Bird Johnson Park. The river is wider here, though less wide than before the airport filled in much of the river. The marina at Daingerfield Island appears briefly between clumps of vegetation."

East and northeast of Potomac Greens, there is a view from Daingerfield Island to large willow oaks (see Figure 2-6:**Figure 2-6**). According to the *Vegetation CLR*, the willow oaks "in the median at Daingerfield Island are the most prominent trees in the central stretch of the Parkway…The oaks tend to focus attention to the center of the Parkway, rather than to the river" (NPS 2009).

2.1.2 Continuous Views

In general, the overall continuous visual experience of GWMP roadway, both northbound and southbound, is of a roadway framed by vegetation, although breaks in vegetation afford views beyond GWMP. The vegetation visible along GWMP is primarily tall and dense, both to the east and the west. Occasional breaks in the vegetation allow intermittent vistas of the Potomac River and NPS facilities (such as Daingerfield Island) along the eastern portion of the corridor, and of built structures, including rail facilities, townhomes, multi-family buildings, the Four Mile Run Bridge, and the Metrorail Bridge along the western portion of the corridor. When driving along GWMP, buildings in Crystal City are visible from within the northern portion of the study area due to breaks in vegetation. In addition, overpasses crossing the GWMP truncate views to the north in this area. The overpasses serve as a visual endpoint. During the winter, the Potomac River and built elements are more prominent due to dormant vegetation.

Continuous views of GWMP are presented in **Figure 2-3**, **Figure 2-5**, and **Figure 2-7** (see Section 2.1.3).

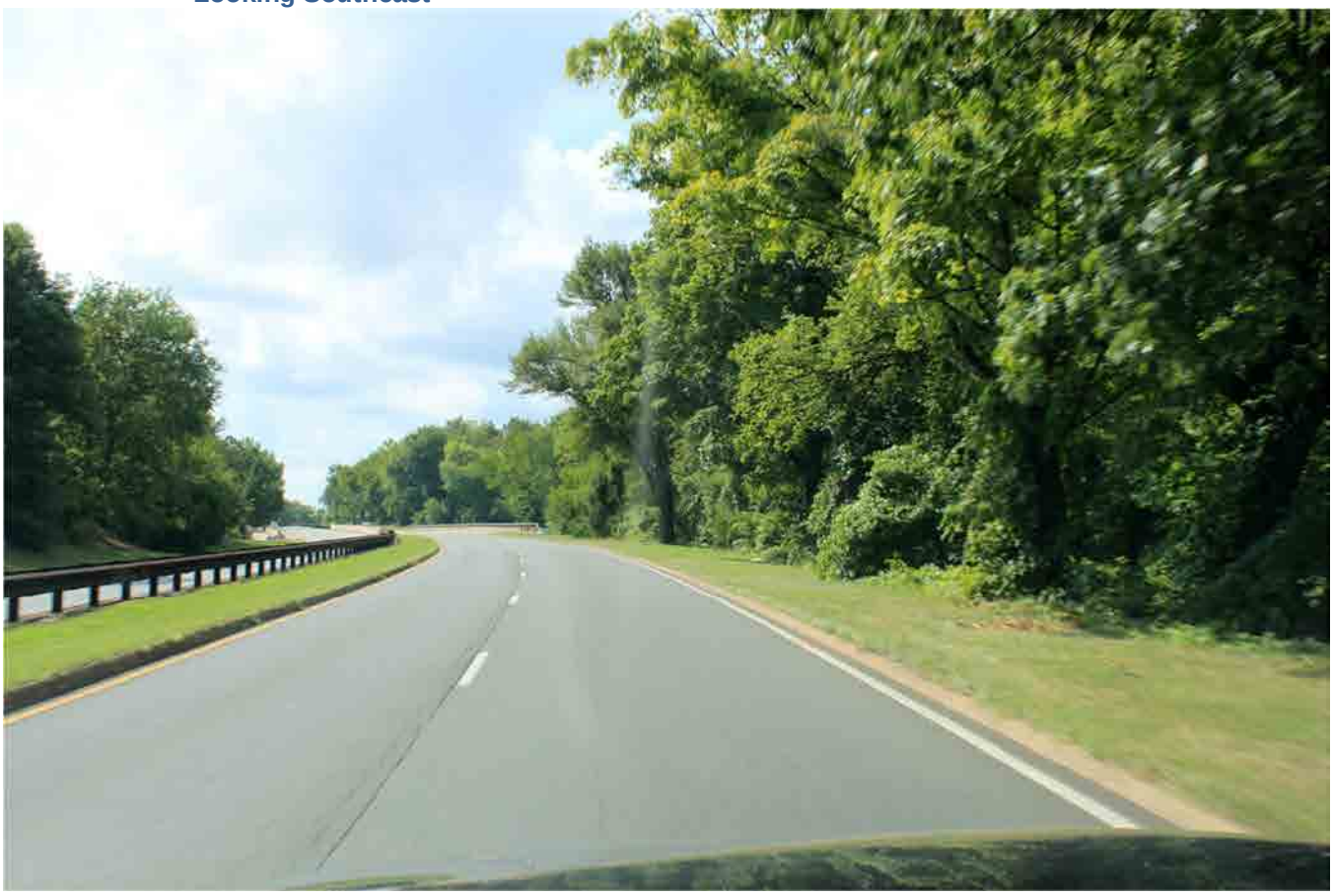
2.1.3 GWMP Viewsheds

Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast

Viewshed 1 encompasses land in the northern portion of the study area along GWMP, north of Four Mile Run. From GWMP north of Four Mile Run, the view southeast is characterized by a tree-lined roadway, with a break in vegetation visible at Four Mile Run. Open sky, opposing traffic, and a W-beam guardrail also characterize this view (see **Figure 2-3**). Vegetation and landscaping include mature trees, shrubs, and landscaped roadway edges, all of which form a continuous line. At this location, the natural landscape has a very high degree of vividness due

to the integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. Viewer response is considered high, due to high viewer exposure and high viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 2-3: Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast



Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

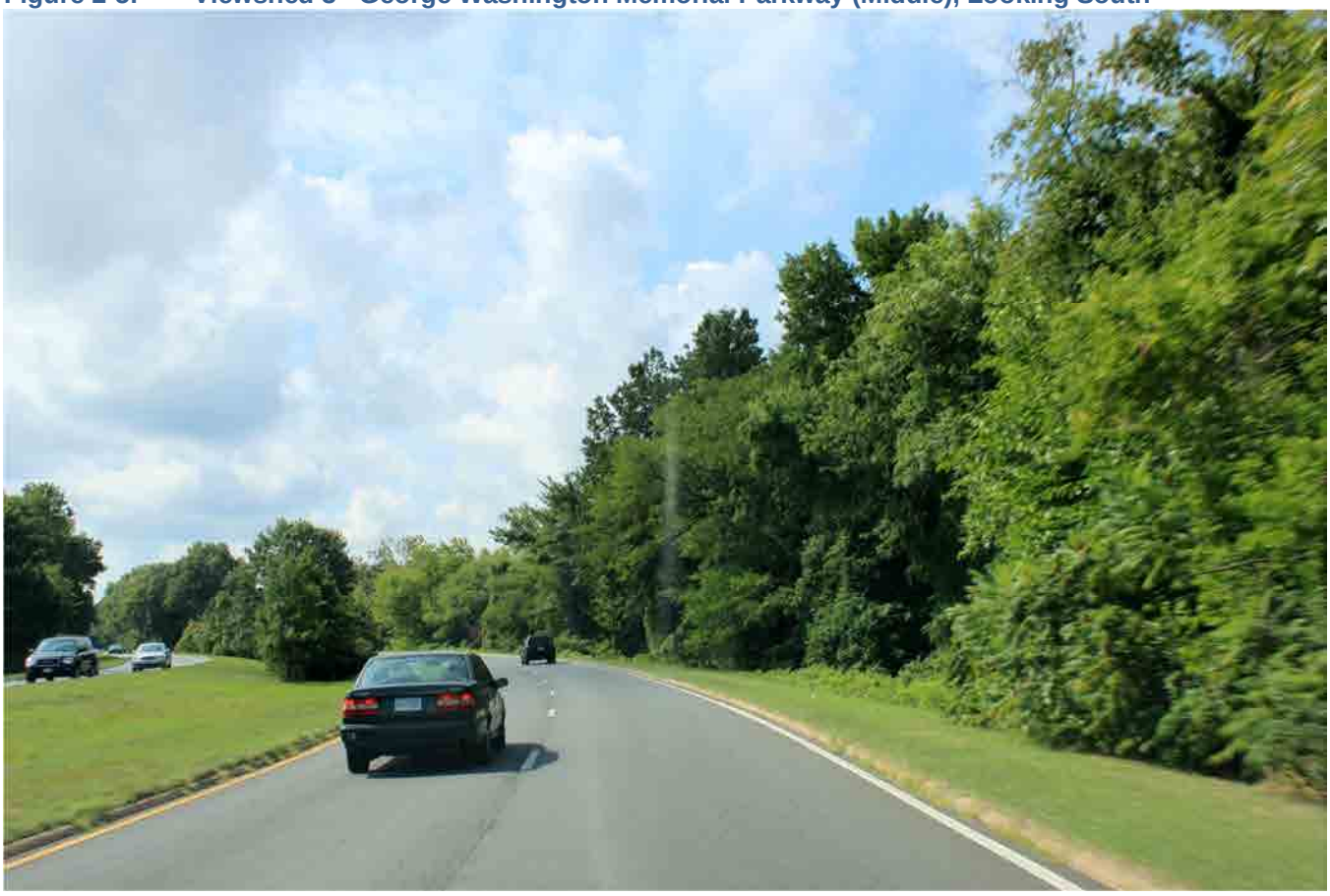
Viewshed 2 is identified in the *Vegetation CLR* as a current view and encompasses land in the northeast portion of the study area along GWMP. From GWMP south of Four Mile Run, the slightly uphill view to the south is characterized by a tree-lined roadway with intermittent breaks in vegetation (see **Figure 2-4**). Open sky, opposing traffic, and the W-beam guardrail contribute to the visual character of the viewshed. In addition, the growth of trees over the roadway to form a visual tunnel and the shade and shadow created by the trees also contribute to the character of the viewshed. The existing Metrorail tracks are partially visible to park users and drivers in both the southbound and northbound lanes of GWMP during winter, when foliage is diminished. Vegetation and landscaping include mature trees, shrubs, and landscaped roadway edges. At this location, the natural landscape has a very high degree of vividness due to the distinct character of the roadway lined by arching vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. Viewer response is considered high, due to high viewer exposure and high viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 2-4: Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

Viewshed 3 - George Washington Memorial Parkway (Middle), Looking South

Viewshed 3 encompasses land along the eastern boundary of the study area along GWMP in the middle portion of the study area. From GWMP between Four Mile Run and Daingerfield Island, the view south is characterized by a curved roadway framed by vegetation, including a series of large trees in the median (see **Figure 2-5**). Open sky and opposing traffic contribute to the character of the viewshed. All of these features exhibit a similar line and form. Potomac Yard and the existing Metrorail tracks are largely obscured from the view of park users and drivers in both the southbound and northbound lanes, although these elements are more visible during winter months. Vegetation and landscaping include mature trees, shrubs, and landscaped roadway edges. At this location, the natural landscape has a very high degree of vividness due to the integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. Viewer response is considered high, due to high viewer exposure and high viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 2-5: Viewshed 3 - George Washington Memorial Parkway (Middle), Looking South



Viewshed 4 – George Washington Memorial Parkway (South), Looking South

Viewshed 4 is identified in the *Vegetation CLR* as a current view and encompasses land along the eastern boundary of the study area along GWMP (see **Figure 2-6:**). From GWMP near Daingerfield Island, townhomes in Potomac Greens are partially visible, a condition that is accentuated during the winter months. Vegetation and landscaping are characterized by mature trees, shrubs, and landscaped roadway edges and by the willow oaks in the median, forming a consistent line and texture. At this location, the natural landscape has a high degree of vividness due to the curving roadway lined by variable wetlands vegetation; a high degree of visual unity due to the roadway and vegetation, although the vegetation on the western portion of the GWMP varies in height; and a high degree of intactness due to consistent visual elements with minimal encroachment from built elements. Combined, these visual quality criteria result in a high degree of visual quality. The viewer response is high due to high viewer exposure and high viewer sensitivity, which is a result of viewer awareness by GWMP visitors.

Figure 2-6: Viewshed 4 – George Washington Memorial Parkway (South), Looking South

Viewshed 5 – George Washington Memorial Parkway (South), Looking West

Viewshed 5 encompasses land in the southern portion of the study area along GWMP. Potomac Yard and the existing Metrorail tracks are mostly obscured from the view of park users and drivers in both the southbound and northbound lanes. Looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail at the George Washington Memorial Parkway northbound shoulder, townhomes in Potomac Greens are partially visible from this location (see **Figure 2-7**). Vegetation and landscaping are characterized by mature trees, shrubs, and landscaped roadway edges. The thin trees and shrubs do not provide adequate canopy to limit invasive vegetation, which is present from this view. A trail is located within the wetlands, but is not visible from this view. At this location, the landscape has a moderately high degree of vividness due to the layered view of the roadway, landscape, and built elements; a moderately high degree of visual unity due to the vegetation that largely filters views of existing built elements; and a moderately high degree of intactness due to the encroachment of built elements on the periphery of the viewshed. Therefore, this viewshed has a moderately high degree of visual quality. The viewer response is high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 2-7: Viewshed 5 – George Washington Memorial Parkway (South), Looking West

Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

Viewshed 9 encompasses land in the middle portion of the study area along the Mount Vernon Trail of GWMP. From this viewpoint along the trail looking west, the view is of a rolling grass hill with taller trees in the background that form a visual barrier (See **Figure 2-8**). Trees in the foreground frame the view; park amenities are also visible. During winter months, trees greatly filter views of South Potomac Yard development. At this location, the natural landscape has a high degree of vividness due to the layered view of natural features; a high degree of visual unity due to the repeated linear patterns of the vegetation; and a high degree of intactness due to consistent visual elements without interruption with limited encroachment of built elements. Therefore, this viewshed has a high degree of visual quality. The viewer response is high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 2-8: Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

2.2 Potomac Greens

The Potomac Greens neighborhood lies to the southeast of the project site, between GWMP and the existing Metrorail tracks. The development contains both townhomes and community amenities, such as Potomac Greens Park, located at the north end of the community. **Figure 2-9** shows a typical neighborhood streetscape.

Figure 2-9: Potomac Greens Neighborhood (Typical Streetscape)

Views of Potomac Greens Park contain layers of horizontal elements along with vegetation, park amenities, and a Metrorail substation building. The existing open space, rail tracks, and fencing establish low horizontal lines. The built elements, such as the gazebo near the street and the building in the background interrupt these lines, as do the irregular spacing and height of vegetation. There is a trail, including boardwalks, within the wetlands north of the Potomac Greens community.

From the lower levels of the Potomac Greens townhomes, views are shallow and are characterized primarily by low horizontal elements, including transportation facilities with some landscape features. The existing concrete retaining wall and iron and chain link fencing are visible, as are the existing Metrorail tracks located west of the development. From those townhomes adjacent to the existing Metrorail tracks in the northern portion of Potomac Greens, retaining walls where the tracks begin to descend into a tunnel are visible. Metrorail tracks, retaining walls, fencing and invasive vegetation dominate the view.

Viewshed 6 – Potomac Greens, Looking West

Viewshed 6 looks west from the northernmost existing townhomes in the Potomac Greens neighborhood toward the existing station reservation. The view is characterized by intermittent landscape vegetation, a series of evergreen trees, and a low horizontal wall with an iron fence, and is framed by nearby townhomes. In the distance, buildings in South Potomac Yard are visible (see **Figure 2-10**). New development in South Potomac Yard would be visible from this location by 2016. This viewshed has a moderate degree of vividness due to the built and landscape components that combine in an indistinct pattern; a moderate degree of visual unity due to the vegetation, built elements, and streets and sidewalks, all of which remain distinct visual elements; and a moderate degree of intactness due to the visibility of built elements in the background and periphery of viewshed, which encroach on the landscape elements. Combined, these visual quality criteria result in a moderate degree of visual quality. The viewer response is high due to high viewer exposure and a high degree of viewer sensitivity, a result of high viewer awareness of Potomac Greens residents.

Figure 2-10: Viewshed 6 – Potomac Greens, Looking West

Viewshed 7 – Potomac Greens Park

Viewshed 7 encompasses land in Potomac Greens Park, located at the north end of Potomac Greens. Areas of South Potomac Yard, the existing Metrorail tracks, the traction power substation, and a portion of the Greens Scenic Area are visible to neighborhood residents at this location (see **Figure 2-11**). By 2016, new residential development at South Potomac Yard would be visible from this location as well. The built environment is partially screened by trees and shrubs. At this location, the natural landscape has a moderate degree of vividness due to the built and landscape components that combine in an indistinct pattern; a moderate degree of visual unity due to the vegetation, built elements, and streets and sidewalks, all of which remain distinct visual elements; and a moderate degree of intactness due to the visibility of built elements in the viewshed, which distract the viewer from the landscape elements. Combined, these visual quality criteria result in a moderate degree of visual quality. Therefore this viewshed has a moderate degree of visual quality. The viewshed has a high viewer response due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by park visitors.

Figure 2-11: Viewshed 7 – Potomac Greens Park, Looking Northwest

2.3 Potomac Yard

Views east from Potomac Yard are characterized by a series of horizontal transportation structures and landscape elements, with occasional breaks in trees and vegetation. The trees and overgrown vegetation along the Metrorail tracks provide a visual barrier to Potomac Greens and the Metrorail tracks. Horizontal elements include a fence that lines the eastern boundary of Potomac Yard, vegetation growing along the fence and CSXT right-of-way, and improvements in Potomac Yard Park.

Viewshed 8 – North Potomac Yard

Viewshed 8, looking northeast and southeast from the intersection of East Glebe Road with Potomac Avenue, encompasses land within Potomac Yard in the approximate location of the "Metrorail Zone" described in the *North Potomac Yard Small Area Plan* adopted in 2010. The area is largely vacant at this point in time, with the exception of local streets, blocks of recently built townhomes, a stormwater retention pond, street trees, and much of the vegetation from Potomac Yard Park, which is currently under construction (see **Figure 2-12** and **Figure 2-13**). In the background, CSXT tracks and fencing add horizontal lines. Looking east and northeast, mature vegetation of Potomac Greens Park and the Greens Scenic Area are visible in the distance. Looking southeast, the WMATA traction power substation and the Potomac Greens townhomes are also visible in the background. By 2016, development allowing up to 20-story buildings in South Potomac Yard and portions of North Potomac Yard development would be visible. Vegetation at Potomac Yard Park would be more mature and construction of the park would be complete, filtering views of development. In the background, mature vegetation is visible facing east along the boundary of Potomac Yard with the railroad tracks and GWMP beyond. The landscape has a moderately low degree of visual vividness due to the built and landscape components (including construction fencing) that combine in an indistinct pattern; a moderately low degree of visual unity due to the vegetation, built elements, and streets and sidewalks, all of which remain distinct visual elements; and a moderately low degree of intactness due to the visibility of built elements in the background, which encroach on the landscape elements. Combined, these visual quality criteria result in a moderately low degree of visual quality. In addition, because

viewers in this area would expect a developed area with a mix of uses, the level of viewer awareness at Potomac Yard results in a medium degree of viewer sensitivity.

Figure 2-12: Viewshed 8 – Potomac Yard, looking Northeast at East Glebe Road and Potomac Avenue

Figure 2-13: Viewshed 8 – Potomac Yard, looking Southeast at East Glebe Road and Potomac Avenue

3.0 POTENTIAL EFFECTS

Permanent effects to visual resource conditions are those that would result from implementation of the project. Examples of impacts on these resources including the following:

- Changes to the overall visual environment;
- Changes to specific viewsheds;
- Changes to visual character;
- Changes to visual quality; and
- Changes to viewer sensitivity and awareness.

3.1 No Build Alternative

Visual Elements of the No Build Alternative

Under the No Build Alternative, no Potomac Yard Metrorail station would be built. Therefore, no station elements would be added to existing view corridors by the No Build Alternative.

While no new station elements would be built, background development at Potomac Yard would adversely impact the existing visual character of GWMP and the Potomac Greens neighborhood. Changes to the visual environment may include up to 1.885 million square feet of development in 2016 and 5.05 million square feet of development in 2040 in southern portions of Potomac Yard, including multi-story townhomes and Potomac Yard Park. Redevelopment of the northern portion of Potomac Yard could include multi-story structures. Many of these buildings would not be visible from GWMP due to their height or location, particularly portions of the 100-foot tall buildings within. Up to 3.6 million square feet of development is permitted in North Potomac Yard without construction of a Metrorail station, which would be largely complete by 2040. Based on the *North Potomac Yard Urban Design Standards* (*Design Standards*) adopted by the City of Alexandria in 2010, the tallest of the new buildings would be 250 feet in height in the northern portion of the development site, near Four Mile Run. However, the *Design Standards* call for building heights to step down closer to GWMP.

George Washington Memorial Parkway

Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under the No Build Alternative in 2016, Viewshed 1 from GWMP north of Four Mile Run looking north would remain characterized by a tree-lined roadway with a break in vegetation visible at Four Mile Run, open sky, opposing traffic, and a W-beam guardrail. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, trees would continue to reinforce the visual lines of the roadway, retaining its character. At this location in 2016, the natural landscape would maintain a very high degree of vividness due to the continued integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to continued consistent visual elements without interruption. Combined, these visual quality criteria maintain a very high degree of visual quality. Viewer response would continue to be high.

Impacts in Year 2040

Under the No Build Alternative in 2040, Viewshed 1 from GWMP north of Four Mile Run looking south would remain characterized by a tree-lined roadway with a break in vegetation visible at Four Mile Run, open sky, opposing traffic, and a W-beam guardrail. Although development in North Potomac Yard would take place, views of the buildings would be largely shielded from view by vegetation. During winter months, vegetation would filter views of development west of the GWMP, although the trees would continue to reinforce the visual line of the roadway. At this location in 2040, the natural landscape would maintain a very high degree of vividness due to the continued integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to continued consistent visual elements without interruption. Combined, these visual quality criteria maintain a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under the No Build Alternative in 2016, Viewshed 2 from GWMP south of Four Mile Run looking south would continue to be largely characterized by a tree-lined roadway with intermittent breaks in vegetation. Open sky, opposing traffic, the W-beam guardrail, and the tunnel-like form of the trees would also continue to contribute to the visual character of the viewshed. The existing Metrorail tracks would remain partially visible to park users and drivers in both the southbound and northbound lanes of the GWMP roadway during the winter months, when foliage is diminished. However, the trees would maintain their tunnel-like form and continue to reinforce the visual lines of the roadway. At this location, the natural landscape would have a very high degree of vividness due to the distinct character of the roadway lined by arching vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. Viewer response would be considered high, due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative in 2040, Viewshed 2 from GWMP south of Four Mile Run looking south would continue to be characterized by a tree-lined roadway with intermittent breaks in vegetation, as well as open sky, opposing traffic, the W-beam guardrail, and the tunnel-like form of the trees. Although development in North Potomac Yard would take place, views of the buildings would be largely shielded from view by vegetation. Vegetation would continue to filter views of the existing Metrorail tracks and North Potomac Yard development during the winter months, when foliage is diminished. However, the trees would maintain their tunnel-like form and continue to reinforce the visual lines of the roadway. At this location in 2040, the natural landscape would maintain a very high degree of vividness due to the distinct character of the roadway lined by arching vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 3 – George Washington Memorial Parkway (Middle), Looking South

Impacts in Year 2016

Under the No Build Alternative in 2016, the view south from Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island would continue to be characterized by a curved roadway framed by vegetation, including a series of large trees in the median, open sky, and opposing traffic. South Potomac Yard and the existing Metrorail tracks would continue to be largely obscured from the view of park users and drivers in both the southbound and northbound lanes, although these elements would be more visible during winter months. However, the trees would continue to reinforce the visual lines of the roadway. At this location, the natural landscape would maintain a very high degree of vividness due to the integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative in 2040, in Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island, the view south would continue to be characterized by a curved roadway framed by vegetation, including a series of large trees in the median, open sky, and opposing traffic. North and South Potomac Yard development and the existing Metrorail tracks would continue to be largely obscured from the view of park users and drivers in both the southbound and northbound lanes, although these elements would be more visible during winter months. However, the trees would continue to reinforce the visual lines of the roadway. At this location, the natural landscape would maintain a very high degree of vividness due to the integrated visual elements of the roadway lined by vegetation; a very high degree of visual unity due to the repeated linear pattern of the viewshed elements; and a very high degree of intactness due to consistent visual elements without interruption. Combined, these visual quality criteria result in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Viewshed 4 – George Washington Memorial Parkway (South), Looking South

Impacts in Year 2016

Under the No Build Alternative in 2016, in Viewshed 4 along GWMP near Daingerfield Island looking south, townhomes in Potomac Greens would remain partially visible, a condition that would be accentuated during the winter months. Development at South Potomac Yard would also be visible during the winter months. This viewshed would continue to have high degrees of vividness due to the curving roadway lined by variable wetlands vegetation; a high degree of visual unity due to the roadway and vegetation, although the vegetation on the western portion of the GWMP varies in height; and a high degree of intactness due to consistent visual elements with minimal encroachment from built elements. Combined, these visual quality criteria result in a high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative in 2040, in Viewshed 4 along GWMP near Daingerfield Island, townhomes in Potomac Greens would remain partially visible, as would development in South Potomac Yard, a condition that would be accentuated during the winter months. At this location, the natural landscape would maintain a moderately high degree of vividness due to the curving roadway lined by variable wetlands vegetation; a moderately high degree of visual unity due to the roadway and vegetation, although the vegetation on the western portion of the GWMP varies in height; and a moderately high degree of intactness due to consistent visual elements without minimal encroachment from built elements. Combined, these visual quality criteria result in a moderately high degree of viewer quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Viewshed 5 – George Washington Memorial Parkway (South), Looking West

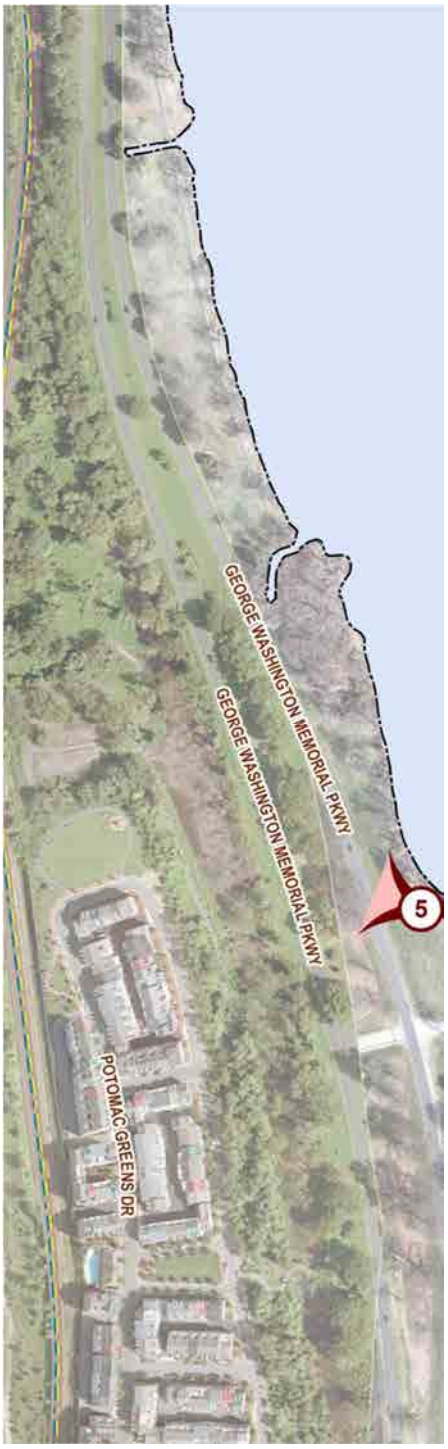
Impacts in Year 2016

Under the No Build Alternative in 2016, in Viewshed 5 looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, townhomes in Potomac Greens would remain partially visible. Vegetation and landscaping would continue to be characterized by mature trees, shrubs, and landscaped roadway edges (see **Figure 3-1**). By 2016, new trees (replacing those recently lost and therefore not part of the existing conditions) would be replanted west of the GWMP roadway to help visually screen the South Potomac Yard development. A trail through the wetlands would be present, but not visible. At this location, the natural landscape would maintain a moderately high degree of vividness due to the layered view of the roadway, landscape, and built elements; a moderately high degree of visual unity due to the vegetation that largely filters views of existing built elements; and a moderately high degree of intactness due to the encroachment of built elements on the periphery of the viewshed. Therefore, this viewshed would possess a moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative in 2040, looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, development in North and South Potomac Yard would be visible, along with the existing townhouses (See **Figure 3-1**). By 2040, the trees replaced west of the GWMP roadway would be mature, helping to screen the South Potomac Yard development. The filtered views of the North and South Potomac Yard development would alter the character of the viewshed. The vividness would be reduced to moderate due to the change in visual lines and forms; a moderate degree of visual unity due to the introduction of built elements into a primarily landscape viewshed; and a moderate degree of intactness due to the encroachment of built elements into the viewshed. Therefore, this viewshed would possess a moderate degree of visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Figure 3-1: No Build Viewshed 5 Visual Elements

View Location	Description/Focus
	From GWMP northbound shoulder, looking west toward existing substation.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

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

Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

Impacts in Year 2016

Under the No Build Alternative in 2016, looking west from the Mount Vernon Trail, views toward the project site would continue to be characterized by layers of vegetation framed by trees in the periphery. Development in South Potomac Yard would be obscured through existing vegetation and that of Potomac Yard Park. During the winter months, the visibility of Potomac Yard would be more pronounced, although trees would continue to filter views of the built elements. This viewshed would continue to have a high degree of vividness due to the layered view of natural features; a high degree of visual unity due to the repeated linear patterns of the vegetation; and a high degree of intactness due to consistent visual elements without interruption. Therefore, this viewshed would have a high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative in 2040, looking west from the Mount Vernon Trail, views toward the project site would continue to be characterized by layers of vegetation. Existing vegetation in GWMP and Potomac Yard Park would continue to obscure views of North and South Potomac Yard development, although the development height and density would increase as North Potomac Yard is completed. During the winter months, development in North and South Potomac Yard would be more visible. This viewshed would decline to have a moderately high degree of vividness due to the interruption of the natural features by the introduction of built elements, changing the existing line, form, and texture of the viewshed; a moderately high degree of visual unity due to the interruption of the linear patterns of the vegetation; and a moderately high degree of intactness due to the encroachment of built elements into the viewshed. Therefore, this viewshed would decline from a high degree to a moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

George Washington Memorial Parkway, Continuous Visual Corridor

Impacts in Year 2016

Under the No Build Alternative, a portion of the planned development along South Potomac Yard and Potomac Yard Park would occur by 2016. These changes would add built elements to the western portions of GWMP view corridor; the eastern portions of the view corridor would remain similar to existing conditions with intermittent views of the Potomac River, Washington, DC, and NPS facilities. The South Potomac Yard development would be more prominent during the winter months, although the trees would continue to provide a visual line along the roadway and to filter views of the built elements. Given the density of the existing vegetation along GWMP, the distance of the development from GWMP, and the presence of the Potomac Greens neighborhood between GWMP and much of the South Potomac Yard development, the overall character of curving roadway framed by vegetation would continue. This viewshed would maintain its very high degree of vividness due to the repeated pattern of vegetation to west and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east; a very high degree of visual unity due to the consistent integration of landscape elements within the view corridor; and a very high degree of intactness due limited encroachment of built elements into the viewshed. Therefore, the overall visual quality of the view would remain very high due to the highly consistent visual patterns throughout the view corridor. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the No Build Alternative, development along North and South Potomac Yard, and Potomac Yard Park would be largely complete, as well as redevelopment in Crystal City. These changes would introduce additional built elements to the western portions of GWMP view corridor, especially in the northern portion of the study area. The North and South Potomac Yard development and Crystal City redevelopment would be most prominent in areas where visual breaks occur, such as the on-ramps for the Airport Access Road and Four Mile Run; in other areas of the continuous view corridor, the built elements would be largely shielded from view by continuous vegetation. The eastern portions of the view corridor would remain similar to existing conditions with intermittent views of the Potomac River, Washington, DC, and NPS facilities. Despite the density of the existing vegetation along GWMP, it is anticipated that GWMP's overall character would change to that of a curving roadway framed by vegetation with intermittent views of built elements to one with more frequent views of buildings noticeable in the periphery of the viewshed, especially at breaks in vegetation and during winter months. However, the trees would continue to provide a visual line along the roadway during winter and to filter views of the built elements.

This viewshed would decline to a high degree of vividness due to the repeated pattern of vegetation to west with more visibility of North Potomac Yard development at visual breaks and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east; a high degree of visual unity due to the introduction of additional built elements along the periphery of the western portion of the view corridor; and a high degree of intactness due limited encroachment of built elements into the viewshed. Therefore, the quality of the viewshed would decline to a high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Potomac Greens

Viewshed 6 – Potomac Greens, Looking West

Impacts in Year 2016

Under the No Build Alternative in 2016, development in South Potomac Yard would add a visual horizontal layer of built forms to the existing viewshed west from Potomac Greens adjacent to the tracks (See **Figure 3-2**). In addition, Potomac Yard Park would add vegetation that would augment the existing vegetation in the background. The vividness of the viewshed would remain moderate, with the built and landscape elements remaining distinct elements. This viewshed would retain a moderate degree of visual unity due to the vegetation, built elements, and streets and sidewalks, all of which remain distinct visual elements. Encroachment of buildings within the background of the viewshed would diminish its intactness. Although the introduction of these elements would somewhat diminish the visual quality, the overall visual quality would remain moderate. Viewer response would be high, due to high viewer exposure and high viewer sensitivity.

Impacts in Year 2040

Under the No Build Alternative in 2040, the vegetation installed as part of Potomac Yard Park would be mature, providing a visual buffer to South Potomac Yard development from views west at Potomac Greens. The North Potomac Yard development, which is anticipated to be largely completed by 2040, would add buildings of up to 250 feet in height in the periphery of the viewshed to the layered horizontal views (See **Figure 3-2**). The vividness and unity of the viewshed would be reduced to moderately low levels, adding further distinct elements to the viewshed. Further encroachment of buildings in the middle ground of the viewshed would diminish its intactness. The introduction of these elements would diminish the visual quality to moderately low levels. Viewer response would remain high, due to high viewer exposure and high viewer sensitivity.

Viewshed 7 – Potomac Greens Park, Looking Northeast

Impacts in Year 2016

Under the No Build Alternative in 2016, the South Potomac Yard development would add a visual horizontal layer of built forms to the existing viewshed northwest from Potomac Greens Park, adjacent to the tracks (See **Figure 3-3**). Potomac Yard Park would add vegetation that would augment the existing vegetation in the background. The vividness and unity of the viewshed would remain moderate, with the built and landscape components remaining distinct elements. Encroachment of buildings within the background of the viewshed would diminish its intactness. Although the introduction of these elements would somewhat diminish the visual quality, the overall visual quality would remain moderate. Viewer response would be high, due to high viewer exposure and high viewer sensitivity

Impacts in Year 2040

Under the No Build Alternative in 2040, the vegetation installed as part of Potomac Yard Park would be mature, providing a visual buffer to views from Potomac Greens looking northwest towards development in South Potomac Yard (See **Figure 3-3**). The North Potomac Yard development, which is anticipated to be largely completed by 2040, would add buildings up to 250 feet in height to the layered horizontal views from Potomac Greens Park. The vividness and unity of the viewshed would be reduced to moderately low levels, adding further distinct elements to the viewshed. Further encroachment of buildings in the middle ground of the viewshed would diminish its intactness. The introduction of these elements would diminish the visual quality to moderately low levels. Viewer response would remain high, due to high viewer exposure and high viewer sensitivity.

Figure 3-2: No Build Viewshed 6 Visual Elements

View Location	Description/Focus
	From Potomac Greens North neighborhood looking west.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

Figure 3-3: No Build Viewshed 7 Visual Elements

View Location	Description/Focus
	From Potomac Greens Park looking northwest towards existing substation. **Existing Viewshed** **2016 Viewshed** **2040 Viewshed**

VISUAL QUALITY	Existing	2016	2040
No Build	Moderate	Moderate	Moderately Low

Potomac Yard

Viewshed 8 – North Potomac Yard

Impacts in Year 2016

Under the No Build Alternative, the completion of Potomac Yard Park would add a layer of vegetation that would augment the existing landscape of the site, providing more visual definition and reinforcing existing horizontal lines (See **Figure 3-4** and **Figure 3-5**). The viewshed would have a moderate degree of visual vividness due to the built and landscape components that combine in a more cohesive pattern; a moderate degree of visual unity due to the continuous lines of vegetation, built elements, and streets and sidewalks; and a moderate degree of intactness due to the visibility of built elements in the background, which would be filtered through the more mature landscape elements. Combined, these visual quality criteria would result in moderate visual quality. The viewer response would remain moderate due to the moderate length of viewer exposure and the moderate sensitivity of viewers.

Impacts in Year 2040

By 2040, development of North Potomac Yard would add additional built forms of up to 250 feet in height to the periphery of the viewshed from Potomac Yard, resulting in encroachment (See **Figure 3-4** and **Figure 3-5**). In addition, the Potomac Yard Park vegetation would mature, further augmenting existing vegetation and filtering views of nearby development. The completed Potomac Yard Park would reinforce horizontal visual lines. The viewshed would have a moderate degree of visual vividness due to the consistent lines and textures of the landscape components that are interrupted by built elements; a moderate degree of visual unity due to the diversity of the vegetative and built elements of the viewshed; and a moderate degree of intactness due to encroachment of built elements into the viewshed. Combined, these visual quality criteria would retain moderate visual quality. The viewer response would remain moderate.

Figure 3-4: No Build Viewshed 8, Looking Southeast Visual Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking southeast.

Existing Viewshed

2016 Viewshed

2040 Viewshed

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately Low	Moderate	Moderate

Figure 3-5: No Build Viewshed 8, Looking Northeast Visual Elements

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

VISUAL QUALITY	Existing	2016	2040
No Build	Moderately Low	Moderate	Moderate

3.2 Build Alternatives

This section describes the visual effects of each Build Alternative.

Figure 3-6 illustrates the nine selected viewpoints and their associated viewsheds for each Build Alternative. In addition, the continuous visual experience along GWMP is considered a viewshed. While the viewpoints remain the same for all three scenarios, the viewing direction for Viewshed 8 changes to look towards the project impact. The red triangles in the figure are indicators of direction, and are not intended to note the entire area of the viewshed.

3.2.1 Build Alternative A

Visual Elements of Build Alternative A

Build Alternative A would involve the construction a Metrorail station along and over existing Metrorail tracks. The new station would extend 740 feet along a north-south axis. Of this length, the roof line would extend approximately 130 feet each on the northern and southern ends; the remaining area between the two ends would serve as the platform. **Table 3-1** provides the heights of the Metrorail station elements. The roofs of the station ends would be approximately 49 feet in height. The platform area would be approximately 16.5 feet high. Pedestrian bridges would extend from each of the station ends, crossing west over the CSXT tracks to Potomac Yard. The elevated walkway would be 72 across the tracks, and the western entry points would vary between 39 feet and 36.5 feet in height, depending upon topography. The new Metrorail station would be located approximately 650 feet from GWMP; 47.5 feet from Potomac Greens; and 200 feet from Potomac Yard. The Potomac Yard Metrorail Station General Plans include elevation drawings that illustrate these measurements.

Table 3-1: Height of Metrorail Station by Element, Alternative A

Station Element	Height in Feet Above Average Finished Grade*
North Station Mezzanine	49
South Station Mezzanine	49
Platform Canopy	16.5
Pedestrian Bridge	45
North Pedestrian Entry	39
South Pedestrian Entry	36.5

*Average Finished Grade was calculated pursuant to the City of Alexandria zoning conditions

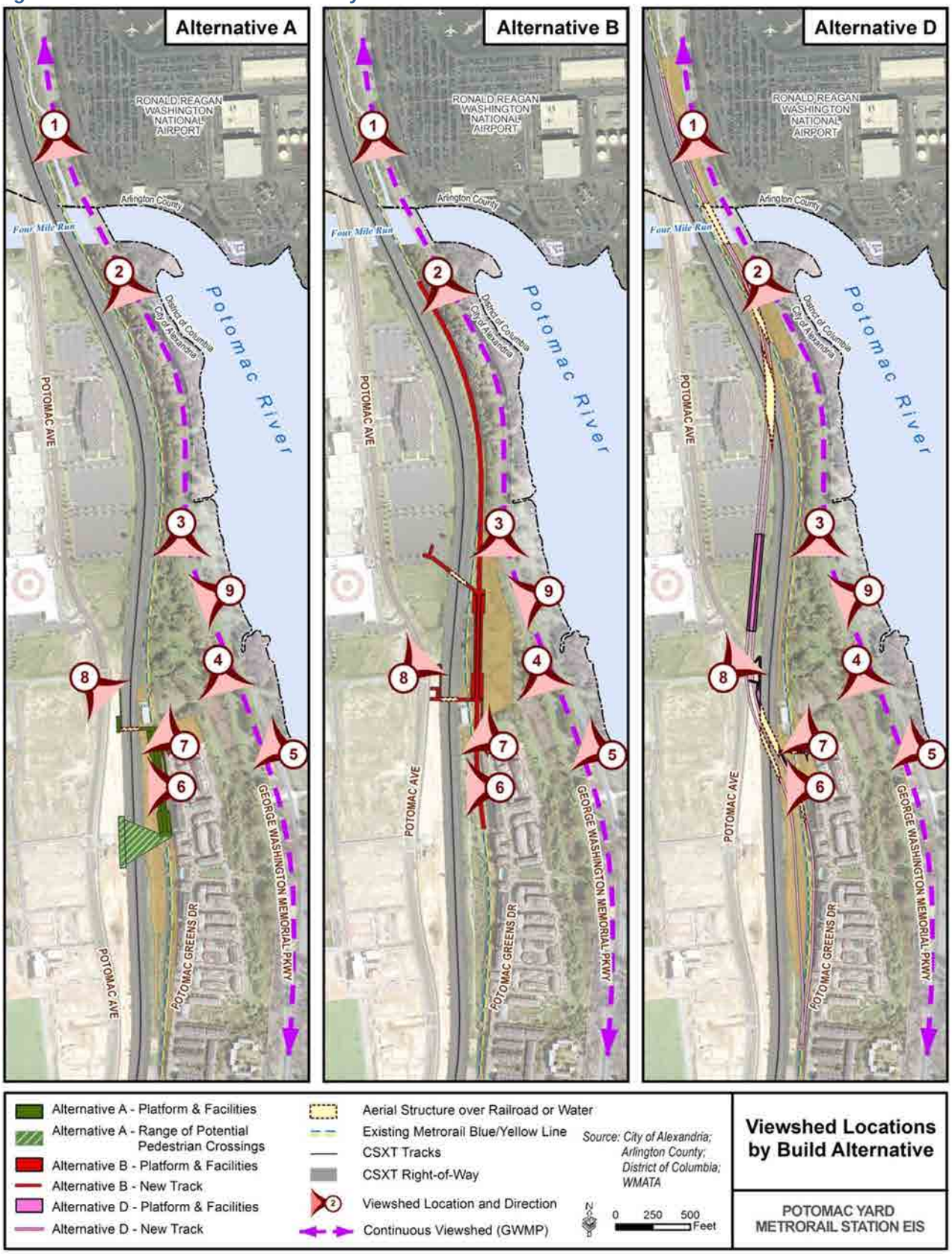
Build Alternative A would require the removal of the existing vegetation bordering the Metrorail tracks west of Potomac Greens due to the construction staging. As a result, Build Alternative A would eliminate this portion of the visual buffer for the CSXT tracks and the Potomac Yard Development. Build Alternative A could also remove many of the existing trees and fencing along the existing Metrorail tracks. Build Alternative A would temporarily remove the open space of Potomac Greens Park, as well as its gazebo, benches, and landscaping. Once completed, the project would re-establish Potomac Greens Park and install new landscaping and park amenities.

George Washington Memorial Parkway

From GWMP, several factors would affect the visual impacts of Build Alternative A. The factors include the height of existing and future buildings, as well as the angles of views resulting from changes in elevation and vantage points.

Of the northbound views identified in the *Vegetation CLR*, the two views northeast at Daingerfield Island, as described in Section 2.3.1, would not include the project area because the views face away from it. The view north from Slaters Lane to the Washington Monument would not include the project site primarily due to the road alignment, which veers slightly east and away from the project site. Additionally, as the trees along the parkway have matured, the plantings have encroached upon the view, further constricting the width of the view. These conditions would continue year-round.

Figure 3-6: Viewshed Locations by Build Alternative



The specific southbound views identified in the *Vegetation CLR* (Viewsheds 2 and 4), described in Section 2.1, would reach the edge of the project site. The existing vegetation of GWMP and wetlands (located north and east of Potomac Greens) would provide visual screening of the station and the views would not be directed at the project site. Along the southern end of the project site, existing vegetation and townhomes would shield the Metrorail station from view due to the distance and sightlines from the parkway to the proposed Metrorail station. The Potomac Greens Townhomes are approximately 40 feet in height. Given the angle of the line of sight, the townhomes would block the southern portion of the Metrorail station from view.

Along the northern portion of the project site, the Metrorail station would be taller than the existing trees and vegetation that lie between the station and the roadway. Because there are no townhomes or other built features near the northern portion of the Build Alternative A project site, the station facility would become a noticeable element from Viewshed 5 (see **Figure 3-7**).

Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative A in 2016, Viewshed 1 from GWMP north of Four Mile Run would be the same as described under the No Build Alternative. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, trees would continue to reinforce the visual lines of the roadway, retaining its character. At this location in 2016, the roadway and natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Impacts in Year 2040

Under Build Alternative A in 2040, Viewshed 1 from GWMP north of Four Mile Run would be the same as described under the No Build Alternative. Although development in North Potomac Yard would take place, views of the buildings would be largely shielded from view by vegetation. During winter months, vegetation would filter views of development west of the GWMP, although the trees would continue to reinforce the visual line of the roadway. At this location in 2040, the roadway and natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative A in 2016, Viewshed 2 from GWMP south of Four Mile Run would be the same as described under the No Build Alternative. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, the trees would maintain their tunnel-like form and continue to reinforce the visual lines of the roadway. At this location, the roadway and natural landscape would have a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would be considered high, due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative A in 2040, Viewshed 2 from GWMP south of Four Mile Run would be the same as described under the No Build Alternative. At this location in 2040, the roadway and natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 3 – George Washington Memorial Parkway (Middle), Looking South

Impacts in Year 2016

Under Build Alternative A in 2016, in Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island, the view south would be the same as described under the No Build Alternative. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, the trees would continue to reinforce the visual lines of the roadway. At this location, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative A in 2040, in Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island, the view south would be the same as described under the No Build Alternative. At this location, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Viewshed 4 – George Washington Memorial Parkway (South), Looking South

Impacts in Year 2016

Under Build Alternative A in 2016, in Viewshed 4 along GWMP near Daingerfield Island, views south would be the same as described under the No Build Alternative. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, the trees would continue to reinforce the visual lines of the roadway. This viewshed would continue to have a high degree of visual quality due to high degrees of vividness, intactness, and unity. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative A in 2040, in Viewshed 4 GWMP near Daingerfield Island, views south would be the same as described under the No Build Alternative. This viewshed would decline to have a moderately high degree of visual quality due to moderately high degrees of vividness, intactness, and unity. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Viewshed 5 – George Washington Memorial Parkway, Looking West (South)

Impacts in Year 2016

Under Build Alternative A in 2016, looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, the Metrorail station would be visible (see **Figure 3-7**). The structure would add a low horizontal line to the existing viewshed, similar to the low vegetation and roadway, with taller vegetation and townhomes on the periphery. By 2016, new trees (replacing those recently lost and therefore not part of the existing conditions) would be replanted west of the GWMP roadway, providing additional screening. At this location, the natural landscape would maintain a moderate degree of vividness due to the addition of new built elements into the viewshed, altering the existing visual pattern layers; a moderate degree of visual unity due to the interruption of the existing view with built elements; and a moderate degree of intactness due to the encroachment of built elements into the viewshed. Combined, these criteria would result in an overall decline in visual quality to moderate levels. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under the Build Alternative A in 2040, looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, the Metrorail station and development from North Potomac Yard would be visible, along with the existing townhouses (see Figure 3-7). By 2040, the trees replaced west of the GWMP roadway would be mature, helping to screen the South Potomac Yard development. The Metrorail structure would add a low horizontal line, while the Potomac Yard development would add taller built structures in the background. The vividness of the viewshed would diminish to moderately low due to the interruption of visual patterns by the presence of the Metrorail station and North Potomac Yard development, which would be filtered by maturing vegetation. The intactness would be reduced to moderately low levels due to the encroachment of Metrorail station elements and North Potomac Yard buildings within the viewshed. Unity would be reduced to moderately low levels by introducing layers of built elements into the existing landscape. Combined, the visual quality would be moderately low. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

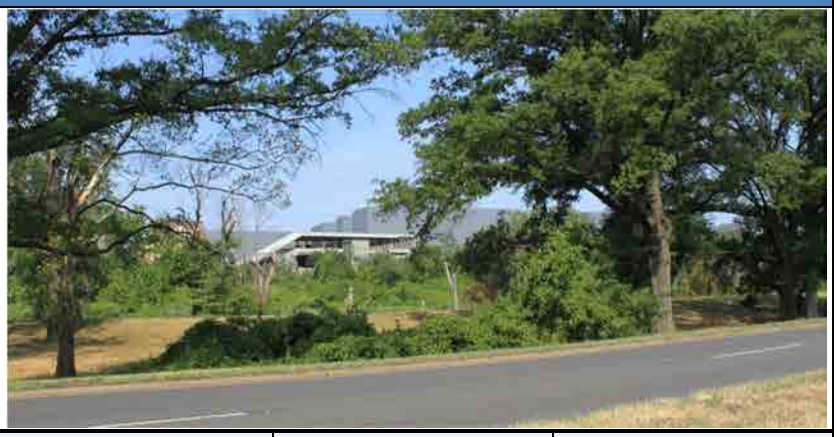
Figure 3-7: Alternative A Viewshed 5 Impacts

View Location	Description/Focus
	From the GWMP northbound shoulder, looking toward existing substation. Focus is on Build Alternative A's station elements and removal of at least two mature trees.

Existing Viewshed

2016 Viewshed

2040 Viewshed



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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

Impacts in Year 2016

Under Build Alternative A in 2016, the view looking west from the Mount Vernon Trail would be characterized by layers of vegetation framed by trees in the periphery. During the summer months, vegetation would block views of the Metrorail station, Potomac Greens townhouses, and development at South Potomac Yard. During the winter months, trees and vegetation would afford filtered views of these built elements. The Metrorail station would appear as a low horizontal structure, consistent with the existing horizontal lines of the viewshed. This viewshed would have a high degree of vividness due to the overall pattern of vegetation and horizontal lines; a moderately high degree of intactness due to the encroachment of the Metrorail into the existing viewshed; and a moderately high degree of unity as a result of a new built element that is of a scale similar to existing buildings into the landscape. Therefore, the overall visual quality of the viewshed would be moderately high. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative A in 2040, the view looking west from the Mount Vernon Trail would be similar to that described for Alternative A in 2016. This viewshed would have a moderately high degree of visual quality due to high degrees of vividness and moderately high degrees of intactness and unity as a result of the introduction of built elements into the visual patterns and the continuous vegetation. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

George Washington Memorial Parkway, Continuous Visual Corridor

Impacts in Year 2016

Upon construction, Alternative A would alter the existing character of the views from GWMP, of a curving roadway framed by vegetation with intermittent views of built elements to the west and views of the Potomac River, the Washington, DC, and NPS facilities to the east, through the introduction of new built elements and the removal of vegetation from areas west of GWMP. Although vegetation would be installed to help screen the Metrorail station from views along GWMP, it would not be mature enough to fully obscure views. These actions would change intermittent vistas of wetlands, rail transportation facilities, and buildings (including townhomes and commercial development) to the west. The Metrorail station and South Potomac Yard development would be more prominent during the winter months, although the trees would continue to provide a visual line along the roadway and to filter views of the built elements. The occasional breaks in vegetation that allow intermittent vistas of the Potomac River and NPS facilities (such as Daingerfield Island) along the eastern portion of the corridor would continue because the existing vegetation along the eastern side of GWMP would remain undisturbed. This viewshed would retain its very high degree of vividness due to the repeated pattern of vegetation to west and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east; a very high degree of visual unity due to the consistent integration of landscape elements within the view corridor; and a very high degree of intactness due to limited encroachment of built elements into the viewshed. Therefore, the visual quality of the parkway would remain very high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

In 2040, the overall character and the quality of views along GWMP would be similar to those in 2016, but would contain additional built elements within Potomac Yard, including buildings up to 250 feet in height. Additional development in Crystal City could also be visible in the northern portion of the study area along GWMP view corridor. Much of the new vegetation installed would be more mature and able to screen views from GWMP. The North and South Potomac Yard development and Crystal City redevelopment would be most prominent in areas where visual breaks occur, such as the on-ramps for the Airport Access Road and Four Mile Run; in other areas of the continuous view corridor, the built elements would be largely shielded from view by continuous vegetation. However, the trees would continue to provide a visual line along the roadway during winter and to filter views of the built elements. This viewshed would decline to a high degree of vividness due to the repeated pattern of vegetation to west with more visibility of the Metrorail station and North Potomac Yard development at visual breaks and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east; a high degree of visual unity due to the introduction of additional built elements along the periphery of the western

portion of the view corridor; and a high degree of intactness due limited encroachment of built elements into the viewshed. Therefore, the quality of the viewshed would decline to a high degree of visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Potomac Greens

Under Build Alternative A, the Potomac Yard Metrorail station would alter the existing views from Potomac Greens. The new station platform would introduce horizontal built elements above what is the existing rail track. The platform cover would be approximately 16.5 feet in height, similar to the second story of adjacent townhomes. The northern and southern portions of the stations, as well as the pedestrian bridges crossing the CSXT tracks to the west, would extend to 49 feet in height, taller than the existing townhomes. At its closest point, the Metrorail station would lie approximately 45 feet from the existing townhomes.

Build Alternative A would require the removal of the existing vegetation bordering the Metrorail tracks west of Potomac Greens eliminating this visual buffer screening the CSXT tracks and the Potomac Yard Development. The construction staging area would also include the existing Potomac Greens Park, removing the existing open area, trees, and fencing. Once completed, the project would re-establish the Potomac Greens Park and fencing, and install park features and new landscaping to restore the visual buffer removed for construction, where feasible.

Viewshed 6 – Potomac Greens, Looking West

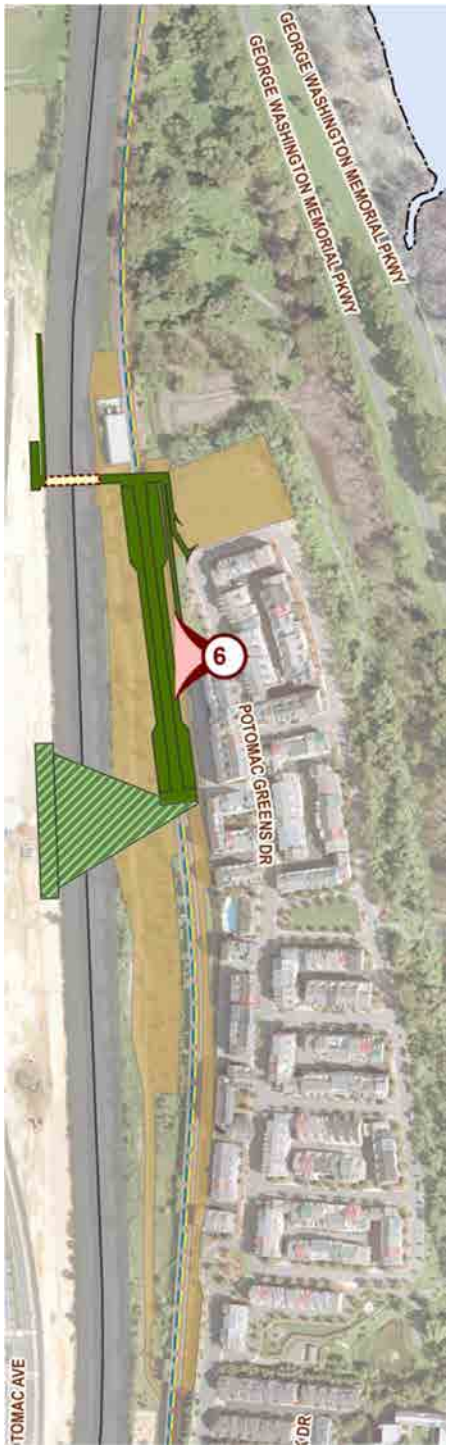
Impacts in Year 2016

Under Build Alternative A in 2016, from the townhomes of Potomac Greens looking west, the Potomac Yard Metrorail station would block views of the existing retaining wall and fencing, as well as the traction power substation beyond (see **Figure 3-8**). The station would alter the character of views from the townhomes from a relatively shallow view of low, predominantly transportation-related facilities, with some landscape elements, to an even shallower view of taller, designed structures. Construction of the station would remove and replace the existing vegetation, including small trees. The viewshed would have a moderately low degree of vividness due to the alteration of visual patterns by the introduction of the horizontal Metrorail station; a moderately low degree of intactness due to the further encroachment of Metrorail station; and a moderately low degree of unity due to the interruption of existing visual patterns by the Metrorail station. Overall, the visual quality would decline to moderately low. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Impacts in Year 2040

Under Build Alternative A in 2040, the character and quality of views from the Potomac Greens neighborhood would be altered by the greater presence of additional built features within Potomac Yard and replaced vegetation. Over time, the replacement vegetation would grow to screen portions of the station (see **Figure 3-8**). The vegetation at Potomac Greens Park would be restored to existing levels, which would help filter views of the station. The vividness of the viewshed would be reduced to moderately low levels due to the encroachment of Metrorail station and the further encroachment of Potomac Yard development, thereby reducing existing visual patterns. Unity would be reduced to moderately low levels due to the interruption of horizontal visual patterns by North Potomac Yard development. Intactness would also be reduced to moderately low levels due to the introduction of additional built elements within the viewshed. As a result, the visual quality of the viewshed would be moderately low, unchanged from the visual quality in 2016. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Figure 3-8: Alternative A Viewshed 6 Impacts

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. Focus is on the impacts of Build Alternative A station elements.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Viewshed 7 – Potomac Greens Park, Looking Northwest

Impacts in Year 2016

Under Build Alternative A in 2016, from Potomac Greens Park looking northwest, the Metrorail station would introduce the station into the existing layered view of horizontal elements, which includes park open space, fencing, and rail tracks as well as vegetation, park amenities, and a utility building (see **Figure 3-9**). The northern portion of the station, which is similar in height to the existing townhomes, would shorten views at the site as well as add a structure to the forefront (to the east) of the visible vegetation, establishing the prominence of the building. The existing vegetation, removed during construction, would be replaced. The viewshed would have a very low degree of visual vividness due to the dominance of the Metrorail station, which disrupts visual pattern; a very low degree of visual unity due to the disruption of the existing visual layers and vary in scale; and a very low degree of intactness due to encroachment of the dominant Metrorail station. Combined, these visual quality criteria would result in very low visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Impacts in Year 2040

Under Build Alternative A in 2040, the overall character and quality of the view from Potomac Green Park would be altered by the dominant presence of the Metrorail station, the greater presence of additional built features within Potomac Yard, including buildings up to 250 feet in height, and removed and replaced vegetation (see **Figure 3-9**). Over time, the replacement vegetation would grow to screen portions of the station. The vegetation at Potomac Greens Park would be restored to meet or exceed existing levels, which would help filter views of the station. Although the vegetation would be more mature, the viewshed would have a very low degree of visual vividness due to the dominance of the Metrorail station and the introduction of Potomac Yard development in the background, which disrupt visual pattern; a very low degree of visual unity due to the addition of elements that differ in scale; and a very low degree of intactness due to encroachment of the dominant Metrorail station and Potomac Yard development. Combined, these visual quality criteria would result in very low visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Figure 3-9: Alternative A Viewshed 7 Impacts

View Location	Description/Focus
	From Potomac Greens Park looking northwest towards existing substation. Focus is on the impacts of Build Alternative A station elements.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Potomac Yard

Under Build Alternative A, the Potomac Yard Metrorail station would alter the visual character of the views to the east from Potomac Yard. The elevation of Potomac Yard is similar to that of Potomac Greens and the grade level at the Metrorail station. As such, the platform of the station would appear to be approximately 16.5 feet in height and the northern and southern portions of the station would be approximately 52 feet in height. The pedestrian bridges, both of which are 45 feet in height, would extend from the station across the CSXT tracks to Potomac Yard, where the northern entrance would be 39 feet in height.

Viewshed 8 – North Potomac Yard

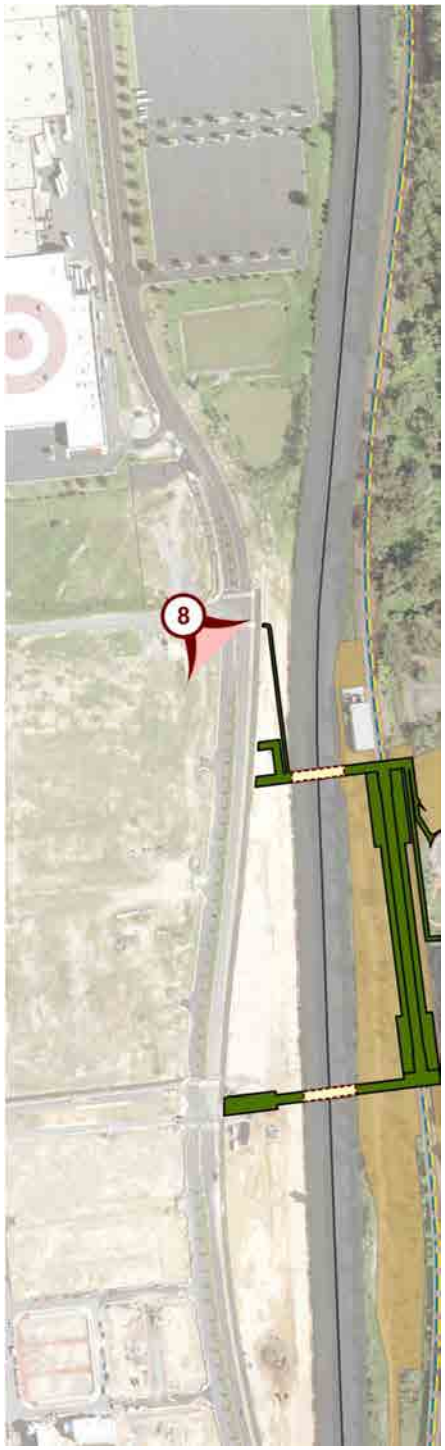
Impacts in Year 2016

Build Alternative A in 2016 would alter views to the southeast from Potomac Yard that are currently characterized by landscape elements with development in the background (see **Figure 3-10**). Under Build Alternative A, the pedestrian bridge and station entrance would introduce new vertical elements into the foreground of the viewshed. The station's platform would also be visible, but would be horizontal in character. The trees and overgrown vegetation along the Metrorail tracks that currently provide a visual barrier from Potomac Yard to Potomac Greens and the Metrorail tracks would be removed as part of the construction staging process, although Potomac Yard Park landscape would also serve to filter views of Potomac Greens. Existing vegetation that lines the eastern portion of Potomac Yard along the fence with the CSXT right-of-way will be replaced by the Potomac Yard Park landscape plantings by 2016 and would remain under Build Alternative A. The CSXT tracks and fence would remain also. The viewshed would have a moderately low degree of visual vividness due to the addition of tall built elements that alter the horizontal line of the viewshed; a moderately low degree of visual unity due to additional diversity of the visual pattern; and a moderately low degree of intactness due to the encroachment of built elements into foreground, which would be filtered through the more mature landscape elements. As a result, the visual quality would be moderately low. The viewer response would remain moderate due to moderate viewer exposure and moderate viewer sensitivity.

Impacts in Year 2040

Under Build Alternative A in 2040, views to the southeast from Potomac Yard would be characterized by the prominent pedestrian bridge (see **Figure 3-10**). Mature vegetation in Potomac Yard Park would partially obscure views of the bridge. In the background, buildings of up to 250 feet in height, landscaping through the implementation of mixed-use development at Potomac Yard would be visible in the periphery. The viewshed would have a moderately low degree of visual vividness due to the maturation of trees screening the Metrorail station and the introduction of North Potomac Yard at the periphery of the viewshed, further disrupting visual patterns; a moderately low degree of visual unity due to additional diversity of the visual pattern through North Potomac Yard development; and a moderately low degree of intactness due to the encroachment of built elements into the periphery and the filtered views of the Metrorail station through more mature landscape elements. As a result, the visual quality would be moderately low. The viewer response would remain moderate due to moderate viewer exposure and moderate viewer sensitivity.

Figure 3-10: Alternative A Viewshed 8 Impacts

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking southeast. Focus is on the impact of the station elements.

Existing Viewshed

2016 Viewshed

2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

3.2.2 Build Alternative B

Build Alternative B would construct a Metrorail station near the existing Metrorail tracks, shifting the track alignment approximately 500 to 1000 yards east. The station would be located along tracks in Potomac Greens Park. The new station would span approximately 745 feet along a north-south axis. Like Build Alternative A, the roof line would extend approximately 140 feet on the northern and southern ends; the remaining area between the two ends would serve as the platform. **Table 3-2** provides the heights of the Metrorail station elements. The roof line would be approximately 56 feet in height from the track level. The platform area would be approximately 17.5 feet high. Two pedestrian bridges would extend across the CSXT right-of-way to Potomac Yard. The western entry points of the elevated walkway would vary between 37 feet and 34 feet in height, depending upon topography. The new Metrorail station would be located approximately 150 feet from GWMP at the northern mezzanine and 425 feet from GWMP at the southern mezzanine, depending upon the exact measurement point; approximately 350 feet from Potomac Greens; and approximately 200 feet from Potomac Yard. A retaining wall approximately 17 feet in height (28 MSL) would run along GWMP in order to support the Metrorail station structure. The Potomac Yard Metrorail Station General Plans include elevation drawings that illustrate these measurements.

Table 3-2: Height of Metrorail Station by Element, Alternative B

Station Element	Height in Feet
	Above Existing Grade Level*
North Station Mezzanine	56
South Station Mezzanine	56
Platform Canopy	17.5
Pedestrian Bridge	43
North Pedestrian Entry	37
South Pedestrian Entry	34

*Average Finished Grade was calculated pursuant to the City of Alexandria zoning conditions

Build Alternative B would remove existing vegetation west of the CSXT right-of-way near Potomac Yard and existing vegetation along GWMP in an area with federally-recognized wetlands. Once completed, the wetlands would be restored to the extent possible. Access to the construction site would be provided from the parkway. Additional construction staging for the pedestrian bridges would take place west of the CSXT right-of-way at Potomac Yard. Potomac Greens Park and Potomac Yard Park would also be restored to the extent possible.

George Washington Memorial Parkway

Of the northbound views identified in the *Vegetation CLR*, the views northeast at Daingerfield Island would not include the project area because the views face away from it under Build Alternative B. The view north from Slaters Lane to the Washington Monument would not include the project site primarily due to the road alignment and the encroachment of mature trees.

Views south of the large willow oaks would occur south and west of the project site and would therefore not be affected under Build Alternative B. The view south to Daingerfield Island would come to the edge of the project site. Build Alternative B would add built elements and remove trees in an area that makes up the western periphery of the southbound view of Daingerfield Island. Although the project site is proximate to this view, the station structures would lie to the northwest of the view corridor, limiting the potential impact. The trees that line this view along the parkway on the west would obscure the construction activity.

The project area under Build Alternative B would be visible in the continuous north and south view corridor of GWMP. The north and south mezzanine structures would be prominent in Viewshed 3 due to the higher elevation of the project site in comparison to GWMP traffic lanes. The pedestrian bridges would also introduce wide built elements to the view corridor. Because the vegetation would be removed as part of the construction staging, the existing vegetation would not provide a visual buffer to the station. Instead, trees near the roadway would be replaced. At this time, plans are uncertain whether the sparse trees within the wetland would be replaced. Depending upon the wetland mitigation and restoration required, trees replaced within the wetland could also offer some screening. The occasional breaks in vegetation that allow intermittent vistas of the Potomac River and NPS facilities (such as Daingerfield Island) along the eastern portion of the corridor would continue.

Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative B in 2016, the view from GWMP north of Four Mile Run would be the same as described under the No Build Alternative, characterized by a tree-lined roadway with a break in vegetation visible at Four Mile Run, open sky, opposing traffic, and a W-beam guardrail. The existing Metrorail tracks would remain partially visible during the winter months, when foliage is diminished. However, the trees would continue to reinforce the visual lines of the roadway. At this location in 2016, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Impacts in Year 2040

Under Build Alternative B in 2040, the view from GWMP north of Four Mile Run would be the same as described under the No Build Alternative, characterized by a tree-lined roadway with a break in vegetation visible at Four Mile Run, open sky, opposing traffic, and a W-beam guardrail. Although development in North Potomac Yard would take place independent of the project, views of the buildings would be largely shielded from view by vegetation. At this location, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative B in 2016, the view from GWMP south of Four Mile Run would be the same as described under the No Build Alternative, largely characterized by a tree-lined roadway with intermittent breaks in vegetation. Open sky, opposing traffic, the W-beam guardrail, and the tunnel-like form of the trees would also continue to contribute to the visual character of the viewshed. The existing Metrorail tracks would remain partially visible during winter, when foliage is diminished. At this location, the natural landscape would have a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would be considered high, due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative B in 2040, Viewshed 2 from GWMP south of Four Mile Run would be the same as described under the No Build Alternative, characterized by a tree-lined roadway with intermittent breaks in vegetation, as well as open sky, opposing traffic, the W-beam guardrail, and the tunnel-like form of the trees in 2040. Although development in Potomac Yard would take place, views of the buildings would be largely shielded from view by vegetation. At this location in 2040, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. Viewer response would continue to be high.

Viewshed 3 – George Washington Memorial Parkway (Middle), Looking South

Impacts in Year 2016

Under Build Alternative B in 2016, the view south from Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island would be altered (see **Figure 3-11**). Alternative B would introduce two breaks in the continuous vegetation of the view corridor as a result of the removal and replacement of vegetation to accommodate the vehicular access to the GWMP during construction. In addition to a curved roadway framed by vegetation, the visual breaks would allow intermittent views of the Metrorail station and existing buildings. During winter months, when foliage is diminished, the Metrorail station and existing buildings would be more visible along the periphery of the viewshed. In areas where visual breaks do not occur, the trees would continue to appear as a solid form along the view corridor during the winter, reinforcing the visual lines of much of the roadway. At this location, the natural landscape would possess a moderate degree of vividness due to a reduction in consistency of the visual line and pattern of vegetation; a moderate degree of intactness due to the encroachment of built elements into the viewshed; and a moderate degree of unity due to the disruption of the landscape. Combined, these visual criteria would result in a moderate degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative B in 2040, the view south from Viewshed 3 along GWMP between Four Mile Run and Daingerfield Island would be of a curved roadway framed by vegetation with intermittent views of the Metrorail station and of North Potomac Yard development along the periphery (see **Figure 3-11**). At this location, the natural landscape would be somewhat disrupted by the portion of vegetation made up of maturing trees, largely blocking views of the Metrorail station and North Potomac Yard development. During winter months, the mature vegetation would filter views of the Metrorail station and North Potomac Yard development. As a result, the viewshed would possess a moderately high degree of vividness due to the breaks in the vegetative visual pattern; a moderately high degree of visual unity due to the distinctness of the built and landscape elements; and moderately high intactness as a result of the encroachment of built elements. Combined, these visual criteria would result in a moderately high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Viewshed 4 – George Washington Memorial Parkway (South), Looking South

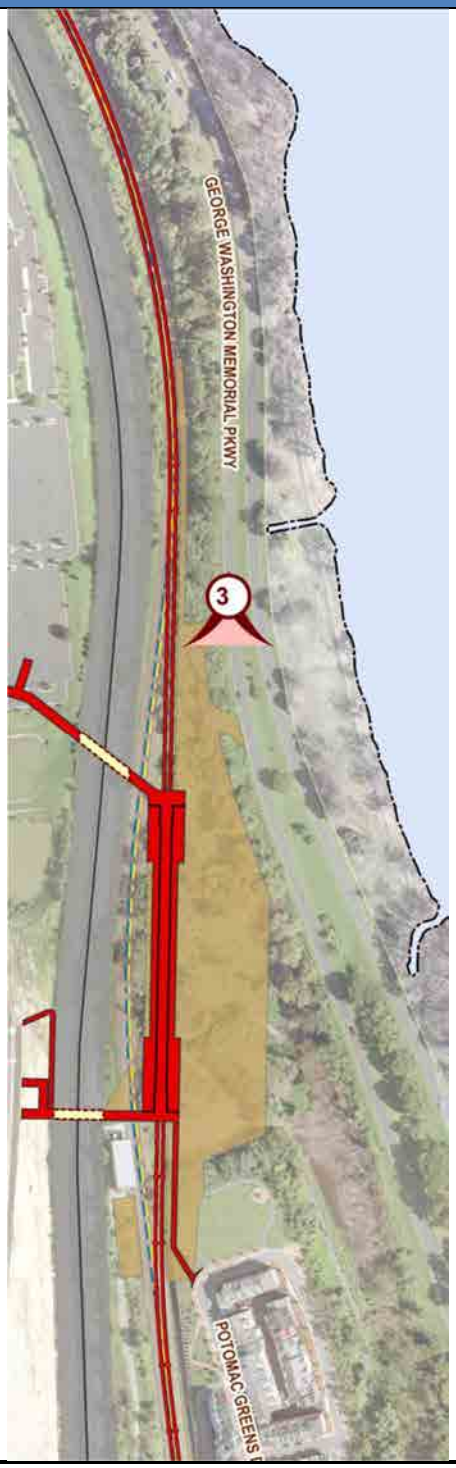
Impacts in Year 2016

Under Build Alternative B in 2016, in the view south from Viewshed 4 along GWMP near Daingerfield Island, views would be of a roadway lined with inconsistent vegetation due to the removal and replacement of vegetation during construction of the Metrorail station. The townhomes in Potomac Greens and the Metrorail station would be minimally visible along the periphery of the view corridor. During the winter months, dormant vegetation would filter views of the townhomes and Metrorail station. Development at South Potomac Yard would also be visible during the winter months. This viewshed would have a moderately high degree of vividness due to the disruption of the visual pattern of vegetation; a moderately high degree of intactness due to the encroachment of built elements at the periphery of the viewshed; and a moderately high degree of unity due to the continued vegetated landscape interrupted by built elements along the periphery. As a result, the visual quality would be moderately high. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative B in 2040, the view south from Viewshed 4 along GWMP near Daingerfield Island would be of a roadway consistently lined with vegetation. Due to the maturity of replaced vegetation by 2040, trees and bushes would largely block views of the townhomes in Potomac Greens, the Metrorail station, and South Potomac Yard development, During the winter months, these built elements would be visible along the periphery of the viewshed due to the varying nature of vegetation within the viewshed, but would not become a focal point. As a result, this viewshed would have a high degree of vividness due to the continuing pattern of vegetation; a moderately high degree of intactness due to the encroachment of built elements, most notably during the winter months; and a moderately high degree of unity due to the intrusion of built elements within the landscape form. The visual quality would be moderately high. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Figure 3-11: Alternative B Viewshed 3 Impacts

View Location	Description/Focus
	From southbound GWMP looking south. Focus is on the impacts of Build Alternative B's station with the removal of existing trees.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Viewshed 5 – George Washington Memorial Parkway (South), Looking West

Impacts in Year 2016

Under Build Alternative B in 2016, in Viewshed 5 looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, townhomes in Potomac Greens would remain partially visible and the Metrorail station would be obscured by vegetation. Vegetation and landscaping would continue to be characterized by mature trees, shrubs, and landscaped roadway edges. By 2016, new trees (replacing those recently lost and therefore not part of the existing conditions) would be replanted west of the GWMP roadway, providing additional screening. During the winter months, the Metrorail station would be partially visible at the periphery of the viewshed, with trees filtering views. The vividness would continue to be moderately high due to the overall maintained visual pattern of landscape elements; a moderately high degree of visual unity due to the maintained layers of vegetation; and a moderate degree of intactness due to the encroachment of built elements into the viewshed. Therefore, the visual quality would continue to be moderately high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative B in 2040, looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail, the Metrorail station and development from North Potomac Yard would be visible, along with the existing townhouses (see **Figure 3-12**). By 2040, the trees replaced west of the GWMP roadway would be mature, helping to screen the South Potomac Yard development. The vividness of the viewshed would be moderate due to the interruption of visual patterns by the presence of the Metrorail station and North Potomac Yard development. The intactness would be at moderate levels due to the filtered encroachment of Metrorail station elements and North Potomac Yard buildings within the viewshed. Unity would be decline to moderate levels by introducing noticeable built elements into the existing landscape. Combined, these criteria would result in a decline to an overall moderate visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

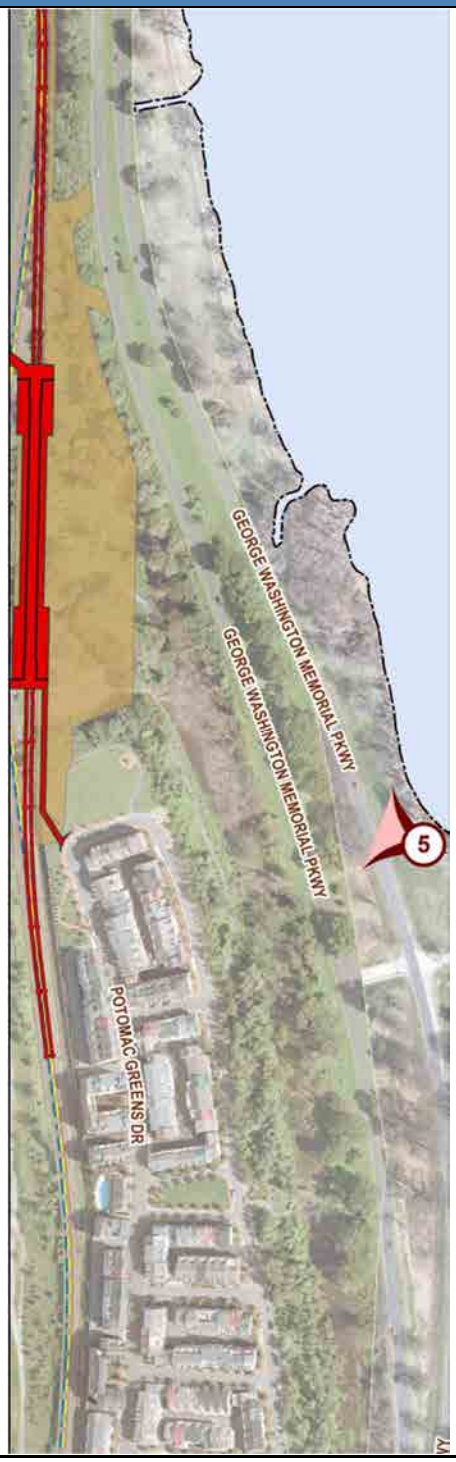
Impacts in Year 2016

Under Build Alternative B in 2016, Viewshed 9 looking west toward the project site from the Mount Vernon Trail would be characterized by layers of vegetation framed by trees in the periphery, blocking views of the Metrorail station. During the winter months, views of the Metrorail station and South Potomac Yard would be filtered by trees and vegetation. This viewshed would continue to have a high degree of vividness due to the layered view of natural features and minimal visibility of built elements; a moderately high degree of visual unity due to the repeated linear patterns of the vegetation with minimal visibility of built elements; and a moderately high degree of intactness due to the encroachment of built elements. Therefore, this viewshed would have a moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative B in 2040, Viewshed 9 looking west toward the project site from the Mount Vernon Trail would be characterized by layers of vegetation framed by trees in the periphery, blocking views of the Metrorail station and South Potomac Yard development; North Potomac Yard development would be visible above the trees. During the winter months, views of the Metrorail station and South Potomac Yard would be filtered by trees and vegetation. This viewshed would decline to have a moderately high degree of vividness due to the interruption of the natural features by the introduction of built elements, changing the existing line, form, and texture of the viewshed; a moderately high degree of visual unity due to the interruption of the linear patterns of the vegetation; and a moderately high degree of intactness due to the encroachment of built elements into the viewshed. Therefore, this viewshed would possess a moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Figure 3-12: Alternative B Viewshed 5 Impacts

View Location	Description/Focus
	From the GWMP northbound shoulder looking toward existing substation. Focus is on Build Alternative B's station elements with removal of trees.
	Existing Viewshed
	2016 Viewshed
	2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

George Washington Memorial Parkway, Continuous Visual Corridor

Impacts in Year 2016

Under Build Alternative B in 2016, the character of GWMP viewshed would be changed from a consistent divided four-lane roadway framed by vegetation, with intermittent views of rail transportation and built elements to the west and river to the east, to that of a roadway framed by vegetation but more frequently interrupted with views of transportation and built elements. Alternative B would add two new breaks in vegetation at the location of the temporary construction access to the project site from the southbound GWMP roadway, where existing vegetation would be replaced by less mature trees and bushes. The vividness of the continuous view corridor would remain very high due to the overall repeated pattern of vegetation to west and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east. Encroachment of built elements into the viewshed would lower the level of intactness to high, while visual unity would decline to a high level due to the consistent integration of landscape elements within the view corridor with limited views of built elements to the west. Combined, the visual quality of the continuous view corridor would be high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

In 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 North and South Potomac Yard would be visible, along with Crystal City redevelopment in the northern portion of the study area. Over time, the restored vegetation would grow to filter views of the Metrorail station from the GWMP roadway. It is unlikely that trees would reach a height and depth that would consistently block views of the station, although they would serve to screen views of the station. Built elements, including the Metrorail station, would be partially visible during the winter months, when foliage is diminished. However, the trees would continue to reinforce the visual lines of the roadway. The vividness of the continuous view corridor would be very high, maintaining overall repeated patterns of vegetation and noteworthy views to the east. The overall intactness would be high, with consistent vegetation throughout much of the view corridor, allowing filtered views of new built elements. Visual unity would diminish to a high level, with consistent patterns of vegetation; the visual breaks created during project construction would diminish as vegetation matured by 2040. Combined, the visual quality of the continuous view corridor would be high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Potomac Greens

Viewshed 6 – Potomac Greens, Looking West

Impacts in Year 2016

Under Build Alternative B in 2016, views west from Potomac Greens would be the same as described under the No Build Alternative. The vividness and unity of the viewshed would remain moderate, with the built and landscape components remaining distinct elements. Encroachment of buildings within the background of the viewshed would diminish its intactness and unity. Although the introduction of these elements would somewhat diminish the visual quality, the overall visual quality would remain moderate. Viewer response would be high, due to high viewer exposure and high viewer sensitivity.

Impacts in Year 2040

Under Build Alternative B in 2040, views west from Potomac Greens would be the same as described under the No Build Alternative. The vividness and unity of the viewshed would decline to moderately low levels as a result of further encroachment by the planned buildings in North Potomac Yard (unrelated to the project), and the built and landscape components remaining distinct elements. Encroachment of buildings within the background of the viewshed would diminish its intactness. Therefore, the overall visual quality would decrease to moderately low. Viewer response would be high, due to high viewer exposure and high viewer sensitivity.

Viewshed 7 – Potomac Greens Park, Looking Northwest

Impacts in Year 2016

Under Build Alternative B in 2016, the Metrorail station would alter the character of views from Potomac Greens Park from a relatively shallow view of low, predominantly transportation facilities, with some landscape elements, to a view of taller, more prominent designed built forms (see **Figure 3-13**). Construction of the station would remove the existing vegetation, including trees that currently provide a visual buffer to the CSXT tracks and the Potomac Yard from the Potomac Greens Park. Because some of the existing trees that serve as a visual buffer are within the wetlands, many of these trees would not be replaced. It is anticipated that any trees replaced would aid in the restoration of the visual buffer. The vividness of the viewshed would decline to moderately low levels, with the built components altering the scale and pattern. The prominence and scale of the built elements would diminish the unity of the viewshed to a moderately low level. Encroachment of built elements within the viewshed would diminish its intactness to a moderately low level. As a result, the overall visual quality would change to moderately low. Viewer response would be high, due to high viewer exposure and high viewer sensitivity.

Impacts in Year 2040

Under Build Alternative B in 2040, the views northwest from Potomac Greens Park would be very similar to those in 2016, although additional buildings would be visible in the background (see **Figure 3-13**). However, the Metrorail ramp and facilities would continue to block much of the development. Vegetation within Potomac Greens Park would mature, providing a filter to the built elements. As a result of the development at Potomac Yard and the Metrorail station, the vividness would be reduced to moderately low levels due to the change in visual lines and form. The prominence and scale of the built elements would diminish the unity of the viewshed to a low level. Encroachment of both Metrorail and North Potomac Yard built elements within the background of the viewshed would diminish its intactness to a low level. Therefore, visual quality would be considered low. Viewer response would be high, due to high viewer exposure and high viewer sensitivity.

Potomac Yard

Viewshed 8 – North Potomac Yard

Impacts in Year 2016

Build Alternative B would alter views northeast and southeast from Potomac Yard in Viewshed 8 that are currently characterized by sparse vegetation in the foreground and series of horizontal transportation structures and landscape elements in the background. Under Build Alternative B, the pedestrian bridges and station entrances would introduce vertical elements into the viewshed (see **Figure 3-14**). The station's platform would also be visible, but would maintain a relatively low horizontal character. Additional vegetation would be installed as part of Potomac Yard Park, filtering portions of the Metrorail station. The viewshed would have a moderately low degree of visual vividness due to the addition of built elements that alter the form and texture of the viewshed; a moderately low degree of visual unity due to a decline in the continuity of the visual pattern; and a moderately low degree of intactness due to the encroachment of built elements, which would be filtered through the more mature landscape elements. As a result, there would be an overall decline to moderately low visual quality. Viewer response would be moderate, due to moderate viewer exposure and moderate viewer sensitivity.

Impacts in Year 2040

In 2040, the overall character of the quality of views from Potomac Yard would continue to be altered by the Metrorail station and additional built features and landscaping through the implementation of mixed-use develop at North Potomac Yard, which would be visible at the periphery of the view. The vegetation of Potomac Yard Park would also have matured, filtering views of the Metrorail station (see **Figure 3-14**). The viewshed would have a moderately low degree of visual vividness due to the maturation of trees screening the Metrorail station and the introduction of North Potomac Yard at the periphery of the viewshed, further disrupting visual patterns; a moderately low degree of visual unity due to additional diversity of the visual pattern through North Potomac Yard development; and a moderately low degree of intactness due to the encroachment of built elements into the periphery and the filtered views of the Metrorail station through more mature landscape elements. As a result, the visual quality would be moderately low. Viewer response would be moderate, due to moderate viewer exposure and moderate viewer sensitivity.

Figure 3-13: Alternative B Viewshed 7 Impacts

View Location	Description/Focus
	From Potomac Greens park looking northwest towards existing substation. Focus is on the impacts of Build Alternative B's station elements.

Existing Viewshed

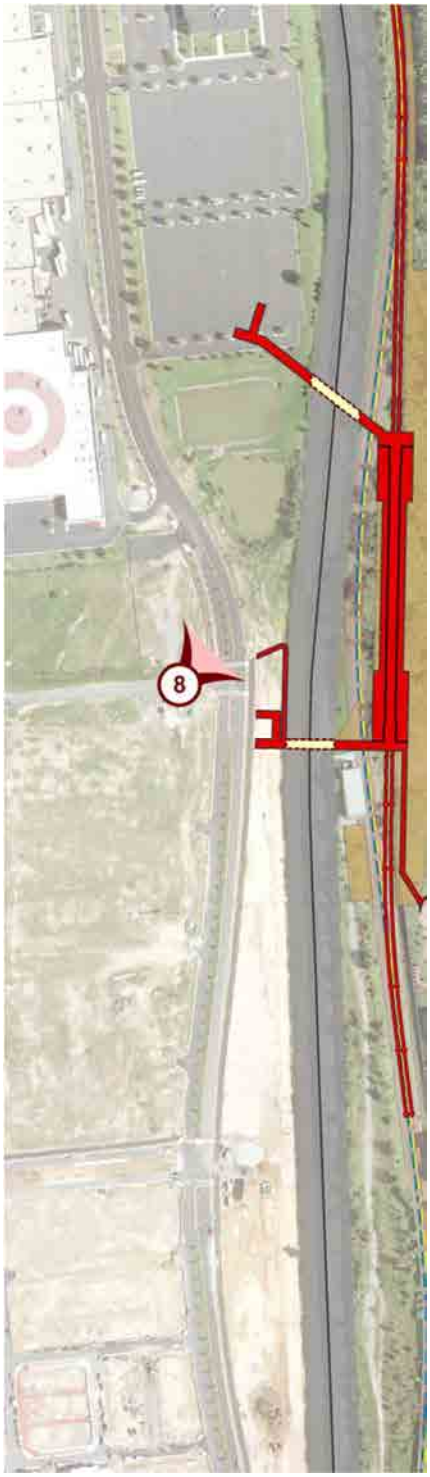
2016 Viewshed

2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Figure 3-14: Alternative B Viewshed 8 Impacts

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast. Focus is on the impact of the station elements.

Existing Viewshed

2016 Viewshed

2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

3.2.3 Build Alternative D

Build Alternative D would introduce a Metrorail station west of the CSXT right-of-way, over what is currently a stormwater pond and west of the existing Target store. The Metrorail tracks would cross over the CSXT right-of-way using two aerial bridges to the north and south of the station, and would include a new structure over Four Mile Run in the northern portion of the study area.

The Build Alternative D Metrorail station would be elevated, with the platform approximately 22 feet above the station entrance. **Table 3-3** provides the heights of the Metrorail station elements. The roof would be approximately 50 feet in height, and would run the length of the station. A pedestrian bridge with one or two access points from the east would extend across the CSXT tracks to Potomac Greens. At its closest point, the new Metrorail station would be located approximately 325 feet from the roadway of GWMP, depending upon the exact measurement point, while the Metrorail station would be located approximately 625 feet from Potomac Greens. The Potomac Yard Metrorail Station General Plans include elevation drawings that illustrate these measurements.

West of the townhomes at Potomac Greens, the trackway would begin to rise 39 feet from the existing track elevation to the Metrorail station over a distance of approximately 2,500 feet. From the Metrorail station, the track would descend approximately 35.5 feet north to join the existing track north of Four Mile Run; the crossing would be elevated approximately 20 feet higher than the existing track. As part of this alignment, approximately 1,200 feet of this track would be shifted east into GWMP.

Construction staging for Build Alternative D would take place along the Metrorail tracks, within Potomac Yard, and along GWMP, where staging would occur along the roadway north and south of Four Mile Run. Construction staging would remove the existing vegetation in these areas, affecting the long-term visual resources.

Table 3-3: Height of Metrorail Station by Element, Alternative D

Station Element	Height in Feet Above Existing Grade Level
North Station Mezzanine	50
South Station Mezzanine	50
Platform Canopy	n/a
Pedestrian Bridge	TBD
North Pedestrian Entry	37
South Pedestrian Entry	34
Aerial Track at Four Mile Run	20
Aerial Track at Potomac Greens	31

George Washington Memorial Parkway

Of the northbound views identified in the *Vegetation CLR*, the two views northeast at Daingerfield Island (in the vicinity of Viewsheds 4 and 5) would not include the project area because the views face away from it. The view north from Slaters Lane to the Washington Monument (identified as the view from King Street in the *Vegetation CLR*) would not include the project site primarily due to the road alignment, which veers slightly east and away from the project site. Additionally, as the trees along the parkway have matured, the plantings have encroached upon the view, further constricting the width of the view. These conditions would continue year-round.

One of the two specific southbound views, identified in the *Vegetation CLR,* the view south toward Daingerfield Island near Four Mile Run, would reach the edge of the project site at the periphery of Viewshed 2 (see **Figure 3-16**). Build Alternative D would include an elevated Metrorail station, which would introduce the elevated tracks to the existing viewshed. Additionally, Build Alternative D would remove and replace existing vegetation through the construction staging process, making the tracks more visible for opening year 2016. Due to its location north and west of the viewshed, Build Alternative D would not alter the other view south (at Daingerfield Island to large willow oaks) identified in the *Vegetation CLR*.

Build Alternative D would introduce built elements into the edges of the continuous view of the GWMP corridor. Vegetation would filter views of the elevated track and Metrorail station, especially during summer months, along much of the view corridor. In the area around Four Mile Run, the track would be more prominent in Viewshed 1 because the tracks would shift from their current location closer to GWMP by approximately 50 feet and

construction staging would remove vegetation, which would be replaced where feasible (see **Figure 3-16**). In addition, the track and bridge structure at the Four Mile Run crossing would be elevated up to 20 feet above the existing track. In comparison to Build Alternative A and Build Alternative B, built elements would be visible over a more extended section of the view corridor due not only to the presence of the Metrorail station, but also to the elevated tracks.

Viewshed 1 – George Washington Memorial Parkway (North), North of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative D in 2016, the view along Viewshed 1 from GWMP north of Four Mile Run looking south would be of a roadway with views of elevated tracks visible through large breaks in vegetation (See **Figure 3-15**). The open sky, oncoming traffic, and W-beam railing would also continue to characterize this view. As a result, the view would appear inconsistent, with distinct built and vegetative elements. During the winter months, built elements west of the GWMP would be more visible. The vividness would be low due to the change in form and line caused by the elevated tracks. The intactness would be low due to encroachment of the tracks and the inconsistent vegetation in the viewshed, while the unity would be low due to the diversity of the landscape and built elements. Overall, Build Alternative D would result in low visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, the view from GWMP north of Four Mile Run looking south would be of a curving roadway lined, in part, by vegetation; breaks in vegetation would allow views of elevated tracks. The open sky, oncoming traffic, and W-beam railing would also continue to characterize this view (See **Figure 3-15**). During the winter months, built elements west of the GWMP, including the Metrorail track, CSX track, and North Potomac Yard development, would be more visible. The viewshed would have a moderate degree of vividness due to the varied continuity of the form and line of vegetation and built elements. The unity would be moderate due to the level of continuity and scale of the vegetation and built elements. The encroachment of the elevated track would result in moderate intactness. Combined, these visual quality criteria would result in moderate visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Viewshed 2 – George Washington Memorial Parkway (North), South of Four Mile Run, Looking Southeast

Impacts in Year 2016

Under Build Alternative D in 2016, the view along Viewshed 2 along GWMP south of Four Mile Run looking south would be of a curving roadway with views of elevated tracks and large gaps in vegetation. The open sky, oncoming traffic, and W-beam railing would also continue to characterize this view (see **Figure 3-16**). During the winter months, built elements west of the GWMP, including the Metrorail track and CSXT track, would be more visible, although trees would help provide a consistent visual line. Vividness would decline to low levels due to the interruption of the visual pattern from the removal of vegetation and visibility of the elevated track. Unity would decline to moderately low levels due to interruption of the vegetation with less mature trees and bushes and the introduction of the Metrorail tracks into the viewshed. Intactness would be low due to inconsistency of the visual pattern and prominent encroachments of built elements into the viewshed. When combined, these visual quality criteria would result in low visual quality. Viewer response would be considered high, due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, the view along GWMP south of Four Mile Run would be of a curving tree-lined roadway with intermittent views of built elements. The open sky, oncoming traffic, and W-beam railing would also continue to characterize this view (See **Figure 3-16**). Vegetation would filter views of development to the west. At this location in 2040, the roadway and natural landscape would maintain a moderate degree of vividness due to the reestablishment of vegetation, restoring visual lines and filtering built elements; a moderate degree of unity due to the mature vegetation restoring the scale and consistency of the viewshed; and a moderate degree of intactness due to the mature vegetation filtering views of built elements. As a result, there would be a moderate degree of visual quality. Viewer response would continue to be high.

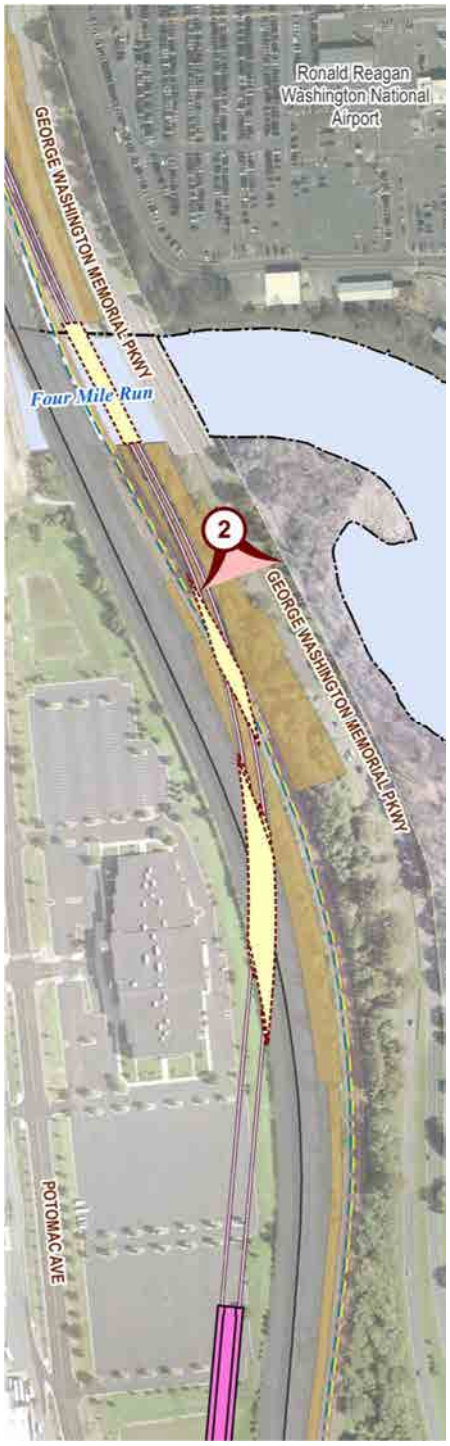
Figure 3-15: Alternative D Viewshed 1 Impacts

View	Description/Focus
	From southbound GWMP looking south. Focus is on the impacts of Build Alternative D's guideway as it rises to the southwest. **Existing Viewshed** **2016 Viewshed** **2040 Viewshed**

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Figure 3-16: Alternative D Viewshed 2 Impacts

View Location	Description/Focus
	From southbound GWMP looking south. Focus is on the impacts of Build Alternative D's guideway as it rises to the southwest. **Existing Viewshed** **2016 Viewshed** **2040 Viewshed**

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Viewshed 3 – George Washington Memorial Parkway (Middle), Looking South

Impacts in Year 2016

Under Build Alternative D in 2016, the view south along Viewshed 3 from GWMP between Four Mile Run and Daingerfield Island would be the same as described under the No Build Alternative. During winter months, the dormant vegetation would appear as a solid form along the view corridor, effectively blocking the peripheral views of the Metrorail station. At this location, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, the view south along GWMP between Four Mile Run and Daingerfield Island would be the same as described under the No Build Alternative. During winter months, the dormant vegetation would appear as a solid form along the view corridor, effectively blocking the peripheral views of the Metrorail station and North Potomac Yard development. At this location, the natural landscape would maintain a very high degree of vividness, visual unity, and intactness, resulting in a very high degree of visual quality. This viewshed also would also retain a high degree of viewer response due to high viewer exposure and high viewer sensitivity, which would be a result of high viewer awareness by GWMP visitors.

Viewshed 4 – George Washington Memorial Parkway (South), Looking South

Impacts in Year 2016

Under Build Alternative D in 2016, the view along Viewshed 4 of GWMP near Daingerfield Island, townhomes in Potomac Greens would be the same as described under the No Build Alternative. During winter months, views of the Metrorail station would be filtered from view by trees, which would also provide a consistent visual line. This viewshed would continue to have a high degree of visual quality due to high degrees of vividness, intactness, and unity. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, the view along GWMP near Daingerfield Island, townhomes in Potomac Greens would be the same as described under the No Build Alternative. During winter months, views of the Metrorail station and North Potomac Yard development would be filtered from view by trees, which would also provide a consistent visual line. This viewshed would possess a moderately high degree of visual quality due to moderately high degrees of vividness, intactness, and unity. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Viewshed 5 – George Washington Memorial Parkway (South), Looking West

Impacts in Year 2016

Under Build Alternative D in 2016, the view looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail would be the same as described under the No Build Alternative. The vividness, intactness, and visual unity of the viewshed would continue to be moderately high, resulting in an overall moderately high level of visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, the view looking west from north of the Daingerfield Island entrance near the Mount Vernon Trail would be the same as described under the No Build Alternative. The vividness, intactness, and visual unity of the viewshed would continue to be moderate, resulting in an overall moderate level of visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Viewshed 9 – George Washington Memorial Parkway (Middle), Mount Vernon Trail, Looking West

Impacts in Year 2016

Under Build Alternative D in 2016, Viewshed 9 looking west toward the project site from the Mount Vernon Trail would be characterized by layers of vegetation framed by trees in the periphery, blocking views of the Metrorail station. During the winter months, views of the Metrorail station and South Potomac Yard would be filtered by trees and vegetation. This viewshed would decline to have a moderately high degree of vividness due to the layered view of natural features and filtered visibility of built elements during the winter months; a moderately high degree of visual unity due to the repeated linear patterns of the vegetation with some visibility of built elements during the winter months; and a moderately high degree of intactness due to the encroachment of built elements. Therefore, this viewshed would have an overall moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

Impacts in Year 2040

Under Build Alternative D in 2040, Viewshed 9 looking west toward the project site from the Mount Vernon Trail would be characterized by layers of vegetation framed by trees in the periphery, blocking views of the Metrorail station. During the winter months, views of the Metrorail station and North and South Potomac Yard would be filtered by trees and vegetation. This viewshed would decline to have a moderately high degree of vividness due to the layered view of natural features and filtered visibility of built elements during the winter months; a moderately high degree of visual unity due to the repeated linear patterns of the vegetation with some visibility of built elements during the winter months; and a moderately high degree of intactness due to the encroachment of built elements. Therefore, this viewshed would have an overall moderately high degree of visual quality. The viewer response would remain high due to high viewer exposure and high viewer sensitivity, which would be a result of viewer awareness by GWMP visitors.

George Washington Memorial Parkway, Continuous Visual Corridor

Impacts in Year 2016

At the opening year, the character of GWMP viewshed under Build Alternative D would change from a consistent divided four-lane roadway framed by vegetation with intermittent views of transportation and built elements to the west and the river to the east, to that of a roadway partially framed by vegetation and views of transportation and built elements to the west; the views east towards the Potomac River would remain. In the northern portion of the study area, where the vegetation would be removed, the visual framing provided by trees would no longer be in place along the western portion of the view corridor. This viewshed would reduce its vividness to high levels due to the introduction and expansion of breaks in vegetation, thereby reducing the visual pattern along the western portion of the view corridor and the continued noteworthy views of the U.S. Capitol and Potomac River to the north and east. Visual unity would decline to moderately high due to the removal of continuous vegetation in the northern portion of the view corridor and the retention of the landscape along the eastern and southern portion of the view corridor. Intactness would decline to moderately high due to the further encroachment of built elements into the northern portion of the view corridor. Therefore, the overall visual quality of continuous views along the GWMP would decline to moderately high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Impacts in Year 2040

In 2040, the visual character of GWMP would be that of a curving roadway framed by vegetation with intermittent views of built elements to the west, while views to the east would remain intact. Built elements in the Potomac Yard development, including buildings of up to 250 feet in height, would be visible from GWMP view corridor where breaks in vegetation occur. Redevelopment in Crystal City would be visible in northern portions of the study area. Over time, the vegetation replaced under Build Alternative D would mature to filter much of the Metrorail station from GWMP. Therefore, Build Alternative D would alter the character of GWMP by introducing built elements into the view corridor. This viewshed would possess a high degree of vividness due to the limited introduction of breaks in vegetation, thereby minimally reducing the visual pattern along the western portion of the view corridor and the continuing the noteworthy views of the U.S. Capitol and Potomac River to the north and east. Visual unity would decline to moderately high due to the continuing break in vegetation at Four Mile Run, thereby diminishing continuous patterns, while retaining the landscape along the eastern and southern portion of the view corridor. Intactness would be moderately high due to the encroachment of built elements into the northern portion of the view corridor. Overall, the visual quality of continuous views along the parkway would be

moderately high. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by GWMP visitors.

Potomac Greens

Viewshed 6 – Potomac Greens, Looking West

Impacts in Year 2016

In 2016, Build Alternative D would shift the tracks within fourteen feet, at the closest point, of the retaining wall behind the townhomes at Potomac Greens (see **Figure 3-17**). The elevation of the tracks would rise to approximately 32 feet higher than existing conditions near the northern portion of Potomac Greens. As a result, viewsheds from the townhomes would change from shallow views characterized primarily by low horizontal built elements with some landscape features to that of an even shallower view of a prominent transportation-related structure. Vividness would decline to very low levels as a result of the introduction of the elevated track, which effectively blocks existing visual patterns. The prominence of the elevated track would disrupt the cohesiveness of the view, diminishing unity to very low levels. Intactness would also decline to very low levels as a result of the encroachment of the prominent elevated track. As a result, the visual quality of the viewshed would be very low. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Impacts in Year 2040

Under Build Alternative D in 2040, the viewshed would be similar to that in 2016, but would contain additional Potomac Yard development in the background. Vegetation in the foreground would mature, providing some screening of the tracks (see **Figure 3-17**). Vividness would decline to very low levels as a result of the introduction of the elevated track, which effectively blocks existing visual patterns. The prominence of the elevated track would disrupt the cohesiveness of the view, diminishing unity to very low levels. Intactness would also decline to very low levels as a result of the encroachment of the prominent elevated track. As a result, the visual quality of the viewshed would be very low visual. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Figure 3-17: Alternative D Viewshed 6 Impacts

View Location	Description/Focus
	From Potomac Greens neighborhood looking west. Focus is on the impacts of Build Alternative D aerial guideway in the background.

Existing Viewshed

2016 Viewshed

2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Viewshed 7 – Potomac Greens Park, Looking Northwest

Impacts in Year 2016

In 2016, Build Alternative D would introduce a new Metrorail station approximately 720 feet north of Potomac Greens Park, when measured from the southern mezzanine; existing townhomes lie further to the south. From Potomac Greens Park, the Metrorail station would be visible above remaining existing vegetation and the replaced vegetation (see **Figure 3-18**). Build Alternative D would alter the character of views from Potomac Greens Park from a relatively shallow view of low, predominantly transportation facilities in the foreground, with some landscape elements, to a view of prominent built forms with some landscape elements in the foreground. The encroachment of the tracks and the changes in the patterns of the viewshed would result in moderately low degrees of intactness and vividness, respectively. The unity of the viewshed would decline to moderately low levels as a result of the elevated tracks disrupting the landscape form. Together, these visual criteria would result in a decline to moderately low visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Impacts in Year 2040

Under Build Alternative D in 2040, the character and quality of views from the Potomac Greens Park would be similar to that in 2016, but with Potomac Yard development in the background that rises above the elevated tracks with matured vegetation in the foreground (see **Figure 3-18**). The vividness would be moderate, due to the improvement of visual patterns stemming from the maturation of vegetation. The intactness of the viewshed would be moderately low, as both the aerial tracks and the North Potomac Yard development encroach into the viewshed. The unity would also be moderately low, as the landscape and built elements remain distinct visual elements. When combined, these visual criteria would result in a moderately low visual quality. The viewer response would remain high due to high viewer exposure and a high degree of viewer sensitivity, which is a result of high viewer awareness by Potomac Greens residents.

Potomac Yard

Viewshed 8 – North Potomac Yard

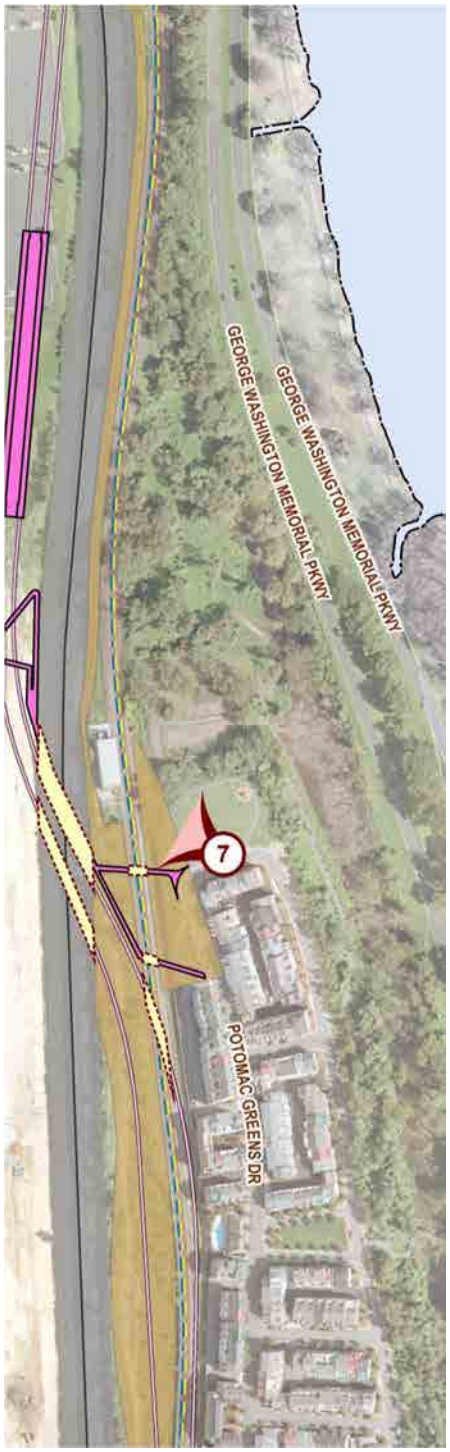
Impacts in Year 2016

In 2016, Build Alternative D would alter views northeast and southeast from Potomac Yard that are currently characterized by landscape elements in the foreground and development, transportation structures, and mature vegetation in the background. Under Build Alternative D, the Metrorail station and aerial track structures would introduce dominant built horizontal elements into the foreground of the viewshed, blocking views of portions of the landscape (see **Figure 3-19**). The aerial track structures would tightly frame broken views of vegetation and development in the background. The vividness of the view would decline to low levels due to the blocking of visual features and patterns as a result of the aerial tracks. The intactness would decline to very low levels as a result of the dominant tracks that are not in keeping with the scale of the area, while unity would decline to very low levels due to the inclusion of large, dominant built elements. Combined, these visual criteria would result in very low visual quality. Viewer response would be moderate, due to moderate viewer exposure and moderate viewer sensitivity.

Impacts in Year 2040

In 2040, the overall character and the quality of views northeast and southeast from Potomac Yard would be altered by the presence of aerial track structures that would dominate the view (see **Figure 3-19**). Breaks in the aerial track structures would allow constricted views of other elements: vegetation of Potomac Yard Park would be more mature, filtering views of development in the background. The vividness of the view would decline to very low levels due to the blocking of visual features and patterns as a result of the aerial tracks. The intactness would decline to very low levels as a result of the dominant tracks that are not in keeping with the scale of the area, while unity would decline to very low levels due to by the inclusion of large, dominant built elements, including the introduction of North Potomac Yard development. Combined, these visual criteria would result in very low visual quality. Viewer response would be moderate, due to moderate viewer exposure and moderate viewer sensitivity.

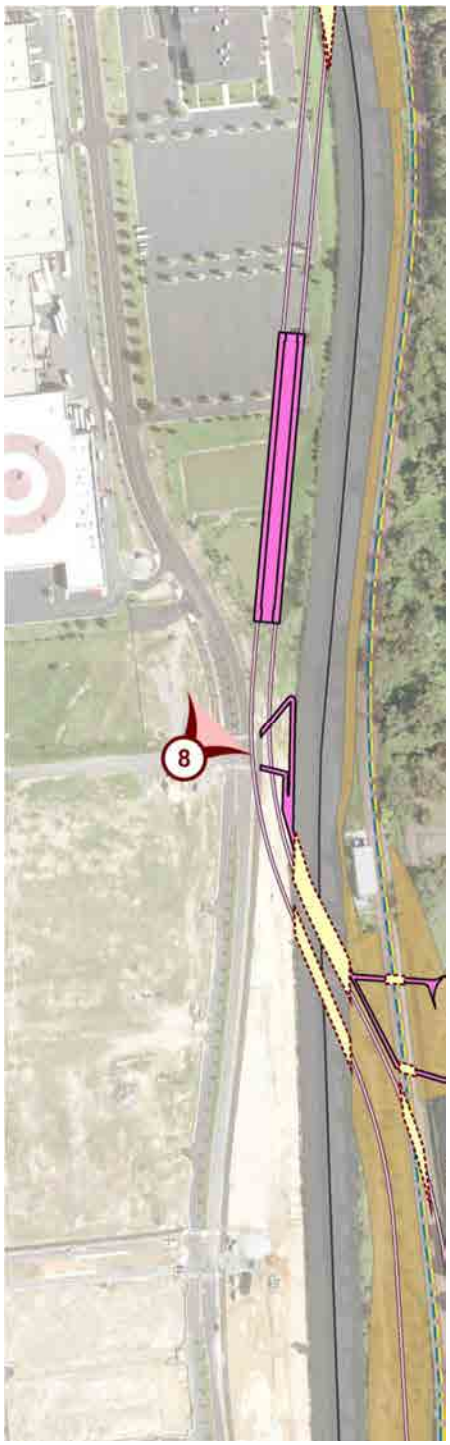
Figure 3-18: Alternative D Viewshed 7 Impacts

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
	2016 Viewshed
	2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

Figure 3-19: Alternative D Viewshed 8 Impacts

View Location	Description/Focus
	From the intersection of East Glebe Road and Potomac Avenue looking northeast. Focus is on the impact of the station and elevated tracks.

Existing Viewshed

2016 Viewshed

2040 Viewshed

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

Note: Renderings of Metrorail Stations are for illustrative purposes only. Finalized designs would be developed during the later design phases of the project.

3.2.4 Summary of Visual Effects

Table 3-4 summarizes visual resource impacts for the alternatives.

Table 3-4: Summary of Visual Resources Impacts

Alternative	Visual Criteria	2016	2040
Viewshed 1			
No Build	Visual Character	Tree-lined roadway with break in vegetation at Four Mile Run. Pattern elements and character are highly compatible.	Same as 2016
	Visual Quality	Very High	Very High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Build Alternative B	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Build Alternative D	Visual Character	Roadway with views of elevated tracks and breaks in vegetation. Pattern elements and character have a low degree of compatibility due to change in form, line, and continuity.	Tree-lined roadway with intermittent views of elevated tracks. Pattern elements and character have a moderate degree of compatibility due to change in form, line, and continuity.
	Visual Quality	Low	Moderate
	Viewer Sensitivity	High	High
Viewshed 2			
No Build	Visual Character	Tree-lined roadway with intermittent breaks in vegetation. Pattern elements and character are highly compatible.	Same as 2016
	Visual Quality	Very High	Very High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Build Alternative B	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Build Alternative D	Visual Character	Roadway with views of elevated tracks and visual gaps due to removal of vegetation. Pattern elements and character have a low degree of compatibility due to change in form, line, and continuity.	Tree-lined roadway with intermittent views of elevated tracks. Moderately consistent visual pattern.
	Visual Quality	Low	Moderate
	Viewer Sensitivity	High	High
Viewshed 3			
No Build	Visual Character	Curved roadway framed by vegetation. Pattern elements and character are highly compatible.	Same as 2016
	Visual Quality	Very High	Very High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		

Alternative	Visual Criteria	2016	2040
Build Alternative B	Visual Character	Curved roadway framed by vegetation with intermittent views of Potomac Yard Metrorail station and existing buildings. Pattern elements and character are moderately compatible due to changes in color and continuity.	Curved roadway framed by vegetation with intermittent views of Potomac Yard Metrorail station and Potomac Yard development. Pattern elements and character are moderately to highly compatible due to maturation of vegetation and changes in color and continuity.
	Visual Quality	Moderate	Moderately High
	Viewer Sensitivity	High	High
Build Alternative D	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Viewshed 4			
No Build	Visual Character	Roadway framed by vegetation and by willow oaks along the median with filtered views of townhomes. Pattern elements and character are compatible.	Similar to 2016, with filtered views of Potomac Yard development
	Visual Quality	High	Moderately High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Build Alternative B	Visual Character	Roadway framed by inconsistent vegetation with intermittent views of the Metrorail station and Potomac Yard development. Pattern changes due to removal of vegetation and encroachment of built elements on the periphery of the viewshed.	Similar to 2016, but with more obscured views of development due to mature vegetation.
	Visual Quality	Moderately High	Moderately High
	Viewer Sensitivity	High	High
Build Alternative D	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Viewshed 5			
No Build	Visual Character	Roadway and vegetation in foreground and vegetation in background, with filtered views of townhomes. Pattern elements and character are moderately compatible.	Similar to 2016, with filtered views of Potomac Yard development
	Visual Quality	Moderately High	Moderate
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Roadway and vegetation in foreground and vegetation in background, with noticeable view of Metrorail Station. Built elements are introduced and are compatible with the pattern elements and character of the viewshed.	Similar to 2016, with filtered views of Potomac Yard development
	Visual Quality	Moderate	Moderately Low
	Viewer Sensitivity	High	High
Build Alternative B	Visual Character	Roadway and vegetation in foreground and vegetation in background, with filtered views of townhomes, with Metrorail station visible on the periphery. Pattern elements and character are moderately compatible.	Similar to 2016, with filtered views of Potomac Yard development.
	Visual Quality	Moderately High	Moderate
	Viewer Sensitivity	High	High

Alternative	Visual Criteria	2016	2040
Build Alternative D	Visual Character	Same as No Build Alternative	Same as No Build Alternative
	Visual Quality		
	Viewer Sensitivity		
Viewshed 9			
No Build	Visual Character	Layered vegetation in the foreground and background, with large trees framing the view. Filtered views of South Potomac Yard development, especially in winter.	Similar to 2016, but with views of further South Potomac Yard development.
	Visual Quality	High	Moderately High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Layered vegetation in the foreground and background, with large trees framing the view. Filtered views of Metrorail station and Potomac Yard development, especially in winter.	Similar to 2016, but with views of further South Potomac Yard development.
	Visual Quality	Moderately High	Moderately High
	Viewer Sensitivity	High	High
Build Alternative B	Visual Character	Layered vegetation in the foreground and background, with large trees framing the view. Filtered views of Metrorail development, especially in winter.	Similar to 2016, but with views of further Potomac Yard development.
	Visual Quality	Moderately High	Moderately High
	Viewer Sensitivity	High	High
Build Alternative D	Visual Character	Layered vegetation in the foreground and background, with large trees framing the view. Filtered views of Metrorail development, especially in winter.	Similar to 2016, but with views of further Potomac Yard development.
	Visual Quality	Moderately High	Moderately High
	Viewer Sensitivity	High	High
Continuous Viewshed			
No Build	Visual Character	Tree-lined roadway in a natural setting with intermittent views of the Potomac River, Washington, DC, and NPS facilities to the east and Potomac Greens to the west.	Similar to 2016, but with views of further Potomac Yard and Crystal City development where visual breaks occur.
	Visual Quality	Very high	High
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Tree-lined roadway in a natural setting with intermittent views of the Potomac River, Washington, DC, and NPS facilities to the east and Potomac Greens and Potomac Yard development to the west.	Similar to 2016, but with views of further Potomac Yard and Crystal City development where visual breaks occur.
	Visual Quality	Very High	High
	Viewer Sensitivity	High	High
Build Alternative B	Visual Character	Tree-lined roadway in a natural setting with intermittent views of the Potomac River, Washington, DC, and NPS facilities to the east and Metrorail, Potomac Greens and Potomac Yard development to the west.	Similar to 2016, but with views of further Potomac Yard and Crystal City development.
	Visual Quality	High	High
	Viewer Sensitivity	High	High

Alternative	Visual Criteria	2016	2040
Build Alternative D	Visual Character	Tree-lined roadway (with less vegetation in the northern portion) in a natural setting with intermittent views of the Potomac River, Washington, DC, and NPS facilities to the east and Metrorail, Potomac Greens, and Potomac Yard development to the west.	Tree-lined roadway in a natural setting with intermittent views of the Potomac River, Washington, DC, and NPS facilities to the east and Metrorail, Potomac Greens, and Potomac Yard and Crystal City development to the west.
	Visual Quality	Moderately High	Moderately High
	Viewer Sensitivity	High	High
Viewshed 6			
No Build	Visual Character	Intermittent views of landscape vegetation, a series of landscape trees, and low horizontal wall; Potomac Yard development visible in background. The pattern elements and character are moderately compatible.	Similar to 2016, but with views of further Potomac Yard development. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderate	Moderately Low
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Shallow view of transportation facilities, with some landscape elements. The Potomac Yard Metrorail platform elements and character are moderately compatible.	Similar to 2016, but with views of further Potomac Yard development. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderately Low	Moderately Low
	Viewer Sensitivity	High	High
Build Alternative B	Visual Character	Intermittent views of landscape vegetation, a series of landscape trees, low horizontal wall, and a portion of the pedestrian connection to Potomac Yard Metrorail Station; Potomac Yard development visible in background. The pattern elements and character are moderately compatible.	Similar to 2016, but with views of further Potomac Yard development. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderate	Moderately Low
	Viewer Sensitivity	High	High
Build Alternative D	Visual Character	Shallow view dominated by transportation-related structure with landscape elements. Pattern elements and character compatibility are low due to form, texture, color, dominance, scale, and continuity.	Similar to 2016, but with views of further Potomac Yard development. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Very Low	Very Low
	Viewer Sensitivity	High	High
Viewshed 7			
No Build	Visual Character	Neighborhood park with landscaping, and transportation facilities in the background. The pattern elements and character are moderately compatible.	Similar to 2016, but with views of further Potomac Yard development. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderate	Moderately Low
	Viewer Sensitivity	High	High
Build Alternative A	Visual Character	Neighborhood park with large built element in addition to open space, fencing, and transportation facilities. The pattern elements and character have low compatibility due to change in form, line, color, dominance, scale, and continuity.	Similar to 2016, with filtered views of Potomac Yard development.
	Visual Quality	Low	Very Low
	Viewer Sensitivity	High	High

Alternative	Visual Criteria	2016	2040
Build Alternative B	Visual Character	Neighborhood park with taller, more prominent designed transportation facilities. The pattern elements and character have a moderately low compatibility due to changes in form, color, scale, dominance, and continuity.	Similar to 2016, with filtered views of Potomac Yard. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderately Low	Low
	Viewer Sensitivity	High	High
Build Alternative D	Visual Character	Shallow views of transportation-related structures with landscape features. The pattern elements and character have a low compatibility due to changes in form, color, scale, dominance, and continuity.	Similar to 2016, with filtered views of Potomac Yard and matured vegetation. Pattern elements are moderately low in compatibility due to changes in form, line, and scale.
	Visual Quality	Moderately Low	Moderately Low
	Viewer Sensitivity	High	High
Viewshed 8			
No Build	Visual Character	Layered views of vegetation (including Potomac Yard Park in the foreground) and views of transportation infrastructure and existing townhomes in the background during winter months.	Similar to 2016, with further encroachment of North Potomac Yard development and more mature vegetation.
	Visual Quality	Moderate	Moderate
	Viewer Sensitivity	Moderate	Moderate
Build Alternative A	Visual Character	Pedestrian bridge and station entrance would introduce new vertical elements and additional vegetation would be present.	Similar to 2016, with further encroachment of North Potomac Yard development and more mature vegetation.
	Visual Quality	Moderately Low	Moderately Low
	Viewer Sensitivity	Moderate	Moderate
Build Alternative B	Visual Character	Pedestrian bridge and station entrance would introduce horizontal elements into the layered view.	Similar to 2016, with further encroachment of North Potomac Yard development and more mature vegetation.
	Visual Quality	Moderately Low	Moderately Low
	Viewer Sensitivity	Moderate	Moderate
Build Alternative D	Visual Character	Layered view of vegetation dominated by aerial track structure.	Similar to 2016, with further encroachment of North Potomac Yard development and more mature vegetation.
	Visual Quality	Very Low	Very Low
	Viewer Sensitivity	Moderate	Moderate

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APPENDIX A:
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APPENDIX B:

BALLOON TESTING TECHNICAL MEMORANDUM

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1.0 INTRODUCTION

This appendix summarizes on-site simulations of station configurations for the proposed Potomac Yard Metrorail Station. These simulations were conducted November 19-20, 2012, and were intended to depict the heights of key elements of the station and aerial track structures of the three Build Alternatives assessed in the project Draft Environmental Impact Statement (EIS) (see **Figure 1-1**).

2.0 METHODOLOGY

This section describes how the field work was conducted and documented. Four balloon test simulations of station and guideway structure heights were conducted by Digital Design and Imaging Service, Inc. (DDIS). For each alternative, the proposed station design (based on the November 2012 draft General Plans) was defined by three tethered balloons (or a fixed mast with an orange ball on top), each approximately nine feet in diameter. The balloons were placed to represent the heights of the north end, midpoint, and south end of the station. For Alternative D, an additional simulation was conducted for the two proposed aerial guideway structures over the CSXT and existing Metrorail tracks.

For each simulation, the balloon tether was set so that the height of the proposed structure was represented by the top of the balloon (not by the balloon's equator or its base).

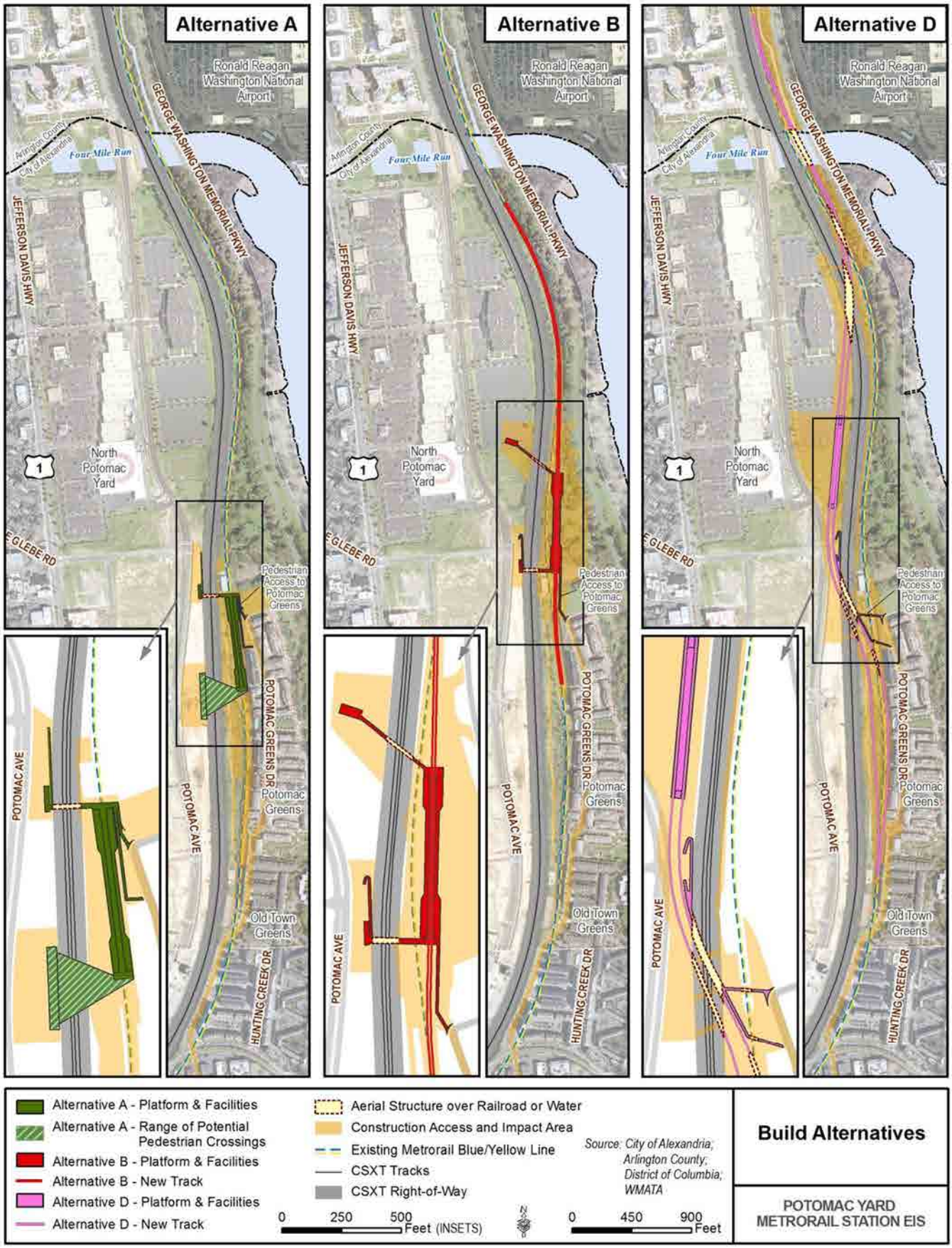
For safety reasons, it was in some cases necessary to horizontally offset certain balloon locations. Specific conditions and constraints for each alternative are described as follows:

- Alternative A – The balloons marked the approximate eastern corners and eastern façade of the proposed station. This change was necessary to provide safe clearances from the existing WMATA right-of-way.
- Alternative B – The balloons marked the approximate eastern corners and eastern façade of the proposed station. Minor offsets were necessary due to existing trees and vegetation.
- Alternative D – The balloons marked the eastern corners and eastern façade of the proposed station, with the exception of the northernmost balloon, which was offset to the west due to the presence of an existing tree.
- Alternative D Guideway – Two balloons were used to simulate the height of the proposed guideway at two locations at which the guideway would pass over the CSXT tracks. Due to safety considerations, it was not possible to fly balloons directly over the CSXT tracks; therefore, the locations were offset as follows:
    - The balloon for the northern crossing was launched west of the CSXT tracks behind the Regal movie theater; and
    - The balloon for the southern crossing, opposite the Potomac Greens neighborhood, was launched east of the CSXT tracks, along the access road for the existing WMATA traction power substation between the CSXT and WMATA tracks.

Each of the simulations was in place for at least one hour. Representatives of the City of Alexandria, the National Park Service, Federal Transit Administration, National Capital Planning Commission, Virginia Department of Historic Resources (VDHR), and WMATA were invited to the site to view the simulations. VDHR representatives indicated in advance that they would not be able to attend.

Photographs of the balloon test simulations for each station alternative were taken at several points along both the northbound and the southbound lanes of the George Washington Memorial Parkway (GWMP). The simulation photographs by were then compared to renderings of the station alternatives used in the assessment of visual effects for the project Draft EIS, which are shown in the *Visual Resources Technical Memorandum* and summarized in Section 3.8 of the Draft EIS Volume I. The comparisons focused on views from the GWMP given the potential for visual effects to this important cultural and historic resource. The comparisons of the photographs and the station renderings were used to refine and verify the heights of the station alternatives as shown in the renderings. **Figure 3-9** through **Figure 3-16** of this document show the comparisons of simulation photographs by DDIS and station renderings from the same viewpoints.

Figure 1-1: Build Alternatives



3.0 RESULTS

The simulations were documented with still photographs and video images as follows:

3.1 Still Photos

For each of the four simulations, a series of still photographs was shot to document visibility and represent the average driver's view of the proposed structure from along the GWMP roadway and from within Potomac Yard. The still photographs were shot at approximately 5,600 pixels wide at 300 pixels per inch (ppi) using a Canon 5D Mark II full-frame DSLR camera with a Canon 50-mm prime lens and 21.9-megapixel resolution, so as to approximate natural human vision. Still photos were taken from the following vantage points:

- GWMP roadway – captured from a 40-mph moving vehicle:
  - One series northbound (NB);
  - One series southbound (SB);
- GWMP Mount Vernon Trail – one still photo from the trail north of the Daingerfield Island Marina, near a small outfall creek for Alternatives B and D;
- Movie theater tripod location – one still photo from the Potomac Yard Shopping Center, in the vicinity of the Regal movie theater; and
- Alternative D station and guideway simulations – additional photos were taken along Potomac Avenue in the vicinity of Four Mile Run.

3.2 Video

Each simulation was professionally videotaped from the northbound and southbound lanes of the GWMP. The video camera footage was shot from a vehicle traveling approximately 40 mph. This high-definition video was filmed with a 50-mm prime lens on a full-frame digital camera sensor, so as to approximate natural human vision. The videographer maintained a stationary position in the moving vehicle until the first sighting of the mock-up balloons. As the vehicle began to pass the proposed structure, the camera panned towards the site until it reached approximately 60° to the side. These angles were intended to simulate the natural tracking movement by a driver to minimize a bias of too much or too little perceived attention by a motorist along a winding roadway. The videos for each of the station alternatives are included on the DVD inside the back cover of this document.

3.3 Visibility Maps

The resulting northbound and southbound video clips were used to create a visibility map for each Build Alternative. **Figure 3-1** through **Figure 3-8** depict locations at which one or more mock-up balloons were visible. A three-color system of icons is used to symbolize whether the balloons were fully screened, fully visible, or partially screened (filtered) by buildings or vegetation at each location. The maps are arranged by Build Alternative and by the moving-vehicle series described in **Section 2.0**. Each map geo-locates every DDIS still photograph location described above. These icons are color-coded according to the visibility of the balloon. These color codes are not intended to depict the visual impact of the entire proposed structure, just the locations marked by the balloons. For reference purposes, the key plans also include viewpoints for existing station renderings, as well as photo locations furnished by City of Alexandria staff for their photographs taken on October 26, 2012 (prior to the balloon study).

Figure 3-1: Build Alternative A Northbound Run Key Plan and Visibility Map

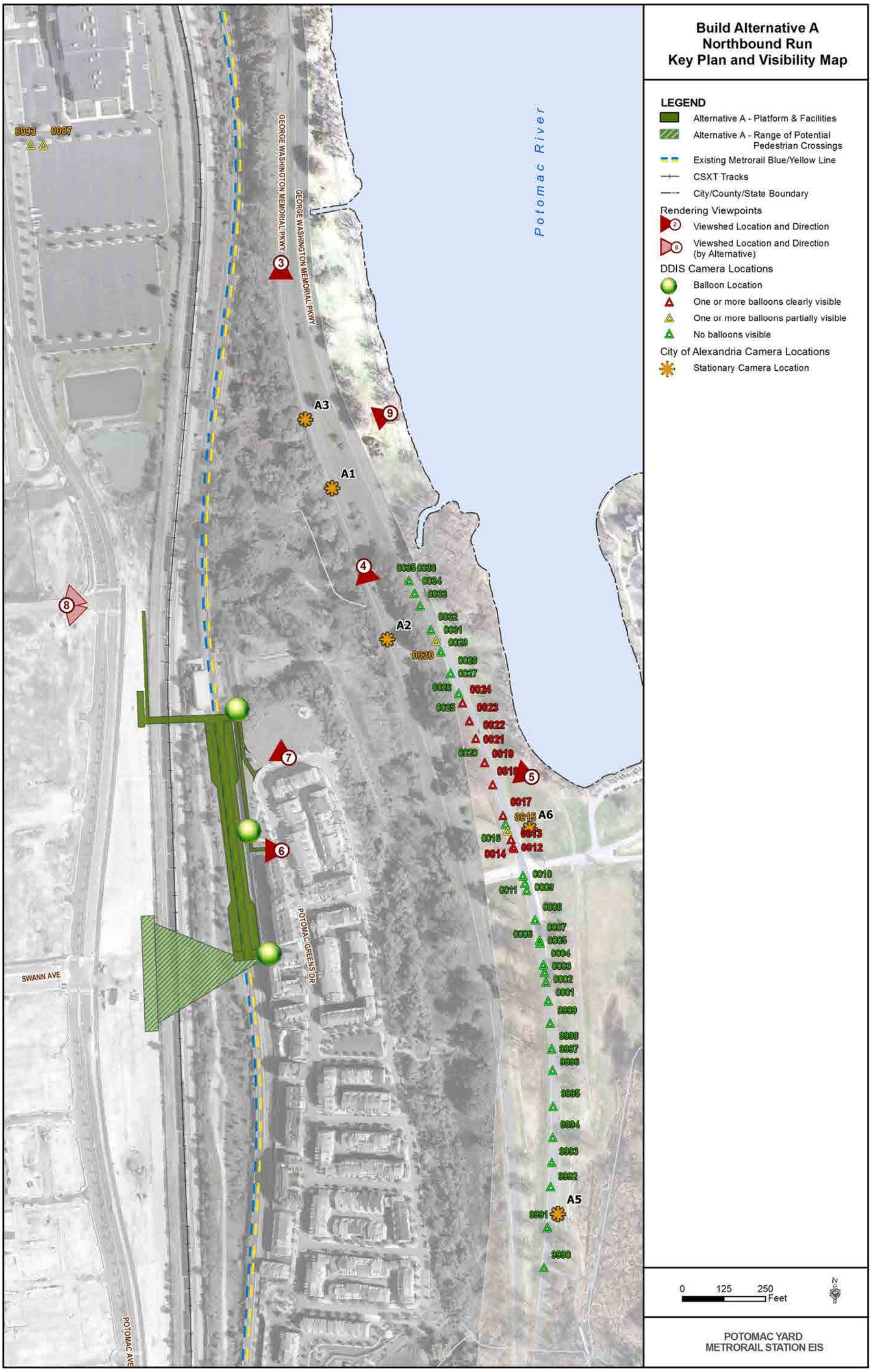


Figure 3-2: Build Alternative A Southbound Run Key Plan and Visibility Map

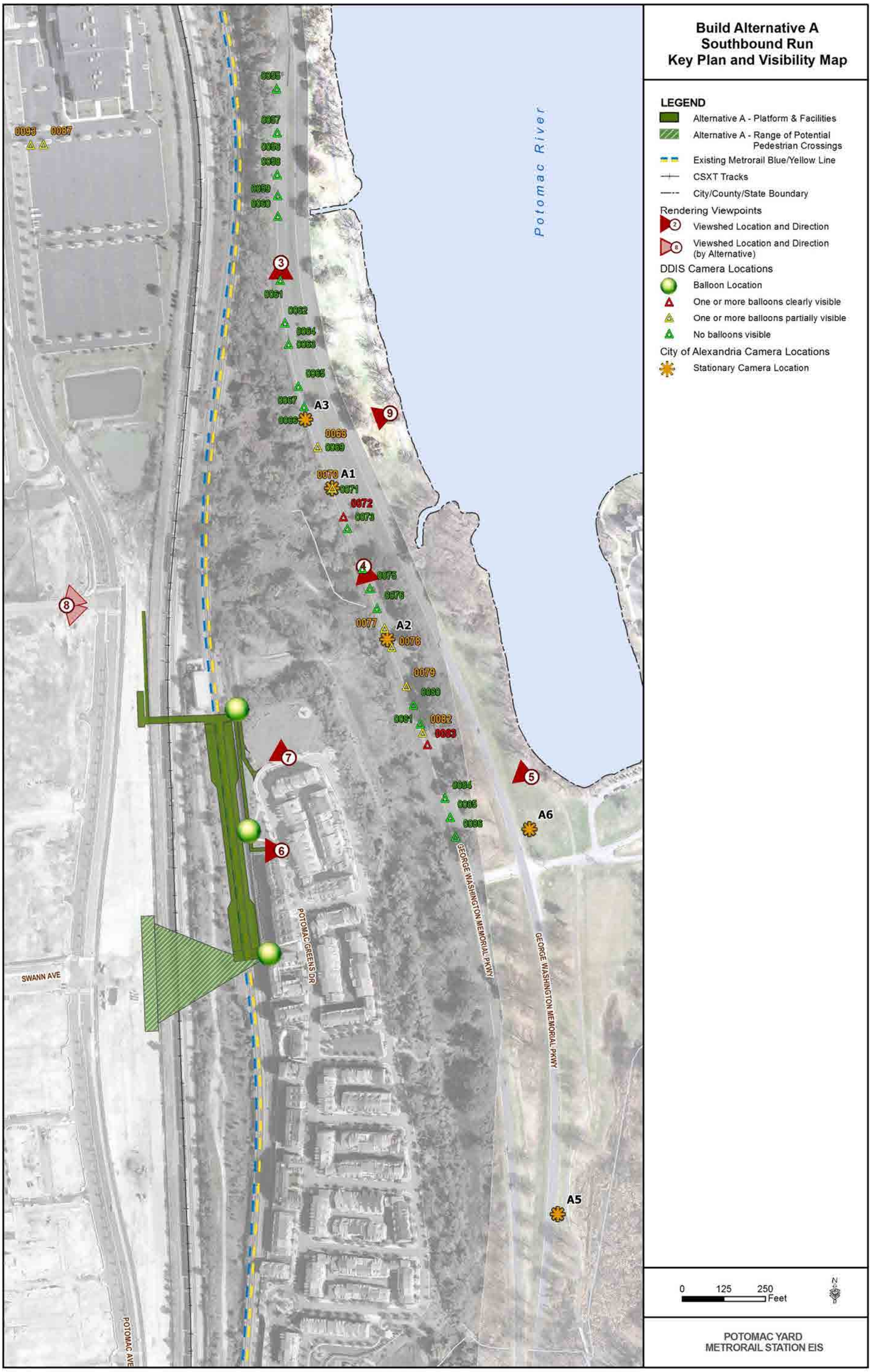


Figure 3-3: Build Alternative B Northbound Run Key Plan and Visibility Map

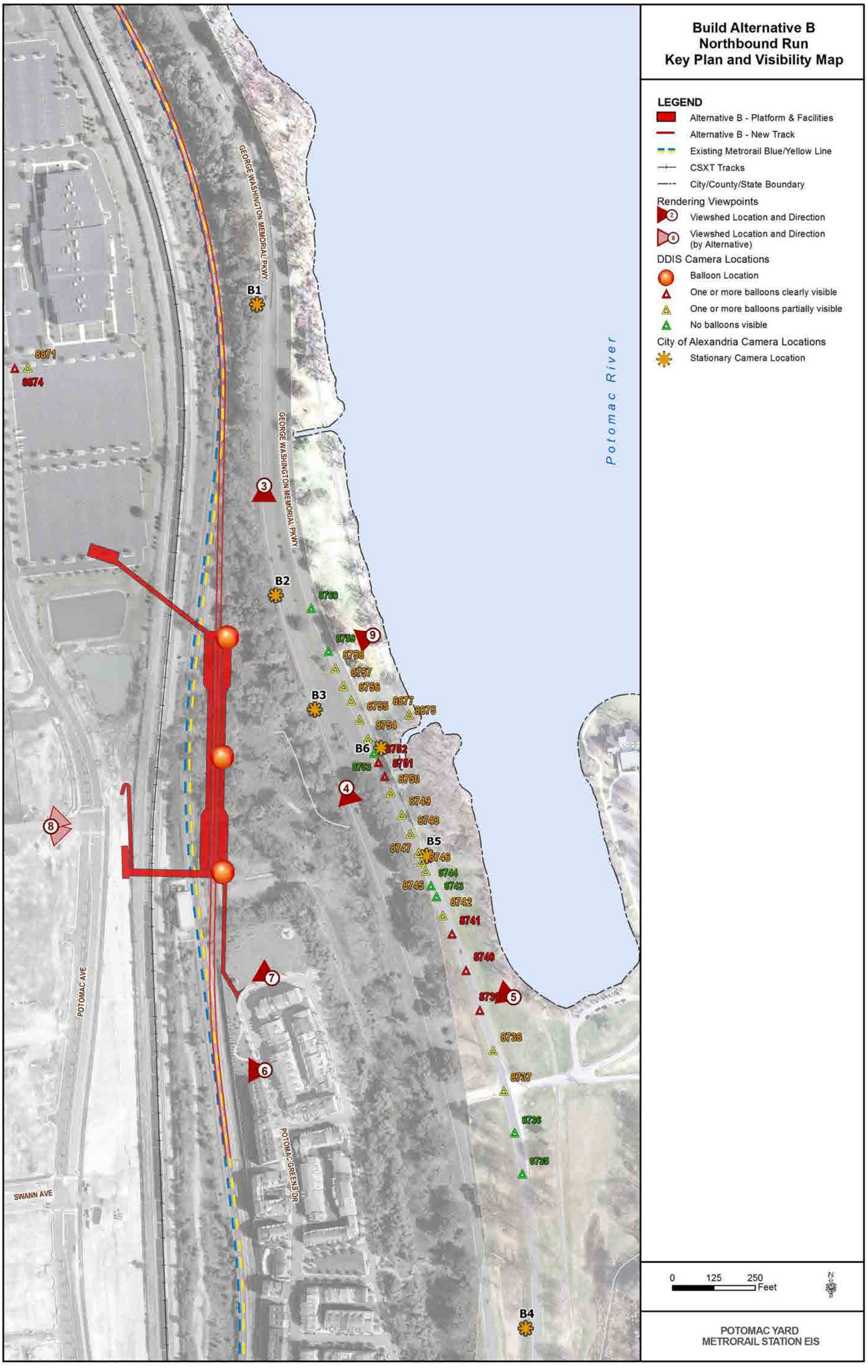


Figure 3-4: Build Alternative B Southbound Run Key Plan and Visibility Map

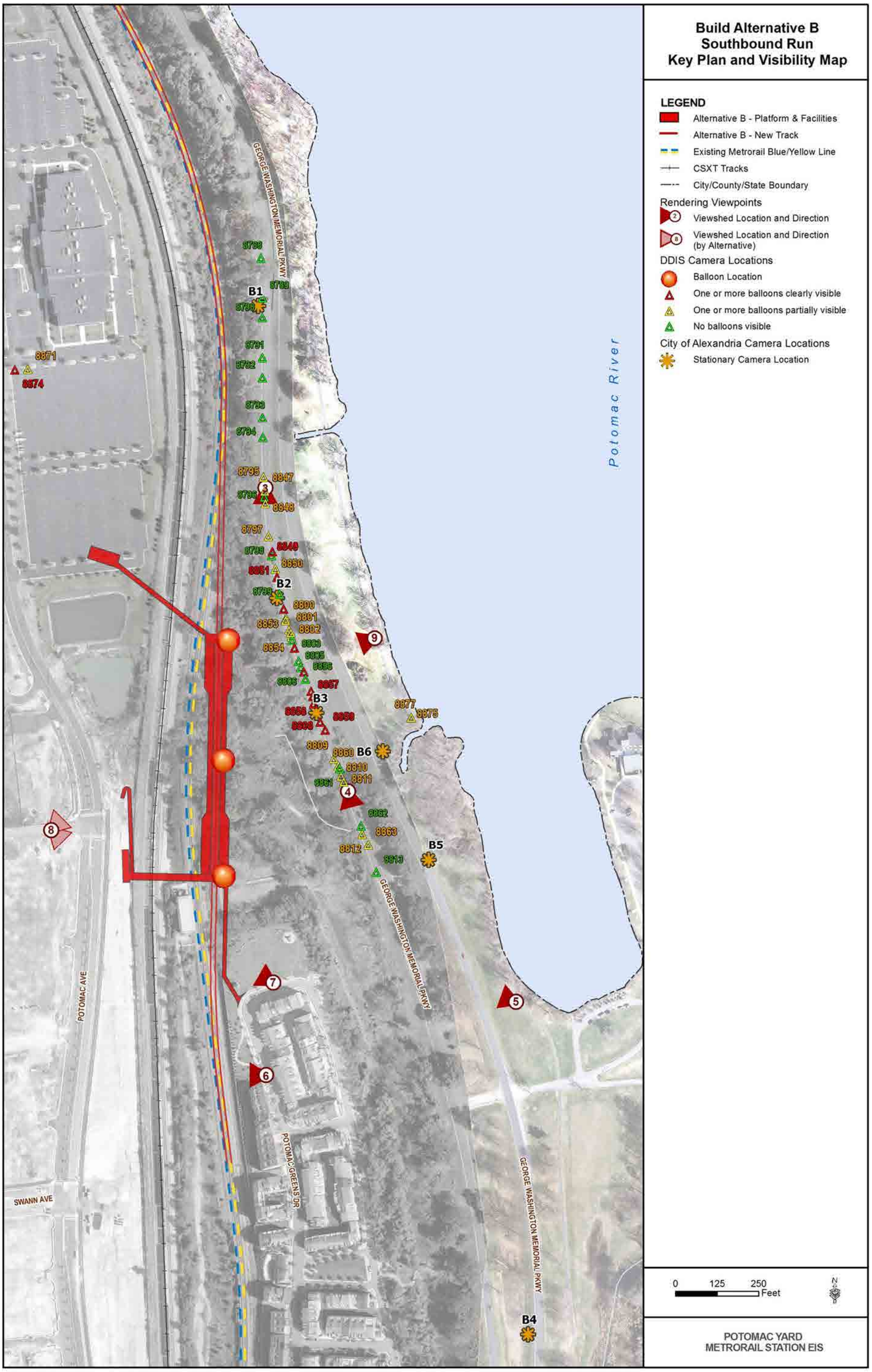


Figure 3-5: Build Alternative D Northbound Run Key Plan and Visibility Map

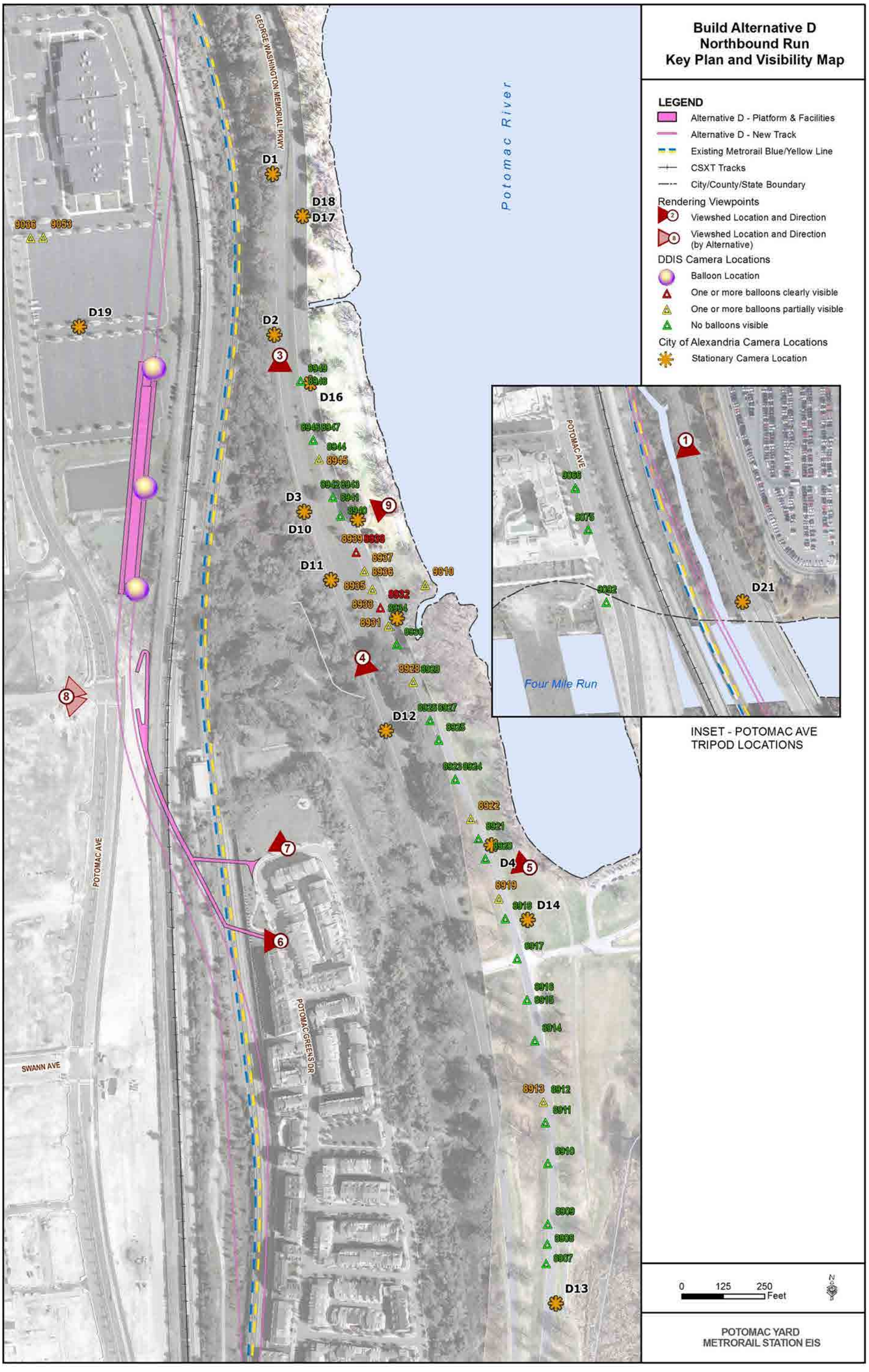


Figure 3-6: Build Alternative D Southbound Run Key Plan and Visibility Map

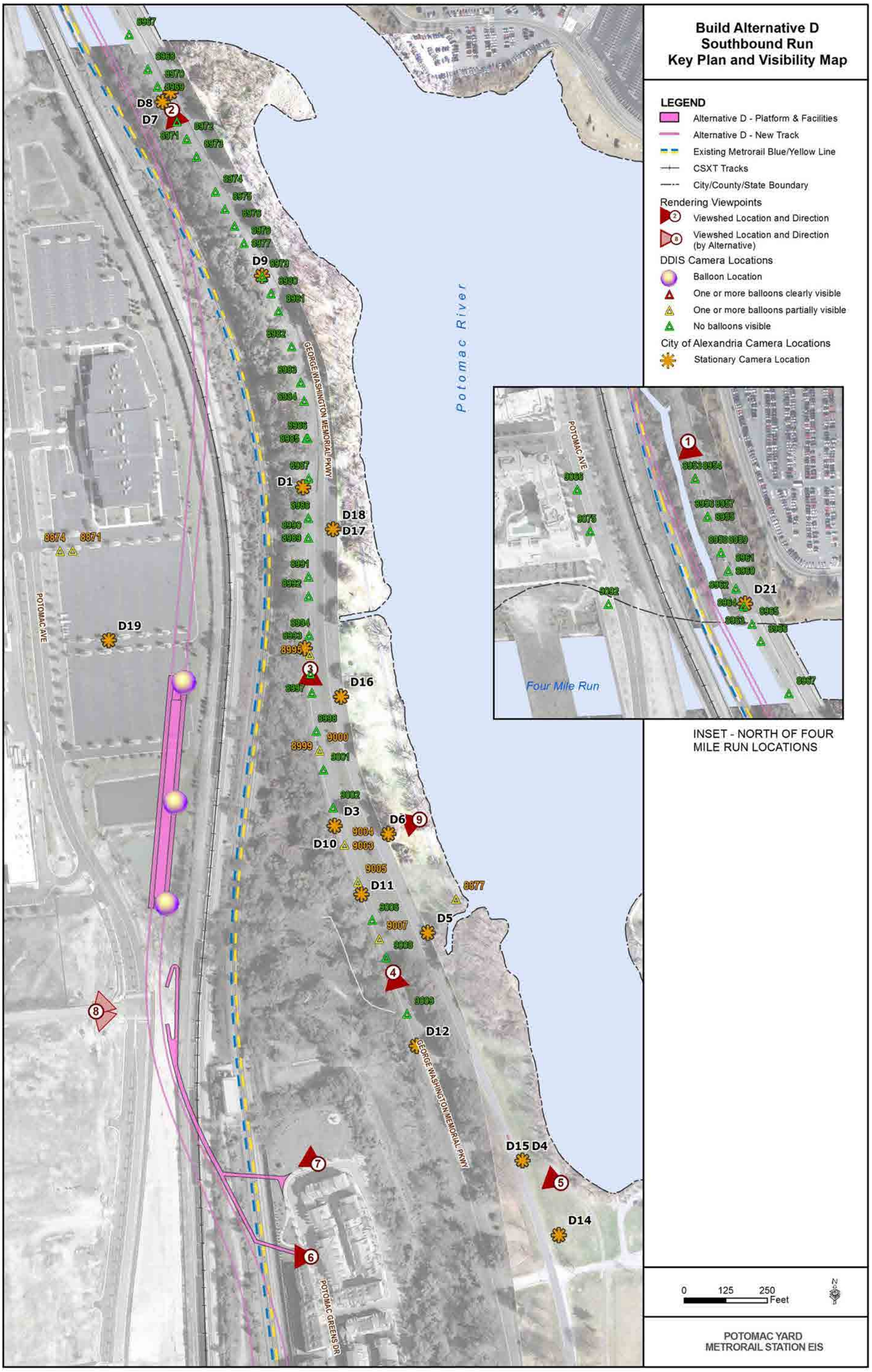


Figure 3-7: Build Alternative D Guideway Northbound Run Key Plan and Visibility Map

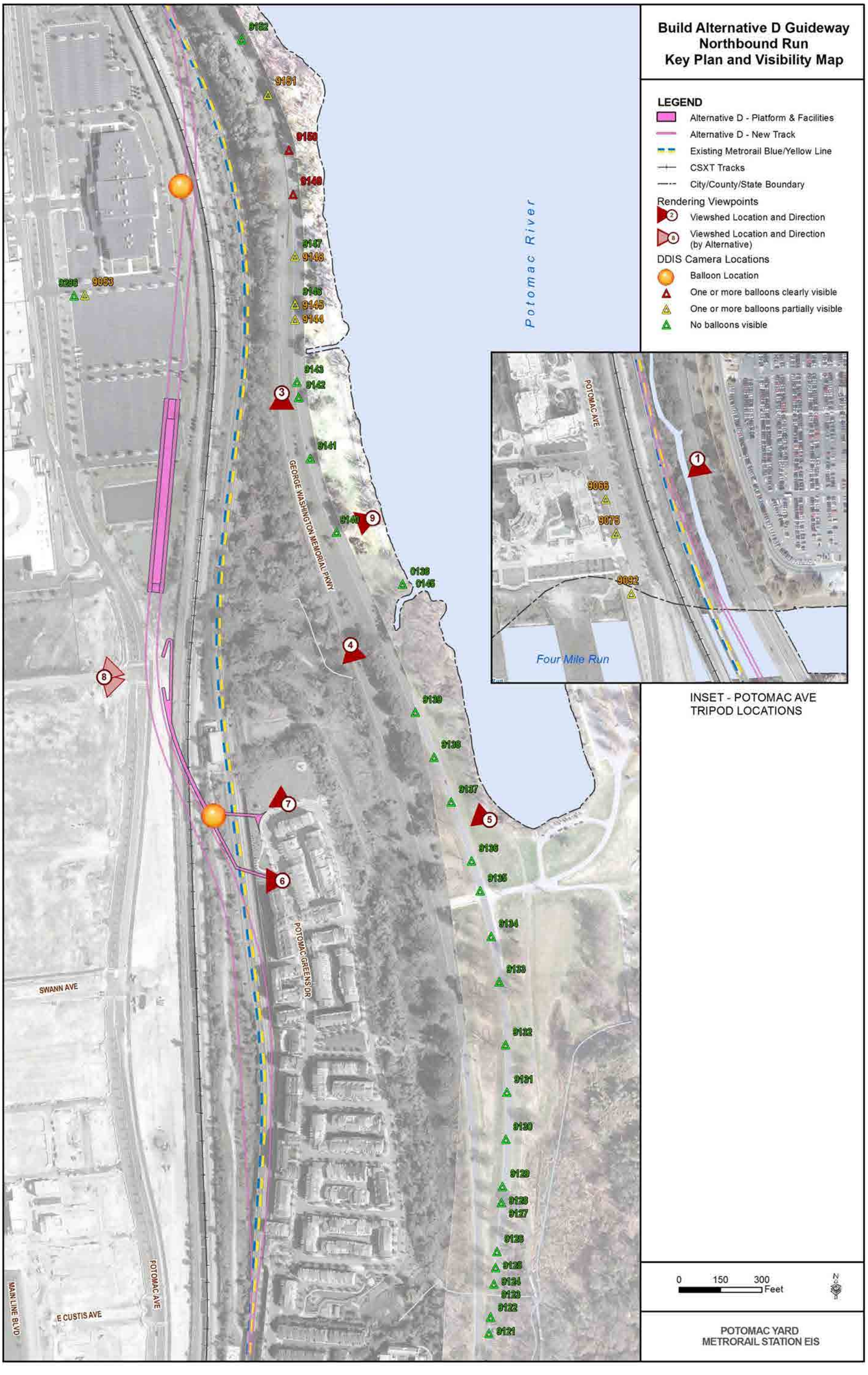
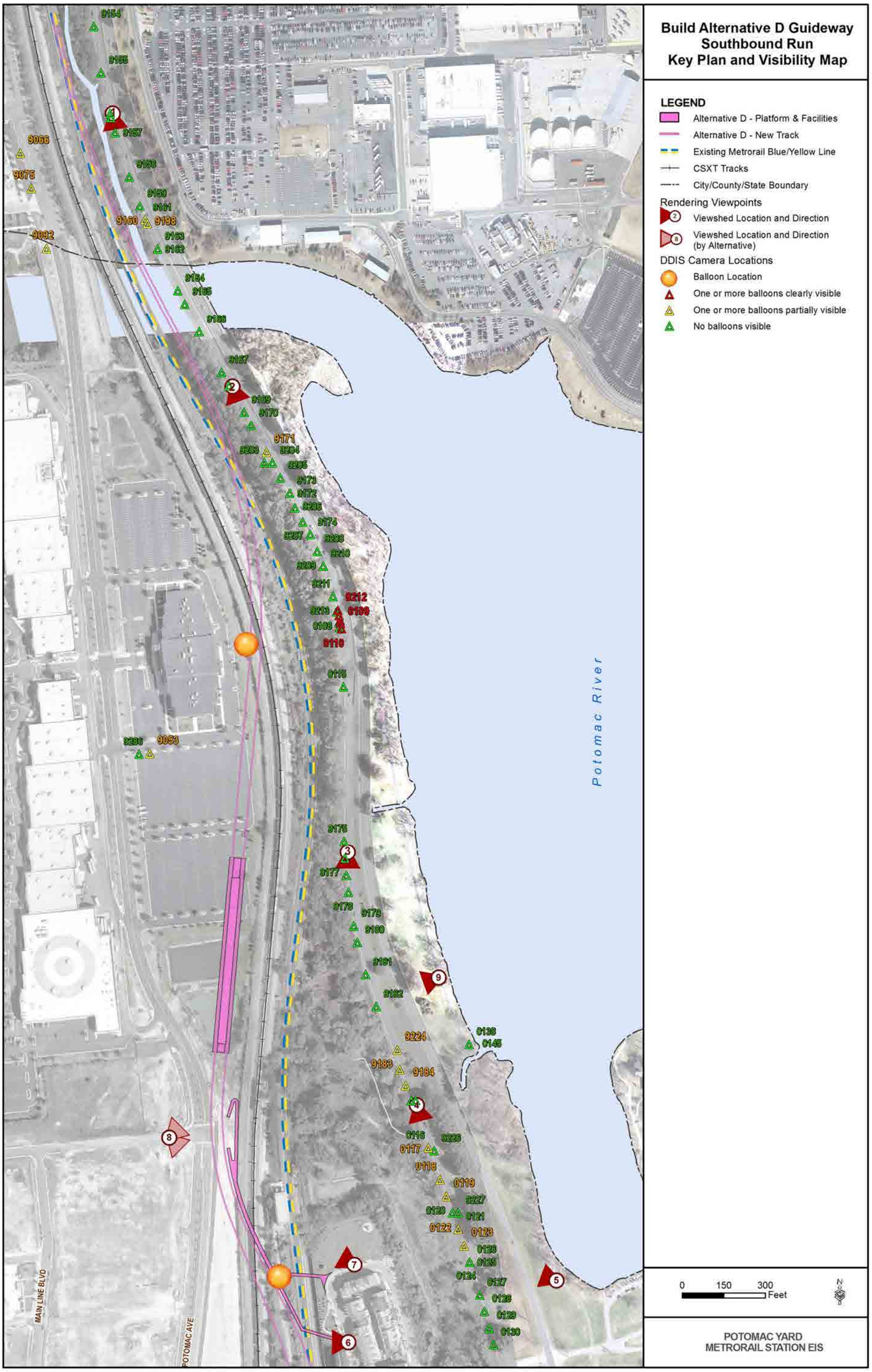


Figure 3-8: Build Alternative D Guideway Southbound Run Key Plan and Visibility Map



3.4 Validation of Station Renderings

Documentation gathered during the field simulations was used to refine previously prepared station renderings of proposed stations presented in the November 2012 version of the *Visual Resources Technical Memorandum*. **Table 3-1** identifies the simulation photographs that most closely match the viewsheds analyzed in the visual effects assessment.

Table 3-1: Correlation of Draft EIS Viewsheds to Balloon Test Photos

Draft EIS Viewshed	Matching or Closest Photo Location from Balloon Test
Alternative A	
Viewshed 5	Northbound Run #0021
Alternative B	
Viewshed 3	Southbound Run #8847
Viewshed 5	Northbound Run #8739
Viewshed 9	Mt. Vernon Trail #8875, 8877
Alternative D	
Viewshed 1	Southbound Run #9198
Viewshed 2	Southbound Run #9171
Viewshed 9	Mt. Vernon Trail #9010

Figures 3-9 through **3-16** show comparisons of the simulation photographs and the station renderings previously prepared for each of the viewsheds considered in the visual effects assessment.

As shown in **Figure 3-10**, the height of the station in the rendering for Alternative B Viewshed 3, appears to be higher than the height of the balloon in the corresponding balloon test photograph. **Figure 3-11** shows a revised station rendering for Alternative B Viewshed 3 with the station height about 10 feet lower than the station height in the original rendering. The revised station rendering more precisely matches the correct height shown in the balloon test simulation photograph. The balloon test photograph provided a benchmark height to assist in preparing a more accurate visualization of the station that did not exist when the original rendering was completed. The revised station rendering for Alternative B Viewshed 3 will be used in the updated visual resources assessment and documented in an updated *Visual Resources Technical Memorandum* and the Draft EIS Volume I for the project.

The balloon test results, as shown in **Figure 3-9** and **Figures 3-12** through **3-16**, validate the visibility and size of the station renderings for the remaining viewsheds from the George Washington Memorial Parkway.

Figure 3-9: Alternative A Viewshed 5

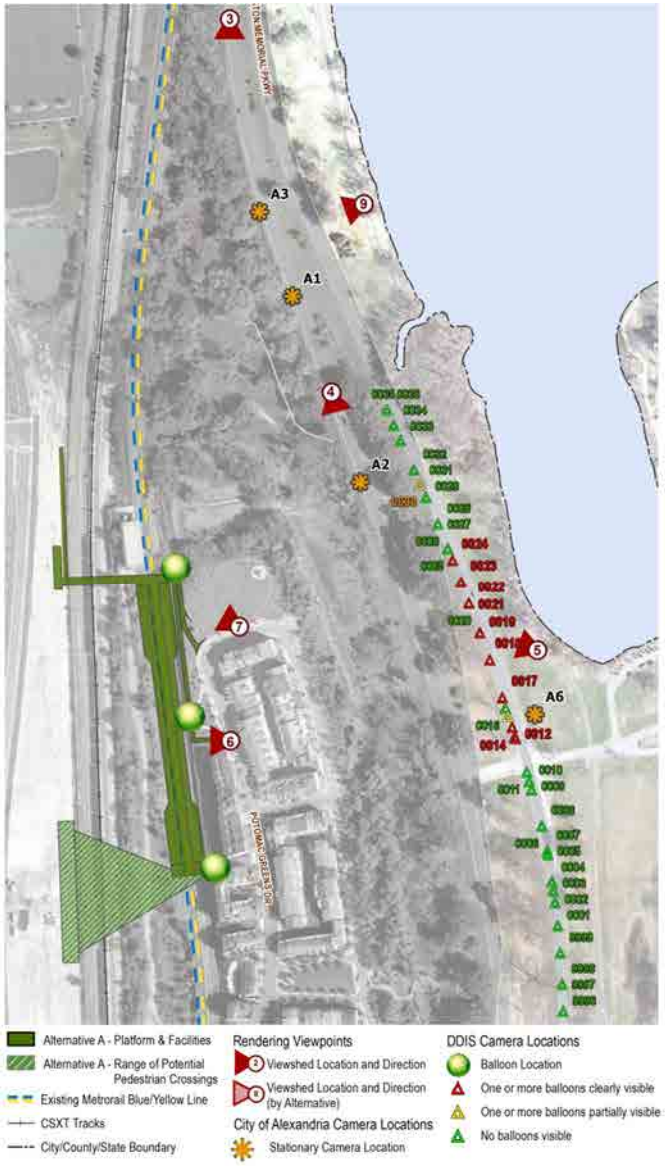
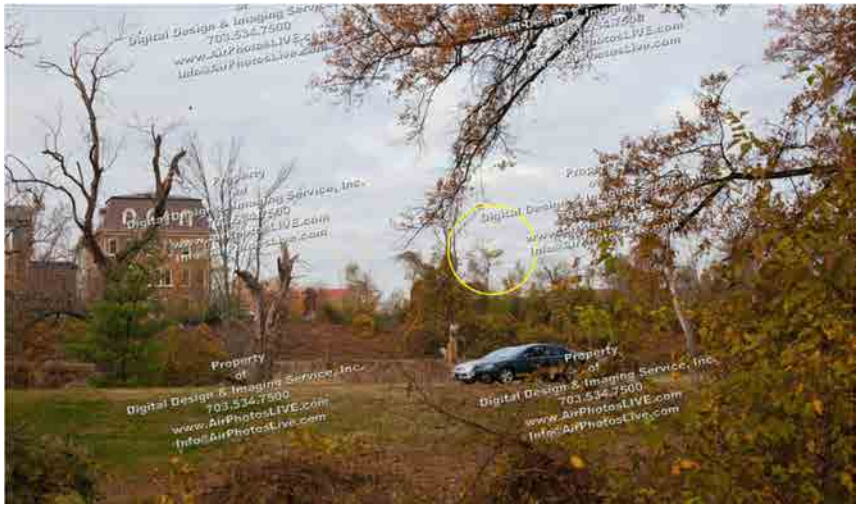
View Location	Description/Findings
	Visibility analysis confirms that station would be visible year-round, and that the building height is accurately depicted in the rendering. **No changes to rendering are warranted.**
	Balloon Test Photo #0021 (Closest)
	
	2016 Viewshed 5 (Rendering)

Figure 3-10: Alternative B Viewshed 3

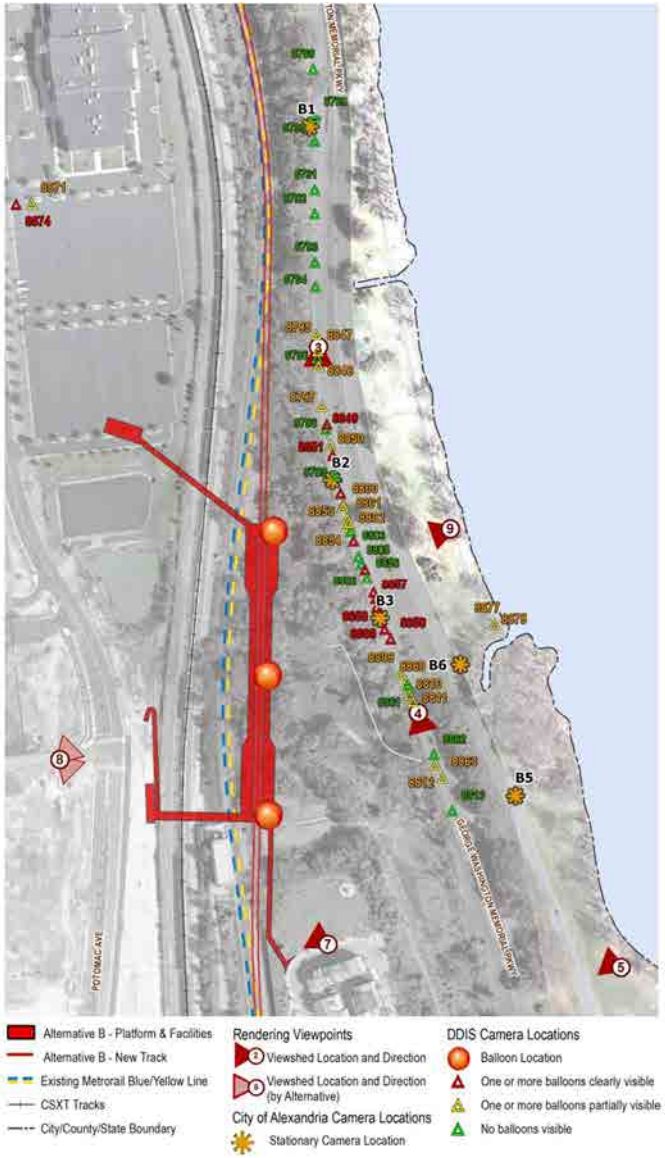
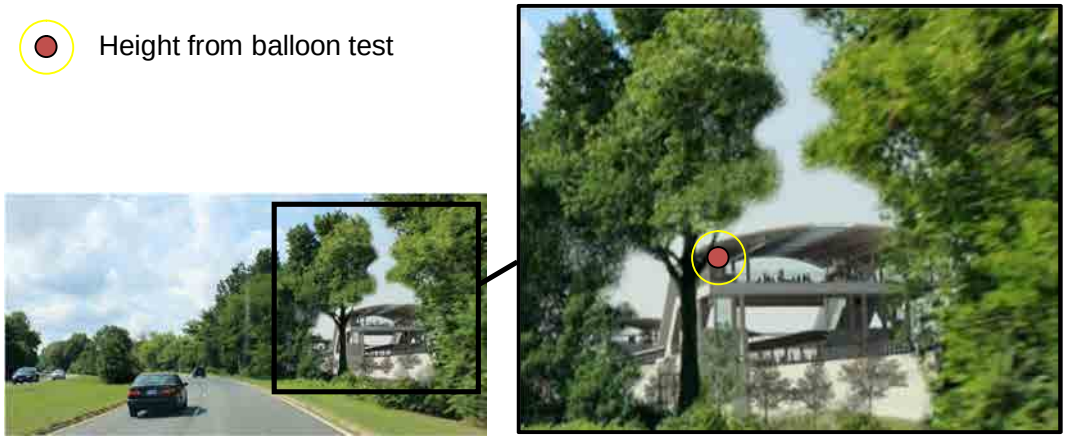
View Location	Description/Findings
	Visibility analysis confirms that the proposed station would be visible from this location. Based on height of balloon it was determined that the original rendering overstates the scale of the building. **The rendering has been modified accordingly.** The revised rendering is shown in Figure 3-11.
	Balloon Test Photo #8847 (Closest)
	ORIGINAL ENLARGED
	2016 Viewshed 3 (Original Rendering)
	Height from balloon test  ORIGINAL ENLARGED

Figure 3-11: Alternative B Viewshed 3 Revised Rendering

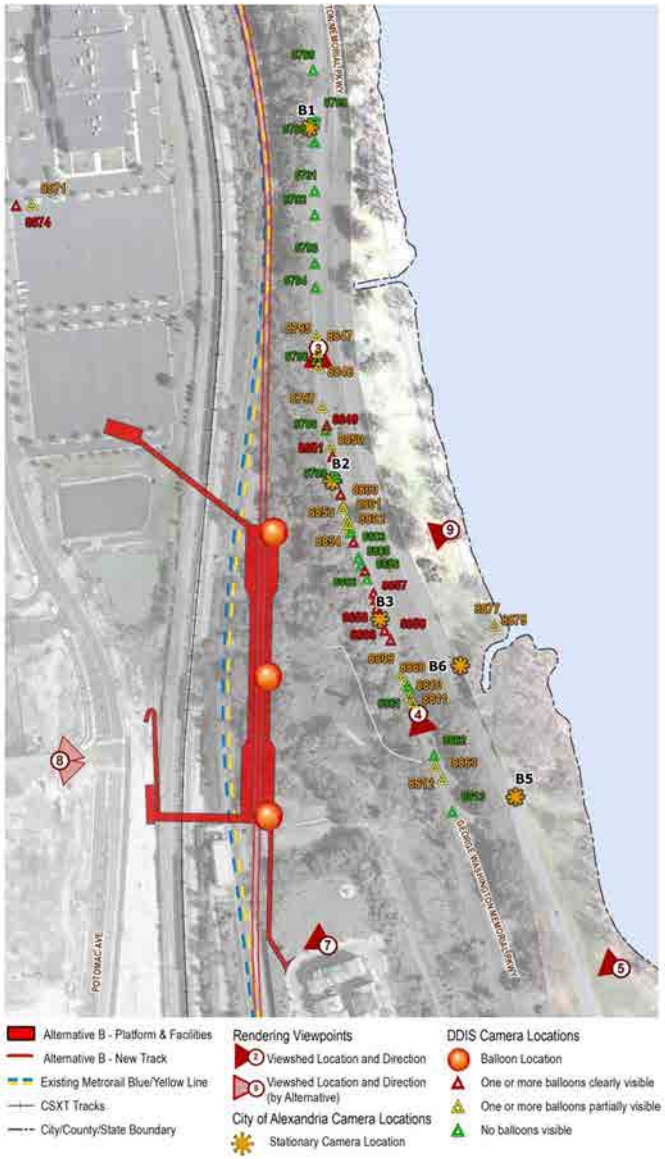
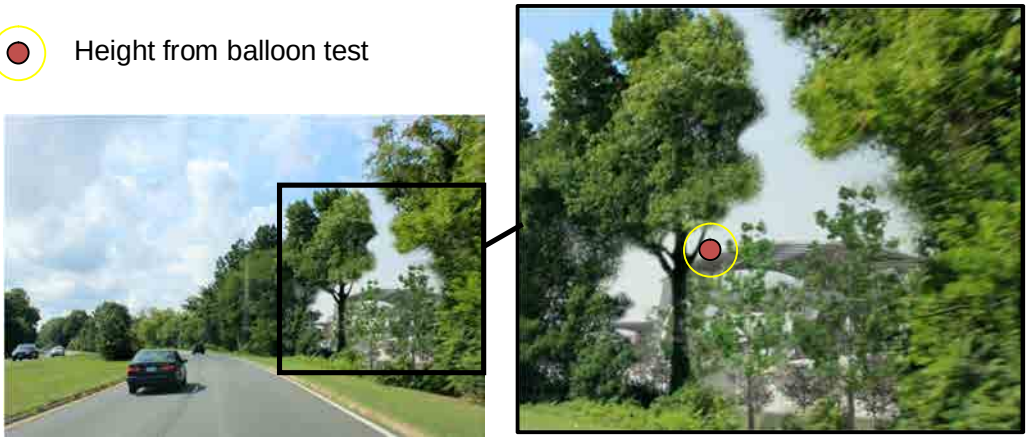
View Location	Description/Findings
	The station rendering for Alternative B Viewshed 3 has been revised as shown below to more precisely match the height of the station as depicted in the balloon test simulation. **Balloon Test Photo #8847 (Closest)** ORIGINAL ENLARGED **2016 Viewshed 3 (Revised Rendering)** Height from balloon test  ORIGINAL ENLARGED

Figure 3-12: Alternative B Viewshed 5

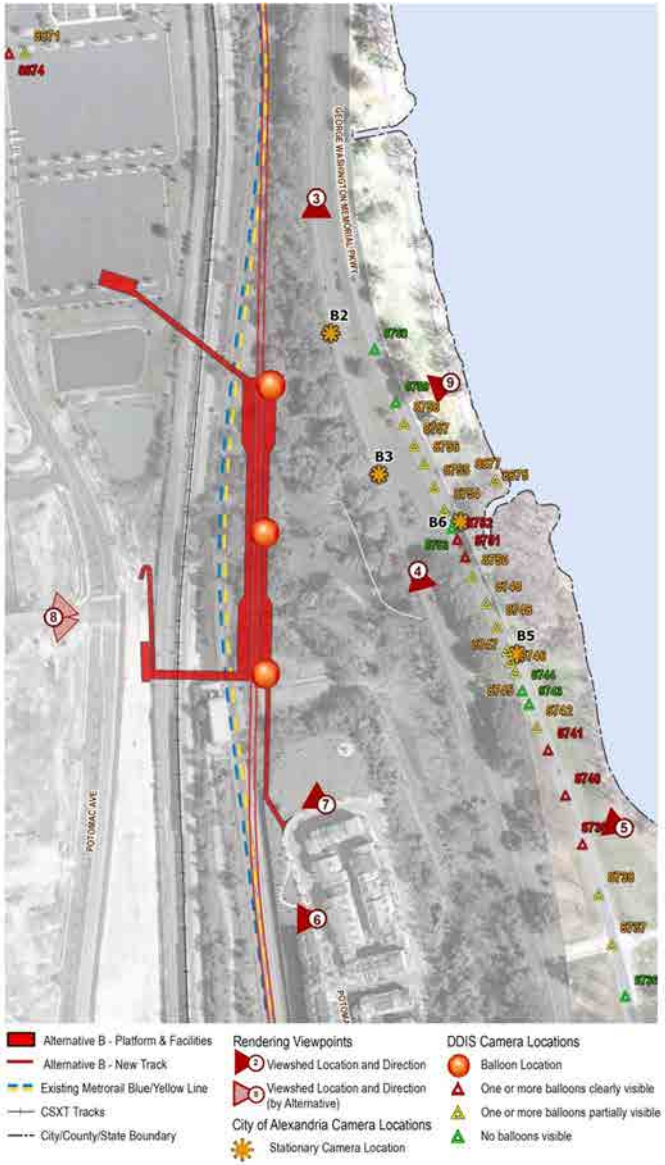
View Location	Description/Findings
	Visibility analysis indicates that station would be partially visible in winter, but obscured behind trees in summer. **No changes to rendering are warranted.**
	Balloon Test Photo #8739 (Closest)
	2016 Viewshed 5 (Rendering)

Figure 3-13: Alternative B Viewshed 9

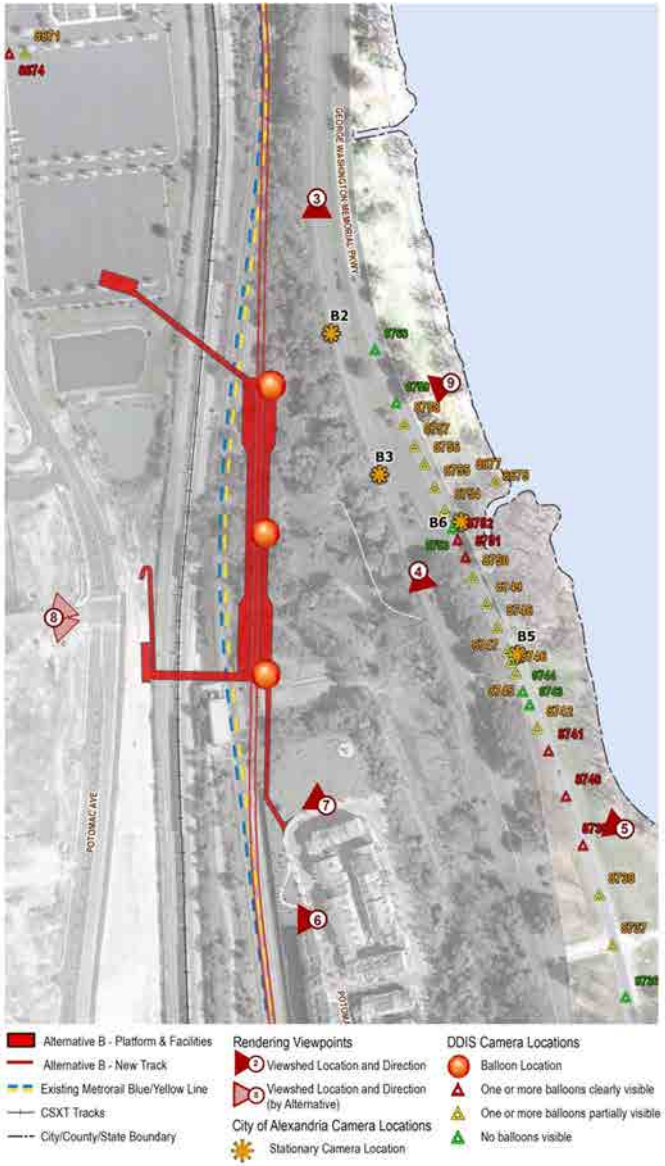
View Location	Description/Findings
	Visibility analysis indicates that station would be partially visible in winter, but obscured behind trees in summer. **No changes to rendering are warranted.**
	Balloon Test Photos #8875 and 8877 (Closest)
	Viewshed 9 (Existing)

Figure 3-14: Alternative D Viewshed 1

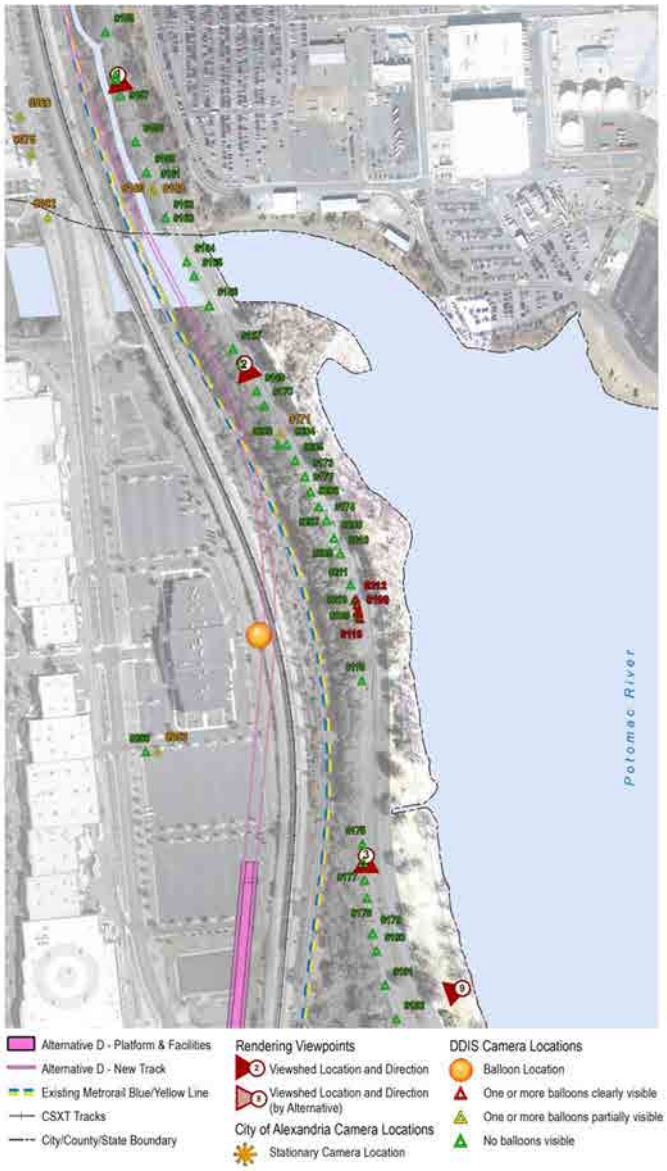
View Location	Description/Findings
	Visibility analysis confirms that guideway would be visible year-round, and that the guideway height is accurately depicted in the rendering. **No changes to rendering are warranted.**
	Balloon Test Photo #9198 (Closest)
	2016 Viewshed 1 (Rendering)

Figure 3-15: Alternative D Viewshed 2

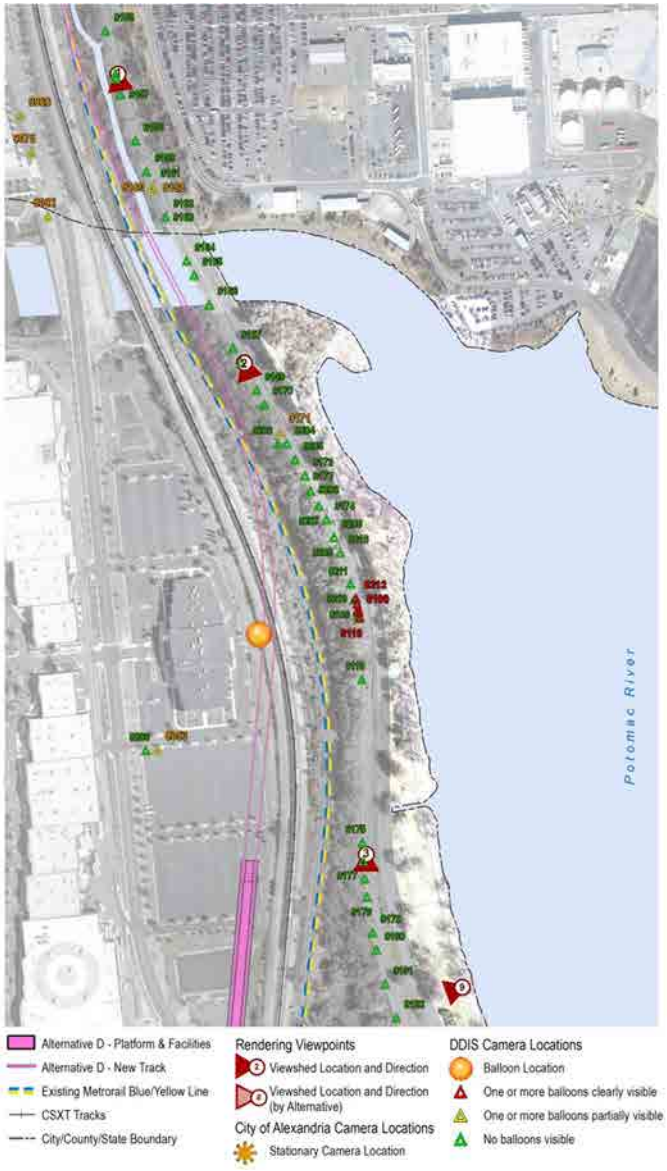
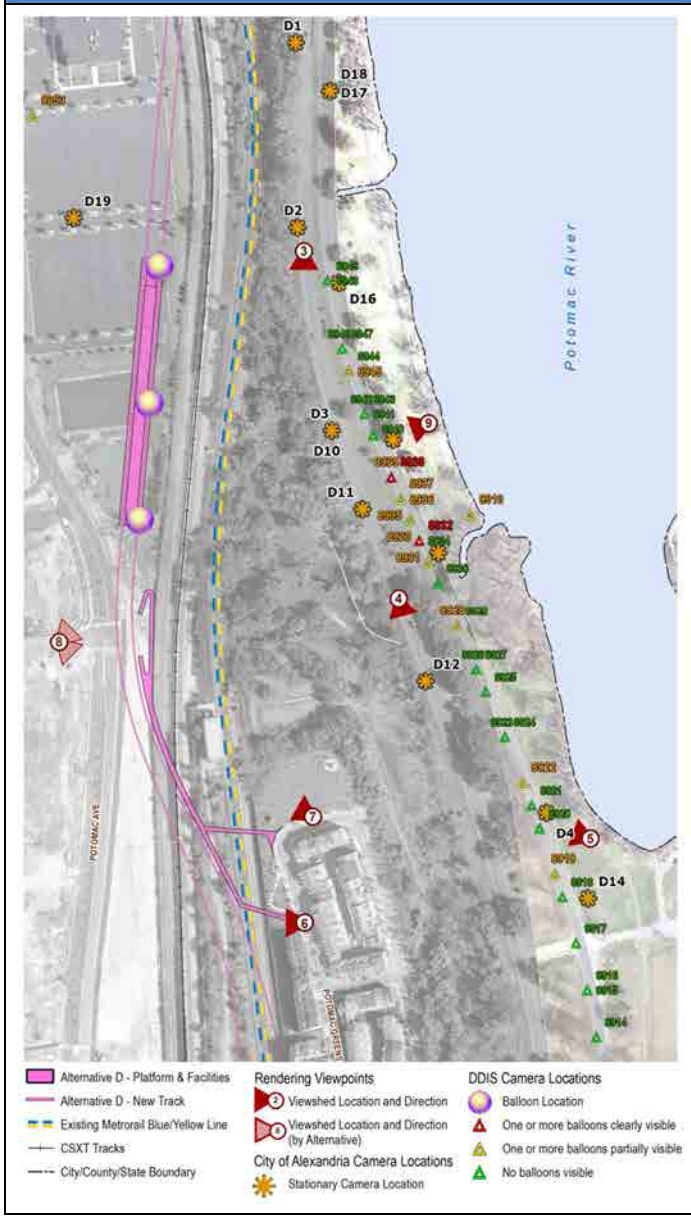
View Location	Description/Findings
	Visibility analysis indicates that the guideway would be partially visible in winter, but obscured behind trees in summer. **No changes to rendering are warranted.**
	Balloon Test Photo #9171 (Closest)
	2016 Viewshed 2 (Rendering)

Figure 3-16: Alternative D Viewshed 9

View Location	Description/Findings
	Visibility analysis indicates that station would be visible in winter, but obscured behind trees in summer. **No changes to rendering are warranted.**
	Balloon Test Photo #9010 (Closest)
	Viewshed 9 (Existing)

POTOMAC YARD METRORAIL STATION
ENVIRONMENTAL IMPACT STATEMENT

Administrative Review Draft

Cultural Resources Technical Memorandum

February 2013

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1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

Cultural resource investigations are being completed for the project in accordance with federal, state and local laws and regulations, including the National Environmental Policy Act (NEPA) [42 U.S.C. 4321], Section 106 of the National Historic Preservation Act of 1966 (NHPA) [16 U.S.C. 470f], 36 CFR Part 800, the Archaeological Resources Protection Act of 1979 (ARPA) [16 U.S.C. Sections 470aa-470mm], the Virginia Antiquities Act (Section 10.1-2300 Code of Virginia), the City of Alexandria's Archaeological Protection Code (Zoning Ordinance, Section 11-411 (D), 1992), Article X, Section 10-100 of the Zoning Ordinance of the City of Alexandria (1992) and Section 31A of the Arlington County Zoning Ordinance.

This technical memorandum summarizes the results of cultural resource investigations through January 2013 to identify and evaluate potential effects to significant cultural resources within the Areas of Potential Effects (APEs). The analysis is ongoing, and this memorandum will be updated to include the results of additional research as it is completed. The findings of this analysis are being incorporated into the Draft EIS.

The document is organized as follows:

- Section 1.0: Introduction
- Section 2.0: The Section 106 Process
- Section 3.0: Opening Year Conditions
- Section 4.0: Assessment of Potential Effects
- Section 5.0: Resolution of Adverse Effects

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

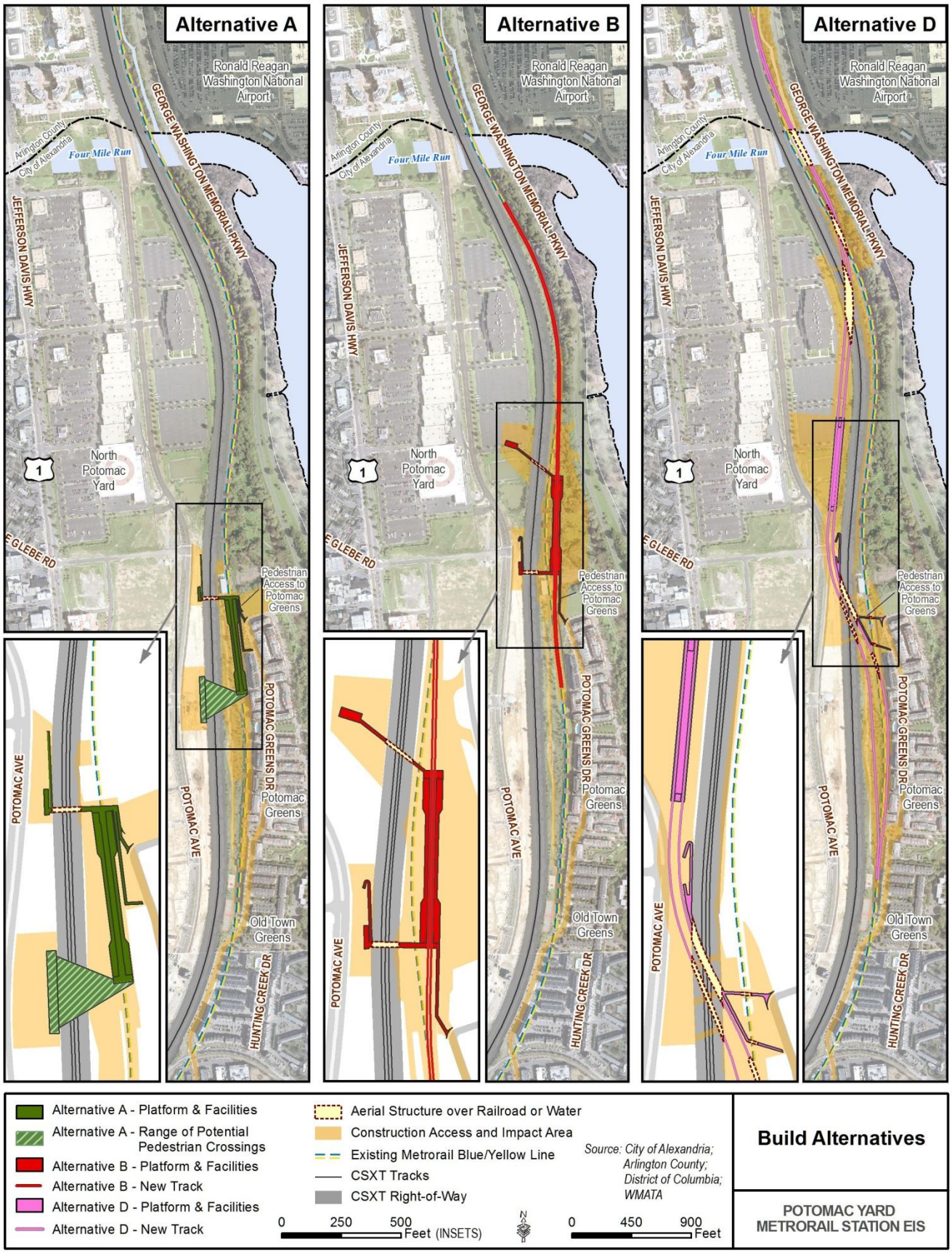
The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail through the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Figure 1-1: Build Alternatives



Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned.

1.2 Regulations and Guidance

Federal, state and local cultural resources laws, regulations and guidance that are most relevant to the proposed project are summarized in this section.

1.2.1 Federal Laws and Guidelines

National Historic Preservation Act of 1966 [16 U.S.C. Section 470 et seq.]

The National Historic Preservation Act of 1966 (NHPA) establishes federal policy and programs on historic preservation, including the National Register of Historic Places (NRHP), through which this policy is implemented. The NRHP is the official federal list of buildings, structures, objects, sites, districts, and landscapes significant in American history, architecture, archeology, engineering, and culture and worthy of preservation (NPS 2011). Referred to as “historic properties” under the NHPA, significant cultural resources include any “prehistoric or historic district, site, building, structure, object, or landscape included in, or eligible for inclusion in, the National Register including artifacts, records, and material remains of such a property or resource” [16 U.S.C. Section 470w(5)]. Historic properties also include resources determined to be National Historic Landmarks (NHL). The NHL program, also established by the NHPA, recognizes nationally significant historic properties designated by the Secretary of the Interior (SOI) because they possess exceptional value or quality in illustrating or interpreting United States heritage.

The NHPA also established the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officers (SHPO). The ACHP is an independent agency responsible for implementing Section 106 of the NHPA by developing procedures to protect cultural resources included in or eligible for inclusion in the NRHP. SHPOs administer the national historic preservation program at the state level by consulting with federal agencies during Section 106 review, reviewing NRHP nominations, and maintaining data on historic properties that have been identified but not yet nominated.

36 CFR Part 800 – Protection of Historic Properties – The Section 106 Process

The Section 106 process (as outlined in 36 CFR Part 800 of the NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties through consultation with SHPOs and other interested parties. The process contains five steps:

1. Initiating the Section 106 process;
2. Identifying historic properties;
3. Assessing adverse effects;
4. Resolving adverse effects, and
5. Implementing stipulations in an agreement document.

The Section 106 process affords the ACHP and the SHPO, as well as other consulting parties, a reasonable opportunity to comment on any undertaking that would adversely affect historic properties listed in or eligible for listing in the NRHP.

Section 4(f) of the Department of Transportation Act (49 U.S.C. Section 1996)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 23 U.S.C. 138 and 49 U.S.C. 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation land, wildlife and waterfowl refuges, and historic sites." Section 4(f) states that the Secretary of Transportation "may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- There is no prudent and feasible avoidance alternative to the use of the land from the Section 4(f) property; and
- The program or project includes all possible planning to minimize harm to the Section 4(f) property resulting from the use.

American Antiquities Act of 1906 [16 U.S.C. Sections 431-433]

The American Antiquities Act was enacted with the primary goal of protecting cultural resources in the United States. As such, it prohibits appropriation, excavation, injury, or destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government, without permission of the secretary of the federal department with jurisdiction.

Archaeological and Historic Preservation Act [16 U.S.C. Sections 469-469(c)-2]

The Archaeological and Historic Preservation Act (AHPA) provides for preserving significant historic or archaeological data that may otherwise be irreparably lost or destroyed by construction of a project by a federal agency or under a federally-licensed activity or program.

Archaeological Resources Protection Act of 1979 [16 U.S.C. Sections 470aa-470mm]

The Archaeological Resources Protection Act of 1979 (ARPA) provides for the protection of archaeological resources on public lands and Indian lands. It does so by regulating legitimate archaeological investigations; defining a range of prohibited actions including damage, defacement and unpermitted excavation or removal of archaeological resources on public and Indian lands; and establishing substantial fines and penalties for those convicted of infractions.

1.2.2 State Laws and Guidelines

Virginia Antiquities Act (Section 10.1-2300 Code of Virginia)

The Virginia Antiquities Act establishes the Director of the Virginia Department of Historic Resources (VDHR) as the SHPO. Under NHPA Section 101b, the SHPO is required to provide consultation for federal undertakings. Additionally, this act provides for the protection of archaeological resources on state-controlled lands and human burials located in the Commonwealth of Virginia.

Virginia Department of Historic Resources, *Guidelines for Conducting Historic Resources Survey in Virginia* (2011)

VDHR as part of its mission to "promote comprehensive, statewide survey of historic resources" establishes standards for archaeological, architectural and cultural landscape surveys in Virginia (2011:6). VDHR's standards are based on more general federal guidelines established in *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (National Park Service 1983, n.d.).

1.2.3 Local Regulations and Guidelines

City of Alexandria Zoning Ordinance, Article X. – Historic Districts and Buildings

Article X of the City's Zoning Ordinance establishes the Old and Historic Alexandria District. The District includes a zone 500 feet east and west of the centerline of the GWMP extending to the border of Arlington County at Four Mile Run. As described in the zoning ordinance, the purpose of the Historic District is to: "promote the education, prosperity and general welfare of the public through the identification, preservation, and enhancement of buildings, structures, landscapes, settings, neighborhoods, places and features with special historical, cultural, artistic, and architectural significance." Any development within the historic district requires review by the City Old and Historic Alexandria District Board of Architectural Review (BAR). The ordinance requires that new development receive a Certificate of Appropriateness which is approved by the BAR. The BAR will consider the architectural design, height, form and style of a new structure before issuing a certificate.

City of Alexandria Zoning Ordinance, Article XI, Division B. – Development Approvals

Article XI of the City Zoning Ordinance describes the development approval process employed in the City of Alexandria to "ensure that the use and development of land as authorized in the zoning ordinance is undertaken in an orderly and proper manner that furthers the public health, safety and welfare and makes adequate provision for ensuring the availability of appropriate public and private services and amenities and for minimizing the adverse effects of such development." With respect to cultural resources, Section 11-407 (A)(1)(f) makes special provisions for pre-application review of development in historic districts at a *conceptual review conference* and Section 11-411, the City of Alexandria's *Archaeological Protection Code* makes provision for archaeological review as part of the normal development approval process.

City of Alexandria Archaeological Standards

The City of Alexandria's *Archaeological Standards* (Alexandria Archaeology 1996) set the minimum standards for archaeological investigations in the City of Alexandria conducted as part of normal compliance with the City's *Archaeological Protection Code*. The standards include requirements for a preliminary archaeological assessment by Alexandria Archaeology (AA), a background documentary study and archaeological evaluation conducted by a qualified archaeological consultant and completion of the required preservation actions detailed in the approved resource management plan.

City of Alexandria, *Master Plan,* Historic Preservation Element Chapter, 1992

The City of Alexandria's Master Plan is composed of 18 Small Area Plans (SAPs) and several city-wide topical chapters. The Historic Preservation Chapter adopted in 1992 identifies issues, principles, goals and recommendations to guide the city in its decision making with respect to historic preservation. It also contains SAPs for historic preservation which "identifies specific resources, issues and preservation objectives and provide recommendations for each neighborhood" (City of Alexandria 1992).

Of particular relevance are sections devoted to the Old and Historic Alexandria District established in 1946, the Mount Vernon Memorial Highway (MVMH), and the Potomac Yard SAP for Historic Preservation (City of Alexandria 1992: 76-82). The Master Plan reaffirms the BAR requirement in the Old and Historic Alexandria District for "any building proposed for construction, reconstruction, alteration or restoration within the District" (City of Alexandria 1992: 5). Additionally, the Master Plan identifies "the protection of the 71 year old George Washington Memorial Parkway's character and visual appearance" as a "critical preservation issue" and notes that "design guidelines which are compatible with the highway and the City's Old and Historic Alexandria District can limit the negative impact upon this important roadway and parkland" (City of Alexandria, 1992: 79).

Arlington County, Arlington Historic Preservation Master Plan, 2006

The Historic Preservation Master Plan is an implementation plan for Arlington County's historic preservation priorities, goals, and objectives and an element of the County's Comprehensive Plan. The Historic Preservation Master Plan was developed in coordination with the Arlington County Historical Affairs and Landmark Review Board (HALRB), the

County's Historic Preservation Program (HPP), and other stakeholders. No study area cultural resources are identified or evaluated in the Historic Preservation Master Plan.

Arlington County Zoning Ordinance, Section 31A Historic Preservation Districts

Section 31A of Arlington County's Zoning Ordinance is the enforceable regulation for the identification, preservation, and enhancement of buildings, structures, landscapes, settings, neighborhoods, places and features with special historical, cultural, architectural and archaeological significance within the County. The ordinance establishes the County's Historical Affairs and Landmark Review Boards, as well as the boards' responsibilities. The ordinance also establishes the process for designating historic overlay districts. There are no County-designated historic overlay districts in the study area.

Arlington County Historic Resources Inventory

The Historic Resources Inventory (HRI) is a planning document that identifies County-designated cultural resources, as well as resources listed in both the Virginia Landmarks Register and the NRHP within Arlington. The HRI does not identify any cultural resources within the study area.

Arlington County Historical Markers List

Arlington County maintains a list of its historic markers erected since 1965 at the sites of 20 Civil War fortifications and other historic sites within the present boundaries of the County. The list does not identify any historical markers within the study area.

1.3 Methodology

1.3.1 Background Research

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

- VDHR Archives in Richmond, Virginia;
- National Register of Historic Places (NRHP);
- Virginia Landmarks Register (VLR);
- Alexandria Archaeology (AA), City of Alexandria, Virginia;
- Alexandria Library, Special Collections, City of Alexandria, Virginia;
- Neighborhood Services Division's Historic Preservation Program, Arlington County, Virginia;
- Department of Planning and Zoning, City of Alexandria, Virginia;
- Office of Historic Alexandria, City of Alexandria, Virginia;
- Library of Congress (LoC), Washington, DC;
- National Archives, Washington, DC, College Park, MD, and Suitland, MD;
- Natural Resources Conservation Service's Geospatial Data Gateway (NRCS 2012b)
- NRCS Soils webpage (NRCS 2012a);
- U.S. Geological Survey (USGS), Store (2012a);
- USGS, EarthExplorer website (2012b); and
- Historic Aerials website (Nationwide Environmental Title Research LLC 2009)
- National Park Service, Mount Vernon Memorial Highway Cultural Landscape Report, 1987; and
- National Park Service, Vegetation of the George Washington Memorial Parkway Cultural Landscape Report, 2009.

Information gathered during background research was used to guide the development of the Areas of Potential Effects (APEs) and the site inspections. Previous cultural resource surveys conducted in proximity to the project area as well as maps of previously recorded historic and and/or prehistoric properties were consulted prior to the site visit in order to assist in the preparation of this report.

1.3.2 Definition of the Areas of Potential Effects

APEs for both archaeology and historic architecture were defined for the project in consultation with VDHR. The APEs encompass all areas where construction activities could directly or indirectly impact significant historic properties. The

APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[d]).

APE for Archaeology

The APE for archaeology encompasses all areas of anticipated project related ground disturbance as well as temporary easements and staging areas. Ground disturbing activities include limited excavation, grading, cutting and filling, and utility installation activities as well as construction activities that may result in unintentional soil compaction, erosion or other disturbance. The APE for archaeology includes the temporary Limits of Construction (LOC) and Permanent Limits of Disturbance (LOD) for each Build Alternative as presented in the *Refinement of Alternatives, Constructability and Construction Staging Report* (AECOM 2012a).

VDHR staff concurred with the proposed APE for archaeology in June 2012. The APE for archaeology is 18.25 hectares (45.1 acres) in area and consists of railroad rights-of-way, commercial and residential properties, wetlands, forested woodlots and manicured parklands including portions of the NPS-administered GWMP (**Figure 1-2**).

APE for Historic Architecture

The APE for historic architecture includes all direct and indirect effects of the proposed project activities. The APE for historic architecture encompasses properties within the limits of disturbance, as well as adjacent properties that may be visually or contextually affected by the project. Development of the APE took into consideration effects that could result from temporary or permanent construction and operational activities that include: physical effects, visual effects, auditory effects, atmospheric effects, vibration effects, and changes in the character or use of historic properties.

In response to VDHR's request for justification of the boundaries of the proposed APE for historic architecture, FTA presented a revised APE at the Section 106 Initiation Meeting held at VDHR's Offices in Richmond, Virginia on July 9, 2012. VDHR staff concurred with the revised APE for historic architecture at that time. See **Appendix K** for a copy of the meeting notes.

Figure 1-2 shows the revised APE for historic architecture. This APE includes Potomac Yard and is bound on the west by U.S. Route 1 (Jefferson Davis Highway), on the east by the Potomac River, and on the south by Slaters Lane. On the north the APE extends a short distance beyond South Glebe Road in Arlington County. The APE includes NPS-administered GWMP park land, as well as the actual parkway and the scenic easement held by the NPS within the project area.

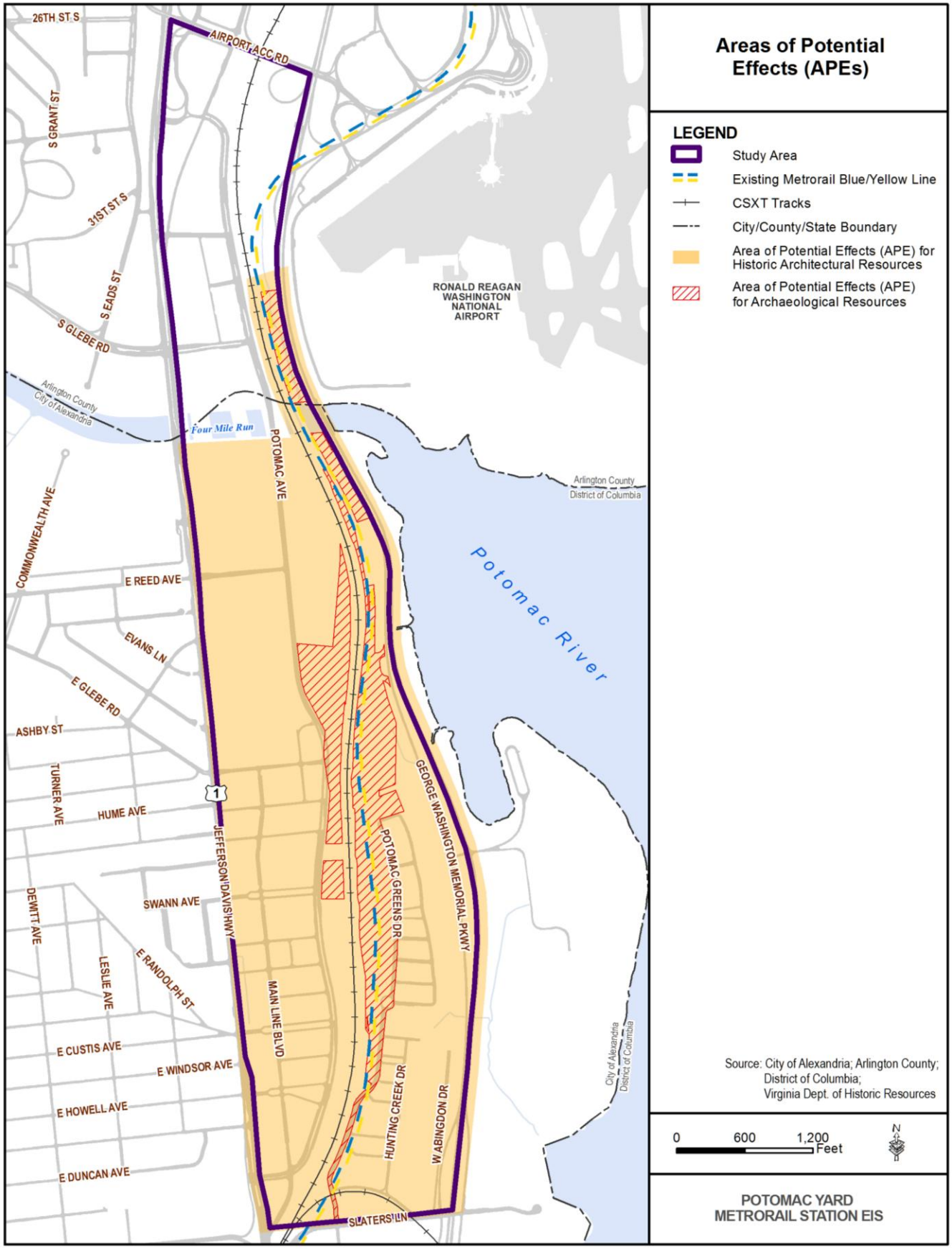
If project plans are modified from those analyzed in this study, the APEs may need to be adjusted and additional research and survey may be necessary to evaluate previously unevaluated areas and the effects of the project on any significant historic properties.

1.3.3 NRHP Criteria for Evaluation

Potential historic properties documented during the identification phase must be evaluated for NRHP eligibility. Historic properties must meet at least one of the four NRHP criteria and retain sufficient historic integrity to convey their significance to be considered eligible for listing in the NRHP. The NRHP uses the following four Criteria for Evaluation (36 CFR 60.4) to evaluate significance:

- **Criterion A**: [properties] that are associated with events that have made a significant contribution to the broad patterns of our history; or
- **Criterion B**: [properties] that are associated with the lives of persons significant to our past; or
- **Criterion C**: [properties] that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- **Criterion D**: [properties] that have yielded, or may be likely to yield, information important in prehistory or history.

Figure 1-2 Areas of Potential Effects (APEs)



Certain kinds of properties that are not usually considered for listing in the NRHP may be eligible if they meet special requirements called Criteria Considerations. In order for a property to qualify under one of the seven Criteria Considerations (36 CFR 60.4), it must first meet one or more of the four Criteria for Evaluation and must also possess integrity. The seven Criteria Considerations are as follows:

- **Criteria Consideration (a):** a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- **Criteria Consideration (b):** a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **Criteria Consideration (c):** a birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or
- **Criteria Consideration (d):** a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, from association with historic events; or
- **Criteria Consideration (e):** a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- **Criteria Consideration (f):** a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- **Criteria Consideration (g): a** property achieving significance within the past 50 years if it is of exceptional importance.

1.3.4 Criteria of Adverse Effect

Section 106 regulations state that if there are historic properties in the APE which may be affected by a federal undertaking, the agency official will assess adverse effects, if any, in accordance with the Criteria of Adverse Effect described in 36 CFR 800.5. As stated in the guidance, an "adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" (36 CFR 800.5(a)(i)). Effects can be direct, indirect, or cumulative.

Examples of adverse effects provided in 36 CFR Part 800.5(a)(2) include:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary [of Interior] *Standards for the Treatment of Historic Properties* (36 CFR Part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

1.3.5 Evaluating Impacts under NEPA

Under NEPA, when determining the significance of adverse effects or impacts to the human environment two variables are assessed: *context*, defined as "the geographic, biophysical, and social context in which the effects will occur"; and *intensity* or "the severity of the impact, in whatever context(s) it occurs" (National Preservation Institute, 2012).

In assessing these variables with respect to cultural resources, the NEPA regulations specify that the agency consider:

1) "Unique characteristics of the geographic area such as proximity to historic or cultural resources" (40 CFR 1508.27(b)(3)); and
2) "The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources" (40 CFR 1508.27(b)(8)).

NEPA recognizes direct effects, effects that occur "at the same time and place" as the action (40 CFR 1508.8(a)); indirect effects that are foreseeable but "occur later in time or farther removed in distance" (40 CFR 1508.8(b)); and cumulative impacts that result "from the incremental impact of the action when added to other past present and reasonably foreseeable future actions" (40 CFR 1508.7). Under NEPA effects and impacts can be characterized as beneficial or detrimental (40 CFR 1508.8).

1.3.6 Resolution of Adverse Effects

As part of the Section 106 process, the federal agency must notify the ACHP of the adverse effect, invite them to participate in consultation, and submit information consistent with 36 CFR part 800.11 for their review. The ACHP may participate in consultation when there are substantial impacts to important historic properties, when a project presents important questions of policy or interpretation, when there is a potential for procedural problems, or when there are issues of concern to Indian tribes. In most cases, consultation results in the development of a Memorandum of Agreement (MOA), which outlines agreed upon measures that the agency will take to avoid, minimize, or mitigate the adverse effects.

1.3.7 ARPA Permitting

The project required an Archaeological Resources Protection Act (ARPA) permit, because portions of the APE are located on federal land. The permit application was approved by NPS in August 2012. The ARPA permit describes the Phase I testing and field work strategies that would be used to identify potential archaeological sites within the APE. After the Phase I testing and field work was completed, a preliminary ARPA report was submitted to NPS and AA in December 2012 presenting the results of the analysis.

2.0 SECTION 106 PROCESS

2.1 State Historic Preservation Office (SHPO) Coordination

Section 106 consultation was initiated by FTA with VDHR on May 10, 2012 (VDHR File No. 2012-0717). In the submission, FTA included proposed APEs for historic architecture and archaeology (**Appendix C**). On June 12, 2012, VDHR concurred that the project was a "federal undertaking" subject to Section 106 review and provided general comments on the proposed undertaking indicating concurrence with the proposed APE for archaeology. Pursuant to 36 CFR Part 800.2 (c), VDHR requested that FTA submit a list of appropriate consulting parties and their comments on the proposed project. VDHR also requested additional justification for the boundaries of the proposed APE for historic architecture (**Appendix D**).

2.2 Section 106 Initiation Meeting

A Section 106 Initiation Meeting was held at VDHR offices in Richmond, Virginia on July 9, 2012. Representatives of VDHR, FTA, WMATA and AECOM were present. In response to VDHR's request for justification of the boundaries of the proposed APE for historic architecture, AECOM presented a revised APE for historic architecture. VDHR staff concurred with the revised APE for historic architecture at that time.

At the meeting, VDHR requested that FTA submit a proposed Phase I archaeological testing methodology to VDHR, AA, and NPS for review and comment. Additionally, VDHR requested a Reconnaissance Level Survey Form be completed for the Potowmack Crossing at Old Town Condominiums complex to satisfy the identification phase for historic architectural resources. Following further research and survey, it was determined that Potowmack Crossing at Old Town Condominiums is potentially eligible as a contributing resource the Colonial Revival Apartment Complexes of Alexandria Multiple Property Submission (MPS). The Reconnaissance Level Survey Form for the CRACA is provided in **Appendix E**. The Reconnaissance Level Survey Form for the Potowmack Crossing at Old Town Condominiums is provided in **Appendix F**. The Reconnaissance Level Survey Forms have not been submitted to VDHR, but the anticipated submittal timeframe is February 2013. The Reconnaissance Level Survey Form the identification phase of the Section 106 process for historic architectural resources.

2.3 Identification of Consulting and Interested Parties

In addition to seeking the views of VDHR, FTA has invited certain organizations and individuals who have a demonstrated interest in the project to participate in the process. These organizations and individuals are referred to as Section 106 consulting parties, which review information relevant to the identification, evaluation and assessment of effects to historic properties that could result from the project. FTA sent invitations to potential consulting parties in September 2012. The list of invited consulting parties is provided in **Appendix G.**

Consulting parties involved in the Section 106 review process to date include FTA, VDHR, NPS, City of Alexandria, and WMATA. The project is presently in the resource evaluation phase of the Section 106 process, and the first consulting parties meeting is scheduled in February/March 2013.

2.4 Section 106 Reporting

2.4.1 Archaeology

The Phase I archaeological testing methodology was approved by VDHR, AA and NPS in September 2012. In accordance with VDHR policies Data Sharing System (DSS) Archaeological Site Recordation Forms were submitted to NPS and VDHR in December 2012. A Draft Phase I cultural resources survey report is being prepared for submission by FTA to VDHR and other consulting parties for concurrent review and comment (anticipated submittal February 2013).

Further Phase II archaeological evaluations (field investigations) are necessary to determine whether archaeological resources are eligible for inclusion in the NRHP or VLR, and thus considered historic properties. The Phase II evaluation will occur after the selection of the preferred alternative. A final effects assessment report will be completed in consultation with and to the standards of VDHR pending completion of a Phase II archaeological evaluation.

2.4.2 Historic Architecture

VDHR requested that an effects assessment report be prepared for the project for significant historic architectural resources. The effects assessment report is subject to the review and approval by VDHR and other consulting parties in accordance with the Section 106 process.

3.0 OPENING YEAR CONDITIONS

3.1 Previously Identified Archaeological Resources

Two archaeological sites have been previously identified in the APE, which are summarized in **Table 3-1.**

Table 3-1: Previously Identified 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	44AX0207 is an 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

Source: VDHR Archives

3.1.1 Alexandria Canal (44AX0028)

Historic mapping (Boschke 1861; Hopkins 1879; Strum 1900) confirms that 44AX0028 likely intersects the southernmost limits of the APE for archaeology in the vicinity of the intersection of Slaters Lane and Portners Road in the City of Alexandria, Virginia. At this location in the APE for archaeology anticipated construction activities are limited to the use of existing surface streets for construction access. The Alexandria Canal has not been assessed for NRHP or VLR eligibility.

3.1.2 Campsite No. 1 of the American Wagon Train Sept. 1781 (44AX0207)

The location of 44AX0207, as recorded with VDHR, was derived from historic documents. The site's precise location on Four Mile Run has not been archaeologically verified to date. Historic mapping (Boschke 1861; Hopkins 1879; BoS 1915; USGS 1945) indicates that the portion of the APE intersected by the mapped location of 44AX0207 consists of made-land constructed between 1915 and 1945 (AECOM 2012b: [14-15]). 44AX0207 has not been assessed for NRHP or VLR eligibility.

3.2 Previously Identified Historic Architectural Resources

VDHR records identified two NRHP- and VLR-listed resources in the APE. The two known historic properties in the APE relate to the George Washington Memorial Parkway: the Mount Vernon Memorial Highway (MVMH) (VDHR ID# 029-0218) and the Parkways of the National Capital Region, 1913-1965 (PNCR) (VDHR ID# 029-5224). These resources are shown in **Figure 3-1.** The complete NRHP nominations for each resource are provided in **Appendices H and I**. See **Table 3-2** and Photographic Plates 1-2 in **Appendix J** for additional details for each resource.

The boundaries of the MVMH and PNCR are assumed to be the same, encompassing the original MVMH right-of-way. The boundary shown in **Figure 3-1** is currently recognized by VDHR as the historic area of the GWMP for Section 106 and NEPA purposes. The boundary may be expanded through the Section 106 process to include all

GWMP park land. For the purpose of this analysis, all GWMP park property, including lands that extend beyond the historic roadway right-of-way, is assumed to be an NRHP-listed or eligible historic architectural resource.

Table 3-2: Previously Identified Historic Architectural Resources in the APE

Name	Location	Description	Federal/State Listing Status	NRHP/VDHR 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: 81000079 VDHR: 029-0218	Transportation engineering, landscape architecture, and sculpture; and a resource commemorative in intent. Period of Significance is 1929-1932
Parkways of the National Capital Region, 1913-1965 (PNCR)	Includes both the MVMH and GWMP	Includes both the MVMH and GWMP as well as the Baltimore-Washington Parkway, Suitland Parkway, and Rock Creek and Potomac Parkway	NRHP: 6/2/1995 VLR: 10/8/1991	NRHP: 64500086 VDHR: 029-5524	Nomination does not specify significance criteria, but it is assumed that they mirror those listed above for MVMH and GWMP

Source: VDHR Archives, and NRHP website (March 2012).

3.2.1 Mount Vernon Memorial Highway

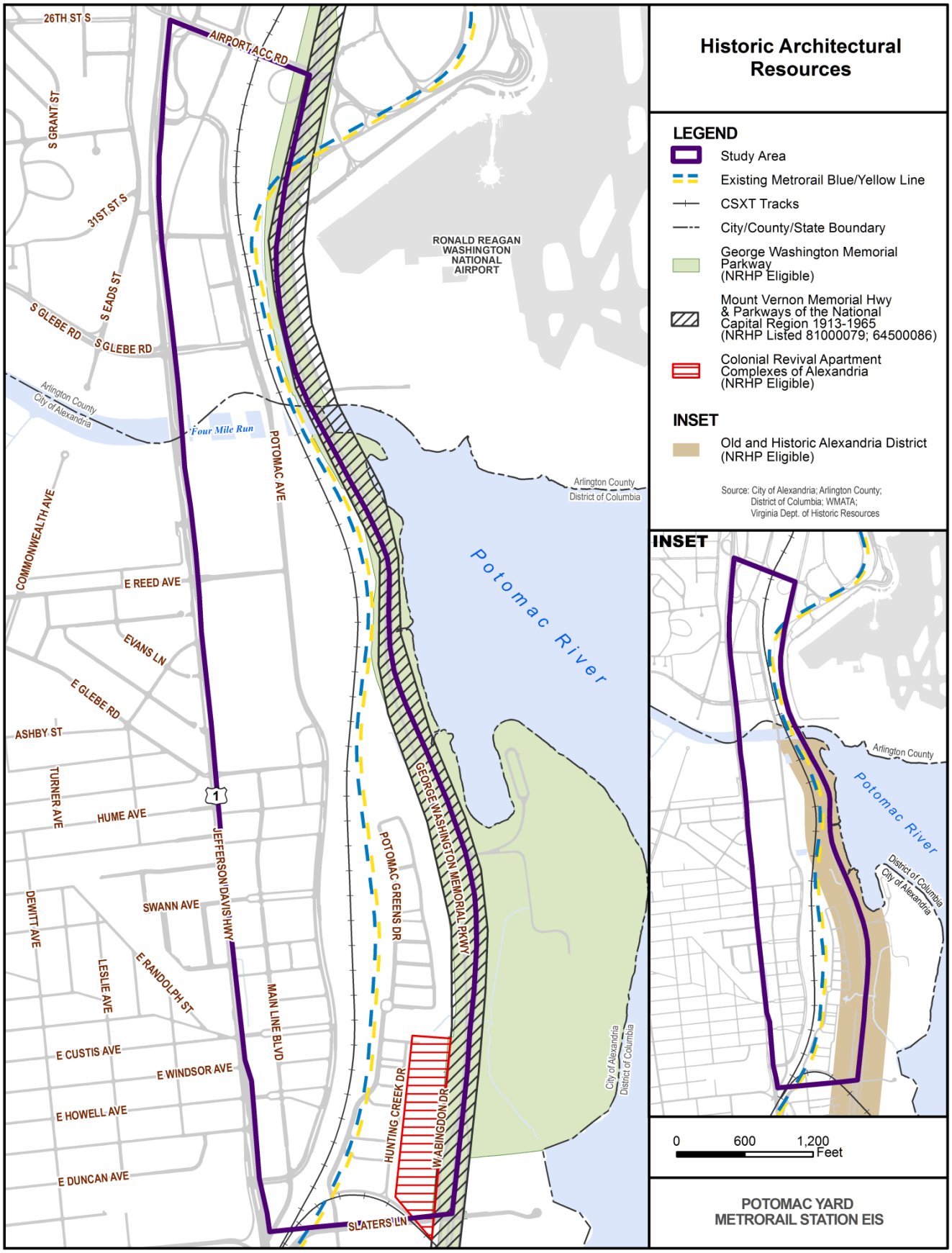
The MVMH covers the extent of the original memorial highway between Arlington Memorial Bridge to the north of the study area and the Mount Vernon Estate to the south. The name of the MVMH was changed to the George Washington Memorial Parkway (GWMP) in 1932, and over the subsequent 30 years the parkway was extended north through Arlington County and McLean, Virginia.

The MVMH is the southernmost section of the GWMP and was opened to traffic in 1932. The 15.2-mile segment was designed and landscaped to maximize scenic, aesthetic and commemorative qualities. Integral to its character and significance, numerous national monuments, historic sites, parks and other landscaped green spaces are visible along the corridor.

As the first parkway built and maintained by the U.S. government, the MVMH is nationally significant. In addition, the MVMH is significant in the areas of landscape architecture, engineering, sculpture and transportation. The MVMH was listed in the NRHP on May 18, 1981, and the Virginia Landmarks Register on March 17, 1981. The period of significance for this listing is 1929-1932.

As an NRHP- and VLR-listed property administered by NPS, substantial efforts beyond the scope of this technical memorandum have already been made to document the history and significance of the MVMH including the preparation of an NRHP nomination form (provided in **Appendix H**).

Figure 3-1: Historic Architectural Resources



3.2.2 Parkways of the National Capital Region

The Parkways of the National Capital Region (PNCR) is an NRHP listing which includes approximately 75-100 miles of parkways in Washington, DC; Montgomery County, Princes George's County, and Anne Arundel County in suburban Maryland; and Arlington County, Fairfax County, and the City of Alexandria in Northern Virginia. The PNCR was a multiple property submission for listing in the NRHP that included the George Washington Memorial Parkway as well as other scenic parkways in the Washington, DC region. The PNCR is also listed in the VLR. According to the NRHP nomination:

> The various parkways of the national capital reflect the culmination of several national trends after the turn of the century: the City Beautiful movements' emphasis on integrated urban green space; automobility and the rapid development of the road systems; and the decline in the quality of city living and resulting popularity of outdoor recreation….Aesthetically unaltered, the parkways remain vital components of the regional transportation arteries and they continue to contribute to the historic symbolism and design of the nation's capital.

As one of the parkways built in the National Capital Region between 1913 and 1965, the MVMH was included in the PNCR nomination and listing in the NRHP.

3.2.3 NRHP Listings for the George Washington Memorial Parkway

There are inconsistencies in the NRHP nomination forms which describe boundaries and nomenclature of several historic architectural resources in the APE. The 1981 MVMH nomination (as described above) includes the original right-of-way for the MVMH. The year the MVMH opened, the name was changed to the GWMP, and over the subsequent 30 years (1933-1966) the GWMP was extended north to Great Falls, Virginia and to include the Clara Barton Parkway in Montgomery County, Maryland. The boundaries of the NRHP-listed MVMH resource (as depicted in the 1981 NRHP nomination, mapping and VDHR records) include the roadway right-of-way between Arlington Memorial Bridge and Mount Vernon.

The PNCR nomination and listing included the GWMP and multiple other parkways in the Washington, DC region as described in the previous section**.** For the purpose of this analysis, the geographic boundaries for both 1981 and 1995 NRHP listings of the MVMH and PNCR are assumed to be the same, and are limited to the historic alignment of the MVMH, and not the entirety of GWMP park property.

A third nomination and NRHP listing for the GWMP was also completed in 1995. This extent of the third NRHP listing begins at the Memorial Bridge and extends to the northern terminus of the GWMP at Great Falls, Virginia outside the study area. This NRHP listing also includes the Clara Barton Parkway. This third NRHP listing does not include resources within the APE and is not being considered in this analysis and is not being considered in this analysis.

3.3 Other Potential Resources in the APE

3.3.1 Old and Historic Alexandria Historic District

The Old and Historic Alexandria District is a local zoning and historic district located within the eastern portion of the APE as shown in **Figure 3-1**. This district was initiated through a Memorandum of Agreement between the City of Alexandria and the Bureau of Public Roads in 1929 to protect the aesthetic quality of buildings along the MVMH. This district was established by Article X of the City of Alexandria's Zoning Ordinance as described in Section 1.2.2.

The ordinance identifies the Old and Historic Alexandria District as a locally designated and regulated zoning district that comprises a large part of Old Town Alexandria, extending north to include the GWMP and areas within 500 feet of the GWMP roadway centerline to the city limit at Four Mile Run. The zoning ordinance requires review and approval of proposed development activities within the district by the Old and Historic Alexandria District Board of Architectural Review (BAR). The BAR issues a *Certificate of Appropriateness* for new development once the requirements of the ordinance are satisfied.

Aside from the MVMH, numerous properties within the Old and Historic Alexandria District have not been evaluated for NRHP eligibility nor would be eligible based on age. The zoning district extends beyond the NRHP-listed Alexandria Historic District, which terminates at Second Avenue within the City of Alexandria south of the study area.

3.3.2 Alexandria NRHP and NHL Historic Districts

Inconsistencies in the nomination for the Alexandria Historic District may affect interpretation of the zoning district boundaries described in Section 3.3.1. The historic district was listed as a National Historic Landmark (NHL) in 1966, VLR in 1968 and the NRHP in 1969. The USGS map contained within the NRHP nomination shows the district encompassing a large part of downtown Alexandria, with the MVMH (Washington Street) traversing the center. As depicted on the map, the boundaries only extend as far north as 2nd Street and do not fall within the APE for this project. However, the written boundary description in the NRHP nomination describes the boundaries as reflecting Ordinance No. 1338, and is described as including the following area:

> "Thence north along a line 500 feet east of George Washington Memorial Highway to the north city limits; thence west with the north city line to a point 500 feet west of the centerline of the George Washington Memorial Highway; then south along a line 500 feet west of the centerline of the George Washington Memorial Highway to the centerline of First Street."

This description suggests that the boundaries of the NRHP-listed Alexandria Historic District include 500 feet on either side of the GWMP centerline from First Street to the northern city limit at Four Mile Run. If this interpretation is determined to include the NRHP-listed District, the Alexandria Historic District would fall within the APE and effects of the project on the resource would have to be evaluated.

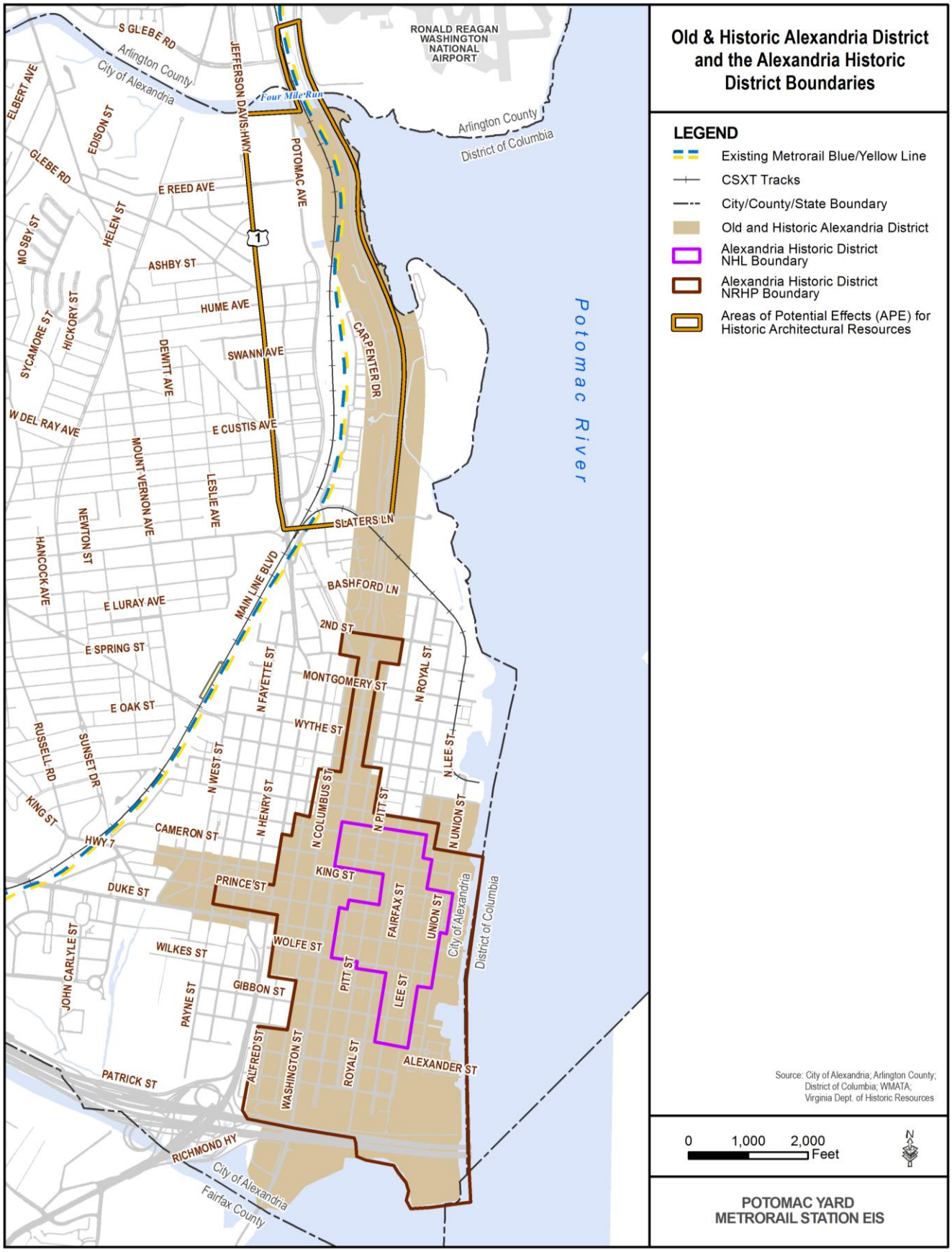
Inconsistencies in the boundaries will be further evaluated through the Section 106 Consulting Parties process. The boundaries recognized by the City of Alexandria for the NRHP- and NHL-listed historic districts are depicted in **Figure 3-2**.

3.3.3 Greens Scenic Area Easement

The Greens Scenic Area easement is located immediately north of the Potomac Greens residential development, bound on the west by the Metrorail right-of-way and on the east by the MVMH right-of-way. The easement is held by the NPS on park land owned by the City of Alexandria. The easement was established in 2000 in an effort to protect the scenic views of the GWMP parkland from unsightly development. The property and easement, previously under the ownership of the Richmond, Fredericksburg & Potomac Railroad Company and the Commonwealth Atlantic Properties, Inc., consist largely of second-growth woodlots and freshwater wetlands. As part of the construction of the Potomac Greens residential development, portions of the property were developed as a park with walking paths, signage, and split-rail fencing. While the Greens Scenic Area is part of the GWMP NPS-administered land, the easement is not part of the NRHP-listed MVMH or PNCR.

A review of the original plans for the MVMH indicates that the Greens Scenic Area was never part of the design and Wilbur Simonson (senior landscape architect of the original MVMH design team) instead designed the landscaping along the MVMH to screen views of the wetlands. As a result, it is recommended that the MVMH boundaries not be amended to include this resource, and the resource should be excluded from the Section 106 evaluation. Therefore, the assessment of cultural resource effects for NEPA purposes does not consider the Greens Scenic Area easement as a historic resource.

Figure 3-2: Old & Historic Alexandria District and the Alexandria Historic District Boundaries



3.4 Previously Unidentified Archaeological Resources

Phase I testing of archaeologically sensitive portions of the APE found three previously unidentified archaeological sites within the boundaries of the GWMP: Sites 44AX0220, 44AX0221 and 44AX0222. See **Table 3-3** for a summary of these resources. These sites are considered potentially eligible for inclusion in the NRHP and VLR at this phase of analysis.

Table 3-3: Previously Unidentified Archaeological Resources in the APE

Site Name	VDHR ID	Description	Federal/State Listing Status	Jurisdiction
Unnamed	44AX0220	44AX0220 is a seventeenth- through nineteenth-century domestic site possibly associated with the historic Preston Plantation. A precontact component of unknown age is also present at this location.	Potentially eligible for inclusion in the NRHP and the VLR	NPS
Unnamed	44AX0221	44AX0221 is an eighteenth- through nineteenth-century domestic site possibly associated with the historic Preston Plantation. A precontact component of unknown age is also present at this location.	Potentially eligible for inclusion in the NRHP and the VLR	NPS
Unnamed	44AX0222	The presence of a buried intact historic Belgian block masonry feature predating 1957 at this location indicates the presence of intact historic archaeological resources at this location.	Potentially eligible for inclusion in the NRHP and the VLR	NPS

Source: AECOM field research (October 2012).

Historic mapping (Stone 1838; Faul 1854; Boschke 1861; Hopkins 1879; etc.) and previous studies (Adams 1996) locate the historic Preston Plantation in the northern portion of the APE. The Preston Plantation was owned by members of the Alexander and later Swann families. However, work by Adams within the boundaries of the Potomac Yard rail yard at the former site of the Preston Plantation indicated that ""the area was disturbed to a level that was below the cultural level" and that "the original historic ground surface had been removed and that those features that may have been deeper in the ground, such as building foundations and burial shafts, were also gone or un-identifiable" (Adams1996: Public Summary).

3.4.1 Site 44AX0220

Site 44AX0220 is located within the GWMP. The presence of both precontact and historic artifacts in association with undisturbed natural soils at 44AX0220 suggests historic and precontact utilization of this upland location. Precontact components are defined as features and artifacts present at an archaeological site that predate the arrival of European colonists to the area. Precontact artifacts may alternately be referred to as prehistoric and are associated with Native American peoples. In addition to modern bottle glass and flat glass, artifacts recovered from 44AX0220 include:

- quartz tertiary flakes (precontact);
- brick fragments;
- manganese mottled earthenware (late seventeenth century – early eighteenth century) (MACL 2003);
- creamware (c. 1750 – 1820) (Brown 1982; FLMNH [2012]);
- undecorated whiteware (c. 1820 – present) (Brown 1982; FLMNH [2012]);
- Goodyear rubber button (produced by the Novelty Rubber Co. between 1855 and 1870) (Sutton and Arkush 2001: 212); and
- clear brown (possibly) turn-molded bottle glass (c.1850 – c.1920) (Lindsey 2012b).

Given the presence of seventeenth- through nineteenth-century domestic artifacts at 44AX0220, its historic occupation appears contemporary with that of the historic Preston Plantation located approximately 200 m (656.2 feet) to the northwest. Because the artifacts recovered from 44AX0220 were identified at relatively shallow depths (≤ 27cm below ground surface) any construction staging activities carried out at this location may affect archaeological deposits and features potentially eligible for inclusion in the NRHP and VLR. If avoidance of this area during construction is not

feasible, the completion of a Phase II evaluation of the archaeological deposits at this location is recommended to assess their eligibility for NRHP and VLR inclusion.

3.4.2 Site 44AX0221

Site 44AX0221 is located within the GWMP. In addition to modern bottle glass, flat glass and roadside refuse, artifacts recovered from 44AX0221 include:

- Quartz secondary and tertiary flakes and flake fragments (precontact);
- Brick fragments;
- Opaque, light blue, cylindrical, single layer, drawn glass bead consistent with Type IA at Mount Vernon (eighteenth century) (MVLA [2012]; Grillo and Aultman 2003; see also Marcoux 2009: 19-21); the bead appears similar in size and color and to two beads from the Seville Plantation in Jamaica documented in the Digital Archaeological Archive of Comparative Slavery (DAACS ID#s 1206-G12.1-DRS—00049 and 1205-G15.2-DRS--00005) (Thomas Jefferson Foundation 2012);
- White ball-clay/kaolin pipe fragments (late sixteenth century – nineteenth century) (Noel Hume [1969]; Malios 2005; Sudbury and Gerth 2011);
- Semivitreous stoneware (produced by Burford Brothers Potter Co. of East Liverpool, Ohio, between 1879 and c.1904) ([Old and Sold Antiques Auction] n.d.; Museum of Ceramics 2009); and
- Coca-Cola "hobble skirt" bottle fragments (after 1916) (Lockhart and Porter 2010).

The presence of both historic and precontact artifacts in association with intact natural soils at 44AX0221 seems to indicate historic and precontact utilization of this location. Given the presence of possible eighteenth- as well as nineteenth-century domestic artifacts at this location, its historic occupation appears contemporary with that of the Preston Plantation and may be a continuation of the archaeological deposits identified in 44AX0220. Although tenuous, the recovery of a blue glass bead from 44AX0221 may indicate an African-American presence at this location during the historic period; several authors have noted a positive association between blue beads and African-American archaeological sites (Stine et al. 1996; Russell 1997; Brown 2001).

The bead recovered from 44AX0221 appears similar in size and color to two beads from the Seville Plantation in Jamaica documented in the Digital Archaeological Archive of Comparative Slavery (DAACS ID#s 1206-G12.1-DRS—00049 and 1205-G15.2-DRS--00005) (Thomas Jefferson Foundation 2012).

If avoidance of this area during construction is not feasible, the completion of a Phase II evaluation of the archaeological deposits at this location is recommended to assess their eligibility for NRHP and VLR inclusion.

3.4.3 Site 44AX0222

Site 44AX0222 is located within the GWMP. At 44AX0222 an articulated mortared Belgian block feature (Feature 1) was identified in multiple shovel test pits (STPs) at a depth of approximately 40 cm below ground surface. Feature 1 appears to be constructed of quarried, mortared, dressed rectangular stones or *setts*. Use of a tile probe suggests Feature 1 measures approximately 2 m (6.6 ft) wide east-west. Initial impressions suggest that Feature 1 represents a late nineteenth- or early twentieth-century drain, footpath or bridle path.

While sporadic but sometimes considerable filling has occurred 44AX0222 and despite a relative scarcity of historic or precontact artifacts in intact context, aerial photographic evidence (USGS 1982) suggests that Feature 1 clearly predates 1957 and may be potentially eligible for NRHP and VLR inclusion. If avoidance of this area during construction is not feasible, the completion of a Phase II evaluation of the archaeological deposits at this location is recommended to better establish the age, function and extent of Feature 1 and to assess its eligibility for NRHP and VLR inclusion.

3.5 Previously Unidentified Historic Architectural Resources

A field reconnaissance survey conducted identified one potentially eligible architectural resource (over 50 years of age) in the APE for historic architecture: the Colonial Revival Apartment Complexes of Alexandria (CRACA). See **Table 3-4**. This resource is potentially eligible as a MPS that includes five apartment complexes flanking the GWMP in Alexandria. See **Appendix E** for the Reconnaissance Level Survey Form containing the full eligibility assessment. Also see Plates 3-8 in **Appendix J** showing the individual apartment complexes. The Abingdon Apartments (currently named Potowmack Crossing at Old Town Condominiums) are the only apartments in the potentially eligible MPS that fall within the APE for historic architecture.

Table 3-4: Previously Unidentified Historic Architectural Resources in the APE

Name	Location	Description	State/Federal Listing Status	NRHP/VDHR ID#	Area/Period of Significance
Colonial Revival Apartment Complexes of Alexandria	Flanking the GWMP/ MVMH, City of Alexandria	Multiple Property Submission that includes post-WWII apartment complexes built along the GWMP/MVMH in Alexandria	Recommended Eligible	VDHR: 100-5264	Criteria A for its association with post-WWII development in Alexandria and Criteria C as a group of Colonial Revival-style apartment complexes

Source: Field Survey (March 2012).

The apartments are significant under Criterion A for their contribution to the early development of apartment construction as well as the early twentieth century development of the north end of Alexandria. The apartments were constructed to accommodate the growing population and the demand for quality housing after the Great Depression and World War II. The apartments are also significant under Criterion C as excellent examples of Colonial Revival-style garden apartments in the City of Alexandria from the second quarter of the twentieth century. Background research did not reveal that CRACA was associated with a person or persons significant in the past (Criterion B), and that suggested CRACA was not likely to yield information important in history or prehistory (Criterion D).

The Colonial Revival style of architecture emerged after the Centennial Exposition of 1876 as the result of a renewed interest in the nation's history. The movement gained momentum in the early twentieth century with the advent of the automobile, which enabled Americans to visit many of the country's historic sites. This was especially true in Alexandria where the MVMH was built in 1932 to commemorate George Washington's birth.

Potowmack Crossing at Old Town Condominiums face eastward on West Abingdon Drive and are situated approximately 100 feet west of the GWMP. The complex consists of four V-shaped garden-style apartment buildings with one C-shaped building at the north end. The Colonial Revival-style apartments are three-stories, brick-faced, with a combination of flat and hipped roofs clad in a mixture of asphalt shingle and slate tile. The buildings exhibit a number of Colonial style details including brick quoins, 6/6 double-hung sash windows with inoperable shutters, hipped roofs, and broken pediment door surrounds. The apartment complexes, with its red brick, Colonial style door surrounds and cupolas was originally named for the Abingdon, the eighteenth century Alexander-Custis Plantation located along on the grounds of Ronald Reagan Washington National Airport.

4.0 ASSESSMENT OF POTENTIAL EFFECTS

This section describes and discusses potential effects to historic properties caused by the proposed federal undertaking in the context of both Section 106 and NEPA regulations.

4.1 Archaeological Resources

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

Table 4-1 summarizes effects to archaeological resources for each alternative.

Table 4-1: Summary of Effects to Archaeological Resources

VDHR ID	Site Name	Alternatives							
		No Build		Build A		Build B		Build D	
		Direct Adverse Effect	Indirect Adverse Effect	Direct Adverse Effect	Indirect Adverse Effect	Direct Adverse Effect	Indirect Adverse Effect	Direct Adverse Effect	Indirect Adverse Effect
44AX0028	Chesapeake and Ohio/ Alexandria Canal	None	None	None	None	None	None	None	None
44AX0207	Campsite No. 1 of the American Wagon Train Sept. 1781	None	None	None	None	None	None	None	None
44AX0220	Unnamed	None	None	None	None	None	None	Yes	Yes
44AX0221	Unnamed	None	None	None	None	Yes	Yes	None	None
44AX0222	Unnamed	None	None	None	None	Yes	Yes	None	None

4.1.1 No Build Alternative

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

4.1.2 Build Alternative A

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

4.1.3 Build Alternative B

Build Alternative B is anticipated to cause both direct and indirect adverse effects to Sites 44AX0221 and 44AX0222. Specifically, if avoidance of Sites 44AX0221 and 44AX0222 is not possible, construction of temporary access roads would likely cause direct adverse effects resulting from damage to all or part of the property, and indirect effects resulting from the potential transfer of land out of federal ownership. Other direct adverse effects to both resources would result from superficial soil disturbance and soil compression caused by the construction of temporary access roads. Indirect adverse effects may be caused by subsequent soil erosion and restoration efforts. Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in later project design phases based on further Phase II archaeological evaluations and in accordance with the ongoing Section 106 review process.

Build Alternative B is not anticipated to cause direct, indirect or cumulative impacts to 44AX0028, 44AX0207 or 44AX0220.

4.1.4 Build Alternative D

Build Alternative D is anticipated to cause both direct and indirect adverse effects to Site 44AX0220. Specifically, if avoidance of 44AX0220 is not possible, construction of temporary access roads would likely cause direct adverse effects resulting from damage to all or part of the property, and indirect effects resulting from the potential transfer of land out of federal ownership. Other direct adverse effects to 44AX0220 would result from superficial soil disturbance and soil compression caused by the construction of temporary access roads. Indirect adverse effects may be caused by subsequent soil erosion and restoration efforts. Design-based avoidance for effects to NRHP and VLR eligible archaeological resources would be developed in later project design phases based on further Phase II archaeological evaluations and in accordance with the ongoing Section 106 review process.

Build Alternative D is not anticipated to cause direct or indirect adverse effects or cumulative impacts to 44AX0028, 44AX0207, 44AX0221 or 44AX0222.

4.2 Historic Architectural Resources

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

4.2.1 No Build Alternative

No direct effect to historic architectural resources is anticipated as a result of the No Build Alternative. Planned development within North Potomac Yard is anticipated to cause indirect effects to the MVMH and PNCR through the introduction of visual elements to the property's setting that contribute to its historic significance.

4.2.2 Build Alternative A

Build Alternative A is not anticipated to cause direct adverse effects to the MVMH, the PNCR or CRACA. There is no indication that these historic properties would be demolished, damaged, altered, or removed as part of this undertaking. Build Alternative A would cause direct effects from temporary construction activities to approximately 0.70 acre within the Old and Historic Alexandria District. See **Figure 4-1** and **Table 4-2** for a summary of the effects assessment for Build Alternative A.

Build Alternative A is anticipated to cause indirect adverse effects to the MVMH and PNCR. The station structure and removal of vegetation would introduce visual elements to the MVMH and PNCR property's setting that contribute to its historic significance (indirect effect).

Build Alternative A is not anticipated to cause indirect adverse effects resulting from increased noise levels. The *Noise and Vibration Technical Memorandum*, completed for the EIS, concluded that the existing noise in the vicinity of the proposed undertaking is already dominated by background noise resulting from roadways (including the MVMH), railroads, and the Ronald Reagan Washington National Airport.

Table 4-2: Effects of Build Alternative A on Historic Architectural Resources

Site Name	Direct Adverse Effect	Indirect Adverse Effect
MVMH	None	Yes, visual effects from the station structure and removal of vegetation would introduce visual elements to the MVMH and PNCR property's setting that contribute to its historic significance.
PNCR	None	Yes, visual effects from the station structure and removal of vegetation would introduce visual elements to the MVMH and PNCR property's setting that contribute to its historic significance.
GWMP Park Land	None	None
CRACA	None	None
Old and Historic Alexandria District	Yes, temporary land use	None

4.2.3 Build Alternative B

Build Alternative B is anticipated to cause both direct and indirect adverse effects on the MVMH and PNCR. Construction of Build Alternative B would cause no adverse effect to CRACA. See **Figure 4-2** and **Table 4-3** for a summary of the effects assessment for Build Alternative B.

Approximately 0.16 acre of GWMP (federal) parkland would be permanently transferred, and 0.74 acres would be temporarily required for the construction of Build Alternative B. Build Alternative B would cause direct effects to approximately 8.24 acres within the Old and Historic Alexandria District. Approximately 3.07 acres of the district would be permanently used for station facilities and realigned track, and approximately 5.17 acres of the district would be used temporarily for construction activities.

Figure 4-1: Build Alternative A Direct Effects to Historic Architectural Resources

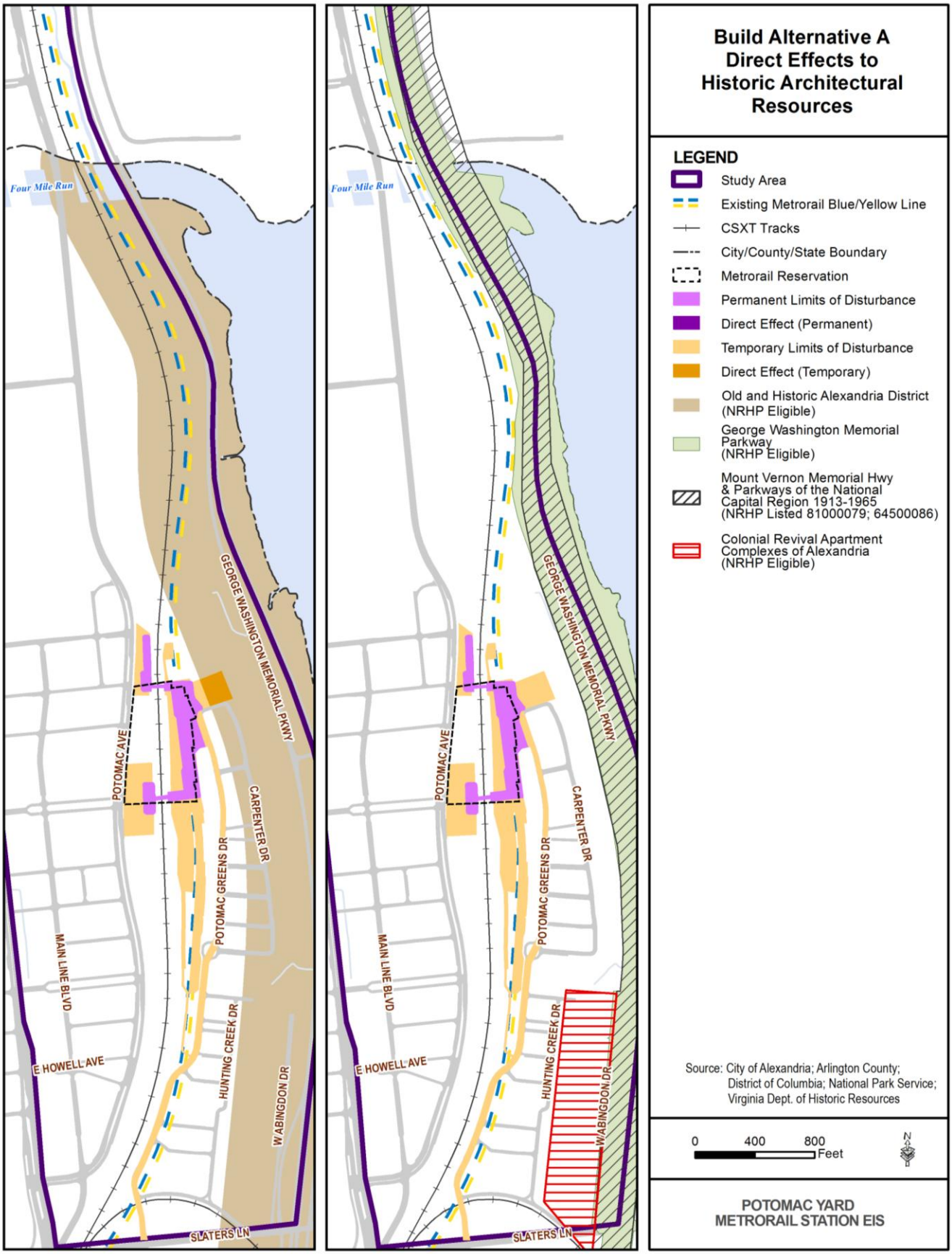
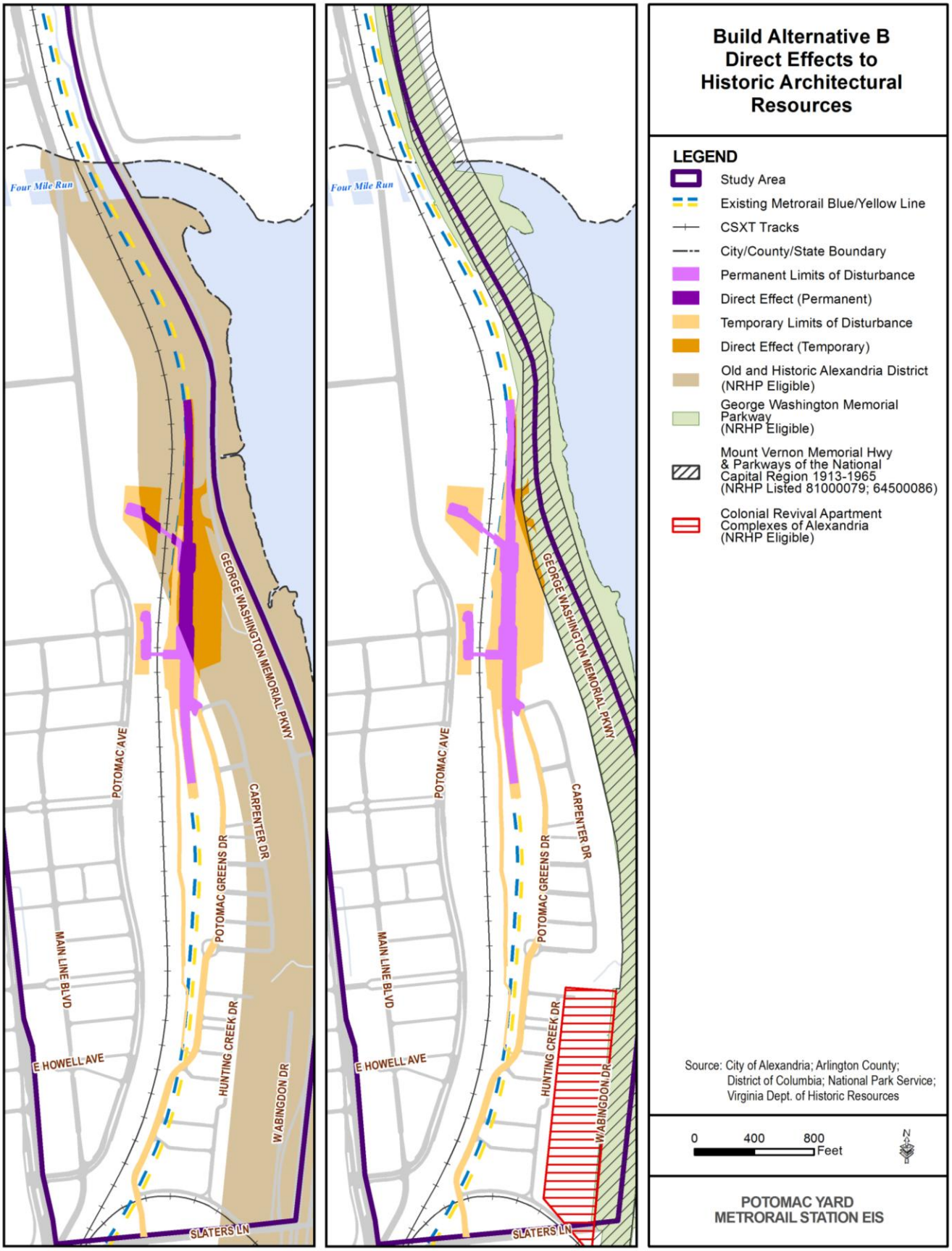


Figure 4-2: Build Alternative B Direct Effects to Historic Architectural Resources



Build Alternative B would require the construction of temporary roads providing secondary access to the MVMH/PNCR, causing damage to part of the resource. The temporary access roads, which are proposed to be constructed on the southbound side of the MVMH/PNCR, would require removal of trees and other vegetation that were planted in 1936 (Virginia Tech 2009). Consisting of mostly pines, the trees were planted soon after the road was completed in an effort to further shield views of Potomac railroad yards from the parkway to perpetuate a scenic quality and contemplative experience for travelers. Removal of the trees, which are considered a contributing resource to the MVMH/PNCR, would constitute a direct adverse effect.

Removal of the vegetation in this location would also introduce visual elements into the property's setting that would compromise its historic significance and cause an indirect adverse effect. Construction of the access roads would create a gap in vegetation and open up views to the proposed Metrorail Station. These views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience, and therefore, construction of the access roads would also cause an indirect adverse effect.

Construction of the temporary access roads would also cause indirect adverse effects as the result of temporary access easements on NPS property. Build Alternative B would not cause indirect adverse effects resulting from increased noise levels. The *Noise and Vibration Technical Memorandum,* completed for the EIS, concluded that the existing noise in the vicinity of the proposed undertaking is already dominated by background noise resulting from roadways (including the MVMH), railroads, and the Ronald Reagan Washington National Airport.

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

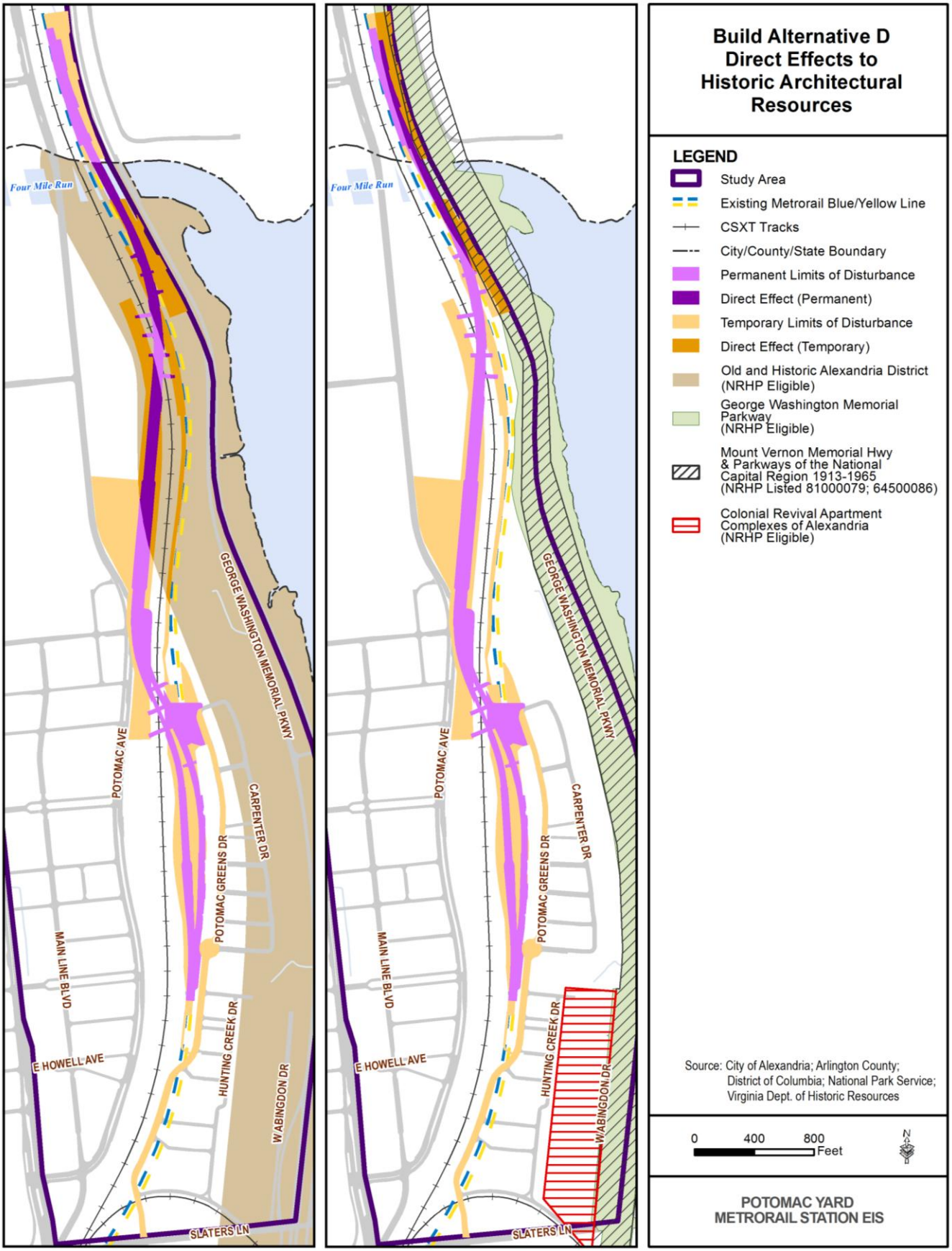
Table 4-3: Effects of Build Alternative B on Historic Architectural Resources

Site Name	Direct Adverse Effect	Indirect Adverse Effect
MVMH	Yes, as the result of the construction of the temporary access road to the MVMH	Yes, as the result of the construction of the temporary access road to the MVMH and the removal of the vegetative buffer that was part of the original design. Removal of the vegetation would open up views to the proposed Potomac Yard Metrorail Station
PNCR	Yes, as the result of the construction of the temporary access road through the park land	Yes, as the result of the construction of the temporary access road through the park land and removal of a vegetative buffer. Removal of the vegetation would open up views to the proposed Potomac Yard Metrorail Station
CRACA	None	None
GWMP Park Land	Yes, as the result of the construction of the temporary access road to the MVMH	Yes, as the result of the construction of the temporary access road to the MVMH and the removal of the vegetative buffer that was part of the original design. Removal of the vegetation would open up views to the proposed Potomac Yard Metrorail Station
Old and Historic Alexandria District	Yes, permanent and temporary land use	None

4.2.4 Built Alternative D

Build Alternative D is anticipated to cause both direct and indirect adverse effects on the MVMH and the PNCR. Construction of Build Alternative D would cause no adverse effect to the CRACA. See **Figure 4-3** and **Table 4-4** for a summary of the effects assessment for Build Alternative D.

Figure 4-3: Build Alternative D Direct Effects to Historic Architectural Resources



Approximately 1.43 acres of GWMP (federal) parkland would be permanently transferred, and 2.40 acres would be temporarily required for the construction of Build Alternative D. Build Alternative D would cause direct effects to approximately 9.01 acres within the Old and Historic Alexandria District. Approximately 3.80 acres of the district would be permanently used for station facilities and realigned track, and approximately 5.21 acres of the district would be used temporarily for construction activities. Construction of the temporary access roads would also cause indirect adverse effects as the result of a transfer of land ownership from the NPS to WMATA.

Construction of temporary roads providing secondary construction access to the MVMH would cause damage to part of the resource. The temporary access roads, which are proposed to be constructed on the southbound side of the MVMH, approximately 300 feet south of Four Mile Run, would require removal of trees and other vegetation that were planted in 1936 (Virginia Tech 2009). Consisting of mostly pines, the trees were planted soon after the road was completed in an effort to further shield views of Potomac railroad yards from the parkway to perpetuate a scenic quality and contemplative experience for travelers. Removal of the trees, which are considered a contributing resource to the MVMH, would constitute a direct adverse effect.

Removal of vegetation for Build Alternative D would also introduce visual elements to the property's setting that would compromise its historic significance and cause an indirect adverse effect. Construction of the access roads would create a gap in vegetation and open up views to the proposed elevated guideway. These views would not perpetuate a scenic quality and contemplative experience for travelers, an important characteristic of the parkway experience, and therefore, construction of the access roads would also cause an indirect adverse effect.

Build Alternative D is not anticipated to cause indirect adverse effects resulting from increased noise levels. The *Noise and Vibration Technical Memorandum,* completed for the EIS, concluded that the existing noise in the vicinity of the proposed undertaking is already dominated by background noise resulting from roadways (including the MVMH), railroads, and the Ronald Reagan Washington National Airport.

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

Table 4-4: Effects of Build Alternative D on Historic Architectural Resources

Site Name	Direct Adverse Effect	Indirect Adverse Effect
MVMH	Yes, as the result of the construction of the temporary access road to the MVMH	Yes, as the result of the construction of the temporary access road to the MVMH and the removal of the vegetative buffer that was part of the original design. Removal of the vegetation would open up views to the Potomac Yard retail complex
PNCR	Yes, as the result of the construction of the temporary access road to the MVMH	Yes, as the result of the construction of the temporary access road to the MVMH and the removal of the vegetative buffer that was part of the original design. Removal of the vegetation would open up views to the proposed Potomac Yard retail complex
GWMP Park Land	Yes, as the result of the construction of the temporary access road through park land	Yes, as the result of the construction of the temporary access road through the park land and the removal of a vegetative buffer. Removal of the vegetation would open up views to the proposed Potomac Yard retail complex
CRACA	None	None
Old and Historic Alexandria District	Permanent and temporary land use	None

5.0 RESOLUTION OF ADVERSE EFFECTS

If FTA determines the proposed project activities would result in an adverse effect to NRHP-listed or eligible cultural resources, as directed in 36 CFR Part 800.6(a)(1), FTA as the lead federal agency would notify the ACHP of the finding of adverse effects. FTA would invite ACHP to participate in further Section 106 consultation to resolve the adverse effects of the project. FTA would provide opportunity and all necessary documentation to consulting parties and the public to comment on and participate in the development of measures to avoid, minimize, or mitigate the adverse effects.

Successful consultation to resolve the adverse effects would likely result in the development and execution of a Memorandum of Agreement (MOA). Agreed to by ACHP (should it choose to participate as a consulting party), FTA, VDHR, and other consulting parties, the MOA would specify the measures that FTA would take to avoid, minimize, or mitigate the adverse effects of the project on NRHP-listed or eligible cultural resources. The MOA would describe commitments between FTA, NPS and other consulting parties on a range of issues including selected treatment measures. If ACHP declines to participate as a consulting party, FTA would provide ACHP with a copy of the executed MOA. Filing the MOA with ACHP formally concludes the Section 106 process.

5.1 Archaeological Resources

Mitigation for any unavoidable effects to NRHP and VLR eligible archaeological resources could include completion of Phase III archaeological data recovery efforts. Phase III archaeological data recovery includes large scale excavations to be developed in consultation with VDHR and other consulting parties, formalized in an MOA and completed prior to the initiation of construction.

5.2 Historic Architectural Resources

Mitigation measures for adversely affected historic architectural resources would be determined in coordination with VDHR and could include the following:

- Equal value land exchange to NPS in property or interest in property (in accordance with 16 USC 460 - Sec. 460l-22).
- Implementation of a Section 106 MOA that includes the following stipulations:
    - Development of landscape and visual screening plans for GWMP and Greens Scenic Area easement lands consistent with the Vegetation Cultural Landscape Report;
    - New landscaping for Potomac Greens Park and GWMP; and
    - Restoration of parkland temporarily used for construction activities to a condition equal to or better than current and planned conditions.

Additional potential mitigation measures could include:

- Preparation of an interpretive exhibit for installation at the Potomac Yard Metrorail Station or local library discussing the history and context of the MVMH and PNCR;
- Implementation of a public artwork project illustrating history and context of the MVMH and PNCR; and
- Selection of building design and materials which could mitigate visual effects.

APPENDIX A:

REFERENCES

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APPENDIX B:

ACRONYMS AND TERMS

List of Acronyms

AA	Alexandria Archaeology
ACHP	Advisory Council on Historic Preservation
AHPA	Archaeological and Historic Preservation Act
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act of 1979
CFR	Code of Federal Regulations
CRACA	Colonial Revival Apartment Complexes of Alexandria
CSXT	CSX Transportation
DAACS	Digital Archaeological Archive of Comparative Slavery
DSS	VDHR Data Sharing System
FTA	Federal Transit Administration
MOA	Memorandum of Agreement
MPS	Multiple Property Submission
NHPA	National Historic Preservation Act
NPS-NCR	National Park Service – National Capital Region
GWMP	George Washington Memorial Parkway
MVMH	Mount Vernon Memorial Highway
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PNCR	Parkways of the National Capital Region
Section 106	Section 106 of the National Historic Preservation Act
SHPO	State Historic Preservation Officer/Office
STP	Shovel Test Pits
THPO	Tribal Historic Preservation Officer/Office
USGS	US Geological Survey

VDHR	Virginia Department of Historic Resource
USC	U.S. Code
VLR	Virginia Landmarks Register
WMATA	Washington Metropolitan Area Transit Authority

Glossary of Terms

Adverse Effect – Under NHPA and as defined in 36 C.F.R. 800.5(1), an adverse effect is found "when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association".

Area of Potential Effects (APE) – As defined in 36 C.F.R. 800.16(d), the area of potential effects is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist".

Contributing/Noncontributing Resource – A building, structure, site, object, or landscape that contributes or does not contribute to the significance of a historic district.

Cultural Resource – Defined as both historic architectural and archaeological resources that include types such as buildings, structures, sites, objects, districts, and landscapes. The historic significance of these types of resources is determined by applying the NRHP Criteria for Evaluation. Cultural resources are eligible for listing in the NRHP if they meet at least one of the NRHP Criteria and retain integrity.

Historic – That period of time commencing with the first recorded documents; in the case of Virginia, that period of time commencing with European contact (after c. 1600 AD).

Historic District –According to National Register Federal Program Regulations, a historic district is "a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development".

Historic Property/Resource – As defined under Section 301 of the NHPA, historic properties/resources include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register including artifacts, records, and material remains of such a property or resource".

Impact – Under NEPA regulations "impacts" and "effects" are synonymous; effects/impacts may be "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (Sec. 1508.8).

Integrity – The ability of a property to convey its significance. A property must meet at least one of the NRHP Criteria for Evaluation and most of the NRHP Seven Aspects of Integrity to be eligible for listing in the NRHP. The Seven Aspects of Integrity include: location, design, setting, materials, workmanship, feeling, and association.

Memorandum of Agreement – The document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties.

National Register of Historic Places (NRHP) - The United States federal government's official list of districts, sites, buildings, structures, objects, and landscapes deemed worthy of preservation. The NRHP was established by the National Historic Preservation Act of 1966. The NRHP is administered by the National Park Service, an agency within the Department of the Interior.

Phase I Archaeological Survey – Sometimes known as an identification level survey, a Phase I archaeological survey includes both documentary and field research to identify all archaeological resources in the APE potentially eligible for, eligible for, or listed in the NRHP.

Phase II Archaeological Evaluation – Also known as an evaluation level survey, a Phase II archaeological evaluation includes both documentary and field research to evaluate the historic significance of a historic property.

Precontact – Also referred to as prehistoric; that period of time prior to recorded history or, in the case of Virginia, prior to European contact (before c. 1600 AD).

Section 106 – A provision of the National Historic Preservation Act of 1966 (NHPA) that requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. Section 106 requires federal agencies meet this statutory obligation through consultation with SHPOs and other interested parties.

Significance – A cultural resource that is associated with an important historic context and meets one or more of the NRHP Criteria for Evaluation.

Virginia Landmarks Register (VLR) – Established in 1966 and managed by the VDHR, the VLR is the state's official list of properties important to Virginia's history.

APPENDIX C:

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES

PROJECT INITIATION PACKAGE

MAY 10, 2012

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION III
Delaware, District of
Columbia, Maryland,
Pennsylvania, Virginia,
West Virginia

1760 Market Street
Suite 500
Philadelphia, PA 19103-4124
215-656-7100
215-656-7260 (fax)

MAY 10 2012

Marc E. Holma
Architectural Historian
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Re: Section 106 Process Initiation and Review Potomac Yard Metrorail Station

Dear Mr. Holma:

The City of Alexandria, as the project sponsor and joint lead agency, and the Federal Transit Administration (FTA), as the lead Federal agency, in cooperation with the Washington Metropolitan Area Transit Authority (WMATA), and the National Park Service (NPS), are preparing to undertake a Federal-aid project: to construct a new Metrorail station located at Potomac Yard within the City of Alexandria. The station would be located along the existing Metrorail Blue and Yellow line between the Ronald Reagan Washington National Airport and the Braddock Road stations.

The FTA and the City of Alexandria are currently preparing an Environmental Impact Statement (EIS) in conformance with the National Environmental Policy Act of 1969 (NEPA), as amended, and other applicable regulations. FTA and the City of Alexandria intend to make every effort to identify historic properties and archaeological resources that could be affected, and to fully assess potential effects on these resources from the proposed undertaking. As a Federal undertaking, the project is subject to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated implementing regulations, 36 CFR Part 800. This letter serves as the official notification from FTA of the initiation of the Section 106 process.

Attached is a project background information package, which includes the following:

- Project Description
- Project Location Map
- Preliminary Results of Background Research
- Preliminary Area of Potential Effects (APE)
- Photographs of the Project Area
- Mapping showing APE and locations of known historic resources

If you have any further questions please contact Daniel Koenig at (202) 219-3528 or at daniel.koenig@dot.gov.

Sincerely,

Brigid Hynes-Cherin
Regional Administrator

Region III Administrator

Enclosures:
Project Background Information Package

cc: Melissa Barlow, FTA DC Metro Office
Daniel Koenig, FTA DC Metro Office
David Hayes, NPS
Ben Helwig, NPS/GWMP
Susan Gygi, City of Alexandria
Jim Ashe, WMATA

Requesting a Project Review from the Department of Historic Resources

The Department of Historic Resources (DHR) is Virginia's State Historic Preservation Office (SHPO). Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to consult with the SHPO and others who may have knowledge of historic properties in identifying known historic properties which may be affected by a federal undertaking, and in determining the need for further survey efforts to identify previously unrecorded historic properties. Information on Section 106 and the text of the Section 106 regulations are available on the web site of the Advisory Council on Historic Preservation (www.achp.gov).

THIS APPLICATION MUST BE COMPLETED FOR ALL FEDERAL UNDERTAKINGS AND SUBMITTED TO THE VIRGINIA DEPARTMENT OF HISTORIC RESOURCES FOR REVIEW. A federal undertaking is defined in the Section 106 regulations as "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency." **This form may also be used to obtain the comments of DHR as part of a state review process.** Please provide a completed form even in cases where project information is included in a separate document, such as an Environmental Impact Report. Environmental documents may be submitted as attachments to the form if they provide an important part of the project description.

A program specific review application form for cell tower projects is available on DHR's website along with several other attachments to the project review application relating to the rehabilitation and demolition of historic structures which are intended to streamline the process.

Before You Complete the Project Review Application Form

1. Determine if your project constitutes an undertaking that has the potential to impact historic properties, assuming such historic properties were present (for the definition of an undertaking, go to the Section 106 Regulations, Definitions section, 36 CFR 800.16, on the web at www.achp.gov/regs.html).
2. Determine the Area(s) of Potential Effect (APE) for the project. For the purposes of Section 106, the area of potential effect (APE) is defined as the entire geographical area in which changes may occur to historic properties if any are present. The APE for archaeological resources may be different than for architectural resources. The viewshed of historic properties often extends well beyond their boundaries and is often an important contributing element to their historic significance. Therefore, projects which alter the landscape drastically - large scale subdivisions, highway construction - or those which insert a large, intrusive structure into the landscape – cell towers, water towers – must take into account the surrounding viewshed when determining the APE. A field inspection of the project area will help to establish the APE. Establishing the APE is the responsibility of the federal agency in consultation with DHR. When acting on the behalf of a federal agency, the APE that is presented to DHR must be the APE that is approved by that agency. The boundaries of the APE should be clearly described and indicated on a U.S.G.S. quad map (original or clear copy). If there are two different APEs – one where ground disturbance is going to occur and one where viewshed is the only concern, for instance, these should be clearly indicated.
3. Gather information to identify the historic properties within or adjacent to the APE that may be affected by your project. Information on recorded historic properties is available in the DHR Archives, and this information must be collected prior to submitting project review application. The Archives are open to the public, and the only charges for use are 15 cents per page for copies. If it is not possible to visit the DHR Archives, the archivist will provide information on recorded properties for a fee (telephone the Archives at 804-367-2323, extension 125 for more information). Please be aware that survey in Virginia is far from complete, and the absence of historic resources in DHR records does not necessarily mean that no historic

properties are present. Information that should be considered in the identification process may also be available in other repositories, such as county planning offices and historical societies. On-site inspections are an essential component of the identification process. Photographs of the subject property and any nearby properties that may be over 50 years old should be provided with your project review application. Please attach the available information on recorded historic properties within the APE and documentation resulting from field inspection to the project review application form. If no historic properties are recorded in the APE, and if no potentially historic properties were observed during field inspection, note this on the application form.

4. Following the identification process, you should complete the project review application form in its entirety by referring to the following instructions. Attach or enclose the required additional information, and submit your application packet to DHR. The Department of Historic Resources will respond to your request within 30 days.

How to Complete the Project Review Application Form

I. GENERAL PROJECT INFORMATION

1. Indicate if the project, or any part thereof, has been previously reviewed by DHR and if so, insert the file number. If we know that a project has been previously reviewed, we can often avoid asking for duplicate information.

2-3. Complete this section in its entirety providing the name and location (independent city or town and county) of the project. If your project involves work on a specific building, please include the street address of the building.

4. Refer to the attached list of agencies and their abbreviations and indicate the abbreviation(s) for the federal and/or state agencies involved in the project (permitting, licensing, funding, etc.). If more than one agency is involved, one must be designated the lead agency for Section 106 compliance. If the appropriate agency is not included on the list, please write the full agency name in the space provided.

5-6. It is important that complete mailing addresses be provided for both the lead federal or state agency contact and the applicant.

II. PROJECT LOCATION AND DESCRIPTION

7. Indicate the name of the USGS quadrangle on which your project area is located. An original or clear photocopy of the 7.5 minute USGS topographic quadrangle, or a **clearly labeled** portion thereof, showing the exact boundaries of the project location, and the project's Area(s) of Potential Effect (APE) **must** be attached to this application. Do **not** reduce or enlarge the map. Topographic maps may be downloaded free of charge from Topozone© (www.topozone.com).

8. Indicate the acreage of the project area.

9. Indicate if an architectural or archaeological survey has been conducted as part of the identification process or in a different context by consulting DHR's Archives. Indicate the author, title, and date of the report and if a copy of it is on file at DHR. If a survey has been completed and a copy is not on file, a copy should be included with the application materials.

10. During the identification stage of the Section 106 process you should determine the presence/absence of structures 50 years old or older. Indicate if the Archives search revealed any historic properties in the APE and if the site inspection revealed any properties over 50 years of age within or adjacent to the project area which may or may not be recorded at DHR. The date of construction for structures is often indicated in county or state tax records. Photographs of all structures over 50 years of age must be included with the application materials.

MAIL COMPLETED FORM AND ATTACHMENTS TO:
Virginia Department of Historic Resources
Attention: Project Review
2801 Kensington Avenue, Richmond, VA 23221
www.dhr.virginia.gov

11-12. These questions are designed to help DHR determine if your project needs to be reviewed by an architectural historian or an archaeologist or both. If the answer to either of these questions is *yes*, a complete explanation is required in the Description.

13. Description. Attach a detailed description of the project area and the proposed undertaking, making sure to include the following information:

a) Description of the existing land use. Include photographs of the project area.

b) Description of any recent modifications to the landscape. [Note: If the existing landscape appears to be markedly different from that shown on the attached quad map, please include information to that effect explaining what changes have occurred since the map was last updated.]

c) For projects involving the rehabilitation, alteration, or demolition of a structure over 50 years of age, a detailed description of the extent of the proposed alterations, along with photographs, architectural and engineering drawings, project specifications, and maps will be required.

d) Detailed project description that includes the precise location of all construction, destruction, and other proposed disturbance, the horizontal and vertical dimensions of all above and below ground construction, and the nature and extent of any previous disturbances – i.e. it is in a plowed field or disturbed VDOT right-of-way – within the APE.

Please Note: A complete project review application consists not only of the fully completed form, but also a completed Archives search, a USGS topographic map with the APE marked, a detailed project description, and all required photographs and project plans. A checklist is provided at the end of the application. Accurate and complete information will help in obtaining a timely response. If all required materials are not submitted, you will receive notification that your application is incomplete and the 30-day review period will not begin until all necessary materials are received.

MAIL COMPLETED FORM AND ATTACHMENTS TO:

Virginia Department of Historic Resources
Attention: Project Review
2801 Kensington Avenue, Richmond, VA 23221
www.dhr.virginia.gov

COMMONLY USED FEDERAL AND STATE AGENCIES AND ABBREVIATIONS

Federal Agencies

Advisory Council on Historic Preservation	ACHP
Department of the Interior, Bureau of Land Management	BLM
Central Intelligence Agency	CIA
Department of Defense, Army Corps of Engineers	COE
Drug Enforcement Administration	DEA
Department of Defense	DOD
Department of Defense, Army	Army
Department of Defense, Navy	Navy
Department of Defense, Marines	Marines
Department of Defense, Air Force	Air Force
Department of the Interior	DOI
Department of Justice	DOJ
Department of Labor	DOL
Defense Security Service	DSS
Department of Education	ED
Department of Commerce, Economic Development Administration	EDA
Environmental Protection Agency	EPA
Department of Transportation, Federal Aviation Administration	FAA
Federal Bureau of Investigation	FBI
Federal Communications Commission	FCC
Federal Deposit Insurance Corporation	FDIC
Federal Emergency Management Agency	FEMA
Department of Energy, Federal Energy Regulatory Commission	FERC
Federal Highway Administration	FHWA
Federal Railroad Administration	FRA
Department of Transportation, Federal Transit Administration	FTA
Department of Housing and Urban Development	HUD
General Services Administration	GSA
Department of Health and Human Services	HHS
Interstate Commerce Commission	ICC
Library of Congress	LC
Metropolitan Washington Airports Authority	MWAA
National Aeronautics and Space Administration	NASA
National Capital Planning Commission	NCPC
National Endowment for the Humanities	NEH
National Imagery and Mapping Center	NIMA
Nuclear Regulatory Commission	NRC
Department of Commerce, National Oceanic and Atmospheric Administration	NOAA
Department of the Interior, National Park Service	NPS
Department of Agriculture, Natural Resources Conservation Service	NRCS

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Comptroller of the Currency	OCC
Department of the Interior, Office of Surface Mining	OSM
Department of Agriculture, Rural Development	RD
Rural Utilities Service	RUS
Small Business Administration	SBA
Smithsonian Institute	SI
Surface Transportation Board	STB
Technology Administration	TA
Tennessee Valley Authority	TVA
United States Coast Guard	USCG
United States Department of Agriculture	USDA
United States Department of Commerce	USDOC
United States Department of Energy	USDOE
Department of Agriculture, Forest Service	USFS
Department of the Interior, Fish and Wildlife Service	USFWS
United States Geological Survey	USGS
United States Postal Service	USPS
Department of Veterans Affairs	VA

State Agencies

Christopher Newport University	CNU
Central Virginia Community College	CVCC
College of William and Mary	CWM
Department of Criminal Justice Services	DCJS
Department of Conservation and Recreation	DCR
Department of Environmental Quality	DEQ
Department of Game and Inland Fisheries	DGIF
Department of General Services	DGS
Department of Housing and Community Development	DHCD
Department of Historic Resources	DHR
Department of Juvenile Justice	DJJ
Department of Mental Health, Mental Retardation and Substance Abuse Services	DMHMRSAS
Department of Mines, Minerals and Energy	DMME
Department of Motor Vehicles	DMV
Department of Accounts	DOA
Department of Corrections	DOC
Department of Education	DOE
Department of Forestry	DOF
Department of Veterans Affairs	DVA
Frontier Culture Museum of Virginia	FCM
Germanna Community College	GCC
Gunston Hall	GH
George Mason University	GMU
James Madison University	JMU

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John Tyler Community College	JTCC
Jamestown-Yorktown Foundation	JYF
Medical College of Virginia	MCV
North Carolina Department of Transportation	NCDOT
Norfolk State University	NSU
Old Dominion University	ODU
Piedmont Virginia Community College	PVCC
Radford University	RU
State Corporation Commission	SCC
Science Museum of Virginia	SMV
Tidewater Community College	TCC
Thomas Nelson Community College	TNCC
University of Mary Washington	UMW
University of Virginia	UVA
Virginia Community College System	VCCS
Virginia Commonwealth University	VCU
Department of Agriculture and Consumer Services	VDACS
Department of Health	VDH
Department of Transportation	VDOT
Virginia Employment Commission	VEC
Virginia Institute of Marine Science	VIMS
Virginia Museum of Fine Arts	VMFA
Virginia Military Institute	VMI
Virginia Museum of Natural History	VMNH
Virginia Outdoors Foundation	VOF
Virginia Port Authority	VPA
Virginia Polytechnic Institute and State University	VPISU
Virginia Resources Authority	VRA
Virginia School for the Deaf and Blind	VSDB
Library of Virginia	VSLA
Department of State Police	VSP
Virginia State University	VSU
Virginia Western Community College	VWCC
Wytheville Community College	WCC
West Virginia Department of Transportation	WVDOT

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Project Review Application Form

This application must be completed for all projects that will be federally funded, licensed, or permitted, or that are subject to state review. Please allow 30 days from receipt for the review of a project. All information must be completed before review of a project can begin and incomplete forms will be returned for completion.

I. GENERAL PROJECT INFORMATION

1. Has this project been previously reviewed by DHR? YES ___ NO x DHR File # _____
2. Project Name: Potomac Yard Metrorail Station Project
3. Project Location: City of Alexandria (City) / Town / Arlington County (County)

4. Specify Federal and State agencies involved in project (providing funding, assistance, license or permit). Refer to the list of agencies and abbreviations in the instructions.

Lead Federal Agency: FTA

Other Federal Agency: NPS

State Agency: _____

5. Lead Agency Contact Information

Contact Person: Daniel Koenig (FTA)

Mailing Address: 1990 K Street NW, Suite 510, Washington D.C., 20006

Phone Number: 202-219-3528 Fax Number: _____

Email Address: Daniel.Koenig@dot.gov

6. Applicant Contact Information

Contact Person: Jim Ashe (WMATA)

Mailing Address: 600 5th Street NW, Washington, DC 20001

Phone Number: 202-962-1745 Fax Number: _____

Email Address: jashe@wmata.com

II. PROJECT LOCATION AND DESCRIPTION

7. USGS Quadrangle Name: Alexandria, Virginia

8. Number of acres included in the project: (see attached text)

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9. Have any architectural or archaeological surveys of the area been conducted? **YES_X_ NO__**

If yes, list author, title, and date of report here. Indicate if a copy is on file at DHR.
(see attached)

10. Are any structures 50 years old or older within or adjacent to the project area? **YES_X_ NO__**

If yes, give date(s) of construction and provide photographs.
(see attached)

11. Does the project involve the rehabilitation, alteration, removal, or demolition of any structure, building, designed site (e.g. park, cemetery), or district that is 50 years or older? If *yes*, this must be explained fully in the project description. **YES__ NO_X_**

12. Does the project involve any ground disturbance (e.g. excavating for footings, installing sewer or water lines or utilities, grading roads, etc.)? If *yes*, this must be explained fully in the project description. **YES_X_ NO__**

13. DESCRIPTION: Attach a complete description of the project. Refer to the instructions for the required information.

To the best of my knowledge, I have accurately described the proposed project and its likely impacts.

_____ _____
Signature of Applicant/Agent Date

The following information must be attached to this form:

x Completed DHR Archives search
x USGS map with APE shown
x Complete project description
x Any required photographs and plans

____ No historic properties affected _____ No adverse effect
____ Additional information is needed in order to complete our review.
____ We have previously reviewed this project. A copy of our correspondence is attached.

Comments: _____

Signature_____ Date _____

Phone number _____ DHR File # _____

This Space For Department Of Historic Resources Use Only

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8. *Project Acreage*

The project area is generally bounded by US Route 1 on the west, George Washington Memorial Parkway and Potomac Greens Drive on the east, Slaters Lane on the south, and the Ronald Reagan National Airport Access Road on the north. Based on the currently understood location of all direct impacts, the project study area measures approximately 45.1 acres. For a detailed description of project alternatives see the attached *Project Overview* document.

9. *Previous Architectural and Archaeological Surveys in the General Study Area*

A reconnaissance level survey has been undertaken as part of this current project. This survey has consisted of a site visit, initial background research and a file search at the VDHR.

Historic Architectural Resources

Within the vicinity of the proposed project, two National Register of Historic Places (NRHP) and Virginia Landmarks Register-listed resources were recorded with VDHR. These resources are:

- Washington National Airport Terminal and South Hangar Line (000-0045), Arlington County
  - NRHP: 9-12-97
  - VLR: 6-27-95

- Mount Vernon Memorial Parkway/George Washington Memorial Parkway (029-0218), Arlington and Fairfax Counties and City of Alexandria
  - NRHP: 5-1981
  - VLR: 3-17-1981

The George Washington Memorial Parkway is also listed on the NRHP as part of the Multiple Property Submission (MPS) for the Parkways of the National Capital Region, 1913-1965 (029-5524), City of Alexandria. This MPS was listed in the VLR on 10-8-1991 and in the NRHP on 6-2-95.

Local Landmark Lists

Research was also conducted to determine if any locally listed landmarks regulated by Arlington County or the City of Alexandria existed within the vicinity for architecture. The following is a summary of those findings:

- Arlington County's Office of Neighborhood Program, Historic Preservation program records no local landmarks in the project area.
- The City of Alexandria's Department of Planning & Zoning and office of Historic Preservation records one locally listed landmark in the project area:
  - The George Washington Memorial Parkway, within the locally designated Old & Historic Alexandria District

Archaeological Resources

Five archaeological resources have been recorded with VDHR within approximately 1 mile of the proposed alternatives. They are:

- Alexandria Canal (44AX0028)
- Four Mile Run Aqueduct (44AX0055)
- 44AX0194
- 44AX0204
- Campsite No. 1 of the American Wagon Train Sept. 1781 (44AX0207)

None of the recorded sites listed above have been evaluated for NRHP or VLR eligibility. The proposed project alternatives may present potential direct impacts to 44AX0207 an eighteenth-century military site recorded by Dr. Robert A. Selig in 2008. The approximate location of this site is based on historic documentation but its exact location has not been archaeologically verified. The proposed alternatives may also impact the remains of the Alexandria Canal (44AX0028) (Figure 1).

Previous Cultural Resource Surveys on File at VDHR

According to DHR records, three cultural resource surveys have been conducted within approximately 1 mile of the proposed alternatives. With the exception of the current location of the Potomac Greens housing development (Israel 1981), the proposed APE has not been previously surveyed. Previous surveys include:

Cheek, Charles D. and Margarita J. Wuellner
1992 *Phase Ia Archaeological Overview and Phase II Historic Architectural Significance Evaluation for the Four Mile Run Bus Garage, Arlington County, Virginia*. John Milner Associates. Report AR-63 on file, DHR, Richmond, VA.

Israel, Stephen S.
1981 *Cultural Resource Reconnaissance of the Richmond, Fredericksburg, and Potomac Railroad's leased Fairchild Property proposed for the deposition of contained disposal materials for the Fourmile Run Navigation Project, Alexandria and Arlington County, Virginia*. Report AR-2 on file, DHR, Richmond, VA.

Parsons Management Consultants
1989 *Historic and Archaeological Survey Report, Washington National Airport*. Report AR-8 on file, DHR, Richmond, VA.

Other Cultural Resource Reports on File at Alexandria Archaeology and the Alexandria Library

Additional research at repositories in the City of Alexandria identified 10 additional letter reports, reports and management summaries documenting archaeological investigations in and around the project area. These surveys have documented substantial soil disturbance in and around the proposed APE most notably in those areas previously occupied by the Potomac Yard rail yard (Adams 1996a, 1996b; Cheek and Heck 1995; Johnson and Bryant 2011; Mullen 2010; etc.) likely resulting from grading, cutting and filling activities carried on during the construction, operation and eventual dismantling of the rail yard.

Historic fill packages in excess of 10 ft have been documented in developed upland areas (Johnson and Bryant 2011; Mullen and Barse 2007) (Plate 5). However, in some cases sites have been indentified beneath the historic fill (44AX0204) and in areas that have escaped substantial twentieth-century development (44AX0194). The reports include:

Adams, Robert M.

1996a *Letter Report on R, F & P Potomac Yard – Track Relocation Project* [draft]. International Archaeological Consultants. Report on file, Alexandria Archaeology, Alexandria, Virginia.

1996b *The Archaeological Investigation of the Former Preston Plantation and Alexandria Canal at Potomac Yard, Alexandria, Virginia.* International Archaeological Consultants. Report on file at Alexandria Archaeology, Alexandria, Virginia.

Cheek, Charles D. and Dana B. Heck

1995 *Archeological Observations at the Townes at Slater's Village, Alexandria, Virginia.* John Milner Associates. Report on file, Alexandria Archaeology, Alexandria, Virginia.

Johnson, Edward W. and Tammy Bryant

2011 *Letter Report: Archeological Investigations within Landbay L (±47 acres), Potomac Yard Property.* Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

Mullen, John P.

2007 *Resource Management Plan for the Potomac Yard Property, Landbays E, G, H, I, J, K, L, and M, City of Alexandria, Virginia.* Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

2010 *Pedological and Geoarchaeological Investigations of Landbay I and J, Potomac Yard Property, City of Alexandria, Virginia, WSSI # 21486.06.* Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

Mullen, John P. and William P. Barse

2007 *Geoarcheological Testing of the Potomac Avenue and East/West Roads Site Plan Potomac Yard, WSSI #21486.01* [management summary]. Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

2008 *Archeological Investigations within a Portion of Potomac Avenue and Associated East/West Roads, Potomac Yard Property, City of Alexandria, Virginia* [draft]. Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

Rose, Craig

2011 *Geoarchaeological Investigations of a Portion of Landbay G.* Thunderbird Archeology. Report on file, Alexandria Archaeology, Alexandria, Virginia.

Thunderbird Archeology

2006 *Potomac Yard, Four Corners Monitoring* [management summary]. Report on file, Alexandria Archaeology, Alexandria, Virginia.

10. Historic Architectural Resources 50 years old or older

The project runs through an industrial corridor consisting of an early airport, railroad yards, shopping centers, apartment complexes, woodlands and wetlands. A portion of the latter is occupied by pedestrian trails. The majority of buildings and structures were constructed in the mid-to-late twentieth century.

Proposed Area of Potential Effects – Historic Architectural Resources

The proposed Area of Potential Effect (APE) for this project includes Potomac Yard and is bound on the west by Jefferson Davis Highway, on the north by Route 233, on the east by the George Washington Memorial Parkway, and on the south by Slater's Lane as depicted on Figure 1. The APE may be expanded and/or shifted as the design develops over time. The APE as depicted is large enough to include all resources over 50 years of age with the potential to be affected either directly or indirectly by the proposed project.

Previously Unidentified Resources

A preliminary site visit was conducted on March 12, 2012 and determined that one additional architectural resource over 50 years of age that was not previously identified, falls within the potential APE for architecture.

- Potowmack Crossing at Old Town Condominiums, Alexandria

The Potowmack Crossing Condominiums face east and are located on W. Abington Drive approximately 100-feet west of the George Washington Parkway. The complex consists of four V-shaped garden-style apartment buildings with one C-shaped building at the north end. The Colonial Revival-style apartments, were constructed ca. 1945 and are three-stories, brick-faced, with a combination of flat and hipped roofs clad in a mixture of asphalt shingle and slate tile. The buildings exhibit a number of Colonial style details including brick quoins, 6/6 double-hung sash windows with inoperable shutters, hipped roofs, and broken pediment door surrounds.

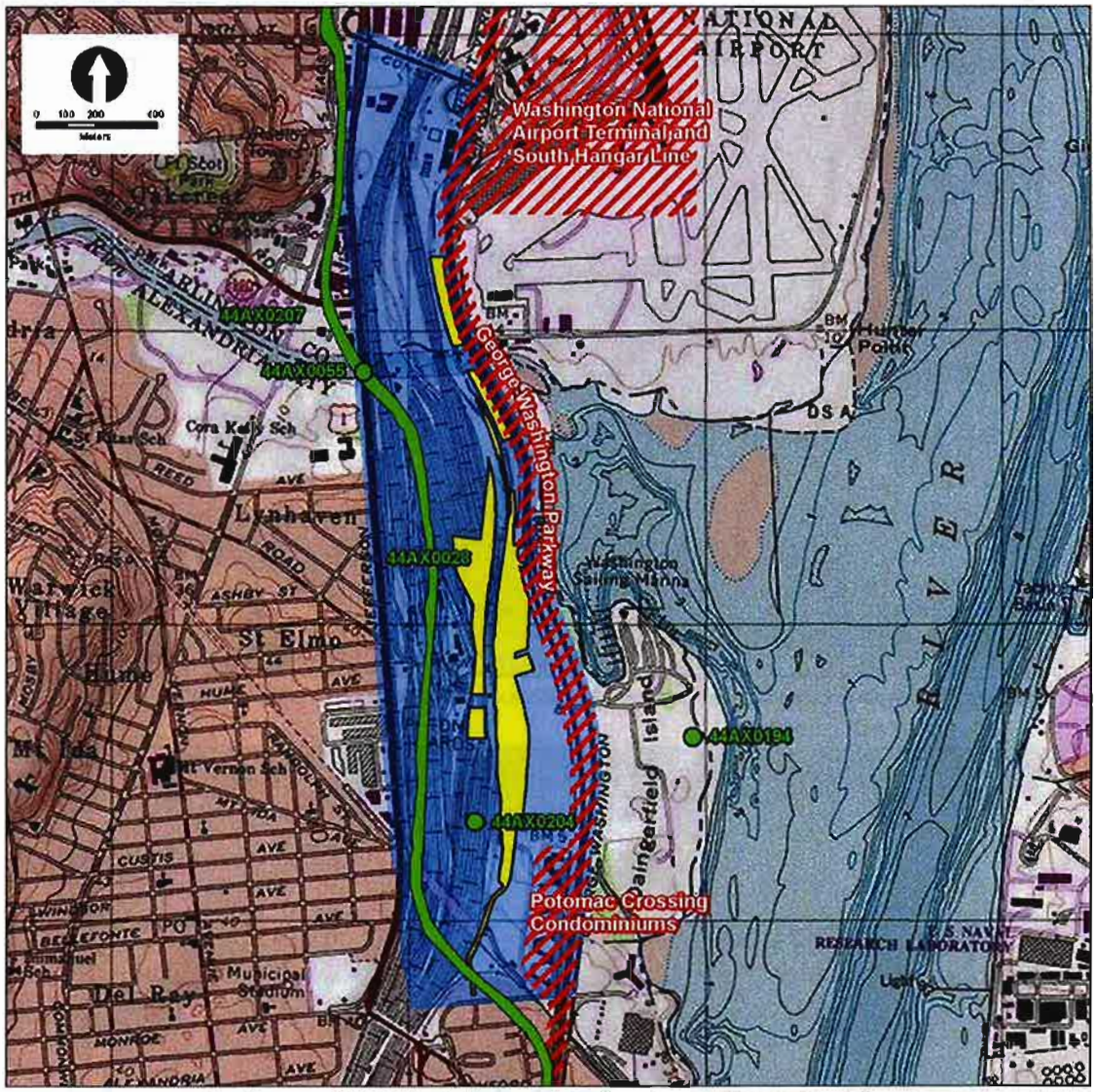


Figure 1: Proposed Architectural APE (blue), Proposed Archaeological APE (yellow), Previously Recorded Archaeological Sites (green) and Historic Architectural Resources (red hachure) (USGS 1965).

Plate 1: Potowmack Crossing Condominiums, C-shaped building at north end from W. Abington Dr., view west.

Plate 2: Potowmack Crossing Condominiums, V-shaped building from W. Abington Dr., view west.

Plate 3: Potowmack Crossing Condominiums, end of V-shaped building from W. Abington Dr., view northwest.

Plate 4: Potowmack Crossing Condominiums, building from W. Abington Dr., view west.

12. Anticipated Ground Disturbance

Dependent on the Build alternative selected (see the attached *Project Overview* document) anticipated ground disturbing activities as part of this project may include:

- aerial or at-grade Metrorail Station and platform construction;
- pedestrian bridge construction;
- track realignment;
- installation of new track;
- cutting, filling and grading;
- repair of existing retaining walls;
- installation of new retaining walls;
- construction of a single span aerial structure over Four Mile Run;
- and utility installation and/or relocation.

Area of Potential Effects – Archaeological Resources

The proposed APE for archaeology has been developed to encompass all areas of proposed ground disturbance associated with the permanent and temporary construction access and impact areas for Build alternatives A, B and D identified in the attached *Project Overview* document. Such areas include permanent and temporary right-of-ways and easements, construction staging areas and material storage areas, as well as the locations of all proposed Build alternatives (Figure 1). The proposed APE for archaeology measures approximately 45.1 acres in extent and consists of railroad right-of-ways, commercial and residential space, wetlands and forested woodlots.

Previous cultural resource surveys have documented substantial soil disturbance in and around the proposed APE most notably in those areas previously occupied by the Potomac Yard rail yard (Adams 1996a, 1996b; Cheek and Heck 1995; Johnson and Bryant 2011; Mullen 2010; etc.) likely resulting from grading, cutting and filling activities carried during the construction, operation and eventual dismantling of the rail yard. Historic fill packages in excess of 10 ft have been documented in developed upland areas (Johnson and Bryant 2011; Mullen and Barse 2007) (Plate 5). Nevertheless, based on field observations and historic map research, the low wooded undeveloped floodplain area flanked by the George Washington Parkway on the east and the current WMATA Blue and Yellow line tracks on the west that extends from the Potomac Greens development in the south to Four Mile Run in the north appears to have escaped substantial modern disturbance (Plates 6 and 7).

Additionally, historic mapping (Boschke 1861; USGS 1885, 1945; Bureau of Soils 1915; etc.) indicates that all areas of the proposed APE for archaeology north of Four Mile Run consist of made land built during the first half of the twentieth century.

As engineering plans mature and a preferred alternative is identified, the extent of the proposed APE for archaeology will be modified to eliminate those areas where no subsurface disturbance is anticipated or where construction impacts are unlikely to impact deeply buried archaeological deposits.

13. Project Description

See attached Project Overview.

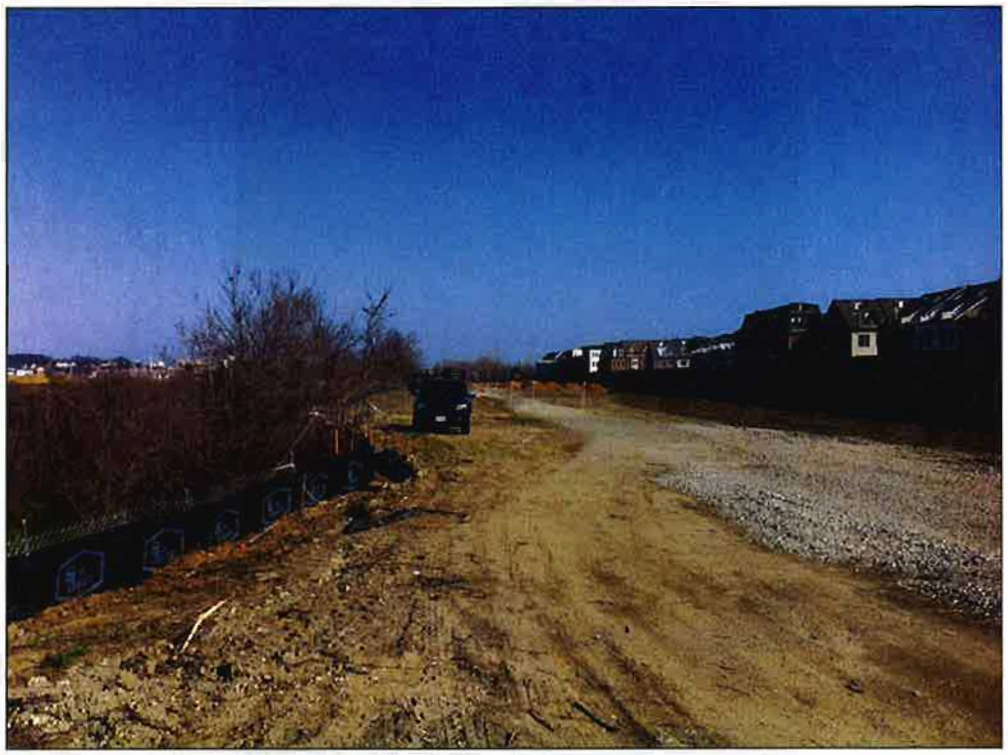


Plate 5: Former site of the Potomac Yard rail yard, view north.

Plate 6: Undeveloped floodplain area.

Plate 7: Undeveloped floodplain area.

References

Boschke, A.

1861 *Topographical Map of the District of Columbia* [map]. D. McClelland: Washington, D.C.

Bureau of Soils (BoS), United States Department of Agriculture

1915 *Soil Map, Virginia, Fairfax-Alexandria Counties Sheet* [map]. A. Hoen and Company: Baltimore, MD. Available online at http://lcweb2.loc.gov/cgi-bin/query/r?ammem/gmd:@field(NUMBER+@band(g3883f+ct000813)).

United States Geological Survey (USGS)

1885 *West Washington* [topographic quadrangle]. 15 Minute Series. 1:62500

1945 *Alexandria, VA.* [topographic quadrangle]. 7.5 Minute Series. 1:24000

1965 *Alexandria, VA* [topographic quadrangle]. Photorevised 1983. 7.5 Minute Series. 1:24000

Project Overview

1.1 Introduction

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, in cooperation with the Washington Metropolitan Area Transit Authority (WMATA), and the National Park Service (NPS), are preparing a Draft Environmental Impact Statement (DEIS), under the National Environmental Policy Act (NEPA), for the proposed Potomac Yard Metrorail Station (or "the project").

The project consists of construction of a new Metrorail station located at Potomac Yard within the City of Alexandria, along the existing Metrorail Blue and Yellow line between the Ronald Reagan Washington National Airport station and the Braddock Road station. The project would serve existing neighborhoods and retail centers as well as high-density, transit-oriented development planned by the City of Alexandria. The project would provide access to the regional Metrorail system for the U.S. Route 1 corridor of north Alexandria. The Potomac Yard area is currently without direct access to the Metrorail system.

1.2 Project Area

The project area for the proposed Potomac Yard Metrorail Station is in the City of Alexandria and Arlington County, Virginia, located in the Northern Virginia portion of the Washington metropolitan region. The project area, shown in **Figure 1-1**, is generally bounded by US Route 1 on the west, George Washington Memorial Parkway and Potomac Greens Drive on the east, Slaters Lane on the south, and the Ronald Reagan National Airport Access Road on the north.

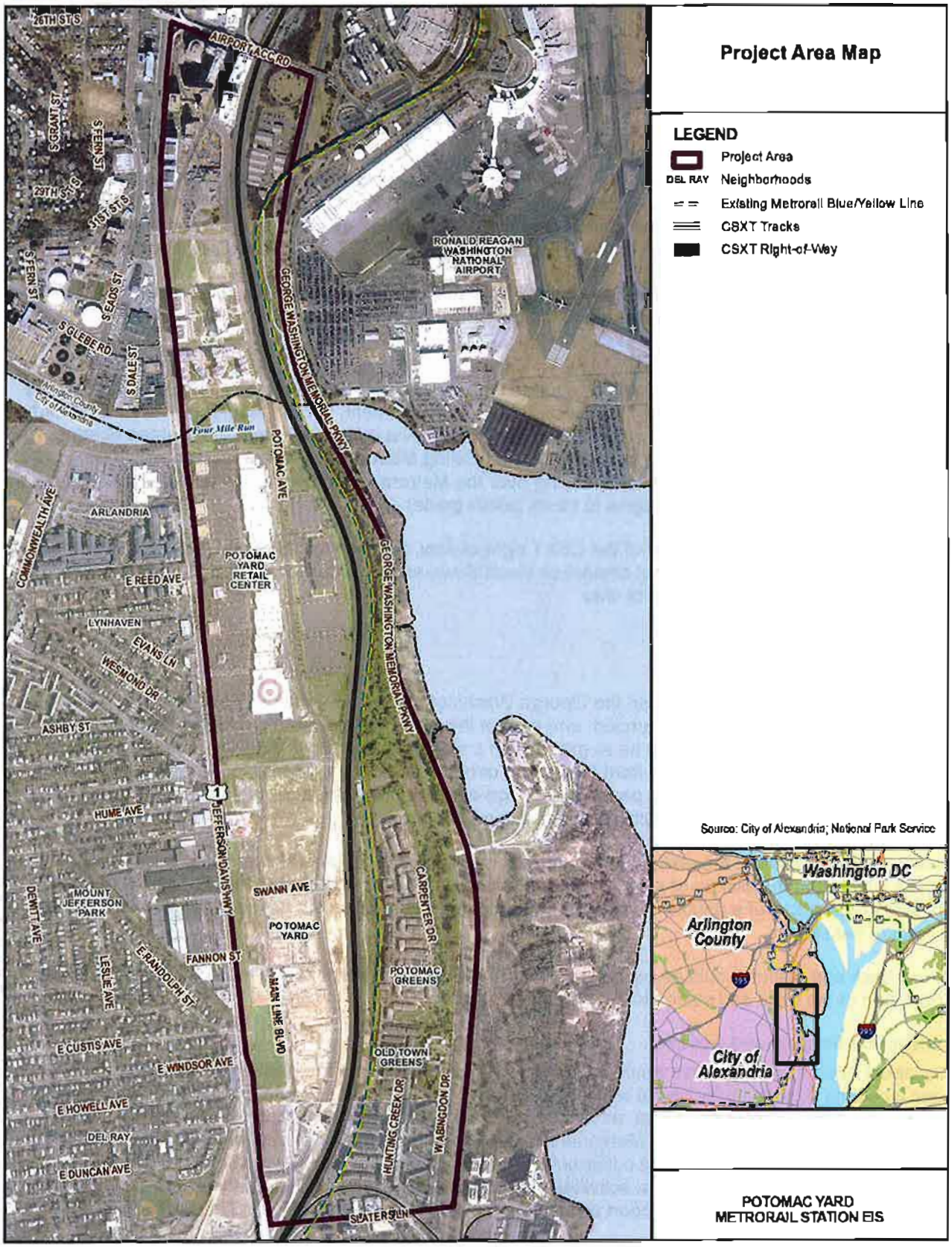
For most of the twentieth century, Potomac Yard served as the largest railroad yard for freight car interchange on the east coast. The rail yard was decommissioned in 1989, and environmental remediation of the site took place in the 1990s and early 2000s. In 1999, the City adopted the *Potomac Yard Coordinated Development District (CDD #10) Concept Plan*, which included a development program to transform part of Potomac Yard into a high-density, mixed-use community surrounded by a network of open spaces. A portion of the site just south of Four Mile Run was redeveloped at the time into a retail center. In 2010, the City of Alexandria adopted the *North Potomac Yard Small Area Plan*, which envisions the replacement of the retail center with a high-density transit-oriented neighborhood, connected by a multi-modal transportation network that includes a Metrorail station.

The project area includes lands administered by the NPS, specifically the George Washington Memorial Parkway, which is listed on the National Register of Historic Places. Some of the Build alternatives have the potential to affect lands owned in fee simple or which are covered by easements granted to the United States and administered by NPS. NPS is a cooperating agency in the NEPA process because of this interest.

1.3 No Build Alternative

The No Build Alternative includes the existing transportation network, plus all of the committed projects within the study area. The No Build Alternative includes the build-out of an internal street network within Potomac Yard, generally from Four Mile Run to Braddock Road, in addition to investments in transit and bicycle/pedestrian facilities. Transit investments include the Crystal City/ Potomac Yard (CCPY) Transitway, as well as expansion of local transit service. The No Build Alternative also includes an off-street trail through the planned linear park between Potomac Avenue and the CSXT right-of-way, enhancing access to the major regional trail network, which serves recreational users and commuters.

Figure 1-1: Project Area



1.4 Build Alternatives

The Draft EIS will evaluate three Build alternatives. Each Build alternative consists of the construction and operation of a Metrorail station. The Build alternatives are described below and in **Table 1-1**, and are shown in **Figure 1-2**.

1.4.1 Alternative A

Description of Alternative A

Alternative A would be located between the CSXT Railroad tracks and the north end of the Potomac Greens neighborhood. The station would be at-grade, with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard, and pedestrian access to the Potomac Greens and Old Town Greens neighborhoods.

Alternative A would include minimal track realignment within the station area and in special track work areas, including construction of a double crossover, located approximately 900 feet south of the station.

Construction Staging and Access

To construct Alternative A, access would be required to the areas immediately west and east of the existing Metrorail alignment. On the east side of the existing Metrorail alignment, access would be provided through the residential areas of Potomac Greens and Old Town Greens via the entire length of Potomac Greens Drive, as shown in **Figure 1-2**. On the west side of the existing Metrorail alignment, access would be provided through Potomac Greens Drive, crossing over the Metrorail alignment at the tennis court area of Old Town Greens (where Metrorail begins to travel below-grade).

Although Alternative A is located east of the CSXT right-of-way, access would also be required west of the CSXT right-of-way to construct vertical circulation touch-down areas. Access would be provided via the existing Potomac Avenue public right-of-way.

1.4.2 Alternative B

Description of Alternative B

Alternative B would be located between the George Washington Memorial Parkway and the CSXT Railroad, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Retail Center and the CSXT right-of-way. The station would be at-grade, with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard, and a pedestrian bridge over the proposed Metrorail alignment to provide access to the Potomac Greens and Old Town Greens neighborhoods.

Alternative B would include the realignment of approximately 500 to 1,000 feet of existing track (double track), as well as the installation of approximately 1,300 feet of new track (double track). Special track work (to include construction of a double crossover) would be required, and would be located approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Construction Staging and Access

To construct Alternative B, access would be required to the area east of the existing Metrorail alignment. Access would be provided through the residential areas of Potomac Greens and Old Town Greens via the entire length of Potomac Greens Drive, as shown in **Figure 1-2**. Additional access to this area would be provided via the George Washington Memorial Parkway. Access to the area west of the existing Metrorail alignment would be required for some construction tasks, including the construction of the two pedestrian bridges. Access for these construction activities would be provided through Potomac Greens Drive, crossing the Metrorail alignment at the tennis court area of Old Town Greens (where Metrorail begins to travel below-grade).

Although Alternative B is located east of the CSXT right-of-way, access would also be required west of the CSXT right-of-way to construct vertical circulation touch-down areas. Access would be provided via the existing Potomac Avenue public right-of-way.

1.4.3 Alternative D

Description of Alternative D

Alternative D would be located just west of the CSXT right-of-way, in the vicinity of the existing Potomac Yard Retail Center. The station would be aerial, with a center platform layout. One pedestrian bridge over the CSXT right-of-way, to be constructed separately from the station, would connect the neighborhoods of Potomac Greens and Old Town Greens to Potomac Avenue at East Glebe Road. The pedestrian bridge would parallel the adjacent, yet separate, Metrorail aerial structure.

Alternative D would include the realignment of approximately 1,000 feet of existing track (double track), as well as the installation of approximately 5,600 feet of new track (double track). Most of the new track would be elevated. Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Special track work (to include construction of a double crossover) would be required, and would be located approximately 100 feet north of the station.

Additional structural improvements would include the removal and replacement of the existing retaining wall at Potomac Greens and the removal of an additional retaining wall on the west side of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Construction Staging and Access

Alternative D would include the removal and installation of approximately 5600 feet of new track and the construction of multiple-span aerial structures. Therefore, to construct Alternative D, construction access would be required in several areas, as described below and shown in **Figure 1-2**.

- On the east side of the existing Metrorail alignment, in two areas:
    - North of Four Mile Run and south of Four Mile Run to the point where the new alignment crosses the existing Metrorail alignment; and
    - Where new track work is required east of the existing Metrorail alignment and adjacent to the Potomac Greens and Old Town Greens neighborhoods.
- Between the existing Metrorail alignment and the CSXT right-of-way, in three areas:
    - Where the new alignment crosses the existing Metrorail alignment and the CSXT right-of-way via an aerial structure north of the proposed station;
    - Where an additional new Metrorail aerial structure and a pedestrian bridge cross the CSXT right-of-way south of the proposed station; and
    - Where new track is constructed west of Potomac Greens and Old Town Greens neighborhoods before tying into the existing alignment.
- West of the CSXT right-of-way, where the new alignment crosses the CSXT right-of-way via a new Metrorail aerial structure, approaches the proposed station, and crosses the CSXT right-of-way again via an additional new Metrorail aerial structure.

Access on the east side of the existing Metrorail alignment, in the vicinity of Four Mile Run, would be provided via the George Washington Memorial Parkway. A construction access easement may be required at Four Mile Run for purposes of installing a temporary bridge pier to support the new Metrorail bridge during

construction. In the vicinity of the Potomac Greens and Old Town Greens neighborhoods, access would be provided via the entire length of Potomac Greens Drive.

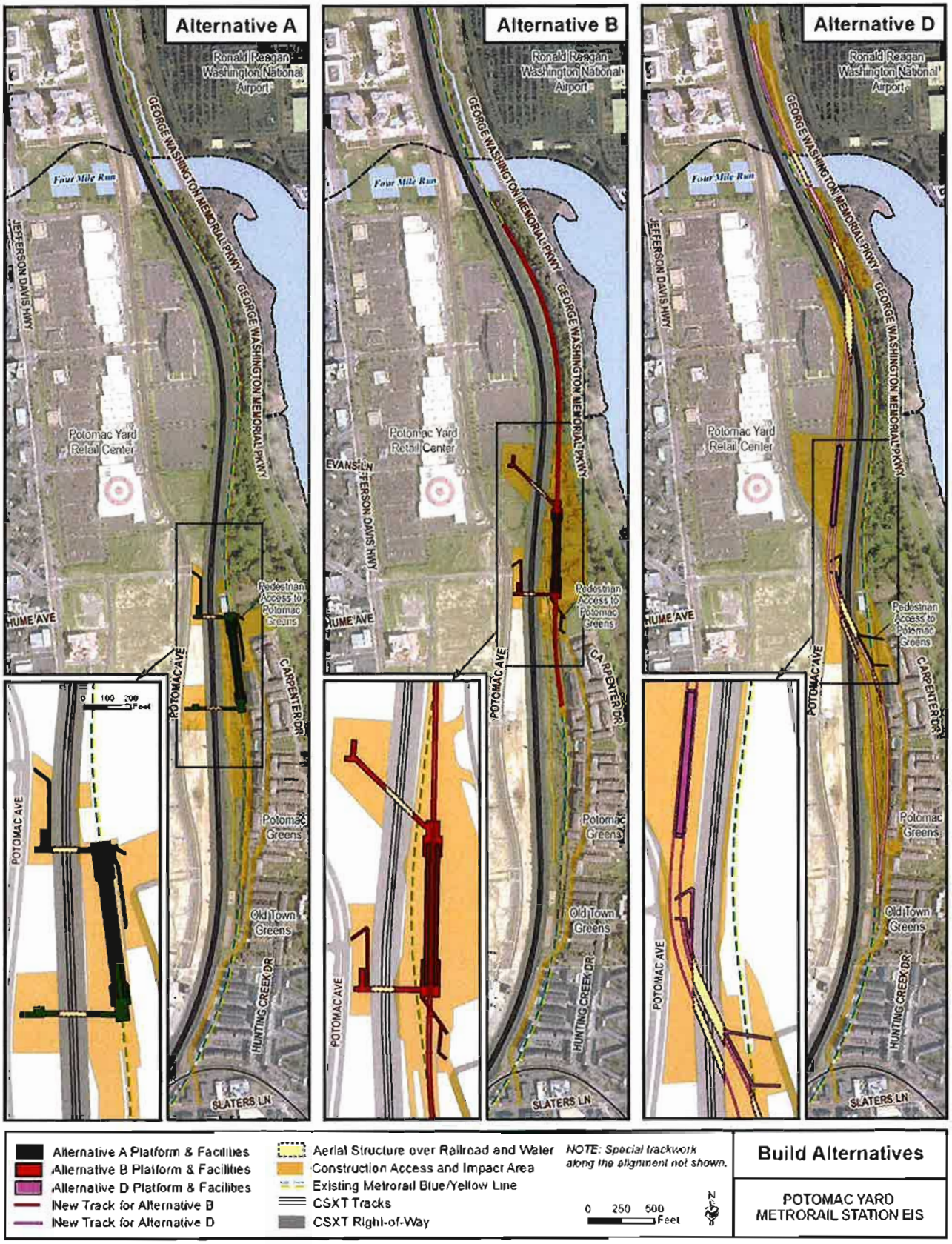
Access to the area between the existing Metrorail alignment and CSXT right-of-way would be provided through Potomac Greens Drive, crossing the Metrorail alignment at the tennis court area of Old Town Greens (where Metrorail begins to travel below-grade). Additional construction access easements would be required at locations where proposed Metrorail aerial structures and pedestrian structures cross over the CSXT right-of-way. A construction access easement would be required from CSXT in the vicinity of Potomac Greens. Temporary removal of a retaining wall may result from the need for construction access at this location.

West of the CSXT right-of-way, access would be provided within Potomac Yard through existing and planned public rights-of-way.

Table 1-1: Build Alternatives

Alternative	Grade and Layout	Track	Facilities for Station Access	Additional Structures Required
A	At-grade, side platform	Use of existing alignment, minimal track work	Two pedestrian bridges over CSXT	
B	At-grade, side platform	Realignment of 500-1,000 feet of existing track; installation of approx. 1,300 feet of new track	Two pedestrian bridges over CSXT, one pedestrian bridge over proposed Metrorail alignment	Retaining wall to support new track and station
D	Aerial, center platform	Realignment of approx. 1,000 feet of existing track; Installation of approx. 5,600 feet of new track	One pedestrian bridge over CSXT	Two aerial structures over CSXT, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west side of the tracks north of the Metrorail portal

Figure 1-2: Build Alternatives



APPENDIX D:

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES

RESPONSE LETTER

JUNE 12, 2012

COMMONWEALTH of VIRGINIA

Department of Historic Resources

Douglas W. Domenech
Secretary of Natural Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

June 12, 2012

Dan Koenig
Federal Transit Administration
1990 K Street NW, Suite 510
Washington, DC 20006-1178

Re: New Construction of WMATA Potomac Yard Metrorail Station – Section 106 Initiation
City of Alexandria and Arlington County, Virginia
DHR File No. 2012-0717

Dear Mr. Koenig,

On May 14, 2012, the Virginia Department of Historic Resources (DHR) received information regarding the above-referenced project for our review and comment pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended. We understand that the proposed project will be receiving federal funding through the Federal Transit Administration (FTA).

DHR understands that the City of Alexandria, in coordination with the FTA, the Washington Metropolitan Transit Authority (WMATA), and the National Park Service (NPS) proposes to construct a new Metrorail station located at the Potomac Yard within the City of Alexandria. The station will be located along the existing Metrorail Blue and Yellow line between the Ronald Regan Washington National Airport and the Braddock Road stations. The FTA is the lead federal agency, and an Environmental Impact Statement (EIS) is currently being prepared for Build Alternatives A, B, and D. Depending on build alternative selected, anticipated construction activities may include the following:

- Aerial or at-grade Metrorail station and platform
- Pedestrian bridge construction
- Track realignment
- Installation of new track
- Cutting, filling, and grading
- Repairing of existing retaining walls
- Installation of new retaining walls
- Construction of a single span aerial structure over Four Mile Run
- Utility installation and/or relocation

As you know, initial Build Alternatives are located in the vicinity of and/or adjacent to the Mount Vernon Memorial Highway/George Washington Memorial Highway (DHR ID#029-0218), and the Washington National Airport Terminal and South Hangar Line (DHR ID#000-0045), both which are listed in the Virginia Landmarks Register (VLR) and the National Register of Historic Places (NRHP). The proposed project alternatives may also directly cross archaeological sites 44AX0207, an 18th century military site, and 44AX0028, the Alexandria Canal; however neither site has yet been evaluated for the VLR/NRHP.

Based upon a review of the information provided, we concur with the FTA's letter, dated May 10, 2012, that the project is a federal undertaking and understand that the FTA is initiating Section 106 consultation. We can provide the following general comments on the proposed undertaking:

- We concur with the proposed Area of Potential Effects (APE) for *direct* effects over 45.1 acres and including all areas of proposed ground disturbance associated with the permanent and temporary construction access and impact areas for Build Alternatives A, B, and D.
- Before we can concur with the proposed APE for *indirect* effects (architecture), we request a justification for the boundaries. Are they primarily visual, or do they account for audible and reasonably foreseeable secondary consequences as well? A new Metrorail station has the potential for additional development in the immediate vicinity of the station as evidenced by other Metrorail stations in the area.
- Pursuant to 36 CFR § 800.2(c), FTA must invite appropriate consulting parties to comment on the proposed project. Please provide a list of consulting parties and their corresponding comments. Since the APE partially extends into Arlington County, they must be included in consultation from the very beginning.

Architectural Resources

Contrary to the application, a reconnaissance survey was not conducted in support of this project. It appears that simply a literature and background search was completed, which was very helpful in understanding the context surrounding this area. Once the APE is agreed upon, we will likely need a better clarification as to the scope of previous survey efforts within the APE. For example, the application state that the proposed APE for indirect effects has not been previously surveyed, yet only one architectural resource not previously identified was detected. Please keep in mind that if the area within the APE has not been previously surveyed, or the area was last surveyed five years ago or more, the area will be need to be resurveyed.

Archaeological Resources

Regarding potential impacts to archaeological resources, we understand that much of the APE has been heavily disturbed and is unlikely to contain significant, intact cultural deposits. However, there remains a possibility that important archaeological deposits exist in protected pockets within the APE. As project plans develop, please continue to coordinate your archaeological identification efforts with our office. Any claims of prior disturbance within the APE must be fully justified and substantiated with field inspections. Because superficial disturbances may leave deeply buried deposits untouched and fill deposits measuring up to 10 feet in thickness are reported, some mechanical trenching may be necessary to assess subsurface integrity. We also recommend seeking the input of Alexandria Archaeology on all work plans, eligibility determinations, and management decisions regarding archaeological resources that may by impacted by this project.

Furthermore, we just received the Methodology Report for the Draft EIS on June 7th, 2012. We intend to review and comment accordingly. For questions regarding archaeology, please contact

Roger Kirchen at (804) 482-6091 or roger.kirchen@dhr.virginia.gov. Should you have any additional questions, please contact me at (804) 482-6084, or via email at andrea.kampinen@dhr.virginia.gov.

Sincerely,

Andrea Kampinen

Andrea Kampinen, Architectural Historian
Office of Review and Compliance

Cc:

Melissa Barlow, FTA
Jim Ashe, WMATA
Ben Helwig, NPS
Susan Gygi, City of Alexandria
Charles Trozzo, AHRPC

APPENDIX E:

COLONIAL REVIVAL APARTMENT COMPLEXES OF ALEXANDRIA

RECONNAISSANCE LEVEL SURVEY FORM

Virginia Department of Historic Resources
Reconnaissance Level Survey

DHR ID#:* 100-5266** ***Other DHR ID#: 100-5264

Resource Information

Resource Name(s): Colonial Revival Apartment Complexes in Alexandria {Descriptive}
Abingdon Apartments {}
Mason Hall Apartments {Historic}
Harbor Terrace Apartments {Historic}
Bashford Hall Apartments {Current}
Locharbor Garden Apartments {Historic}

Date of Construction: ca 1942

Local Historic District :

National Register Eligibility Status

Property has been recommended Eligible for listing or is listed in the National Register of Historic Places

This Resource is associated with the Colonial Revival Apartment Complexes of Alexandria

Location of Resource

Commonwealth of Virginia

County/Independent City: Alexandria

Magisterial District:
Town/Village/Hamlet:
Tax Parcel:
Zip Code:
Address(s): 1600 West Abingdon Drive {Current}
1420 West Abingdon Drive {Current}
1301-1417 East Abingdon Drive {Current}
500-614 Bashford Lane {Current}
402-418 Bashford Lane {Current}

USGS Quadrangle Name: ALEXANDRIA
UTM Boundary Coordinates :

NAD	Zone	Easting	Northing

UTM Center coordinates :
UTM Data Restricted?. No

Resource Description

Ownership Status: Private
Government Agency Owner:
Acreage:
Surrounding area: Suburban
Open to Public: No
Site Description:

January 2013: The Colonial Revival Apartment Complexes of Alexandria is a collection of five garden-style apartments in the Colonial Revival style of architecture. All five complexes are situated along or close to the George Washington Memorial Parkway, immediately north of downtown Alexandria.

Secondary Resource Summary:

The Colonial Revival Apartment Complexes of Alexandria includes the following contributing elements:
Abingdon Apartments
Mason Hall Apartments
Harbor Terrace Apartments
Bashford Hall Apartments
Locharbor Garden Apartments

The tennis courts and swimming pool located at Abingdon Apartments and the gazebo located at Harbor Terrace Apartments are noncontributing elements.

Individual Resource Information

Count	Resource Types	Resource Status
5	Apartment Building	Contributing
1	Pool/Swimming Pool	Non-Contributing
1	Tennis Court	Non-Contributing
1	Gazebo	Non-Contributing

Individual Resource Detail Information

Resource Type.	Apartment Building	*Primary Resource?*	Yes
Date of Construction:	ca 1942	*Accessed?*	
Architectural Style:	Colonial Revival	*Number of Stories:*	0.0
Form:		*Condition:*	Good
Interior Plan Type:			
		Threats to Resource:	None

Abingdon Apartments includes four v-shaped and one c-shaped Colonial Revival-style buildings constructed circa 1942-1945. The apartments are three stories, brick-faced, and have a combination of flat and hipped roofs clad in a mixture of asphalt shingles and slate tiles. The buildings exhibit a number of Colonial-style details including brick quoins, 6/6 double hung synthetic sash windows (replacing the original metal sash windows) with inoperable shutters, hipped roofs, and broken pediment door surrounds.

Mason Hall Apartments consists of one long, linear building with perpendicular extensions on the east side that was constructed circa 1949. The Colonial Revival-style building is four stories with a brick exterior and flat roof with an entablature-style cornice. Windows are arranged symmetrically and are slightly recessed and contain 8/8, 12/12 double-hung wood sashes. Entrances contain Colonial-style wood surrounds with transoms and sidelights that contain replacement panes and doors. A brick belt course wraps around the building above the first floor.

Harbor Terrace Apartments consist of approximately 15 rectangular buildings adjoined at varying ends to form l-shapes and u-shapes. The main building sits at the northeast corner of East Abingdon Drive and Bashford Lane. The two-story Colonial Revival-style complex was constructed circa 1943-1944. The exterior is clad in American bond brick and has a hipped roof covered with slate tiles. Windows contain 6/6 double hung vinyl sashes with stone jack arches and flat stone sills. Entrances contain wood Colonial-style surrounds with fluted pilasters and flat entablature top. Windows over entrances are 12-pane arched wood casements. Other Colonial Revival details include quoins, cupolas, columned porticos, ocular casement windows, and brick water table.

Bashford Hall Apartments consist of two rectangular buildings and one L-shaped building that were built circa 1942-1943. The Colonial Revival-style building is three stories, clad in American bond brick and has a combination of hipped and flat roofs covered with slate tiles. Windows contain 6/6 double hung vinyl sashes with simple wood surrounds and inoperable shutters. The main building features three gabled dormers with four-pane casement windows. Entrances contain flat-roofed Colonial-style porticos with simple circular supports and decorative railings along the roofline. Other Colonial Revival details include ocular casement windows and brick water table.

Locharbor Gardens Apartments consist of one u-shaped building that was built circa 1939-1943. The Colonial Revival-style building is two stories, clad in painted brick and has a flat roof with a cornice featuring stepped brickwork. Windows are arranged in singles and in threes and contain 6/6 and 4/4 double hung vinyl sashes with simple wood surrounds and inoperable shutters. The building also has ocular casement windows. Entrances contain pedimented and broken pedimented Colonial-style surrounds with sidelights.

Primary Resource Exterior Component Description:

Historic Time Period(s): Q- World War I to World War II (1917-1945)

Historic Context(s): Architecture/Community Planning
Architecture/Landscape

Significance Statement

The Colonial Revival Apartment Complexes of Alexandria (Multiple Property Submission) is significant under Criterion A for their contribution to the early development of apartment construction as well as the early twentieth century development of the north end of Alexandria. The apartments, designed in the Colonial Revival-style of architecture were constructed to accommodate the growing population and the demand for quality housing after the Great Depression and during WWII. The apartments are also significant under Criterion C as excellent examples of Colonial Revival-style garden apartments in the City of Alexandria from the second quarter of the twentieth century. The Colonial Revival style of architecture emerged after the Centennial Exposition of 1876 as the result of a renewed interest in the nation's history. The movement gained momentum in the early twentieth century with the advent of the automobile, which enabled Americans to visit many of the country's historic sites. This was especially true in Alexandria where the Mount Vernon Memorial Highway was built in 1932 to commemorate George Washington's bicentennial birthday.

National Register Eligibility Information (Intensive Level Survey):

NR Count	NR Resource Type	NR Resource Status
5	Building	Contributing
Contributing: 5		

National Register Criteria: A- Associated with Broad Patterns of History
C- Distinctive Characteristics of Architecture/Construction

Period of Significance: 1939-1945
Level of Significance: local

NR Areas of Significance: Architecture
Community Planning and Development

Graphic Media Documentation

DHR Negative #	*Photographic Media*	*Negative Repository*	*Photo Date*	*Photographer*
	Digital Photographs	AECOM, Trenton, NJ	November 14, 2012	V. Zeoli

Bibliographic Documentation

Reference #: 1
Bibliographic RecordType: Map
Author:
DHR CRM Report Number:
Notes:
United States Geological Survey
1949 Historic Map. Electronic document available online at: http://www.usgs.gov/pubprod/, accessed February 2012.

Reference #: 2
Bibliographic RecordType: Photograph/Hist
Author: NETR
DHR CRM Report Number:
Notes:
Nationwide Environmental Title Research (NETR)
2012 Historic Aerials. Electronic document available online at: http://www.historicaerials.com, accessed January 2013.

Virginia Department of Historic Resources
Reconnaissance Level Survey

DHR ID#: **100-5266** ***Other DHR ID#:*** 100-5264

Cultural Resource Management (CRM) Events

CRM Event # 1,

Cultural Resource Management Event: Survey:Phase I/Reconnaissance

Date of CRM Event: January 11, 2013

CRM Person: AECOM

CRM Event Notes or Comments:

January 2013:Reconnaissance Level form completed as part of the Section 106 identification phase of the Potomac Yard Metrorail Station project. Further detail documented in an EIS (with cultural resource technical memorandum) and forthcoming Section 106 Effects Assessment Report.

Bridge Information

Cemetery Information

Ownership Information

Colonial Revival Apartment Complexes
of Alexandria (DHR ID# 100-5266)
January 11, 2013
Parcel Boundaries
100
Meters
1 - Abingdon Apartments
2 - Mason Hall Apartments
3 - Harbor Terrace Apartments
4 - Bashford Hall Apartments
5 - Locharbor Garden Apartments
1
2
3
4
5
GEORGE
SHFORD
LANE

Colonial Revival Apartment Complexes
of Alexandria (DHR ID# 100-5266)
January 11, 2013
CRACA
Parcel Boundaries
90
Meters
1 - Abingdon Apartments
2 - Mason Hall Apartments
3 - Harbor Terrace Apartments
4 - Bashford Hall Apartments
5 - Locharbor Garden Apartments
Hawkins Way
Arch Hall Ln
Catt's Tavern Dr
Norfolk Ln
Hunting Creek Dr
Massey Ln
W Abingdon Dr
E Abingdon Dr
Slaters Ln
Portner Rd
Bernard St
Portner Pl
Devon Pl
Chetworth Pl
Michigan Ave
Avon Pl
Seaport Ln
Bashford Ln
Michigan Ct
N Royal St

DIGITAL PHOTO LOG

DHR 100-5266
Colonial Revival Apartment Complexes of Alexandria (CRACA), Alexandria, VA
City of Alexandria, VA
Photographer: Vanessa Zeoli
Location of Original Digital Files: AECOM, 516 E. STATE STREET, TRENTON, NJ 08609

Photo Date	File Name	Photo Description	Direction of View
11/12/2012	100-5266_Abingdon Apartments_2012_exterior_ NW_view.tif	View northwest from W. Abingdon Drive	Northwest
11/12/2012	100-5266_Abingdon Apartments_2012_exterior_ SW_view.tif	View southwest from W. Abingdon Drive	Southwest
11/12/2012	100-5266_MasonHallApartments_2012_exterior_ W_view.tif	View west from W. Abingdon Drive	West
11/12/2012	100-5266_MasonHallApartments_2012_exterior_ NW_view.tif	View northwest from W. Abingdon Drive	Northwest
11/12/2012	100-5266_HarborTerraceApartments_2012_exterior_ NE_view.tif	View northeast from Bashford Lane and E. Abingdon Drive	Southeast
11/12/2012	100-5266_HarborTerraceApartments_2012_exterior_ N_view.tif	View north from Bashford Lane and E. Abingdon Drive	North
11/12/2012	100-5266_BashfordHallApartments_2012_exterior_ SE_view.tif	View southeast from Bashford Lane and N. Pitt St	Southeast
11/12/2012	100-5266_BashfordHallApartments_2012_exterior_ S_view.tif	View south from Bashford Lane	South
11/12/2012	100-5266_LocHarborGardensApartments_2012_exterior_ SE_view.tif	View southeast from Bashford Lane and Abingdon Drive	Southeast
11/12/2012	100-5266_LocHarborGardensApartments_2012_exterior_ S_view.tif	View south from Bashford Lane	South

DHR#: 100-5266
November 12, 2012
Abingdon Apartments
View northwest from W. Abingdon Drive.

DHR#: 100-5266
November 12, 2012
Abingdon Apartments
View southwest from W. Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Mason Hall Apartments
View west from W. Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Mason Hall Apartments
View northwest from W. Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Harbor Terrace Apartments
View northeast from Bashford Lane and E. Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Harbor Terrace Apartments
View north from Bashford Lane and E. Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Bashford Hall Apartments
View southeast from Bashford Lane and N. Pitt St.

DHR#: 100-5266
November 14, 2012
Bashford Hall Apartments
View south from Bashford Lane.

DHR#: 100-5266
November 14, 2012
Locharbor Apartments
View southeast from Bashford Lane and Abingdon Drive.

DHR#: 100-5266
November 14, 2012
Locharbor Apartments
View south from Bashford Lane.

APPENDIX F:

POTOWMACK CROSSING AT OLD TOWN CONDOMINIUMS

RECONNAISSANCE LEVEL SURVEY FORM

Virginia Department of Historic Resources
Reconnaissance Level Survey

DHR ID#:* 100-5264** ***Other DHR ID#: 100-5266

Resource Information

Resource Name(s): Abingdon Apartments {Historic}
Potowmack Crossing at Old Town Condominiums {Current}

Date of Construction: ca 1945

Local Historic District :

National Register Eligibility Status

Property has been recommended Eligible for listing or is listed in the National Register of Historic Places

This Resource is associated with the Colonial Revival Apartment Complexes of Alexandria

Location of Resource

Commonwealth of Virginia

County/Independent City: Alexandria

Magisterial District:
Town/Village/Hamlet:
Tax Parcel:
Zip Code:
Address(s): 1600 West Abingdon Drive {Current}
USGS Quadrangle Name: ALEXANDRIA
UTM Boundary Coordinates :

NAD	Zone	Easting	Northing
Unknown	18	322514	4298987
Unknown	18	322438	4299045
Unknown	18	322533	4299461
Unknown	18	322482	4299435
Unknown	18	322569	4299438

UTM Center coordinates :
UTM Data Restricted?.

Resource Description

Ownership Status: Private
Government Agency Owner:
Acreage:
Surrounding area: Suburban
Open to Public: No
Site Description:

January 2013: Abingdon Apartments is a garden-style apartment building situated on the west side of the George Washington Memorial Highway in the City of Alexandria, Virginia. The condominium complex is located in a suburban area that developed during the second half of the twentieth century and consists mostly of large residential apartment complexes and townhouse communities. The complex is characterized by four V-shaped and one C-shaped buildings that are dominated by courtyards and parking lots on the east side and additional parking lots on the west side. The east side is landscaped with a collection of young and mature deciduous trees and shrubs with paths to various entrances, wood split rail fencing, lampposts, and benches. The property also contains tennis courts and a swimming pool that were constructed in the 1980s.

Secondary Resource Summary:

January 2013:The tennis courts and swimming pool date from the 1980s and are non-contributing.

Individual Resource Information

Count	Resource Types	Resource Status
5	Apartment Building	Contributing
1	Pool/Swimming Pool	Non-Contributing
1	Tennis Court	Non-Contributing

Individual Resource Detail Information

Resource Type.	Apartment Building	*Primary Resource?*	Yes
Date of Construction:	ca 1945 {Site Visit/Photograph}	*Accessed?*	No
Architectural Style:	Colonial Revival	*Number of Stories:*	3.0
Form:		*Condition:*	Good
Interior Plan Type:			
		Threats to Resource:	None

Abingdon Apartments is a garden-style complex that includes four v-shaped and one c-shaped Colonial Revival-style buildings constructed circa 1942-1945. The apartments are three stories, brick-faced, and have a combination of flat and hipped roofs clad in a mixture of asphalt shingles and slate tiles. The buildings exhibit a number of Colonial-style details including brick quoins, 6/6 double hung synthetic sash windows (replacing the original metal sash windows) with inoperable shutters, hipped roofs, and broken pediment door surrounds.

Primary Resource Exterior Component Description:

Component	Comp Type/Form	Material	Material Treatment
Foundation	Foundation - Not Visible	Unknown	Foundation - Not Visible
Roof	Roof - Hipped	Asphalt	Roof - Shingle
Roof	Roof - Hipped	Slate	Roof - Shingle
Roof	Roof - Flat	Unknown	Roof - Not visible
Structural System	Structural System - Not Visible	Unknown	Structural System - Unknown
Windows	Windows - Sash, Double-Hung	Vinyl	Windows - 6/6
Chimneys	Chimneys - Interior end	Brick	Chimneys - Bond, American

Historic Time Period(s): Q- World War I to World War II (1917-1945)

Historic Context(s): Architecture/Community Planning

Significance Statement

January 2013: Abingdon Apartments is one of a collection of garden-style apartment complexes that were constructed in the City of Alexandria during the late 1930s and 1940s. Preliminary research indicates that this complex is only marginally associated with events that have contributed to broad patterns of our history (Criterion A). There is no indication that the complex is associated with persons significant in the past (Criterion B). As a typical, and generally unremarkable example of a vernacular Colonial Revival apartment complex, the Abingdon Apartments is not architecturally significant (Criterion C). There is also no indication that the complex yields or may be likely to yield, information important in history or prehistory (Criterion D). Therefore, Abingdon Apartments is not recommended as individually eligible for listing in the National Register of Historic Places.

While the Abingdon Apartments do not appear to qualify as individually eligible for listing in the NRHP, background research and additional field work suggest that it may be a contributing resource to a collection of thematically-related apartment complexes in the region named the Colonial Revival Apartment Complexes of Alexandria. The apartments are significant under Criterion A for their contribution to the early development of apartment construction as well as the early twentieth century development of the north end of Alexandria. The apartments, designed in the Colonial Revival-style of architecture were constructed to accommodate the growing population and the demand for quality housing after the Great Depression and during WWII. The apartments are also significant under Criterion C as excellent examples of Colonial Revival-style garden apartments in the City of Alexandria from the second quarter of the twentieth century. The Colonial Revival style of architecture emerged after the Centennial Exposition of 1876 as the result of a renewed interest in the nation's history. The movement gained momentum in the early twentieth century with the advent of the automobile, which enabled Americans to visit many of the country's historic sites. This was especially true in Alexandria where the MVMH was built in 1932 to commemorate George Washington's bicentennial birthday.

National Register Eligibility Information (Intensive Level Survey):

NR Count	NR Resource Type	NR Resource Status
5	Building	Contributing
Contributing: 5		

National Register Criteria: A- Associated with Broad Patterns of History
C- Distinctive Characteristics of Architecture/Construction

Period of Significance: 1935-1949
Level of Significance:

NR Areas of Significance: Architecture
Community Planning and Development

Graphic Media Documentation

DHR Negative #	*Photographic Media*	*Negative Repository*	*Photo Date*	*Photographer*
	Digital	AECOM, Trenton, NJ	February 2012	V. Zeoli

Bibliographic Documentation

Reference #: 1
Bibliographic RecordType: Map
Author: USGS
DHR CRM Report Number:
Notes:
United States Geological Survey
1949 Historic Map. Electronic document available online at: http://www.usgs.gov/pubprod/, accessed February 2012.

Reference #: 2
Bibliographic RecordType: Photograph
Author: NETR
DHR CRM Report Number:
Notes:
Nationwide Environmental Title Research (NETR)
2012 Historic Aerials. Electronic document available online at: http://www.historicaerials.com, accessed February 2012.

Cultural Resource Management (CRM) Events

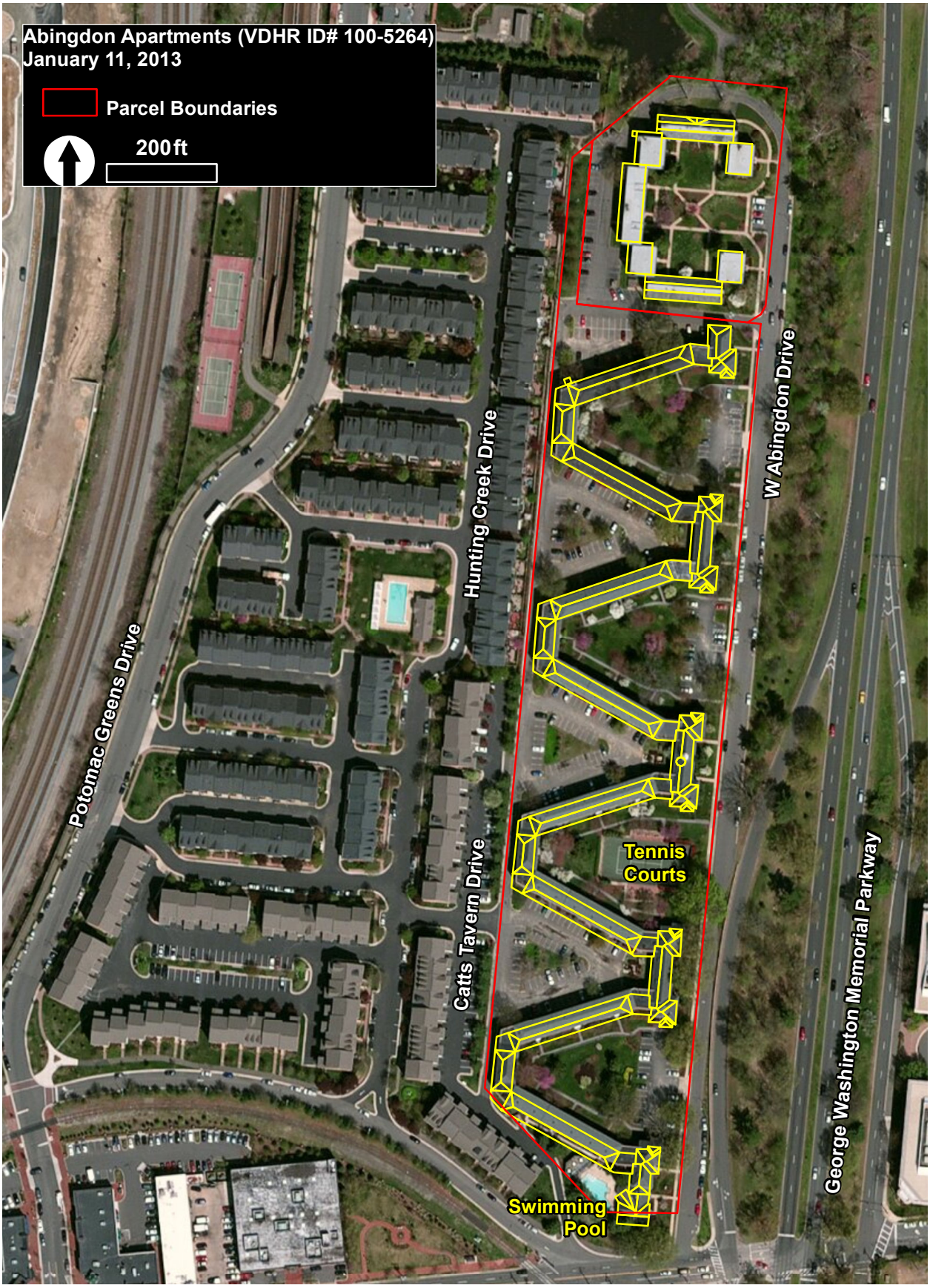
CRM Event # 1,
Cultural Resource Management Event: Survey:Phase I/Reconnaissance
Date of CRM Event: January 09, 2013
CRM Person: AECOM
CRM Event Notes or Comments:
January 2013:Reconnaissance Level form completed as part of the Section 106 identification phase of the Potomac Yard Metrorail Station project. Further detail documented in an EIS (with cultural resource technical memorandum) and forthcoming Section 106 Effects Assessment Report.

Bridge Information

Cemetery Information

Ownership Information

Abingdon Apartments (VDHR ID# 100-5264)
January 11, 2013
Parcel Boundaries
270
Meters
Alexandria VA Topographic Quadrangle (USGS 1965)
BM 5
GEORGE WASHINGTON
Daingerfield Islan
BASHFORD
LANE


Abingdon Apartments (VDHR ID# 100-5264)
January 11, 2013
Parcel Boundaries
200 ft
Potomac Greens Drive
Hunting Creek Drive
Catts Tavern Drive
W Abingdon Drive
George Washington Memorial Parkway
Tennis Courts
Swimming Pool

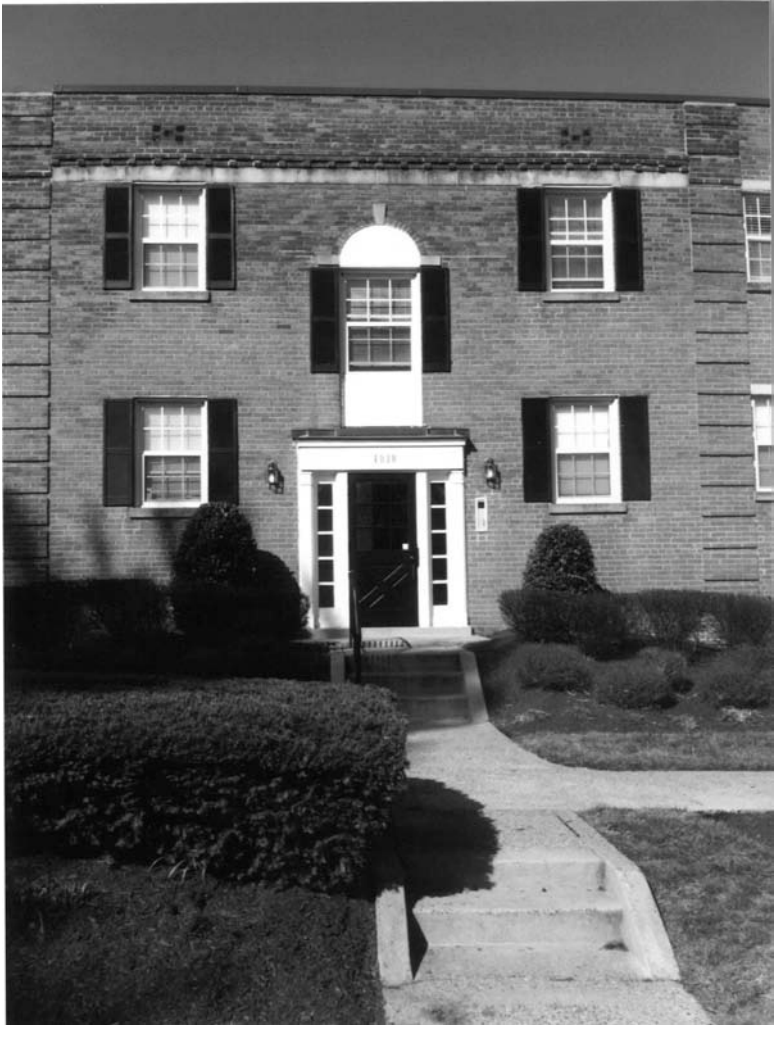
DIGITAL PHOTO LOG

DHR 100-5264
Abingdon Apartments
1600 W. Abingdon Drive
City of Alexandria, VA

Photographer: Brian Albright
Location of Original Digital Files: AECOM, 516 E. STATE STREET, TRENTON, NJ 08609

Photo Date	File Name	Photo Description	Direction of View
3/12/2012	100-5264_AbingdonApartments_2012_exterior_W_view1.tif	East elevation from W. Abingdon Drive, view west	West
3/12/2012	100-5264_AbingdonApartments_2012_exterior_W_view2.tif	East elevation from W. Abingdon Drive, view west	West
3/12/2012	100-5264_AbingdonApartments_2012_exterior_NW_view.tif	View northwest from GWMP off-ramp at Slaters Lane	Northwest
3/12/2012	100-5264_AbingdonApartments_2012_exterior_SW_view.tif	Northwest elevation, view west	Southwest

1990



DHR#: 100-5264

March 13, 2012

Abingdon Apartments

East elevation from W. Abingdon Drive, view west.

1714

APPENDIX G:

CONSULTING PARTIES CORRESPONDENCE AND MAILING LIST

Proposed Section 106 Consulting Parties

Revised list of proposed consulting parties submitted to VDHR on August 24, 2012:

- The National Park Service, George Washington Memorial Parkway (GWMP);
- The United States Army Corps of Engineers (USACE);
- The Tuscarora Nation (Federally Recognized);
- The Mattaponi Tribe;
- The Pamunkey Tribe;
- The Chickahominy Tribe
- The Eastern Chickahominy Tribe
- The Rappahannock Tribe
- The Upper Mattaponi Tribe;
- The Nansemond Tribe;
- The Monacan Indian Nation;
- The Cheroenhaka (Nottaway) Indian Tribe of Southampton County;
- The Nottaway Indian Tribe of Virginia;
- The Patawomeck;
- Arlington County Department of Community Planning, Housing & Development and its Neighborhood Services Division;
- Arlington County Department of Parks and Recreation;
- City of Alexandria Office of Historic Alexandria;
- City of Alexandria Department of Planning and Zoning, Historic Preservation Office;
- Alexandria Archaeology;
- Alexandria Historical Society;
- Arlington Historical Society;
- National Railway Historical Society – Old Dominion Chapter;
- Virginia Historical Society;
- Del Ray Citizens Association;
- Lynhaven Civic Association;
- Alexandria Federation of Civic Associations;
- North Old Town Independent Citizens Association (NOTICe), of Alexandria, Virginia;
- Potomac Greens Homeowners Association;
- Old Town Greens Townhome Owners Association;

- Aurora Highlands Civic Association (in Arlington);
- Arlandria Chirilagua Business Association;
- Del Ray Business Association;
- Old Town Business and Professional Association.

U.S. Department
of Transportation
**Federal Transit
Administration**

SEP 13 2012

REGION III
Delaware, District of
Columbia, Maryland,
Pennsylvania, Virginia,
West Virginia

1760 Market Street
Suite 500
Philadelphia, PA 19103-4124
215-656-7100
215-656-7260 (fax)

RE: Potomac Yard Metrorail Station Project, City of Alexandria, Virginia – Section 106 Consulting Parties Invitation

Dear Consulting Party:

The Federal Transit Administration (FTA), as the lead Federal agency, and the City of Alexandria as the project sponsor and joint lead agency, in cooperation with the Washington Metropolitan Area Transit Authority (WMATA), the National Park Service (NPS), and the United States Army Corps of Engineers (USACE) are preparing an Environmental Impact Statement (EIS) and conducting supporting investigations for the Potomac Yard Metrorail Station (PYMS) project in conformance with the National Environmental Policy Act of 1969 (NEPA), as amended. The PYMS project consists of the construction of a new Metrorail station located at Potomac Yard within the City of Alexandria along the existing Metrorail Blue and Yellow line between Ronald Reagan Washington National Airport station and the Braddock Road Station.

The purpose of this letter is to inform you that FTA has initiated formal consultation with the Virginia Department of Historic Resources (VDHR), in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. §470) and its implementing regulations, 36 CFR Part 800. You or your organization have been identified as having a "demonstrated interest" and we invite you to participate as a consulting party for the PYMS project.

Archaeologists and historians working on behalf of WMATA and the City of Alexandria, and in consultation with VDHR, are conducting a survey of known and potential historic resources in the PYMS project study area. Historic resources include historic or prehistoric districts, sites, buildings, structures or objects potentially eligible for, determined eligible for, or listed in the National Register of Historic Places (NRHP). According to the implementing regulations of Section 106, local governments that have jurisdiction over affected areas in or adjacent to the project are entitled to become consulting parties. In addition, certain individuals and organizations with a demonstrated interest may participate as consulting parties.

If you wish to become a consulting party, please submit your request in writing within 30 days to:

Daniel Koenig
1990 K St. NW Suite 510
Washington, DC 20006

We look forward to any comments that you may have on this undertaking. If you have any questions, please contact Daniel Koenig at 202-219-3528 or daniel.koenig@dot.gov.

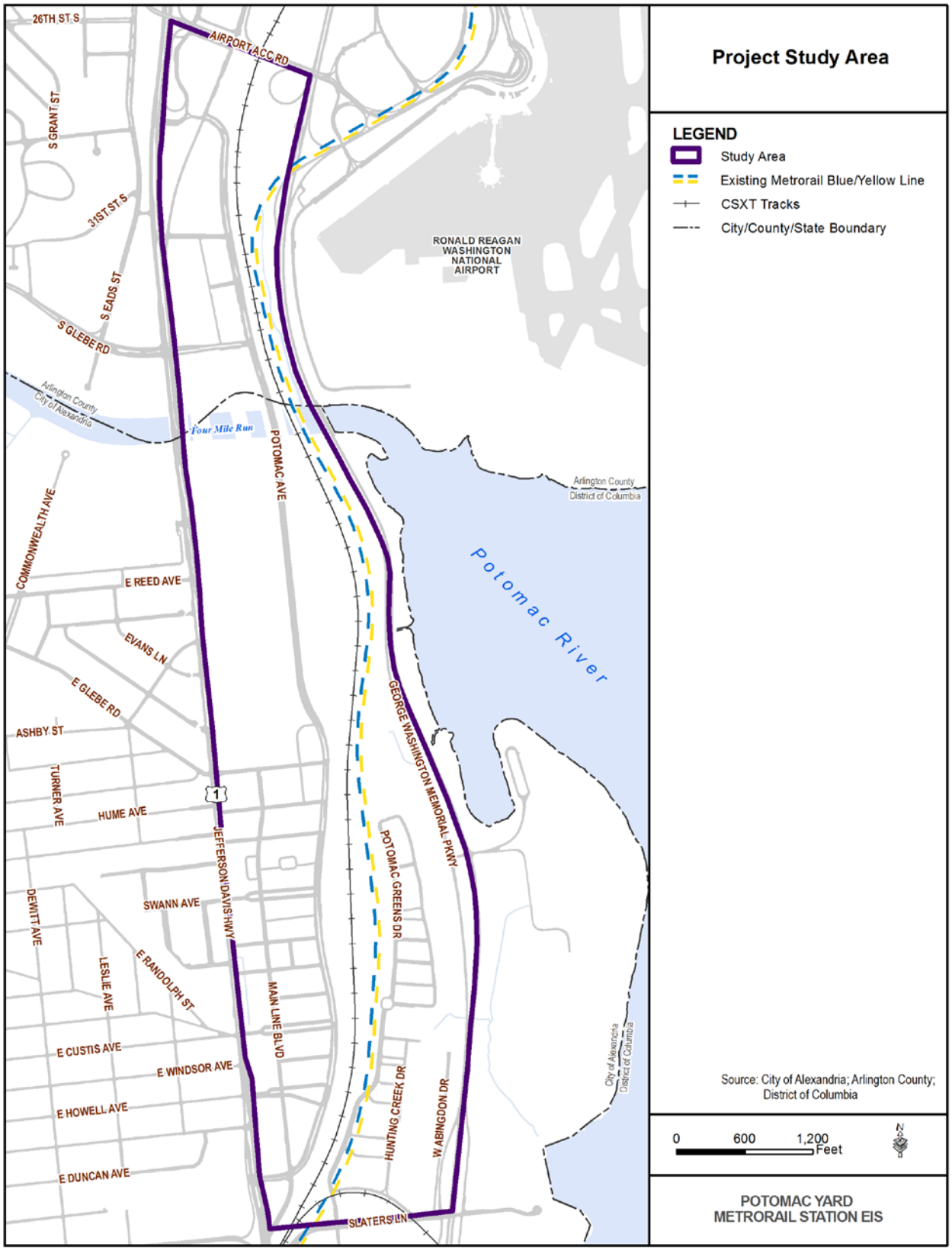
Sincerely,

Brigid Hynes-Cherin
Regional Administrator

Enclosures:
Project Location Map

cc: Melissa Barlow, FTA DC Metro Office
Daniel Koenig, FTA DC Metro Office
Susan Gygi, City of Alexandria
Jim Ashe, WMATA
Andrea Kampinen, VDHR
Roger Kirchen, VDHR

Project Study Area



APPENDIX H:

MOUNT VERNON MEMORIAL HIGHWAY

NATIONAL REGISTER OF HISTORIC PLACES NOMINATION FORM

Department of Historic Resources
Reconnaissance Level Survey

Fairfax (County)

DHR Id#: 029-0218

Other Id#: 029-5524

Resource Identification

Property Name(s): ..... George Washington Memorial Highway (portion) {Alternate Name}
Mount Vernon Memorial Highway {Historic/Current}

Property Date: ..... ca 1929

Address(s): ..... Mount Vernon Memorial Highway {Current}

County/Independent City: Fairfax (County)

Vicinity of: ..... Arlington/Alexandria/Mount Vernon

State, Zip: .....Virginia

USGS Quad Name: ..... ALEXANDRIA

Surrounding area: ..... Suburban

Restricted location data?. No

National Register Eligibility Status

Property is Historic (50 years or older)

Property has been recommended Eligible for listing or is listed on the National Register of Historic Places

This Property is associated with the Parkways of the National Capital Region, 1913-1963 (MPS) [district]

Resource Description

Ownership Status: ..... Public - Federal
Resource is open to the public

Primary Resource Exterior Component Description:

Site Description: ..... July 2007: This resource does not appear to have been altered in any significant way. Refer to previous description(s) for details.

WUZIT Count:

No.	Wuzit Types	Historic?
1	Parkway	Contributing

NR Resource Count:

Individual Resource Information

WUZIT: ..... Parkway

Est. Date of Construction: .... 1929 ca {Written Data}

Primary Resource? ..... Yes

Architectural Style: ..... No Style Listed

Interior Plan Type: .....

Accessed? .....

Number of Stories: 0.0

Condition: ..... Excellent

Threats to Resource: ..... None Known

Description: The Mount Vernon Memorial Highway, a portion of the George Washington Memorial Parkway, links the southwestern end of Arlington Memorial Bridge on Columbia Island, Washington, D.C., with Mount Vernon in Fairfax County, Va., along a route roughly paralleling the Potomac River. The highway was designed and landscaped to maximize scenic, esthetic, and commemorative qualities and retains much of its intended charater. Please see National Register of Historic Places Nomination Form in VDHR Survey File for more detailed information and description.

July 2007: The Mount Vernon Memorial Highway opened to travelers in 1932. It comprises the southern-most section of the larger George Washington Memorial Parkway (029-0228), extending northward from George Washington's former home at Mount Vernon (Fairfax County) for roughly 15.2 miles (24.46 km). It meanders along the path of the Potomac River before terminating at the west-end entrance to the Arlington Memorial Bridge (000-0014). Numerous monuments, historic sites, parks, and other landscaped green spaces are visible along the highway's corridor, and are integral to the resource's overall character and design. The U.S. Marine Corps. War Memorial (a.k.a., the Iwo Jima Memorial) and the Lyndon B. Johnson Memorial Grove are just two examples.

Cemetery Information

Bridge Information

e Information

nal Register Eligibility Information

Historic Context(s): ..... Architecture/Landscape
Transportation/Communication

Historic Time Period(s):..... Q- World War I to World War II (1914-1945)

Significance Statement: The Mount Vernon Memorial Highway is significant as the first parkway constructed and maintained by the U.S. Government and as the first such road with a commemorative function explicit in its name and alignment. Although predated by other parkways, notably in Westchester County, New York, the Mount Vernon Memorial Highway south of Alexandria is probably the least altered of such early roads in the United States today. Its distinctive stone-faced arch bridges, concrete slab base, beveled curbing, and landscape plantings mark its special quality. Please see National Register Nomination Form in the VDHR Survey File for more detailed information on the history of the site.

2007: The Mount Vernon Memorial Highway was listed on the NRHP in 1981 in the areas of engineering, transportation and landscape architecture, with Criterion exceptions F, G and D for archaeology. It was the first parkway built and maintained under the direct supervision of the Federal Government (DHR 2007; Mackintosh 1980).

ibliographic Documentation

Reference #: 1
Bibliographic RecordType: ..... Report
Author: ..... Sean Maroney
Citation Abbreviation: ..... CRM
Notes: ..... Maroney, Sean. 2007. "Cultural Resource Survey of the Arlington Cemetery Cellular Tower Site, Arlington County, Virginia." Dovetail Job #07-040. Dovetail Cultural Resource Group I, Inc., Fredericksburg, Virginia.

wnership Information

raphic Media Documentation

Medium	Depository ID #	Photo Depository	Date	File Name
B&W		DHR	2007/07/99	Parkway, facing N
B&W		DHR	2007/07/99	Parkway, facing S

Cultural Resource Management (CRM) Events

79-71R

Department of Historic Resources
Reconnaissance Level Survey

Fairfax (County) ***DHR Id#: 029-0218***

CRM Event # 1,

Cultural Resource Management Event: ..... VLR Listing
Date: 1981/03/17
Organization or Person: ..... VHLC
CRM Event Notes or Comments: .....

CRM Event # 2,

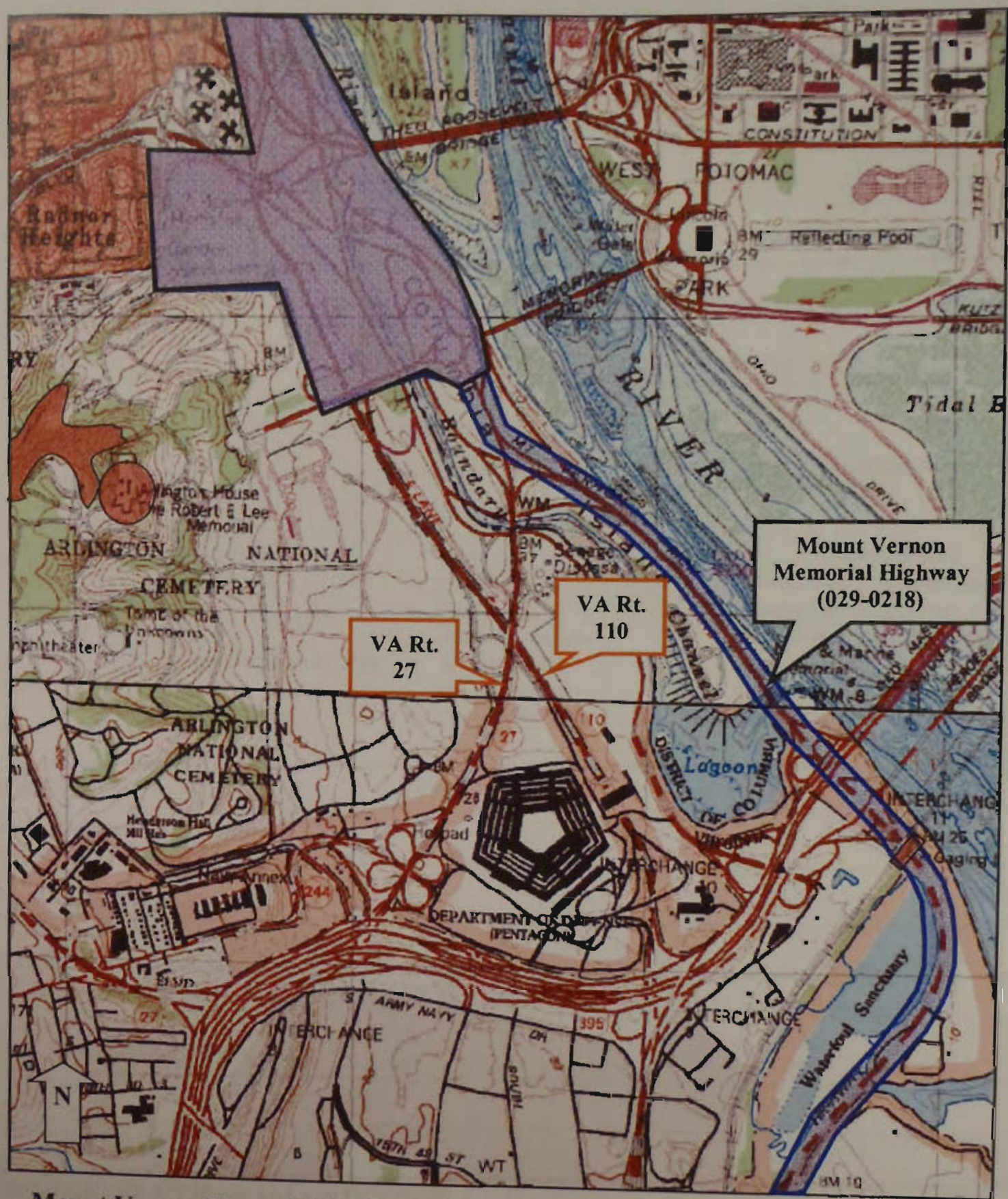
Cultural Resource Management Event: ..... NRHP Listing
Date: 1981/05/18
Organization or Person: ..... NPS
CRM Event Notes or Comments: .....

CRM Event # 3,

Cultural Resource Management Event: ..... NRHP Nomination
Date: 1990/09/15
Organization or Person: ..... Sara Amy Leach
CRM Event Notes or Comments: ..... Multiple Property Documentation - Parkways of the National Capital Region, 1913-1963 (MPS)

CRM Event # 4,

Cultural Resource Management Event: ..... Reconnaissance Survey
Date: 2007/07/99
Organization or Person: ..... Sean Maroney
VDHR Project ID # Associated with Event: .. 2007-1150
CRM Event Notes or Comments: ..... July 2007: The property was examined by Dovetail Cultural Resource Group as part of the Arlington Cemetery cell tower project. The work involved an archaeological survey of the tower pad area and an architectural survey and viewshed analysis of all previously-identified above-ground resources in the project APE.



Mount Vernon Memorial Highway (029-0218), Washington West (DC, MD, VA) Quadrangle (USGS 1981.

c. 1-306 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

ATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR FEDERAL PROPERTIES

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

VLR 3/17/81
NRHP 5/18/81

1 NAME

HISTORIC
Mount Vernon Memorial Highway

AND/OR COMMON
George Washington Memorial Parkway (portion)

2 LOCATION

STREET & NUMBER
x from Memorial bridge S to Mount Vernon

__NOT FOR PUBLICATION

CITY, TOWN
Arlington/Alexandria/Mount Vernon __ VICINITY OF

CONGRESSIONAL DISTRICT
8th (VA)

STATE
Virginia; Washington, D.C.

CODE
VA:51; DC:11

COUNTY
Alexandria (510), Arlington (013), Fairfax (059), D.C. (001)

CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	X PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 AGENCY

REGIONAL HEADQUARTERS: *(If applicable)*
National Capital Region, National Park Service

STREET & NUMBER
1100 Ohio Drive, S.W.

CITY, TOWN
Washington

__ VICINITY OF

STATE
D.C. 20242

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

DATE

__FEDERAL __STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN

STATE

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	X LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	X SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	X OTHER (SPECIFY) Commemoration
		__INVENTION		

SPECIFIC DATES 1929-32 BUILDER/ARCHITECT U.S. Bureau of Public Roads

STATEMENT OF SIGNIFICANCE

The Mount Vernon Memorial Highway is significant as the first parkway constructed and maintained by the U.S. Government and as the first such road with a commemorative function explicit in its name and alignment. Although predated by other parkways, notably in Westchester County, New York, the Mount Vernon Memorial Highway south of Alexandria is probably the least altered of such early roads in the United States today. Its distinctive stone-faced arch bridges, concrete slab base, beveled curbing, and landscape plantings mark its special quality.

Planning for a highway "of noble proportions" linking Washington, D.C., with the national shrine of Mount Vernon began in 1887-88 with the formation of the Mount Vernon Avenue Association, chartered by the Commonwealth of Virginia. Pursuant to a congressional directive, Lt. Col. Peter C. Hains of the U.S. Army Corps of Engineers surveyed several routes from the Virginia end of Aqueduct Bridge (predecessor of Key Bridge) to George Washington's home and tomb. Hains' vision of the nature and purpose of the road was reflected in his report; submitted in 1890:

> It is to commemorate the virtues of the grandest character in American history.... A road, therefore, built from the capital of the nation to the tomb of its founder, would not be such as built for ordinary traffic. It should have the character of a monumental structure, such as would comport with the dignity of this great nation in such an undertaking, and the grandeur of character of the man to whom it is dedicated.... The grades should be light, the alignment in graceful curves, and it should pass over some of the high grounds from which the beautiful scenery along the route could be enjoyed, and possibly near the places that Washington himself frequented--places that now have a historical interest because they are associated with him.... The roadway should be well paved and well kept. It should be such a work as no American need feel ashamed of.

The highway plans received a setback in 1892 when the Washington, Alexandria, and Mount Vernon Railroad built an electric railway to Mount Vernon, reducing the functional need for the proposed road. But the concept was kept alive in the comprehensive 1902 report of the Park Improvement Commission of the District of Columbia, sponsored by the Senate Committee on the District of Columbia chaired by Senator James McMillan. The Senate Park Commission or McMillan Commission, as it was popularly known, proposed the construction of the present Arlington Memorial Bridge and recommended that a highway proceed from its southwest terminus to Mount Vernon along one of the higher and more inland routes surveyed by Hains.

(continued)
ON #3

9 MAJOR BIBLIOGRAPHICAL REFERENCES

James M. Goode. The Outdoor Sculpture of Washington, D.C. Washington: Smithsonian Institution Press, 1974.

David Murphy. "Mount Vernon Memorial Highway; Forty Years in Design." 23 p. typescript, National Capital Region, National Park Service.

National Capital Planning Commission. Worthy of the Nation: The History of Planning for the National Capital. Washington: Smithsonian Institution Press, 1977.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY c. 515

UTM REFERENCES SEE CONTINUATION SHEET

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A				B			
C				D			

VERBAL BOUNDARY DESCRIPTION

The boundary includes those Federal lands of the George Washington Memorial Parkway deliniated on the accompanying U.S.G.S maps, plus Washington Street in Alexandria as subject to a Federal easement for parkway purposes.

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
Virginia	51	Arlington	013
		Alexandria (city)	510
		Fairfax	059
District of Columbia	11		001

11 FORM PREPARED BY

NAME / TITLE
Barry Mackintosh, Regional Historian

ORGANIZATION
National Capital Region, National Park Service

DATE
June 1980

STREET & NUMBER
1100 Ohio Drive, S.W.

TELEPHONE
(202)426-6660

CITY OR TOWN
Washington

STATE
D.C. 20242

12 CERTIFICATION OF NOMINATION

STATE HISTORIC PRESERVATION OFFICER RECOMMENDATION

YES X NO ___ NONE ___

Tucker Hill, Executive Director
Va. Historic Landmarks Commission & 3/17/81
STATE HISTORIC PRESERVATION OFFICER SIGNATURE

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Historic Preservation Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The evaluated level of significance is ___National ___State ___Local.

FEDERAL REPRESENTATIVE SIGNATURE

TITLE

DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
X EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	X ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Mount Vernon Memorial Highway, a portion of the George Washington Memorial Parkway, links the southwestern end of Arlington Memorial Bridge on Columbia Island, Washington, D.C., with Mount Vernon in Fairfax County, Va., along a route roughly paralleling the Potomac River. The highway was designed and landscaped to maximize scenic, esthetic, and commemorative qualities and retains much of its intended character.

The 8-1/2-mile section in Fairfax County from Mount Vernon north to Hunting Creek, the southern boundary of Alexandria, is the least altered portion of the highway. Much of the original concrete slab construction remains exposed on this section of the road, which is four lanes wide with occasional planted median dividers at grade separations and intersections.

At the Mount Vernon terminus is a landscaped traffic circle with flanking parking areas screened by vegetation in accordance with the original design. Facing the circle next to the gateway to George Washington's estate is the Mount Vernon Inn, a colonial revival restaurant, snack bar, and gift shop; it and a comparably designed octagonal structure in front used as a Park Police office were built in conjunction with the parkway. A bronze plaque on a boulder nearby identifies the Mount Vernon Memorial Highway and its construction for the bicentennial of Washington's birth.

A single-arch bridge with battered abutments and a decorative projecting stone course carries the highway across Little Hunting Creek where it enters the Potomac just east of Washington's estate. The alignment then curves north with the riverbank, the road running close to the river's edge as it passes Fort Washington on the Maryland shore to provide scenic views of that impressive 19th century stone fortress. A bridge of a single segmental arch bordered by battered buttress projections carries Alexandria Avenue across the parkway. At the north end of the section is the bridge over Hunting Creek, three arches between battered abutments with battered buttresses articulating the piers. All bridges are compatibly faced with varicolored rough random ashlar.

Beveled curbing is used throughout the southern section of the highway for easy pull-off onto the adjacent grass. Guard rails where needed are of treated, unpainted wood to blend with the natural landscape. The original plantings here are most fully intact at the Mount Vernon terminus and at Belle Haven, a short distance south of Hunting Creek.

North of Hunting Creek through the Old Town section of Alexandria the parkway utilizes Washington Street, which runs straight on a nearly north-south alignment about 1-3/4 miles to just north of First Street. Laid out in the late 18th century, Washington Street is lined with many late 18th and 19th century buildings. In 1929 the city of Alexandria granted the United States a perpetual easement over the

(continued)
on #1

street in furtherance of the memorial highway development. The agreement conveying the easement provided, inter alia, that the United States would reconstruct and maintain Washington Street consistent with its new function as a parkway link, that Alexandria would control entering traffic to give the street precedence as a main thoroughfare, and that the city would ban facing billboards and restrict the street "to residential and business development of such character and of such type of building as will be in keeping with the dignity, purpose and memorial character" of the highway. These provisions and the city's Old and Historic Alexandria District ordinance dating from 1946 perpetuated the distinctive character of Washington Street evident today. (Washington Street and the historic buildings facing it are already included in the National Register as elements of the Alexandria Historic District; the street is included again here by virtue of the Federal interest in it as a component of the memorial highway.)

North of First Street the highway returns to the full jurisdiction of the United States and continues about 5-1/2 miles to the traffic circle at the end of Arlington Memorial Bridge. This section was and is divided by a median strip. Alterations from the original construction include asphalt paving, realignment around National Airport, widening to six lanes between the airport and the 14th Street bridges to Washington, and relocation of the southbound lane where it formerly joined the circle at the bridge. The beveled curbing continues.

For about the first 3/4-mile of this section the northbound lanes are on axis with the Washington Monument in Washington, D.C., offering motorists a striking vista to the giant obelisk over four miles distant. This slightly downsloping stretch, known as Monument View Hill, also contains remnants of the original plantings. The bridge over Four Mile Run to the north (the boundary between Alexandria and Arlington County) was constructed in the late 1970s and is not a contributing element of this nomination. A bridge like the Alexandria Avenue overpass carried the parkway on its original alignment through what is now National Airport; since the parkway was realigned west of the airport, the bridge has remained to carry internal airport traffic over an access road to the north terminal. (The bridge is now outside National Park Service jurisdiction and no longer serves the parkway, so it is not included in this nomination.) Just north of the airport the highway crosses Roaches Run on an original stone-faced box culvert. The random ashlar facing of the parkway bridges was employed by the Richmond, Fredericksburg, and Potomac Railroad in its bridge over the highway and to a lesser degree in the more recent Rochambeau and George Mason (14th Street) highway bridges paralleling the railroad to the north. A wholly modern, functional Metrorail overpass was added in the late 1970s between the railroad and highway bridges. (These spans are outside Service jurisdiction and excluded from this nomination.) A short distance beyond these overpasses the parkway crosses the Boundary Channel to Columbia

(continued)

Island, Washington, D.C., on another single arch bridge with battered buttress projections and varicolored random ashlar facing. The road proceeds along the island for about a mile to its terminus at the Arlington Memorial Bridge circle.

Although not constructed in connection with the Mount Vernon Memorial Highway, the Navy-Marine Memorial adjoins it on the eastern end of Columbia Island and is included in this nomination. The memorial features a cast aluminum sculpture of a rolling wave with seven seagulls intricately balanced atop it. The base is of green granite. The memorial, approximately 30 feet long and 35 feet tall, commemorates the men of the U.S. Navy and U.S. Marine Corps who died at sea during World War I.

Approximately 1/4-mile from the Navy-Marine Memorial on the west side of the parkway is the Lyndon Baines Johnson Memorial Grove on the Potomac, a modern landscaped memorial to President Johnson. It is listed separately in the National Register.

In 1922 Congress appropriated funds for the planning of Arlington Memorial Bridge, and in 1924 it created the United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George Washington. Construction of the bridge beginning in 1926 gave impetus to plans for a road linking it to Mount Vernon, and an act of Congress approved May 23, 1928, directed the survey and construction of a "suitable memorial highway" between these points under the auspices of the Washington bicentennial commission. The act ordered the Secretary of Agriculture, who had jurisdiction over the Bureau of Public Roads, to survey routes for selection by the commission and prepare highway plans with "provision for the planting of shade trees and shrubbery and for such other landscape treatment, parking, and ornamental structures as he may prescribe...."

Because of Westchester County's pioneering role in parkway design and construction, the Bureau of Public Roads hired as consultants three employees of the Westchester County Park Authority: Chief Engineer Jay Downer, Landscape Architect Gilmore D. Clarke, and Landscape Plantsman Henry Nye. The resulting design similarity to the New York parkways was evident in such features as the bridges of reinforced concrete slab and girder construction masked by native stone arches and the rustic wooden guardrails.

Two routes were chosen as alternatives, both of which were further modifications of alignments proposed by Hains. The commission ultimately selected the route nearest the Potomac, which afforded fine views of the river and the striking axial vista of the Washington Monument for traffic northbound from Alexandria--especially fitting given the highway's commemorative purpose. Construction began under the direction of the Bureau of Public Roads on September 17, 1929; the road was opened to traffic on January 16, 1932, the bicentennial year of Washington's birth. President Hoover traveled the highway to Mount Vernon that November for its formal dedication.

While the Mount Vernon Memorial Highway was still under construction, the Capper-Crampton Act of May 29, 1930, authorized the Federal acquisition of additional lands on both sides of the Potomac for the development of the George Washington Memorial Parkway. This act provided for the transfer of the completed Mount Vernon Memorial Highway to the Office of Public Buildings and Public Parks of the National Capital--subsumed by the National Park Service in 1933--as a component of the larger parkway, which ultimately extended northwest to Great Falls on the Virginia side of the river and from Chain Bridge to Cabin John on the Maryland side. (A proposed linking bridge across the Potomac at Great Falls and an extension in Maryland south to Fort Washington were never built.) The road remains under National Park Service administration.

(continued)

With the exception of traffic lights in Alexandria, there are no impediments to the free flow of traffic on the parkway in keeping with its historic character. The highway serves as the major access to a number of scenic and recreational features along its route, including Riverside, Fort Hunt, Belle Haven, Dyke Marsh, Daingerfield Island, Gravelly Point, Roaches Run, and Collingwood.

The Navy-Marine Memorial was erected in 1934 on lands of the Mount Vernon Memorial Highway at the east end of Columbia Island, Washington, D.C. Designed by the sculptor Ernesto Begni del Piatta in 1922, the dynamic rolling wave and soaring gulls were to have rested on an elaborate stepped base of polished green granite evocative of the sea. Funds for this base were inadequate, and in 1940 the present abbreviated granite pedestal replaced the rough concrete base installed for the dedication. The cast aluminum sculpture itself is nevertheless a unique and striking specimen among Washington's abundant memorial art.

UTM REFERENCES

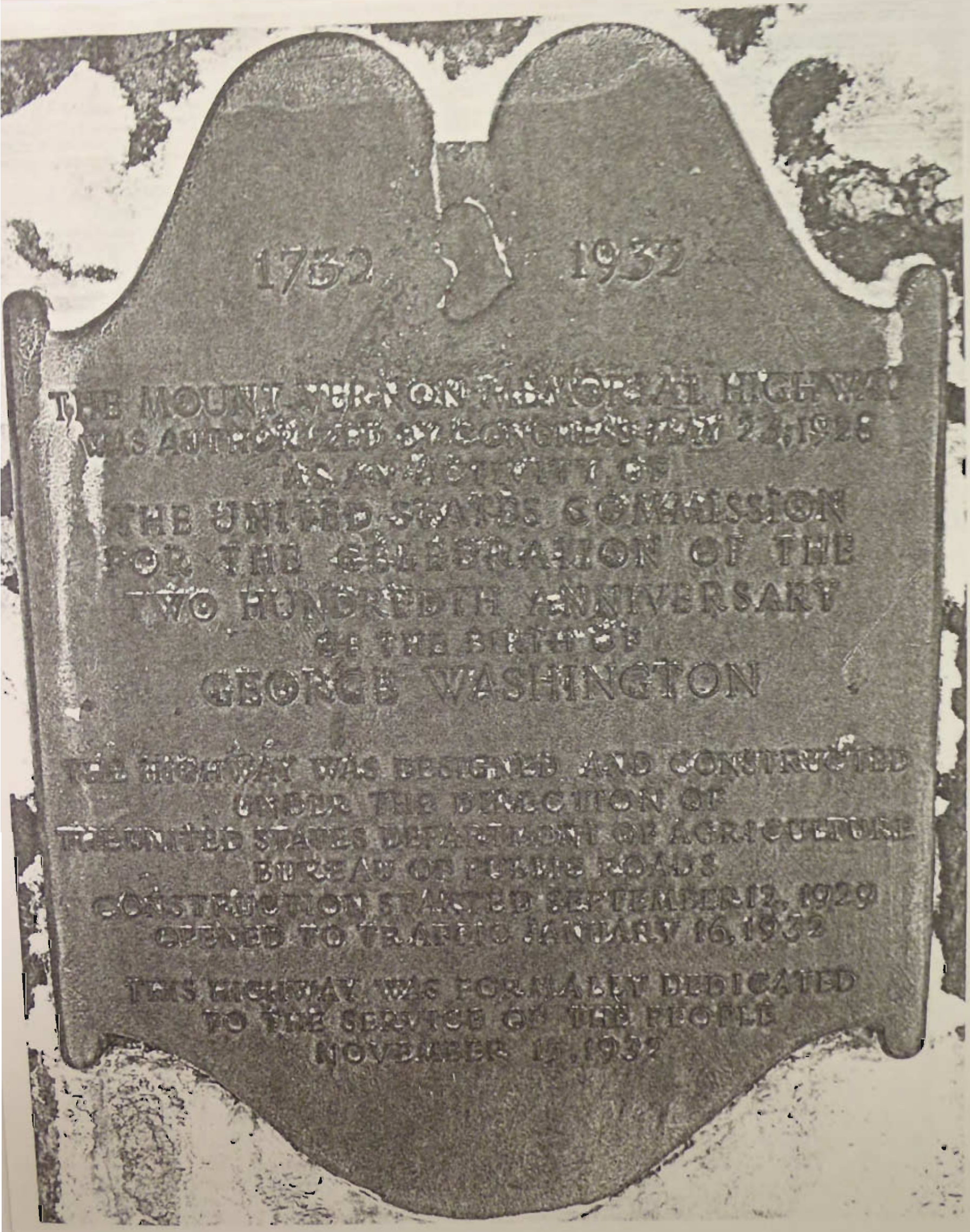
A:	18/321160/4306050	(Washington West quad.)
B:	18/323240/4304130	(Alexandria quad.)
C:	18/322520/4303060	"
D:	18/322220/4301500	"
E:	18/322710/4299550	"
F:	18/322470/4298050	"
G:	18/321980/4295410	"
H:	18/321540/4294610	"
I:	18/321820/4293730	"
J:	18/321590/4292650	"
K:	18/322020/4291800	"
L:	18/321880/4291220	"
M:	18/322030/4289870	(Mount Vernon quad.)
N:	18/321940/4289030	"
O:	18/322550/4288560	"
P:	18/322410/4287140	"
Q:	18/321520/4286340	"
R:	18/319790/4286370	"
S:	18/319080/4287170	"
T:	18/318600/4286440	"
U:	18/318430/4286550	"
V:	18/318380/4287040	"
W:	18/319120/4287580	"
X:	18/320000/4286530	"
Y:	18/321290/4286520	"
Z:	18/322200/4287280	"
AA:	18/322320/4288480	"
BB:	18/321750/4288970	"
CC:	18/321920/4289900	"
DD:	18/321770/4291070	(Alexandria quad.)
EE:	18/321910/4291720	"
FF:	18/321460/4292660	"
GG:	18/321700/4293770	"
HH:	18/321380/4294590	"
II:	18/321940/4295640	"
JJ:	18/322420/4298060	"
KK:	18/322530/4299620	"
LL:	18/322040/4301260	"
MM:	18/322300/4302830	"
NN:	18/322830/4304150	"
OO:	18/321380/4305590	(Washington West quad.)

Plaque at Mount Vernon Terminus, Mount Vernon Memorial Highway NPS 1980

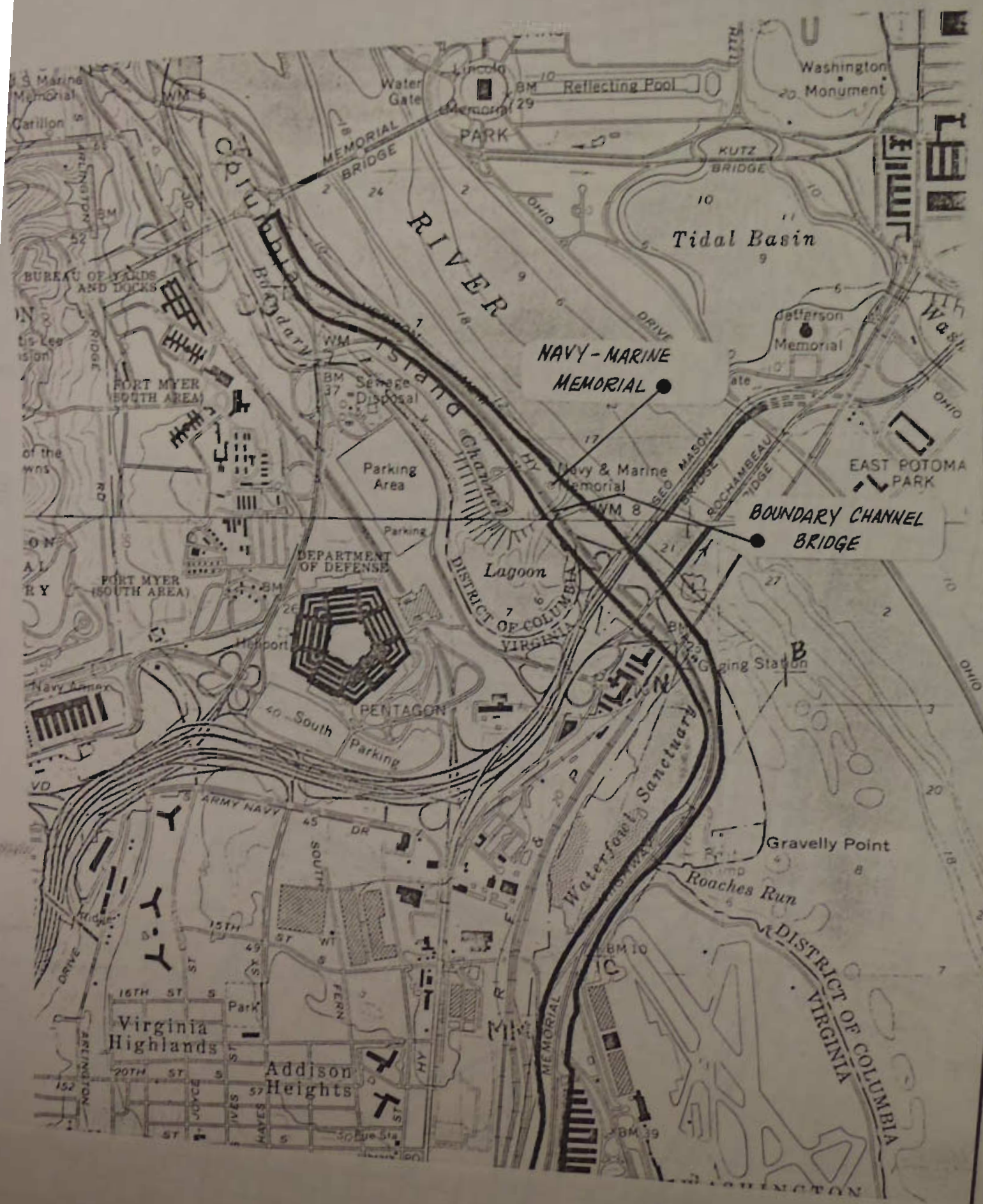
Mount Vernon Inn, Mount Vernon Memorial Highway NPS 1980

Little Hunting Creek Bridge, Mount Vernon Memorial Highway NPS 1980

Mount Vernon Memorial Highway Fort Washington, Md., Vista NPS 1980


1732
1932
THE MOUNT VERNON MEMORIAL HIGHWAY
WAS AUTHORIZED BY CONGRESS MAY 23, 1928
AS AN ACTIVITY OF
THE UNITED STATES COMMISSION
FOR THE CELEBRATION OF THE
TWO HUNDREDTH ANNIVERSARY
OF THE BIRTH OF
GEORGE WASHINGTON
THE HIGHWAY WAS DESIGNED AND CONSTRUCTED
UNDER THE DIRECTION OF
THE UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
CONSTRUCTION STARTED SEPTEMBER 12, 1929
OPENED TO TRAFFIC JANUARY 16, 1932
THIS HIGHWAY WAS FORMALLY DEDICATED
TO THE SERVICE OF THE PEOPLE
NOVEMBER 15, 1932

Washington West
7.5



Alexandria
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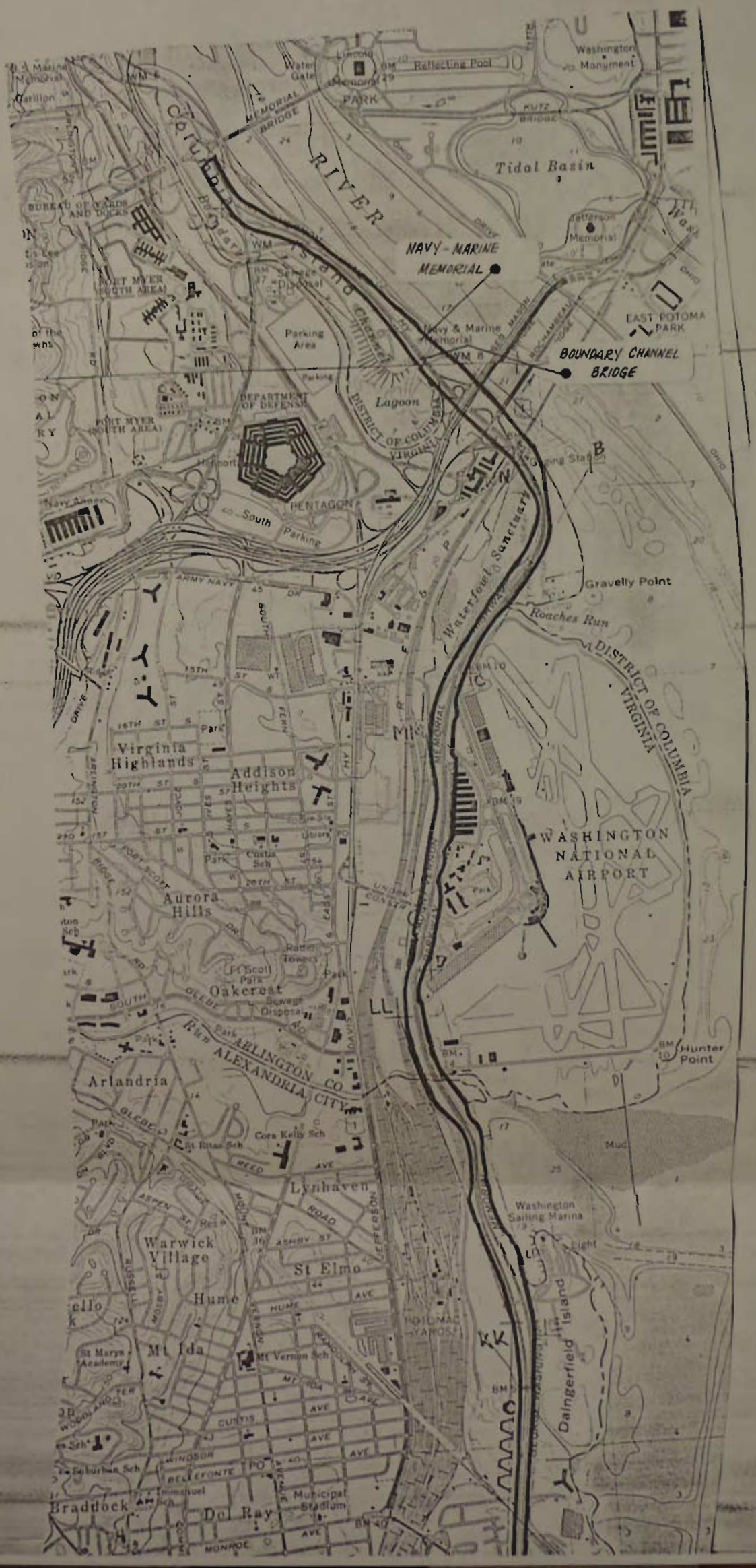
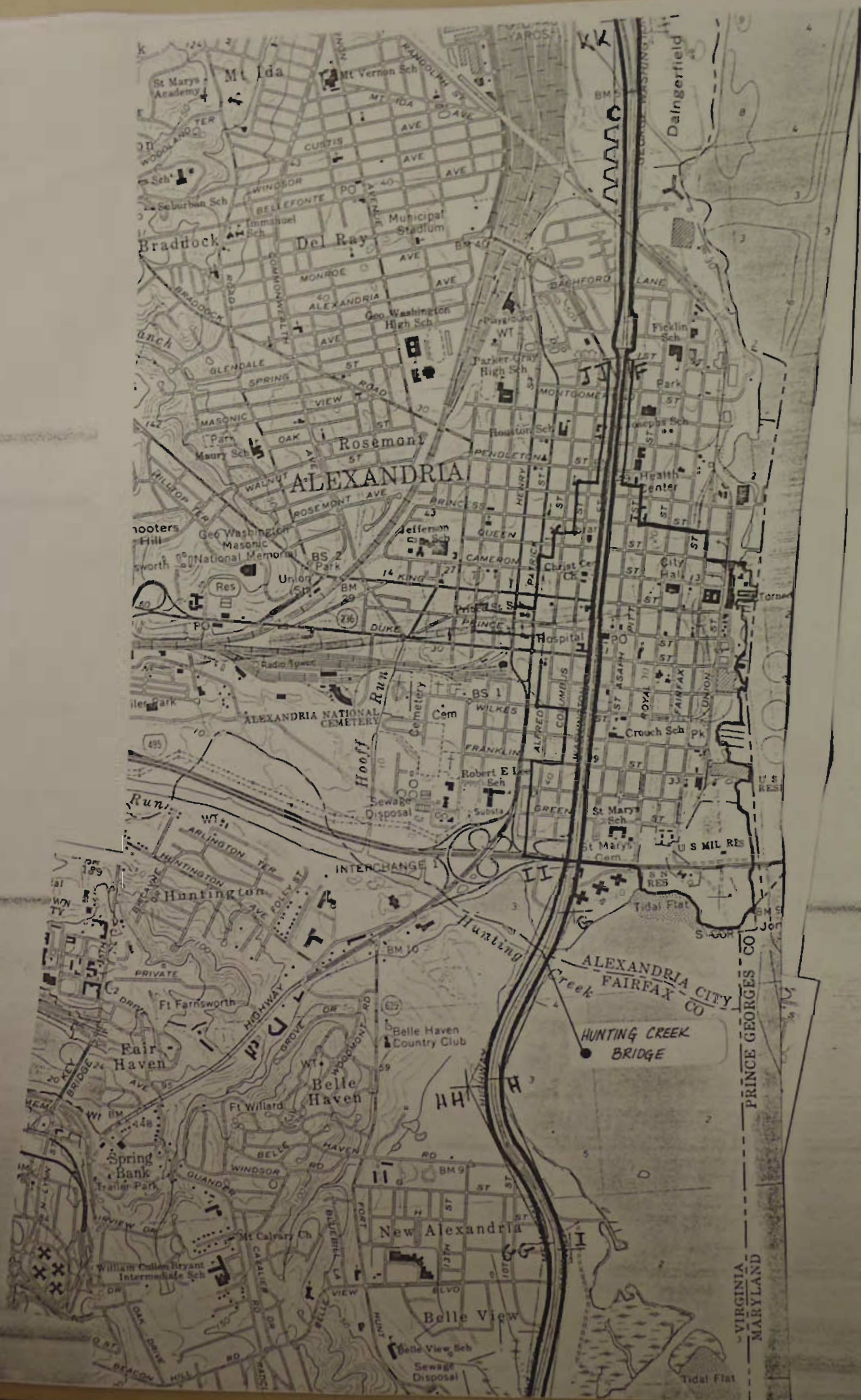

NAVY-MARINE MEMORIAL
BOUNDARY CHANNEL BRIDGE
Tidal Basin
Washington Monument
Reflecting Pool
Lincoln Memorial
Jefferson Memorial
EAST POTOMA PARK
Navy & Marine Memorial
Parking Area
Lagoon
DEPARTMENT OF DEFENSE
PENTAGON
South Parking
Gravelly Point
Roaches Run
Waterfowl Sanctuary
DISTRICT OF COLUMBIA
VIRGINIA
WASHINGTON NATIONAL AIRPORT
Hunter Point
Mud
Washington Sailing Marina
Daingerfield Island
Virginia Highlands
Addison Heights
Aurora Hills
Oakcrest
Arlington Co
Alexandria City
Arlandria
Lynhaven
Warwick Village
St Elmo
Hume
Mt Ida
Braddock
Del Ray
Municipal Stadium
Cora Kelly Sch
Mt Vernon Sch
Immanuel Ch
Suburban Sch
St Marys Academy
Radio Towers
Sewage Disposal
Alexandria
7.5


Mt Ida
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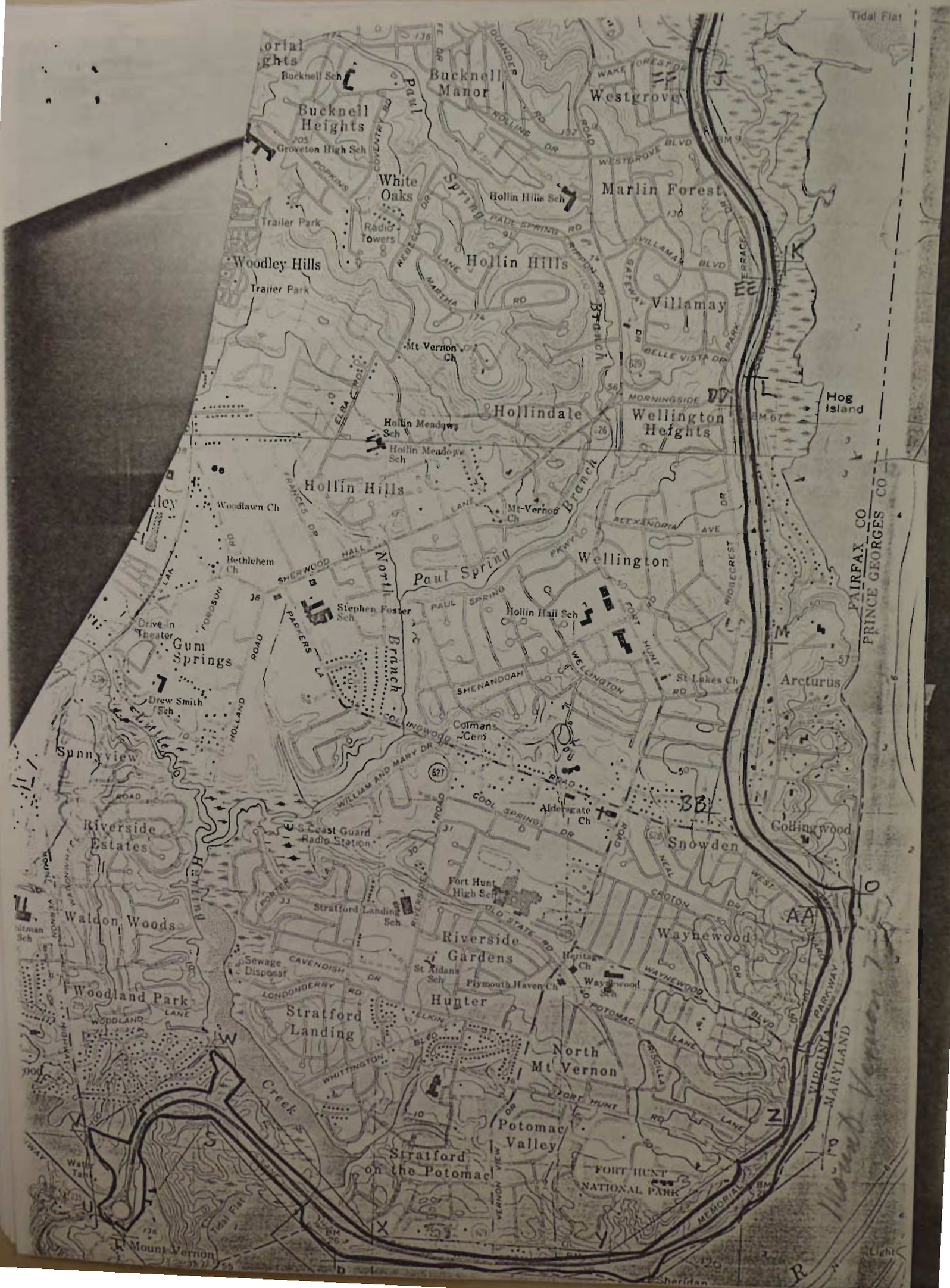
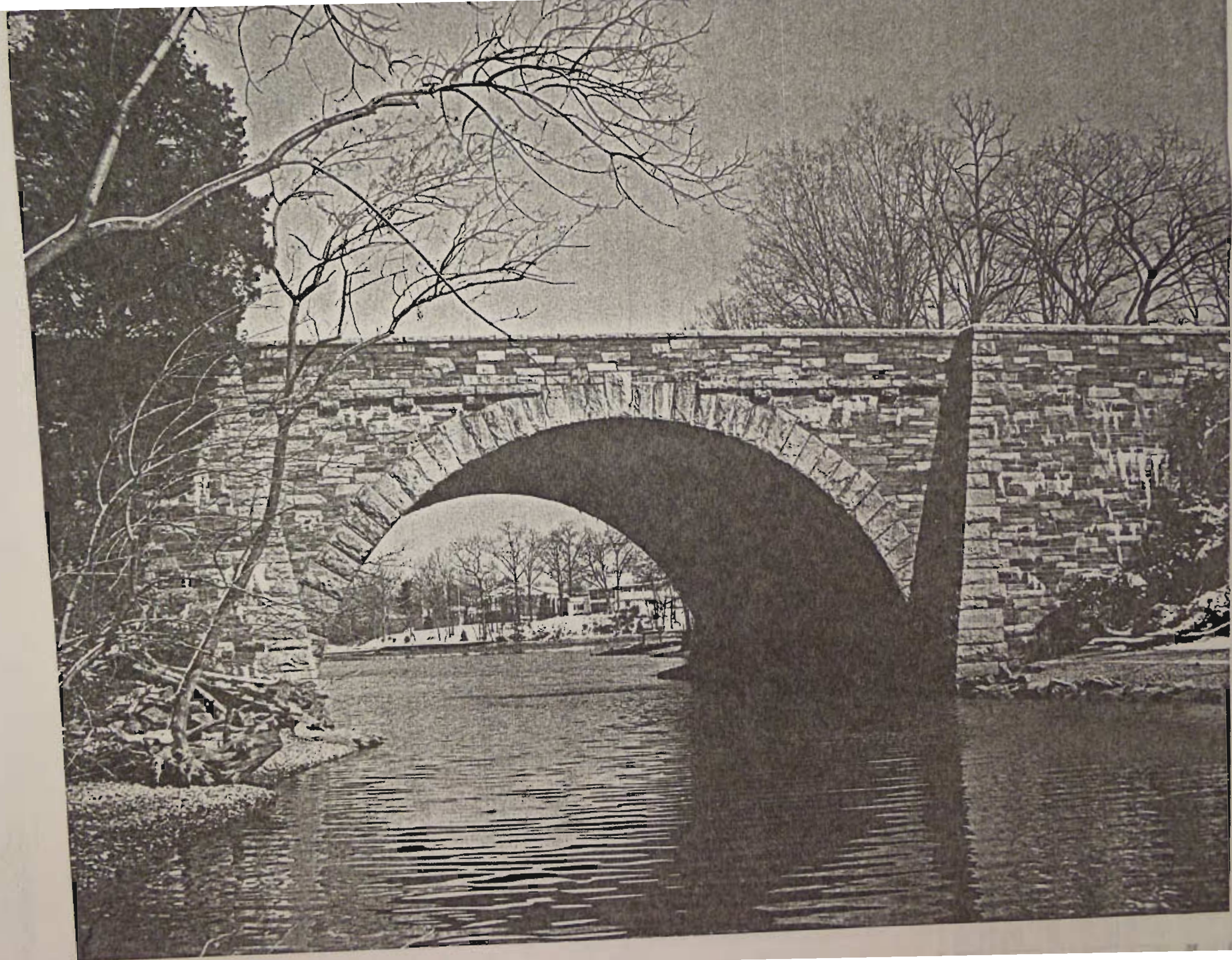
Suburban Sch
Immanuel Sch
Braddock
Del Ray
Municipal Stadium
Geo Washington High Sch
Parker Gray High Sch
Rosemont
ALEXANDRIA
Maury Sch
Geo Washington Masonic National Memorial
Union Sch
Jefferson Sch
Hospital
City Hall
Health Center
Ficklin Sch
Dalngerfield
ALEXANDRIA NATIONAL CEMETERY
Cemetery
Hooff Run
Robert E Lee Sch
Sewage Disposal
Crouch Sch
St Marys Sch
St Marys Cem
U S MIL RES
Tidal Flat
INTERCHANGE 1
Huntington
Ft Farnsworth
Fair Haven
Belle Haven Country Club
Ft Willard
Spring Bank Trailer Park
Mt Calvary Ch
William Cullen Bryant Intermediate Sch
New Alexandria
Belle View
Belle View Sch
Hunting Creek
ALEXANDRIA CITY
FAIRFAX CO
PRINCE GEORGES CO
VIRGINIA
MARYLAND
HUNTING CREEK BRIDGE


Tidal Flat
Bucknell Sch
Bucknell Manor
Westgrove
Bucknell Heights
Groveton High Sch
White Oaks
Paul Spring Branch
Hollin Hills Sch
Marlin Forest
Trailer Park
Radio Towers
Woodley Hills
Trailer Park
Hollin Hills
Villamay
Mt Vernon Ch
Hog Island
Hollindale
Wellington Heights
Hollin Meadows Sch
Hollin Meadows Sch
Hollin Hills
Woodlawn Ch
Mt-Vernon Ch
Bethlehem Ch
Wellington
Paul Spring
North Branch
Stephen Foster Sch
Hollin Hall Sch
Drive-in Theater
Gum Springs
Drew Smith Sch
St Lukes Ch
Arcturus
PAIRFAX CO
PRINCE GEORGES CO
Colmans Cem
Sunnyview
Aldergate Ch
Riverside Estates
S Coast Guard Radio Station
Snowden
Collingwood
Fort Hunt High Sch
Waldon Woods
Stratford Landing Sch
Waynewood
Riverside Gardens
Sewage Disposal
St Aidans Sch
Heritage Ch
Plymouth Haven Ch
Waynewood Sch
Woodland Park
Hunter
Stratford Landing
North Mt Vernon
Potomac Valley
Stratford on the Potomac
FORT HUNT NATIONAL PARK
VIRGINIA
MARYLAND
Mount Vernon
Sheridan

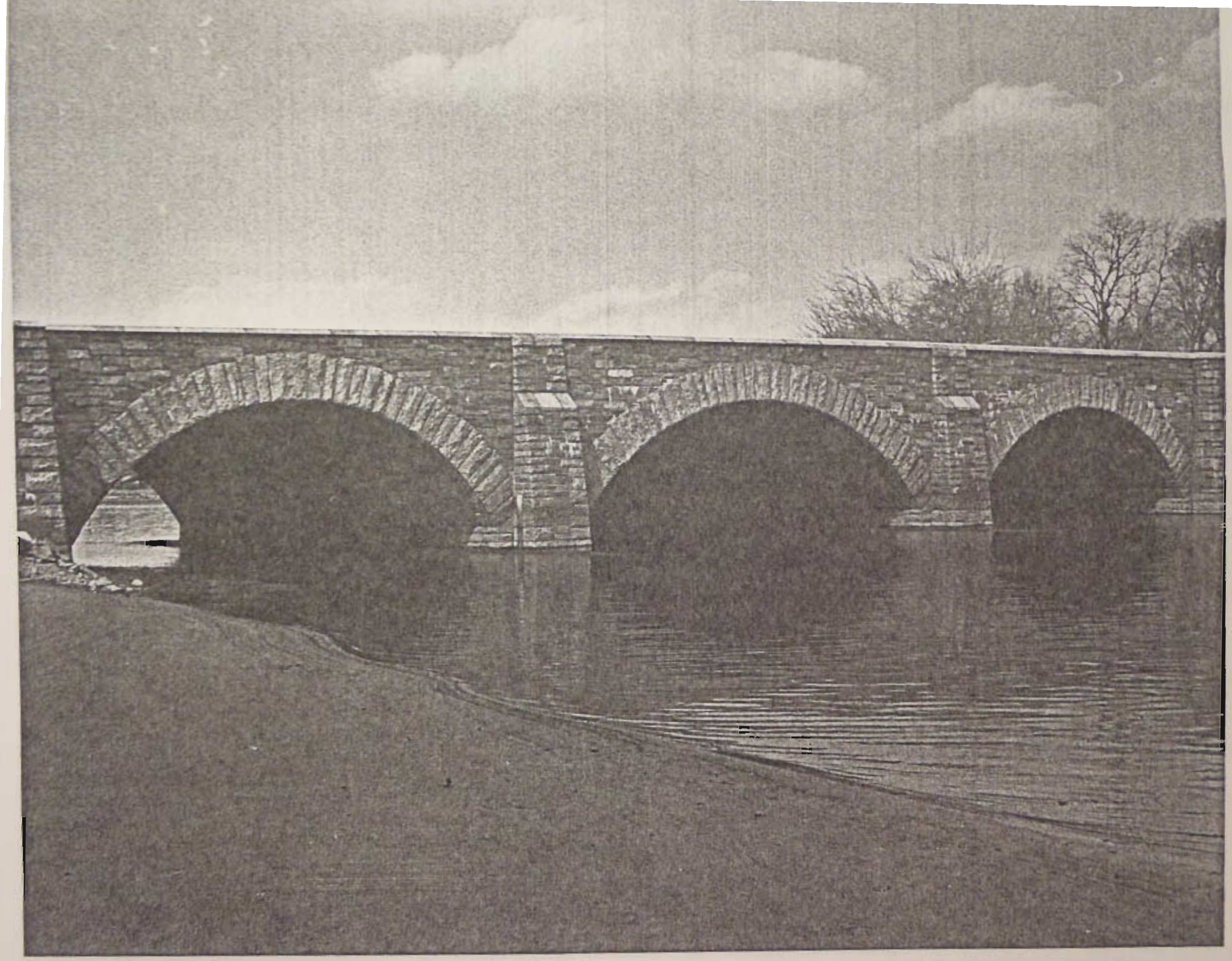


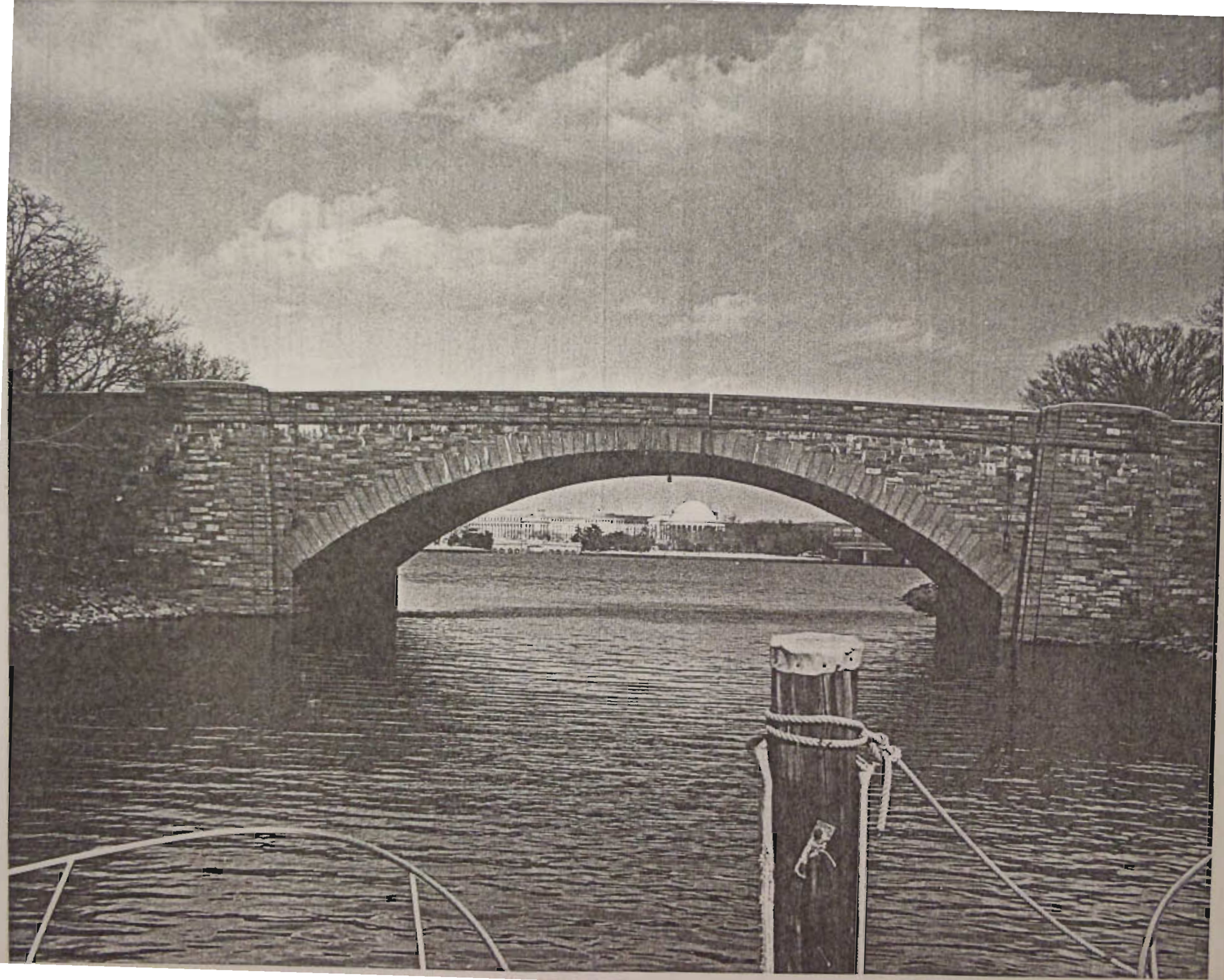
Fort Hunt
Road
Fort Hunt
Picnic Area
NEXT RIGHT

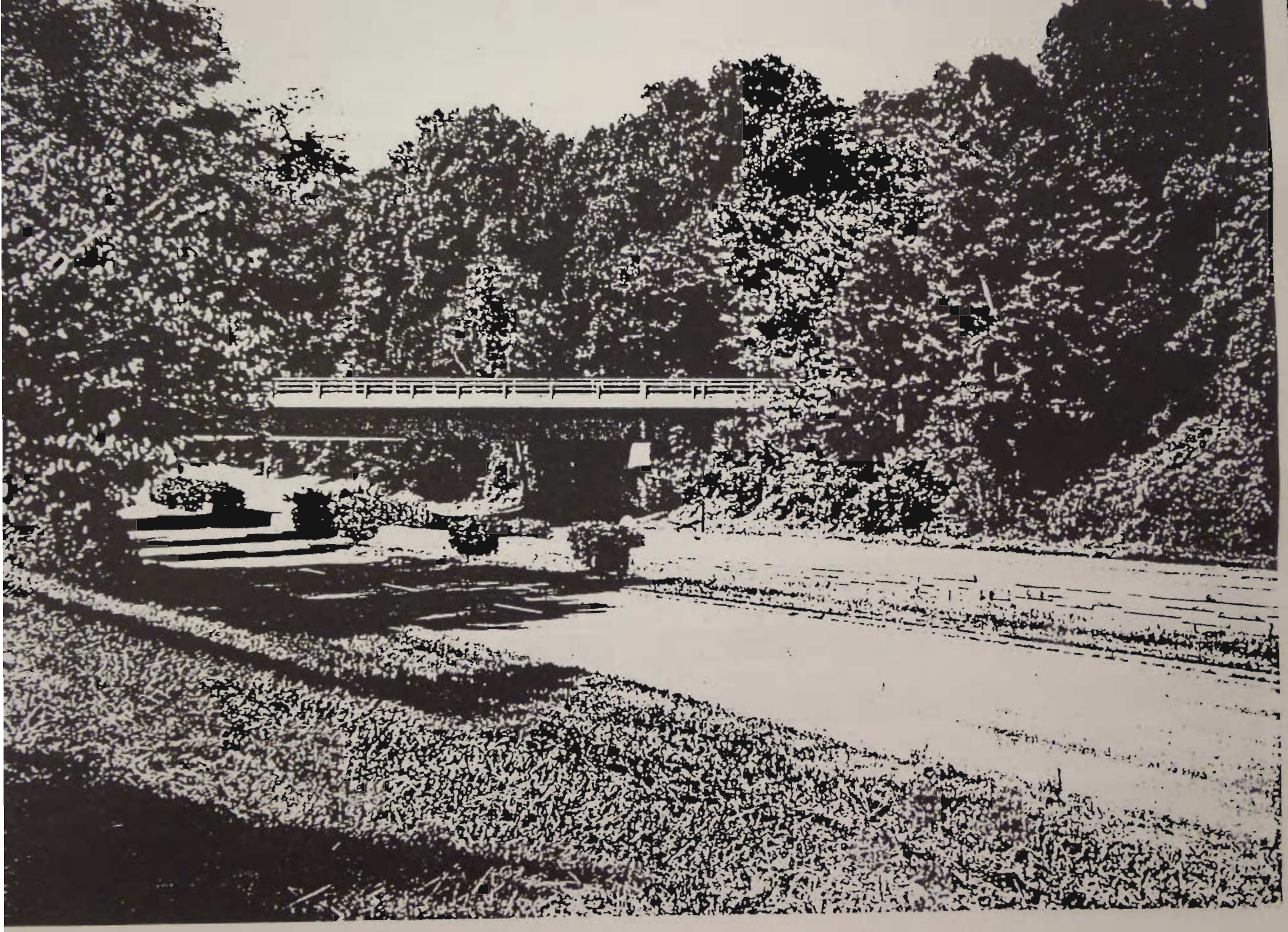
Hunting Creek Bridge, Mount Vernon
Memorial Highway NPS 1980

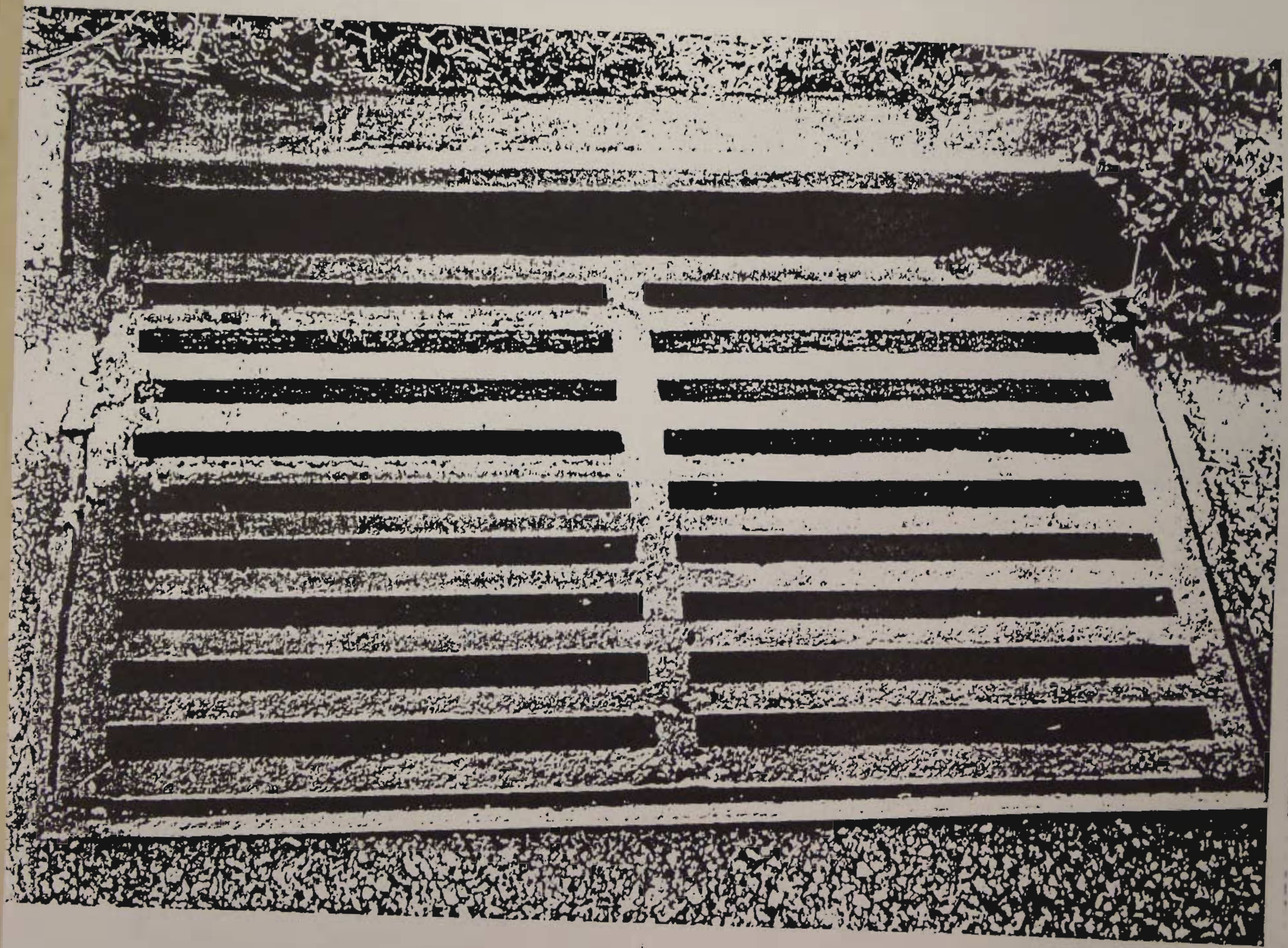
Boundary Channel Bridge, Mount Vernon
Memorial Highway NPS 1980

Navy-Marine Memorial, Mount Vernon
Memorial Highway NPS 1980









Form 10-900-b
1987

OMB No. 1024-0018

nited States Department of the Interior
ational Park Service

ational Register of Historic Places
ultiple Property Documentation Form

VLR 10/8/91
NRHP 6/2/95

is form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in *Guidelines for mpleting National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering e requested information. For additional space use continuation sheets (Form 10-900-a). Type all entries.

. Name of Multiple Property Listing

PARKWAYS OF THE NATIONAL CAPITAL REGION, 1913 - 1965 #029-5524

. Associated Historic Contexts

EVOLUTION OF THE URBAN PARKWAY
DEVELOPMENT OF THE NATIONAL CAPITAL PARKWAY SYSTEM

C. Geographical Data

The estimated 75-100 miles of parkways located in the National Park Service's National Capital Region are found in Washington D.C.; Montgomery, Prince Georges, and Anne Arundel counties in suburban Maryland; and Arlington and Fairfax counties, and the City of Alexandria, in Northern Virginia. The boundaries of the contributing arterial thoroughfares are coterminus with their rights-of-way, and include the Baltimore-Washington Parkway and Suitland Parkway, extending from the eastern boundary of the District of Columbia; the Mount Vernon Memorial Highway/George Washington Memorial Parkway along the Potomac River shoreline between Mount Vernon and Great Falls; Rock Creek and Potomac Parkway between the East and West Potomac Parks and Rock Creek Park; and numerous strip parks located throughout the greater Washington area, including the Sligo Branch Parkway.

☐ See continuation sheet

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Signature of certifying official — Date

State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register — Date

EVOLUTION OF THE URBAN PARKWAY

The parkways constructed in the Greater Washington area range stylistically from nationally significant schemes modeled on the precedent-setting, picturesque suburban New York system, to include simple tributary byways and the straightforward Baltimore-Washington Parkway completed shortly after mid-century. Contributing cultural influences include the increased use of the automobile, the City Beautiful movement, and popularity of outdoor recreation.

A parkways' foremost task is to separate traffic into two distinct groups: pleasure motorists and heavy commercial users. During the early decades of automobile use, the greatest proportion of use was devoted to recreation. But in the late 1930s when the emphasis shifted from the pastime of "getting there" to simply "arriving"--so, too, changed road design. The newly formed National Capital Park & Planning Commission (NCP&PC) in 1927 indicated:

> There are and should be in the development of plans. . . a number of things which may be called parkways, to serve as lines of pleasure traffic; but in another sense part of the thoroughfare system of the District. There is overlapping there of the two types of functions. We need to be careful. . .that it does not extend too far.[1]

NCP&PC landscape architect Frederick Law Olmsted, Jr., cites only two criteria that serve as a design guide--"controlling purposes" and local physical conditions--from which four types of parkways emerge: an elongated park, a glorified and ornamental street, and:

> A thoroughfare, boulevard, or parkway, the prime purpose of which is to enable the public to travel from one part of its course to another under conditions which are made more enjoyable by almost any means, than those of an ordinary city street.[2]

Within this last category are three subtypes: a single road with planted and ornamental flanks, which "may be really verdant and justify the name 'parkway'"; dual roadways with a central planted strip and some flanking ornamentation, much like a boulevard; and a central road flanked by any type of formal or informal landscaping, with or without pedestrian amenities.

The fourth parkway model is "somewhat intermediate and transitional between the first and the third" type, a border treatment that does not attempt to buffer surrounding buildings, and often places the roadway to one side of the green space and a waterway. This "border parkway" was later cited in a Washington-Baltimore regional study that called for "eventual acquisition [of]

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[1] Minutes of the NCP&PC (16-18 September, 1927).

[2] Frederick Law Olmsted, "Memorandum as to 'Border Roads' for Parkways and Parks" (25 September, 1925), pp. 1-3. RG 66, Box 156.

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selected stream valley 'strip parks' [to] be protected by public purchase of scenic easements in all parks of the area." While these do not possess extraordinary scenic qualities, they protect the floodplain and "assure provision of open spaces to prevent uninterrupted built-up areas."[3]

During the 1930s, one application of the term "parkway" hinged on use and legal access. Of a parkway, highway and freeway, all involve public land; the parkway alone is devoted to recreation rather than movement; and only the highway allows adjacent land owners to retain rights of light, air or access.[4]

This is supported by the casually synonymous use of "freeway" and "parkway" within the context of landscape by itself, rather than the thoroughfare in its entirety. A freeway, for instance, was characterized by one planner as about 100 feet wide with a center pavement "flanked by 20-foot strips of parkway, planted with trees, ground covers, shrubs, and hedges. . .adequate for a landscape composition of varied interest."[5] Shared features include the pleasure derived from planted borders instead of billboards and business frontage, a reduced volume of traffic, improved travel time, and safety. This type of road was considered particularly effective in an area where residential and business subdivisions were slated, and was destined to reorient transportation patterns--a setting particularly relevant to development of the Baltimore-Washington metropolitan corridor.

Legally, a parkway was designed simply as "an attenuated park with a road through it," but the federal government did not address general parkway guidelines until the "Regulations and Procedure to Govern the Acquisition of Rights-of-way for Parkways" was approved by the Secretary of the Interior on 8 February 1935.[6] This was the foundation for a set of eight characteristics intended to differentiate parkways from ordinary highways, as identified by the NPS three years later. It represents the culmination of thirty years of modern parkway planning--designated, ironically--just as the highway needs of the nation were about to shift away from recreational motoring.

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[3] MNCP&PC, "Regional Planning Report IV: Baltimore-Washington-Annapolis Area" (November 1937), p. 2, 34.

[4] Baltimore-Washington-Annapolis report, p. 60.

[5] George D. Hall, "The 'Freeway', A New Thought for Subdividers," Landscape Architecture, vol. 21, no. 2 (January 1931), p. 115-118.

[6] NCP&PC, "Comments on Report of Maryland State Planning Commission on State Recreational Areas," (unpublished, 1938?), cited in Jere Krakow, "Historic Resource Study, Baltimore-Washington Parkway" (1987), p. 28; this and resource studies on other NPS Washington-area parkways are collectively published in Jere L. Krakow, Historic Resource Study: Rock Creek and Potomac Parkway, George Washington Memorial Parkway, Suitland Parkway, and Baltimore-Washington Parkway (NPS, January 1990). Memorandum for A.E. Demaray, Appendix A, Minutes of the NCP&PC (16-17 March, 1944), p. 2. RG 328.

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These specifications are: a limit to non-commercial, recreational traffic; the avoidance of unsightly roadside developments; a wider-than-average right-of-way to provide a buffer from abutting property; no frontage or access rights, to encourage the preservation of natural scenery; preference for a new site, to avoid already congested and built-up areas; to best access native scenery; the elimination of major grade crossings; well-distanced entrance and exit points to reduce traffic interruptions and increase safety.[7] Collectively, they ensured a self-contained, well-preserved, and safe thoroughfare.

Despite these in-house Park Service ideals, in 1944 the U.S. Department of Interior complained that, "To date, Congress has not defined parkways. Legislation pertaining to parkways is piecemeal and lacks uniformity."[8]

In Washington, at least, the definition of a parkway has historically differed according to the period of development, site, and transportation needs. And although its function as a road can never be divorced from its scenic role, parkways have been consistently patterned as formally or informally designed connectors within a system of predetermined destinations that include parks and monuments--and later, federal reservations. Credit for this belongs to the City Beautiful movement.

CITY BEAUTIFUL MOVEMENT

The City Beautiful movement that developed around the turn of the century is evidenced in particular in the urban park systems of Boston and New York--a vital element of which are parkways. Using these as models, planners and landscape architects assembled in Washington to develop a similar program for the nation's capital. The McMillan Plan of 1902 calls for numerous "parkways" linking the Great Falls, Mount Vernon, Potomac River bridges, and existing parks. Like New York City's Riverside Drive, Washington had its own token "riverside drive," a muddy carriage path built in 1904. It wound around the Tidal Basin and up 26th Street in northwest, serving as a literal and figurative prologue to the era of parkway construction.

The parkway was a byproduct of the suburbanization movement, born in the late nineteenth

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[7] Harlan D. Unrau and G. Frank Williss, Administrative History: Expansion of the National Park Service in the 1930s (Washington D.C.: Denver Service Center, 1983), p. 146; ASLA fellow Laurie D. Cox identified the same standards in an article, "Appearance: Essential Element in Superhighway Plans," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 56.

[8] Memo to Demaray, Appendix A, p. 1.

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century; however, its role accelerated with the increasing sense of city-to-city regionalism and the rise of motoring characteristic of the twentieth century,.

> The purpose served by parkways and boulevards is, roughly, to provide agreeable routes connecting parks with each other, the parks with the centers of population, and the suburbs and countryside with the congested districts. The first two purposes have long been established. The last is a recognition of the changed methods of travel introduced with the automobile.[9]

The car--which gave enormous impetus to the improvement of the American road system in general--had a significant impact on parkways and the development of recreational roadways. According to Charles W. Eliot II: "It is the informal landscape parks of all sizes, and in the parkways, that the automobile has notably changed the situation."[10]

As an added bonus, Eliot felt that if recreation-seekers took to scenic roads, it might alleviate the inevitable and increasing congestion of national and state parks, as well as "atone for the exclusion of automobiles from landscape parks except under rigorous conditions," which he advocated.[11] The speed of motorized vehicles, as compared to horse-drawn carriages, also lent itself to new design needs: convenient and unobtrusive parking areas, service facilities, and dramatic-but-simple landscaping enjoyable from afar at 75 mph, rather than in detail at a meandering pace.

Although the District of Columbia's Division of Trees and Parking (established in 1871 and later part of the city's Engineer Department) was "one of the first public bodies to regard street-tree planting as a public function," the city trailed behind others in the development of urban green space. Massachusetts, one of the forerunners in the City Beautiful movement, became the first state to enact legislation for the caring of shade trees on public highways in 1890. But it was not until 1933 and the National Industrial Recovery Act that "appropriate landscaping of parkways or roadside on a reasonably extensive mileage," was provided at the federal level.[12]

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[9] Eliot, p. 36; for information on Eliot, see footnote 24.

[10] Charles W. Eliot, II, "The Influence of the Automobile on the Design of Park Roads," Landscape Architecture, vol. 13, no. 1 (October 1922), p. 27.

[11] Eliot, p. 36.

[12] Wilbur H. Simonson, "Roadside Planting," Landscape Architecture, vol. 26, no. 4 (July 1936), p. 167.

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comprehensive scheme of urban parks and parkways in Washington. "There has been candid admission in Congress," reported one newspaper, "that the park system of the National Capital is not what it should be"--for which the poor "economies of the past five years" were blamed.[13]

As the desirability for sophisticated roads grew, "the modification of highway design to conform to the principles and technique of landscape architecture" became a direct concern of the American Society of Landscape Architects (ASLA). This remained true even as the engineering aspects of road construction improved, because "the fundamental purpose of roadside planting operations should be to make the highway strip a mere foreground, or screen against what lies beyond."[14] As late as 1940, however, an ASLA editorial reported:

> There is still a tendency to consider the work of the landscape architect as a last step after all the other important decisions of design are made and put into effect.[15]

Despite the growing acknowledgement that landscape architecture was a mandatory component to road design, certain parkway characteristics remained subordinate to one another: Traffic provisions, safety, and economical maintenance take precedent over landscape design; while landscape-design features including location, alignment, profile, and adaptation to natural topography, take precedent over horticultural embellishments. All, however proportioned, are crucial parkway elements.[16]

And last, the site design of a parkway should appear compositionally natural, with irregular groupings of plantings recommended: The purpose was to enhance native vegetation beyond. According to one landscape architect:

> In the open countryside it is a mistake to use exotic plants, or anything which is not indigenous to that general region and to the particular type of topography at hand. . . .Native materials should be

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[13] Bill Price, "A Great National Park Along the Potomac," Washington Times (18 April, 1922).

[14] Simonson, p. 171, 173; ASLA committee reports of 1939-40 outline the procedure for the collaboration between landscape architects and engineers "in the design and construction of highways, "Landscape Design in Highway Development," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 72.

[15] Harlean James, "Comment: Tendency to View Landscape Contribution as Final Step," Landscape Architecture, vol. 30, no. 3 (April 1940), p. 117.

[16] Arthur R. Nichols, "Landscape Design in Highway Development," Landscape Architecture, vol. 30, no. 3 (April 1940), p. 115.

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used not only because they are likely to be more permanent than others, . . .but most important of all, because the effect of regional individuality may be retained.[17]

Thus, during the first half of the twentieth century, a recognized set of design criteria evolved that were common to all parkways constructed. These were initiated with New York's Westchester County system of the early twentieth century, under the aesthetic direction Gilmore Clarke, the landscape architect who would greatly influence parkway development in Washington. Also, as technology improved and recreational goals changed, new motives altered the appearance and use of these roads up to World War II, when parkway development was--for all practical purposes--usurped by modern highway construction.

DEVELOPMENT OF THE NATIONAL CAPITAL PARKWAY SYSTEM

In Washington, Maryland and Virginia, the national capital park system is composed of more than 8,761 acres and 74 miles of formal parkways. The major components are: Rock Creek and Potomac Parkway, connecting Rock Creek Park in and north of Washington, to the East and West Potomac Parks along the river; more than 12,000 acres of neighborhood "stream valley," or "strip," parks that cushion and protect the crucial tributaries, many adjacent to Rock Creek Park; the Mount Vernon Memorial Highway, connecting the estate and Washington via the Potomac shore and Memorial Bridge, and its extension into the George Washington Memorial Parkway, up to Great Falls in Maryland and Virginia[18]; Suitland Parkway, a defense-highway link to Andrews Air Force Base; the Baltimore-Washington Parkway, an intercity thoroughfare that serves as a primary commuter route and defense road among the two cities and several federal reservations.

Some elements of Washington's fully idealized parkway system did not come to fruition. The Fort Drive circuit, a proposed connection of forty or so Civil War fortifications, would have encircled the city. Two extensive links with the George Washington Memorial Parkway remain unbuilt: a parkway along the Chesapeake & Ohio Canal route between Great Falls and Cumberland, Maryland, which would have served as a ceremonial entry to the city, and a similar route in Maryland along the Potomac River south to Fort Washington. Only a few fragments of disjunct border parkways

[17] Malcolm Dill, "Planting in Streets, Parkways, Highways, and Byways," Landscape Architecture, vol. 22, no. 2 (January 1932), p. 129-31.

[18] In 1989, the 7.7-mile portion of this parkway in Maryland, from the MacArthur Boulevard in Montgomery County to Canal Road in the District of Columbia was redesignated the Clara Barton Parkway with the enactment of Public Law 101-177/101st Congress (Approved November 28, 1989).

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exist of the never-realized Archbold-Glover Parkway in northwest D.C. Despite their absence, a system of largely complete parkways does exist in the capital.

The vision of a National Capital laid out along wide avenues and ceremonial routes replete with parks and formal city entrances, is descended from the design scheme of engineer-turned-city planner Maj. Charles Pierre L'Enfant. His 1791 plan for the Federal City incorporates political, residential, and commercial centers, as well as waterways such as the Potomac and Anacostia (or Eastern Branch) rivers, two canals, and Rock Creek with its tributaries.

With the urban schemes of Paris and other world capitals in mind, L'Enfant surveyed the site of the future U.S. capital from all directions, including the north approach from Baltimore, "which offered travelers a synoptic view of the town and its natural setting from the hills above the Bladensburg Road."[19] Among the guidelines for his plan are thoroughfares "to not merely contrast with the general regularity, not to provide a greater variety of seats with pleasant prospects. . .but principally to connect each part of the city."[20] In addition to "outroads" identified on William T. Partridge's 1926 study of plans by L'Enfant and his successor, William Ellicott, a "city entrance" occupies a prominent position on the Potomac River in the approximate area where the Baltimore-Washington Parkway exits the city today.[21] Little of L'Enfant's vision was constructed during the eighteenth- or nineteenth centuries, however.

New and extended modes of transportation dominated the nineteenth century that--for service and speed--superseded those provided by water- and roadways. A rail line operated between the two cities in 1835, bettering the traditional stage coach travel time by half.[22] The Baltimore & Ohio Railroad opened a direct line to Washington City and encouraged regional development between the capital and not-insignificant Maryland port to the north. All the while, in Washington and environs a miscellany of crossroads towns and farms steadily grew up within the ten-mile city boundaries. One exception to such growth was the region along the east bank of the Anacostia River: "An area of commanding panoramic views and a hilly topography.[23]

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[19] Gutheim, Frederick, Worthy of a Nation (D.C.: Smithsonian Institution Press, 1977), p. 20.

[20] Cited in Gutheim, p. 25..

[21] Gutheim, p. 32.

[22] Ibid. p. 49.

[23] Ibid., p. 108.

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The first attempt to cohesively develop L'Enfant's scheme beyond city limits came in the 1890s with successive--but equally ineffectual--legislation, the 1893 and 1898 Highway Acts. Authorization was introduced for a plan extending L'Enfant's street plans, taking into account already-established subdivisions, but it failed to address funding or offer a timetable for implementation. The "Permanent System of Highways Plan," however, became the foundation for the McMillan Commission's revival of the original urban scheme in the grand, baroque tradition.

Several nationwide movements contributed to Washington's urban development at this time: The unparalleled success of the 1893 World's Columbian Exposition in Chicago turned designers on to comprehensive and formally integrated city planning that included a generous landscape component, the essence of the City Beautiful movement; the increasing popularity and affordability of the automobile, which necessitated adequate roadways and service facilities; and the general decline of urban living conditions through overcrowding and poverty, which logically resulted in the out-of-doors as a popular recreation destination.

A trio of local events further drew the focus to Washington. "A small group of the country's best-known designers" assembled there to coordinate the centennial celebration of the "removal of government" to the city; the American Institute of Architects convened in 1900 to address issues of sculpture, landscape and public-building design; and, Senator James McMillan of Michigan orchestrated the creation of the Senate Park Commission. The McMillan Commission--as it is better known--was a highly influential group that advised the formation of a team of professionals "eminent in their professions, who shall consider the subject of the location and grouping of public buildings and monuments to be erected in the District of Columbia and the development of the entire park system of the District of Columbia."[24]

Commission members included: Charles Moore, assistant to McMillan (who later served on the Commission of Fine Arts for twenty-seven years); Charles Eliot II, whose father designed Boston's comprehensive park system and worked at the Olmsted brothers' firm; Frederick Law Olmsted, Jr., a principal in that office and head of the nation's first landscape-architecture curriculum at Harvard University; pre-eminent architects Charles F. McKim and Daniel Burnham, both of whom worked on the Columbian Exposition; and sculptor August Saint-Gaudens who joined the team later. Moore, Olmsted and Eliot would remain key figures in the design of the national capital region during the next three decades.

[24] Ibid., p. 113, 116.

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In addition to downtown development, the McMillan Commission recommended a series of drives and park connections around the city: in Virginia along the Potomac River down to Mount Vernon, in Maryland and D.C. up to Great Falls; a Fort Drive to connect forty or so historic Civil War sites; and to enlarge and embellish Rock Creek Park for intensified recreational use.[25] In keeping with L'Enfant's vision:

> The City Beautiful movement in Washington was. . . swept along to include city entrances, parkways, boulevards, monumental bridges, and entire streets.[26]

This was followed by the Commission of Fine Arts' (CFA, established in 1910) recommendation in 1918 for a "permanent system of highways [to] be revised to allow for the new park schemes." Crucial to a citywide network of local and "grand entrance" parkways was the Olmsted Brothers' urging for protection of the Rock Creek Park property. The idea followed up by a U.S. Army Corps of Engineers' recommendation for the acquisition of 400-foot strips of land along Rock Creek and its tributaries in D.C. and neighboring Montgomery County, Maryland.[27]

ROCK CREEK & POTOMAC PARKWAY: 1913–1935

The Rock Creek and Potomac Parkway was legislated 1913 as a two and one-half-mile connector between the East and West Potomac Parks on the river, and Rock Creek Park and the zoo. Rock Creek Park was established in 1890 as a nature preserve, an "open valley" of streams and forest to which hiking and riding trails were later added. A winding two-lane road, Beach Drive, provides the primary access through the park, which occupies 1,754 acres in the District and Montgomery County, Maryland. Access to the park interior is limited to about twenty entry points from small neighborhood thoroughfares.

Distinguishing traffic use through the park was an issue during the 1920s, even as the parkway was being developed. Frederick Law Olmsted, Jr., believed there should be a distinction between the lower and upper portions of the Rock Creek Valley. The bulk of the valley--above the zoo--

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[25] Ibid., p. 125.

[26] Ibid., p. 135.

[27] Ibid., p. 145; these neighborhood parkways, also called "strip parks" or "border roads," protected the creek's floodplain and provided welcome green space within the urban sprawl.

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remains a park, while the parkway to the zoo is the narrowest right-of-way and serves as a commuter route. "You must be careful not to ruin that valley if it is to be all one. The valley of Rock Creek should not be turned into that kind of thoroughfare and ruin the stream and park character," he warned.[28]

A parkway linking the zoo and the Potomac parks was first studied in 1900, when Congress allocated $4,000 to employ landscape architect Samuel Parsons, Jr. During the early years of the century--concurrent to the McMillan Commission's workings--two options evolved. The first was to fill the valley and enclose the creek in an underground brick culvert--the fate that earlier befell Tiber Creek. This was determined to be a long-term and costly undertaking, and the commission pursued the second option: to maintain the open-valley plan and bring a road through it, thus allowing east-west traffic to traverse the park on bridges at non-grade level.[29]

But it was not until President William Howard Taft signed the parkway's enabling legislation in March 1913 that any progress was made--for reasons of conservation and transportation:

> That for the purpose of preventing the pollution and obstruction of Rock Creek and of connecting Potomac Park with the Zoological Park and Rock Creek Park, a commission. . .is authorized and directed to acquire. . .such land and premises. . .lying on both sides of Rock Creek. . . .That [such] lands. . .are hereby appropriated to and made a part of the parkway herein authorized to be acquired.[30]

The bill--whose justification resembled the New York legislation of 1906 that resulted in the Westchester parkways--included a $1.3 million appropriation for land acquisition, the cost of which was to be shared equally by District and federal governments. The Rock Creek and Potomac Parkway Commission, which included landscape architect James D. Langdon, sought to acquire slightly more than 4.1 million square feet of land, assessed at $1.42 million. By 1923, the commission had 82 percent of its goal, but funds ran out while twelve acres were still needed. This was mitigated through boundary adjustments and land condemnations. Segments of the road were under construction in the mid-20s, but title disputes and unacquired land prevented a continuous thoroughfare. The last leg of the parkway, between K and P streets, opened to traffic in October 1935.[31]

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[28] NCP&PC minutes (16-18 September, 1927), p. 15.

[29] Barry Mackintosh, Rock Creek Park: An Administrative History (Washington, D.C.: NPS History Division, 1985), p. 49.

[30] Congressional Record, pp. 4693-94, 4816. Pub. 432, 62nd Congress, 37 Stat. 885.

[31] Mackintosh, p. 61, 63.

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BORDER, STRIP, AND STREAM VALLEY PARKS

Ancillary to Rock Creek, and the Potomac and Anacostia Rivers are a number of "strip" or "border" parks that occupy the floodplain of local tributaries or park-related topography. These have historically been identified for local importance.

> Stream valley parks form the backbone and major portion of the District of Columbia and Metropolitan Park System. Their value as routes for passenger car traffic augmenting the city and metropolitan street system cannot be overestimated. One of their primary values which is often overlooked is the conservation of small wild life, woodland and water.[32]

In the District, Maryland and Virginia, a total of 11,552 publicly owned acres were devoted to such stream valley parks by the late 1930s, with nearly 12,000 additional acres planned.[33]

Maryland's Sligo Branch Parkway, conceived in the 1920s, is the single-largest strip park in the region. It descends about ten miles (northwest to southeast) from the city of Wheaton in Montgomery County to Hyattsville in Prince George's County, to link up with parkway extensions of the northeast and northwest branches of the Anacostia River, the Baltimore-Washington Parkway and Anacostia Park. The two-lane, undivided roadway winds alongside Sligo Creek, where numerous picnic and recreational spots are provided in a wooded setting, although access to the parkway from adjacent neighborhoods is limited. Right-of-way width varies within relatively narrow boundaries, and offers a limited buffer between the road and community development. During the late 1930s, Maryland was accepting donations of stream valley lands of 80 to 100 feet wide, with a total of forty-six miles anticipated upon completion.

The Piney Branch Parkway (extending east at 16th Street and Arkansas Avenue) was to average 400 feet wide, as an extension of Rock Creek Park's Beach Drive in 1908, and again in the 1920s.[34] Similarly, Pinehurst Parkway (extending west from the park along Beech Street to the Montgomery County line) is a slim green space flanked by residential streets that "embraces an important feeder stream."[35] The function of flood control was one important reason to protect these small waterways.

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[32] Max Wehrly, "Stream Valley Parks in the District of Columbia and Metropolitan Area" (12 October, 1939). RG 328, Box 18.

[33] Ibid.

[34] Mackintosh, p. 64.

[35] "Potomac Power Dam Report Due Today," Evening [Washington] Star (13 January, 1944). RG 66, Box 69.

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Linear parks created between roadways also include Beach Parkway (at the northernmost point of the District boundary) and the nearby North Portal Parkway at Blair Road. A "Northern Parkway" around Western Avenue and Oregon Avenue-extended (out to Old Bladensburg Road) was identified in 1945 as a priority project for the next five years by the Maryland National Capital Park & Planning Commission, as were improvements to the Western Avenue-Dalecarlia Reservoir area, and the George Washington Memorial Parkway from D.C. to Great Falls. Only the last of these three was constructed, and it was not completed until 1965.[36]

The western corner of the District contains the fragments of a minor park and parkway system that also failed to materialize in its entirety. Glover-Archbold Park in north Georgetown very nearly connects with the Rock Creek & Potomac Parkway. The NCP&PC had long planned for the nearby Whitehaven Parkway to extend from the Palisades Park to Massachusetts Avenue through this park, but today it exists as a road leading to it, then as a green extension of the park, and picking up again as a brief parkway that ends at Wisconsin Avenue. This was still a trouble spot in the 1950s when the NCP&PC sought to acquire the land between Wisconsin Avenue and Dumbarton Oaks Park to link the parkway with Whitehaven Street, only to discover that Dumbarton's dedication deed prohibits the incorporation of roadways.[37] In the 1920s, the Office of Public Buildings and Grounds sought to build the Klingle Valley Parkway to connect with the Normanstone Parkway, north of Dumbarton Oaks Park and the Naval Observatory, to serve as a western detour around the zoo; the development of each continued into the 1950s, but the connection between them never did.[40]

Nearby, the Arizona Parkway was slated for development between Canal Road and Van Ness Street: In a "portion of the valley of Foundry Branch along the general line of Arizona Avenue. . .of a parkway character that will provide facilities as a means of access to the park and to provide for a scenic highway for through traffic."[41] Had this been accomplished, it would have completed a link with the Dalecarlia Parkway, which occupies the right-of-way buffer along the Dalecarlia Reservoir grounds, situated at the D.C.-Montgomery County boundary abutting the Palisades Park.

Another slender park exists in the B&O railroad right of way that turns north at the Maryland

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[36] Fred Tuemmler to John Nolen (22 March, 1945). RG 328.

[37] W.E. Finley to Mr. and Mrs. Robert Woods Bliss (12 March, 1959).

[40] Mackintosh, p. 64-65.

[41] "Memorandum of Agreement between the NPS and the Government of the District of Columbia Relative to the Development of the Arizona Parkway" (16 April, 1948) RG 66, Box 8.

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line, and continues along the west side of the reservoir. Between Massachusetts Avenue and Bradley Boulevard, the Little Falls Parkway serves as a limited-access thoroughfare that leads into Chevy Chase, Maryland, park areas. During the 1920s, it was proposed to use this and the Dalecarlia property as part of "a circuit drive around the District of Columbia beyond Rock Creek Park."[42] Between the District line and Great Falls lies the Cabin John Creek, whose valley "in many respects compares favorably in scenery with the famous valley of Rock Creek." The NCP&PC sought this parkway to connect the city of Rockville with the Potomac River.[43]

The two linear parks that contain the Anacostia River branches are served by minimal abutting roads, although they are not identified as parkways proper. A similar parkway is found in the Cabin Branch tributary (between Sheriff Road and Central Avenue), located in Maryland near the Eastern Avenue District boundary. In 1927 the National Capital Parks and Planning Commission recommended that land in the creek's floodplain "be acquired for park purposes to serve the growing communities of Capitol Heights and Seat Pleasant." Oxen Run, flanking the Southern Avenue D.C. boundary, was also slated to "be developed with a parkway and recreational facilities" in the 1920s. Today the upper valley portion contains a golf course and lands that connect with the Suitland Parkway, and the lower valley consists of a park; neither includes a designated parkway.[44]

Planning for these parkways had quickly become a regional concern, one taken up by the National Capital Parks and Planning Commission (NCP&P, founded 1926) and Maryland National Capital Park & Planning Commission (MNCP&PC, 1927). To protect Rock Creek's watershed to the north, an extension of the park was idealized, but "to inspire the District's neighbors to substantive action, the carrot of federal aid was deemed necessary."[45]

The vehicle for the expansion of Rock Creek Park into Maryland, the Mount Vernon Memorial Highway and other parkways was the Capper-Cramton Act, approved 29 May, 1930. This act provided $16 million "for the acquiring of such lands in the District of Columbia as are necessary and desirable for the suitable development of the National Capital park, parkway and playground

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[42] Charles Eliot II and NCP&PC, "Preliminary Report: Park System for the National Capital Washington Region" (February 1927), p. 16. RG 328.

[43] Eliot and NCP&PC, "Park System. . . ," p. 16.

[44] Eliot and NCP&PC, "Park System. . . ," p. 16.

[45] Mackintosh, p. 67.

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system. . . ." It provided that the government would grant one-third, and advance two-thirds, of the cost of these constructions, with a $1.5 million ceiling for the federal contribution and $3 million more for the advance.[46]

MOUNT VERNON MEMORIAL HIGHWAY: 1928–1932
GEORGE WASHINGTON MEMORIAL PARKWAY: 1930–1965

The George Washington Memorial Parkway (GWMP) on the Virginia shore includes the parkway from Mount Vernon, about twelve miles south of Washington, to Great Falls, fifteen miles to the north. The oldest portion--from the estate to the site of Memorial Bridge--was built as the Mount Vernon Memorial Highway (MVMH) from 1928-32; and the northern parkway leg, as the GWMP, from the 1930s-65. Buffering the District shore, the parkway is composed of Palisades Park, the Chesapeake & Ohio Canal [National Historical Park], and the B&O railway right-of-way as far as the Montgomery County line.

The MVMH was legislated on 23 May, 1928, to commemorate the bicentennial of George Washington's birth--an idea dating to a citizen's group organized in 1886. In 1930 Congress concluded the parkway should extend even farther: north to Great Falls on both shores, and down to Fort Washington in Maryland. Two years later, all existing and future components were renamed the George Washington Memorial Parkway.

Gilmore Clarke, consulting landscape architect for the MVMH, attested that the Bronx River Parkway (1923), a thirteen-mile thoroughfare in New York designed exclusively for pleasure motoring, set the precedent for the Virginia parkway:

> I doubt whether the Mount Vernon Memorial Highway would have been built in the manner in which it was, had those in charge not seen and profited by the work of the Westchester County Park Commission. And so Washington has one example of the type of motorway that should. . .extend out from every portal of the city.[47]

Even before the MVMH/GWMP was begun, this New York parkway was cited as a model for a

[46] Mackintosh, p. 67-68.

[47] Gilmore Clarke, "D.C. Need of Modern Parkway Cited by Fine Arts Chairman," The Sunday [Washington] Star (5 June, 1938).

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similar thoroughfare leading north from the nation's capital. The proponent was "keenly interested in the subject of trying to work out a parkway between Washington and Baltimore on lines somewhat similar to the Bronx Parkway--a parkway which will average perhaps a thousand feet in width, but vary according to local conditions, topography, etc."[48]

Clarke was responsible for designing bridges and small architectural elements of the parkway, as well as heading the design team made up largely of Westchester County Parkway Commission alumni: besides himself, engineer Jay Downer, landscape architect Wilbur Simonson, and plantsman Henry Nye. Clarke's MVMH bridges are characteristically romantic and rustic, low-slung segmental-arched concrete with rough-faced stone cladding--nearly identical to those he designed for Westchester.

The fifteen and one-half-mile MVMH was built by the federal Bureau of Public Roads and was one of the first facilities planned using aerial photography, which afforded much greater detail of topography, drainage patterns, the existing road, and options for the new parkway. These novelties generated a more sinuous and irregular roadway than did traditional, tangential curves.[49]

From Mount Vernon to Alexandria, the four-lane, undivided road clings to the shoreline it protects, from thickly wooded sections to open, grassy embankments and marsh; occasional overlooks and park/parking areas provide points for picnicking and occasional views to Fort Washington across the river. In contrast, the route from Alexandria to the bridge is divided by a median, open and manicured. This portion also contains several formal monuments--the Columbia Island Circle at the junction of the bridge, the Navy-Marine Memorial, and the LBJ Memorial Grove --the backdrop to which is an ongoing vista of the magnificent Washington skyline. In recent years the parkway has been augmented by a bicycle/pedestrian path of complementary winding character.

Federal acquisition of land northward continued from the 1930s to 1966: The 9.7-mile north leg of the Virginia parkway from Memorial Bridge to the interstate Beltway was completed in 1965 at a cost of $30 million. The 7.7-mile Maryland section on the opposite shore (renamed the Clara Barton Parkway in 1989) cost $18 million. The entire parkway is composed of 7,146 acres, of which 44 percent are developed (road, pavement, lawn) and 42 percent are natural woodlands; about 300 acres of scenic easements offer additional protection.

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[48] Letter to Joseph T. Shirley (17 November, 1927), RG 328.

[49] Department of Transportation, America's Highways, p. 329, 396.

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SUITLAND PARKWAY: 1943–1944

As the 1940s approached, highways, expressways, and turnpikes took on new and more exacting connotations--and were in great demand. The lagging economy and impending war demanded that speed, safety, and efficiency take precedent over aesthetic considerations. With these ideals gaining strength, parkways could no longer be developed strictly as pleasure roads.

> By the 1930s especially express highways [were promoted] with a view toward rescuing their cities. As urbanites moved to the suburbs of deteriorating and congested cities, planners insisted that an accelerated road program would hasten traffic flow and boost morale and economic development. . . . Highway building was a form of social and economic therapy.[50]

Post-Depression unemployment was great, and throughout the 1930s President Franklin D. Roosevelt thought "principally of highway building as part of a package aimed at relieving unemployment"; yet, by 1939 he still "simply could not make up his mind about the relationship between road building and economic recovery." Meanwhile, the Bureau of Public Roads began to press for a 30,000-mile national expressway system.[51]

A highway-needs study of the Baltimore-Washington region reported that parkways are intended "for passenger vehicle use only, and to accommodate high-speed vehicles without interference from other vehicles which may stop or start to load or unload passengers or enter or depart from such highways"; while freeways are "designed to accommodate passengers and commercial traffic."[52] And while the emphasis was clearly moving away from pleasure motoring, it remained an integral-if-diminishing component of general road construction, for the Federal Highway Act of 1938 (section 8) provides:

> For the construction and maintenance of parkways, to give access to national parks and national monuments, or to become connecting sections of a national parkway plan. . . .[53]

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[50] Mark Rose, Interstate: Express Highway Politics 1941-56 (Lawrence: Regents Press of Kansas, 1979), p. 5.

[51] Rose, p. 2, 4, 10.

[52] E.D. Merrill to Thomas MacDonald (19 March, 1945), RG 328.

[53] Memo for A.E. Demaray, Appendix A, p. 1.

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With World War II came a modern and new justification for a road type that combines parkway principals with freeway efficiency; its model was the sleek, direct, and high-speed oriented German autobahen. Beginning in 1941, FDR called for a priority on "roads important to national defense," and later that year he restricted the Federal Works Administration to approving only those road projects "essential to national defense as certified by the appropriate Federal defense agencies."[54] This included access roads to military installations, defense plants, airports, and ports. The Defense Highway Act of 1941 appropriated $10 million in federal monies to this end, to be matched with state funds.

Suitland Parkway (1943-44) exemplifies such a defense highway, although its origin lays with the McMillan Commission's plans. The nine and one-half-mile dual-road parkway connects South Capital Street in the District to Route 4 in Maryland, and Bolling Field with Andrews Air Force Base (formerly Camp Springs Army Air Base). The $6 million construction cost was part of the Camp Springs development, pushed through Congress as a War Department expenditure. Plans to extend it eastward to the Chesapeake Bay were never fulfilled.

The parkway remained unfinished in 1945 when it became the responsibility of the National Park Service, and so it remains today. Yet, "it was so designed and construction so executed that the roadway system could be ultimately developed into a fully landscaped parkway."[55] About four miles of the "B roadway" in Maryland is unpaved, so traffic shares a single, undivided 24-foot lane. Five major bridges traverse the parkway, whose right-of-way is composed of nearly eighty-eight acres. Other characteristics include some at-grade crossings, semi-maintained buffer plantings, and a variable-width median 6 to 200 feet wide. The parkway's unfinished and uncharacteristic state must have been perceived as an invitation for improvement, for in 1958 it was proposed to bring it up to "freeway standards at several points."[56]

One function of a defense highway was to be impervious to air attack. Thus, a typical parkway site--fitted to the natural contours of the landscape--would provide a detour and scatter area, while plantings would provide camouflage for vehicles seeking concealment. While the efficient autobahen formula did enhance the safety and the speed factors, it failed as a defensible avenue because, noted one Bureau of Public Roads representative: "I recall how effectively these direct and highly conspicuous arteries, passing from one important center to another, can be used to guide

[54] Rose, p. 12.

[55] D.G. White to T.S. Settle (22 April, 1948), RG 328.

[56] Washington Star ??

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hostile air attack to its important objectives."[57] The limited access of parkways and military highways also permitted easy closure to non-military traffic in times of emergency.[58] This application was later confirmed when justifying the Baltimore-Washington Parkway.

While construction of non-military projects was stalled until "September 6, 1945, when Harry S Truman dropped wartime controls [and] normal state and federal road construction got underway," the planning process continued all the while.[59] Congress had approved a national system of interstate highways and a system of secondary and feeder roads in rural areas with passage of the Federal-Aid Highway Act 1944. In the meantime, FDR also created the Interregional Highway Committee, which included Frederic Delano of the NCP&PC (and FDR's uncle), and Rexford Tugwell, who worked on the planned city of Greenbelt. Road construction was a high priority:

> This deferment of normal construction programs has resulted in a huge backlog of needed highway facilities which is most serious in and near cities where traffic congestion is our country's No. 1 post-war highway problem.[60]

It is not surprising, then, that "the years after 1945 were especially prosperous for members of the road transport and highway construction industries." And between 1946-50, state, local, and federal officials spent $8.4 billion--more than any previous five-year period in history.[61]

In this hurried context, landscape architects continued to assert that even the most efficient and streamlined road could be improved at no extra cost through preliminary incorporation of landscape features like grade differentials and plantings. Characteristics essential to parkway aesthetics also benefitted highway design, though they were considered unnecessary. "Most of these practices have been dictated. . .by the criterion of beauty," asserted one critic. "Yet time has proved not only their

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[57] H.S. Fairbank, "Military Highways," Proceedings of the 27th Annual Highway Conference, vol. 43 (July 24, 1941), p. 37.

[58] Carl W. Wild, "Designing Highways for Peace and Defense," Landscape Architecture, vol. 32, no. 4 (July 1942), p. 137-39.

[59] Rose, p. 12.

[60] Wilbur Simonson, "Advanced Designs for Post-War Highway Needs," Landscape Architecture, vol. 33 (July 1943), p. 130.

[61] Rose, p. 29, 31.

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popularity, but also their promotion of safety, comfort, and speed with respect to traffic, and efficiency with respect to maintenance and operation.[62]

These not unfamiliar factors include the elimination of grade crossings, the aesthetic treatment of bridges with material such as rough-faced stone, elimination of access to abutting properties, and separation of directional traffic by a central, planted strip. With the maturation of parkway use and design from pleasure motorway to a thoroughfare aimed at speed, safety, and national defense, the elements were in place for development of the Baltimore-Washington Parkway.

BALTIMORE-WASHINGTON PARKWAY: 1942–1954

The Baltimore-Washington Parkway (BWP) stretches twenty-nine miles northeastward from the capital to Baltimore: the northern ten miles were built and are maintained by the state of Maryland; the southern nineteen miles (to Jessup Road) were built by the Bureau of Public Roads and are maintained by the National Park Service. Although completed after mid-century, a Baltimore-to Washington route was studied and promoted from the 1920s as a proper entry to the capital, and a safer option to the near-parallel U.S. Route 1, unanimously proclaimed one of the deadliest stretches of road in the nation.

Here, era and function are reflected in a design that blends parkway principles with post-war austerity. The route accesses Fort Meade, the Agricultural Research Center, and the then-experimental Greenbelt community, as well as other reservations that abut more than half its course. By extending the road to Baltimore, Maryland grabbed the opportunity to develop an important route at relatively small expense.

The forested flanks and modest natural topography are much-suited to high-speed appreciation. This is speculatively the simple background envisioned by landscape architect T.C. Jeffers, for the parkway was never technically completed with a comprehensive planting plan. The bridge designs also indicate a concession to economy. The crossings over and visible from the parkway are clad in the rough-faced stone associated with structures of the 1920-30s, while the bridges underneath are unadorned concrete arches.

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[62] Laurie D. Cox, "Appearance: Essential Element in Superhighway Plans," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 55-56.

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A $2 million appropriation in 1942 took the BWP as far as land acquisition and piecemeal grading, which was followed by eight years of continued design and discussion over funding and purpose. Although the war threat had passed, the thoroughfare was justified like Suitland Parkway. "This is, in reality, a national-defense road," one congressman testified in 1950 hearings. "If this is not a national-defense road from here to Fort Meade and the other Federal reservations, it would be difficult to point one out."[63] The federal portion of the parkway today retains its scenic qualities and characteristics, and serves as a primary intercity and regional route. Stylistically it reflects the final gasp of parkway development, as the aesthetics originally intended as park connectors merged with high-speed expressway design.

Thus, as the parkways of the national capital were systematically conceived during the first half of the twentieth century, in the wake of the precedent-setting parkway network of suburban New York, their design and implementation reflect a transportation priority. Recreation, conservation, commemoration, and military defense are diminishing--and often overlapping--secondary justifications. After World War II, creative parkway development was--for all practical purposes--eclipsed by modern highway construction.

F. Associated Property Types

I. Name of Property Type parkway

II. Description

The National Capital parkway system is composed of more than 8,761 acres of protected arterial byways in Washington, D.C., suburban Maryland, and Northern Virginia, totaling more than 74 miles. The contributing parkways include the Rock Creek and Potomac, Mount Vernon Memorial Highway George Washington Memorial, Suitland, Baltimore-Washington, and numerous neighborhood strip parks (although this last category is not included in the acreage/miles figures given). All are related to provide a "garden system" within a densely developed urban scheme, in keeping with a scale and layout that dates to the eighteenth century. The parkways serve as a link among the parks, monuments, and suburbs of the national capital region, with features that include scenic overlooks, hiking/biking trails, picnic/parking areas, native and ornamental plantings, and formal monuments--each situated to provide advantageous vistas and accessible day-use recreation

III. Significance

The various parkways of the national capital reflect the culmination of several national trends after the turn of the century: the City Beautiful movements' emphasis on integrated urban green space; automobility and the rapid development of road systems; and the decline in the quality of city living and resulting popularity of outdoor recreation. In Washington, D.C., the McMillan Commission's recommendation for a series of parks and parkways was coupled with the American Institute of Architects's assessment of a cityscape badly in need of formal planning and direction--in keeping with the original eighteenth-century urban scheme by Pierre L'Enfant. The four primary parkways and numerous small, regional strip parks--developed from 1913 to 1965 through the cooperative efforts of Maryland, Virginia, and District authorities--collectively represent all major justifications

IV. Registration Requirements

A. Landscape architecture
1. natural terrain and topography
2. existing and enhanced native vegetation
3. variable-width median and buffer articulation
4. vistas

B. Architecture/structures
1. dual-lane roadway
2. culverts and guard rails
3. bridges
4. monuments and statuary

C. Site
1. limited and well-distanced access
2. vertical and horizontal curves
3. enhancement of natural scenic features
4. roadside overlooks, parks, parking areas

[X] See continuation sheet

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☐ See continuation sheet for additional property types

II. Description continued

by local and visiting citizenry. All associated architectural and landscape architectural characteristics typify the period of parkway development--from the early twentieth century to World War II. For each, traffic is limited to non-commercial motoring; single- and dual-lane roads fit the natural topographic contours, and variable-width medians separate lanes when possible; indigenous vegetation has been preserved, maintained, and encouraged, especially as right-of-way buffer from adjacent property owners; limited access and few, if any, at-grade crossings enhance factors of speed and safety; and private access and commercial frontage is banned, as is unsightly signage. Bridges, culverts, walls, and similar structures are designed as harmonious complements to the natural environment. Materials such as rustic rough-cut stone masonry and concrete are used in eclectic and romantic compositions of horizontal, arched designs. All properties remain largely unchanged from their period of development, and are used today for their original purpose of transportation in and around Washington, D.C.

III. Significance continued

for a parkway type of thoroughfare. Consistently intended as a transportation route, the Rock Creek and Potomac Parkway and strip parks also represent natural-resource conservation efforts; the Mount Vernon Memorial Highway/George Washington Memorial Parkway, a ceremonial and recreational route; Suitland, a defense highway; and the Baltimore-Washington Parkway, a defense and intercity highway. After the precedent-setting network of suburban New York parkways--after which it was idealized--Washington's system is the most comprehensive and monumental extant in the nation. Aesthetically unaltered, the parkways remain vital components of the regional transportation arteries and they continue to contribute to the historic symbolism and design of the nation's capital.

G. Summary of Identification and Evaluation Methods

Numerous resources were used to evaluate the significance of Washington, D.C.'s parkway system. The general history of the period of significance--approximately the first half of the twentieth century--is historically linked to regional cultural organizations and the comprehensive plans they issued: the McMillan Commission, National Capital Park and Planning Commission, the Maryland-National Capital Park and Planning Commission, and the Commission of Fine Arts. Each has been concerned with the same historic and physical boundaries of the national capital and neighboring suburbs in Maryland and Virginia. The integrity of the contributing landscape-architectural features and structures has remained high because of ongoing ownership and maintenance by the National Park Service, the arbiter of the guiding Secretary of the Interiors' Standards for Historic Preservation. Federal records exist for each parkway in the collection of the National Archives, as well Historic Resource Study: Rock Creek and Potomac Parkway, George Washington Memorial Parkway, Suitland Parkway, Baltimore-Washington Parkway, by Historian Jere Krakow (NPS, 1990). Also, a Rock Creek Park administrative history documents the development of that parkway. The original section of the George Washington Memorial Parkway--the Mount Vernon Memorial Highway--is listed in the National Register of Historic Places and is the subject of a historic-resource study being produced by EDAW Inc. of Alexandria. The Historic American Buildings Survey/Historic American Engineering Record Division, NPS, completed a selective survey of historic bridges in the National Capital Region, NPS, including many associated with the parkways discussed here. This material provided information on the contexts and themes related to the parkways: conservation, history and development of the park and parkway system of the national capital, and the influence of automobiles and the development of commuter arteries.

H. Major Bibliographical References

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RG 351, Records of the District of Columbia
RG 328, National Capital Park & Planning Commission
RG 79, National Park Service
RG 30, Bureau of Public Roads

[X] See continuation sheet

Primary location of additional documentation:

- [ ] State historic preservation office
- [ ] Other State agency
- [XX] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: National Capital Region, NPS; National Capital Planning Commission

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MPD NOMINATION

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COMMUTER

029-0218

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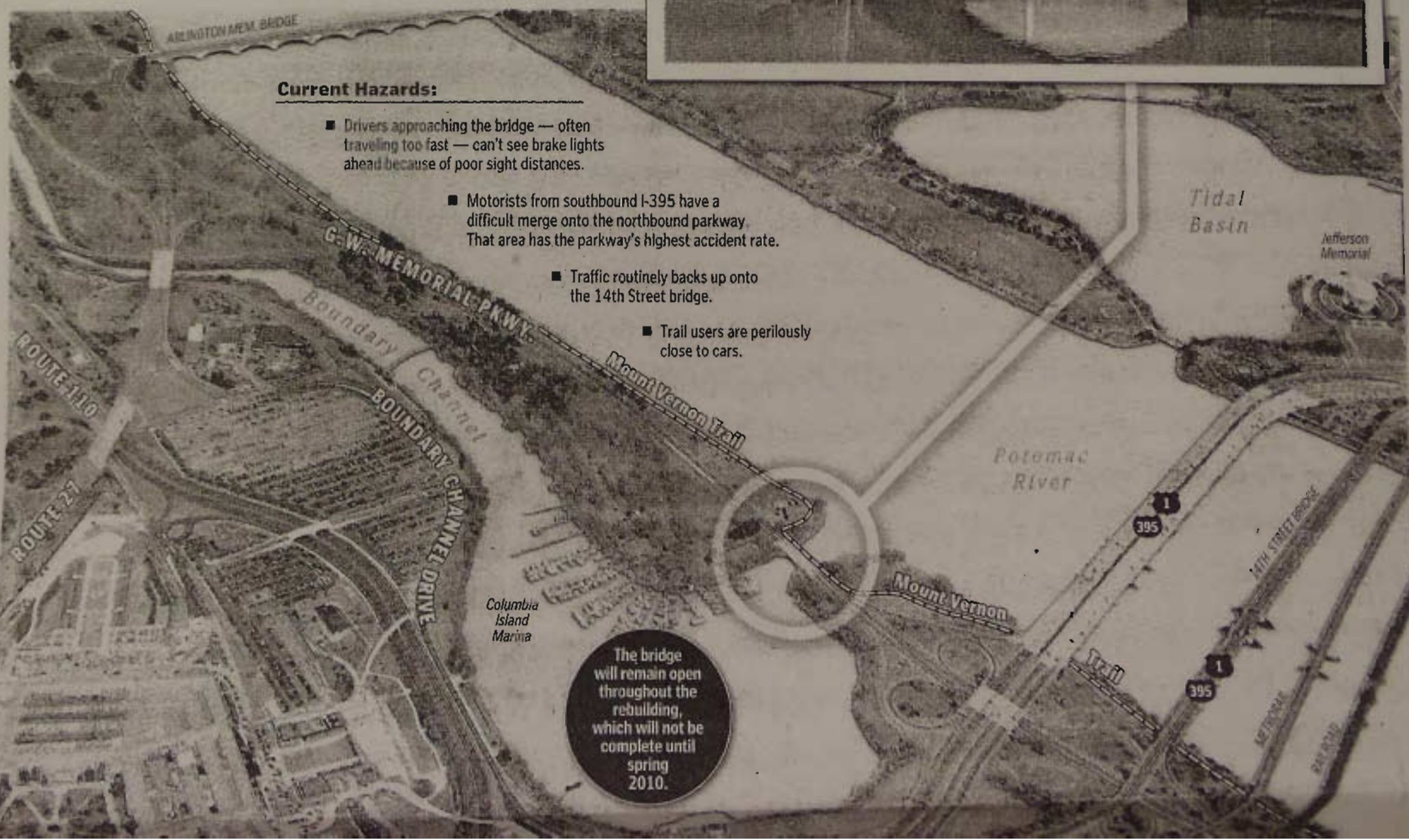
Bridge Gets a Makeover

The George Washington Parkway's Humpback Bridge just wasn't made for these times. Built in 1932, the bridge across Boundary Channel now carries 75,000 vehicles a day. The drivers have limited sightlines and a difficult merge with incoming traffic from Interstate 395. Meanwhile, bikers and walkers on the popular Mount Vernon Trail must follow a narrow path across the bridge that puts them right next to all that traffic.



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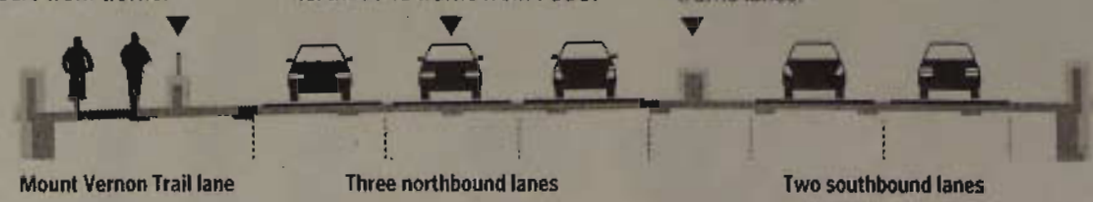
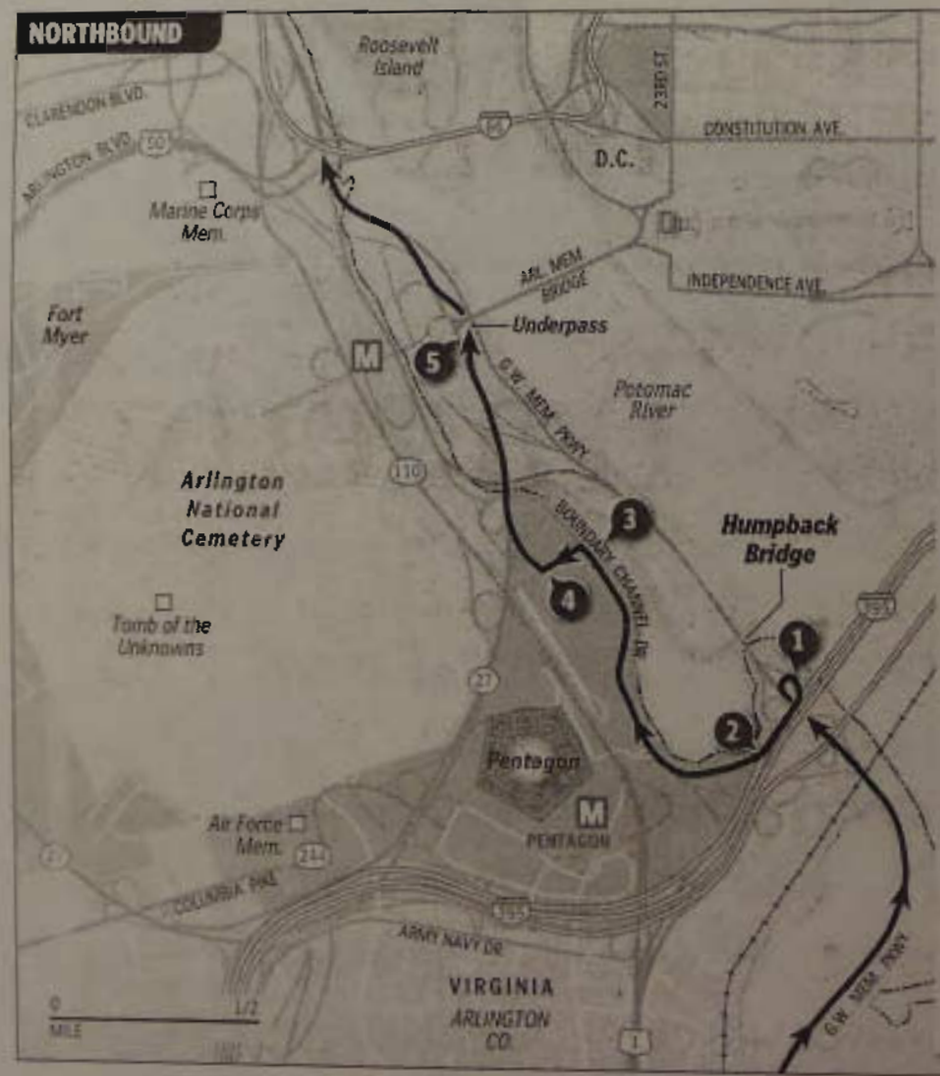
Project improvements:

The National Park Service and Federal Highway Administration have begun a **$35 million reconstruction** of the bridge to address a range of issues:



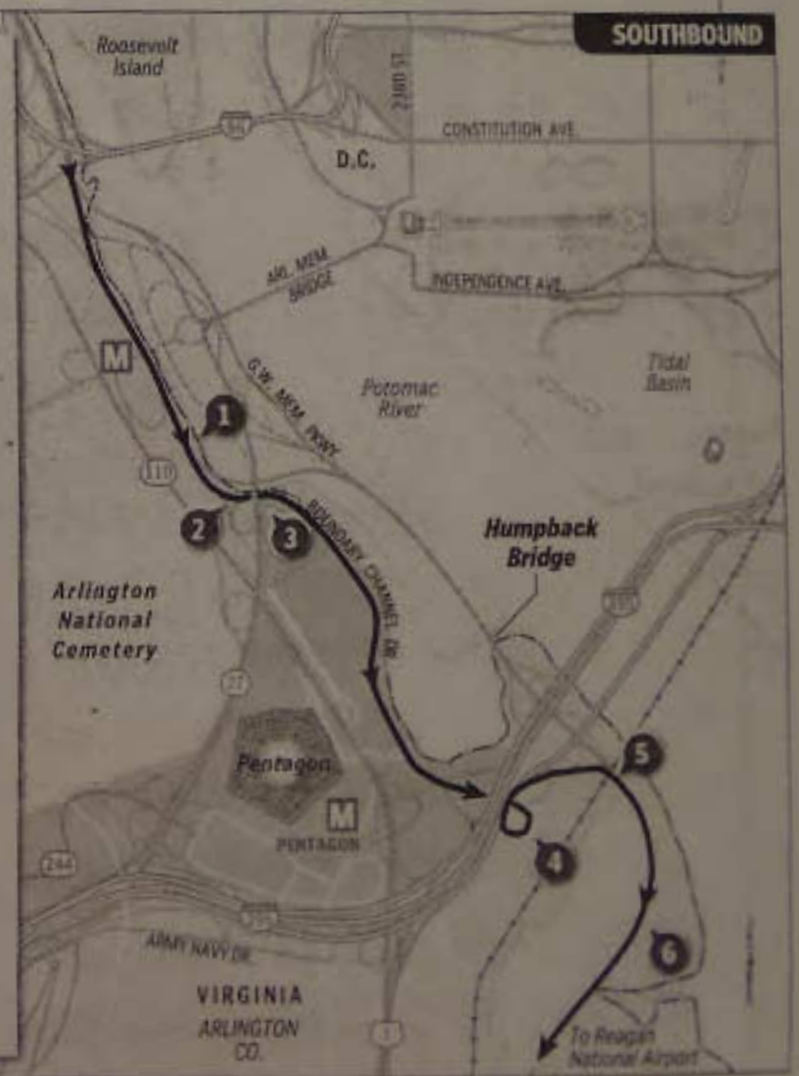
- Lower the grade of the parkway across the bridge to improve sight distance.
- Eliminate a pedestrian crosswalk on the parkway and add a tunnel under the bridge for safer passage between Columbia Island Marina and the Mount Vernon Trail.
- Close the northbound vehicle entrance to the Columbia Island Marina and Johnson Memorial Grove parking areas.

Detours to avoid the construction:



Key details for commuters:

- All lanes will be open during rush periods. But there will be some lane shifts, and at times, the pavement could be a little rough and traffic could slow.
- Lane closures on both the northbound and southbound sides will occur between 10 a.m. and 3 p.m. and between 7 p.m. and 5:30 a.m.
- Work can take place seven days a week.
- The Mount Vernon Trail will remain open.
- Watch for signs and message boards for details of current traffic patterns. Check for weekly project updates from the Federal Highway Administration at *www.humpbackbridge.dot.gov*. By phone, use the 511 information line in Virginia or call 800-578-4111.



1. From G.W. Memorial Parkway North, exit at I-395 south toward Richmond

50th ANNIVERSARY

1932 1982

MOUNT VERNON
MEMORIAL
HIGHWAY

REDEDICATION

The idea of a scenic roadway to be built as a memorial to George Washington was originated by a group of public spirited citizens from Alexandria, Virginia in 1886. Two years later the Mount Vernon Avenue Association was incorporated by the Virginia Legislature to further this idea. Although the concept for a highway between Washington and Mount Vernon was endorsed and commended from time to time by Presidents, members of Congress and others, no tangible progress was made until the passage of the 1928 Act. This law directed the Bicentennial Commission (United States Commission for the Celebration of the 200th Anniversary of the Birth of George Washington), to construct a suitable memorial highway connecting Mount Vernon, the home of George Washington and the Arlington Memorial Bridge. For this project the Commission was authorized to use the services of the Department of Agriculture with the intention of completing the highway for the bicentennial celebration in 1932.

The Secretary of Agriculture immediately delegated the responsibility for surveying and supervising the construction of the highway to the Bureau of Public Roads. Two alternative routes were considered for the location of the highway: one along the shore of the Potomac River, passing through the City of Alexandria; the other a more direct inland route skirting the City of Alexandria. After considering the merits of each route, the Commission unanimously adopted the river route. It had greater scenic and historic advantage and offered greater opportunities for development of park areas between the highway and the river.

Construction of the 15.4 mile highway began on September 12, 1929. It was built in a number of different stages or units, each requiring particular types of equipment and construction techniques. Unit I included the construction of the hydraulic fills and the riprap foundation for the sea wall; Unit II consisted of the grading work; Unit III involved the construction of the 12 bridges; Unit IV involved the construction of all paving, curbs and guardrails; Unit V consisted of the lighting system; and Unit VI included the landscaping. For the project, including the engineering, right-of-way acquisition and construction, $7,200,000 was appropriated and expended.

The Mount Vernon Memorial Highway was completed and opened to traffic on January 16, 1932. It was not dedicated however until November 15, 1932 in a special ceremony in conjunction with the annual meeting of the American Association of State Highway Officials. The occasion of the dedication provided an opportunity for the highway engineers to examine at first hand the full development of a parkway concept. The Mount Vernon Memorial Highway exemplified a limited access road constructed in a manner compatible with local topography and providing opportunities for recreation and panoramic views.

Today, fifty years later, we commemorate the engineering and design achievements which this memorial highway represents. Listed on the National Register of Historic Places, this highway is being preserved by the National Park Service as one of the most scenic drives in the nation and a lasting tribute to our first President.

Rededication Ceremony
celebrating the

Fiftieth Anniversary
of the
Mount Vernon Memorial Highway
featuring the
Mount Vernon High School Band

November 15, 1982
11 a.m.

Welcome
John F. Byrne, Superintendent
George Washington Memorial Parkway

John A. Castellani, Resident Director
Mount Vernon Ladies' Association of the Union

Comments
Wilbur H. Simonson
Co-designer, Mount Vernon Memorial Highway

Remarks
Manus J. Fish, Regional Director
National Capital Region, National Park Service

Presentation
Robert M. Lawrence, President
American Institute of Architects

Mount Vernon High School Band
Mr. Stanley R. Schoonover, Director

A small photo collection of the Mount Vernon Memorial Highway is on display in the Mount Vernon Inn.

Mount Vernon Memorial Highway (029-02 9)
Arlington, VA
page 1 of 1

#8

Mount Vernon Memorial Highway
(029-0218, associated with 029-0228)

Between I-395 and Memorial Drive

Dovetail Cultural Resource Group
July 2007

Overview of Mount Vernon Memorial Parkway
near Lyndon B. Johnson Memorial Grove
Facing N

LS L24UC-7HKSKL0 10000008 30.JPG
SS 620211

#9

Mount Vernon Memorial Highway (029-0218, Associated w/ 029-0228)

Between I-395 & Memorial Drive

Dovetail Cultural Resource Group
July 2007

Overview of Mount Vernon Memorial Parkway near Lyndon B. Johnson Memorial Grove,
facing South

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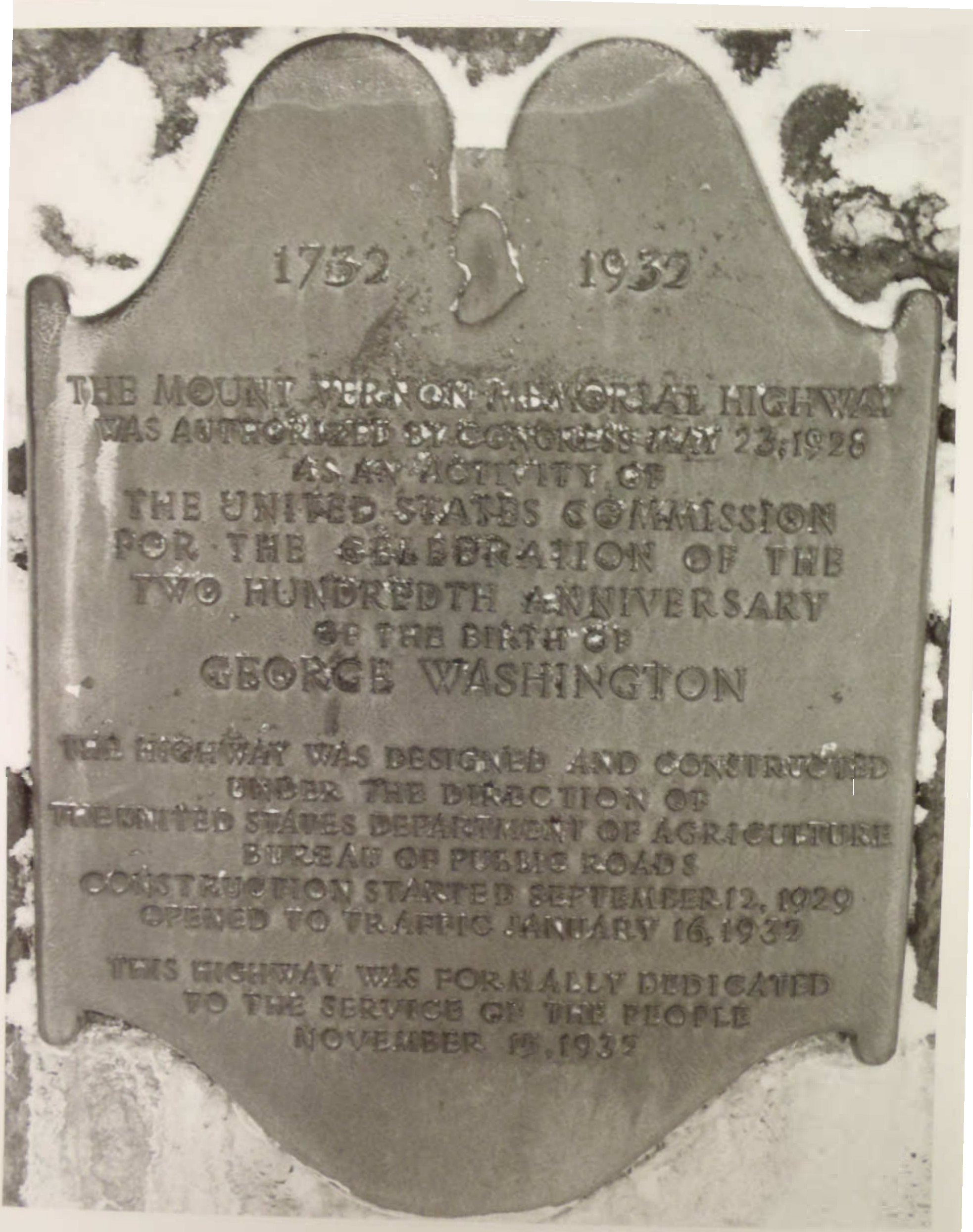
SS 620211


1732 1932
THE MOUNT VERNON MEMORIAL HIGHWAY
WAS AUTHORIZED BY CONGRESS MAY 23, 1928
AS AN ACTIVITY OF
THE UNITED STATES COMMISSION
FOR THE CELEBRATION OF THE
TWO HUNDREDTH ANNIVERSARY
OF THE BIRTH OF
GEORGE WASHINGTON
THE HIGHWAY WAS DESIGNED AND CONSTRUCTED
UNDER THE DIRECTION OF
THE UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
CONSTRUCTION STARTED SEPTEMBER 12, 1929
OPENED TO TRAFFIC JANUARY 16, 1932
THIS HIGHWAY WAS FORMALLY DEDICATED
TO THE SERVICE OF THE PEOPLE
NOVEMBER 15, 1932

Mount Vernon Inn, Mount Vernon Memorial Highway NPS 1980

APPENDIX I:

PARKWAYS OF THE NATIONAL CAPITAL REGION, 1913-1965

NATIONAL REGISTER OF HISTORIC PLACES

MULTIPLE PROPERTY SUBMISSION FORM

City of Alexandria, Virginia

Vola Lawson
City Manager

September 25, 1991

Mr. James Christian Hill
Department of Historic Resources
Commonwealth of Virginia
221 Governor Street
Richmond, Virginia 23219

Dear Mr. Hill,

The City of Alexandria is pleased to learn that the Department of Historic Resources has received a completed nomination for the Parkways of the National Capital Region. I am delighted that the National Park Service has prepared the nomination in order to facilitate the registration of the George Washington Memorial Parkway to the Virginial Landmarks Register and the National Register of Historic Places.

It is my understanding that the portion from Alexandria to Mount Vernon is already on the Register. It is particularly appropriate to recognize all of the Parkways of the National Capital Region by seeking this nomination.

I understand that the State Review Board will be meeting on October 8, 1991, to consider this recommendation of eligibility for the Virginia Landmarks Register and the National Register of Historic Places.

The citizens of Alexandria are very supportive of the register process, and we look forward to adding significant structures and areas to Alexandria's listings on the Commonwealth of Virginia Register and on the National Register of Historic Places.

Sincerely,

Vola Lawson

Vola Lawson
City Manager

cc: The Honorable Mayor and Members of City Council

REGISTER FILE.

RS
IC H. COX, JR., AIA, CHAIRMAN
ELLIE WHITE BUNDY, VICE CHAIRMAN
GENE GRAHAM, AIA
A. HARRISON, III
D HAYNES
ENNETH R. HIGGINS
ICK D. NICHOLS
. WALKER
EUGENE WORRELL

COMMONWEALTH of VIRGINIA

Virginia Historic Landmarks Commission

TUCKER HILL
EXECUTIVE DIRECTOR

221 GOVERNOR STREET
RICHMOND, VIRGINIA 23219
TELEPHONE (804) 786-3143

August 31, 1981

Mrs. Louis Petersen
4018 Robertson Blvd.
Alexandria, Virginia 22309

RE: MOUNT VERNON MEMORIAL HIGHWAY
GEORGE WASHINGTON MEMORIAL PARKWAY, FAIRFAX COUNTY

Dear Mrs. Petersen:

Please find enclosed a copy of The National Register Nomination for the Mount Vernon Memorial Highway--George Washington Memorial Parkway. The Virginia Historic Landmarks Commission listed the property on the Virginia Landmarks Register on March 17, 1981; subsequently, it was listed on the National Register of Historic Places in May, 1981.

If I can be of any further services, please feel free to call or write.

Sincerely,

Richard C. Cote
Architectural Historian

RCC:slb
cc: Tucker Hill
State Historic Preservation Officer

COMMONWEALTH of VIRGINIA

C. Miller, Director

Department of Historic Resources
221 Governor Street
Richmond, Virginia 23219

TDD: (804) 786-1934
Telephone (804) 786-3143
FAX: (804) 225-4261

September 9, 1991

The Honorable Patricia J. Ticer, Mayor
City Hall, 301 King Street
Alexandria, VA 22314

RE: Parkways of the National Capital Region, 1913-1963
Arlington and Fairfax Counties and City of Alexandria
(Multiple Property Submission Cover Document)

Dear Mayor Ticer:

The Department of Historic Resources has received a completed nomination for the above-referenced Multiple Property Submission. A Multiple Property Submission cover document establishes the context for the inclusion of a number of related resources on the National Register of Historic Places and the Virginia Landmarks Register. The Department is interested in establishing this context in order to facilitate the registration of the George Washington Memorial Parkway as well as the possible future listing of related resources on the Virginia Landmarks Register and the nomination of those resources to the National Register of Historic Places. Before this action is taken, I would like to clarify for you the nature of these designations.

The Virginia Landmarks Register is an official listing of places in the Commonwealth judged to have state or national archaeological, architectural, and/or historical significance. At its next meeting on Tuesday, October 8, 1991, the State Review Board will have the opportunity to consider the above cover document for inclusion on this register. The board will refer to this document in its deliberations concerning the listing of the George Washington Memorial Parkway for which consideration this letter also serves as notification. You will be notified prior to any consideration by the board of the possible future listing of related resources. Should the board determine the prepared nomination for this Multiple Property Submission is acceptable, it will automatically nominate it to the National Register of Historic Places maintained by the Department of the Interior.

Listing in the National Register provides recognition and assists in preserving our Nation's heritage. Listing of a resource recognizes its historic importance and assures protective review of Federal projects that might adversely affect the character of the

resource. If the Parkways of the National Capital Region, 1913-1963, are subsequently listed in the National Register, certain Federal investment tax credits for rehabilitation and other provisions may apply.

Listing in the National Register does not mean that limitations will be placed by the Federal Government upon those resources subsequently listed as part of this Multiple Property Submission. The Federal Government will not attach restrictive covenants to the resources or seek to acquire them.

You are invited to attend the State Review Board meeting at which the nomination will be considered. The Board will meet at 10:00 a.m. on Tuesday, October 8, 1991, in Senate Room A of the General Assembly Building, Richmond, Virginia. We hope that you can come. The nomination will also be considered by the Historic Resources Board on October 9, 1991 at 10:00 a.m. in Senate Room A. This meeting is open to the public and you are welcome to attend.

Enclosed, please find a notice that explains, in greater detail, the results of listing in the National Register and that describes the rights and procedures by which an owner may comment on or object to listing in the National Register.

Should you have any questions about this nomination before the Department of Historic Resources State Review Board meeting, please contact me at (804) 371-0821.

Sincerely,

James Christian Hill

James Christian Hill, National Register Assistant
State Historic Preservation Office

JCH/sdm

Enclosures

Virginia Department Of Historic Resources-Richmond
National Register Evaluation Committee
May 20, 2004

Present: Green, Holma, Loth, Smead, and Wagner.

Project Review

Susan Smead presenting:

NPS Cultural Landscape Inventory, Fort Hunt (part of George Washington Memorial Parkway), Arlington Co., DHR File Number 029-0103; DHR Project Review Number 2004-0214.

The resource, a former portion of the national defense system and now a unit of the National Park Service, was evaluated as nationally significant under Criteria A (Recreation/Social Life, Military) and D (Archaeology) with a POS of 1890-1942. The area under consideration was expanded by NPS from 13 to 190 acres. The committee **concurs** with the findings of the report, and **further recommends the addition of the theme of recreation to Criterion A**, and **recommends extending the end date of the POS to 1946**.

NPS Cultural Landscape Inventory, Memorial Avenue Corridor (part of Arlington Memorial Bridge Nomination), Arlington Co., DHR File Number 000-0014; DHR Project Review Number 2004-0215.

The resource was evaluated as nationally significant under Criterion C (Architecture) with a POS of 1901-1941. The committee **concurs** with the findings of the report, and **further recommends the addition Criterion G** with an expansion of the POS to include the recent monuments in the original niches.

NPS Cultural Landscape Inventory, Arlington Ridge Park (part of George Washington Memorial Parkway), Fairfax Co., DHR File Number 029-0218; DHR Project Review Number 2004-0216.

The resource, which contains the Marine Corps Monument and the Netherlands Carillon, was evaluated as nationally significant under Criteria A (Recreation/Social Life, Military), C (Architecture) with Criteria Exceptions F and G and D (Archaeology) with a POS of 1954-1964. The committee **concurs** with the findings of the report.

Register

Marc Wagner presenting:

Kilmarnock Fire Station, Lancaster Co., Town of Kilmarnock, DHR File Number 249-5005.

This material was received as Part 1 of a Tax Credit application. The committee **defers** consideration until the applicant completes a PIF application with enough information for the resource to be evaluated.

NEXT SCHEDULED MEETING: 9:00 A.M., Thursday June 3, 2004

NPS Form 10-900-b
(Jan. 1987)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

VLR 10/08/1991
NRHP 6/2/95

This form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. For additional space use continuation sheets (Form 10-900-a). Type all entries.

A. Name of Multiple Property Listing

PARKWAYS OF THE NATIONAL CAPITAL REGION, 1913 - 1965 #029-5524

B. Associated Historic Contexts

EVOLUTION OF THE URBAN PARKWAY
DEVELOPMENT OF THE NATIONAL CAPITAL PARKWAY SYSTEM

C. Geographical Data

The estimated 75-100 miles of parkways located in the National Park Service's National Capital Region are found in Washington D.C.; Montgomery, Prince Georges, and Anne Arundel counties in suburban Maryland; and Arlington and Fairfax counties, and the City of Alexandria, in Northern Virginia. The boundaries of the contributing arterial thoroughfares are coterminus with their rights-of-way, and include the Baltimore-Washington Parkway and Suitland Parkway, extending from the eastern boundary of the District of Columbia; the Mount Vernon Memorial Highway/George Washington Memorial Parkway along the Potomac River shoreline between Mount Vernon and Great Falls; Rock Creek and Potomac Parkway between the East and West Potomac Parks and Rock Creek Park; and numerous strip parks located throughout the greater Washington area, including the Sligo Branch Parkway.

☐ See continuation sheet

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Signature of certifying official — Date

State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register — Date

EVOLUTION OF THE URBAN PARKWAY

The parkways constructed in the Greater Washington area range stylistically from nationally significant schemes modeled on the precedent-setting, picturesque suburban New York system, to include simple tributary byways and the straightforward Baltimore-Washington Parkway completed shortly after mid-century. Contributing cultural influences include the increased use of the automobile, the City Beautiful movement, and popularity of outdoor recreation.

A parkways' foremost task is to separate traffic into two distinct groups: pleasure motorists and heavy commercial users. During the early decades of automobile use, the greatest proportion of use was devoted to recreation. But in the late 1930s when the emphasis shifted from the pastime of "getting there" to simply "arriving"--so, too, changed road design. The newly formed National Capital Park & Planning Commission (NCP&PC) in 1927 indicated:

> There are and should be in the development of plans. . . a number of things which may be called parkways, to serve as lines of pleasure traffic; but in another sense part of the thoroughfare system of the District. There is overlapping there of the two types of functions. We need to be careful. . .that it does not extend too far.[1]

NCP&PC landscape architect Frederick Law Olmsted, Jr., cites only two criteria that serve as a design guide--"controlling purposes" and local physical conditions--from which four types of parkways emerge: an elongated park, a glorified and ornamental street, and:

> A thoroughfare, boulevard, or parkway, the prime purpose of which is to enable the public to travel from one part of its course to another under conditions which are made more enjoyable by almost any means, than those of an ordinary city street.[2]

Within this last category are three subtypes: a single road with planted and ornamental flanks, which "may be really verdant and justify the name 'parkway'"; dual roadways with a central planted strip and some flanking ornamentation, much like a boulevard; and a central road flanked by any type of formal or informal landscaping, with or without pedestrian amenities.

The fourth parkway model is "somewhat intermediate and transitional between the first and the third" type, a border treatment that does not attempt to buffer surrounding buildings, and often places the roadway to one side of the green space and a waterway. This "border parkway" was later cited in a Washington-Baltimore regional study that called for "eventual acquisition [of]

[1] Minutes of the NCP&PC (16-18 September, 1927).

[2] Frederick Law Olmsted, "Memorandum as to 'Border Roads' for Parkways and Parks" (25 September, 1925), pp. 1-3. RG 66, Box 156.

X See continuation sheet

F. Associated Property Types

I. Name of Property Type parkway

II. Description

The National Capital parkway system is composed of more than 8,761 acres of protected arterial byways in Washington, D.C., suburban Maryland, and Northern Virginia, totaling more than 74 miles. The contributing parkways include the Rock Creek and Potomac, Mount Vernon Memorial Highway George Washington Memorial, Suitland, Baltimore-Washington, and numerous neighborhood strip parks (although this last category is not included in the acreage/miles figures given). All are related to provide a "garden system" within a densely developed urban scheme, in keeping with a scale and layout that dates to the eighteenth century. The parkways serve as a link among the parks, monuments, and suburbs of the national capital region, with features that include scenic overlooks, hiking/biking trails, picnic/parking areas, native and ornamental plantings, and formal monuments--each situated to provide advantageous vistas and accessible day-use recreation

III. Significance

The various parkways of the national capital reflect the culmination of several national trends after the turn of the century: the City Beautiful movements' emphasis on integrated urban green space; automobility and the rapid development of road systems; and the decline in the quality of city living and resulting popularity of outdoor recreation. In Washington, D.C., the McMillan Commission's recommendation for a series of parks and parkways was coupled with the American Institute of Architects's assessment of a cityscape badly in need of formal planning and direction--in keeping with the original eighteenth-century urban scheme by Pierre L'Enfant. The four primary parkways and numerous small, regional strip parks--developed from 1913 to 1965 through the cooperative efforts of Maryland, Virginia, and District authorities--collectively represent all major justifications

IV. Registration Requirements

A. Landscape architecture
1. natural terrain and topography
2. existing and enhanced native vegetation
3. variable-width median and buffer articulation
4. vistas

B. Architecture/structures
1. dual-lane roadway
2. culverts and guard rails
3. bridges
4. monuments and statuary

C. Site
1. limited and well-distanced access
2. vertical and horizontal curves
3. enhancement of natural scenic features
4. roadside overlooks, parks, parking areas

[X] See continuation sheet

[ ] See continuation sheet for additional property types

G. Summary of Identification and Evaluation Methods

Numerous resources were used to evaluate the significance of Washington, D.C.'s parkway system. The general history of the period of significance--approximately the first half of the twentieth century--is historically linked to regional cultural organizations and the comprehensive plans they issued: the McMillan Commission, National Capital Park and Planning Commission, the Maryland-National Capital Park and Planning Commission, and the Commission of Fine Arts. Each has been concerned with the same historic and physical boundaries of the national capital and neighboring suburbs in Maryland and Virginia. The integrity of the contributing landscape-architectural features and structures has remained high because of ongoing ownership and maintenance by the National Park Service, the arbiter of the guiding Secretary of the Interiors' Standards for Historic Preservation. Federal records exist for each parkway in the collection of the National Archives, as well Historic Resource Study: Rock Creek and Potomac Parkway, George Washington Memorial Parkway, Suitland Parkway, Baltimore-Washington Parkway, by Historian Jere Krakow (NPS, 1990). Also, a Rock Creek Park administrative history documents the development of that parkway. The original section of the George Washington Memorial Parkway--the Mount Vernon Memorial Highway--is listed in the National Register of Historic Places and is the subject of a historic-resource study being produced by EDAW Inc. of Alexandria. The Historic American Buildings Survey/Historic American Engineering Record Division, NPS, completed a selective survey of historic bridges in the National Capital Region, NPS, including many associated with the parkways discussed here. This material provided information on the contexts and themes related to the parkways: conservation, history and development of the park and parkway system of the national capital, and the influence of automobiles and the development of commuter arteries.

H. Major Bibliographical References

GENERAL

National Archives:
RG 66, Commission of Fine Arts
RG 351, Records of the District of Columbia
RG 328, National Capital Park & Planning Commission
RG 79, National Park Service
RG 30, Bureau of Public Roads

[X] See continuation sheet

Primary location of additional documentation:

- [ ] State historic preservation office
- [ ] Other State agency
- [XX] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: National Capital Region, NPS; National Capital Planning Commission

I. Form Prepared By

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selected stream valley 'strip parks' [to] be protected by public purchase of scenic easements in all parks of the area." While these do not possess extraordinary scenic qualities, they protect the floodplain and "assure provision of open spaces to prevent uninterrupted built-up areas."[3]

During the 1930s, one application of the term "parkway" hinged on use and legal access. Of a parkway, highway and freeway, all involve public land; the parkway alone is devoted to recreation rather than movement; and only the highway allows adjacent land owners to retain rights of light, air or access.[4]

This is supported by the casually synonymous use of "freeway" and "parkway" within the context of landscape by itself, rather than the thoroughfare in its entirety. A freeway, for instance, was characterized by one planner as about 100 feet wide with a center pavement "flanked by 20-foot strips of parkway, planted with trees, ground covers, shrubs, and hedges. . .adequate for a landscape composition of varied interest."[5] Shared features include the pleasure derived from planted borders instead of billboards and business frontage, a reduced volume of traffic, improved travel time, and safety. This type of road was considered particularly effective in an area where residential and business subdivisions were slated, and was destined to reorient transportation patterns--a setting particularly relevant to development of the Baltimore-Washington metropolitan corridor.

Legally, a parkway was designed simply as "an attenuated park with a road through it," but the federal government did not address general parkway guidelines until the "Regulations and Procedure to Govern the Acquisition of Rights-of-way for Parkways" was approved by the Secretary of the Interior on 8 February 1935.[6] This was the foundation for a set of eight characteristics intended to differentiate parkways from ordinary highways, as identified by the NPS three years later. It represents the culmination of thirty years of modern parkway planning--designated, ironically--just as the highway needs of the nation were about to shift away from recreational motoring.

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[3] MNCP&PC, "Regional Planning Report IV: Baltimore-Washington-Annapolis Area" (November 1937), p. 2, 34.

[4] Baltimore-Washington-Annapolis report, p. 60.

[5] George D. Hall, "The 'Freeway', A New Thought for Subdividers," Landscape Architecture, vol. 21, no. 2 (January 1931), p. 115-118.

[6] NCP&PC, "Comments on Report of Maryland State Planning Commission on State Recreational Areas," (unpublished, 1938?), cited in Jere Krakow, "Historic Resource Study, Baltimore-Washington Parkway" (1987), p. 28; this and resource studies on other NPS Washington-area parkways are collectively published in Jere L. Krakow, Historic Resource Study: Rock Creek and Potomac Parkway, George Washington Memorial Parkway, Suitland Parkway, and Baltimore-Washington Parkway (NPS, January 1990). Memorandum for A.E. Demaray, Appendix A, Minutes of the NCP&PC (16-17 March, 1944), p. 2. RG 328.

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These specifications are: a limit to non-commercial, recreational traffic; the avoidance of unsightly roadside developments; a wider-than-average right-of-way to provide a buffer from abutting property; no frontage or access rights, to encourage the preservation of natural scenery; preference for a new site, to avoid already congested and built-up areas; to best access native scenery; the elimination of major grade crossings; well-distanced entrance and exit points to reduce traffic interruptions and increase safety.[7] Collectively, they ensured a self-contained, well-preserved, and safe thoroughfare.

Despite these in-house Park Service ideals, in 1944 the U.S. Department of Interior complained that, "To date, Congress has not defined parkways. Legislation pertaining to parkways is piecemeal and lacks uniformity."[8]

In Washington, at least, the definition of a parkway has historically differed according to the period of development, site, and transportation needs. And although its function as a road can never be divorced from its scenic role, parkways have been consistently patterned as formally or informally designed connectors within a system of predetermined destinations that include parks and monuments--and later, federal reservations. Credit for this belongs to the City Beautiful movement.

CITY BEAUTIFUL MOVEMENT

The City Beautiful movement that developed around the turn of the century is evidenced in particular in the urban park systems of Boston and New York--a vital element of which are parkways. Using these as models, planners and landscape architects assembled in Washington to develop a similar program for the nation's capital. The McMillan Plan of 1902 calls for numerous "parkways" linking the Great Falls, Mount Vernon, Potomac River bridges, and existing parks. Like New York City's Riverside Drive, Washington had its own token "riverside drive," a muddy carriage path built in 1904. It wound around the Tidal Basin and up 26th Street in northwest, serving as a literal and figurative prologue to the era of parkway construction.

The parkway was a byproduct of the suburbanization movement, born in the late nineteenth

[7] Harlan D. Unrau and G. Frank Williss, Administrative History: Expansion of the National Park Service in the 1930s (Washington D.C.: Denver Service Center, 1983), p. 146; ASLA fellow Laurie D. Cox identified the same standards in an article, "Appearance: Essential Element in Superhighway Plans," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 56.

[8] Memo to Demaray, Appendix A, p. 1.

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century; however, its role accelerated with the increasing sense of city-to-city regionalism and the rise of motoring characteristic of the twentieth century,.

> The purpose served by parkways and boulevards is, roughly, to provide agreeable routes connecting parks with each other, the parks with the centers of population, and the suburbs and countryside with the congested districts. The first two purposes have long been established. The last is a recognition of the changed methods of travel introduced with the automobile.[9]

The car--which gave enormous impetus to the improvement of the American road system in general--had a significant impact on parkways and the development of recreational roadways. According to Charles W. Eliot II: "It is the informal landscape parks of all sizes, and in the parkways, that the automobile has notably changed the situation."[10]

As an added bonus, Eliot felt that if recreation-seekers took to scenic roads, it might alleviate the inevitable and increasing congestion of national and state parks, as well as "atone for the exclusion of automobiles from landscape parks except under rigorous conditions," which he advocated.[11] The speed of motorized vehicles, as compared to horse-drawn carriages, also lent itself to new design needs: convenient and unobtrusive parking areas, service facilities, and dramatic-but-simple landscaping enjoyable from afar at 75 mph, rather than in detail at a meandering pace.

Although the District of Columbia's Division of Trees and Parking (established in 1871 and later part of the city's Engineer Department) was "one of the first public bodies to regard street-tree planting as a public function," the city trailed behind others in the development of urban green space. Massachusetts, one of the forerunners in the City Beautiful movement, became the first state to enact legislation for the caring of shade trees on public highways in 1890. But it was not until 1933 and the National Industrial Recovery Act that "appropriate landscaping of parkways or roadside on a reasonably extensive mileage," was provided at the federal level.[12]

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[9] Eliot, p. 36; for information on Eliot, see footnote 24.

[10] Charles W. Eliot, II, "The Influence of the Automobile on the Design of Park Roads," Landscape Architecture, vol. 13, no. 1 (October 1922), p. 27.

[11] Eliot, p. 36.

[12] Wilbur H. Simonson, "Roadside Planting," Landscape Architecture, vol. 26, no. 4 (July 1936), p. 167.

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comprehensive scheme of urban parks and parkways in Washington. "There has been candid admission in Congress," reported one newspaper, "that the park system of the National Capital is not what it should be"--for which the poor "economies of the past five years" were blamed.[13]

As the desirability for sophisticated roads grew, "the modification of highway design to conform to the principles and technique of landscape architecture" became a direct concern of the American Society of Landscape Architects (ASLA). This remained true even as the engineering aspects of road construction improved, because "the fundamental purpose of roadside planting operations should be to make the highway strip a mere foreground, or screen against what lies beyond."[14] As late as 1940, however, an ASLA editorial reported:

> There is still a tendency to consider the work of the landscape architect as a last step after all the other important decisions of design are made and put into effect.[15]

Despite the growing acknowledgement that landscape architecture was a mandatory component to road design, certain parkway characteristics remained subordinate to one another: Traffic provisions, safety, and economical maintenance take precedent over landscape design; while landscape-design features including location, alignment, profile, and adaptation to natural topography, take precedent over horticultural embellishments. All, however proportioned, are crucial parkway elements.[16]

And last, the site design of a parkway should appear compositionally natural, with irregular groupings of plantings recommended: The purpose was to enhance native vegetation beyond. According to one landscape architect:

> In the open countryside it is a mistake to use exotic plants, or anything which is not indigenous to that general region and to the particular type of topography at hand. . . .Native materials should be

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[13] Bill Price, "A Great National Park Along the Potomac," Washington Times (18 April, 1922).

[14] Simonson, p. 171, 173; ASLA committee reports of 1939-40 outline the procedure for the collaboration between landscape architects and engineers "in the design and construction of highways, "Landscape Design in Highway Development," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 72.

[15] Harlean James, "Comment: Tendency to View Landscape Contribution as Final Step," Landscape Architecture, vol. 30, no. 3 (April 1940), p. 117.

[16] Arthur R. Nichols, "Landscape Design in Highway Development," Landscape Architecture, vol. 30, no. 3 (April 1940), p. 115.

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used not only because they are likely to be more permanent than others, . . .but most important of all, because the effect of regional individuality may be retained.[17]

Thus, during the first half of the twentieth century, a recognized set of design criteria evolved that were common to all parkways constructed. These were initiated with New York's Westchester County system of the early twentieth century, under the aesthetic direction Gilmore Clarke, the landscape architect who would greatly influence parkway development in Washington. Also, as technology improved and recreational goals changed, new motives altered the appearance and use of these roads up to World War II, when parkway development was--for all practical purposes--usurped by modern highway construction.

DEVELOPMENT OF THE NATIONAL CAPITAL PARKWAY SYSTEM

In Washington, Maryland and Virginia, the national capital park system is composed of more than 8,761 acres and 74 miles of formal parkways. The major components are: Rock Creek and Potomac Parkway, connecting Rock Creek Park in and north of Washington, to the East and West Potomac Parks along the river; more than 12,000 acres of neighborhood "stream valley," or "strip," parks that cushion and protect the crucial tributaries, many adjacent to Rock Creek Park; the Mount Vernon Memorial Highway, connecting the estate and Washington via the Potomac shore and Memorial Bridge, and its extension into the George Washington Memorial Parkway, up to Great Falls in Maryland and Virginia[18]; Suitland Parkway, a defense-highway link to Andrews Air Force Base; the Baltimore-Washington Parkway, an intercity thoroughfare that serves as a primary commuter route and defense road among the two cities and several federal reservations.

Some elements of Washington's fully idealized parkway system did not come to fruition. The Fort Drive circuit, a proposed connection of forty or so Civil War fortifications, would have encircled the city. Two extensive links with the George Washington Memorial Parkway remain unbuilt: a parkway along the Chesapeake & Ohio Canal route between Great Falls and Cumberland, Maryland, which would have served as a ceremonial entry to the city, and a similar route in Maryland along the Potomac River south to Fort Washington. Only a few fragments of disjunct border parkways

[17] Malcolm Dill, "Planting in Streets, Parkways, Highways, and Byways," Landscape Architecture, vol. 22, no. 2 (January 1932), p. 129-31.

[18] In 1989, the 7.7-mile portion of this parkway in Maryland, from the MacArthur Boulevard in Montgomery County to Canal Road in the District of Columbia was redesignated the Clara Barton Parkway with the enactment of Public Law 101-177/101st Congress (Approved November 28, 1989).

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exist of the never-realized Archbold-Glover Parkway in northwest D.C. Despite their absence, a system of largely complete parkways does exist in the capital.

The vision of a National Capital laid out along wide avenues and ceremonial routes replete with parks and formal city entrances, is descended from the design scheme of engineer-turned-city planner Maj. Charles Pierre L'Enfant. His 1791 plan for the Federal City incorporates political, residential, and commercial centers, as well as waterways such as the Potomac and Anacostia (or Eastern Branch) rivers, two canals, and Rock Creek with its tributaries.

With the urban schemes of Paris and other world capitals in mind, L'Enfant surveyed the site of the future U.S. capital from all directions, including the north approach from Baltimore, "which offered travelers a synoptic view of the town and its natural setting from the hills above the Bladensburg Road."[19] Among the guidelines for his plan are thoroughfares "to not merely contrast with the general regularity, not to provide a greater variety of seats with pleasant prospects. . .but principally to connect each part of the city."[20] In addition to "outroads" identified on William T. Partridge's 1926 study of plans by L'Enfant and his successor, William Ellicott, a "city entrance" occupies a prominent position on the Potomac River in the approximate area where the Baltimore-Washington Parkway exits the city today.[21] Little of L'Enfant's vision was constructed during the eighteenth- or nineteenth centuries, however.

New and extended modes of transportation dominated the nineteenth century that--for service and speed--superseded those provided by water- and roadways. A rail line operated between the two cities in 1835, bettering the traditional stage coach travel time by half.[22] The Baltimore & Ohio Railroad opened a direct line to Washington City and encouraged regional development between the capital and not-insignificant Maryland port to the north. All the while, in Washington and environs a miscellany of crossroads towns and farms steadily grew up within the ten-mile city boundaries. One exception to such growth was the region along the east bank of the Anacostia River: "An area of commanding panoramic views and a hilly topography.[23]

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[19] Gutheim, Frederick, Worthy of a Nation (D.C.: Smithsonian Institution Press, 1977), p. 20.

[20] Cited in Gutheim, p. 25..

[21] Gutheim, p. 32.

[22] Ibid. p. 49.

[23] Ibid., p. 108.

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The first attempt to cohesively develop L'Enfant's scheme beyond city limits came in the 1890s with successive--but equally ineffectual--legislation, the 1893 and 1898 Highway Acts. Authorization was introduced for a plan extending L'Enfant's street plans, taking into account already-established subdivisions, but it failed to address funding or offer a timetable for implementation. The "Permanent System of Highways Plan," however, became the foundation for the McMillan Commission's revival of the original urban scheme in the grand, baroque tradition.

Several nationwide movements contributed to Washington's urban development at this time: The unparalleled success of the 1893 World's Columbian Exposition in Chicago turned designers on to comprehensive and formally integrated city planning that included a generous landscape component, the essence of the City Beautiful movement; the increasing popularity and affordability of the automobile, which necessitated adequate roadways and service facilities; and the general decline of urban living conditions through overcrowding and poverty, which logically resulted in the out-of-doors as a popular recreation destination.

A trio of local events further drew the focus to Washington. "A small group of the country's best-known designers" assembled there to coordinate the centennial celebration of the "removal of government" to the city; the American Institute of Architects convened in 1900 to address issues of sculpture, landscape and public-building design; and, Senator James McMillan of Michigan orchestrated the creation of the Senate Park Commission. The McMillan Commission--as it is better known--was a highly influential group that advised the formation of a team of professionals "eminent in their professions, who shall consider the subject of the location and grouping of public buildings and monuments to be erected in the District of Columbia and the development of the entire park system of the District of Columbia."[24]

Commission members included: Charles Moore, assistant to McMillan (who later served on the Commission of Fine Arts for twenty-seven years); Charles Eliot II, whose father designed Boston's comprehensive park system and worked at the Olmsted brothers' firm; Frederick Law Olmsted, Jr., a principal in that office and head of the nation's first landscape-architecture curriculum at Harvard University; pre-eminent architects Charles F. McKim and Daniel Burnham, both of whom worked on the Columbian Exposition; and sculptor August Saint-Gaudens who joined the team later. Moore, Olmsted and Eliot would remain key figures in the design of the national capital region during the next three decades.

[24] Ibid., p. 113, 116.

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In addition to downtown development, the McMillan Commission recommended a series of drives and park connections around the city: in Virginia along the Potomac River down to Mount Vernon, in Maryland and D.C. up to Great Falls; a Fort Drive to connect forty or so historic Civil War sites; and to enlarge and embellish Rock Creek Park for intensified recreational use.[25] In keeping with L'Enfant's vision:

> The City Beautiful movement in Washington was. . . swept along to include city entrances, parkways, boulevards, monumental bridges, and entire streets.[26]

This was followed by the Commission of Fine Arts' (CFA, established in 1910) recommendation in 1918 for a "permanent system of highways [to] be revised to allow for the new park schemes." Crucial to a citywide network of local and "grand entrance" parkways was the Olmsted Brothers' urging for protection of the Rock Creek Park property. The idea followed up by a U.S. Army Corps of Engineers' recommendation for the acquisition of 400-foot strips of land along Rock Creek and its tributaries in D.C. and neighboring Montgomery County, Maryland.[27]

ROCK CREEK & POTOMAC PARKWAY: 1913–1935

The Rock Creek and Potomac Parkway was legislated 1913 as a two and one-half-mile connector between the East and West Potomac Parks on the river, and Rock Creek Park and the zoo. Rock Creek Park was established in 1890 as a nature preserve, an "open valley" of streams and forest to which hiking and riding trails were later added. A winding two-lane road, Beach Drive, provides the primary access through the park, which occupies 1,754 acres in the District and Montgomery County, Maryland. Access to the park interior is limited to about twenty entry points from small neighborhood thoroughfares.

Distinguishing traffic use through the park was an issue during the 1920s, even as the parkway was being developed. Frederick Law Olmsted, Jr., believed there should be a distinction between the lower and upper portions of the Rock Creek Valley. The bulk of the valley--above the zoo--

[25] Ibid., p. 125.

[26] Ibid., p. 135.

[27] Ibid., p. 145; these neighborhood parkways, also called "strip parks" or "border roads," protected the creek's floodplain and provided welcome green space within the urban sprawl.

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remains a park, while the parkway to the zoo is the narrowest right-of-way and serves as a commuter route. "You must be careful not to ruin that valley if it is to be all one. The valley of Rock Creek should not be turned into that kind of thoroughfare and ruin the stream and park character," he warned.[28]

A parkway linking the zoo and the Potomac parks was first studied in 1900, when Congress allocated $4,000 to employ landscape architect Samuel Parsons, Jr. During the early years of the century--concurrent to the McMillan Commission's workings--two options evolved. The first was to fill the valley and enclose the creek in an underground brick culvert--the fate that earlier befell Tiber Creek. This was determined to be a long-term and costly undertaking, and the commission pursued the second option: to maintain the open-valley plan and bring a road through it, thus allowing east-west traffic to traverse the park on bridges at non-grade level.[29]

But it was not until President William Howard Taft signed the parkway's enabling legislation in March 1913 that any progress was made--for reasons of conservation and transportation:

> That for the purpose of preventing the pollution and obstruction of Rock Creek and of connecting Potomac Park with the Zoological Park and Rock Creek Park, a commission. . .is authorized and directed to acquire. . .such land and premises. . .lying on both sides of Rock Creek. . . .That [such] lands. . .are hereby appropriated to and made a part of the parkway herein authorized to be acquired.[30]

The bill--whose justification resembled the New York legislation of 1906 that resulted in the Westchester parkways--included a $1.3 million appropriation for land acquisition, the cost of which was to be shared equally by District and federal governments. The Rock Creek and Potomac Parkway Commission, which included landscape architect James D. Langdon, sought to acquire slightly more than 4.1 million square feet of land, assessed at $1.42 million. By 1923, the commission had 82 percent of its goal, but funds ran out while twelve acres were still needed. This was mitigated through boundary adjustments and land condemnations. Segments of the road were under construction in the mid-20s, but title disputes and unacquired land prevented a continuous thoroughfare. The last leg of the parkway, between K and P streets, opened to traffic in October 1935.[31]

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[28] NCP&PC minutes (16-18 September, 1927), p. 15.

[29] Barry Mackintosh, Rock Creek Park: An Administrative History (Washington, D.C.: NPS History Division, 1985), p. 49

[30] Congressional Record, pp. 4693-94, 4816. Pub. 432, 62nd Congress, 37 Stat. 885.

[31] Mackintosh, p. 61, 63.

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BORDER, STRIP, AND STREAM VALLEY PARKS

Ancillary to Rock Creek, and the Potomac and Anacostia Rivers are a number of "strip" or "border" parks that occupy the floodplain of local tributaries or park-related topography. These have historically been identified for local importance.

> Stream valley parks form the backbone and major portion of the District of Columbia and Metropolitan Park System. Their value as routes for passenger car traffic augmenting the city and metropolitan street system cannot be overestimated. One of their primary values which is often overlooked is the conservation of small wild life, woodland and water.[32]

In the District, Maryland and Virginia, a total of 11,552 publicly owned acres were devoted to such stream valley parks by the late 1930s, with nearly 12,000 additional acres planned.[33]

Maryland's Sligo Branch Parkway, conceived in the 1920s, is the single-largest strip park in the region. It descends about ten miles (northwest to southeast) from the city of Wheaton in Montgomery County to Hyattsville in Prince George's County, to link up with parkway extensions of the northeast and northwest branches of the Anacostia River, the Baltimore-Washington Parkway and Anacostia Park. The two-lane, undivided roadway winds alongside Sligo Creek, where numerous picnic and recreational spots are provided in a wooded setting, although access to the parkway from adjacent neighborhoods is limited. Right-of-way width varies within relatively narrow boundaries, and offers a limited buffer between the road and community development. During the late 1930s, Maryland was accepting donations of stream valley lands of 80 to 100 feet wide, with a total of forty-six miles anticipated upon completion.

The Piney Branch Parkway (extending east at 16th Street and Arkansas Avenue) was to average 400 feet wide, as an extension of Rock Creek Park's Beach Drive in 1908, and again in the 1920s.[34] Similarly, Pinehurst Parkway (extending west from the park along Beech Street to the Montgomery County line) is a slim green space flanked by residential streets that "embraces an important feeder stream."[35] The function of flood control was one important reason to protect these small waterways.

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[32] Max Wehrly, "Stream Valley Parks in the District of Columbia and Metropolitan Area" (12 October, 1939). RG 328, Box 18.

[33] Ibid.

[34] Mackintosh, p. 64.

[35] "Potomac Power Dam Report Due Today," Evening [Washington] Star (13 January, 1944). RG 66, Box 69.

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Linear parks created between roadways also include Beach Parkway (at the northernmost point of the District boundary) and the nearby North Portal Parkway at Blair Road. A "Northern Parkway" around Western Avenue and Oregon Avenue-extended (out to Old Bladensburg Road) was identified in 1945 as a priority project for the next five years by the Maryland National Capital Park & Planning Commission, as were improvements to the Western Avenue-Dalecarlia Reservoir area, and the George Washington Memorial Parkway from D.C. to Great Falls. Only the last of these three was constructed, and it was not completed until 1965.[36]

The western corner of the District contains the fragments of a minor park and parkway system that also failed to materialize in its entirety. Glover-Archbold Park in north Georgetown very nearly connects with the Rock Creek & Potomac Parkway. The NCP&PC had long planned for the nearby Whitehaven Parkway to extend from the Palisades Park to Massachusetts Avenue through this park, but today it exists as a road leading to it, then as a green extension of the park, and picking up again as a brief parkway that ends at Wisconsin Avenue. This was still a trouble spot in the 1950s when the NCP&PC sought to acquire the land between Wisconsin Avenue and Dumbarton Oaks Park to link the parkway with Whitehaven Street, only to discover that Dumbarton's dedication deed prohibits the incorporation of roadways.[37] In the 1920s, the Office of Public Buildings and Grounds sought to build the Klingle Valley Parkway to connect with the Normanstone Parkway, north of Dumbarton Oaks Park and the Naval Observatory, to serve as a western detour around the zoo; the development of each continued into the 1950s, but the connection between them never did.[40]

Nearby, the Arizona Parkway was slated for development between Canal Road and Van Ness Street: In a "portion of the valley of Foundry Branch along the general line of Arizona Avenue. . .of a parkway character that will provide facilities as a means of access to the park and to provide for a scenic highway for through traffic."[41] Had this been accomplished, it would have completed a link with the Dalecarlia Parkway, which occupies the right-of-way buffer along the Dalecarlia Reservoir grounds, situated at the D.C.-Montgomery County boundary abutting the Palisades Park.

Another slender park exists in the B&O railroad right of way that turns north at the Maryland

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[36] Fred Tuemmler to John Nolen (22 March, 1945). RG 328.

[37] W.E. Finley to Mr. and Mrs. Robert Woods Bliss (12 March, 1959).

[40] Mackintosh, p. 64-65.

[41] "Memorandum of Agreement between the NPS and the Government of the District of Columbia Relative to the Development of the Arizona Parkway" (16 April, 1948) RG 66, Box 8.

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line, and continues along the west side of the reservoir. Between Massachusetts Avenue and Bradley Boulevard, the Little Falls Parkway serves as a limited-access thoroughfare that leads into Chevy Chase, Maryland, park areas. During the 1920s, it was proposed to use this and the Dalecarlia property as part of "a circuit drive around the District of Columbia beyond Rock Creek Park."[42] Between the District line and Great Falls lies the Cabin John Creek, whose valley "in many respects compares favorably in scenery with the famous valley of Rock Creek.' The NCP&PC sought this parkway to connect the city of Rockville with the Potomac River.[43]

The two linear parks that contain the Anacostia River branches are served by minimal abutting roads, although they are not identified as parkways proper. A similar parkway is found in the Cabin Branch tributary (between Sheriff Road and Central Avenue), located in Maryland near the Eastern Avenue District boundary. In 1927 the National Capital Parks and Planning Commission recommended that land in the creek's floodplain "be acquired for park purposes to serve the growing communities of Capitol Heights and Seat Pleasant." Oxen Run, flanking the Southern Avenue D.C. boundary, was also slated to "be developed with a parkway and recreational facilities" in the 1920s. Today the upper valley portion contains a golf course and lands that connect with the Suitland Parkway, and the lower valley consists of a park; neither includes a designated parkway.[44]

Planning for these parkways had quickly become a regional concern, one taken up by the National Capital Parks and Planning Commission (NCP&P, founded 1926) and Maryland National Capital Park & Planning Commission (MNCP&PC, 1927). To protect Rock Creek's watershed to the north, an extension of the park was idealized, but "to inspire the District's neighbors to substantive action, the carrot of federal aid was deemed necessary."[45]

The vehicle for the expansion of Rock Creek Park into Maryland, the Mount Vernon Memorial Highway and other parkways was the Capper-Cramton Act, approved 29 May, 1930. This act provided $16 million "for the acquiring of such lands in the District of Columbia as are necessary and desirable for the suitable development of the National Capital park, parkway and playground

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[42] Charles Eliot II and NCP&PC, "Preliminary Report: Park System for the National Capital Washington Region" (February 1927), p. 16. RG 328.

[43] Eliot and NCP&PC, "Park System. . . ," p. 16.

[44] Eliot and NCP&PC, "Park System. . . ," p. 16.

[45] Mackintosh, p. 67.

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system. . . ." It provided that the government would grant one-third, and advance two-thirds, of the cost of these constructions, with a $1.5 million ceiling for the federal contribution and $3 million more for the advance.[46]

MOUNT VERNON MEMORIAL HIGHWAY: 1928–1932
GEORGE WASHINGTON MEMORIAL PARKWAY: 1930–1965

The George Washington Memorial Parkway (GWMP) on the Virginia shore includes the parkway from Mount Vernon, about twelve miles south of Washington, to Great Falls, fifteen miles to the north. The oldest portion--from the estate to the site of Memorial Bridge--was built as the Mount Vernon Memorial Highway (MVMH) from 1928-32; and the northern parkway leg, as the GWMP, from the 1930s-65. Buffering the District shore, the parkway is composed of Palisades Park, the Chesapeake & Ohio Canal [National Historical Park], and the B&O railway right-of-way as far as the Montgomery County line.

The MVMH was legislated on 23 May, 1928, to commemorate the bicentennial of George Washington's birth--an idea dating to a citizen's group organized in 1886. In 1930 Congress concluded the parkway should extend even farther: north to Great Falls on both shores, and down to Fort Washington in Maryland. Two years later, all existing and future components were renamed the George Washington Memorial Parkway.

Gilmore Clarke, consulting landscape architect for the MVMH, attested that the Bronx River Parkway (1923), a thirteen-mile thoroughfare in New York designed exclusively for pleasure motoring, set the precedent for the Virginia parkway:

> I doubt whether the Mount Vernon Memorial Highway would have been built in the manner in which it was, had those in charge not seen and profited by the work of the Westchester County Park Commission. And so Washington has one example of the type of motorway that should. . .extend out from every portal of the city.[47]

Even before the MVMH/GWMP was begun, this New York parkway was cited as a model for a

[46] Mackintosh, p. 67-68.

[47] Gilmore Clarke, "D.C. Need of Modern Parkway Cited by Fine Arts Chairman," The Sunday [Washington] Star (5 June, 1938).

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similar thoroughfare leading north from the nation's capital. The proponent was "keenly interested in the subject of trying to work out a parkway between Washington and Baltimore on lines somewhat similar to the Bronx Parkway--a parkway which will average perhaps a thousand feet in width, but vary according to local conditions, topography, etc."[48]

Clarke was responsible for designing bridges and small architectural elements of the parkway, as well as heading the design team made up largely of Westchester County Parkway Commission alumni: besides himself, engineer Jay Downer, landscape architect Wilbur Simonson, and plantsman Henry Nye. Clarke's MVMH bridges are characteristically romantic and rustic, low-slung segmental-arched concrete with rough-faced stone cladding--nearly identical to those he designed for Westchester.

The fifteen and one-half-mile MVMH was built by the federal Bureau of Public Roads and was one of the first facilities planned using aerial photography, which afforded much greater detail of topography, drainage patterns, the existing road, and options for the new parkway. These novelties generated a more sinuous and irregular roadway than did traditional, tangential curves.[49]

From Mount Vernon to Alexandria, the four-lane, undivided road clings to the shoreline it protects, from thickly wooded sections to open, grassy embankments and marsh; occasional overlooks and park/parking areas provide points for picnicking and occasional views to Fort Washington across the river. In contrast, the route from Alexandria to the bridge is divided by a median, open and manicured. This portion also contains several formal monuments--the Columbia Island Circle at the junction of the bridge, the Navy-Marine Memorial, and the LBJ Memorial Grove --the backdrop to which is an ongoing vista of the magnificent Washington skyline. In recent years the parkway has been augmented by a bicycle/pedestrian path of complementary winding character.

Federal acquisition of land northward continued from the 1930s to 1966: The 9.7-mile north leg of the Virginia parkway from Memorial Bridge to the interstate Beltway was completed in 1965 at a cost of $30 million. The 7.7-mile Maryland section on the opposite shore (renamed the Clara Barton Parkway in 1989) cost $18 million. The entire parkway is composed of 7,146 acres, of which 44 percent are developed (road, pavement, lawn) and 42 percent are natural woodlands; about 300 acres of scenic easements offer additional protection.

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[48] Letter to Joseph T. Shirley (17 November, 1927), RG 328.

[49] Department of Transportation, America's Highways, p. 329, 396.

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SUTTLAND PARKWAY: 1943–1944

As the 1940s approached, highways, expressways, and turnpikes took on new and more exacting connotations--and were in great demand. The lagging economy and impending war demanded that speed, safety, and efficiency take precedent over aesthetic considerations. With these ideals gaining strength, parkways could no longer be developed strictly as pleasure roads.

> By the 1930s especially express highways [were promoted] with a view toward rescuing their cities. As urbanites moved to the suburbs of deteriorating and congested cities, planners insisted that an accelerated road program would hasten traffic flow and boost morale and economic development. . . . Highway building was a form of social and economic therapy.[50]

Post-Depression unemployment was great, and throughout the 1930s President Franklin D. Roosevelt thought "principally of highway building as part of a package aimed at relieving unemployment"; yet, by 1939 he still "simply could not make up his mind about the relationship between road building and economic recovery." Meanwhile, the Bureau of Public Roads began to press for a 30,000-mile national expressway system.[51]

A highway-needs study of the Baltimore-Washington region reported that parkways are intended "for passenger vehicle use only, and to accommodate high-speed vehicles without interference from other vehicles which may stop or start to load or unload passengers or enter or depart from such highways"; while freeways are "designed to accommodate passengers and commercial traffic."[52] And while the emphasis was clearly moving away from pleasure motoring, it remained an integral-if-diminishing component of general road construction, for the Federal Highway Act of 1938 (section 8) provides:

> For the construction and maintenance of parkways, to give access to national parks and national monuments, or to become connecting sections of a national parkway plan. . . .[53]

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[50] Mark Rose, Interstate: Express Highway Politics 1941-56 (Lawrence: Regents Press of Kansas, 1979), p. 5.

[51] Rose, p. 2, 4, 10.

[52] E.D. Merrill to Thomas MacDonald (19 March, 1945), RG 328.

[53] Memo for A.E. Demaray, Appendix A, p. 1.

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With World War II came a modern and new justification for a road type that combines parkway principals with freeway efficiency; its model was the sleek, direct, and high-speed orienred German autobahen. Beginning in 1941, FDR called for a priority on "roads important to national defense," and later that year he restricted the Federal Works Administration to approving only those road projects "essential to national defense as certified by the appropriate Federal defense agencies."[54] This included access roads to military installations, defense plants, airports, and ports. The Defense Highway Act of 1941 appropriated $10 million in federal monies to this end, to be matched with state funds.

Suitland Parkway (1943-44) exemplifies such a defense highway, although its origin lays with the McMillan Commission's plans. The nine and one-half-mile dual-road parkway connects South Capital Street in the District to Route 4 in Maryland, and Bolling Field with Andrews Air Force Base (formerly Camp Springs Army Air Base). The $6 million construction cost was part of the Camp Springs development, pushed through Congress as a War Department expenditure. Plans to extend it eastward to the Chesapeake Bay were never fulfilled.

The parkway remained unfinished in 1945 when it became the responsibility of the National Park Service, and so it remains today. Yet, "it was so designed and construction so executed that the roadway system could be ultimately developed into a fully landscaped parkway."[55] About four miles of the "B roadway" in Maryland is unpaved, so traffic shares a single, undivided 24-foot lane. Five major bridges traverse the parkway, whose right-of-way is composed of nearly eighty-eight acres. Other characteristics include some at-grade crossings, semi-maintained buffer plantings, and a variable-width median 6 to 200 feet wide. The parkway's unfinished and uncharacteristic state must have been perceived as an invitation for improvement, for in 1958 it was proposed to bring it up to "freeway standards at several points."[56]

One function of a defense highway was to be impervious to air attack. Thus, a typical parkway site--fitted to the natural contours of the landscape--would provide a detour and scatter area, while plantings would provide camouflage for vehicles seeking concealment. While the efficient autobahen formula did enhance the safety and the speed factors, it failed as a defensible avenue because, noted one Bureau of Public Roads representative: "I recall how effectively these direct and highly conspicuous arteries, passing from one important center to another, can be used to guide

[54] Rose, p. 12.

[55] D.G. White to T.S. Settle (22 April, 1948), RG 328.

[56] Washington Star ??

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hostile air attack to its important objectives."[57] The limited access of parkways and military highways also permitted easy closure to non-military traffic in times of emergency.[58] This application was later confirmed when justifying the Baltimore-Washington Parkway.

While construction of non-military projects was stalled until "September 6, 1945, when Harry S Truman dropped wartime controls [and] normal state and federal road construction got underway," the planning process continued all the while.[59] Congress had approved a national system of interstate highways and a system of secondary and feeder roads in rural areas with passage of the Federal-Aid Highway Act 1944. In the meantime, FDR also created the Interregional Highway Committee, which included Frederic Delano of the NCP&PC (and FDR's uncle), and Rexford Tugwell, who worked on the planned city of Greenbelt. Road construction was a high priority:

> This deferment of normal construction programs has resulted in a huge backlog of needed highway facilities which is most serious in and near cities where traffic congestion is our country's No. 1 post-war highway problem.[60]

It is not surprising, then, that "the years after 1945 were especially prosperous for members of the road transport and highway construction industries." And between 1946-50, state, local, and federal officials spent $8.4 billion--more than any previous five-year period in history.[61]

In this hurried context, landscape architects continued to assert that even the most efficient and streamlined road could be improved at no extra cost through preliminary incorporation of landscape features like grade differentials and plantings. Characteristics essential to parkway aesthetics also benefitted highway design, though they were considered unnecessary. "Most of these practices have been dictated. . .by the criterion of beauty," asserted one critic. "Yet time has proved not only their

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[57] H.S. Fairbank, "Military Highways," Proceedings of the 27th Annual Highway Conference, vol. 43 (July 24, 1941), p. 37.

[58] Carl W. Wild, "Designing Highways for Peace and Defense," Landscape Architecture, vol. 32, no. 4 (July 1942), p. 137-39.

[59] Rose, p. 12.

[60] Wilbur Simonson, "Advanced Designs for Post-War Highway Needs," Landscape Architecture, vol. 33 (July 1943), p. 130.

[61] Rose, p. 29, 31.

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popularity, but also their promotion of safety, comfort, and speed with respect to traffic, and efficiency with respect to maintenance and operation.[62]

These not unfamiliar factors include the elimination of grade crossings, the aesthetic treatment of bridges with material such as rough-faced stone, elimination of access to abutting properties, and separation of directional traffic by a central, planted strip. With the maturation of parkway use and design from pleasure motorway to a thoroughfare aimed at speed, safety, and national defense, the elements were in place for development of the Baltimore-Washington Parkway.

BALTIMORE-WASHINGTON PARKWAY: 1942–1954

The Baltimore-Washington Parkway (BWP) stretches [illegible]ty-nine miles northeastward from the capital to Baltimore: the northern ten miles were built and are maintained by the state of Maryland; the southern nineteen miles (to Jessup Road) were built by the Bureau of Public Roads and are maintained by the National Park Service. Although completed after mid-century, a Baltimore-to Washington route was studied and promoted from the 1920s as a proper entry to the capital, and a safer option to the near-parallel U.S. Route 1, unanimously proclaimed one of the deadliest stretches of road in the nation.

Here, era and function are reflected in a design that blends parkway principles with post-war austerity. The route accesses Fort Meade, the Agricultural Research Center, and the then-experimental Greenbelt community, as well as other reservations that abut more than half its course. By extending the road to Baltimore, Maryland grabbed the opportunity to develop an important route at relatively small expense.

The forested flanks and modest natural topography are much-suited to high-speed appreciation. This is speculatively the simple background envisioned by landscape architect T.C. Jeffers, for the parkway was never technically completed with a comprehensive planting plan. The bridge designs also indicate a concession to economy. The crossings over and visible from the parkway are clad in the rough-faced stone associated with structures of the 1920-30s, while the bridges underneath are unadorned concrete arches.

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[62] Laurie D. Cox, "Appearance: Essential Element in Superhighway Plans," Landscape Architecture, vol. 32, no. 2 (January 1942), p. 55-56.

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A $2 million appropriation in 1942 took the BWP as far as land acquisition and piecemeal grading, which was followed by eight years of continued design and discussion over funding and purpose. Although the war threat had passed, the thoroughfare was justified like Suitland Parkway. "This is, in reality, a national-defense road," one congressman testified in 1950 hearings. "If this is not a national-defense road from here to Fort Meade and the other Federal reservations, it would be difficult to point one out."[63] The federal portion of the parkway today retains its scenic qualities and characteristics, and serves as a primary intercity and regional route. Stylistically it reflects the final gasp of parkway development, as the aesthetics originally intended as park connectors merged with high-speed expressway design.

Thus, as the parkways of the national capital were systematically conceived during the first half of the twentieth century, in the wake of the precedent-setting parkway network of suburban New York, their design and implementation reflect a transportation priority. Recreation, conservation, commemoration, and military defense are diminishing--and often overlapping--secondary justifications. After World War II, creative parkway development was--for all practical purposes--eclipsed by modern highway construction.

[63] Congressional Record, vol. 96, no. 103, 1950, p. 7131.

II. Description continued

by local and visiting citizenry. All associated architectural and landscape architectural characteristics typify the period of parkway development--from the early twentieth century to World War II. For each, traffic is limited to non-commercial motoring; single- and dual-lane roads fit the natural topographic contours, and variable-width medians separate lanes when possible; indigenous vegetation has been preserved, maintained, and encouraged, especially as right-of-way buffer from adjacent property owners; limited access and few, if any, at-grade crossings enhance factors of speed and safety; and private access and commercial frontage is banned, as is unsightly signage. Bridges, culverts, walls, and similar structures are designed as harmonious complements to the natural environment. Materials such as rustic rough-cut stone masonry and concrete are used in eclectic and romantic compositions of horizontal, arched designs. All properties remain largely unchanged from their period of development, and are used today for their original purpose of transportation in and around Washington, D.C.

III. Significance continued

for a parkway type of thoroughfare. Consistently intended as a transportation route, the Rock Creek and Potomac Parkway and strip parks also represent natural-resource conservation efforts; the Mount Vernon Memorial Highway/George Washington Memorial Parkway, a ceremonial and recreational route; Suitland, a defense highway; and the Baltimore-Washington Parkway, a defense and intercity highway. After the precedent-setting network of suburban New York parkways--after which it was idealized--Washington's system is the most comprehensive and monumental extant in the nation. Aesthetically unaltered, the parkways remain vital components of the regional transportation arteries and they continue to contribute to the historic symbolism and design of the nation's capital.

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APPENDIX G

LIST OF POTENTIAL CONSULTING PARTIES

Proposed Section 106 Consulting Parties

Revised list of proposed consulting parties submitted to VDHR on August 24, 2012:

- The National Park Service, George Washington Memorial Parkway (GWMP);
- The United States Army Corps of Engineers (USACE);
- The Tuscarora Nation (Federally Recognized);
- The Mattaponi Tribe;
- The Pamunkey Tribe;
- The Chickahominy Tribe
- The Eastern Chickahominy Tribe
- The Rappahannock Tribe
- The Upper Mattaponi Tribe;
- The Nansemond Tribe;
- The Monacan Indian Nation;
- The Cheroenhaka (Nottaway) Indian Tribe of Southampton County;
- The Nottaway Indian Tribe of Virginia;
- The Patawomeck;
- Arlington County Department of Community Planning, Housing & Development and its Neighborhood Services Division;
- Arlington County Department of Parks and Recreation;
- City of Alexandria Office of Historic Alexandria;
- City of Alexandria Department of Planning and Zoning, Historic Preservation Office;
- Alexandria Archaeology;
- Alexandria Historical Society;
- Arlington Historical Society;
- National Railway Historical Society – Old Dominion Chapter;
- Virginia Historical Society;
- Del Ray Citizens Association;
- Lynhaven Civic Association;
- Alexandria Federation of Civic Associations;
- North Old Town Independent Citizens Association (NOTICe), of Alexandria, Virginia;
- Potomac Greens Homeowners Association;
- Old Town Greens Townhome Owners Association;

- Aurora Highlands Civic Association (in Arlington);
- Arlandria Chirilagua Business Association;
- Del Ray Business Association;
- Old Town Business and Professional Association.

APPENDIX J:

PHOTOGRAPHIC PLATES

Plate 1: View northbound on the MVMH/PNCR from the entrance to the Daingerfield Island Marina parking lot

Plate 2: View southbound on the MVMH/PNCR near Four Mile Run

Plate 3: View northwest showing Abingdon Apartments (Potowmack Crossing at

Old Town Condominiums) from W. Abingdon Drive

Plate 4: View southwest showing Abingdon Apartments (Potowmack Crossing at Old Town Condominiums) from W. Abingdon Drive

Plate 5: View west of Mason Hall Apartments from W. Abingdon Drive

Plate 6: View northeast from Bashford Lane and E. Abingdon Drive showing Harbor Terrace Apartments

Plate 7: View south east from Bashford Lane and N. Pitt Street showing the Bashford Hall Apartments

Plate 8: View southeast from Bashford Lane and E. Abingdon Drive showing Locharbor Gardens Apartments

APPENDIX K:

SECTION 106 PROJECT INITIATION MEETING MINUTES

JULY 9, 2012

Potomac Metrorail Station Environmental Impact Statement (EIS)
Meeting with Virginia Department of Historic Resources
July 9, 2012
Meeting Minutes

Participants:

Andrea Kampinen- Virginia Department of Historic Resources (VDHR)
Roger Kirchen- Virginia Department of Historic Resources (VDHR)
James Ashe- Washington Metropolitan Area Transit Authority (WMATA)
Alan Tabachnick- AECOM, Inc.
Brian Albright- AECOM, Inc.
Mark Niles- AECOM, Inc.
Daniel Koenig- Federal Transit Administration (FTA) (via telephone)

Introductions

- Jim Ashe of WMATA introduced himself, the consultant team from AECOM, and Daniel Koenig from FTA to the VDHR staff
- Jim Ashe of WMATA provided an overview of the Potomac Yard Metrorail Station project and described the four alternatives under consideration for the Draft EIS. The Alternatives consist of the No-Build Alternative and Build Alternatives A, B, and D.

Proposed level of effort and archeological testing strategy on property east of WMATA Metro Line and just south of Four-Mile Run

- Brian Albright of AECOM described the proposed Phase 1 archeological testing for the property located between the George Washington Memorial Parkway and the WMATA Metrorail Blue/Yellow Line corridor just south of Four-Mile Run within the current limits of disturbance for Build Alternatives A, B and D and the proposed Area of Potential Effect (APE) for archeology. The proposed testing consists of regularly spaced shovel test pits (STPs).

- Brian Albright indicated that areas located on the eastern periphery of the Potomac Yard Rail Yard property likely avoided much of the disturbance and filling associated with the construction, operation and eventual demolition of the rail yard during the twentieth century. This area was also identified as an area of archeological concern by the NPS.

Proposed level of effort and proposed testing strategy of undeveloped property between GWMP and WMATA corridor

- For the undeveloped floodplain west of the GWMP and east of the WMATA Metrorail Blue/Yellow Line, Brian Albright proposed limited Phase I archeological testing in the form of test unit (TU) excavation. He explained that given the presence of bounding wetlands and active railroad corridors, mechanical trenching is not feasible at this location.

- Brian Albright explained that a cultural resources reconnaissance was previously conducted for the southern portion of the undeveloped floodplain west of the GWMP and east of the WMATA Metrorail Blue/Yellow Line in 1981. Based on existing geotechnical boring data from 11 locations in this area and the absence of artifacts on the disturbed surface, the area was previously characterized as having low potential for archeological resources. However, historic aerial photography indicates that this area was used for the disposal of fly ash during the middle to late twentieth century, which may have capped any intact natural soil horizons. Although there is no definitive evidence of intact buried surfaces, some evidence of capping of remnant natural topsoil with gravel and ballast materials was documented in 1996 for the northern and eastern parts of the Potomac Yard site.

Proposed level of effort and proposed testing north of Four Mile Run and west of WMATA Blue/Yellow Line corridor

- Based on previous studies and recommendations in 1996, 2007, and 2010, Brian Albright proposed no Phase I archeological testing west of the CSXT corridor. No areas of extensive buried intact soil predating the construction and operation of the rail yard have been identified in the vicinity of Build Alternatives A, B and D.

- Brian Albright indicated that for the northern and western portions of the former Potomac Rail Yard, trenches and geotechnical borings indicate a comprehensive removal of the natural topsoil as part of the construction of the rail yard and subsequent filling with gravels and ballast material.

- Brian Albright also proposed no Phase I testing of the area between the CSXT corridor and the WMATA Metrorail Blue/Yellow Line corridor since no direct permanent effects are anticipated in this area and since both remain active railroad corridors.

Discussion of proposed archeological testing strategy

- VDHR staff agreed with the proposed archeological testing strategy and approach.

- VDHR Staff requested that the proposed archeological testing strategy and work plan be circulated to National Park Service (NPS) and to the City of Alexandria to get their concurrent review and approval of the work plan. VDHR staff emphasized that all three agencies need to agree with the approach to completing the work.

- VDHR Staff also noted that City of Alexandria has substantial expertise on the land and resources within their jurisdiction and want to make sure that their available information is considered in the analysis. Brian Albright noted that AECOM has coordinated with them already and had gathered their information.

- FTA suggested that the APE for archeology be slightly expanded to the east include all of the area between the temporary construction limits and the western edge of the southbound George Washington Memorial Parkway to accommodate flexibility in the potential location of the construction access driveways from the parkway. VDHR, WMATA and AECOM staff agreed to make this adjustment and reflect this change in the ARPA permit application submitted to NPS to conduct testing on NPS property. The ARPA permit area will also be expanded to the north and south as well to allow greater flexibility for design changes after the selection of a preferred alternative.

Proposed APE for architecture and justification

- Alan Tabachnick of AECOM presented a proposed APE for historic architectural resources bounded by US 1 (south of Four Mile Run) and CSXT Railroad (north of Four Mile Run) on the west, Ronald Reagan National Airport Access Road on the north, northbound lanes of the George Washington Memorial Parkway on the east, and Slaters Lane on the south.
- The Mount Vernon Memorial Parkway/George Washington Memorial Parkway and the Washington National Airport Terminal and South Hangar are two known historic architectural resources within the proposed APE
- Potowmack Crossing at Old Town Condominiums is a historic architectural resource in the proposed APE that is more than 50 years old and has not been previously surveyed.
- VDHR staff agreed with the proposed APE for historic structures

Discussion of proposed scope of work for architectural survey

- VDHR staff requested that the Potowmack Crossing at Old Town Greens be surveyed and that a VDHR survey form be prepared for this resource.

- VDHR agreed that no other properties will need to be surveyed.

AECOM

Agenda: VDHR Consultation for the Potomac Yard Metrorail Station Project (DHR File # 2012-0717

Date: Monday, July 9, 2012, 2:00 PM EST

Moderator: Alan Tabachnick, AECOM

Participants:

AECOM
Mark Niles
Brian Albright
Alan Tabachnick

VDHR
Andrea Kampinen
Roger Kirchen

FTA
Daniel Koenig

WMATA
Jim Ashe

Discussion Topic:

1. Introductions;
2. Discussion of level of effort and proposed testing strategy on property east of WMATA Metro Line and just south of Four-Mile Run;
3. Discussion of level of effort and proposed testing strategy of undeveloped property between GWMP and WMATA corridor;
4. Discussion of recommendation of no testing north of Four Mile Run and west of WMATA Blue/Yellow Line corridor;
5. Discussion of changes to the proposed APE for architecture and justification;
6. Discussion of proposed scope of work for architectural survey.

Notes: See Attached

Any questions, comments, additions, please contact: Alan D. Tabachnick, AECOM - Transportation
609-599-4261 ext. 41; 215-370-3579 (cell); alan.tabachnick@aecom.com

Proposed Phase I Archeological Testing Strategy at Potomac Yard

1) Based on the current Limits of Disturbance (LOD) for Build Alternatives A, B and D and the proposed Area of Potential Effect (APE) for archeology, no archeological testing is recommended north of Four Mile Run (Figure 1). Historic mapping (Bureau of Soils 1915; Boschke 1861; Hopkins 1879; USGS 1945) indicates that those portions of the LOD and APE north of Four Mile Run occupy made-land constructed between 1915 and 1945.

2) Phase I archeological testing in the form of regularly spaced shovel test pits (STPs) is recommended on property between the George Washington Memorial Parkway (GWMP/SR 400) and the WMATA Metrorail Blue/Yellow Line corridor just south of Four-Mile Run within the current LOD for Build Alternatives A, B and D and the proposed APE for archeology. The areas to be tested measure approximately 2 ac in total extent. In addition to being located in an area of archeological concern identified by the NPS, historic mapping (BoS 1915; Boschke 1861; Hopkins 1879; USGS 1885, 1945), digital data (National Cartography and Geospatial Center n.d.), historic aerial photography (EROS 1974; NETR 2009) and previous studies (Cheek and Heck 1996) indicate that these areas located on the eastern periphery of the Potomac Yard Rail Yard property likely avoided much of the disturbance and filling associated with the construction, operation and eventual demolition of the rail yard during the twentieth century. An ARPA permit application has been submitted to the NPS requesting permission to conduct Phase I archeological testing in these areas.

3) Limited Phase I testing in the form of test unit (TU) excavation is recommended in the area of direct, permanent impact to the undeveloped floodplain west of the GWMP and east of the WMATA Metrorail Blue/Yellow Line corridor. In 1981 on behalf of the United States Army Corps of Engineers (USACE), a cultural resources reconnaissance was conducted of the southern three-quarters of this area (Israel 1981) for its use as a potential dump site for dredge spoils. Based on geotechnical boring data from 11 peripheral locations and the absence of artifacts on the ñdisturbedò surface, Israel characterized this area as having low potential for archeological resources and recommended no additional testing. However, historic aerial photography indicates that this area was used for the disposal of fly ash during the middle to late twentieth century (NETR 2009). This practice may have effectively capped any intact natural soil horizons. Although definitive evidence for the presence of intact buried surfaces was lacking, some evidence for the incidental capping of remnant natural topsoil with gravel and ballast materials at Potomac Yard was documented by Cheek and Heck (1996) particularly in the northern and eastern limits of their project area. Given the presence of bounding wetlands and active rail road corridors, mechanical trenching is not feasible at this location.

4) Based on previous studies and recommendations (Adams 1996; Thunderbird Archeology 2007; Mullen 2010) phase I archeological testing is not recommended west of the CSXT corridor. Although some areas of intact buried natural soils were identified in previous studies (TA 2007; Mullen 2010), particularly toward the south of the proposed APE, no areas of extensive buried intact soil predating the construction and operation of the rail yard (c. 1906) have been identified in the vicinity of Build Alternatives A, B and D. In almost all cases in the northern and western portions of the Potomac Yard rail yard, trenches and geotechnical borings alike point to a comprehensive removal of the natural

topsoil as part of the construction of the rail yard and subsequent filling with gravels and ballast material at the beginning of the twentieth century.

5) As no direct permanent effects are currently anticipated and since both remain active rail road corridors, no phase I testing of the narrow area between the CSXT corridor and the WMATA Metrorail Blue/Yellow Line corridor is recommended.

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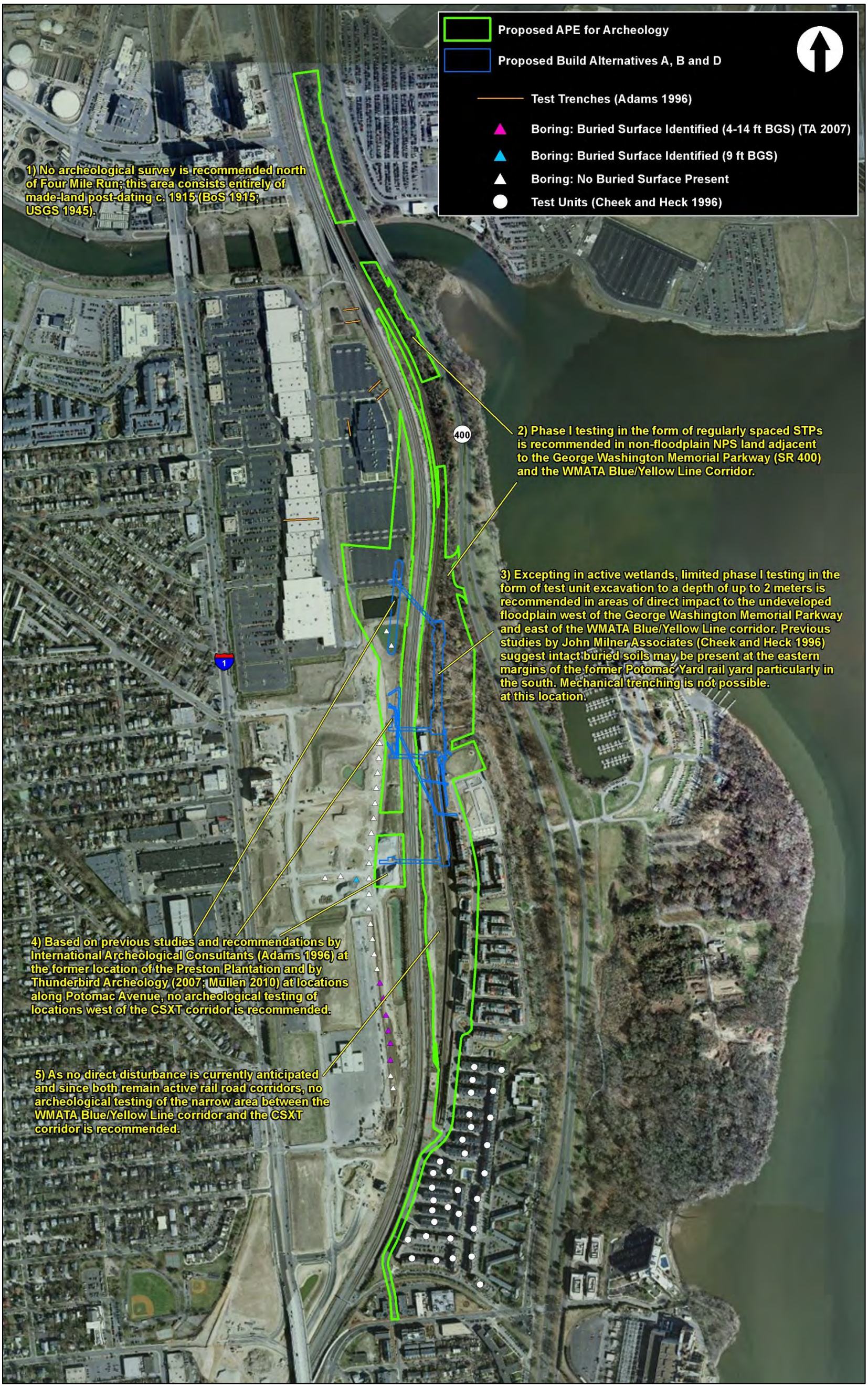

Figure 1: Proposed Archeological Testing Strategy (ESRI 2012).

Proposed Reconnaissance-Level Historic Architectural Survey

1) A Reconnaissance-Level Historic Architectural Survey is recommended to solidify the proposed APE (Figure 2) and to identify any historic architectural resources over 50 years of age in the APE. The study will be submitted in a combined report with the archaeological study.

    - Background research and a vehicular survey conducted for the Project Review Form determined that two known historic architectural resources are located within a possible APE:
        - Washington National Airport Terminal and South Hangar Line (000-0045), Arlington County (NRHP: 9-12-97; VLR: 6-27-95)
        - Mount Vernon Memorial Parkway/George Washington Memorial Parkway (029-0218), Arlington and Fairfax Counties and City of Alexandria (NRHP: 5-1981; VLR: 3-17-1981)

    - Background research and a vehicular survey also revealed that there is one historic architectural resource over 50 years of age within the APE that has not been previously surveyed:
        - Potowmack Crossing at Old Town Condominiums, Alexandria

2) An architectural historian will conduct a pedestrian survey of the project area to determine the extents of the indirect APE and identify and photograph all resources over 50 years of age located in the APE. The resources listed below will be surveyed and any additional resources will also be recorded.
3) Background research will be conducted at VDHR and at local and regional repositories to prepare a historic context for the project area.
4) As part of this effort, interested and consulting parties will be identified and letters will be sent out to invite them to participate and share any background information they may have on the area. It is anticipated that the interested and consulting parties will include (but not be limited to) the following organizations:
    a. Arlington Countyôs Office of Neighborhood Program, Historic Preservation Program
    b. City of Alexandriaôs Department of Planning & Zoning and Office of Historic Preservation
    c. Alexandria Historical Society
    d. Arlington Historical Society
    e. Virginia Historical Society
    f. National Park Service
5) The report will also list any locally listed landmarks and coordination with local entities that may be required for this project
6) Information gathered during the background research and during the reconnaissance survey will be analyzed and compiled into a report that will be combined with the archaeological study and submitted to VDHR for review, comment, and concurrence.

Figure 2: Proposed APE for Architecture (ESRI 2012).

APPENDIX L:

SECTION 106 AGENCY COORDINATION LOG

Potomac Yard Metrorail Station Environmental Impact Statement
Section 106 Coordination Log

Format	Date	From	To	cc	Subject	Status
Letter	5/10/12	FTA	VDHR		Section 106 consultation initiated by FTA with VDHR (VDHR File No. 2012-0717). Initiation package included the proposed Areas of Potential Effects (APE) for historic architectural resources and archaeology.	Complete
Letter	6/12/12	VDHR	FTA		VDHR concurrence that the project was a "federal undertaking" subject to Section 106 review and provided general comments on the proposed undertaking.	Complete
Meeting	7/9/12				Project Section 106 Initiation Meeting held at VDHR offices in Richmond, Virginia. Representatives of VDHR, FTA, WMATA and AECOM in attendance. See meeting notes for summary of action items and discussion topics.	Complete
Deliverable	7/10/12	AECOM	NPS-NCR		Application for Permit for Archaeological Investigations (ARPA) to for the proposed Phase I Archaeological Survey.	Complete
Deliverable	7/24/12	FTA	VDHR, AA and NPS		Submittal of proposed Phase I archaeological testing methodology to the VDHR, AA, and the NPS for review and comment.	Complete
Deliverable	8/28/12	FTA	VDHR		Submittal of Potowmack Crossing at Old Town Condominiums Reconnaissance Level Survey Form through the VDHR Data Sharing System (DSS).	Incomplete
Approval	8/28/12	NPS-NCR	AECOM		Issuance of ARPA Permit# 12-GWMP-00 to conduct Phase I Archaeological Investigations within the GWMP.	Complete
Email	9/7/12	AA	FTA		AA concurrence on phase I methodology for archaeology.	Complete
Email	9/10/12	VDHR	FTA		VDHR concurrence on phase I methodology for archaeology.	Complete
Email	9/18/12	NPS	FTA		NPS concurrence on phase I methodology for archaelogy.	Complete
Email	DATE	FTA	VDHR		Submittal of proposed consulting parties list to VDHR.	Complete

Potomac Yard Metrorail Station Environmental Impact Statement
Section 106 Coordination Log

Format	Date	From	To	cc	Subject	Status
Letter	9/21/12	FTA	Consulting Parties		Invitations to potential Section 106 consulting parties. See mailing list for complete list.	In Progress
Email	10/18/12	VDHR	FTA		VDHR request for revisions to the Survey Form. Revisions are underway and will be resubmitted to VDHR in early January 2013. VDHR review and concurrence with the eligibility assessment can take up to 30 days.	In Progress
Email	10/22/12	VDHR	AECOM?		VDHR request to prepare an Effects Assessment Report for historic architectural resources in the APE.	In Progress
Deliverable	11/9/12	AECOM	NPS-NCR		Submittal of preliminary ARPA report to NPS-NCR for review and comment in accordance with ARPA 12-GWMP-006.	Complete
Deliverable	11/9/12	AECOM	AA		Submittal of preliminary ARPA report to NPS-NCR for review and comment in accordance with ARPA 12-GWMP-006.	Complete
Email	11/27/12	AA	AECOM		Comments on the Draft preliminary ARPA report.	Complete
Email	12/6/12	NPS-NCR	AECOM		Comments on the Draft preliminary ARPA report.	Complete
Deliverable	12/21/12	AECOM	NPS-NCR, AA		Submittal of finalized preliminary ARPA report.	Complete
Deliverable	12/7/12	FTA	VDHR		Submittal of Draft DSS archaeological site forms for review and comment.	Complete
Deliverable	Anticipated January 2013	FTA	VDHR		Submittal of Draft Phase I Cultural Resources Survey Report for review and comment.	Not Completed
Deliverable	Anticipated January 2013	AECOM	NPS-NCR		Submittal of Draft Phase I Cultural Resources Survey Report for review and comment.	Not Completed
Deliverable	Anticipated January 2013	FTA	VDHR		Submittal of Draft Historic Architectural Effects Assessment Report	Not Completed

Potomac Yard Metrorail Station Environmental Impact Statement
Section 106 Coordination Log

Format	Date	From	To	cc	Subject	Status
Deliverable	Anticipated January 2013	FTA	VDHR		Submittal of Final Phase I Cultural Resources Survey Report for review and comment.	Not Completed
Deliverable	Anticipated January 2013	AECOM	NPS-NCR		Submittal of Final Phase I Cultural Resources Survey Report for review and comment.	Not Completed

POTOMAC YARD METRORAIL STATION
ENVIRONMENTAL IMPACT STATEMENT

Administrative Review Draft
Air Quality
Technical Memorandum

February 2013

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APPENDIX C: 2012 FINANCIALLY CONSTRAINED LONG RANGE TRANSPORTATION PLAN PROJECT AMENDMENT

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1.0 INTRODUCTION

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Alexandria, as the project sponsor and joint lead agency, have prepared a Draft Environmental Impact Statement (Draft EIS) in accordance with the National Environmental Policy Act (NEPA) for the proposed Potomac Yard Metrorail Station ("the project"). The Draft EIS has been prepared in cooperation with the Washington Metropolitan Area Transit Authority (WMATA) and the National Park Service (NPS).

This technical memorandum identifies the potential effects to air quality of the No Build and three Build Alternatives. The memorandum describes the following:

- Project alternatives
- Applicable regulations and guidance
- Methodology
- Opening year conditions
- Potential effects of each alternative (note that construction effects are described separately in the Construction Impacts Technical Memorandum)
- Mitigation

The findings of this analysis will be incorporated into the Draft EIS.

1.1 Project Alternatives

The Draft EIS evaluates a No Build Alternative and three Build Alternatives. Each Build Alternative includes the same area improvements as the No Build Alternative in addition to construction and operation of a Metrorail station.

1.1.1 No Build Alternative

The No Build Alternative is defined as the existing highway and transit network and committed transportation improvements from the National Capital Region Transportation Planning Board's Financially Constrained Long Range Plan (CLRP). The Draft EIS assumes that any improvements that are anticipated to be implemented by the project horizon year, whether physical or operational, are part of the No Build Alternative, with the exception of the new Metrorail Station at Potomac Yard.

The No Build Alternative includes the build-out of an internal street network within Potomac Yard (roughly from Four Mile Run to Braddock Road) and additional investments in transit and bicycle/pedestrian facilities, including a pedestrian bridge over the Metrorail and CSX Transportation (CSXT) rights-of-way between Potomac Greens and Potomac Yard. Anticipated transit investments include the Crystal City/Potomac Yard (CCPY) Transitway and an expansion of local transit service. The No Build Alternative also includes an off-street, multi-use trail through the planned linear park between Potomac Avenue and the CSXT right-of-way. This new off-street, multi-use trail will enhance access to the existing regional trail network, which serves both recreational users and commuters.

1.1.2 Build Alternatives

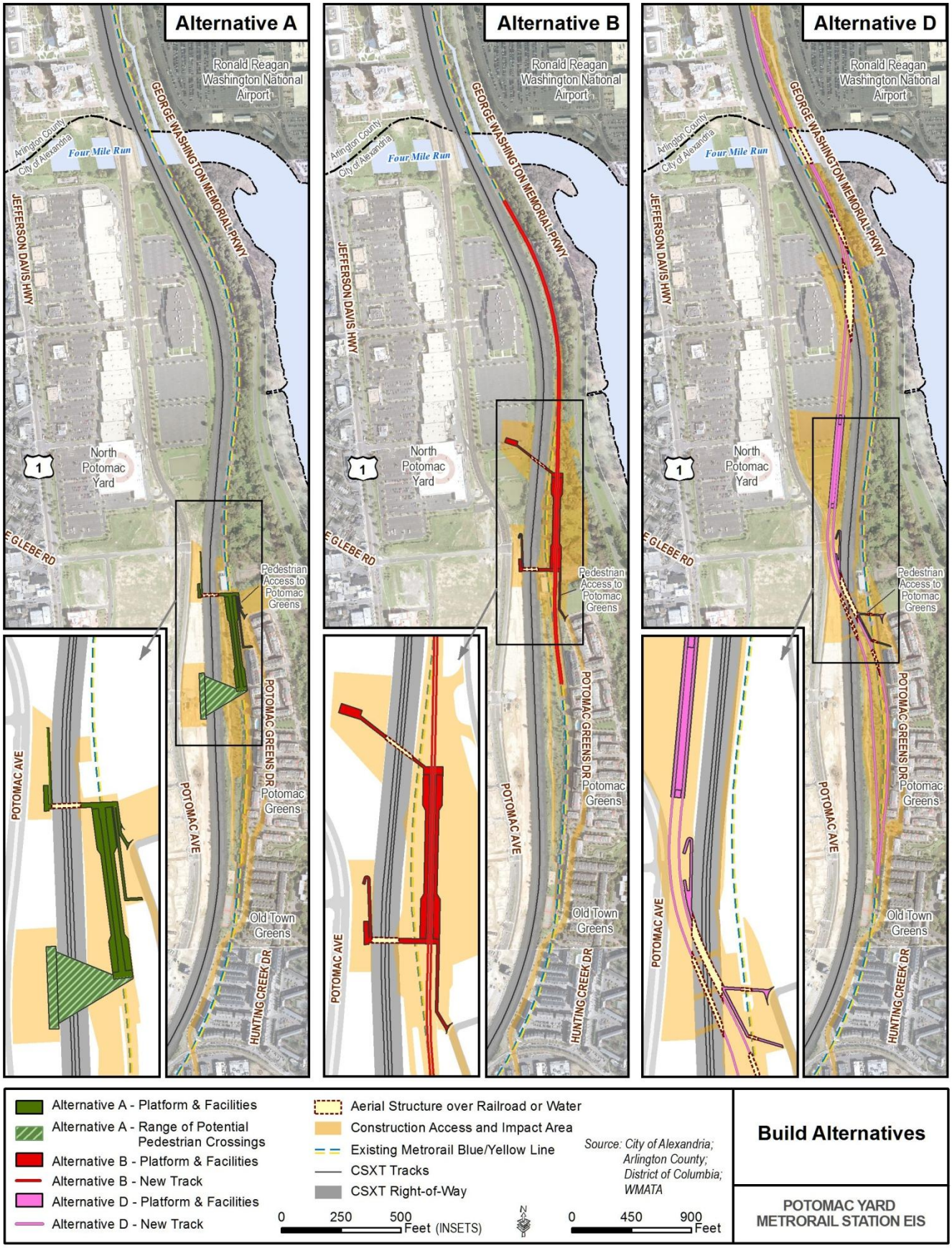
The Build Alternatives are described below and shown in **Table 1-1** and **Figure 1-1**.

Build Alternative A

Build Alternative A would be located between the CSXT right-of-way and the north end of the Potomac Greens neighborhood in the existing Metrorail Reservation easement designated during earlier planning efforts for the Potomac Yard area. The station would be at-grade with a side platform layout. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the northern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative A would require minimal track realignment within the station area and would include construction of a double crossover located approximately 900 feet south of the station.

Figure 1-1: Build Alternatives



Build Alternative B

Build Alternative B would be located between the George Washington Memorial Parkway (GWMP) and the CSXT right-of-way, north of the Potomac Greens neighborhood, and east of the existing Potomac Yard Shopping Center and the CSXT right-of-way. The station would be at-grade. Additional station facilities would include two pedestrian bridges from the station over the CSXT right-of-way to the planned development in Potomac Yard. The bridge at the southern end of the station would provide 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood.

Build Alternative B would require the realignment of approximately 650 feet of existing track, as well as the installation of approximately 1,450 feet of new track. Special track work – a double crossover – would be required approximately 100 feet north of the station.

The new track and station would be built on retained fill, and a new retaining wall would be constructed on the east side of the track and station to support the structures.

Build Alternative D

Build Alternative D would be located west of the CSXT right-of-way near the existing Potomac Yard Shopping Center. The station would be aerial with a center platform layout. One pedestrian bridge over the CSXT right-of-way would be constructed, providing 24-hour pedestrian/bicycle access between Potomac Yard and the Potomac Greens neighborhood. The pedestrian bridge would be parallel to the adjacent new Metrorail bridge over the CSXT right-of-way.

Build Alternative D would require the realignment of approximately 550 feet of existing track, as well as the installation of approximately 5,800 feet of new track. The majority of new track would be elevated. Build Alternative D would also include construction of two Metrorail aerial bridges crossing the CSXT right-of-way to the north and south of the station, and a new, single span, aerial structure over Four Mile Run. Construction of a double crossover would be required in a location approximately 100 feet north of the station. Following completion of construction, the old Metrorail tracks would be removed from service.

Additional structural improvements would include the removal and replacement of the existing retaining wall near the Potomac Greens neighborhood and the removal of an additional retaining wall west of the existing Metrorail tracks, north of the portal at the southern end of the neighborhood.

Table 1-1: Build Alternatives

Alternative	Type and Layout	Track Work	Facilities for Station Access	Additional Structures Required
Build Alternative A	At-grade, side platform	Minimal track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	None
Build Alternative B	At-grade, side platform	Moderate track work	Two pedestrian bridges over CSXT right-of-way; access to Potomac Greens via walkway	Structures (retaining wall) to support new track and station
Build Alternative D	Aerial, center platform	Major track work	One pedestrian bridge over CSXT right-of-way to provide access between Potomac Yard and Potomac Greens	Two aerial structures over CSXT right-of-way, one Metrorail bridge over Four Mile Run, aerial track and supports, and retaining wall replacement on the east and west sides of the tracks north of the existing Metrorail portal. New structures would pass over the existing Metrorail tracks, which would be removed following construction.

Note: Track work for Build Alternatives B and D assumes existing Blue and Yellow Line Metrorail track would be removed where track is realigned.

1.2 Applicable Regulation and Guidance

This section describes the applicable federal, state and local regulations and guidance for conducting the air quality analysis.

1.2.1 Clean Air Act (42 USC 85)

The Clean Air Act (CAA), as amended, is the basis for most federal air pollution control programs. The U.S. Environmental Protection Agency (USEPA), under the CAA, regulates air quality nationally and delegates authority to the Virginia Department of Environmental Quality (VDEQ) for monitoring and enforcing air quality regulations in the Commonwealth of Virginia. The *Virginia State Implementation Plan* (SIP), developed in accordance with the CAA, contains the major state-level requirements with respect to transportation in general.

Any project constructed in the Commonwealth of Virginia must comply with the National Ambient Air Quality Standards (NAAQS), a set of standards established by USEPA under the authority of the CAA for various "criteria" of air pollutants described in more detail in the Methodology section.

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

Under the CAA, it is the responsibility of federal agencies, such as FTA, to ensure that a proposed project conforms to the SIP. As the region's metropolitan planning organization, the National Capital Region Transportation Planning Board (TPB) requires transportation conformity to ensure that those transportation activities which receive federal funding and approval are consistent with air quality goals. USEPA promulgated the *Transportation Conformity Rules* under the CAA, as amended (40 CFR Parts 51 and 93).

1.3 Methodology

1.3.1 National Ambient Air Quality Standards

As described in the previous section, any project constructed in the Commonwealth of Virginia has to achieve compliance with the National Ambient Air Quality Standards (NAAQS), a set of standards established by USEPA under the authority of the CAA for various "criteria" air pollutants. **Table 1-2** lists the NAAQS for the seven criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and Pb.

1.3.2 Pollutants of Concern

The pollutants that are most relevant to the project are those principally traceable to motor vehicle engines and electrical power plants. In the study area, ambient concentrations of CO and O_3 are predominantly influenced by roadway motor vehicle activity. Emissions of Volatile Organic Compounds (VOCs), Nitrogen Oxide (NO_x), PM_{10}, and $PM_{2.5}$ come from both mobile and stationary sources, while emissions of SO_x and Pb are associated mainly with various stationary sources. Pollutant emissions from electric-powered transit vehicles are expected to be minor and generally occur well outside the study area. This is partly because of the comparatively small proportion of expected future train activity to the existing and future roadway motor vehicle activity in the project study area. Electricity purchased from the national electrical grid may be produced by either fossil-fueled power plants, nuclear plants, or renewable energy plants.

Table 1-2: National and Virginia Ambient Air Quality Standards

Pollutant	Standard Type	Averaging Period	Standard Concentration[1]
Carbon Monoxide (CO)	Primary [2]	8-Hour average	9 ppm [3]
	Primary	1-Hour average	35 ppm
Nitrogen Dioxide (NO_2)	Primary and Secondary	Annual arithmetic mean	53 ppb [4]
	Primary	1-Hour average	100 ppb
Ozone (O_3)	Primary and Secondary	8-Hour average	0.075 ppm [5]
Sulfur Dioxide (SO_2)	Primary	Annual arithmetic mean	0.03 ppm
	Primary	24-Hour average [6]	0.14 ppm
	Secondary	3-Hour average	0.5 ppm
	Primary	1-Hour average [7]	0.075 ppm
Particulate Matter (PM_{10}) [8]	Primary and Secondary	24-Hour average	150 µg/m^3 (9)
Particulate Matter ($PM_{2.5}$) [10]	Primary and Secondary	Annual arithmetic mean	15 µg/m^3
		24-Hour average	35 µg/m^3
Lead (Pb)	Primary and Secondary	3-month rolling average	0.15 µg/m^3

[1] Short-term standards (1 to 24 hours) are not to be exceeded more than once per calendar year.
[2] Former national secondary standards for carbon monoxide have been repealed.
[3] Concentrations are shown in parts per million (ppm), milligrams per cubic meter (mg/m^3) or micrograms per cubic meter (µg/m^3).
[4] The official level of the annual NO_2 standard is 0.053 ppm; 53 ppb is shown here for a clearer comparison to the 1-hour standard.
[5] Maximum daily one-hour (eight-hour) average. The ozone standard is attained when the expected number of days with maximum hourly (eight-hourly) average concentrations above the value of the standard, averaged over a three year period, is less than or equal to one. The O_3 criterion was updated by USEPA on May 27, 2008 from 0.08 to 0.075 ppm.
[6] National standards are block averages, which represent a static moving average.
[7] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.
[8] PM_{10} refers to particulate matter with an aerodynamic diameter of 10 microns and smaller. Particulates over 10 microns are captured in the nose and throat and are readily expelled from the body. The majority of PM emissions from mobile sources are attributed to diesel vehicles.
[9] For each particle size, the annual PM standard is met when the three-year average of the annual mean concentration is less than or equal to the value of the standard. The 24-hour PM_{10} ($PM_{2.5}$) standard is met when the three-year average of the annual 99th (98th) percentile values of the daily average concentrations is less than or equal to the value of the standard.
[10] $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter of 2.5 microns and smaller. Particles smaller than 2.5 microns can reach the air ducts (bronchi) and the air sacs (alveoli) and have been associated with increased incidence of respiratory diseases such as asthma, bronchitis, and emphysema; cardiopulmonary disease; and cancer. The majority of PM emissions from mobile sources are attributed to diesel vehicles.
Note: CO, NO_2, O_3, and PM are transportation-related pollutants.
Source: 40 CFR 50, National Primary and Secondary Ambient Air Quality Standards.

1.3.3 Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). There are six main GHGs generated by human activities: carbon dioxide (CO_2), nitrous oxide (N_20), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are generated from both direct sources and indirect sources. Vehicles, which are considered an indirect source of GHGs, contribute to climate change primarily through the burning of gasoline and diesel fuels. The GHGs associated with transportation uses are water vapor, CO_2, CH_4, and N_20. CO_2 comprises most of the emissions from transportation uses.

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

1.3.4 Analysis of Opening Year Conditions

Opening year conditions were evaluated using data from VDEQ air quality monitoring stations identified in the study area vicinity.[1] VDEQ maintains an area-wide network of monitoring stations that routinely measure pollutant concentrations in the ambient air. These stations provide data to assess air quality compliance with the NAAQS proximate to the project study area and to evaluate the effectiveness of pollution control strategies. **Figure 1-2** shows the closest monitoring stations, which include:

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

The relevant monitored pollutants are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), fine particulate matter (both $PM_{2.5}$ and PM_{10}), and sulfur dioxide (SO_2).

1.3.5 Impact Analysis

Regional Air Quality Conformity Determination

To demonstrate compliance with the federal Transportation Conformity Rule, a regional conformity determination is required. The project is included in the TPB 2012 CLRP (see **Appendix C** for CLRP project amendment). Because the project is included in the region's CLRP, which was approved by TPB on July 18, 2012, the project is assumed to comply with both the region's air quality conformity goals and the SIP. The project is included in the region's current approved *2013-2018 Transportation Improvement Program* (TIP).

Hot-Spot Analysis

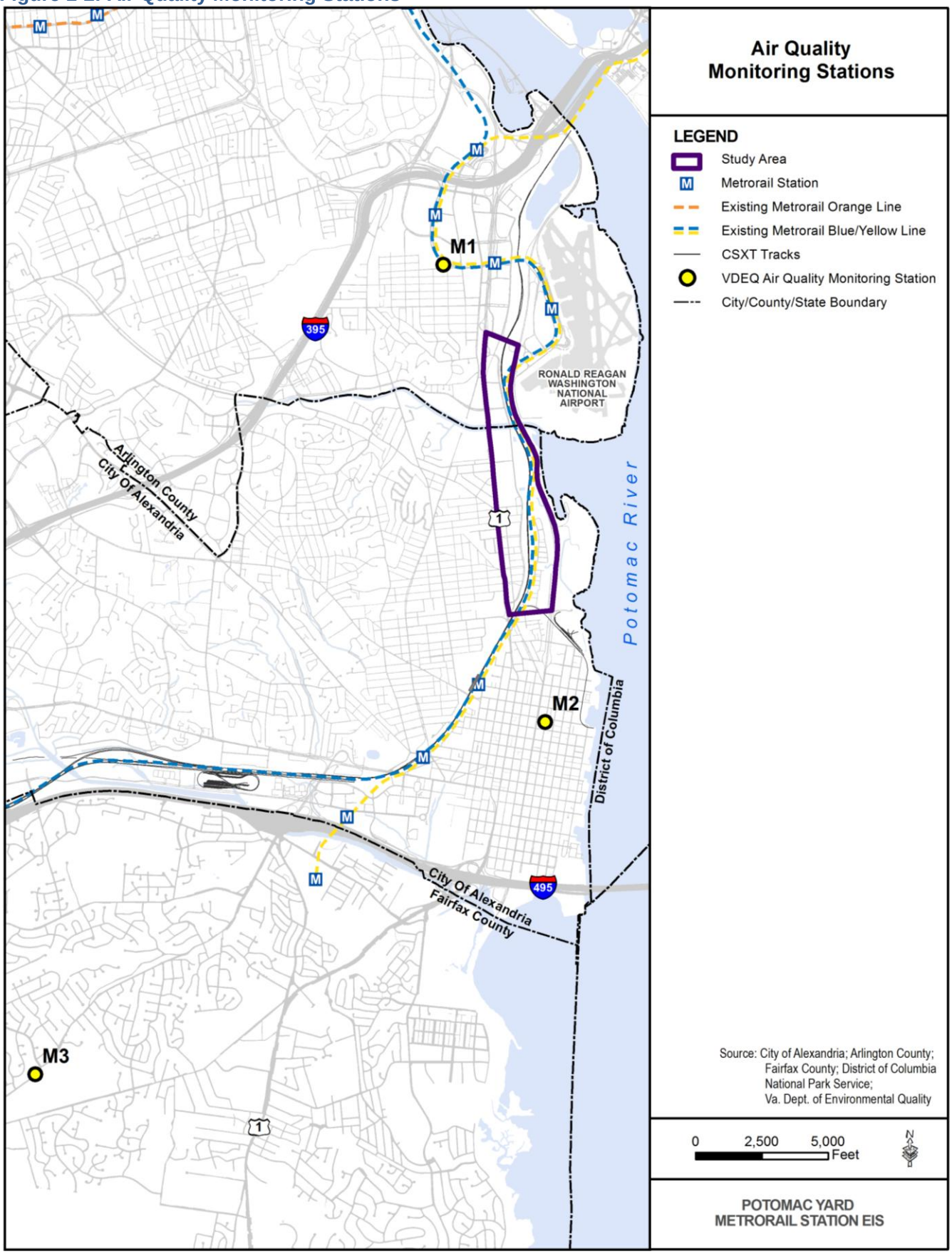
To determine whether a localized pollutant emissions "hot-spot" analysis was required for the project, the study reviewed the Transportation Conformity guidelines "Procedures for determining localized CO, PM_{10}, and $PM_{2.5}$ concentrations (hot-spot analysis)", as described in 40 CFR 93.123. According to these guidelines, the project would not exceed the relevant criterion in 40 CFR 93.123(b)(1)(iii). Specifically, the project would not create "new bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location." Based on Appendix B of USEPA's *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (March 2010), an example of a project that is not an air quality concern under 40 CFR 93.123(b)(1) would be a "new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles, including such projects involving congested intersections operating at level of service (LOS) D, E, or F)."

Two feeder bus lines would service the Potomac Yard Metrorail Station; however, these existing bus routes currently operate in the project area and would simply add the station to their existing route. Even if the future bus dwell times at the station would be slightly longer than at a current bus stop, the slight increase would not result in a "significant number of diesel vehicles congregating at a single location" as defined by 40 CFR 93.123.

Although motor vehicle emissions at congested intersections are the predominant source of CO, the surrounding region of the study area continues to be designated as in attainment for CO. The region is currently classified as a CO "maintenance area" due to a documented violation almost 30 years ago. However, a CO hot-spot analysis is not required, because the project is not expected to significantly degrade the LOS at nearby congested intersections.

[1] Monitoring stations were identified through the VDEQ Air Monitoring Site Information Database Website (http://vadeq.ipsmtx.com/cgi-bin/site_info.pl).

Figure 1-2: Air Quality Monitoring Stations



The traffic analysis conducted for the project found that overall congestion delay at study intersections does not increase as a result of the project (see the *Potomac Yard Metrorail Station EIS Transportation Technical Memorandum*). Also, as recent concentrations of CO monitored in the vicinity of the project by VDEQ in Arlington County and the City of Alexandria are well below the NAAQS, no exceedances would be reasonably expected under the Build Alternatives as a result of any insignificant increases in intersection delay. The maximum 8-hour concentrations of 1.4 to 1.8 ppm monitored over the past three years are well below the applicable CO standard of 9 ppm.

Based on the insignificant level of bus service proposed for the project, neither a qualitative nor a quantitative $PM_{2.5}$ or CO hotspot analysis is required for this project, because it is not a project of local air quality concern under 40 CFR 93.123(b)(1). The CAA Amendments and the Transportation Conformity requirements are met without a hot-spot analysis because this project has been found not to be of air quality concern under 40CFR 93.123(b)(1). Consequently, the project meets statutory and regulatory transportation conformity requirements for $PM_{2.5}$ without a hot-spot analysis.

2.0 OPENING YEAR CONDITIONS

Table 2-1 presents the maximum concentrations for criteria pollutants measured at three representative monitoring station sites closest to the study area, as reported by VDEQ for the three most recent years for which data are available (2009-2011).

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

Table 2-1: Regional Ambient Air Quality

Pollutant	Site Name[3]	Period	Units	NAAQS	Type	Measured Concentration		
						2009	2010	2011
Ozone[1]	Arlington	8-hour	ppm	0.075	Primary/Secondary	0.067	**0.087**	**0.087**
$PM_{2.5}$ [(2)]	Arlington	24-hour	µg/m^3	35	Primary/Secondary	23	22	22
		Annual	µg/m^3	15	Primary/Secondary	10.1	10.4	10.4
PM_{10}	Alexandria	24-hour	µg/m^3	150	Primary/Secondary	50	42	43
CO	Arlington	1-hour	ppm	35	Primary/Secondary	1.7	2.3	4.2
		8-hour	ppm	9	Primary/Secondary	1.6	1.8	1.4
NO_2	Arlington	1-hour	ppb	100	Primary	46	52	46
		Annual	ppb	53	Primary/Secondary	15	16	ND[4]
SO_2	Alexandria	Annual	ppm	0.03	Primary	ND	ND	ND
		24-hour	ppm	0.14	Primary	65	10	6
		1-hour	ppm	0.075	Primary	35	17	14
		3-hour	ppm	0.5	Secondary	55	17	ND
Pb	Fairfax	Annual	µg/m^3	0.15	Primary/Secondary	0.006	0.005	0.004

[1] The reported pollutant concentration for ozone is the fourth highest 8-hour level. The Commonwealth of Virginia, in accordance with VDEQ Chapter 30, does not always select the maximum measured concentration to determine the attainment status for a given criteria pollutant.
[2] The reported pollutant concentration for $PM_{2.5}$ is the 98th percentile level. The Commonwealth of Virginia, in accordance with VDEQ Chapter 30, does not always select the maximum measured concentration to determine the attainment status for a given criteria pollutant.
[3] The VDEQ monitoring sites include South 18th and Hayes Street in Arlington County, Site ID 510130020 (Arlington); 517 North Saint Asaph Street, Alexandria Health Center, Site ID 515100009 (Alexandria); and Groveton in Fairfax County, Site ID 510590030 (Fairfax).
[4] ND denotes that no data were available from VDEQ or USEPA.
Note: **Bolded** numbers exceed NAAQS.
Source: VDEQ Air Monitoring Website (http://www.deq.state.va.us/airmon/publications.html, accessed June 2012).

Recent monitored values of secondary particulate precursors, such as nitrogen dioxide (NO_2) and sulfur dioxide (SO_2), are decreasing. This downward trend in NO_2 and SO_2 may be due to the ultra-low sulfur diesel (ULSD) fuel that has been used for the past several years. The ULSD fuel has a sulfur content of only 15 ppm compared to the previous diesel fuel, which had a sulfur content of 500 ppm.

3.0 POTENTIAL EFFECTS

3.1 No Build Alternative

The No Build Alternative is anticipated to have air quality conditions similar to existing conditions.

3.2 Build Alternatives

Since the Potomac Yard Metrorail Station is not a project of local air quality concern under 40 CFR 93.123(b)(1), no potential effects are expected on regional air quality. The project is included in the TPB 2012 CLRP. Therefore, the project meets statutory and regulatory transportation conformity requirements without a hot-spot analysis.

Greenhouse Gas Emissions

Table 3-1 lists the opening year regional average weekday VMT for the No Build and Build Alternatives. The Build Alternatives would result in slight decreases in VMT (approximately 2,500 fewer weekday VMT out of 106,258,400 total regional VMT) and in vehicle trips (600 fewer weekday vehicle trips out of 13,553,000 total regional trips), relative to the No Build Alternative as a result of personal automobile trips diverted to transit. As the difference in total vehicle trips and VMT at the regional level is insignificant, there would be no substantial effect on GHG emissions by the Build Alternatives.

Table 3-1: Opening Year Average Weekday Vehicle Trips and Vehicle Miles Traveled (VMT)

	No Build Alternative	Build Alternative A	Build Alternative B	Build Alternative D
Average Weekday Total				
Vehicle Trips	13,553,633	13,552,996	13,552,998	13,552,940
VMT	106,258,351	106,255,941	106,255,921	106,255,698
Change versus No Build Alternative				
Vehicle Trips	-	(637)	(635)	(693)
VMT	-	(2,410)	(2,430)	(2,653)

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

4.0 MITIGATION MEASURES

4.1 No Build Alternative

As no project elements are proposed under the No Build Alternative, no mitigation is proposed.

4.2 Build Alternatives

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

APPENDIX A:
REFERENCES

Regulatory Guidance

40 CFR 93, *Determining Conformity of Federal Actions To State or Federal Implementation Plans.*

Clean Air Act of 1963 (42 U.S.C. §§ 85).

National Ambient Air Quality Standards (NAAQS) – as of October 2011. U.S. Environmental Protection Agency. Accessed at: http://www.epa.gov/air/criteria.html.

Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas. U.S. Environmental Protection Agency. EPA-420-B-040. December 2010.

Reports

Financially Constrained Long-Range Transportation Plan – 2012. Metropolitan Washington Council of Governments, Accessed August 1, 2012. http://www.mwcog.org/clrp/projects/search.asp.

Transportation Improvement Program for the Metropolitan Washington Region FY2013-2018. Metropolitan Washington Council of Governments, Accessed July 18, 2012. http://www.mwcog.org/clrp/projects/tip/fy1318.asp.

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Databases

Air Monitoring Site Information, 2012. Virginia Department of Environmental Quality. Accessed at: http://vadeq.ipsmtx.com/cgi-bin/site_info.pl.

Map Data

Arlington County, GIS data CD, 2011.

City of Alexandria, GIS data DVD, Spring 2012.

District of Columbia, DC GIS Geodatabase, June 2011.

National Park Service, GIS data, 2010.

Washington Metropolitan Area Transit Authority, survey data and aerial imagery, 2011.

APPENDIX B:
LIST OF ACRONYMS AND ABBREVIATIONS

BMPs	best management practices
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	methane
CLRP	Constrained Long Range Plan
CO	carbon monoxide
CO_2	carbon dioxide
FR	Federal Register
FTA	Federal Transit Administration
GHG	greenhouse gases
HFCs	hydrofluorocarbons
LOS	level of service
MWCOG	Metropolitan Washington Council of Governments
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NO_x	nitrogen oxide
NO_2	nitrogen dioxide
N_2O	nitrous oxide
O_3	ozone
Pb	lead
PFCs	perfluorocarbons
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
SF_6	sulfur hexafluoride
SIP	State Implementation Plan for Air Quality
SO_2	sulfur dioxide
TPB	Transportation Planning Board (National Capital Region)
TIP	Transportation Improvement Program
USEPA	U.S. Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VMT	vehicle miles traveled
VOC	volatile organic compounds

APPENDIX C:

FINANCIALLY CONSTRAINED LONG RANGE PLAN PROJECT AMENDMENT